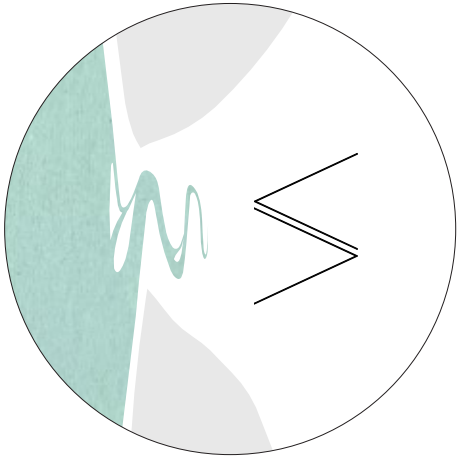


Diplomarbeit

The Vjosa / Aoos River Region
Part two: Albania

ausgeführt zum Zwecke der Erlangung des akademischen
Grades eines Diplom-Ingenieurs unter der Leitung von

Univ.Prof. Dipl.-Ing. M.Arch. (AA Dist) Tina Gregoric Dekleva
E253/1, Abteilung für Gebäudelehre und Entwerfen

eingereicht an der Technischen Universität Wien
Fakultät für Architektur und Raumplanung von

Basilis Neururer
1027050

Wien, Dezember 2019

ABSTRACT

The Vjosa (Albanian) or Aoos (Greek) is Europe's last wild, free-flowing river. Apart from the first 10 km, it is completely undisturbed by dams and hydropower plants and can flow freely from its source to the mouth, forming an incredibly dynamic and impressive river system, that is without par in Europe. With plans for the edification of 2796 hydro power plants in the Balkan Peninsula, 38 of which are located on the Vjosa and its tributaries, this natural heritage is in imminent danger.

This diploma is aimed at offering an alternative to the use of the river purely as a source of energy. Based on a thorough analysis of the river region and its potentials we propose a regional strategy that offers specific impulses for a sustainable development of the region.

As a result, six architectonic interventions spread out across the entire region and embedded in a newly conceived Vjosa/Aoos hiking trail, highlight its unique natural beauty as well as local features of the region.

Die Vjosa (albanisch) oder der Aoos (griechisch) wird als der letzte Wildfluss Europas bezeichnet. Fast gänzlich ungestört von Dämmen und Wasserkraftwerken kann er von Quelle bis Mündung frei fließen und bildet somit zusammen mit den Zuflüssen ein unglaublich dynamisches und beeindruckendes Flussystem, das in dieser Form in Europa einzigartig ist. Dieses Naturerbe ist mittlerweile durch den Bau von 2796 Wasserkraftwerken in der gesamten Balkanregion akut bedroht, 38 davon sollen in den nächsten Jahren an der Vjosa entstehen.

Ziel der Arbeit ist es, ein Alternative zu der geplanten Nutzung des Flusses als reinen Energielieferanten darzustellen.
Basierend auf einer umfassenden Analyse der Flussregion und deren Potentialen, entsteht eine regionale Strategie, anhand derer gezielte Impulse für eine nachhaltige Entiwcklung gesetzt werden können.

Sechs konkrete architektonische Enwtürfe, eingebettet in einen neu konzipierten Vjosa/Aoos Wanderweg, sollen sowohl das einzigartige Naturerlebnis als auch kulturelle und lokale Besonderheiten in den Vordergrund rücken.

PREFACE

The aim for our thesis was to develop a project from a thorough regional analysis with a strong local influence. We wanted it to be bottom-up, grown from discussions, influenced and steered by the people who will use it. It should become a project that connects to real places, real people and real stories.

Having decided the general direction of the project, we had to find a region that we would work on. Our starting point was the idea of finding an area that we could relate to through our cultures, passions and individual background. Vlad remembered an area which he often visited in his youth located in the eastern-most part of Romania, the Danube delta, where the Danube enters the Black Sea; a vast natural park, mostly untouched due to its limited access and only scarcely used for tourism, with a lot of untapped potential. Simultaneously, it triggered Basilis' passion for fly-fishing; the endless canals, streamlets and tributaries of the Delta. The thought of a river that connected Vienna to so many other cities and countries, across several borders, fascinated us. But the sheer size of the river seemed overwhelming, simply too big for our cause. However, a river was a logical starting point for our project. Rivers usually offer a huge variety of landscapes, change seasonally, connect settlements, village and cities and are central to many human activities. They host everything that is vital for the survival, development and growth of a region. Rivers are and have always meant life.

Combing through our memories and experiences, we remembered a specific river that we had heard of from different sources, scientific journals, environmental activists and the outdoor and fly-fishing community; The river Vjosa, or Aoos in Greek, the last free-flowing river in Europe.

Basilis Neururer and Vlad Popa

TABLE OF CONTENT

I.

Introduction

Meaning of Rivers

An Introduction

'I do not know much about gods; but i think that the river is a strong brown god – sullen, untamed and intractable."
T.S. Eliot in Four Quartets

As a source of both beauty and destruction, rivers have always found a place in literature, poems and paintings. They are present in every human landscape, drawn on every map and woven into every folklore tale. Even the Book of Genesis describes a river watering the Garden of Eden, humanity's first home, that separates into four headwaters, the Pishon, Gihon, Tigris and Euphrates.[1]

Throughout history rivers often played an important role as barriers, physical or imaginary, or a connecting thread. They are sources of food and water and inevitably connected to human settlement. As the architecture critic and historian Lewis Mumford has observed "all the great historic cultures ... have thriven through the movement of men and institutions and inventions and goods along the natural highway of a great river"[2], linking the success of civilizations directly to the successful management of water. Their importance in everyday life has made them present even in our language. Metaphorically 'crossing the Rubicon' means passing the point of no return and refers to Caesar crossing the small river in order to conquer Rome.

The significance of a river cannot be disputed, but what exactly is a river?

From a scientific perspective, rivers start at mountain peaks or hilltops, where snowmelt and rainfall wash through underground rivulets to form mountain streams. As they descend, tributaries and groundwater add their volume to form the actual rivers. Cutting through the mountains, they flow from valleys into plains, where they start to meander and braid, seeking the path of least resistance. Eventually they arrive at the mouth, where they join a bigger water body and their sediments wash out to form the most biologically productive parts of the river – the nutrient rich deltas. Their waters evaporate and they enter the next stage of the hydrological cycle, manifesting as clouds and descending back to the mountains where they originated from.[3]

The new encyclopedia Britannica defines a river as a "flowing water in a channel with defined banks".[4] This would mean that a river stops to exist as soon as it dries out, yet we still call them rivers during droughts. The meaning of a river is thus much more complex, it is dynamic and ever changing, difficult to force in between two simple lines, as even the lines are constantly moving according to the amount of water it carries.

I Map of Europe's 135 million rivers

1 Mauch C. and Zeller T. (ed. 2008). p.1
2 Coates P. (2013).
3 McCully P. (2001). 1st chapter
4 Encyclopedia Britannica vol.26 (2007). p.843

River Management

Historic overview

Throughout history, humanity has always sought to take control of rivers and their ever changing lines, in an attempt to keep them at bay and harness their potential. Ever since the earliest 'hydraulic civilisations"[5] started inhabiting the banks of rivers such as the Nile or Indus, and regulating the water flow for the benefit of agriculture and to protect against floods, there have been constant innovations in dealing with flowing waters.

Since the 17th century, scientific methodologies started influencing the works of river management. A seminal book on the topic was 'Travaux de Rhine', published in 1820 by the French engineer M.Fontaine, which set guidelines for regulating the Rhine in France. One of the rules stated that: "No stream or river needs more than one bed" and this thinking greatly influenced the course of action by hydraulic engineers at the time.[6] With the dawn of industrialization in Europe, new tools allowed for river beds to be increasingly straightened and turned into canals to protect our cities from floods and sediment erosion, as well as to facilitate navigation. Previously inaccessible land could be laid dry and reclaimed for agriculture or construction of new settlements. By the beginning of the 20th century, most of the large rivers worldwide had been regulated. The subsequent development of new dam-building technologies meant that complete control of rivers was possible.[7]

Rivers have always played a major role for socio-economic development. While fishing has proven a constant source of food and flowing water has enabled the transport of people and goods, the river water has been essential for domestic, agricultural and industrial purposes. Today, hydropower plants are able to provide entire countries with electricity. Due to the intense use and regulation applied to the global river network, talk of efficient river management has become an important topic. More economically developed European countries, with abundant alternative energy sources, have understood the ecological value of a more natural river state, as well as the growing desire of their citizens to connect more with nature in an increasingly urbanised environment. In response, several de-damming projects have been put into motion and some river sections have been fully renaturated. Landscape architects and urban planners have tried to find solutions to enable leisure and recreation along urban rivers and their alluvial corridors by reverting the functional, regulated river channels to a more natural state. Less developed countries, especially those with abundant river networks, see in hydropower a huge potential for economic growth and are increasingly open to dam construction projects.

Our dependence on hydropower as sustainable energy source has made dams a common feature of European rivers. They obstruct the flow and trap sediments but also create new lakes and spaces for recreational use. This development has changed the appearance of our rivers to such a degree, that we have become incapable of imagining an unregulated river. When we see the open floodplains of the Tagliamento in Italy, we get a glimpse at what rivers and riverbeds used to look like. Although such sights have become scarce in Europe, they still exist in the Balkan Peninsula, which is rightfully known in the community of fly fishermen, kayakers and hikers as the 'Blue Heart of Europe'.[8] With an abundance of wild rivers, clear streams, enormous gravel beds and deep gorges, the Balkan has become a beloved hotspot for outdoor enthusiasts.

5 Wittfogel K. A. (1956). p.152–164
6 Petts G.E. (1999).
7 Gore J.A. and Petts G.E. (2018).
8 Riverwatch (2019). 'Campaign'.

I Plan for the regulation of the Danube river in Vienna around 1931

River Activism

The movement against hydropower

In the last couple of years organisations such as Riverwatch have been working relentlessly to raise awareness about the vulnerability and ecological importance of the Balkan rivers and have been fighting to stop the building of dams in the region. One of these organisations, an NGO called 'Balkan River Defence', arranged a series of kayaking tours, with participants from all over Europe, with the purpose of exploring these last free flowing rivers. During these tours they have organised protests in order to change the mindset of politicians, held workshops and presentations for the locals to communicate the challenges and find solutions together, and even gathered volunteers for river cleanup actions. A documentary presenting their efforts is currently being shown at film festivals around the world and has already received numerous awards.[9]

Every movement needs an example which epitomises its ideals and in the Balkans one river stands out as such. Vjosa, or Aoos, as it is named on Greek territory, with its intact river system is presented as one of the last wild rivers of Europe. At the same time, surprisingly little information exists about it. This has started to change in the last couple of years, with several local and international groups of scientists noticing the potential and conducting research on its ecosystem. As a result, several new papers have been written on the subject, improving our understanding of the river. An additional expedition, 'Scientists for Vjosa', was conducted in 2017 together with 'Riverwatch', 'EuroNatur' and 'EcoAlbania' and 'Balkan River Defence', in response to the imminent dam projects at Poçem and Kalivaç. In total, there are 38 hydropower plants foreseen for the Vjosa catchment area, eight of which would be built in the river basin itself. The initiative focused on the negative environmental impact dams would have on the ecosystem and concluded that maintaining such a dynamic and natural river system, as a base of research, would be of utmost importance as Europe does not possess any other river with these qualities. They have also highlighted the significance as a national heritage as well as the potential for future developments such as tourism, and promoted the idea of a 'Vjosa National Park'.[10] 'Scientists for Vjosa' was presented on the site of Patagonia, the well-known American clothing brand which focuses on sustainability and environmental protection.[11] As a means of spreading the image of the Vjosa, Patagonia has even developed a clothing collection named after the river and sponsored a documentary which presents its story and the imminent danger that hydropower poses.

Other respected broadcasters like Arte and ORF filmed short documentaries of their own depicting the condition of the Vjosa. More recently the Hollywood celebrity and environmentalist Leonardo di Caprio reposted a video on his Instagram account, originally shown in an article written by the New York-based Associated Press news agency, that criticises the dam projects planned along the Vjosa.[12] News of the river is starting to spread in a larger international context.

The pristine image of the river and its ecological significance make for a good story and turn it into the perfect poster child for the movement against hydropower, but what are the alternatives? Could the Vjosa evolve from a symbol to a catalyst for development in the region?

9 Balkan River Defence (2019).
10 Riverwatch (2019). 'Vjosa River'
11 Schiemer F. (2017).
12 Becatoros E. and Flesher J. (2019).

save the blue heart of europe

I 'Vjosa, no dams!', where over 150 participants gathered on the banks of the river to attract the attention of the Albanian prime minister Edi Rama

II.

Water

An analysis of the river

"The Viósa pours through a narrow gorge in the rocks at the foot of Mount Kúdhesi, and above this dark outlet rise the detached and finely-formed mountains of Trebushín and Khórmovo. Immediately below the spectator is the great extent of stony river course, along which the Viósa, no longer confined in its straitened limits – its dark waters sparkling like so many winding threads on a dazzling white ground – rushed in broad freedom, and many-channeld, to the sea."

Edward Lear during his travels in 1848

The Vjosa/Aoos

An introduction

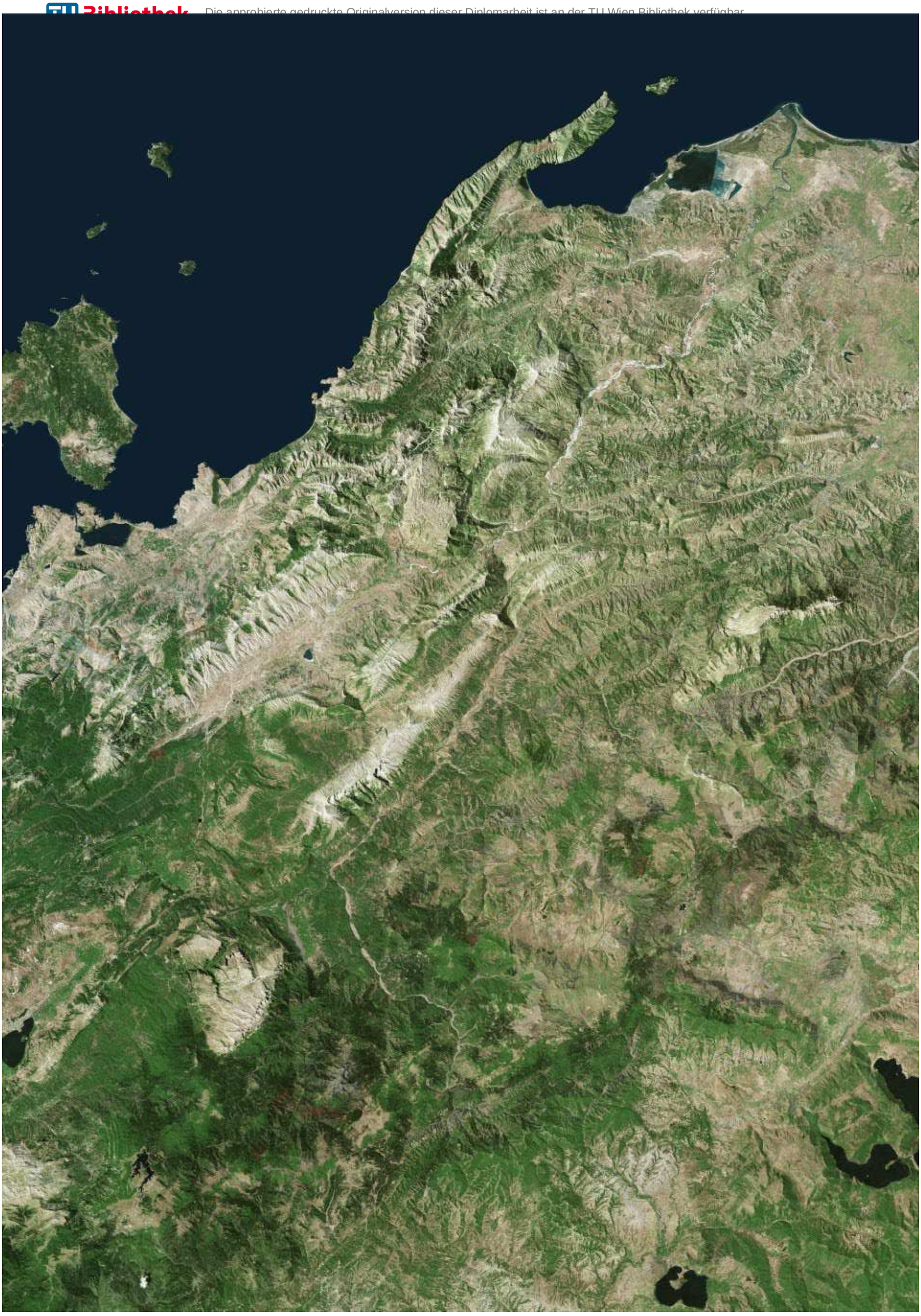
In order to better understand the meaning of the Vjosa/Aoos, we first have to clear the disparity regarding its name. The Greek appellation 'Aous', or 'Aoos' might be derived from the Indo-European root au(e)-, which means to flow[13], or from an ancient Greek dialect, in which 'aa' signifies water. The Albanian Vjosë/Vjosa, as it is referred to in present times, is derived from 'Voioussa' - which was said to mean 'a never failing current'. This form of the name was mentioned by well-known scholars during the 19th century, such as Nicolae Iorga or Conrad Malte-Brun, in their descriptions of the Ottoman Empire.[14] The name of the river might also be related to 'Băiasa', the Aromanian name for the village of Vovousa[15], which is the first settlement along the river's banks. For the purpose of simplicity, we will mention the river as Aoos, on the Greek side and Vjosa on the Albanian side of the border.

The Aoos emerges from the springs reservoir located close to the village of Metsovo, in the northern-most province of Greece, Epirus. In this reservoir, the Aoos Springs dam was built in 1988 and concentrates several small streams into a large artificial lake.[16] From there on, the mountain stream starts its journey again, at this point not much larger than a hand span, and winds its way down, past the stone village of Vovousa. It passes through the valleys of the Vikos-Aoos National Park, past the city of Konitsa where it is joined by one of its main tributaries, the Voidomatis, and across the border to Albania. At the border, it unites with another large tributary and grows substantially in size. The Vjosa continues on past the mountains of southern Albania through a more urbanised landscape and reaches Permet, the largest city along the river. By the time it arrives at Tepelena, it flows into an almost 1km wide riverbed; the uniform channel splitting into little branches and braiding its way through the floodplain. The river continues on through hillsides and flatlands, where it waters extensive agricultural fields between Fier and the coastal city of Vlora, before it finally reaches its estuary in the Adriatic Sea. From the total length of 272 km, approximately two thirds of the Vjosa/Aoos flows through Albania and one third through Greece.

When meeting the river for the first time, it's the beautiful turquoise water that catches the eye. The wild landscapes surrounding it are equally impressive, but when confronted with the enormity of the floodplains at Tepelena or watching the sun set along the wide braids at Byllis, from the hill where the ancient Iliryan ruins still lie, one has to take a moment and reflect upon the surreal beauty of this river.

From a scientific point of view, the context of the river offers a unique opportunity of study. "The floodplains of the Vjosa river in the south of Albania count as one of the most magnificent riparian ecosystems of the Balkan peninsula, standing out due to their natural hydromorphodynamic fluvial processes. A broad main stream with anabranches, open gravel bars and islands, and pioneer vegetation, as well as bushes of willows, poplars and tamarisks give Vjosa's floodplain an extraordinary distinction. Combined with large grasslands and small-area softwood forests, they build the vegetation mosaic along the river".[17]

13 Pokorny J. (1959). p.78
14 Malte-Brun, C. (1827). p.105
15 Lambridis I. (1870).
16 Leontaritis A.D.1 and Baltas E (2014). p.3
17 Rössler N., Egger G., Drescher A. (2018). p.1



The Vjosa/Aoos

The river in numbers

RIVER HARD FACTS

Length 272km

Width up to 2km

Elevation 1300m

Av. discharge 203 m³/s

Bridges 31

TRIBUTARIES

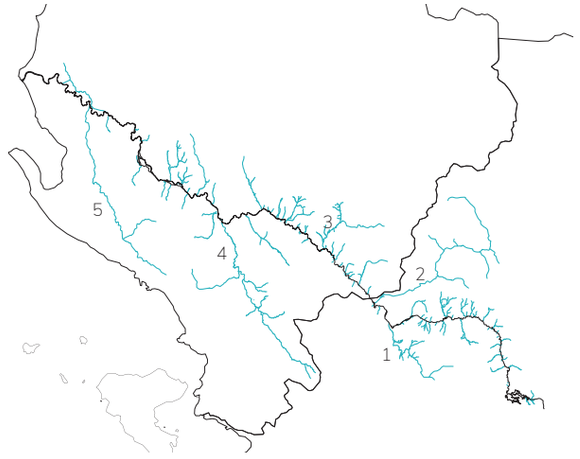
1 Voidomatis 15 km

2 Sarantaporos 50 km

3 Langarica 20 km

4 Drinos 84km

5 Shushica 80 km

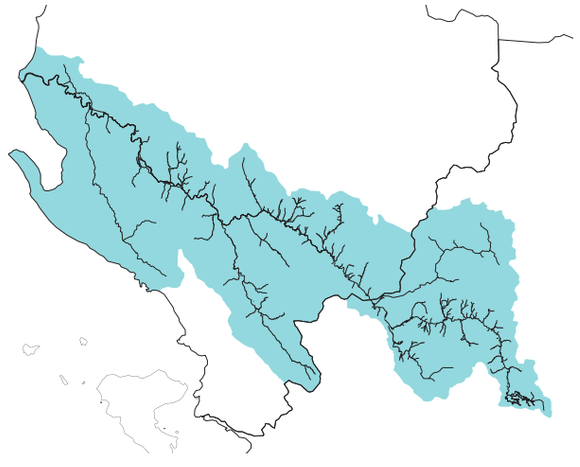


RIVER BASIN

Basin size 6520km²

The basin of the Vjosa/Aoos includes large parts of southern Albania and most of the Pindos mountains.

It is home to many communities of species that have largely or completely disappeared from European river systems. Many of them are endemic to the Balkan Region.



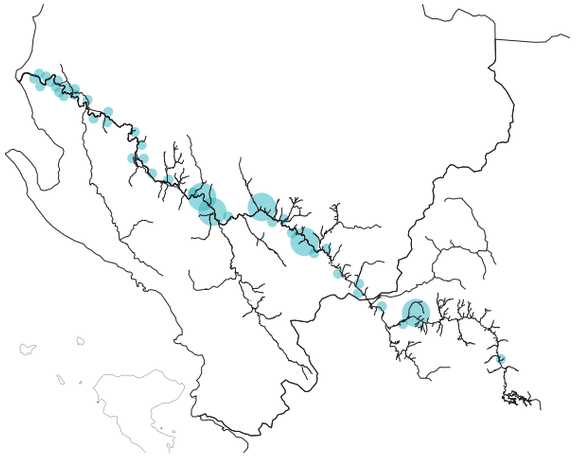
SETTLEMENTS ALONG THE RIVER

Over 40 settlements line the river banks from source to end.

4 of them are located in Greece, in the upper course of the river.

As the river progresses, the valley widens and the density of settlements increases. The highest density is found in the lower course of the river.

The largest of these are Konitsa in Greece and Permet, Kelcyra, Tepelena and Memaliaj in Albania.

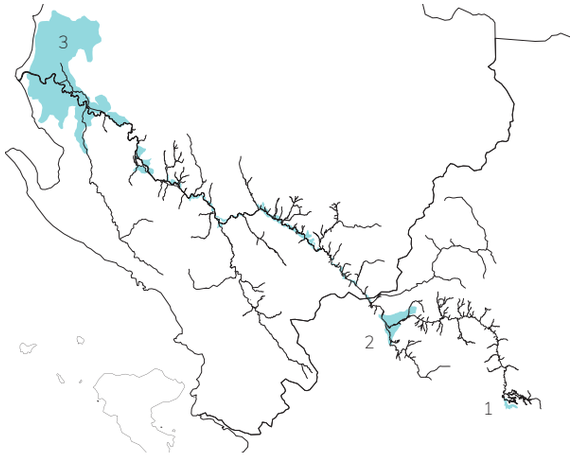


AGRICULTURAL FIELDS

1 Aoos artificial lake
After the first 10km of the river an artificial lake was created for the irrigation of agricultural fields and grazing areas.

2 Konitsa plain
The plains in front of Konitsa are the first location where the river is extensively used for agriculture. From this point until the river estuary, fields line the river banks.

3 Mizeqe plain
The so-called “Albanian granary” are the vast fields of farmland that surround the river close to the delta. They include about 1350km² of fields that mostly produce cotton and grain.



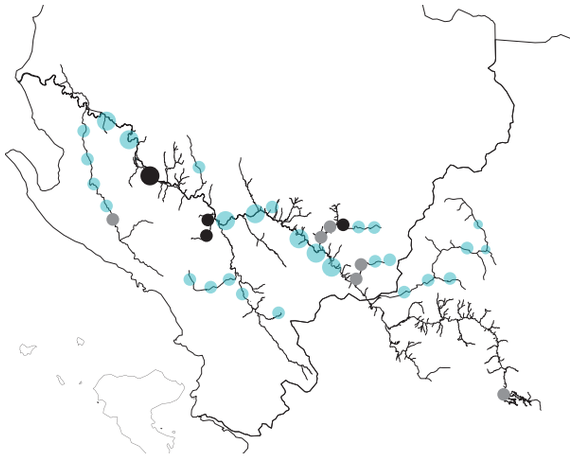
HYDROPOWER PLANTS

38 hydropower plants are projected along the entire length of the Vjosa/Aoos.

6 of them are currently planned in Greece, one - the Pigai large Dam - is already in operation.

31 are planned in Albania, 8 of which are located on the main river, the rest on its tributaries. 4 are completed and construction for another 4 has already started.

- Planned
- Under construction
- Existing



River Comparison

Graphical analysis

In the never-ending quest for electric energy, humanity came across the potential of hydropower as a renewable form of production and started damming rivers all over the planet in order to harness it. This process brought with itself a massive change of the landscape surrounding us. Everybody knows the size of artificial lakes and the imposing appearance of the dams keeping them at bay, as well as the trickle that follows where once there was a river. These artificial lakes submerge large areas of land and their vastness fills up those former valleys and canyons which flowing water took ages to shape. We seem to have forgotten how rivers used to look in their natural state, and this is one of the reasons the Vjosa leaves its visitors in a state of awe.

In order to visualize the effects of anthropogenic interventions we conducted a graphical analysis, in which we compared the Vjosa/Aoos to 6 other rivers from the Balkan Peninsula, with different lengths and degrees of regulation.

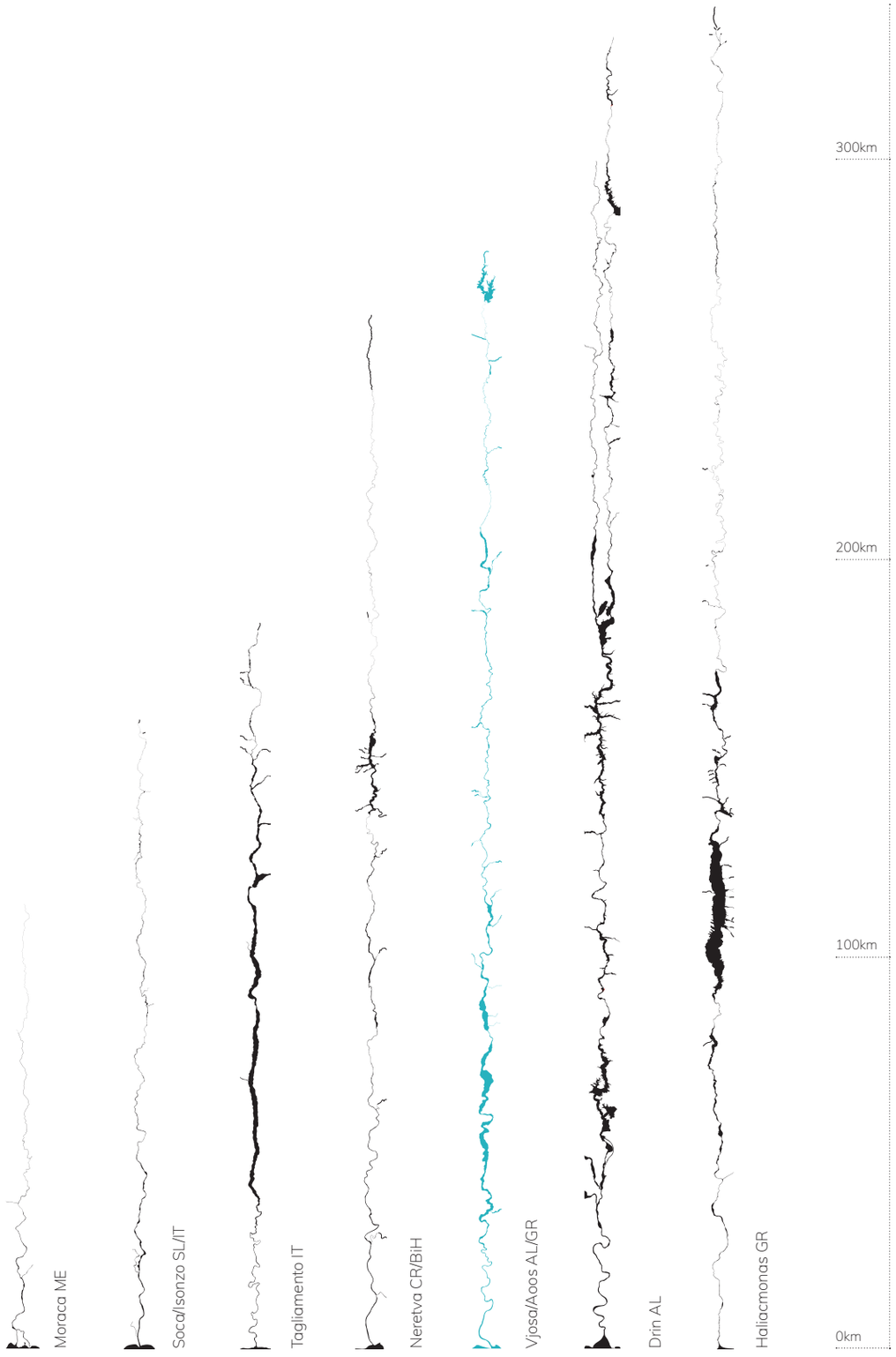
As it can be seen in the adjacent diagram, the Vjosa basin tends to become narrower in a mountainous landscape, before entering a flood plain where it can naturally expand and the water discharge becomes gradually larger, from one measuring station to another.[18]

By comparison, the Drin, a river of great significance for the Albanian economy as the 7 hydropower plants built along it produce most of the country's electricity[19], human regulation caused drastic changes. As described by Ullrich Schwarz in his article on the Drin "The river turns from highly dynamic braided river sections with huge gravel bars and islands into very slow flowing to stagnant (during low water period) reservoirs".[20] This means that the natural shape of the river was altered and it is now widest where it should be narrow.

Another river we looked at is the Haliacmon, the longest river in Greece that springs near the source of the Aoos but discharges into the Aegean Sea. The middle section of the river was transformed into the artificial lake Polyfytos, one of the largest in the country and is clearly distinguishable in the diagram.

Neretva, Tagliamento and Moraca, all discharge in the Adriatic Sea, as well as Soca, a river whose upper part is experiencing a boom in tourism and bears many similarities to the Vjosa/Aoos.

By retracing the watercourse from source to mouth it became apparent how rivers react to obstacles or changes in landscape, either manmade or natural. Certain river typologies vanish completely where water regulation is the strongest, but make room for new bodies of water- big artificial lakes that are used for irrigation and recreational uses while also causing great changes in fauna and flora. Comparing these rivers next to one another allows for river regulation and human intervention to become visible.



18 Leontaritis A.D. and Baltas E. (2014). p.3
19 Wikipedia (n.d.). 'Drin River'.
20 Schwarz U. (2009). p.4

River Profiles

Topographical analysis of the Vjosa/Aoos

The following pages contain an analysis of nine different topographical situations which emerge along the Vjosa/Aoos, each representing different relations between the water surface, the riverbed and the surrounding landscape.

Valley: In the upper course, near the headwaters the river channel is mostly straight and has a steep inclination. The terrain here is rocky and similarly steep, with a tendency of landslides, thus the river shores are hard to access. During floods the velocity of the water and the coarse sediment carried along make these rough sections extremely dangerous.

Gorge: The river cuts deep into the mountains, creating steep walls that make it impossible to access this river section on foot. The mountainous landscapes, where gorges are typically formed, allow for spectacular views of the river from the distance.

Gorge opening: The walls of the gorge gradually widen when opening up to a valley, allowing to walk in between the steep rock formations and the water course.

Confluence: The points where tributaries meet the main river mostly represent natural barriers and one must look for a bridge to cross over to the other side. Strong currents are formed downstream because of the two bodies of water combining their flows.

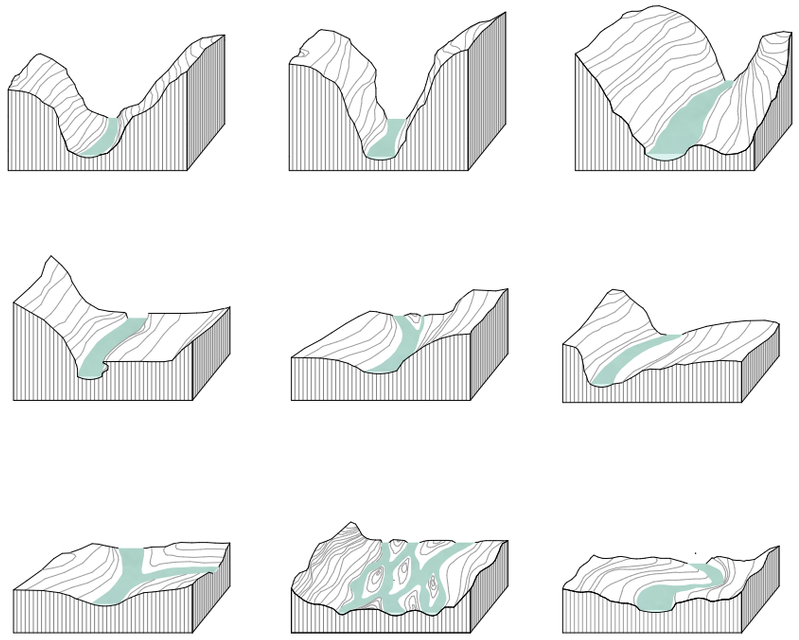
Conglomerate canyon: These environments, found especially in the middle part of the river where it flows through wide valleys or flatlands, are formed by natural consolidation of mixed, harder sediment. Here the river flow is confined between stepped walls and not directly accessible, although it is possible to reach the ledge of these canyons and watch the water from above.

Outer bend: Typical of the meandering middle section, the outer bends are more vulnerable to erosion due to the higher river energy and velocity. On the outer bends, the river encourages the forming of steep cliffs (cut banks).

Inner bend: On the other side of a meander, the stream is slower and deposits the eroded material, creating gentle slopes and large sand or gravel banks.

Braided river: Water flows freely over a broad plain with a medium gradient. The water body splits into multiple streams or little rivulets depending on the season. In summer the river bed is mostly dry, with only a few streams meandering through the valley, while in times of floods the whole width of the riverbed can be filled.

Meandering river: As the inclination becomes gentler the river starts to meander slowly through the landscape, in a concentrated line, folding into itself and creating a snake-like pattern. With a very steady flow, it creates an optimal living space for animals and a variety of fish species. Meandering rivers are exclusively found on unregulated segments of the river, usually surrounded by dense vegetation and a natural landscape.



How accessible is a river at a certain point? What activities are possible? How do floods influence the river? How does the river and the landscape relate to human scale? The graphics are an attempt to understand these questions, as basis for possible architectural interventions

River Profiles

Vjosa/Aoos upper course

1 VALLEY (VOVOUSA)

Riverbed: 24m wide, average water level <1m

Accessibility: reaching the water possible (difficult, rough and dense vegetation, steep terrain), walking possible along narrow gravel banks, crossing over possible over large rocks scattered through the riverbed

Activities: fishing, kayaking (class IV difficulty), stone collecting

2 GORGE (VRYSOCHORI)

Riverbed: 20m wide, average water level <1m

Accessibility: reaching the water not possible (steep walls)

Activities: kayaking, rafting (class IV difficulty, no exit points)

3 GORGE OPENING (KONITSA)

Riverbed: 40m wide, average water level 1-2m

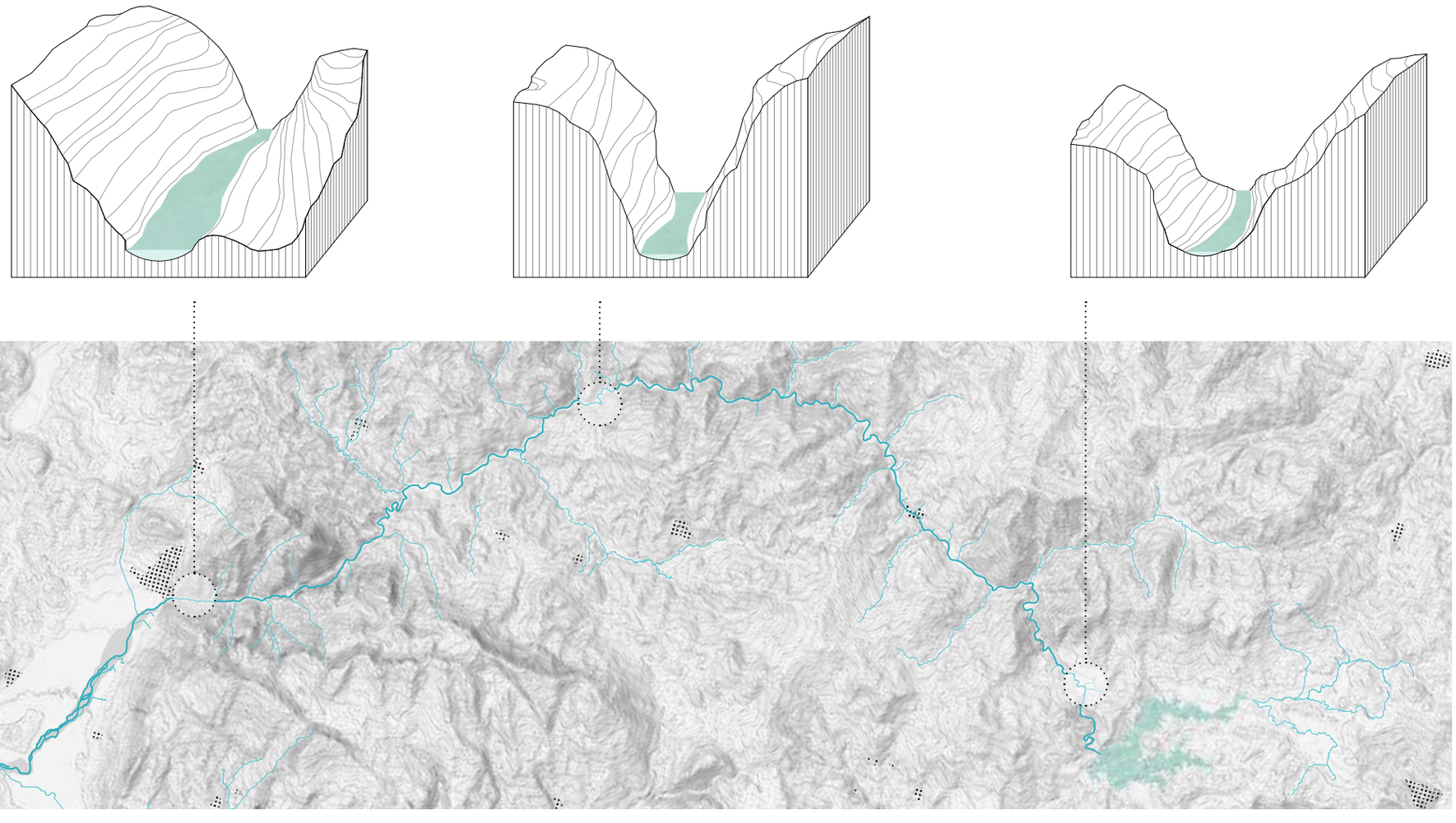
Accessibility: reaching the water possible, walking possible along the steep walls

Activities: swimming, kayaking, rafting (class III difficulty), fishing

3

2

1



River Profiles

Vjosa/Aoos middle course

1 CONFLUENCE (GR-AL BORDER)

Riverbed: 230m wide, average water level 1-2m

Accessibility: reaching the water possible, walking possible along narrow gravel banks, crossing over not possible without a bridge

Activities: kayaking, rafting (class II difficulty, strong currents), fishing (very good spot), stone collecting

2 INNER BEND (PERMET)

Riverbed: 80m wide, average water level 1-2m

Accessibility: reaching the water possible, walking possible along large gravel banks

Activities: swimming (very good spots), kayaking, rafting (class II difficulty), fishing, stone collecting, camping

3 CONGLOMERATE CANYON (PERMET)

Riverbed: 30m wide, average water level >2m

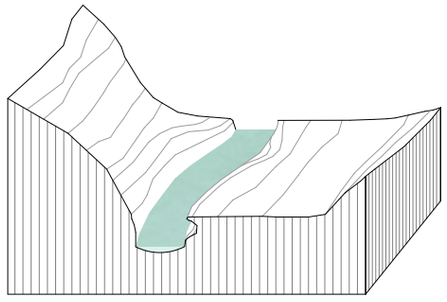
Accessibility: reaching the water not possible (ledge)

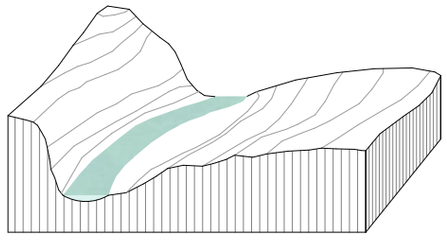
Activities: swimming, cliff diving, kayaking, rafting (class II difficulty), fishing

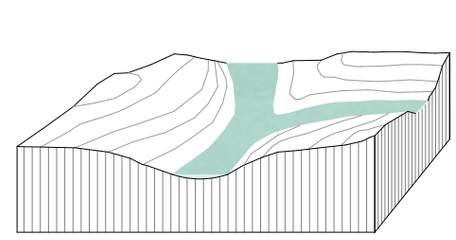
3

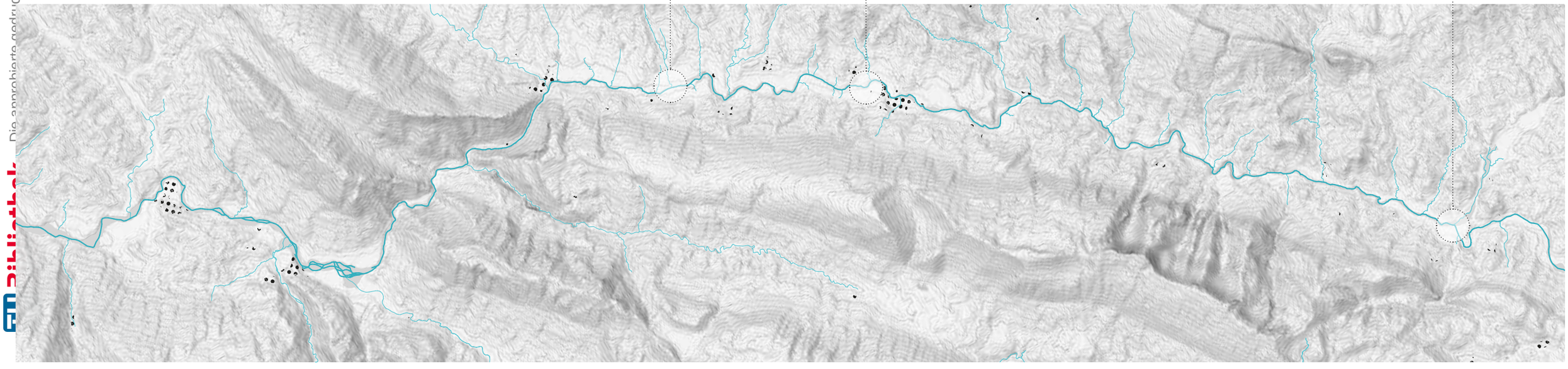
2

1









River Profiles

Vjosa/Aoos lower course

1 OUTER BEND (MEMALIAJ)

Riverbed: 120m wide, average water level >2m

Accessibility: reaching the water not possible (steep cliff)

Activities: swimming (dangerous, strong current), cliff diving, kayaking, rafting (class II difficulty), fishing

2 BRAIDED RIVER (KALIVAC)

Riverbed: 900m wide, average water level 1-2m

Accessibility: reaching the water possible (depending on water level sometimes the entire river bed may have to be crossed to reach the water), walking possible along large gravel banks

Activities: swimming, kayaking, rafting (class II difficulty), fishing, stone collecting

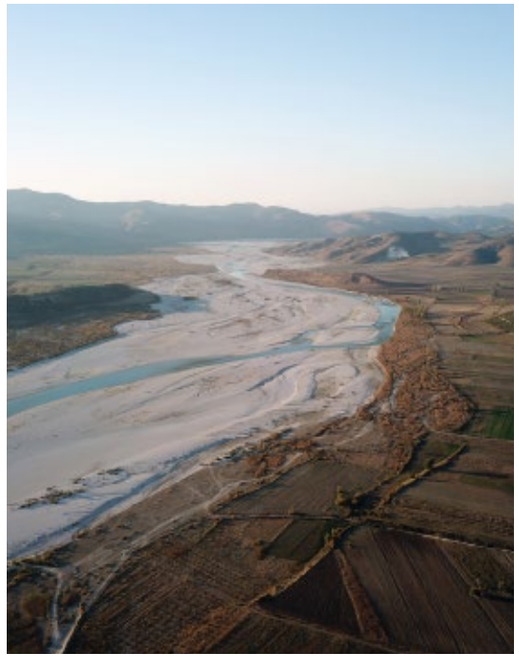
3 MEANDERING RIVER (DELTA)

Riverbed: 240m wide, average water level >2m

Accessibility: reaching the water possible (approach difficult, wet plains and thick underbrush), walking along river partly possible

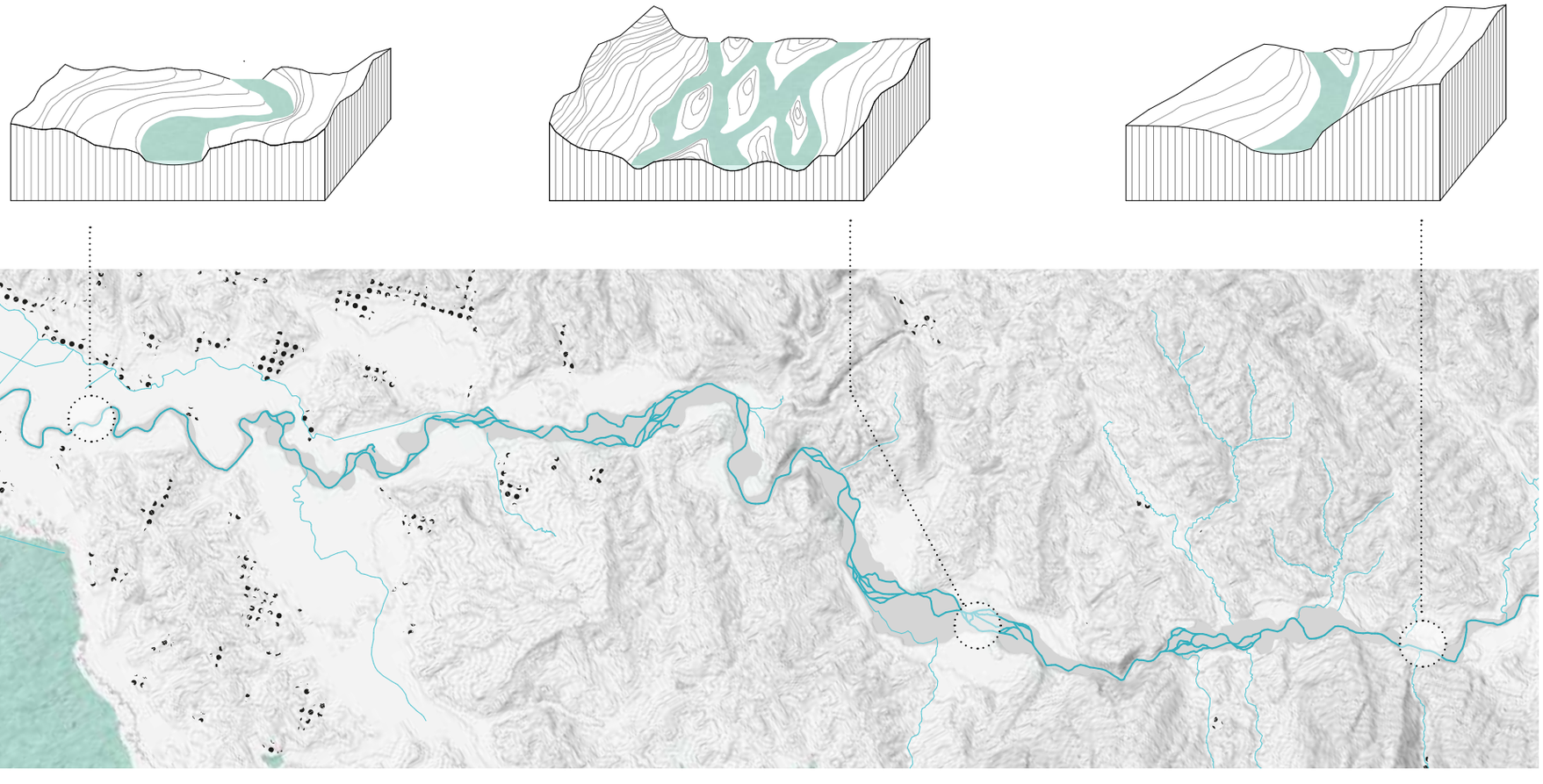
Activities: swimming, kayaking, (class II difficulty), fishing (very good spot)

3



2

1



River Morphology

Over time and seasons

Changes in river morphology of the Vjosa at Tepelena over a four year time period

Top: September 2019

Bottom: August 2015

Seasonal changes of the Vjosa at Tepelena between autumn and spring

Top: October 2018

Bottom: March 2019

III.

Land

An analysis of the river region

Historic Timeline

From Antiquity to the Ottoman Empire

The history of southern Albania has since ancient times been intertwined with that of Epirus and Greece. Today you can find Illyrian and Greek ruins scattered around the region and most of the locals speak Greek as second language while Albanian shepherds roam the Greek mountains. To fully understand the connection between the two cultures and what role the river played, one must look back at the history of both countries.

The beginning of Albanian history is still largely disputed, although it is generally accepted among historians, that by the 7th century BC certain tribes sharing a common Illyrian Language had settled into the territory of the modern state of Albania. Illyrians are described as the tribes who at one time occupied much of the Balkan peninsula as far north as the Danube. Whether Greeks or Illyrians inhabited much of the southern region of Albania is to this day a very controversial issue. During this time, Greek settlers (Molossians) and traders established the first colonies in the south, today known as Durres, Butrint and Vlora (Apollonia), that developed trading links with the tribes further inland.[21] After the roman occupation in 168 BC and the splitting of the empire in 395 AD southern Illyria became part of Eastern Roman Empire and the Eastern Church.

In the upcoming centuries, the indigenous tribes were regularly attacked by Slav raids and by the end of the 10th century the entire central Balkan region became the scene of conflict between the Bzantines and the Bulgarian tsars. By then, the Illyrian tribes were already known to their neighbours as Albani, with their own language.[22] In 1018 the Bulgarians were defeated close to Berat and the Byzantines could reestablish their rule over the Albanian-speaking regions. Following the religious schism in 1054 the Albanian regions were divided into a Catholic north and an Orthodox south, each respectively with Latin and Greek as main language.[23] After the sack of Constantinople in 1205 by Christian crusaders, most of the coastal area of southern Albania fell to Venetian rule, which had previously established important trading posts along the coast. Meanwhile the Despotate of Epirus was founded and established its rule as part of the Byzantine Empire over Albania and northern Greece until the beginning of the Ottoman rule in 1479.

For around five hundred years the Balkan Peninsula, as well as Greece, was governed, to varying degrees, by the Ottoman Empire. During their rule many Albanians throughout the country converted to Islam due to political and financial benefits or to pursue a carrier in the military or government, however the south of Albania largely remained orthodox. When the power of the Ottomans started to decline in the 18th century, Ali Pasha of Tepelena established an independent region with Ioannina as its capital, which he ruled with renowned brutality until his assassination in 1822.

Up until the First World War, the river never played the role of border, but was always part of a greater geographical region. This led to the cultural and religious similarities throughout the whole river region that we can experience today.

Ancient Illyria and Epeiros, until 27 B.C.

Byzantine Empire, 27 B.C.

Bulgarian invasion, 880 A.D.

Despotate of Epirus, 1204

Ali Pasha's domain during Ottoman Empire, until 1822

21 Vickers M. (2005). p.1
22 Hammond N. (1992). p.39
23 Vickers M. (2005). p.3

Historic Timeline

The 20th century

Following the First Balkan War and the Treaty of London in 1913, the current borders were defined, leaving Greek and Albanian minorities on both sides in foreign territory. Part of the Greek population based around Gjirokaster refused to be incorporated into the Albanian state and promptly declared their independence as the autonomous Republic of Northern Epirus, which remained in Greek hands until 1923.[24] When Albania was occupied by Italian forces in 1939, Greece military pushed back and recaptured northern Epirus again until the arrival of the German troops in 1941. After the Second World War, another tug of war erupted around the region, when the Greek nationalist resistance movement laid claims on the territories around Gjirokaster, but they were driven back for the final time.[25]

In the aftermath of the wars, the communist Enver Hoxha quickly rose to power in Albania and ruled the country with an iron fist until 1985. Although credited with the modernisation of agricultural and industrial sectors in the early half of the 20th century, his increasing paranoia led to fully detaching Albania from the rest of the world. Until the fall of the dictatorial communist regime in 1991, Albania was completely isolated from its surrounding neighbors and experienced high poverty and poor quality of life.[26] After the collapse of the regime, large portions of the population emigrated to Greece and Italy to escape the Kosovo War and the conditions of their country.

Greece in the meantime endured the Greek Civil War following the retreat of the German troops in 1944 and the return of their former government from exile. The conflict between the left- and right-wing parties cost the lives of 100 000 people and would determine the fate of the country in the following decades. Epirus became the scene of brutal guerilla fights in the mountains of Pindus. In the second half of the 20th century, the country struggled with the economic consequences of its recent war-torn history. After a short-lived dictatorship of the military junta from 1967-1974, the political system stabilized.

Even though relations between the two countries are generally good today, with EU funded cross-border programmes and many common interests, a traditional feud between Albanians and Greeks still exists , promoted by nationalist movements on both sides, driven by politics and prejudice.[27] The large Greek community around Gjrisokaster maintains Greek traditions and culture, while Albanian minorities, the Muslim Chams, live side by side with ethnic Greeks in Epirus. The border between the countries exists, but when crossing it, the cultural landscape only gradually changes.

24 Bowden W. (2003). p.28
25 Kavas (n.d.).
26 Stefa E. and Mydyti G. (2012). p.13
27 Elsie R. and Destani B. (ed. 2013). p.345

1914 Northern Epirus declaring its autonomy

1940 WWII: troops on the slopes of Pindos

1944-1985 Regime of Enver Hoxha

2013 Border conflict today

Republic of Albania and
Hellenic Republic, 1912 - today

Introduction of the Region

Greece and Albania

In the recent years, a plethora of papers and studies have been produced about the Vjosa or Aoos, with emphasis on its ecological value and importance in the future of Europe's rivers. While the river has been increasingly well documented, the region it passes through has been largely ignored. It is mainly divided into two countries, Albania and Greece. Although the two countries share many similarities, their recent history set them on completely different trajectories.

Greece is located in south-east Europe, at the south end of the Balkan Peninsula. With an abundance of more than 6000 islands, distributed in the Aegean, Ionian and Adriatic Sea and a history that dates back thousands of years, it attracts more than 33 million visitors per year and has subsequently built a large part of its economic existence on the basis of tourism. Almost 80% of the country is covered by mountains and hills, with the highest peaks concentrated in the north of the country in the district of Epirus, where the source of the Aoos river is located.

The recent economic collapse of Greece in 2010 has completely changed the social and political climate of the country. Decades of prosperity were suddenly replaced by harsh austerity measures, leaving large parts of the population in dire straits.[28] Cuts in public expenditure and pensions coupled with rising unemployment rates , especially in the young population, have dismantled social protection networks and have left many destitute. Although the situation is slowly improving, the recent developments, including the migration crisis of 2015, have left their marks on Greek society.

Albania is located to the north of Greece, bordering Montenegro and the Kosovo to the north and Northern Macedonia to the East. With a mean elevation of more than 700m, it is characterised by its rich relief of mountains and hills and is considered one of the most mountainous countries in the world.[29] The highest peaks are mainly found to the north in the Albanian Alps and to the south in the Nemercka mountain range that defines the Vjosa valley. Albania's economy is mainly based on the agricultural and industrial sector but in the recent years the country is being discovered for its wild landscapes and beautiful Riviera.

In the last two decades, Albania has undergone a major population change.[30] After the fall of communism in 1990, a wave of emigrants left the country heading mostly for Greece and Italy. This mass emigration, known as the Albanian diaspora, has led to one of the highest emigration rates in the world, with almost 40% of the population living abroad.[31] As a result, many Albanians today have lived abroad at one point in their life and thus speak multiple languages.

28 Knight D. (2015). p.2
29 Wulfenia (2007). p.15
30 Instat (2014).
31 Oculus News (2017).

Albania

28.748 km²

2.821.977 inh.
60,3 % urban population

13,3 $ GDP/c.
12,9 % unemployment total
39,8 % unemployment (15-24)

Economic sectors I./II./III.

Religion

Greece

131.957 km²

10.768.477 inh.
79,1 % urban population

30,25 $ GDP/c.
18,9 % unemployment total
49,8 % unemployment (15-24)

Economic sectors I./II./III.

Religion

Introduction of the Region

The region in numbers

REGIONAL DISTRICTS

Vlora
175.640 inh.
2706 km²
6 % of total GDP

Fier
310.331 inh.
1890 km²
13,2 % of total GDP

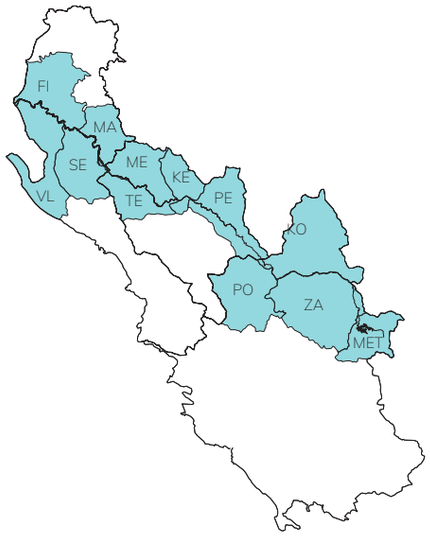
Gjirokaster
72.176 inh.
2884 km²
2,6 % of total GDP

Epirus
336.856 inh.
9203 km²
2,2 % of total GDP

MUNICIPALITIES

Fier (FI) 120.655 inh. / 619 km²
Vlora (VL) 130.827 inh. / 616 km²
Selenice (SE) 18.476 inh. / 561 km²
Mallakaster (MA) 27.062 inh. / 329 km²
Tepelena (TE) 8949 inh. / 431 km²
Memaliaj (ME) 10.657 inh. / 372 km²
Kelcyra (KE) 6.113 inh. / 304 km²
Permet (PE) 10.614 inh. / 601 km²

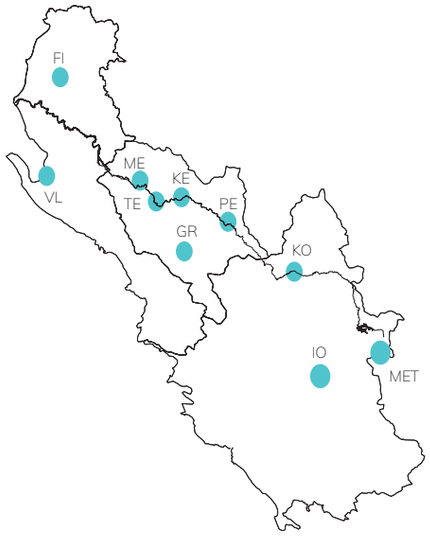
Konitsa (KO) 6.362 inh. / 949 km²
Zagori (ZA) 3.724 inh. / 995 km²
Pogoni (PO) 8.960 inh. / 701 km²
Metsovo (MET) 6.196 inh. / 363 km²



CITIES

Fier (FI) 55.845 inh.
Vlora (VL) 79.513 inh.
Tepelena (TE) 4.342 inh.
Memaliaj (ME) 2.647 inh.
Kelcyra (KE) 2.651 inh.
Permet (PE) 5.945 inh.

Konitsa (KO) 4.632 inh.
Ioannina (IO) 80.371 inh.
Metsovo (MET) 3.469 inh.



PROTECTED AREAS

1 Vjosa-Narta Protected Landscape
established in 2004
19,4 km²

2 Fir of Hotovë-Dangelli National Park
established in 1996
34,3 km²

3 Vikos-Aoos National Park
established in 1973
126 km²

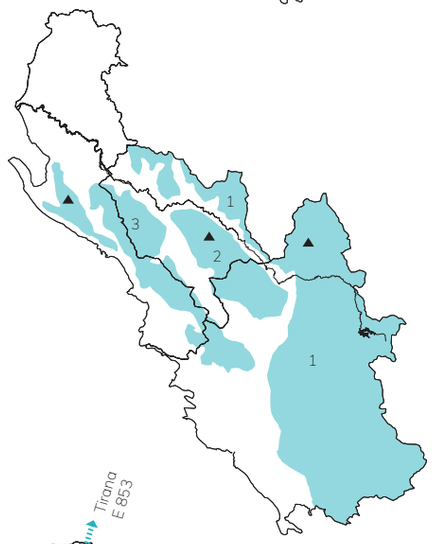
4 Pindus National Park
established in 1966
69 km²

MOUNTAINS

1 Pindos Mountains
max. elevation 2632m
highest peak 'Smolikas'

2 Nemercka Mountains
max. elevation 2485m
highest peak 'Maja e Papingut'

3 Ceraunian Mountains
max. elevation 2044m
highest peak 'Maja e Çikës'



ROADS / BORDER STATIONS

North/South Highway E853 - E951
Connecting Tirana via Fier-Tepelena-Gjirokaster-Ioannina to Arta

West/East Highway E90 (Egnatia Odos)
Connecting Igoumenitsa via Ioannina-Metsovo-Grevena-Kozani-Veria to Thessaloniki

SH75
Following the Vjosa/Aoos

SH8
Following the coastline

1 Kakavia border station

2 Tre Urat border station

Epirus

An introduction

In Greece, the Aoos flows through the province of Epirus, the northernmost of the thirteen administrative regions of the country. It is the least densely populated region in Greece, largely due to its mountainous landscapes and rugged terrain. Most of the population is concentrated in and around the capital, the city of Ioannina. Dominating the landscape just north of Ioannina is the limestone mountain range of Pindos, where the source of the river is located. With an elevation of up to 2632m it represents Greece's most mountainous region. It is home to the the Vikos-Aoos and the Pindos National Park with their impressive natural scenery, beautiful rivers, picturesque stone villages and the famous Vikos gorge – Europe's deepest gorge.

Located directly on the border to Albania, it has always been a place of migration, resulting in a very complex demography constituted of ethnic Greek Sarakatsani and many different minorities. The biggest group concentrated around the Aoos river basin are the Aromanians, or Vlachs. The nomadic tribe initially came from the geographic region of today's Romania and settled into Epirus as shepherds, laborers and artisans. Emigrating abroad for work, they brought back wealth and education. To this day they populate many of the mountain villages surrounding the Aoos, retaining their own culture and language.[32] At the time of Ottoman occupation, these villages grew to become prosperous trading posts.

In recent years, the region suffered from immense population decline, the young moving into the cities to find work in an increasingly difficult economic climate. The older generations remained in the villages living in relative solitude, tending to their flocks of sheep and goats. In the harsh environment the Epirotes have developed a very distinctive form of mountain culture. A feeling of solitude, sorrow, harshness but also pride and strength seems ever-present and is deeply rooted in the cultural fabric of the region, reaching all the way to Albania. This is mirrored in the traditional folk songs, the mirologi, a form of lamentation that is still sung today to mourn death or at the yearly festivities of the paneigiri, for which Epirus is renowned.[33]

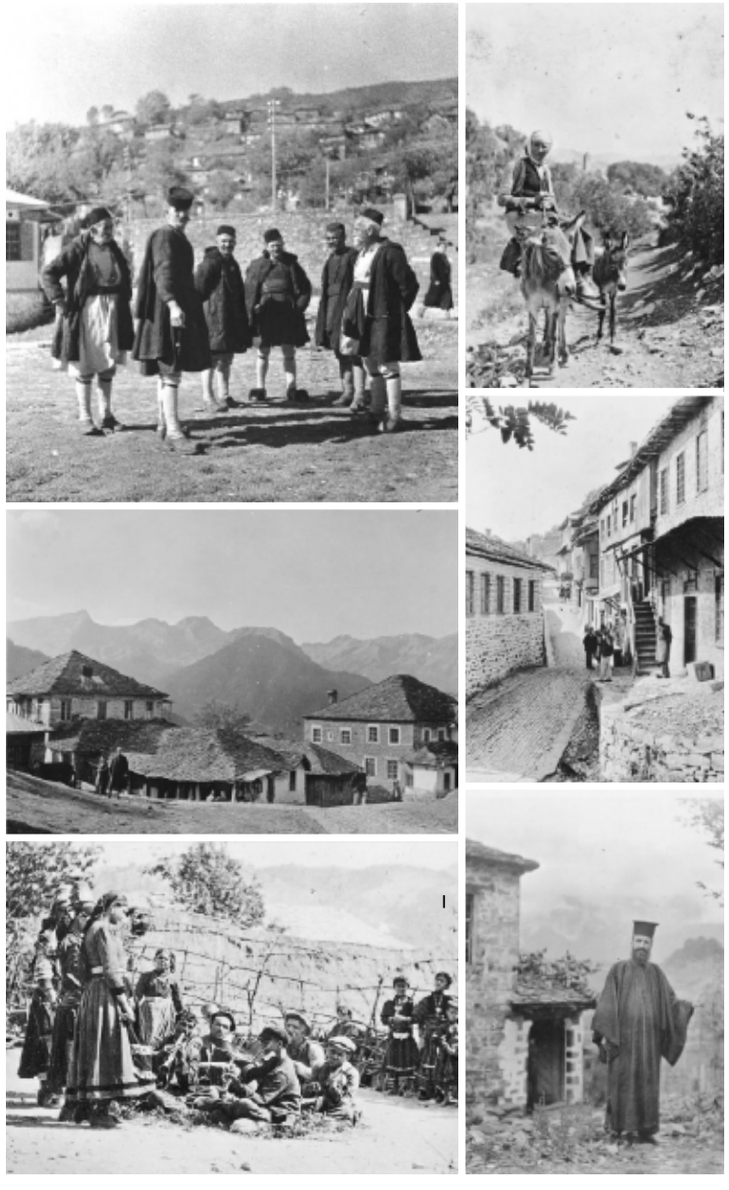
Today, with financial help of the European Union, the villages are being restored and new houses are constructed, actively attempting repopulate the area and protect its rich cultural and natural heritage.[34]

I Mountain Scene in Epirus, 1890

32 Potts J. (2010). p.183
33 King C. (2018). p.114
34 Potts J. (2010). p.187

Epirus

Historic impressions



Epirus through the lense of Margaret Hasluck, around 1920
Travelling through the mountains she photographed - among others - the town of Metsovo and the Aromanian and Sarakatsani shepherds and artisans populating the region

Southern Albania

An introduction

In Albania, the Vjosa crosses three regional districts, or Qarks: Gjirokaster to the east, Vlora on the coast and Fier to the north of the delta. The biggest cities along the river are Permet, Kelcyra, Tepelena and Memaliaj. Apart from that, the region around the river is characterised by small settlements scattered across the Vjosa valley that mostly survive off agricultural activities like crop production and livestock farming. The river has always played an important role in the region, since the surrounding population depended on it for the irrigation of the extensive agricultural fields.[35]

Gjirokaster, to the east, directly bordering Greece, is the most mountainous of the three districts, where about a third of the river length is located. Similar to Epirus, the mountains are populated by Aromanians, Greeks as well as Albanians that have brought with them the culture of transhumant pastoralism, making use of the abundant grazing land. During Ottoman rule under the famous Ali Pasha, the region of Grjirokaster prospered. Cities like Tepelena became centers for arts, culture and developed polyphonic singing, a type of music that is still practiced today.

Fier is located to the north of the lower part of the Vjosa, where most of the fertile lowlands of the Mizeqe plain are found. In 1928, the Patos-Marinza oil field was discovered close to the city of Fier, just north of the river, and the province has since played an important economic role in the country.

Vlora is the coastal province that includes the coastline along the Ionian Sea, the Albanian Riviera. The capital with the same name is located only a couple of kilometers south of the Vjosa. Home to one of Albanias largest ports it has grown to become one of the most significant cities of southern Albania, economically as well as culturally. Just north of it is the Narta lagoon, a protected landscape that encompasses the lower part of the Vjosa delta and is a valuable habitat for a variety of birds and fish species.
The south of Albania, especially further inland, is generally less developed, suffering from high rates of unemployment. Changes in political and everyday life, as well as increasingly hard conditions for the small agricultural businesses created in socialist times have caused migration towards the urban centers and abroad, leading to the depopulation of the area.[36]

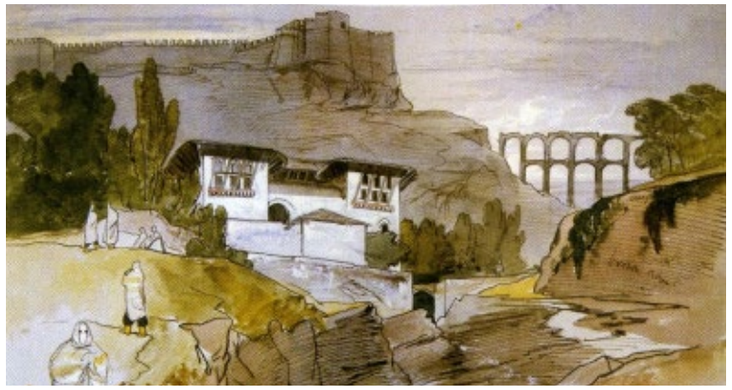
Although a road has been recently built along the Vjosa, infrastructure and public transport are in bad condition, but the situation is gradually improving. With the plans of the Albanian government to enter negotiations for joining the EU by 2030, an optimistic mood has settled into the region. Programmes like the Rilindja Urbane direct financial help towards urban renewal and infrastructural enhancement and are currently being implemented by the municipalities.[37] Further, the goal is to reduce unemployment by investing in the agricultural sector, although it remains to be seen what this territorial plan can set in motion.

I The city of Tepelena on the banks of the Vjosa 1848

35 Riverwatch – Society for the protection of rivers (n.d.). 'Europe's Unknown Wild Jewel'
36 Ahmedaja A. and Haid G. (2008). p.215
37 Isto R. (2019).

Southern Albania

Historic impressions



Southern Albania through the eyes of the landscape painter Edward Lear, around 1848
The paintings show the Vjosa close to Tepelena and the city of Gjirokaster

Architecture

In Epirus and Southern Albania

The region is mostly known for its stone architecture, concentrated in and around the region of Zagori. The so-called Zagorochoria are located in the Pindos Mountains just north of Ioannina. The municipality consists of 46 stone villages that are famous throughout Greece and Albania due to the 160 stone arch bridges that were built to cross the many streams and rivers of the area, each unique and different in design. Constructed during the Ottoman rule, they connected important trading routes through the mountains.

The buildings are exclusively built out of local lime- or sandstone, with timber roofs that carry roof tiles made of slate.[38] The stone slabs lie on top of each other, traditionally without using mortar, held together just by their weight. They are typically organized around one or several town squares, the mesochori, where the townspeople up to this day gather for various festivities to dance and celebrate.[39] The squares are defined by a tall plane tree that acts as a marker and provides shading or protection against rain. It is so distinctive that the locals constantly use it to judge distances or give directions in the village. The buildings and squares are connected by cobblestone streets, essentially creating mono-materialistic villages that look like they have been carved out of a single rock. The mansions are maintained in remarkably good condition, due to the strict building regulations in the entire Zagori regions. Until the 1950s there were no roads or other signs of modernity, only 200 year old stone bridges and cobbled paths.[40] Today the houses are still maintained, used and newly constructed, but the core structure of the buildings has been substituted by concrete.

The villages stand testament to a rich history of stonemasons that practiced their craft in Epirus as well as southern Albania, since many builders were ethnic Albanians. Many of these stone villages also exist on the other side of the border. Lesser-known and sometimes still in use, they have been left in a much more original state. Sadly, the traditional craft of the stonemasons fell in decline after the Balkan Wars, the remaining few living on the Albanian side of the border.

Further downstream, the built environment is characterized by the industrial architecture that was built during the communist regime as well as slab buildings for residential use in the settlements along the river. The industrial buildings are mostly abandoned today; the brutal reinforced concrete ruins are a reminder of coal mining and oil industry that surrounded Memaliaj and Berat.[41]

At the lower part of the river, where the flatlands provide excellent nutrient rich soil for crops and livestock, informal architecture dominates the landscape. Huts used for fishing or to provide shade for the nearby plantations are mostly crude, temporary buildings created out of locally available or repurposed materials.

Top: Aerial view of Tsepelovo, one of the Zagorochoria

Bottom: Arched stone bridge in Albania, close to the thermal baths of Benja

38 National Technical University of Athens (2019).
39 Zagori (2013).
40 Tuppen H. (2019).
41 Sorotou A., Katsaros A., Dedej Z., Christou V., Capullari M., Elton I. (2014). p.93

Industrial ruin near Memaliaj

Fishing hut in the delta of the Vjosa

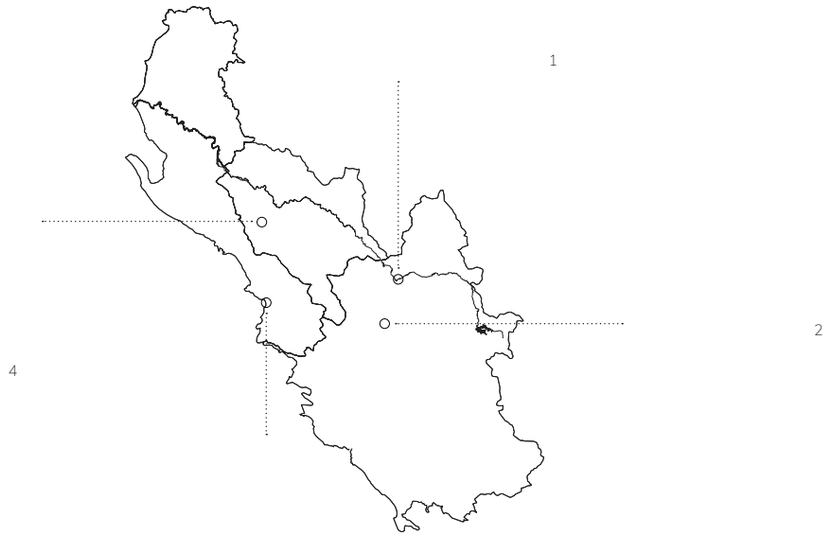
Tourism

In Epirus and Southern Albania

Tourism in Southern Albania and Epirus is concentrated around the coastal parts, with cities like Saranda and Korfu catering to the needs of mass tourism. With its impressive rocky coast and beautiful beaches, it has become a prime destination for summer tourists. Additionally, Gjirokastra, a stone city and main seat of Ali Pasha close to the coast, has been given the status of a UNESCO world heritage site in 2005 and has now become one of the main touristic hotspots of the region. Further inland in Albania Well-known sights are scarce; a few Illyrian, Greek and Roman ruins like Byllis or Amantia in the are of note and apart from that, the region of the Pindos mountains is visitied for its impressive stone architecture and stone arch bridges.

In recent times, the demand for reconnecting with nature, slowing down the pace of life and living and travelling environmentally friendly has been growing steadily. In the Greek mountains the community of outdoor enthusiasts have already realised the potential of this stretch of land and have been creating new hiking trails, climbing routes and kayaking opportunities. Although mostly focused on the neighboring Vikos gorge, the Aoos valley offers a similar variety of activities. This form of active tourism is becoming more and more popular as an alternative to the overcrowded beaches of the coast.[42]

Similarly, especially due to the recent international attention, residents in Albania are realizing the potential of the Vjosa and its natural heritage. The rising demand for eco-tourism provides a viable option to make a living and thus many small businesses have emerged, offering activities like kayaking and canoeing. They are all basing their existence on a free-flowing Vjosa.[43] Up until now, this development happened on a small scale, since the potential of the region was only known to a specific group of outdoor enthusiasts and scientists. But the promotion of the Vjosa by media and protests has set in motion something larger. While the use of the river for eco- and active tourism could provide an important alternative to hydropower, it also represents the risk of overusing the river. As it gains in popularity, a balance must be found to enable a sustainable use of the region as a touristic destination.



I Touristic hotspots in the region of Epirus and Southern Albania

1 Bridge in Konitsa
2 Vikos gorge
3 Saranda
4 Gjirokastra

42 Papadimitriou D. and Gibson J.H. (2008).
43 Riverwatch – Society for the protection of rivers (n.d.). 'Europe's Unknown Wild Jewel'.

IV.

Defining the region

Development of a regional strategy

Field Trip

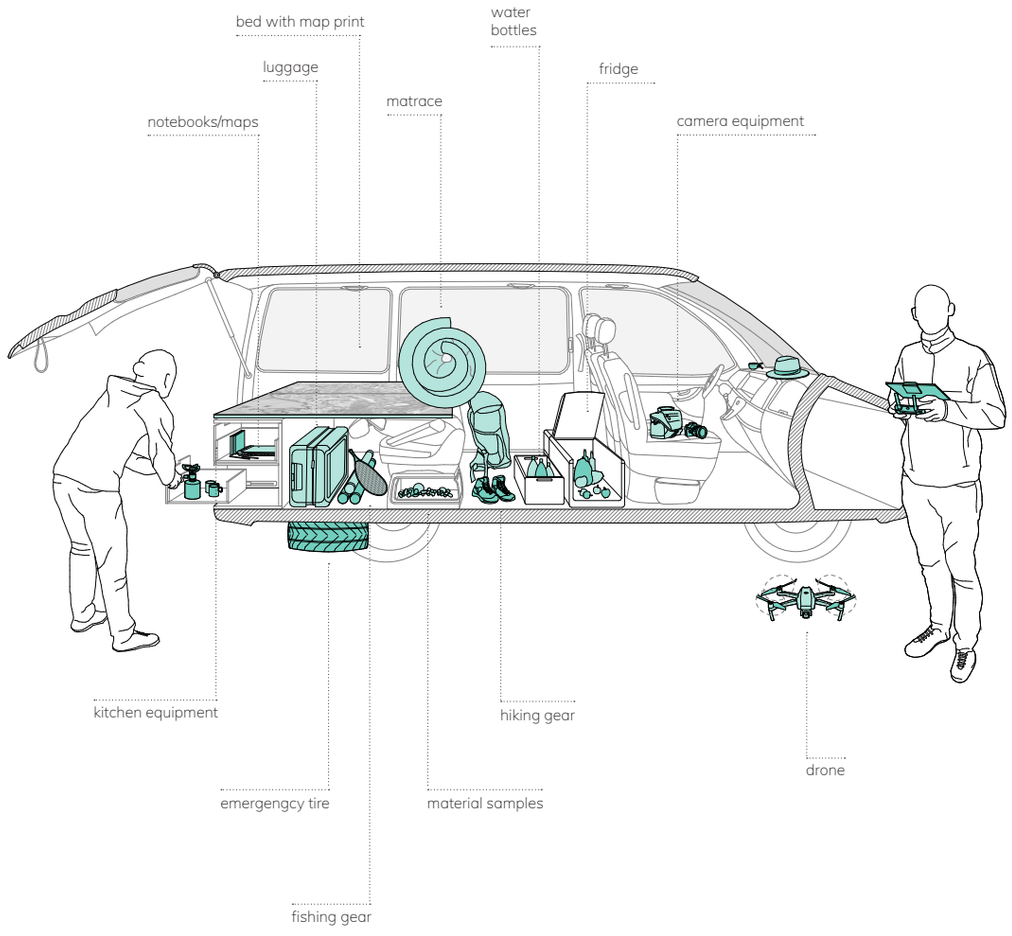
Visiting the Region

Information on the ecosystem, the biodiversity and the rivers beauty was widely available, but details especially about the region in Albania were hard to come by. In order to gain further insight into the region, we decided to conduct field research and visit the area ourselves. The aim was to follow the river as closely as possible, eat, sleep and live on its banks for the duration of our stay. Additionally, we needed to document points of interests, possible building sites, existing buildings, conduct interviews and collect samples.

Before embarking on our adventure, we connected to people we knew, who had already been in the region. A hydrobiologist, Paul Meulenbroeck, who himself had written multiple papers on the Vjosa's ecosystem, established a connection with Viktor Vahdat, currently writing his thesis in the field of landscape design on the topic of the Vjosa and had documented the river from source to mouth for his own work. Through the two contacts from Vienna, we were further introduced to organizations and stakeholders who were connected to the river. It quickly became obvious that a whole network of people who are actively involved in researching and documenting the region for varying purposes had come together with one common interest in mind – the Vjosa or Aoos.

Unsure what to expect, we filled our VW van to the brim with photo equipment, hiking, fishing and camping gear. Knowing we were dealing with a large region and a wild, sometimes inaccessible river, we packed a drone for aerial photography of the landscape. Our approach for the analysis of the region was very simple – visit and get a feeling for the river, local culture, the people and the region.

The resulting project is, apart from the research surrounding it, strongly influenced by the experiences gathered during our two visits.



I Van and enquipment used during our travels

Layers of Perception

How the river is currently percieved

The name Vjosa and Aoos river region implies that it is at least perceived as a single geographically defined area. But when people, residents and tourists, talk about the river it quickly becomes obvious that in reality this is not the case. A few factors come into play here which can be used to explain this situation.

Firstly, the region is divided by a country border, at this time even a Schengen external border, which represents a physical barrier. This barrier is extended to the water body - the Aoos ends and the Vjosa begins. Secondly, the river spans a long distance of about 270km from its source to the sea, constantly changing its size and appearance, flowing through a variety of landscapes. The mountain stream is very different from the wide meandering water surface in the delta. Similar to the appearance of the river, the people living close to the river also change: from the shepherds up on Tymfi to the city residents of Permet. Without a good overview of the whole area it is hard to understand how all of it is connected. Thirdly and most importantly, the perception of the river is largely based on the experiences and interests along the river. Whether one remembers the river from a childhood fishing adventure, uses it to water fields of grain, builds a cafe on the riverbank or analyses the whole water basis for scientific purposes, the meaning of the river changes.

The diagram to the right shows a mapping of these perceptions, attempting to explain how residents and visitors are linked to the river. It creates a dense tapestry of experiences that sometimes overlap, and other times don't meet at all. At a first glance, some of them don't seem connected but any event, be it a natural disaster or man-made, could trigger a chain reaction that affects all of them.

... as a business

In order to deliver a renewable, sustainable and reliable energy source to the surrounding villages and cities, we decided to tap the still unused potential of the Vjosa and its tributaries. With just a few state of the art hydropowerplants on strategic positions along the river green energy could be delivered to the region, additionally creating jobs int the energy sector.

... as a destination

Visiting the mountains in the north of Greece was always a dream of mine, with its impressive masonry and network of stone bridges. The cold, clear mountain air was a welcome change from the heat of the summer months. Staying in one of the small mountain villages we enjoyed the daily hikes taking us up to see the impressive scenery of the Pindos mountains.

... as a memory

As a kid I remember playing in the water by the main square in Vovousa, jumping off the rocks into to the deep pools. We challenged ourselves who would jump off the highest rocks and how long we could swim in the faster currents. In the summer months we hiked further down into the canyon to try fishing with rods made out of the flexible branches of the surrounding forests.

... as an opportunity

The beauty of the river always fascinated me. I realized early on that it was special, that the fascination would spread. I invested in a small lot close to my home, where a beautiful river bend and the main road meet. Now more and more tourists arrive here at my little shack and I plan to build a small café or replenishing station for the passer-bys.

... as a poster-boy

This river is not only unique in Europe, the last free-flowing river, but a symbol for what has been destroyed by the hydropower industry during the last century. The damage though is not irreparable, we have to start putting nature before the interests of the hydropower lobby starting now, with this river.
Save the Vjosa!

... as an ecosystem

Our field trip in the flood plains of the Vjosa river near Tsepelovo were absolutely breathtaking. I had never seen such a lush lora accompanied by fauna only briefly mentioned in scientific journals. Every day we took samples of a multitude of different fish species, found and documented species of semi aquatic plants and gathered mineral samples for analysis in the labs.

... as a resource

The river and the nutritious sediments it brings into the river basin provide the perfect ground for the local plants and vegetables. Using the infinite water supply it offers, we are able to economically and efficiently grow our crops almost all year round. The roaming flocks of sheep and goats also profit from the lush plant vegetation that surrounds it.

The VA River Region

Naming the region

While the reasons for people's interest in the Vjosa/Aoos may vary, they all have one thing in common: they are dependent on the survival of the river, in one form or another. The question remains: how can a common ground between these perceptions be found?

On both sides of the Schengen border, the territory is divided into a variety of administrative units, making it hard to create a strategy for the entire river. These administrative units are not interlinked and in the current conditions the stakeholders mostly create plans and concepts for a very specific purpose in their area of interest. This is one of the major issues that become visible when looking at the planning process of the dams, where construction had started before the local communities had received any information about it. This short-sighted decision-making inevitably leads to a fragmentation of the region and a chaotic development.

By defining the Vjosa/Aoos river as one coherent, cross-border geographical unit, to be regarded as such by policy-makers, planners, residents and visitors, a foundation would be laid, upon which the general perception could be transformed. The region would appear on the map with a particular name, which can be talked and written about. The unified perception of this singular entity would have the potential to create a powerful brand, which can be communicated to the outside and generate a strong local identity as well.

The image of the river has been evolving in recent times. Engaged activism has attracted local and international attention and not only among outdoor enthusiasts. This attention has spread further to scientific circles and numerous expeditions were organised over the past few years with the purpose of analysing and understanding the specific ecosystem. A scientific background has been created as a result of the investigations, which makes the communication of the causes and effects of human intervention possible, and stimulates environmental awareness. A next step would be to highlight the potential of a regional development and how, by focusing on the river as a whole, the geographical region surrounding it could grow together. For this, it is imperative to show the benefits of a collaboration to everyone involved or who would be affected by the changes, as well as persuade the decision-makers of such an enterprise through concrete examples.

Now, the river represents a means to an end for many different individuals and organisations. In the future, it could play a central role in the growth of the region around it. It is an asset which cannot be ignored. This first step, although simple as it is, is essential in creating a holistic strategy for the sustainable development of the river.

The *VA River Region* is defined across administrative borders

Material Identity

Creating a connecting thread

The question remains however, what the common identity of the region actually is and how it can be incorporated into our projects. In the case of the *VA River Region*, it is not something that exists only in theory, but in the form of a physical entity: something which can be touched, felt and seen. It is and has always been the river; a common thread. Through millennia it created the valleys, gorges and wetlands seen today and thus in a way formed the people, architecture and cultures that surround it. No matter what form the river embodies, the raw materials: the water, stones and sediments it carries always persist.

In order to make the VA brand more recognisable, a new site-specific building element is needed which would be recurring throughout the region and would be directly associated with the VA; a material that represents the river and connects the individual places directly to the river itself. Additionally to the abstract process of naming the brand, this new physical element would help enhance its identity through materiality.

After hours and hours spent with our favorite activity – collecting stones along the river, we stumbled upon large rock formations with river stones embedded inside them: conglomerates. A conglomerate is a sedimentary rock with rounded fragments trapped in a matrix and can be thought of as a naturally occurring concrete.[44] Inspired by this, we decided to use the collected stones to create a new material which can be used for the creation of new interventions along the river. These would speak the same language, but would be unique at the same time. By binding the stones into concrete with different surface finishes, we created a material that can be used for different purposes – the *Riverstone Concrete*.

To see what was possible and how the material can be produced, we decided to conduct some experiments.

Conglomerate with trapped river stones regularly appear in the river bed - a form of natural concrete

44 Hudson J.A. and Cosgrove J.W. (2019). p.112

Material Identity

Developing a formula

Experimenting with different ratios and types of cement, sand and stones, it quickly becomes apparent that the possibilities are endless. In order to develop a formula, the type of cement, the ratio between cement, sand and aggregate and the size of the river stones had to be determined.

The question of what type of cement to use was the first one we had to answer. The addition of white cement causes a change in color and provides a more neutral background for the colorful stones. White Portland cement is produced of high purity raw materials with low iron contents, at higher temperatures and in smaller quantities. As a result, it is 2-3 times more expensive than normal Portland cement.[45] Grey Portland cement takes the focus away from the stones and reduces the contrast between the two materials. The main advantage though, is that it is cheaper and more easily available.

Additionally, the visibility of the stones can be altered by how they are added to the process. Placing the stones in the cast at the beginning of the process enables us to create very specific patterns, as the stones remain in position. Stones mixed into the concrete protrude irregularly, creating a more randomized appearance of the surface. Embedding the stones in the cast concrete while it is still wet, enables us to create profiled surfaces that show larger portions of the river stones. All these factors play an important role in how the finished material performs.

The surface finish of the concrete determines especially how the material performs in a small scale. Concrete is very adaptable in that perspective, since it enables us to create smooth, textured or uneven and rough surfaces, thereby altering the tactile and visual experience of the material by changing only the finish. Five main categories of surface finishes can be differentiated which can be combined to achieve a specific effect:
Leaving it as cast doesn't alter the appearance of the concrete. It keeps its form after removing the formwork and the finished surface usually contains board marks or wood grains. Abrasive blasted surfaces expose fine and coarse aggregate that are smooth to the touch. This method is effective for large surface areas. Mechanical altering of the concrete removes chunks of the outer layer and creates a rough, fractured surface. Depending on the tool used, the results vary. With the use of chemical solutions, so called retarders, the binding process can be delayed. By applying them to the cast, the cement at the surface of the concrete can be washed out to expose its aggregates. This process exposes the larger river stones embedded in the outer layer, creating an uneven surface. The last option is the grinding of the surface to create a terrazzo-like finish.[46]

Taking all these factors into account and based on our own experiments, we decided to use ground and exposed aggregate concrete based on their unique qualities for our projects. The smooth surface of the ground concrete creates a stark contrast to the natural surroundings, water and plants wash off quickly and the concrete patina develops very slowly. This makes it perfect for uses where the material acts as a sign, marker or for interior uses. The exposed aggregate creates a bigger surface area for water, algae and plants, deteriorating faster and developing a patina that enables it to blend into the natural environment. Ideally, this is used in the exterior or when a rough surface is needed. The two finishes can also be applied on the same object to create contrast.

45 Reeves R.M., Sims I. and Cripps J.C. (ed. 2006). p.433
46 The American Institute of Architects, Hall J.D. (ed. 2010). p.463

I Experimenting with different mixture ratios of cement, sand, aggregate, water and river stones

Creating the casts for the *Riverstone Concrete* tests

River stones placed on the not-yet dry concrete

Material Identity

Experiments

Pattern: random, mixed in
Aggregate: 0-8mm
River stones: 6-12mm
Concrete: grey portland cement
Ratio cement/aggregate: 1:2
Surface finish: half exposed aggregate, half unaltered

Pattern: random, mixed in
Aggregate: 0-8mm
River stones: 12-24mm
Concrete: grey portland cement
Ratio cement/aggregate: 1:2
Surface finish: half exposed aggregate, half unaltered

Pattern: random, mixed in
Aggregate: 0-8mm
River stones: 24-50mm
Concrete: grey portland cement
Ratio cement/aggregate: 1:2
Surface finish: half exposed aggregate, half unaltered

Pattern: none
Aggregate: none
River stones: none
Concrete: grey/white portland cement
Ratio cement/aggregate: 1:1,5
Surface finish: unaltered

Pattern: random, mixed in
Aggregate: 0-8mm
River stones: 0-24mm
Concrete: grey/white portland cement
Ratio cement/aggregate: 1:5
Surface finish: exposed aggregate

Pattern: placed on formwork
Aggregate: 0-8mm
River stones: 16-32mm
Concrete: grey/white portland cement
Ratio cement/aggregate: 1:2
Surface finish: exposed aggregate

Pattern: none
Aggregate: none
River stones: none
Concrete: grey portland cement
Ratio cement/aggregate: 1:1,5
Surface finish: unaltered

Pattern: random, mixed in
Aggregate: 4-16mm
River stones: 0-24mm
Concrete: grey portland cement
Ratio cement/aggregate: 1:3
Surface finish: exposed aggregate

Pattern: placed on top
Aggregate: 4-16mm
River stones: 16-32mm
Concrete: grey portland cement
Ratio cement/aggregate: 1:2
Surface finish: sanded

Pattern: none
Aggregate: none
Stones: none
Concrete: white portland cement
Ratio cement/aggregate: 1:1,5
Surface finish: unaltered

Pattern: random, mixed in
Aggregate: 0-16mm
River stones: 0-32mm
Concrete: grey portland cement
Ratio cement/aggregate: 1:3
Surface finish: mechanically altered (hammer)

Pattern: placed on top
Aggregate: 0-8mm
River stones: 16-32mm
Concrete: grey portland cement
Ratio cement/aggregate: 1:2
Surface finish: sanded

Die approbierte gedruckte Originalversion dieser Diplomarbeit ist an der TU Wien Bibliothek verfügbar.

Material Identity

Manufacturing methods

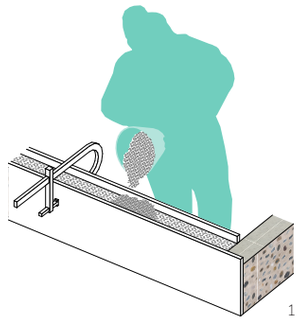
Apart from cement type, sand to cement ratio and surface finishes, the most important thing is the production method itself. This determines in what form the material can be incorporated into our buildings. In order to use the *Riverstone Concrete* that we propose in our architecture, we decided on four different methods and developed solutions on how to create the stone patterns.

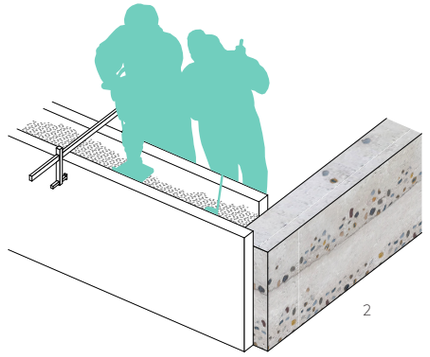
Prefabricating concrete has the advantage of producing more precise parts, better surface quality and a shorter building duration. However, the restrictions of prefabrication are evident. The transportation, as well as the movement of the parts on the building site are often problematic. Maximum slab dimensions for economic transport are a length of 10m and a width of 4m.[47] In prefabrication, parts are generally produced horizontally, as it is easier to control the flow of concrete. This makes the method perfectly suitable to create our proposed river stone patterns, as they can be cast horizontally and then used as vertical elements like walls or columns.

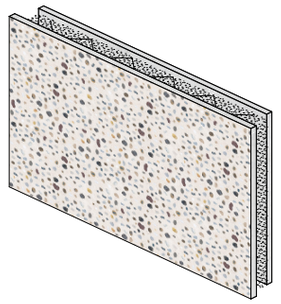
In-situ concrete is largely dependent on the formwork that is used to create the mold for the part and how it is mounted. Since the river stones must be placed into the outer layer of the wall to become visible, using formwork to cast them vertically poses a problem. Adapting this technique to our needs, the river stones are mounted onto the formwork with silicone. When the hardening process is complete, the cast can be removed and the stones stay in the outer layer of the concrete. This technique only works for small structures, since the added pressure of the poured concrete in larger wall segments would rip off the stones.

Rammed concrete derived from the so called Pisé-technique used since the early 17th century in France. Instead of the loam that was originally used, a mixture of dry concrete and aggregate that can be sourced locally is poured into the cast in layers of at least 15cm. Each layer can then be condensed with hands and feet. After about a day of drying the next layer is applied.[48] The river stones are added in between each layer, making this method ideal for creating vertical wall elements on-site. Additionally, the process of creating such a wall adds a participative component to the creation of a building, since many people are required for the intense manual labor.

UHPC (Ultra High Performance Concrete) is a concrete with very high density, making it ideal for bridge construction and other wide spanning elements. It consists of very fine aggregate of 0,5 to 2mm and is reinforced by adding 2,5% of steel fibers that are up to 20mm long.[49] Adding different aggregate like our river stones to the mixture would result in highly reduced stability. By adding a thin layer of spray-on concrete instead, in which the river stones are placed, the part can be then sanded down to its final shape and size and used for bridge construction.


1


2


3

1 In-situ
2 Rammed concrete
3 Prefabricated elements

47 Bögl M. and Gierer A. (2012). p.654
48 Baunetzwissen (n.d.).
49 Schmidt (2003). p.7

Strategy

A regional plan

In order to deal with a region that spreads on such a large area, we devised a strategy that is implemented in three phases and works on different scales. Following these steps, we ensure the connection and activation of the region, on which further development along the river can be based.

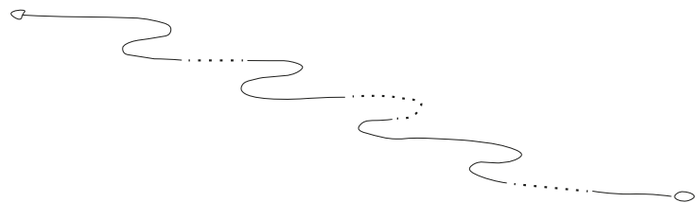
The first step is the implementation of a hiking trail that follows the river from the source to the mouth. It is created by connecting exiting paths and trails and adding the missing links. It is almost 300km long and follows the river as closely as possible. Divided into 15 stages that can be reached within a day's hike, we add an access or exit point at the end of each stage, providing water, rest, orientation and necessary information for the hikers.

The second phase consists of small-scale interventions along the hiking trail. They enhance the experience of the trail, as their programmeme is specifically designed to serve the needs of the hikers and of other users visiting the *VA River Region*.

The third phase focuses on large-scale interventions with a regional impact. Based on local potentials, they create new impulses for the entire *VA River Region*.

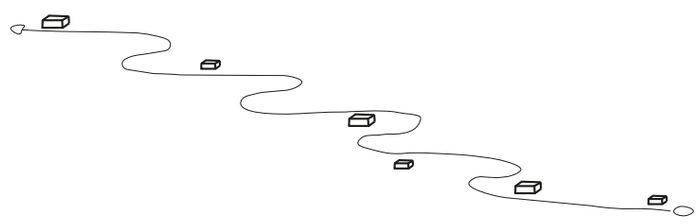
Phase 1

THE HIKING TRAIL



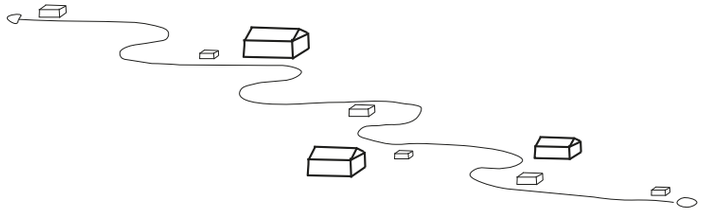
Phase 2

SMALL SCALE INTERVENTIONS



Phase 3

LARGE SCALE INTERVENTIONS



The Kiosk

The Field Lab

The Factory

River delta

Vlora

Kalivac

Vjosa

Memaliaj

Tepelena

0 5km 15km

Albania

Greece

The Refuge

The Cultural Convent

The Milestone

Permet

Vjosa

Vjovousa

Aoos

Source

Metsovo

Ioannina

The book is split in
'Part One: Greece' and
'Part Two: Albania',
each containing
'The Hiking Trail' and three
design projects.

The VA Organisation

A platform for communication

Finding a common ground between all these different opinions, approaches and interests is no simple task. To facilitate this process, we propose an organisation that acts as a mediator across theoretical and administrative barriers.

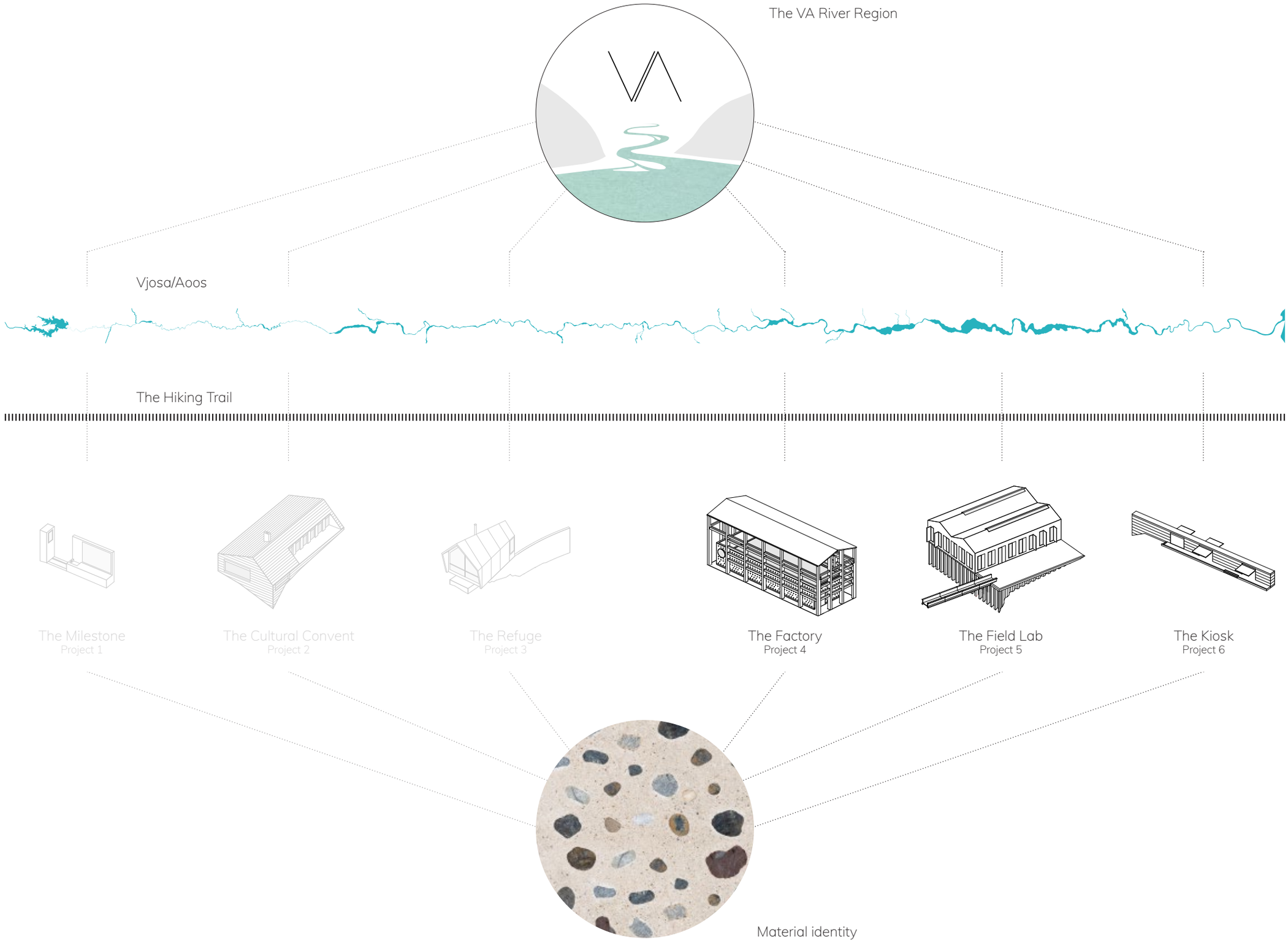
As a platform for communication, it encourages decision-making based on a bottom-up approach that involves everyone connected to the river. This could be achieved in the form of monthly meetings that encourage the different parties involved to present their thoughts on the future development of the river. Although this is possible in the form of online forums and similar media, it is necessary to provide a physical space for debate. In addition to these discussions, events can be organised through the platform of the VA. The different facets of the river region can be moved into the spotlight through cultural, culinary and sports events and the qualities of the river region can reach their full potential. By bringing stakeholders together and combining their energy and influence, as has rarely been done in the recent history of the Vjosa and Aoos, the movement gains more political weight and can thus achieve much more.

Apart from the role as a mediator for communication on a local level, the organisation would also act as a conveyor for the VA brand. The brand enables the organisation to better impart the image of the river region to the world, make it more recognisable and thus put it on the map of naturally and culturally appealing areas. Additionally, the brand can help the visitor understand the complexity and diversity that is the *VA River Region*.

I The VA Organisation acts as a platform for communication and thus tries to find a common ground between different perceptions of the region

Summary

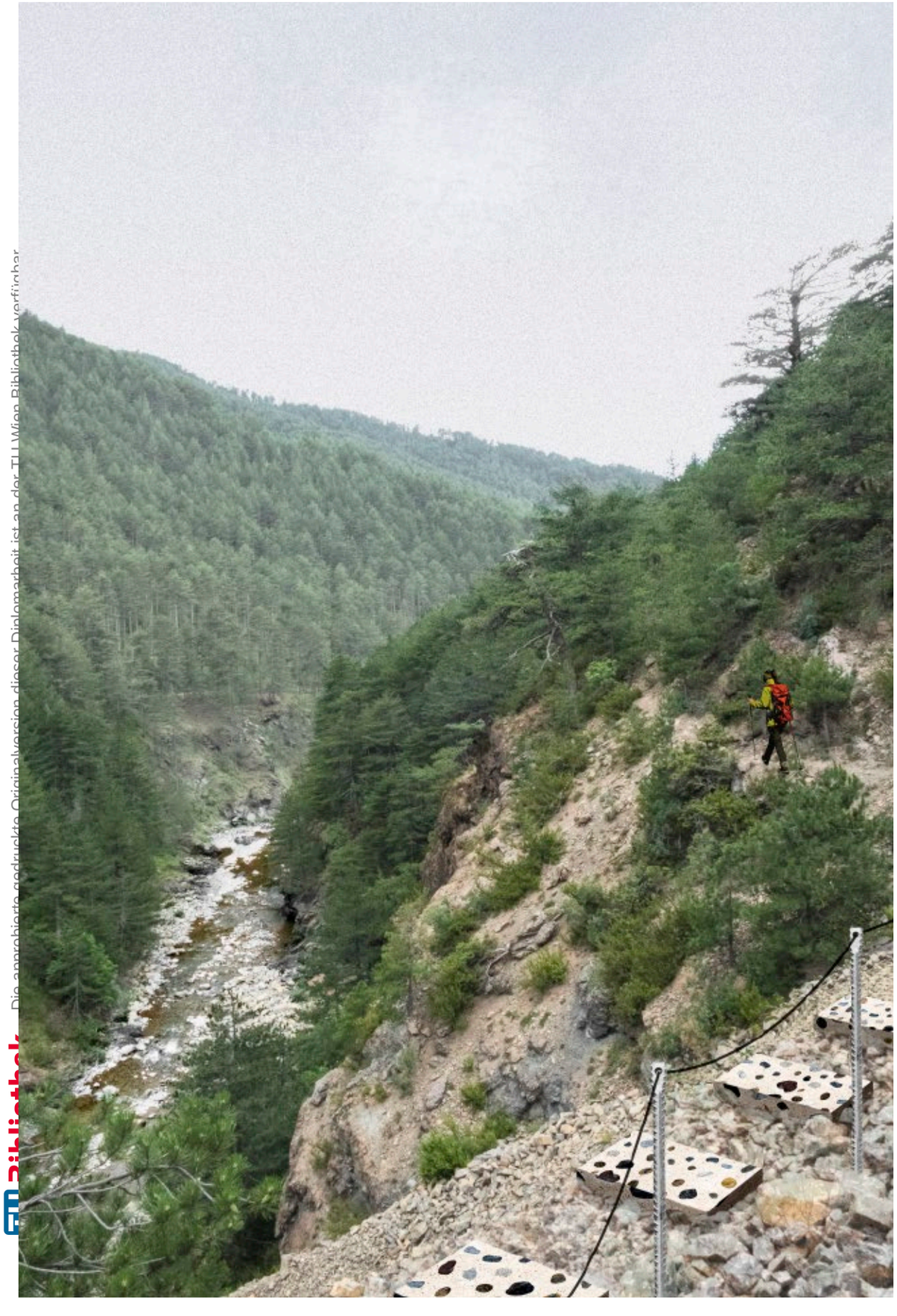
Overview



V.

The Journey

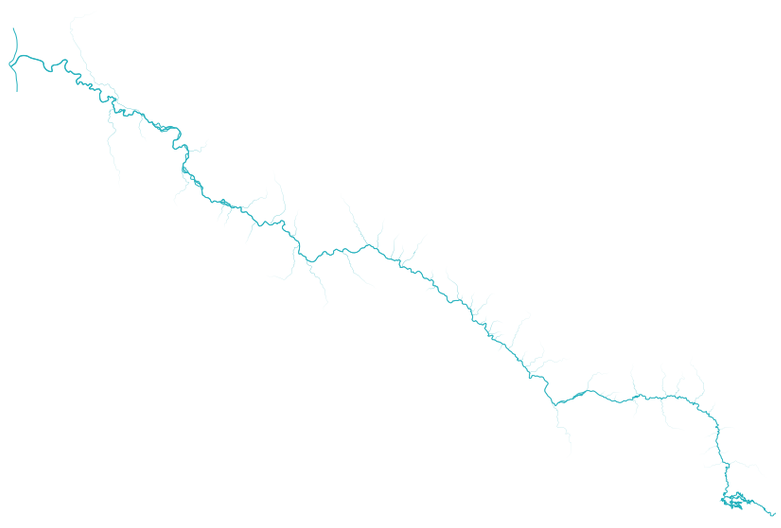
A hike from the source to the delta



The Hiking Trail

Prelude

The VA Hiking Trail is mapped across the entire region and systematic solutions for specific situations are developed.



Paths in the Region

As the Aoos slowly makes its descent it passes through an ever-changing landscape until it finally reaches the sea. From the mountains in Pindos, through the canyon at Konitsa, over the plains of Tepelena, to the delta, the topography and vegetation vary fundamentally and so do the people's means of transportation and movement. Over the years, shepherds, foresters, traders and fishermen had to adapt the landscape in order make the region accessible, according to their preoccupation and mode of transport. Consequently, a tapestry of different trails, paths and roads was formed which connect settlements to one another and to the nature around them. Several types of distinctive trails can be identified within the region, upon which the newly conceived hiking trail is based.

Unique to the mountainous part of the region is an extensive network of cobblestone streets made of locally sourced limestone and sometimes granite - the kalderimia.[50] Built during Ottoman rule, they were initially used for hoofed transport, trading and seasonal migration. They connected the many bridges in the area to form important trading routes through the mountains. Today, this style of path can be observed in almost every village of the Zagori area and can appear up to Tepelena. In these parts, whole towns are cobbled to facilitate movement, especially in the harsh conditions of winter. Made of stone, over the centuries they have blended into the nature and have thus become one with the landscape.

Shepherd's trails are the least noticeable in the area even though they are everywhere. The flocks of goats, sheep and even cows, in their never-ending search for fresh grazing spots, leave behind chaotic, usually very steep and inaccessible trails. The more frequented they are, the more visible they become.

In the mountains of Pindos the local economy depends largely on forestry and therefore numerous forest roads were cut deep into the woods to allow, initially carriages and more recently four-by-four vehicles or logging trucks to move around the region. These roads are mostly steep, rough and rocky, and sometimes blocked by landslides or fallen trees.

Local fishermen, the only people who venture into the delta wetlands on a regular basis, use improvised roads in between marshes or sand-dunes and paths along the river banks to access their fishing nets. These access routes were formed gradually because of an increased traffic condensing the sandy terrain.

In the region, especially in the Pindos area, there are some established hiking trails as well which are either based on existing trails and roads or were specially set up for the hikers. The demand for outdoor tourism is growing and in response more hiking trails are appearing on the map of the area.

A variety of different paths exist in the VA River Region

[50] Wilson L. (2015).

The Hiking Trail

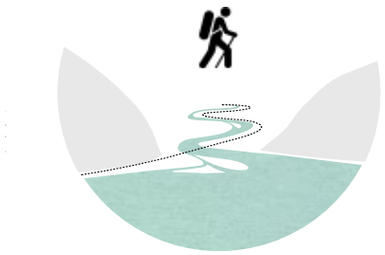
Based on this variety of different paths, a tapestry as diverse as the people and landscapes of the area, the idea of a hiking trail along the Vjosa/Aoos was born. By connecting different types of paths and adding missing routes, we propose a pilgrimage along the river that can be hiked in 15 days, allowing the user to experience the river from the beginning at the source to end in the delta. Being the first trail that runs along the entire length of the river, it enables visitors to experience the characteristics and beauty of the constantly changing river. Additionally it provides access to the many sights surrounding it and lets the user understand the diversity of the *VA River Region*.

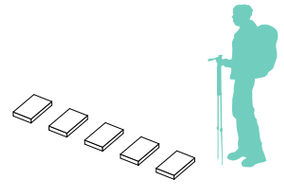
To achieve this, we first had to map the whole trail and find a way to convey this information to the user. Splitting the *VA River Region* into nine chapters, we created a series of hiking maps that provide orientation and information for the user. The reader can find the location of the access points, height profiles, distances to close infrastructure and length of the stages.

Next, we defined the missing links of the trail and tried to find solutions for reinforcing and marking dangerous sections of the new parts. As the basis for our design we asked ourselves what the main obstacles are along the trail and how hikers would deal with them in a natural, unaltered situation.

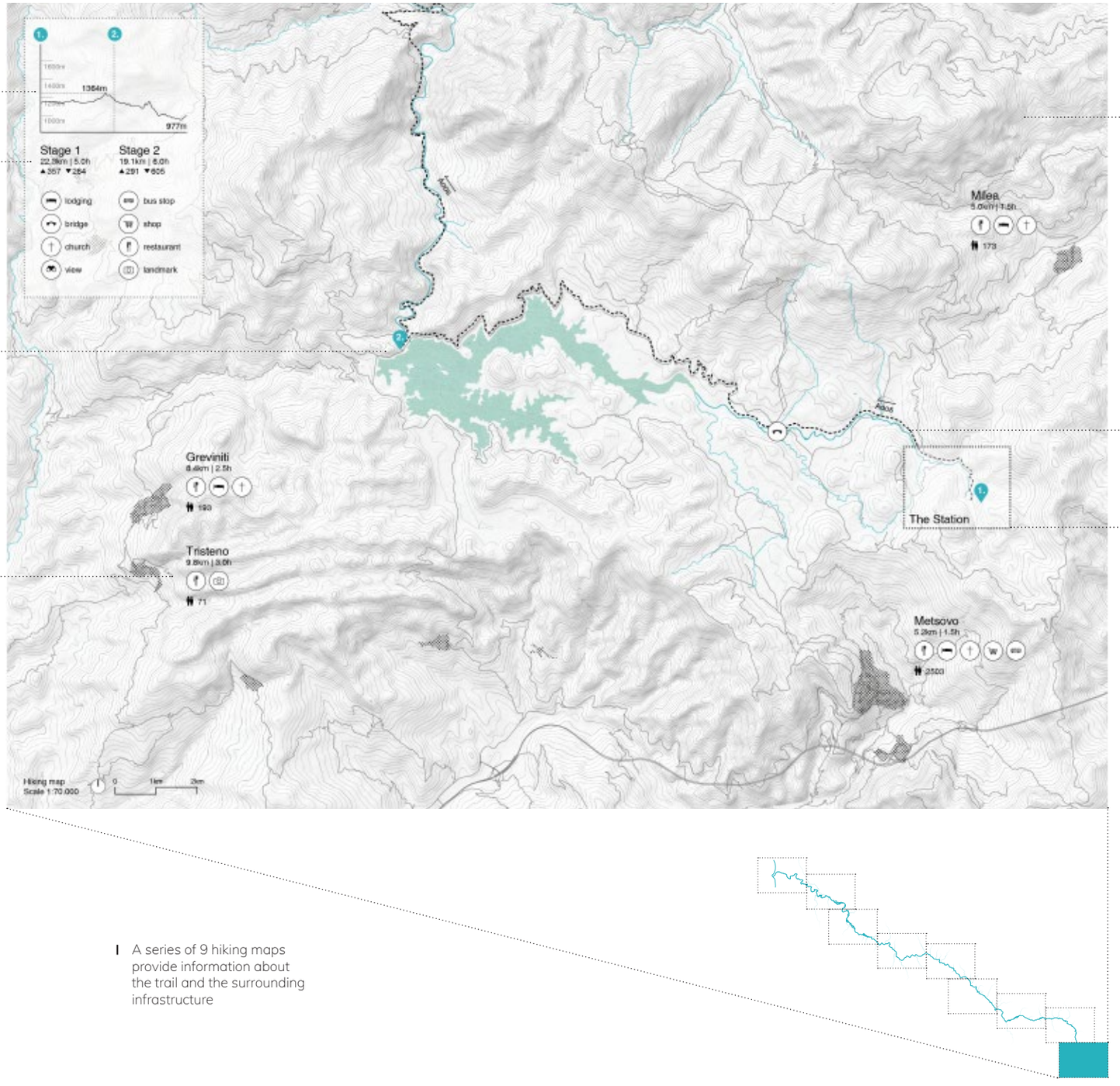
The crossing of a river can be one of the most memorable hiking experiences one can encounter. At the same time it is essential for the *VA Hiking Trail*, since walking along the course of the river, its tributaries often present a challenge that has to be overcome. Finding a shallow section of the river, the hiker can use stones protruding from the water surface to jump over them and reach the other side. Based on this concept of skipping stones, *Riverstone Concrete* slabs are positioned in line with the trail to assist the crossing of a river or other obstacles, by creating a direction and an improved sense of security. Made from exposed aggregate *Riverstone Concrete*, they blend into the landscape, leaving a minimal impact on the natural environment. Additionally, we add a railing to improve safety. The railing also provides visibility when the steps vanish due to rising water levels or when they are overgrown.

Using our *Riverstone Concrete*, the slabs are prefabricated or created in-situ out of exposed aggregate concrete, providing the friction needed to comfortable walk on them. The format of the slabs is 336mm / 259mm and 40mm thick. The stones are optimised for their weight, providing just enough space for two booted feet. Weighing just seven kg, a person can carry up to two of them.





Hiking Maps



Heightprofile of the stage

Distance and duration of the stage

End/beginning of a stage

Information about surrounding villages, infrastructure, lodging, sights and distance to next entry/exit point

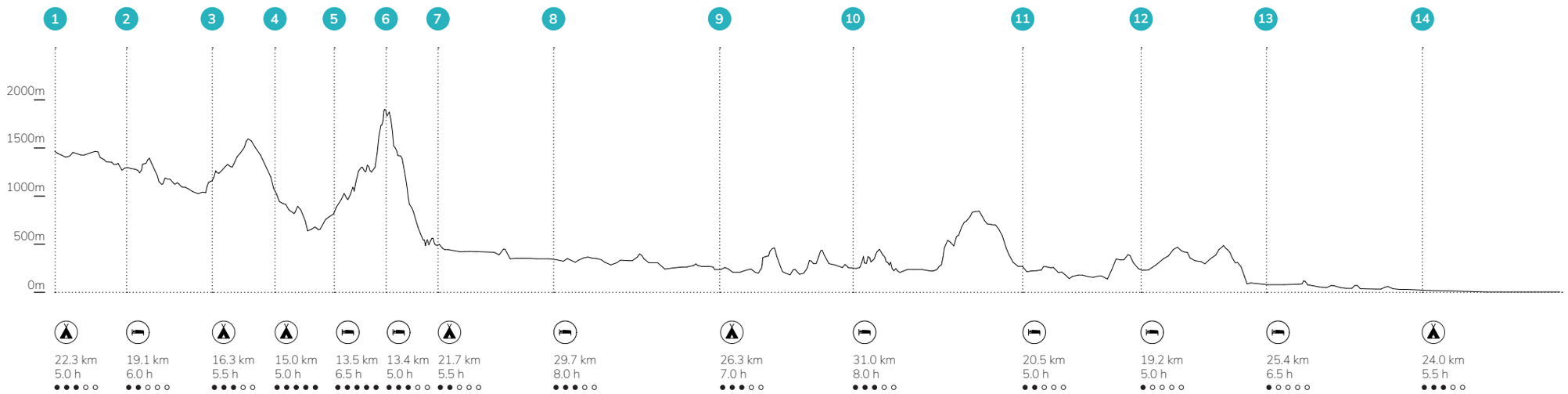
20m height lines showing the terrain

The Hiking Trail

Focus area of the chapter

I A series of 9 hiking maps provide information about the trail and the surrounding infrastructure

Hiking Trail Overview



existing trails

new hiking trail

tent needed

lodging available

difficulty 1-5

Total - 14 stages

266,4km

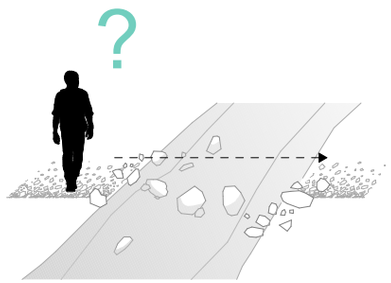
36km new trail

83.0h

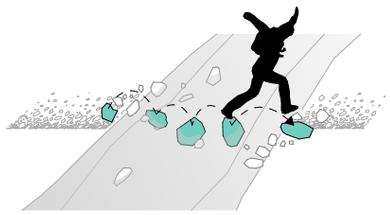
5282m

6234m

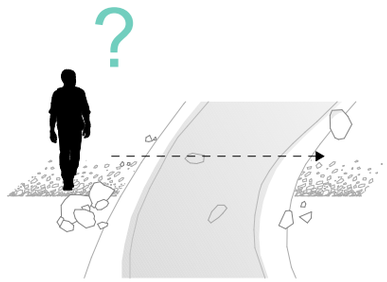
Design Concept



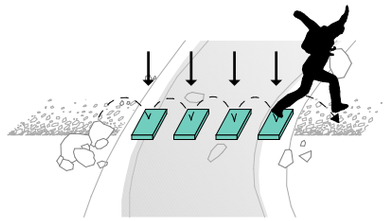
Problem of crossing a river tributary



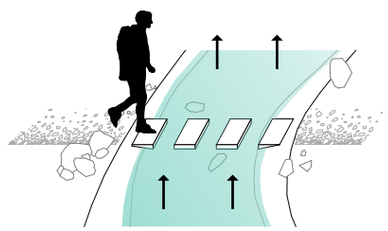
Skipping over river stones



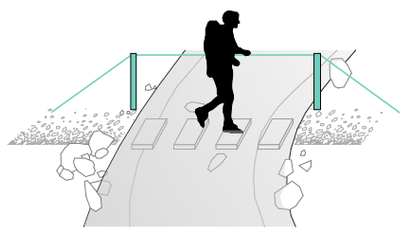
Problem of crossing a tributary without rocks



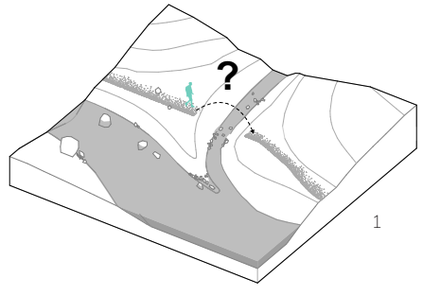
Placement of *Riverstone Concrete* slabs to create a trail



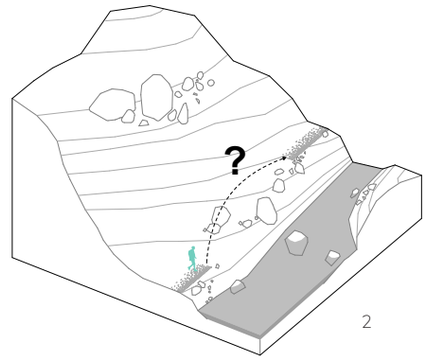
Water levels rise and fall, covering the stepping stones



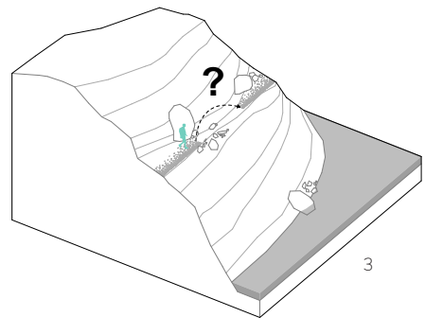
Add a railing for additional safety and direction when the trail is not visible



1



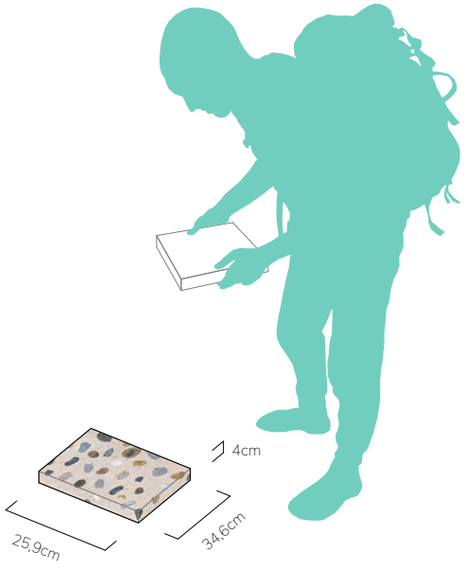
2



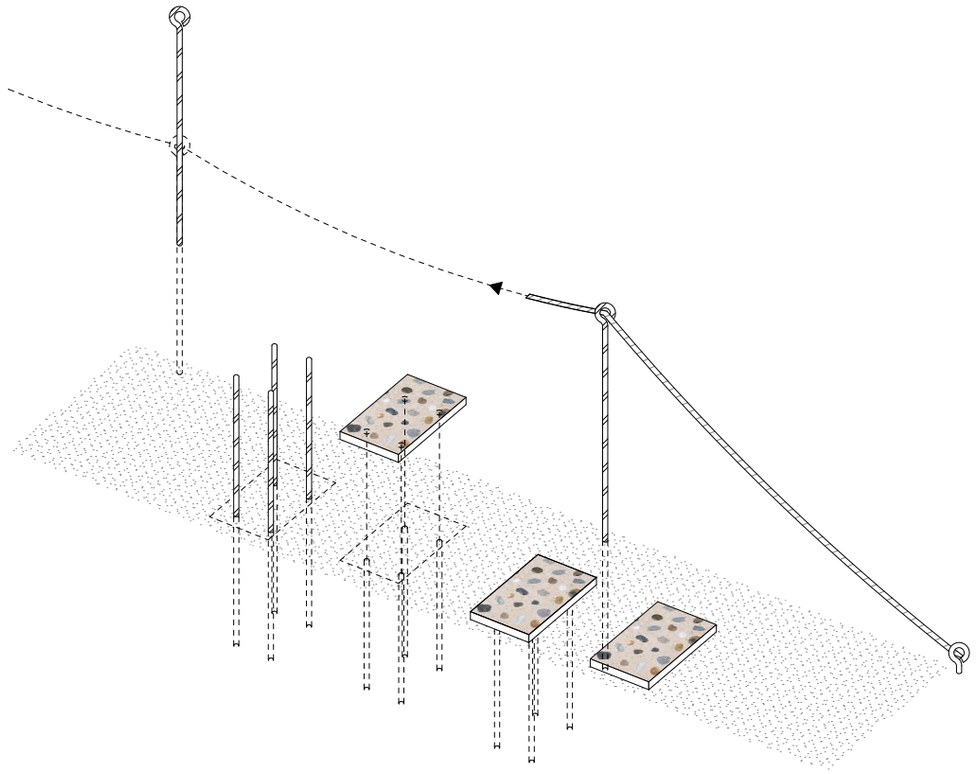
3

Concept is adapted to the different obstacle situations encountered along the trail

1 Tributary crossing
2 Slope crossing
3 Ridge crossing

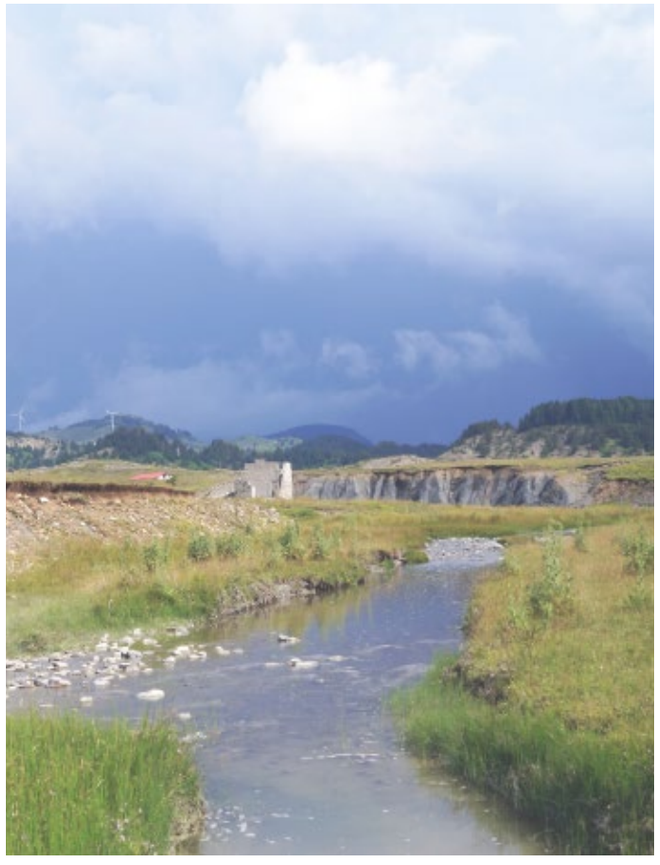


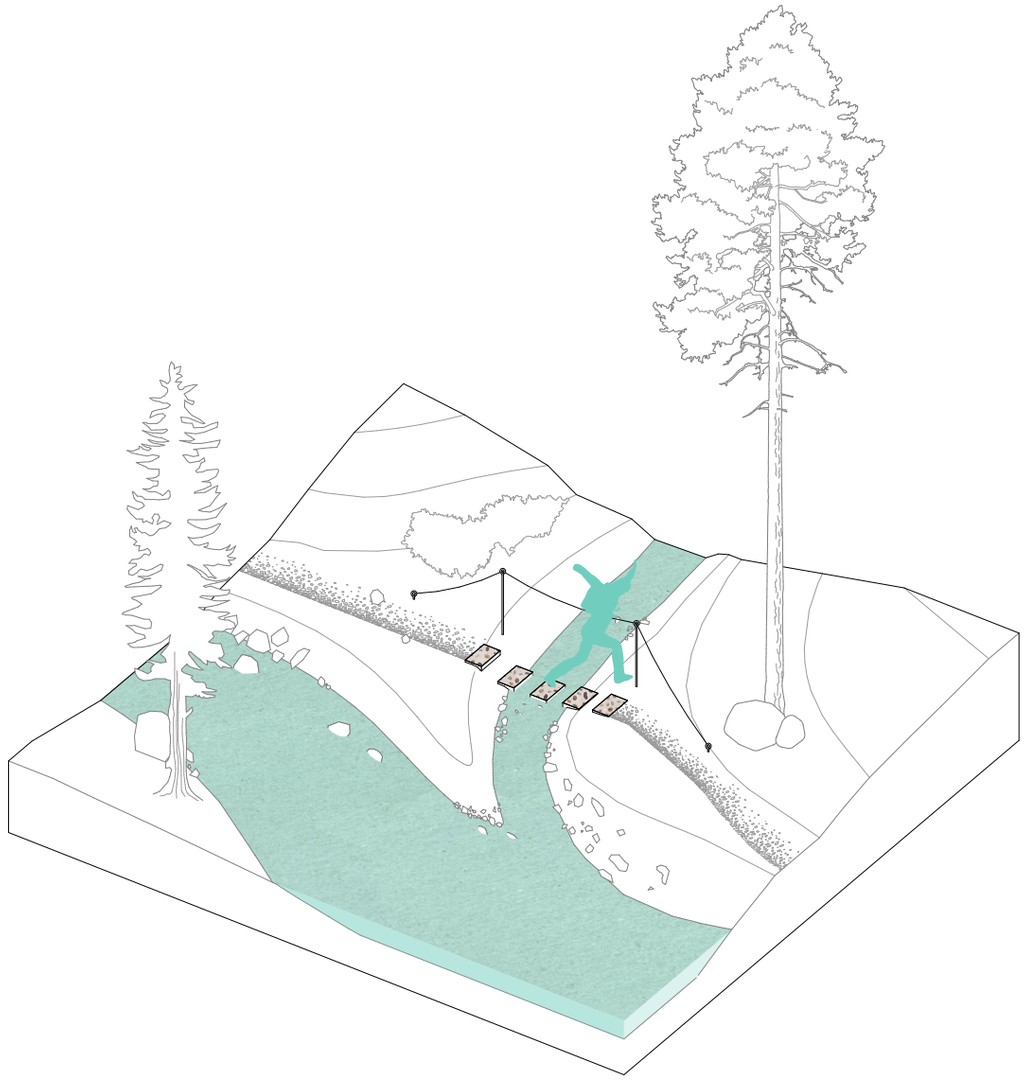
The stone slabs are either prefabricated or created in-situ, depending on what the situation allows



Rebar is rammed into the earth to provide a better foundation and prevent the slabs from rotating. They are held down by their own weight

Tributary Crossing

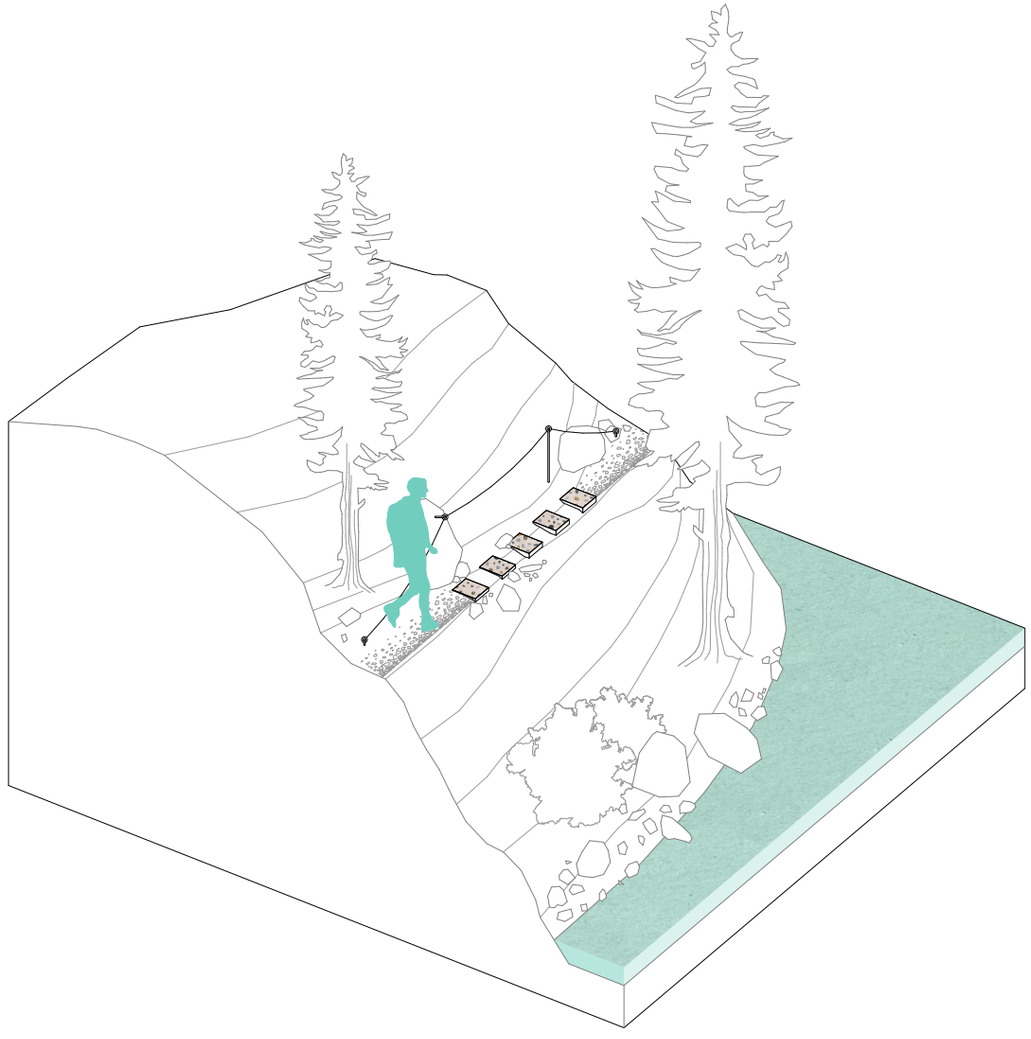




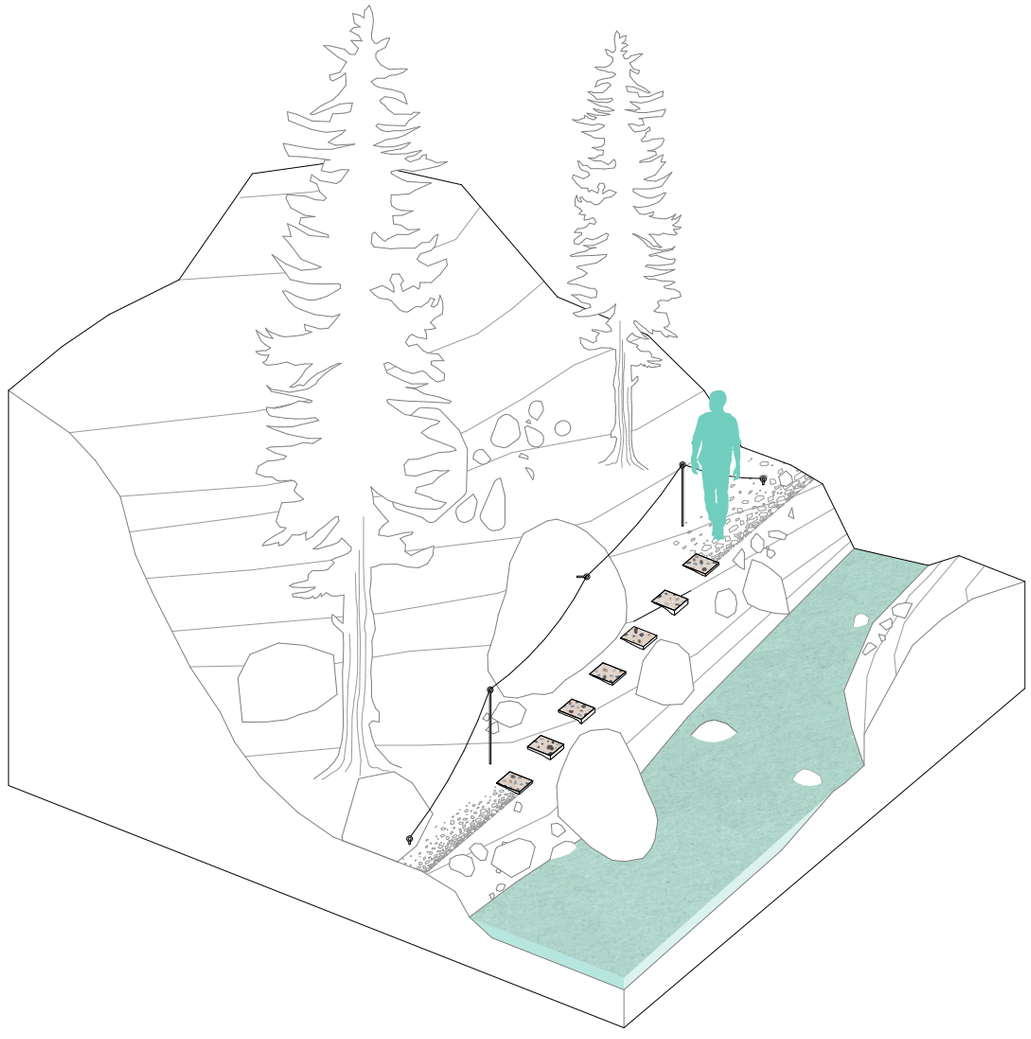
The trail frequently has to deal with tributaries that flow into the main river. The concrete slabs are positioned as stepping stones in the water, marking a safe spot to cross

Ridge Crossing

Steep ridges are prone to landslides that oftentimes make the trail impossible to cross. Reinforcing these situations provides them with more protection, but maintanance is still required



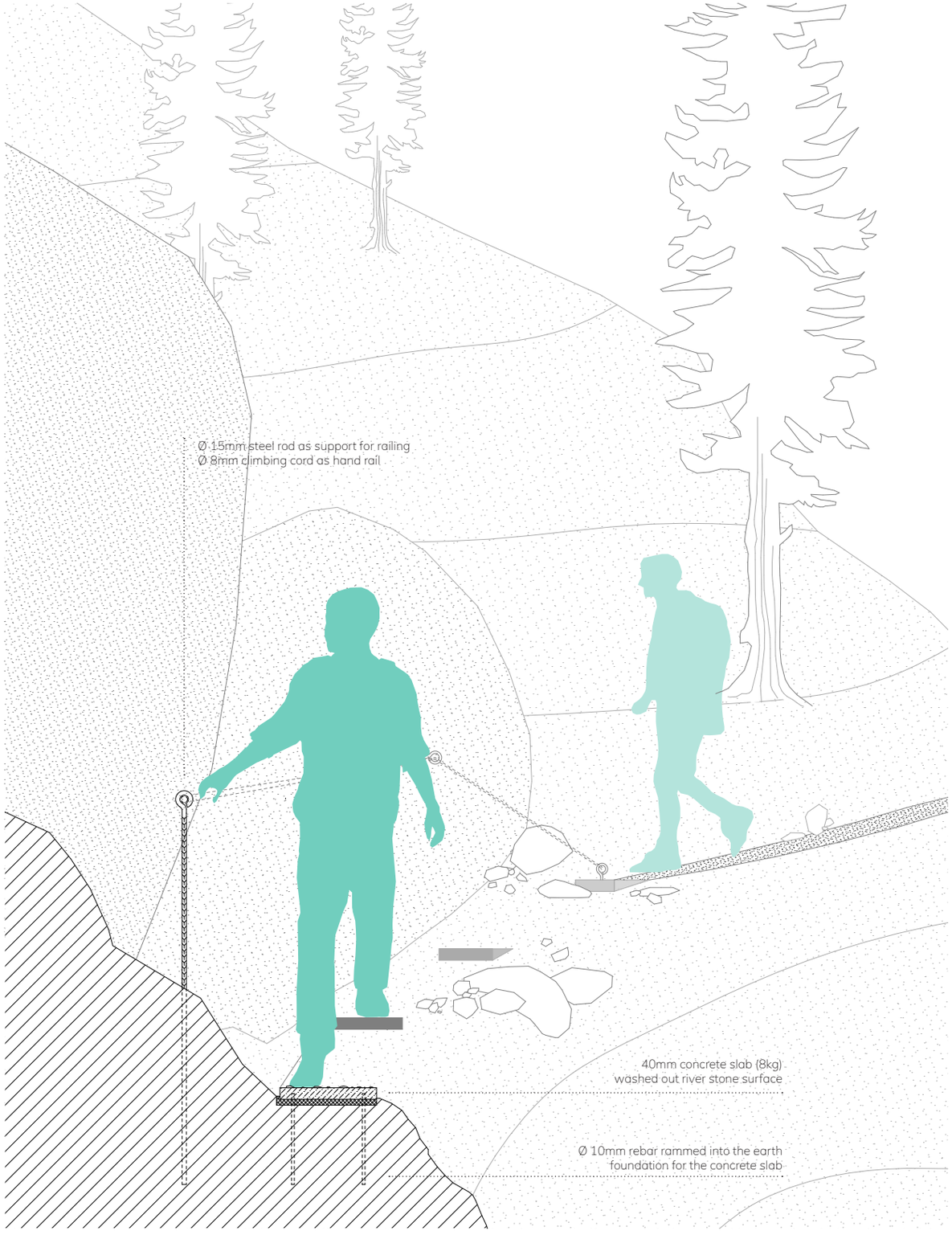
Slope Crossing



I Placing the riverstone slabs like a stair enables the hiker to overcome steep slopes, the railing adds addiotional security and visibility

Detail

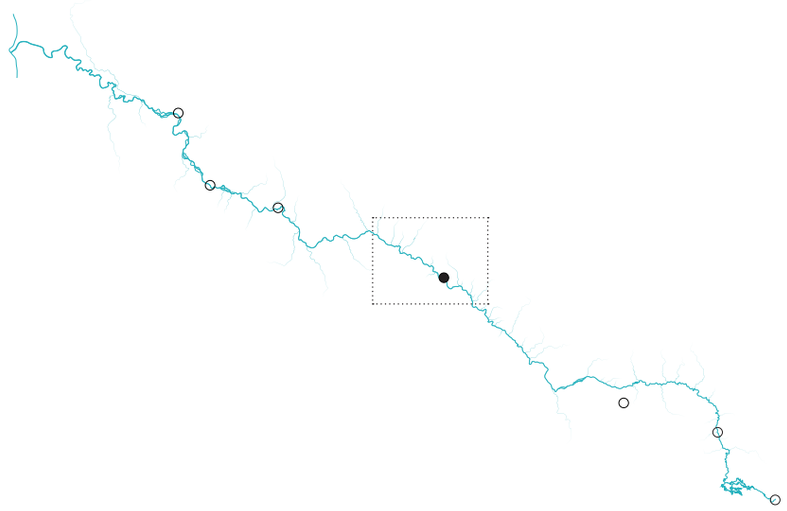
The friction of the slabs is increased by washing out the surface to expose the riverstones and aggregate fo the *Riverstone Concrete*



Detail section
Scale 1:20

The Camping

An existing camping run by a young Albanian couple is mapped and integrated into the hiking trail.

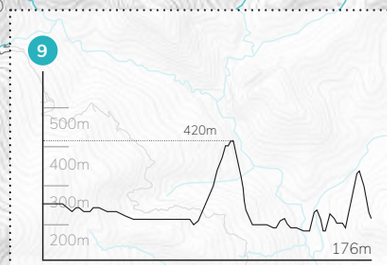


Impressions

– View from a rafting boat close to the border

– The city of Permet, with almost 6000 inhabitants

– The city is built directly on the banks of the Vjosa



Stage 9
26.3km | 7h
▲560 ▼605

lodging
bridge
church
view
bus stop
shop
restaurant
landmark

Piskovë
9.7km | 2.0h
587

Kosinë
3.5km | 0.8h
982

Përmet
3.5km | 0.8h
5945

Leusë
5.4km | 1.5h
126

Petran
4.6km | 1.0h
1622

9

Vjosa

Hiking map
Scale 1:70.000
0 1km 2km

The Camping

Moving on towards Permet, the landscape changes and the valley opens up, leaving more room for the Vjosa. The river widens and changes appearance drastically compared to the mountain river it was before the confluence at the border. In this area, many smaller settlements appear along the river bed, providing opportunities to eat and accommodation to the traveler.

Shortly before the city of Permet, a small campsite appears close to the river course. Donna and Robert, the owners, are enthusiastic outdoor people who are actively involved in Albania's small outdoor community and frequently host events at their campsite. Conveniently located directly along the road and only a short detour from the *VA Hiking Trail*, it provides an excellent spot for the end of the stage.

In addition to accommodation, the young couple offers a variety of watersport activities such as kayaking and rafting on the stretch between the border and their campsite.

I Donna and Robert, the owners

The Camping

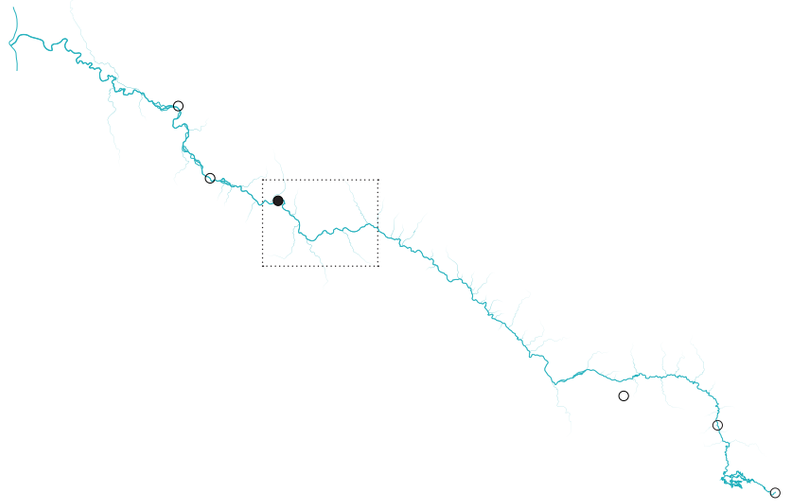
The charming little camping offers a variety of river-related activities

Picking up the rafting boats from the exit point of the tour

The Factory

Project 4

A center for regionality where agricultural products can be produced, processed and displayed.



Impressions

– Conglomerate canyon in the Kelcyra gorge

– Confluence of Drinos at the foot of mount Golik near Tepelena

– View from the castle ruin near Kelcyra into the gorge

11

The Factory

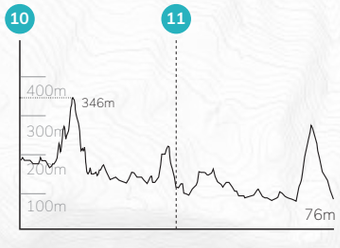
Memaliaj
2.4km | 0.3h
2647

Tepelenë
12.4 | 3.0h
4342

Këlcyrë
4.4km | 1.0h
2651

10

Vjosa



Stage 10
31.0km | 8h
▲511 ▼58

Stage 11
20.5km | 5h
▲280 ▼323

- lodging
- bridge
- church
- view
- bus stop
- shop
- restaurant
- landmark

Hiking map
Scale 1:70.000

0 1km 2km

Memaliaj and the Old Factory

Established in 1946, the small mining town of Memaliaj flourished when the coal mines northeast of the town opened in 1949. Workers from all around Albania were relocated to work in the mines or provide services to the inhabitants. In just a short time, it grew to become a thriving community of workers, with more than two thousand workers at its peak. After the fall of the socialist regime in the early 2000s and the subsequent closure of the mines, the population declined and the town began to deteriorate. Today it is still associated with the coal industry and known as an industrial town with high levels of unemployment.[51]

On the edge of the town lies the abandoned ruin of an old phosphate factory. The phosphate produced there was used to fertilize the surrounding fields and plantations and provided an important economic catalyst for the small town. It was built on the inner bend of the river, with an impressive view of the fluvial plains downstream of it, just where the main road meets the river. Established during the communist regime which also owned the plot until 1991, it was recently acquired by an Albanian investor based in Tirana – Alb-Building. Its plans for the old factory are unclear.

The large complex consists of three buildings; the former factory building, where the fertilizer was produced. It consisted of a main building with six floors and an adjacent 20m high storage hall. The middle of the plot is occupied by the former garage building. As it was used to shelter the big trucks that are necessary in the mining industry, what remains is a roof with an elevation of around fifteen meters, held up by crude concrete columns. The third structure used to be a mechanics workshop, with long ditches used for accessing and repairing the underside of cars.

The buildings are all built out of prefabricated reinforced concrete skeletons, filled out with brick material to create the walls. Years of abandonment have left the brick walls in a deteriorated condition, loose bricks lying around everywhere. The concrete columns on the other hand remain largely intact, being of massive, industrial scale.

The factory complex is located at the edge of Memaliaj on an inner bend of the river

51 Isto R. (2019).

The three buildings are located right where the main street exiting Memaliaj and the river meet

Goats and sheep roam around freely and enjoy the shade of the trees and the large concrete structures

Agriculture in the Region

Agriculture in various forms dominates the second half of the Vjosa river basin, where the rivers terraces provide excellent soil for crops and livestock farming. Five decades of a centrally planned socialist economy have resulted in the creation of small-scale farms, that mostly grow vegetables and plants for self-use or to sell them on stands found along the main road.[52] Especially in the area around Memaliaj many rural households survive off this subsistence agriculture.[53] The second major form of agriculture in the region is livestock farming. The wild landscape irrigated by the river offers extensive pastureland for goats, sheep and cows. Not surprisingly, shepherds with their flocks are ever-present. The milk produced is used for various types of cheeses, feta among others, locally produced and often homemade. Although in terms of economy not very efficient, the region produces incredibly high-quality ecological goods, the small scale eradicating the need for the use of fertilizers. In a world of mass production, these agricultural products provide an ecological alternative.

Apart from the above-mentioned goods produced, Albania and Greece have a long tradition of olive oil production that is renowned throughout the world. One of the highest densities of olive trees is located close to Memaliaj, where the mild climate provides perfect conditions for agricultural activities and oftentimes even wild olive trees grown along the river. While olive tree plantations exist and oil presses in Berat and Vlora already produce local olive oil, small plantations and wild trees offer enormous potential.

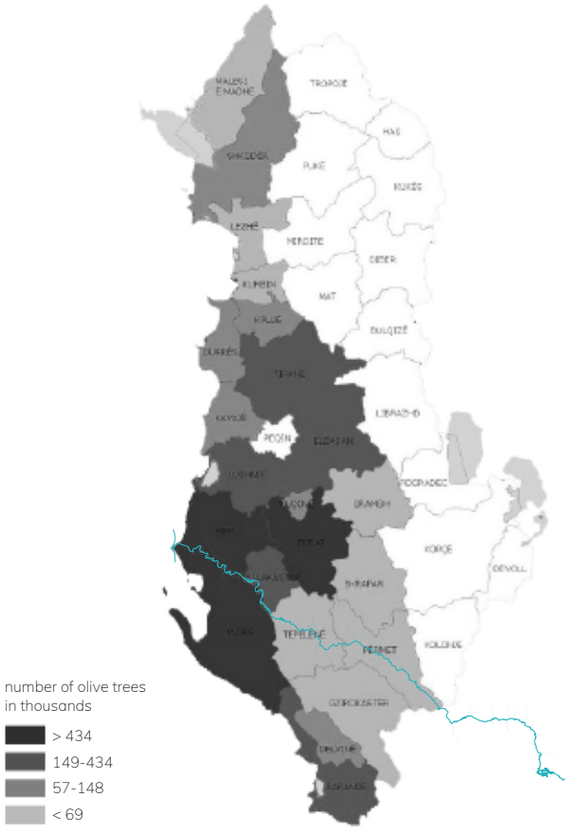
The territorial plan for 2030 of Albania includes large investments into the agricultural and tourism sector. Having recognized the trend in the European market for the consumption of bio-organic products, the plan proposes to improve organic farming and direct the local tourism more towards an eco-friendly form of agro-tourism.[54] This could benefit the town of Memaliaj and provide a chance to tackle the issue of unemployment.

A shepherd on the way home, descending to the agricultural plains of the Vjosa valley

52 Skreli E., Halbrendt C.C. and Balliu A. (2008). p.2
53 Food and Agriculture Organization of the United Nations (2015). p.7
54 Gjermeni E. (2017). p.100

Agriculture in the Region

Wild olive trees frequently appear on the shores of the river along the trail



The distribution of olive trees in Albania shows that there is an abundance in the flatlands of the Vjosa valley. Although there are many olive oil producers in the region, wild olive trees remain unharvested and unused

The Factory

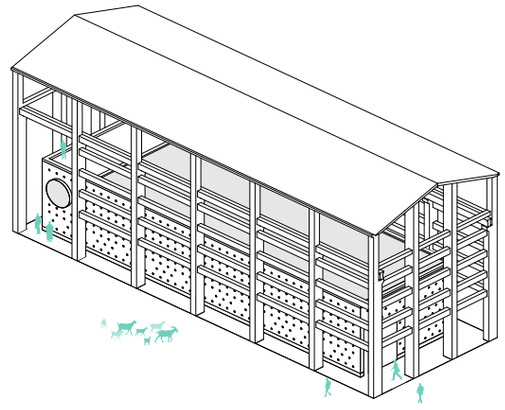
Using the potential of the agricultural businesses which are scattered around, we propose to turn the old factory complex into a center for regional products and enhance the surrounding park to turn it into a public space. The resulting project acts as a catalyst for the local economy and a park for visitors, hikers and the residents of Memaliaj. Three different interventions placed inside the existing buildings create the programmeme for the *Factory*.

A new marketplace offers a location were goods can be presented and sold, offering a permanent location for the many stands selling foods and goods along the main street that accompanies the Vjosa. Raising the platform of the market with reused bricks creates a clean surface for market activities while allowing the rest of the hall to continue to be used by shepherds and their flock.

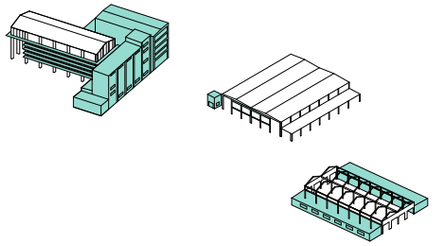
The former mechanics workshop is turned into a greenhouse where plants and vegetable can be grown, acting like a museum for local plants as well as a place for production.

The last of the three buildings is the olive oil factory. It is an industrial building that houses a press and the necessary equipment to produce olive oil. Olives from surrounding farms and trees can be brought to Memaliaj to be turned into oil for self-use or to be sold, generating an opportunity for locals to use what is sometimes freely available in the region on a small-scale.

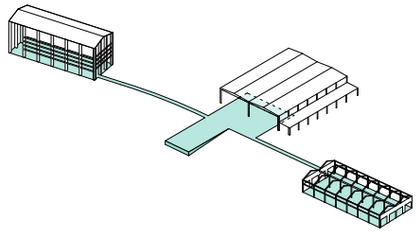
The building is placed inside the enormous concrete skeleton structure of the existing factory, which is first consolidated and repaired. Using large prefabricated concrete elements and metal parts, pipes and silos, it strongly references the surrounding ruin. The main entrance is a long corridor with a staircase that runs parallel to the actual production hall. The visitor is guided along a low wall further up, until he surpasses the wall and the view into the machine hall opens up. From there he can observe the process from an elevated platform, without disturbing the production activities below. Directly connected to the platform is the tasting room in the front part of the building that offers a view onto the river through a re-used silo. A spiral staircase leads up to the roof terrace, giving an overview of the entire plot while being surrounded by the massive concrete columns of the existing storage hall.



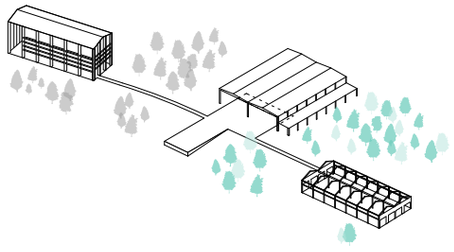
Site Concept



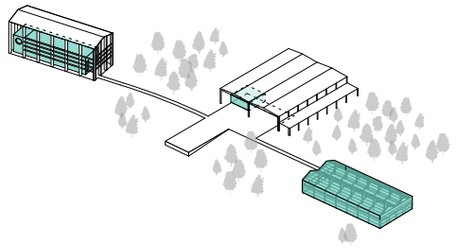
Desolate buildings parts are removed and damaged roofs repaired. Brick material is kept for reuse



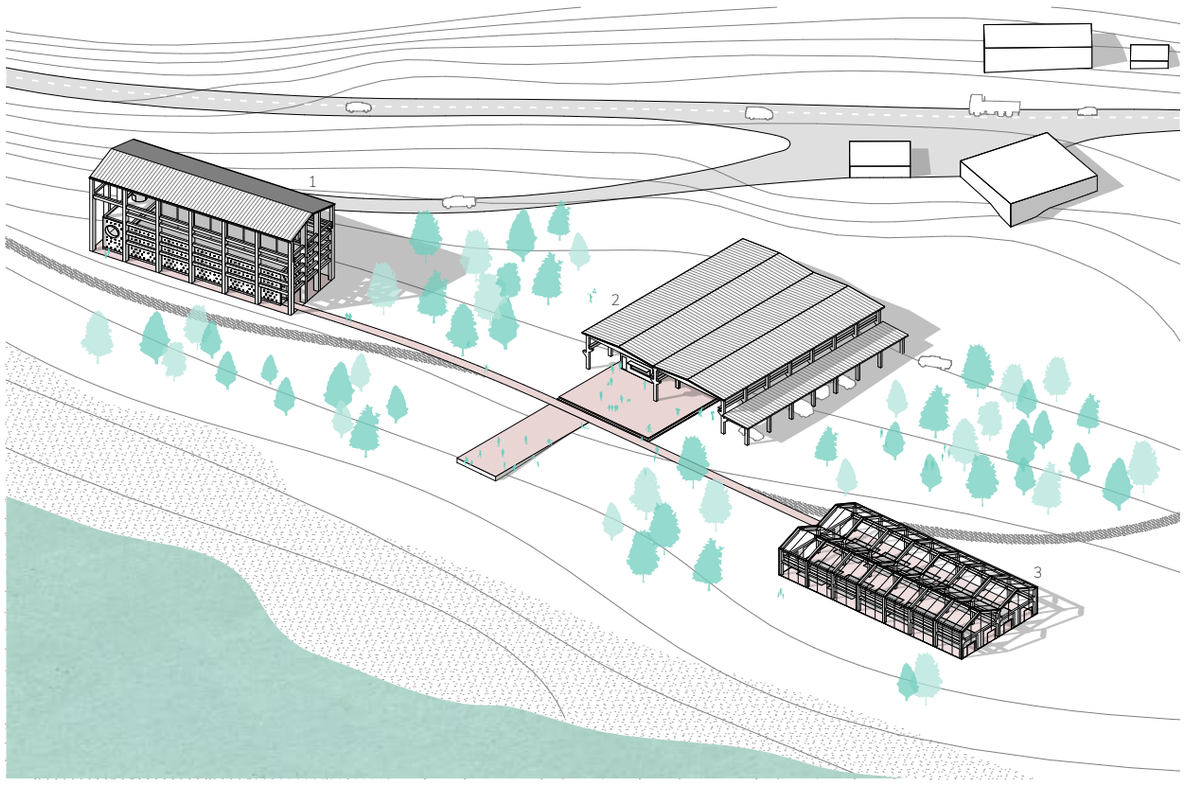
Brick material is reused to pave parts of the square to create a clean surface for the marketplace and new additions



Plants and trees are added to the eastern area of the plot to create a park



Remaining structures are used to create the new programmeme

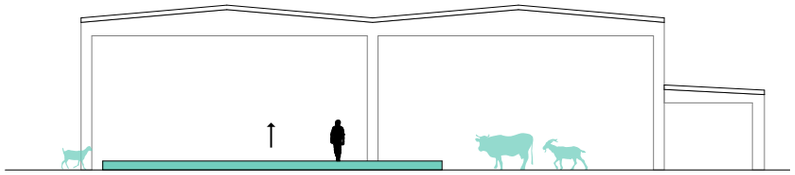


The Center for Regionality is distributed across the whole plot. The three new additions are connected by a park and a public square

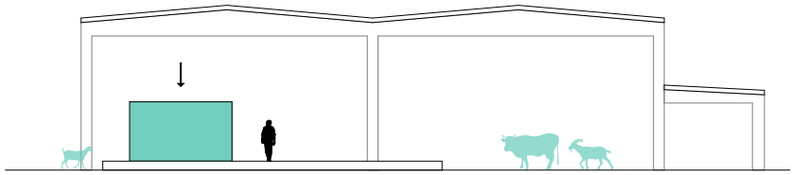
1 Olive Oil Factory
2 Market Hall
3 Greenhouse

Design concept

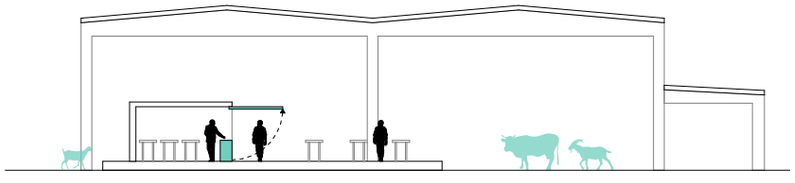
Market Hall



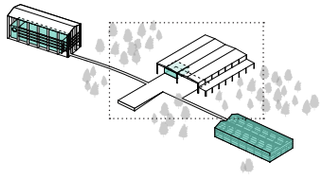
Platform is raised as barrier for the animals and to create a clean surface for the marketplace

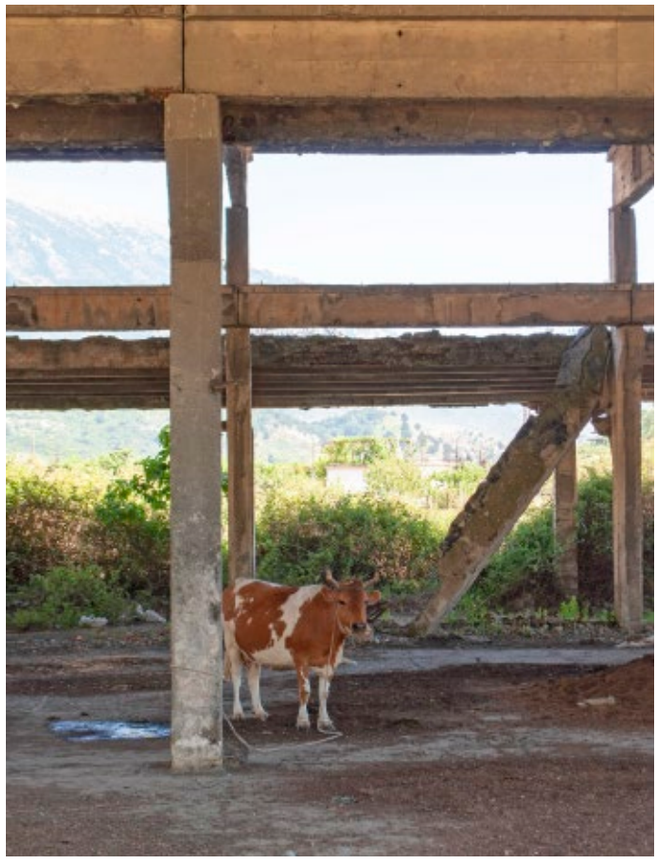


Volume is placed on top of the platform



The new building acts as storage for mobile market tables and a stand for refrigirated goods

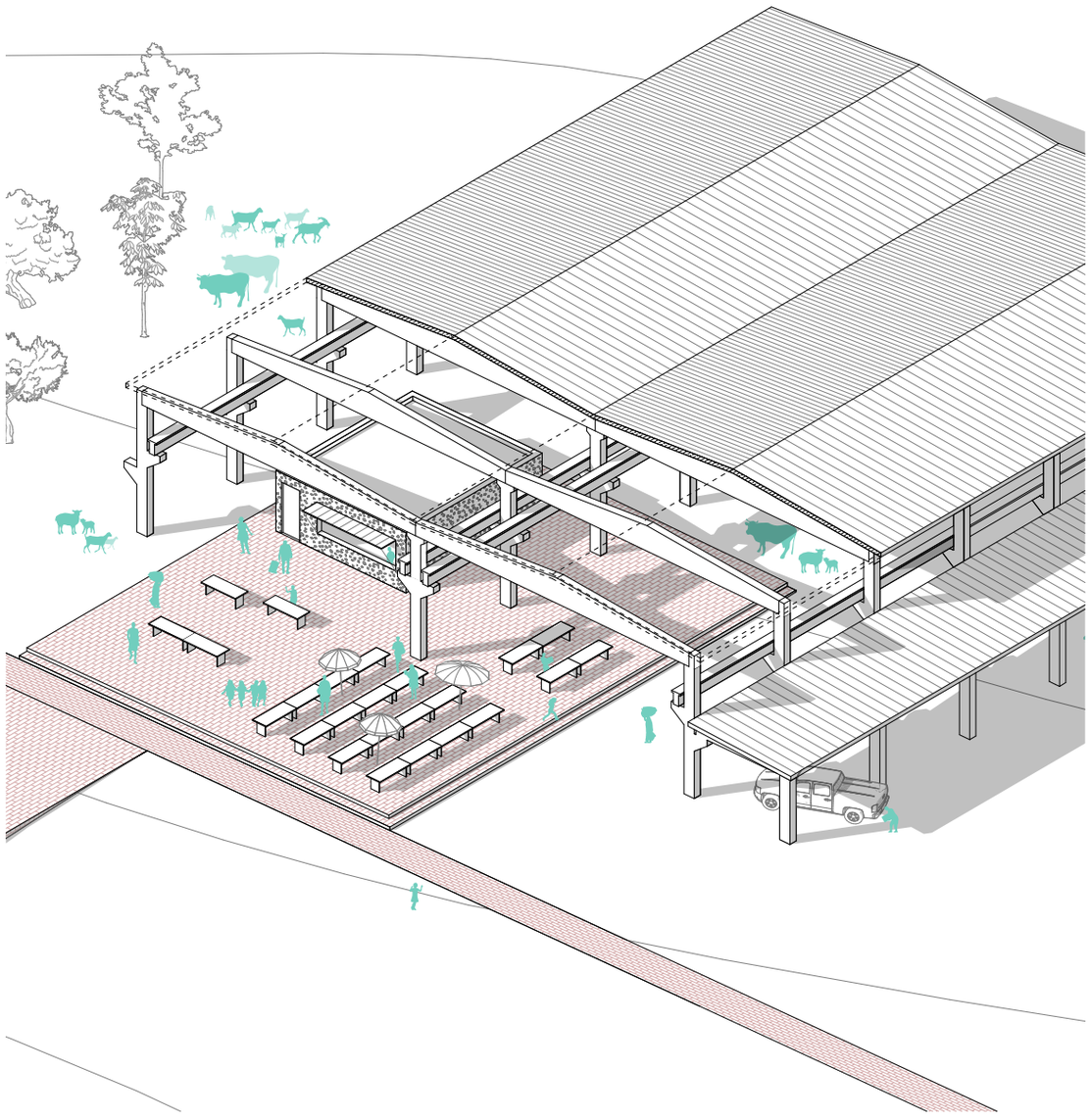




The large concrete roofs create shaded areas that are currently used as open stables for cows, goats and sheep

Design concept

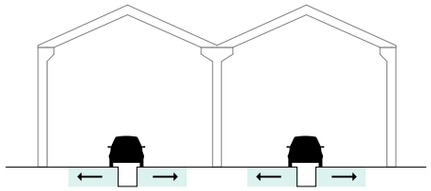
Market Hall



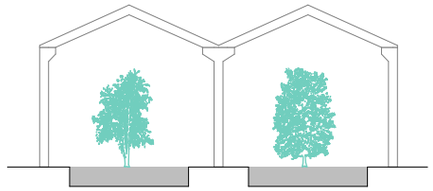
The maketplace offers an elevated platform made out of re-used bricks

Design Concept

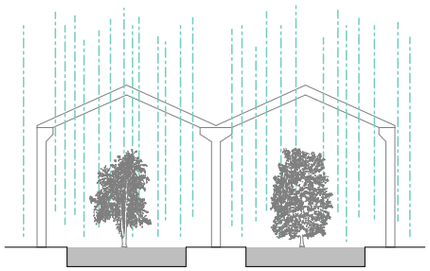
Greenhouse



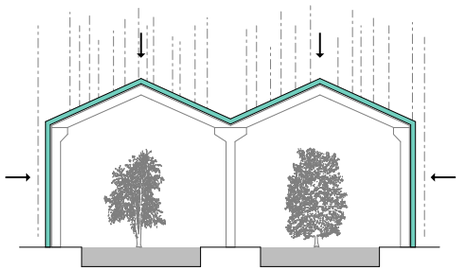
Widen existing ditches formerly used for car repairs



Fill the ditches with soil and plant a variety of plants

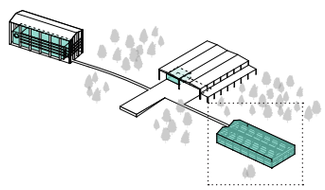


Hall is exposed to outside weather influences



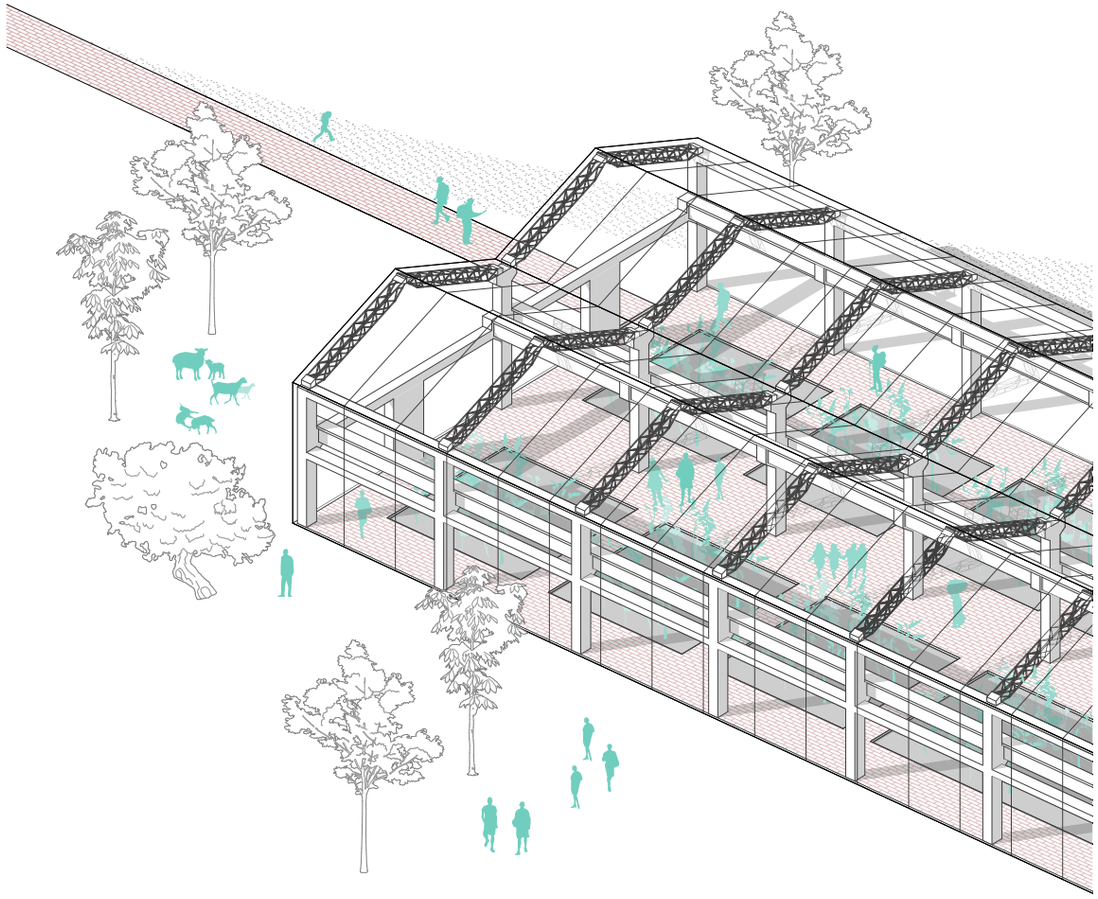
Add glass envelope to create an all year round environemnt for plants

I Steel trusses made of welded rebar create a filigree roof construction



Design Concept

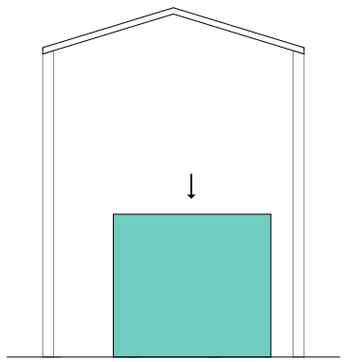
Greenhouse



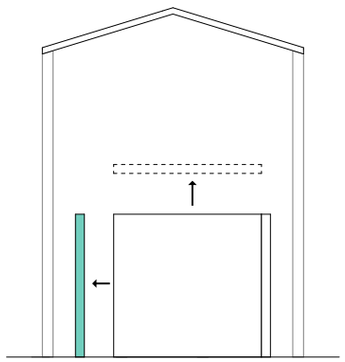
The greenhouse uses the existing mechanics ditches for the plantation of crops

Design Concept

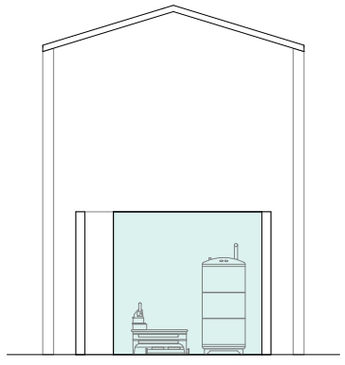
Olive Oil Factory



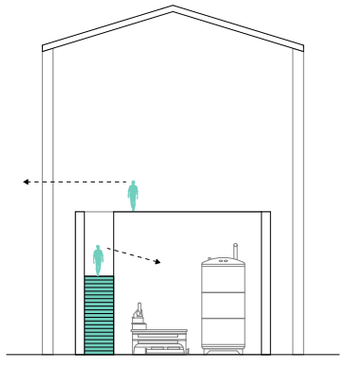
Place volume of the olive oil factory under the existing roof



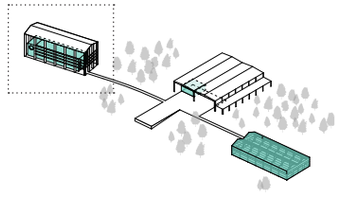
Remove the ceiling and extend the volume

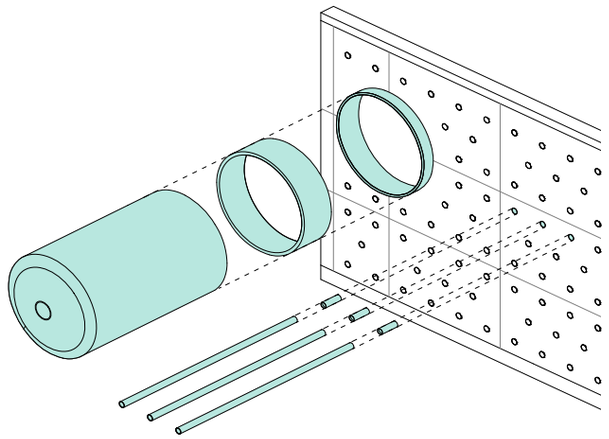


Create a transparent roof and wall that is protected by the new sides and the existing structure



Add staircase to enable visitor to access the roof and overview the production process

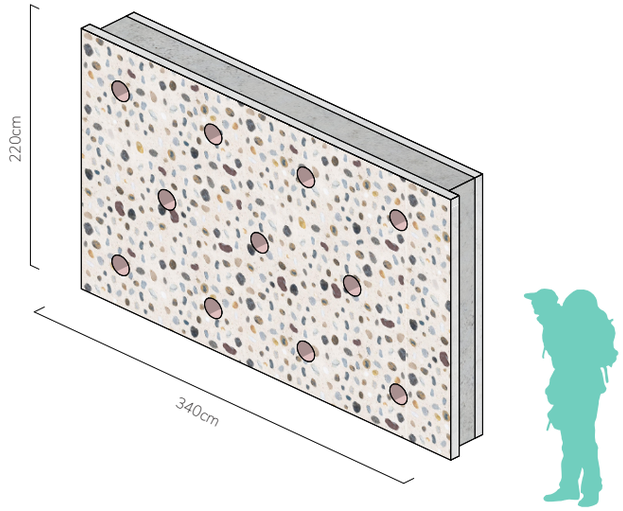




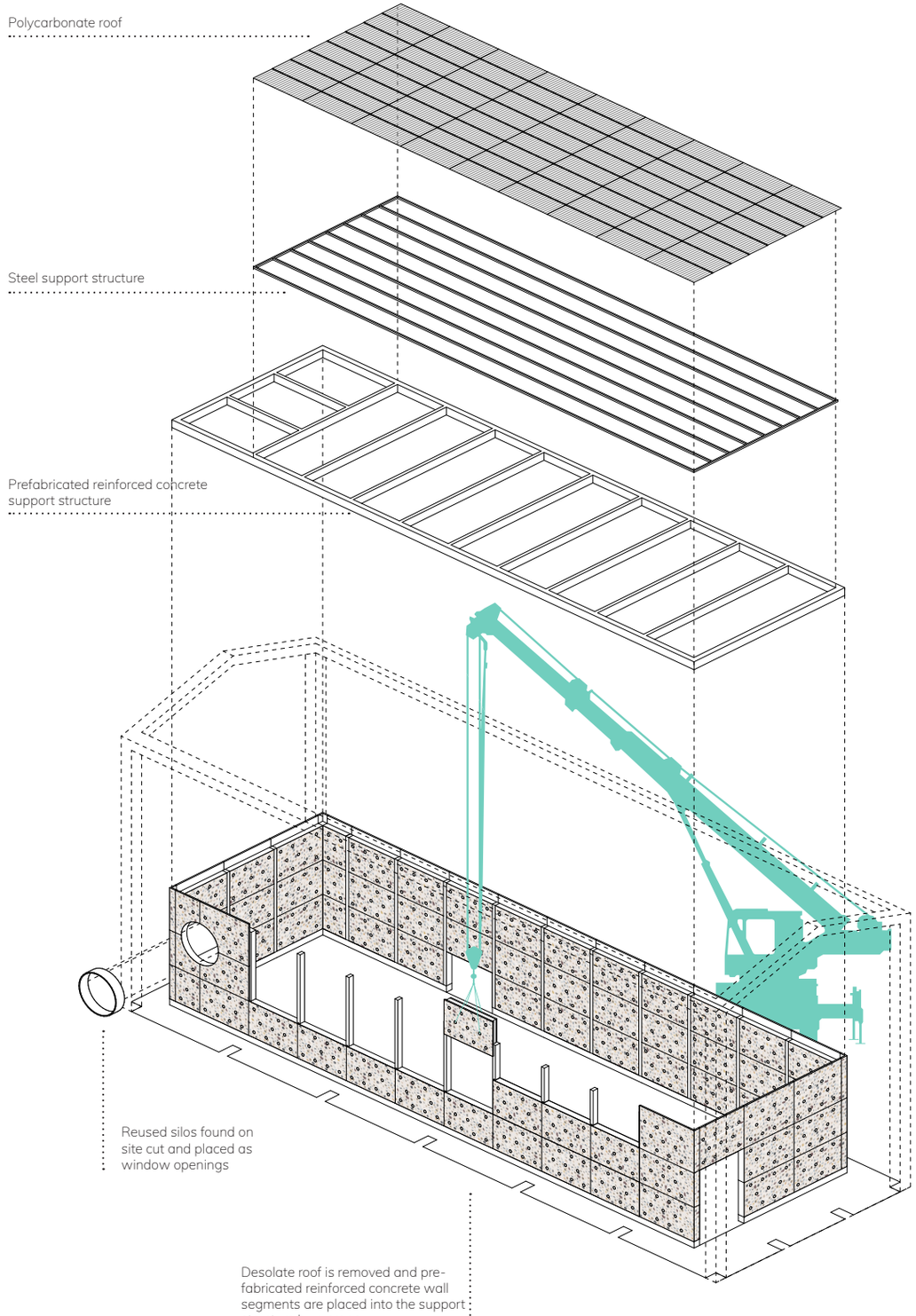
I Old silos found on the site and pipes from the old factory are cut and used to create window openings

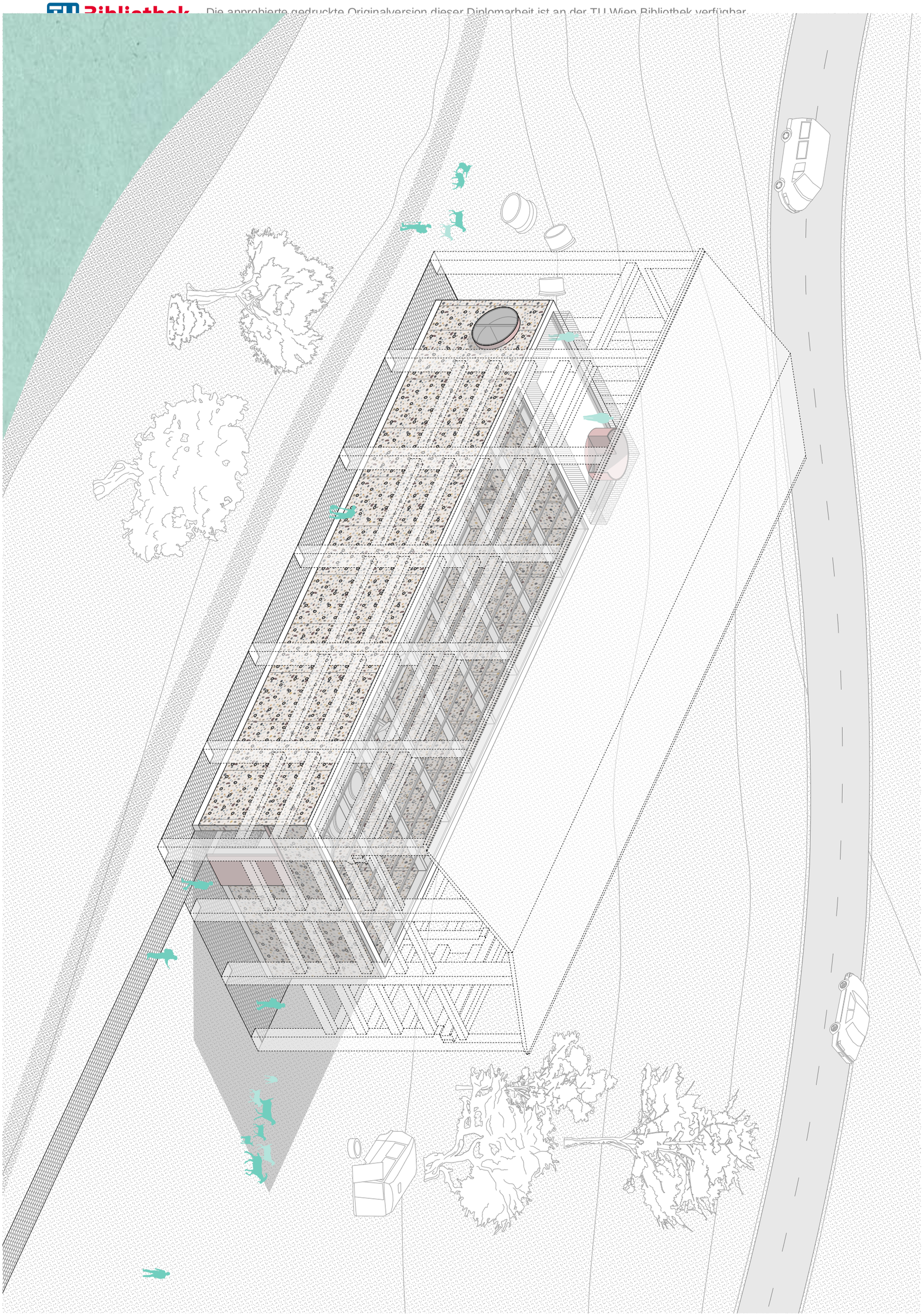
Material Concept

Olive Oil Factory



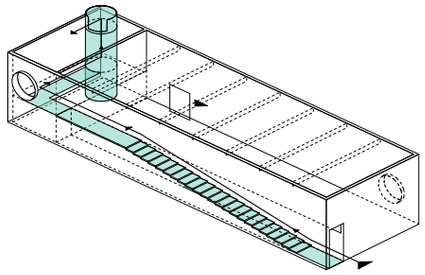
Metal pipes found in the old factory building are used as lost cast in the prefabricated elements to create holes in the facade



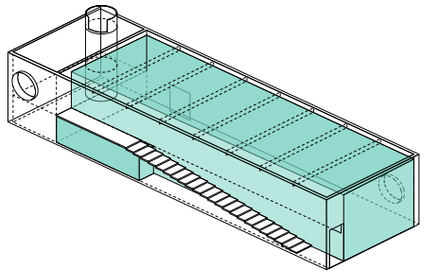


Programme

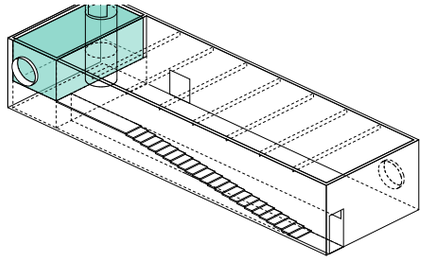
Olive Oil Factory



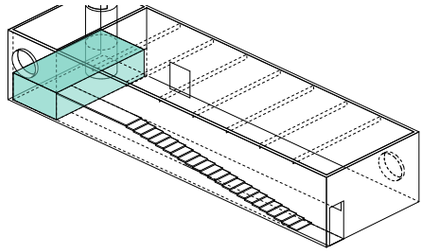
circulation



factory hall and storage

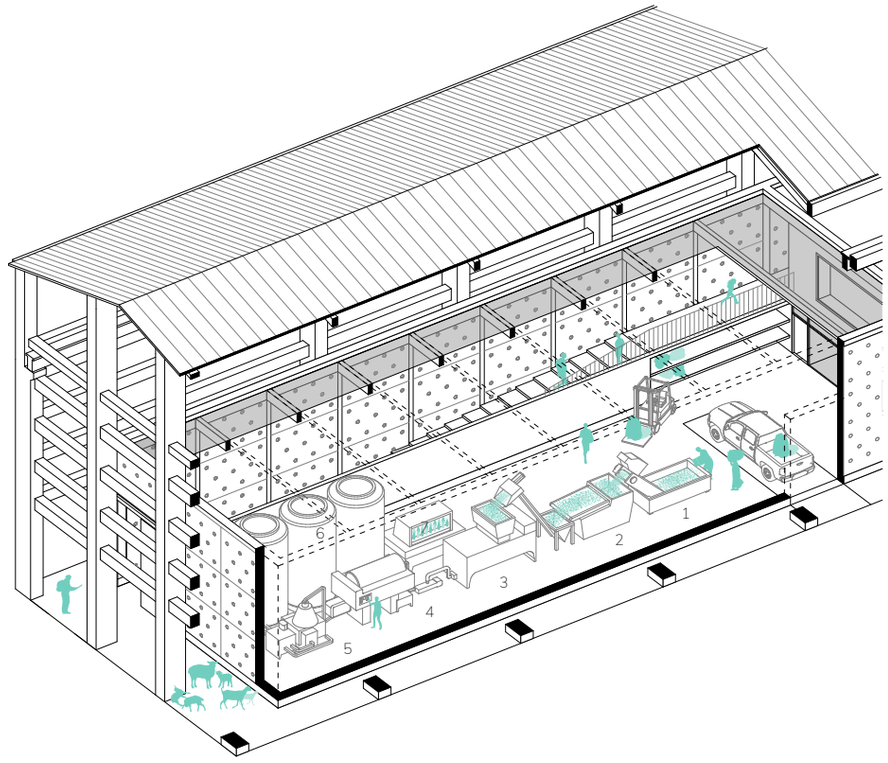


tasting room



staff rooms

I The *Factory* consist of two main parts: the head of the building contains the tasting room and a roof terrace with the offices down below. The main production hall has a seperate entrance for visitors

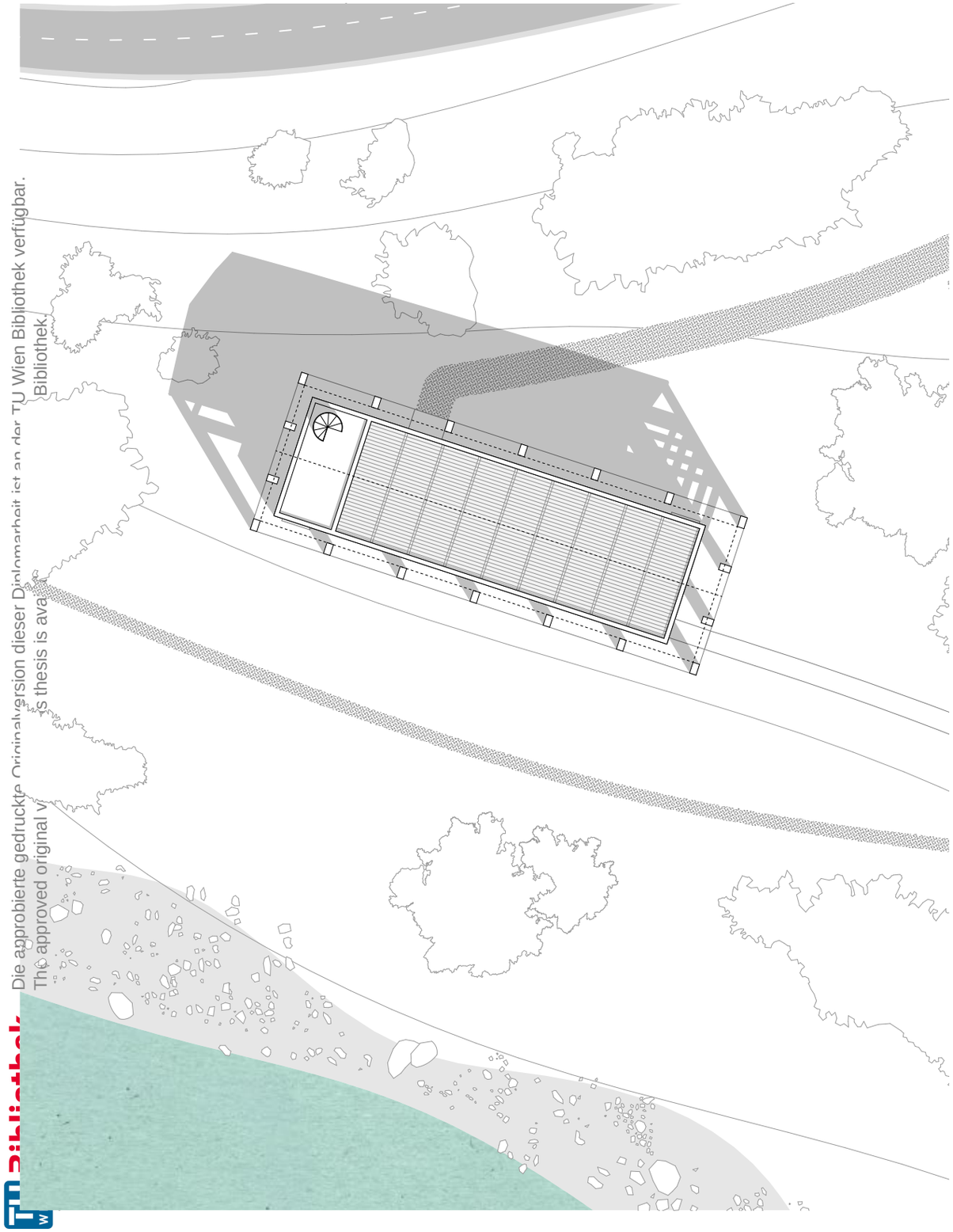


I Axonometric view of the *Factory* hall. From the viewing platform visitors can observe the olive oil manufacturing process

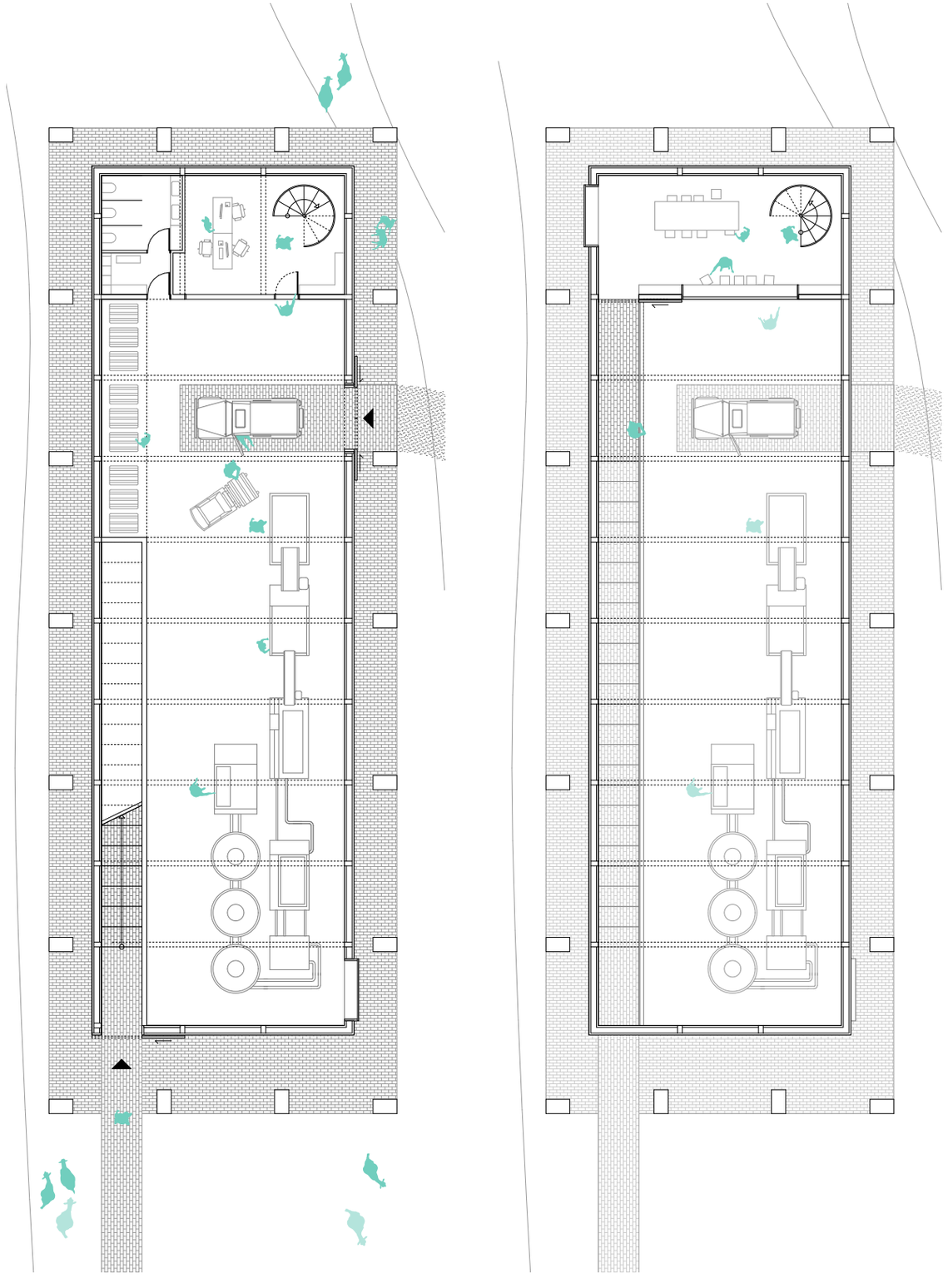
1 Leaf removal, washing
2 Crushing
3 Malaxing
4 Centrifugal press
5 Oil separation
6 Storage
7 Bottling

Plans

Olive Oil Factory



Site plan
Scale 1:500

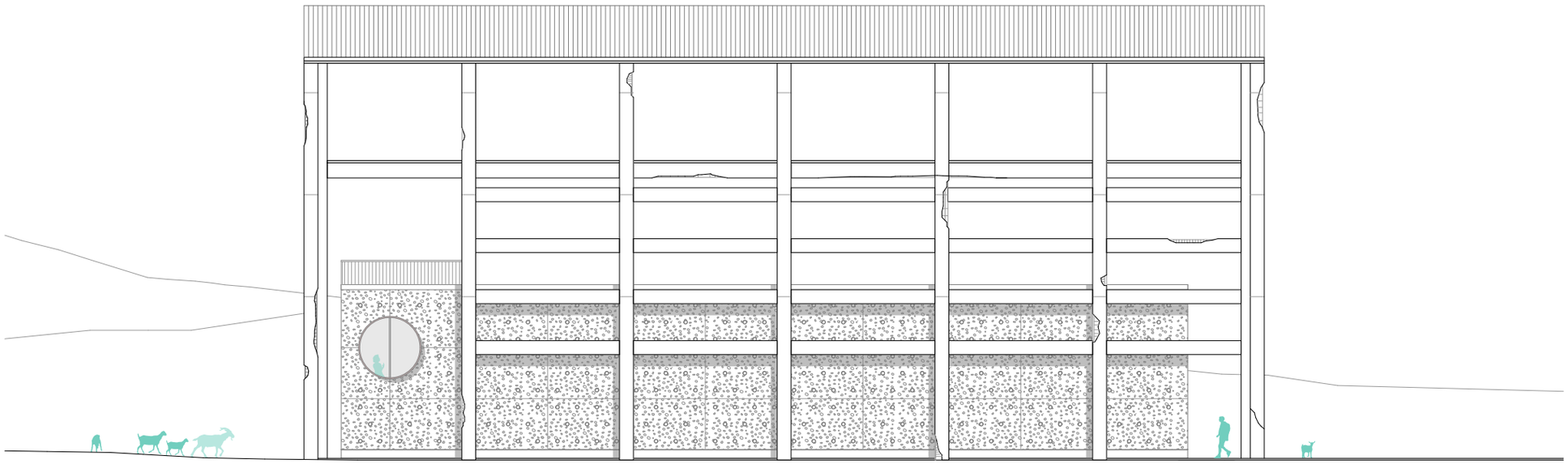


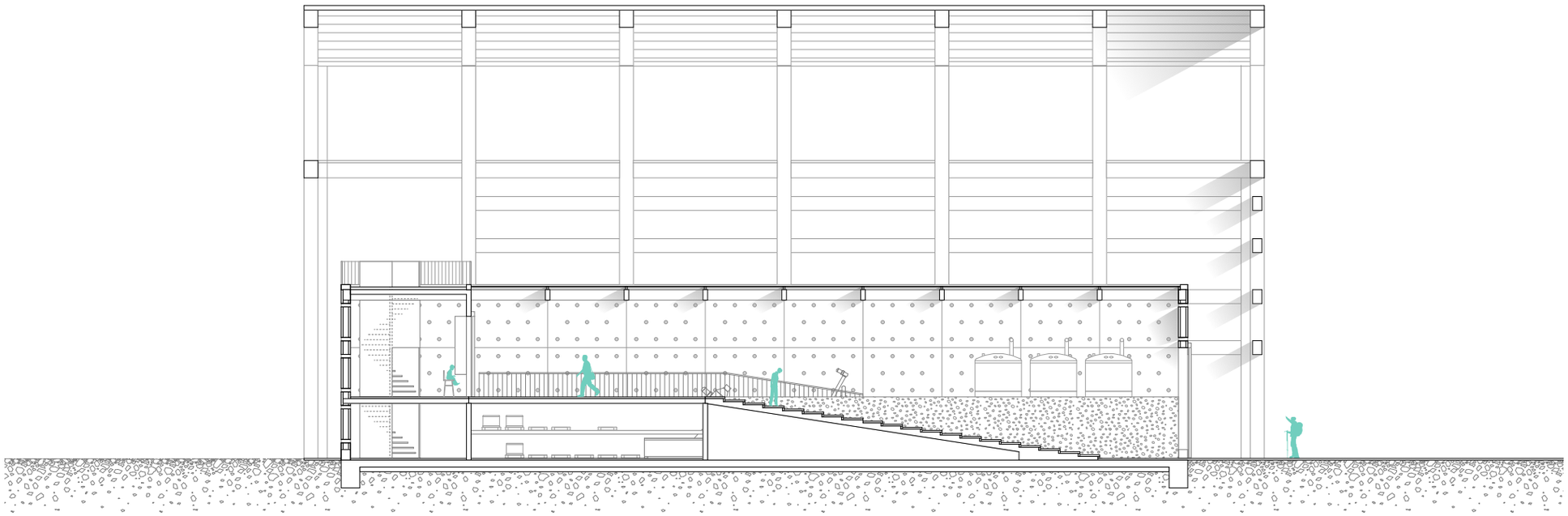
Floor plans
Scale 1:250

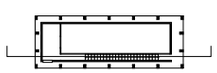
0 2 5

Plans

Olive Oil Factory





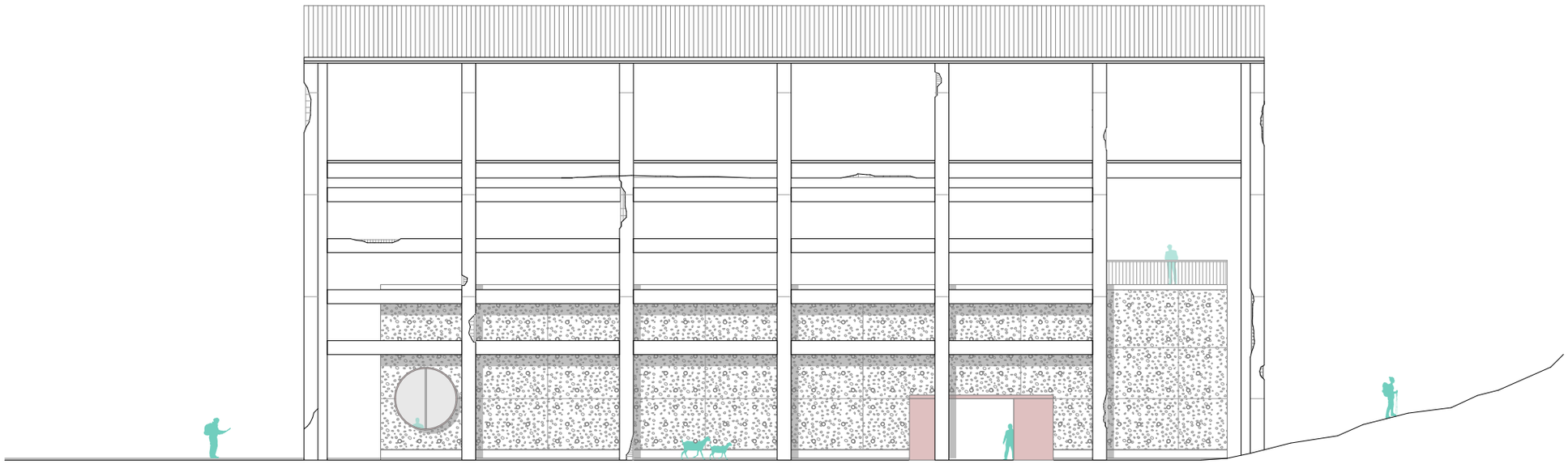


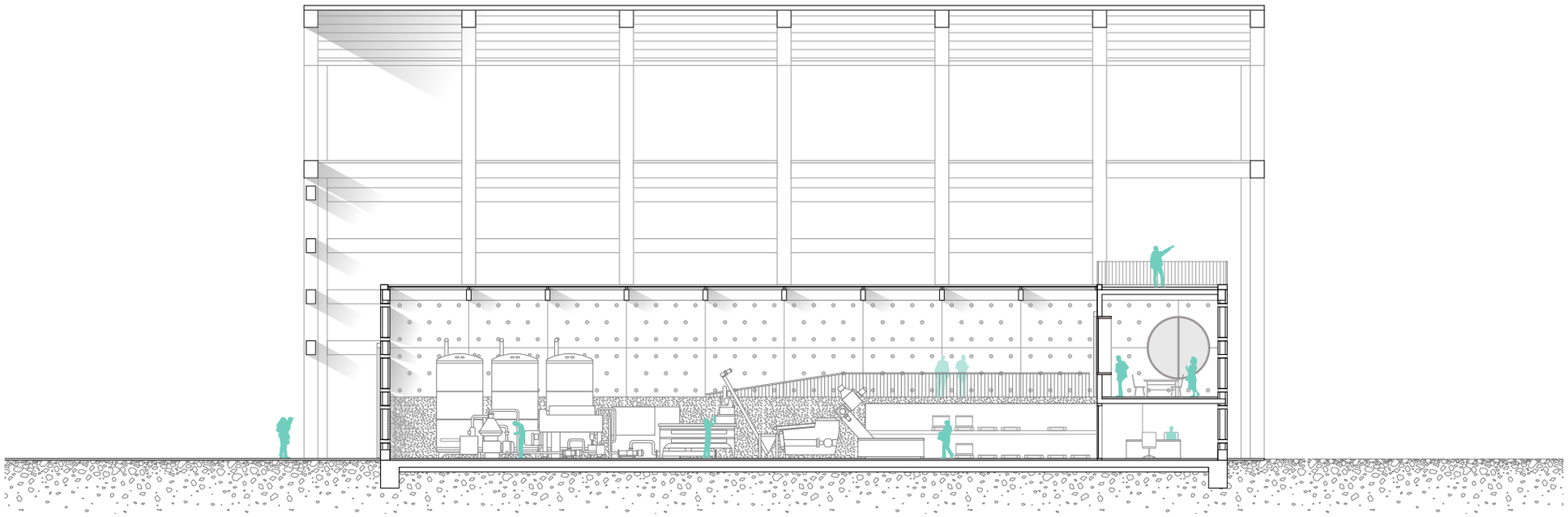
Section and elevation
Scale 1:250

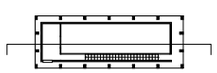
0 2 5

Plans

Olive Oil Factory





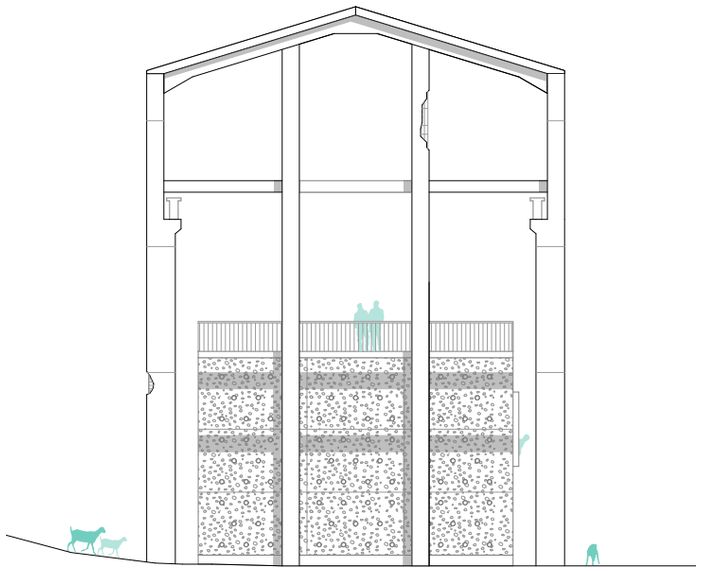


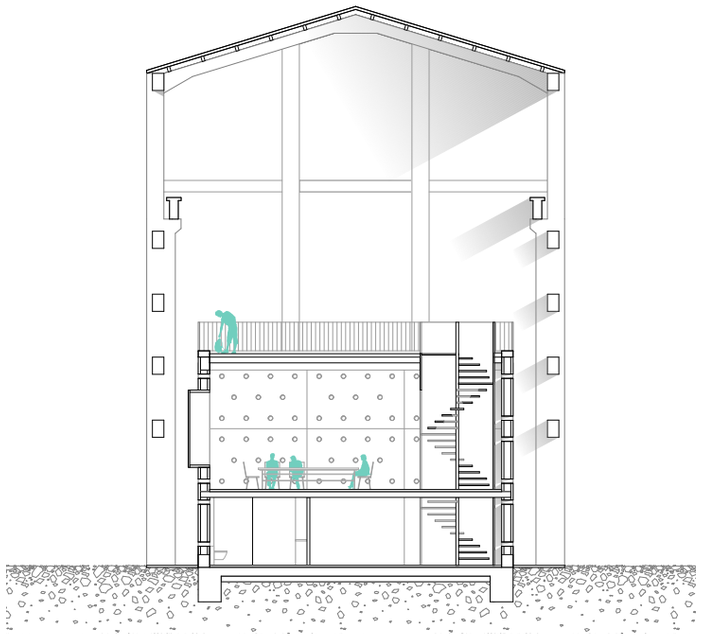
Section and elevation
Scale 1:250

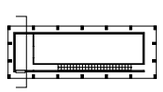
0 2 5

Plans

Olive Oil Factory

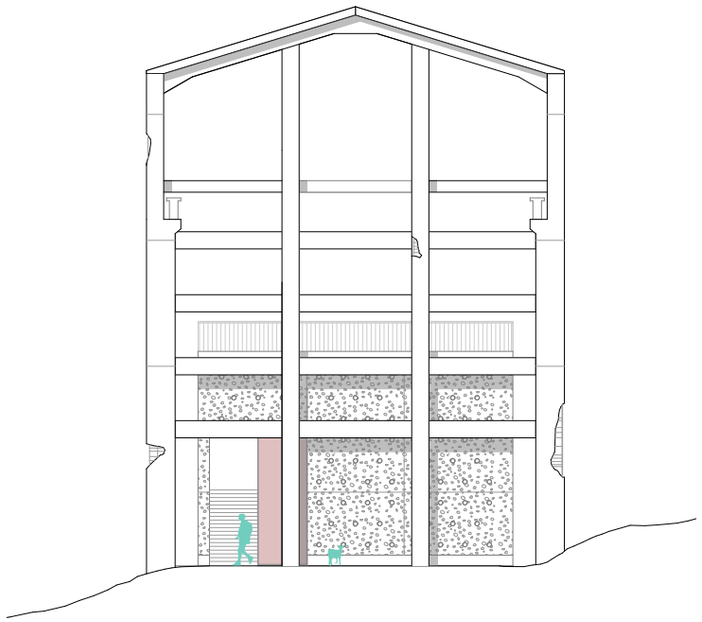


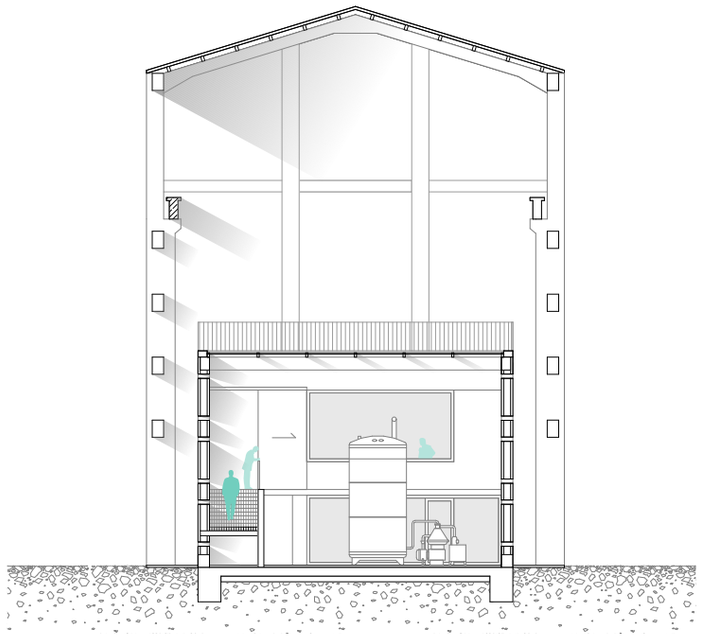


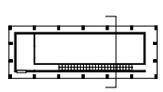


Section and elevation
Scale 1:250

0 2 5





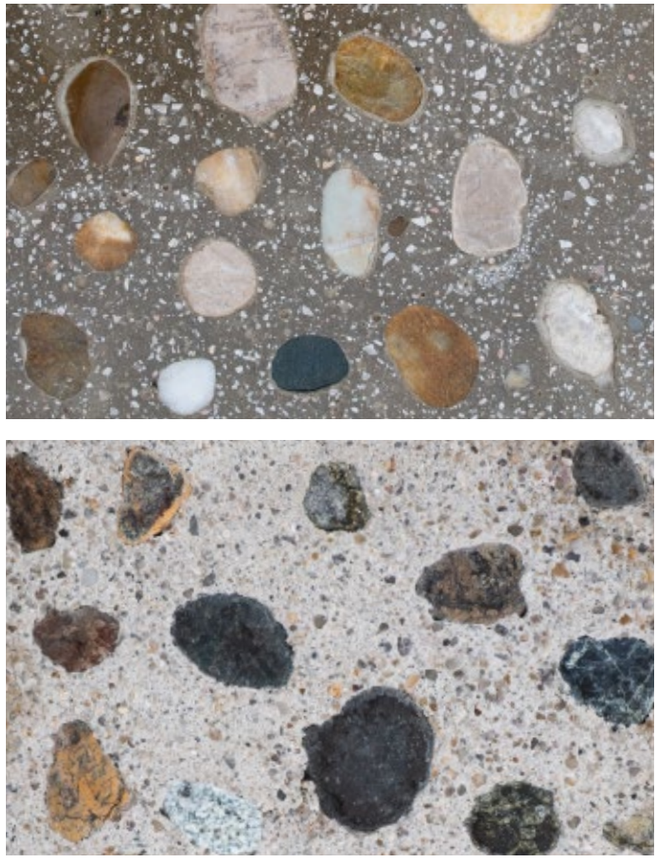


Section and elevation
Scale 1:250

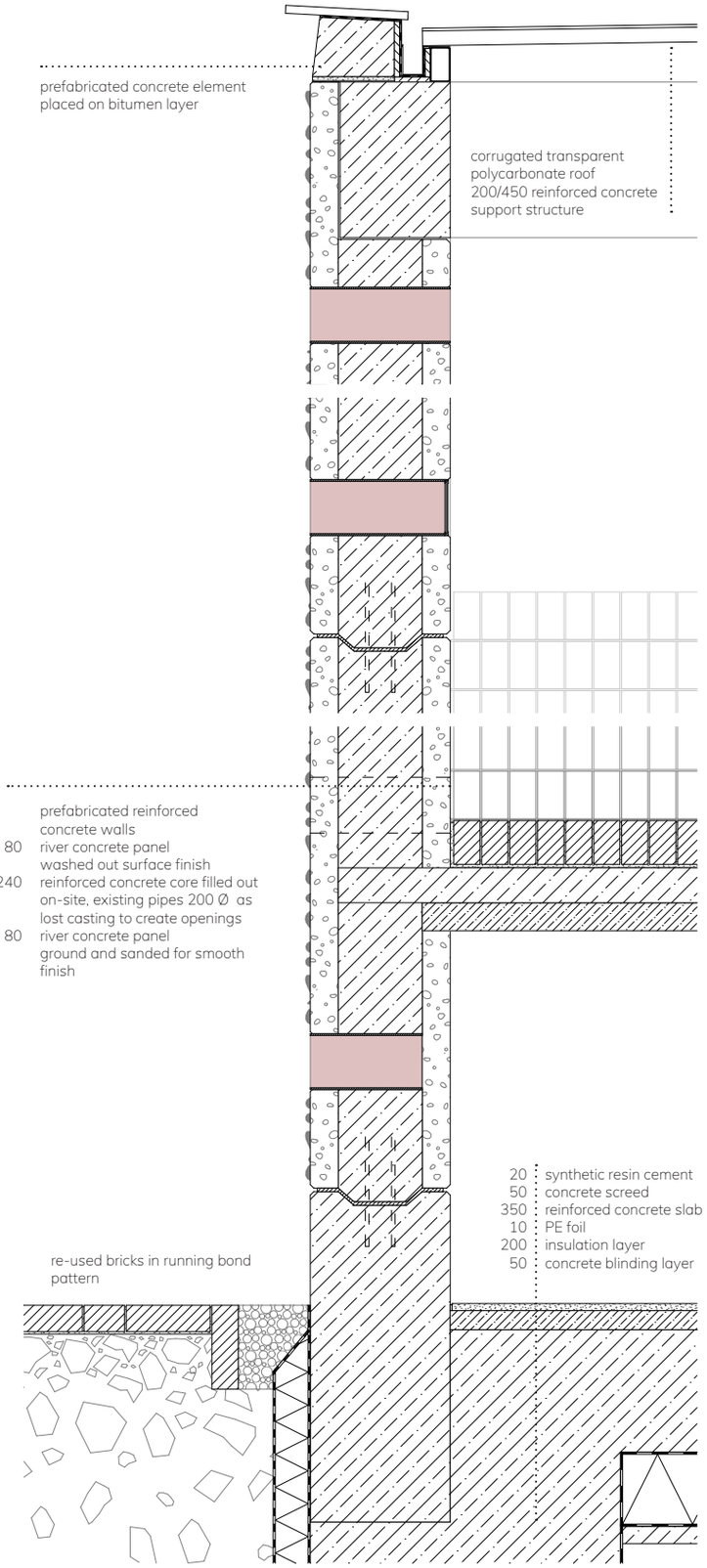
0 2 5

Detail

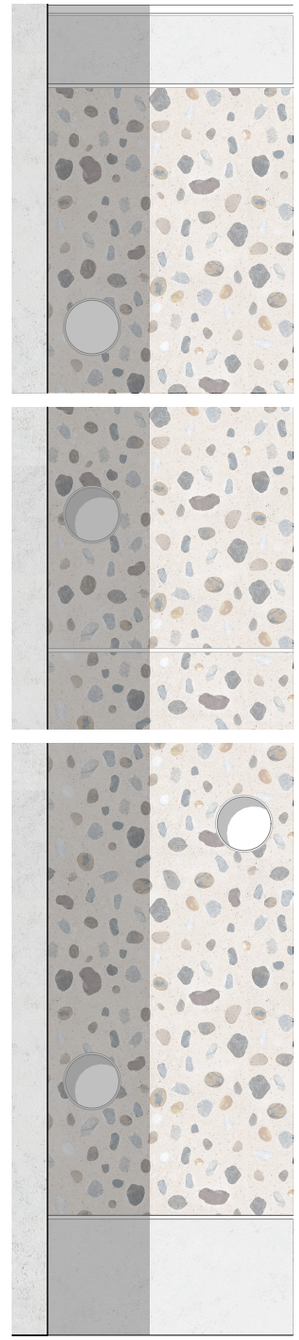
Olive Oil Factory

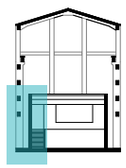


Exposed aggregate concrete is used on the outer facade, creating a rough weather resistant layer, while ground concrete is used for the interior



Detail section
Scale 1:20



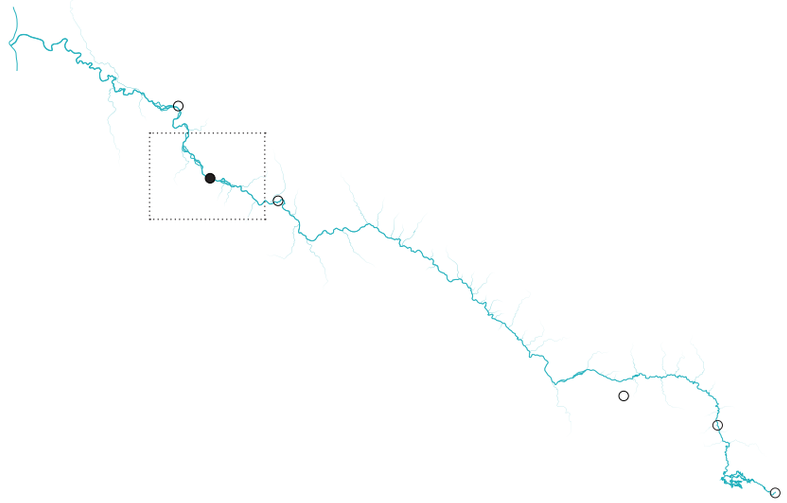


The view from the tasting room out onto the river –

The Field Lab

Project 5

A field laboratory for visiting scientists or educational institutions
at an abandoned dam building site connected by a footbridge.



Impressions

– Aerial view downstream of the Kalivac gorge

– The Kalivac gorge from the perspective of the existing shepherds trail

– The vast floodplains of the Vjosa

12

400m
300m
200m
100m
304m
39m

Stage 12

19.2km | 5.0h
▲244 ▼272

lodging
bus stop
bridge
shop
church
restaurant
view
landmark

Kutë
9.8km | 2.5h
1977

Kalivaç
1.9km | 0.5h
152

The Field Lab

Sevaster
9.3km | 2.0h
438

Hiking map
Scale 1:70.000

0 1km 2km

Kalivaç Dam

The Vjosa or Aoos represents one of Europe's last largely intact river systems. The absence of a management plan for the entire river basin has given investors the opportunity to plan a total of 38 hydropower plants in the entire Vjosa catchment, endangering the unique status of the river.

In 1997 the government appointed the Italian Becchetti Energy Group (BEG) with the construction of the first hydroelectric dam on the main river of the Vjosa at Kalivaç. The dam was designed with a height of 45 meters and a reservoir capacity of 350 million cubic meters. It would therefore flood most of the ecologically vital plains and agricultural land upstream from the narrow valley. The structure was scheduled to be finished in 2002, but a series of missed deadlines due to allegations of political intrigue led to the delay and eventual temporary stop of the dam project. In 2014 the Albanian government under Edi Rama canceled the BEG's concession agreement and selected a Turkish-Albanian consortium in 2017 to replace BEG as the manager of the Kalivaç project.[55]

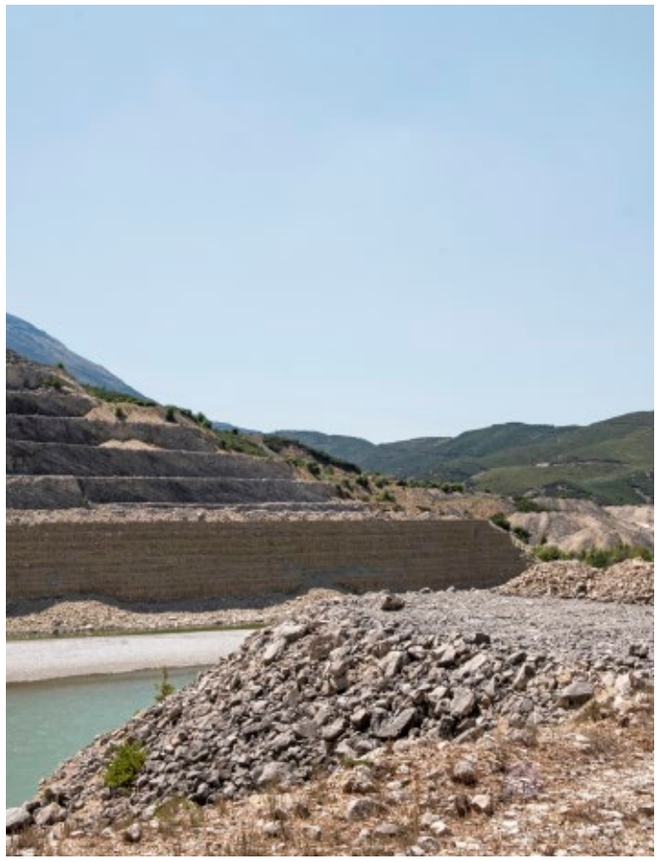
The landscape near Kalivaç is characterized by a narrow valley and two big floodplains down- and upstream of it. A specific section of the valley has been chosen for the dam, where a natural bottleneck of the landscape facilitates the construction. As of now, adjacent hills have been excavated to extract the necessary rock material for a concrete faced rockfill dam. The material has been piled on the shores of the river, where it was used to create two platforms that narrow the river bed at the exit of the valley, thus already obstructing the natural flow of the river. The hills have been terraced down and reinforced with sprayed concrete, permanently altering the appearance of the landscape.

Apart from the landscape alterations, temporary construction site buildings and sheds have been built to house construction vehicles such as excavators and belt loaders. This type of industrial architecture is characterized by rough concrete and crude steel constructions, clad in cheap and easily accessible materials such as corrugated metal.

I The abandoned site created a scar in the landscape that will take decades to recover from. The river and yearly floods, given time, will shape the riverbed back to its original form

– Since 2005, large quantities of material have been excavated from the surrounding hills and placed in the valley to create two platforms for the rock-fill dam

55 Del Bene D. (2017).



Rocks and sand from the surrounding hills were used to create the 8 meter high platforms

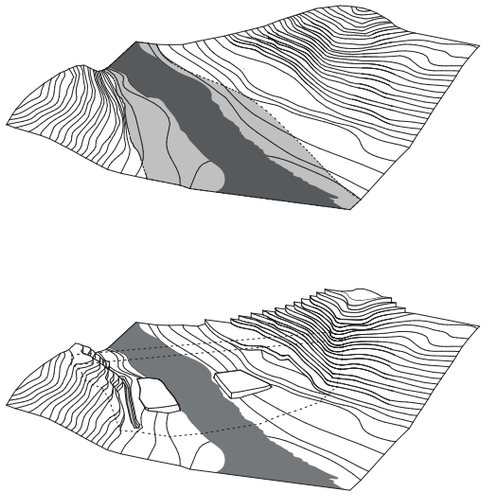
Remnants of the abandoned dam site are scattered around the area

Kalivaç Dam

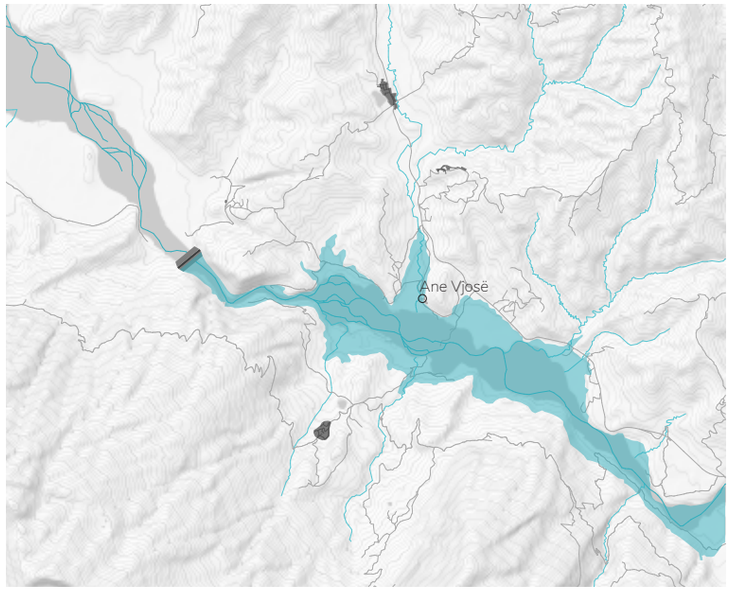
With a height of around 130m, the dam building site is enormous, especially when compared to human scale

A makeshift ferry has been installed that carries animals and people across the river

Kalivaç Dam



A rock-fill dam uses local material to create a foundation for a concrete core that is later reinforced with rocks and sand



The 45 meter high structure would flood the valley and create an artificial lake that covers an area of around 18 km² including fields, scattered sheds and stables and the village of Ane Vjosë

Importance of Science

The enormous interest the Vjosa gets from the science community is based on the fact that it remains one of the last hydromorphologically intact river systems in Europe and is thus invaluable for river science. As such, it serves as a reference system for future renaturation projects that are becoming more and more common in Europe.

International scientists argue that only improved scientific understanding can lead to a future-oriented river management plan.[56] To achieve this, a research project by German, Austrian and Albanian scientists together with local institutions was started as a joint venture in 2017, including experts in hydrology and geomorphology, geology, limnology, vegetation ecology, taxonomy and biogeography. The goal of this project was to "gain insight and build up an increased local capacity for assessing riverine landscapes and the expertise to communicate scientific know-how to the public and decision makers."[57]

During three weeks of field research, the scientists sampled an area of 300 river kilometers, including the Vjosa and many of its tributaries, attempting to create the first conclusive dataset for the river. Using state-of-the-art equipment like electronic fishing gear and measuring equipment, they collected samples of fish scales, biological material, measured flow rates and water quality and documented rare aquatic and terrestrial species in the Vjosa basin.[58] The findings of this expedition give a glimpse of the incredible biodiversity of the river and its great ecological value. The resulting report published in 2018 represents one of the first conclusive scientific papers on the Vjosa and sets an important *Milestone* for further studies.

The 'Scientists for Vjosa' movement received a lot of attention in media, proving to be an important factor in finding a balance for the future use of the river.

Scientists collecting samples in the Vjosa basin during an expedition in 2017

56 Rössler N., Egger G. and Drescher A. (2018). p.2
57 Rössler N., Egger G. and Drescher A. (2018). p.2
58 Riverwatch – Society for the protection of rivers (2019). 'Vjosa Science Expedition'.

The Field Lab

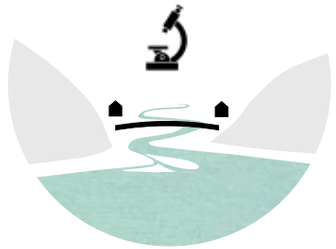
The *Field Lab* is a building that acts as a base of operations for visiting scientists. At a location that represents the destruction of the river, we intend to implement a new function that plays a vital role in sustaining the river system. By offering a place where scientists and educational institutions can conduct research, we ensure that scientific knowledge of the river can constantly grow and try to show that the river can be seen as large scale natural laboratory for river ecology that provides excellent conditions to study ecological processes under near-natural conditions. Although the river might take back what has been artificially altered, our goal was to keep part of the memory alive as a reminder of what could have happened there and what still might. The building should thus speak the language of the surrounding crude sheds, abandoned, rusty vehicles, metal sheets and broken landscape; a brutal environment opposing the marvellous beauty of the river itself.

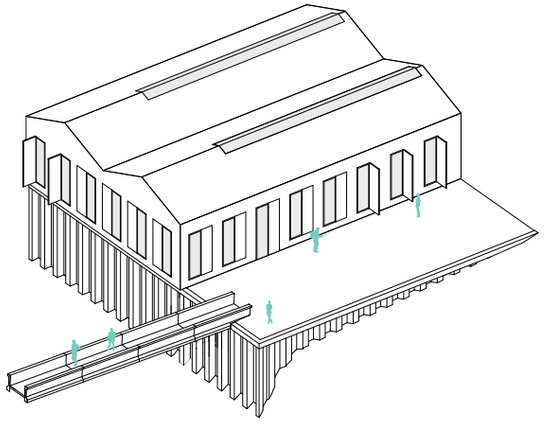
The sheer size of the plot adds to this aura of brutality. It is difficult to grasp without experiencing it in person. When going to Kalivaç, one immediately realizes the enormous effort that goes into the creation of a dam and how much energy it takes to tame a force of nature like the Vjosa. In order to captivate this exact feeling, we decided to spread the *Field Lab* out across the entire site, extending over both shores of the river, enabling scientists and visitors to experience the scale of the unfinished dam.

Scientists returning from an expedition first encounter an expedition hall where equipment and material samples can be stored. This material archive is expected to grow significantly through use and acts as an ecological museum that can be visited as well as used. It also houses laboratories and work spaces, where the gathered material can be further analyzed and they can prepare for the next expedition.

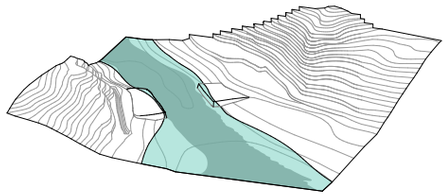
The long footbridge offers an amazing view onto the enormous floodplains that spread out downstream of the *Field Lab*. Crossing the bridge, the communal building is located on the opposite platform. A kitchen, a dining room and a terrace facing the river offer well deserved rest after a day of field research.

Lastly, the accommodations for the scientists are scattered around the terraces and hills of the site. The small huts are designed with minimal cost and effort in mind, offering only bunk beds and a small bathroom. Making use of the elevated terrain, the location offers stunning views of the river.

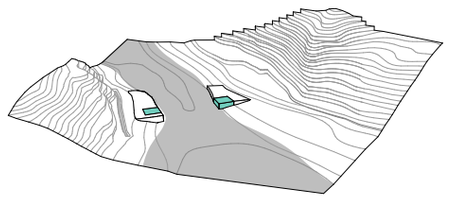




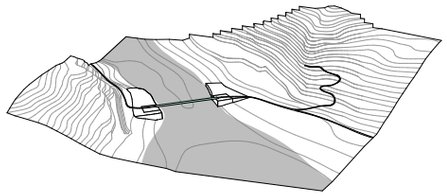
Site Concept



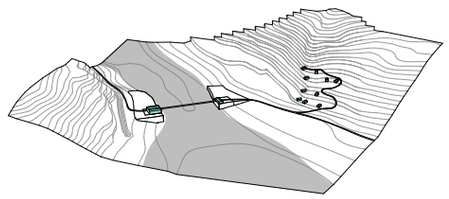
Original riverbed is redefined to enable the river to remove landfill material by itself in the upcoming years



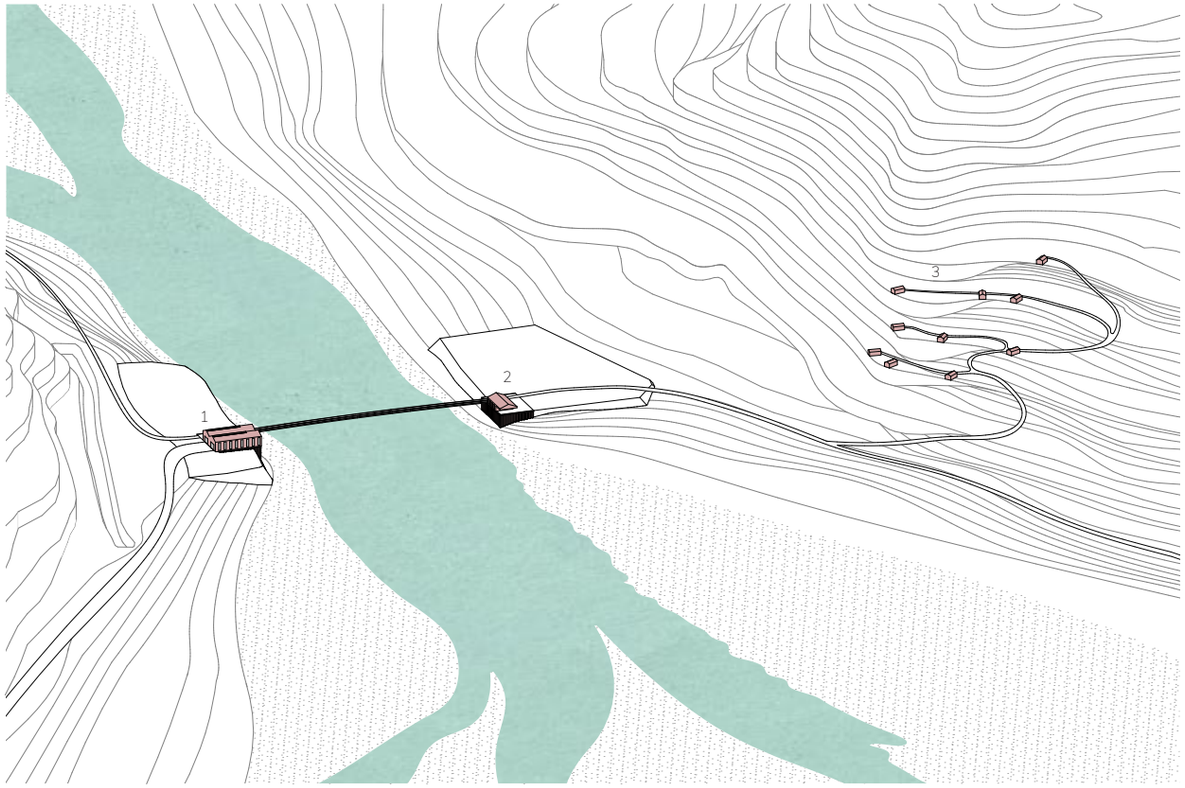
Steel walls used in dam construction are used to reinforce and newly define the contour of our building platforms. The landfill material will be contained within these walls and serve as foundations for the *Field Lab* and the footbridge



A connection via a footbridge is created. This enables the trail to continue through the *Field Lab* enabling the hiker to experience the scale of the dam construction site and the view along the river



Lastly the *Field Lab* is placed onto the site, spread out across both sides of the river

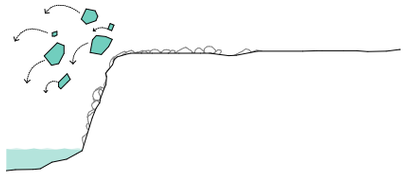


The *Field Lab* consists of two buildings on the opposing platforms, connected via a long footbridge. Small huts for accommodation are distributed across the hills of the building site

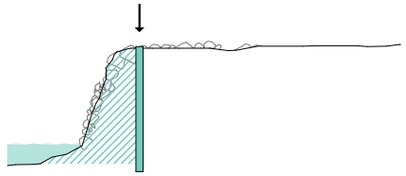
1 Expedition Hall
2 Community Hall
3 Lodges

Design Concept

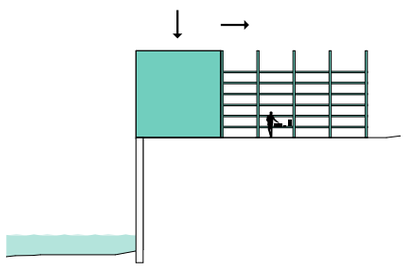
Expedition Hall



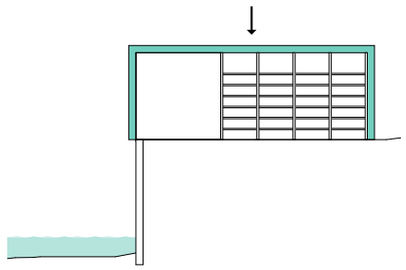
The platforms are made of loose landfill material like rocks and sand



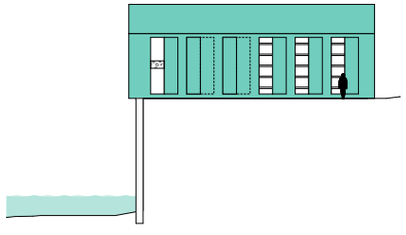
Sheet pile walls used in dam construction are rammed into the earth to secure the platform



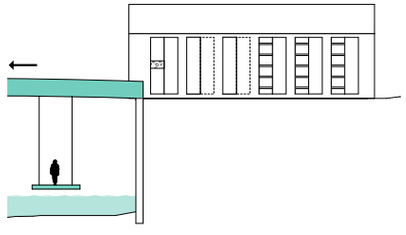
An instulated *Riverstone Concrete* core is placed, extended by a shelf-like steel construction



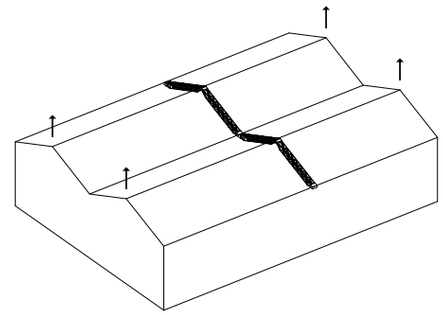
The building is enveloped by a steel facade

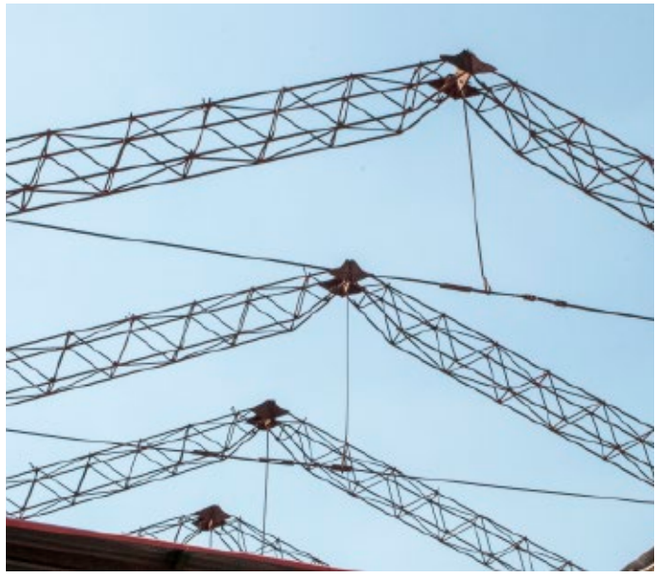


Large panels allow the envelope to be opened and closed



A bridge is placed as a connection including a small platform that can be lowered to the water surface

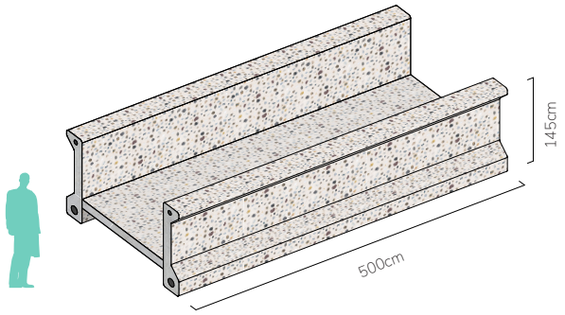




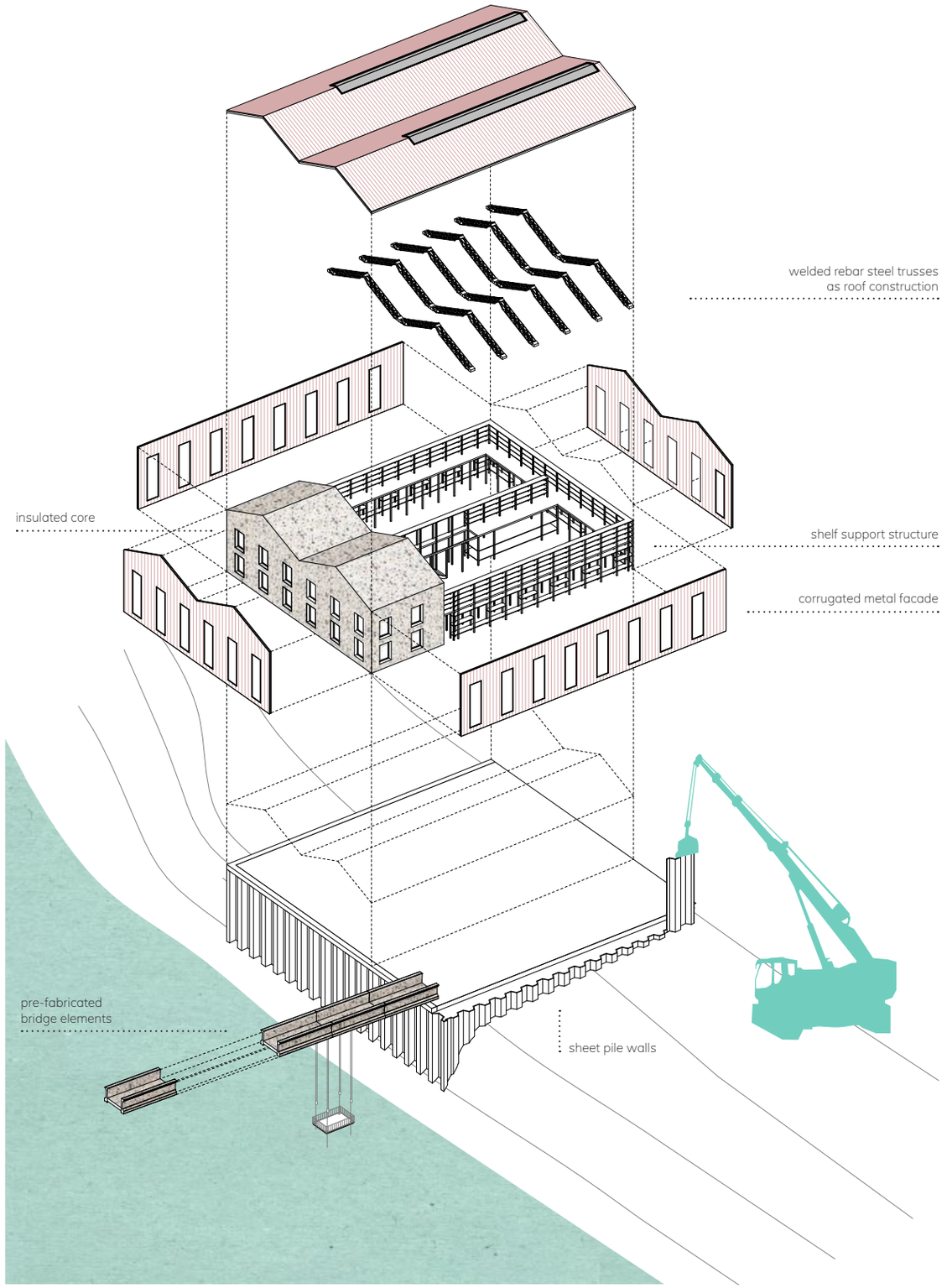
I Steel trusses inspired by the beams at the old factory in Memaliaj are used for the construction of the roof, creating a double pitch

Material Concept

Expedition Hall

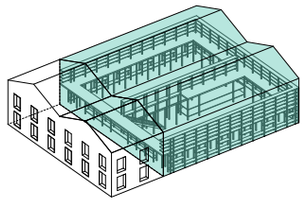


- Ground and polished *Riverstone Concrete* is used for the prefabricated bridge elements

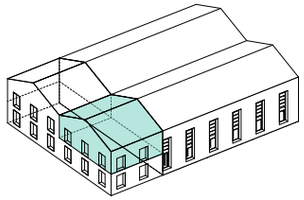


Programme

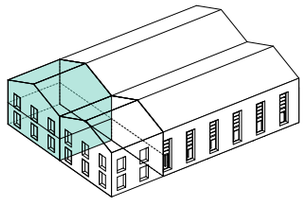
Expedition Hall



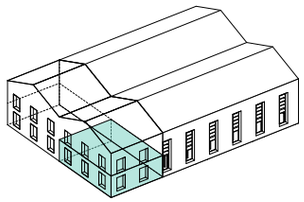
material archive, garage and preparation hall



seminar room

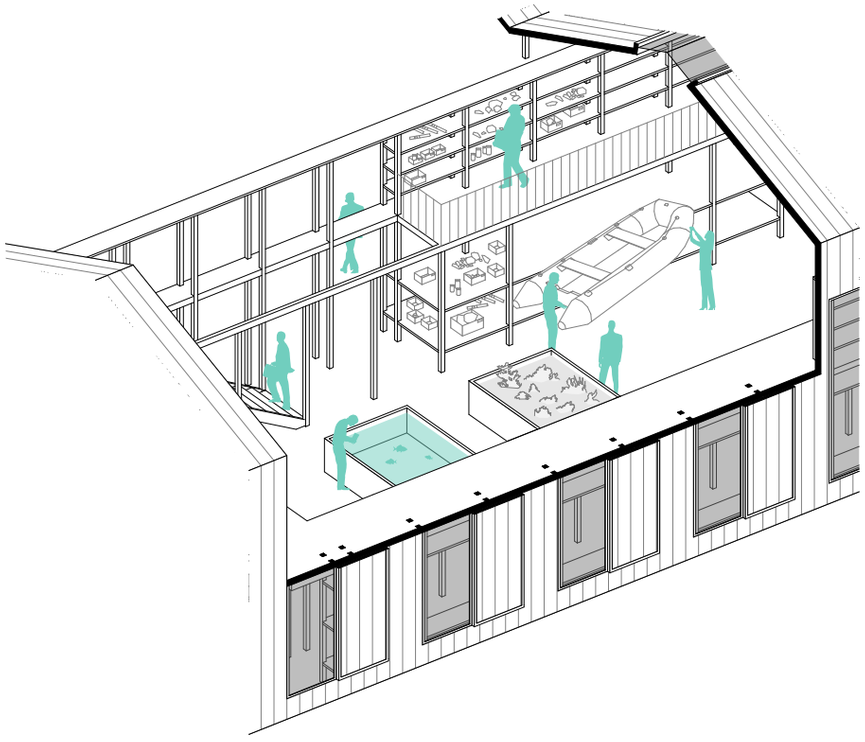


office, laboratory and photo lab



changing rooms and toilets

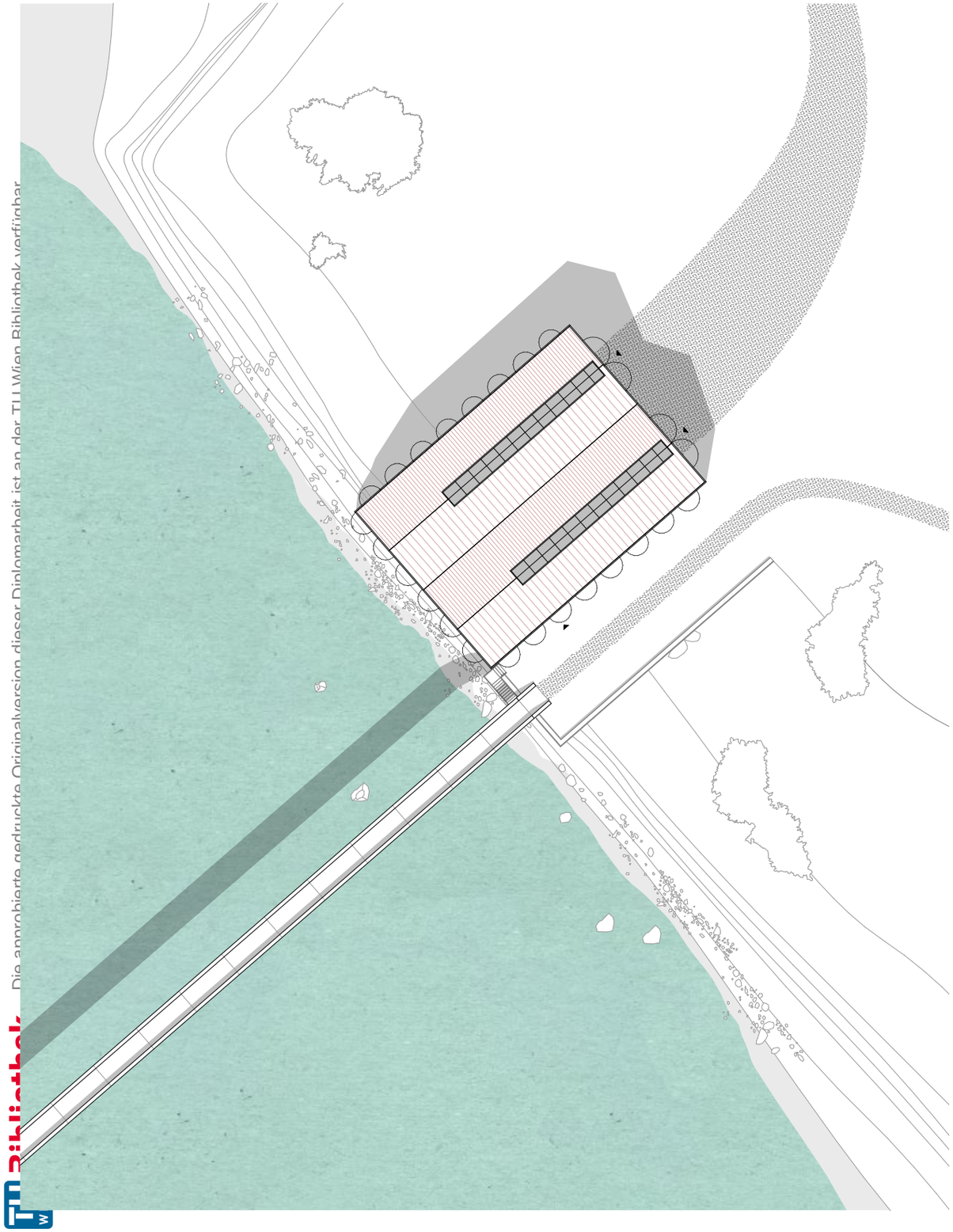
The programme of the Expedition Hall is structured in two main parts: the large hall offers space for the preparation of an expedition while the insulated core contains the communal areas for working



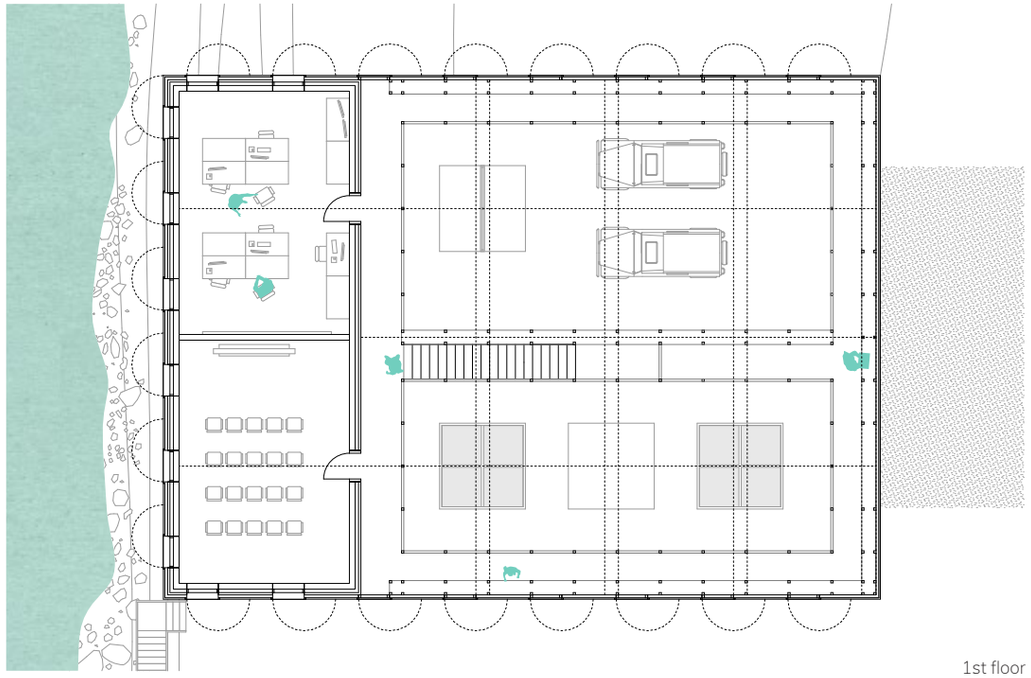
Interior situation of the material archive. The shelves allow for different uses while additional tanks can be used for temporary storage of biological material and animals

Plans

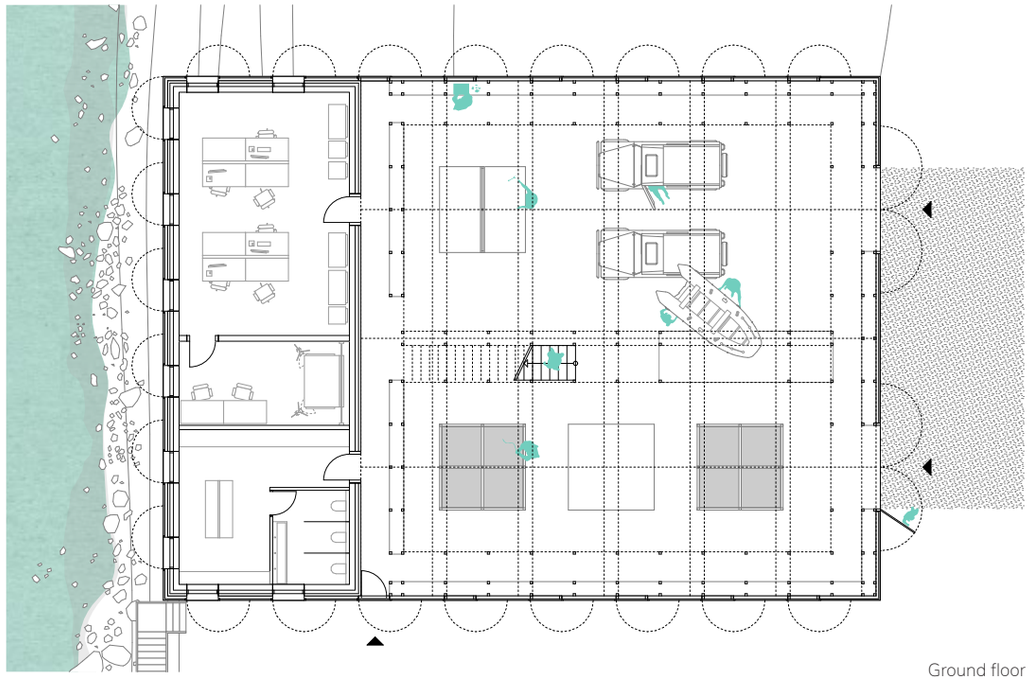
Expedition Hall



Site plan
Scale 1:500



1st floor



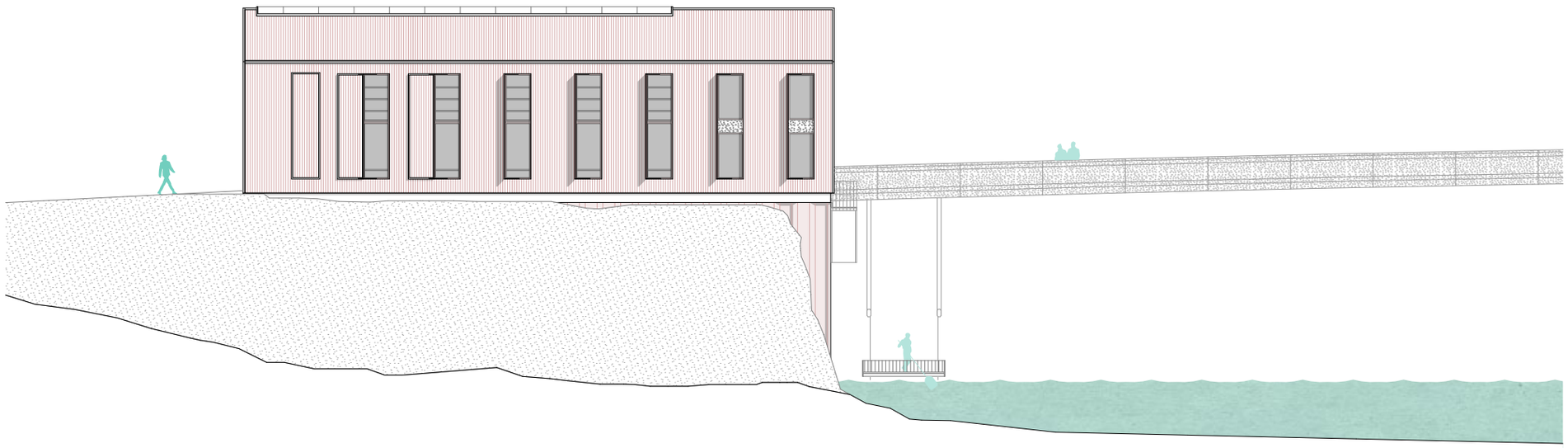
Ground floor

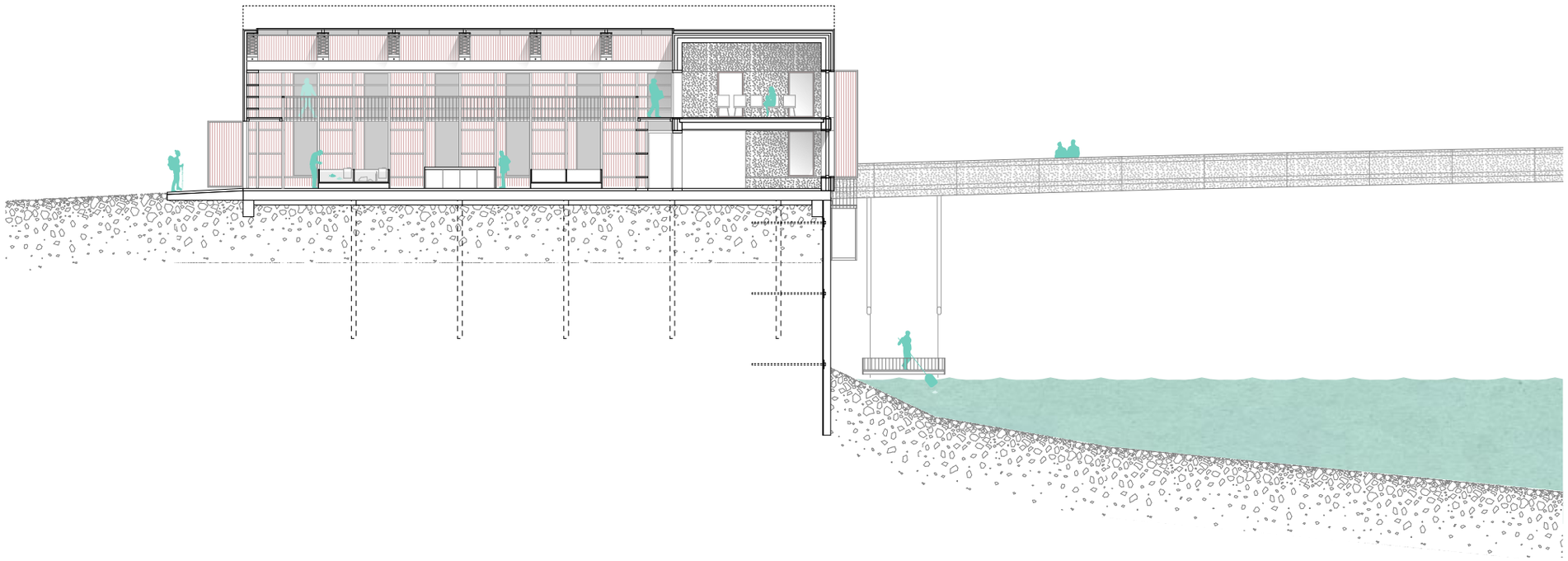
Floor plans
Scale 1:250

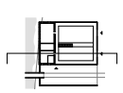
0 2 5

Plans

Expedition Hall





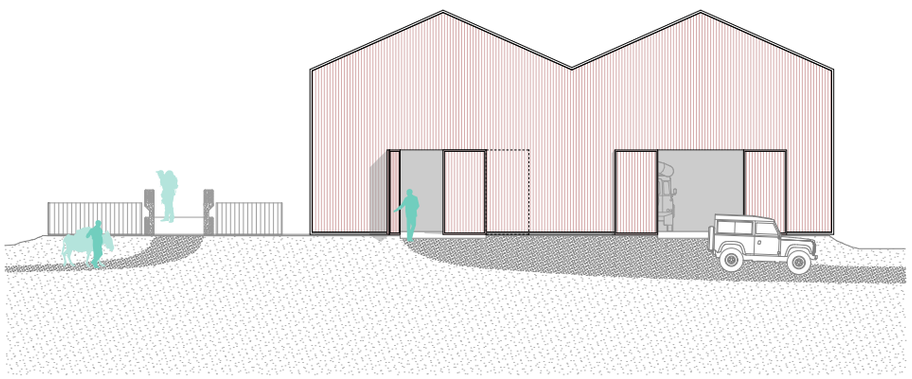


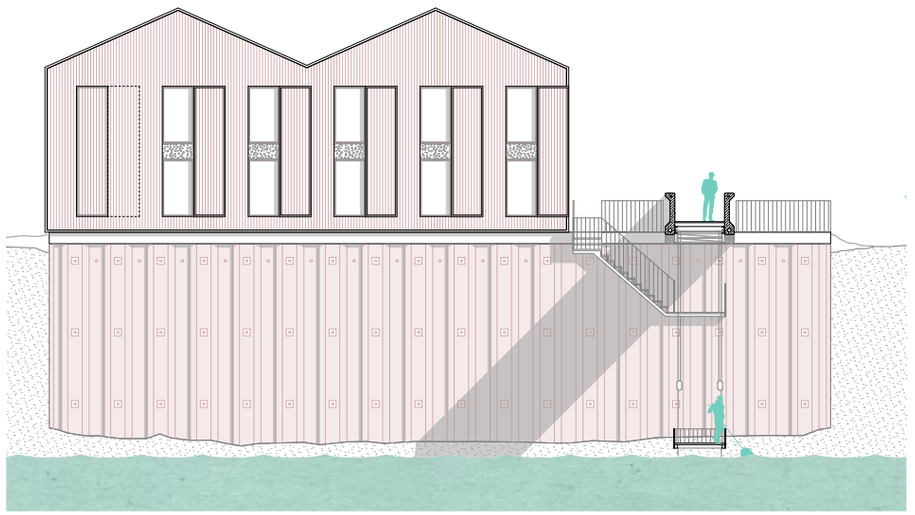
Section and elevation
Scale 1:250

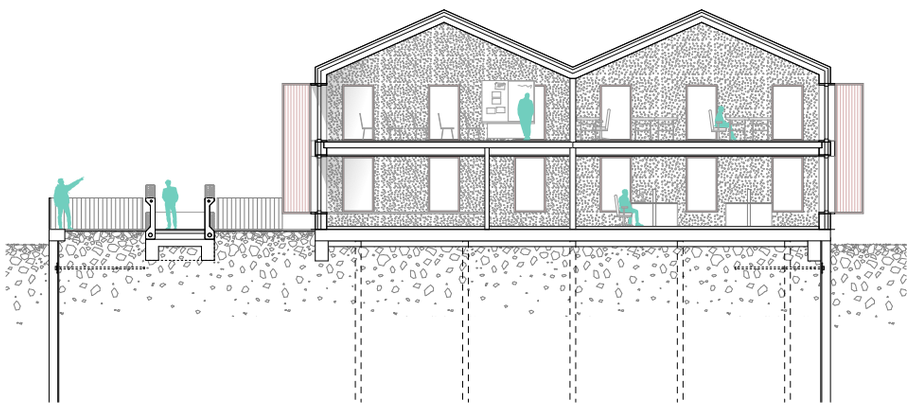
0 2 5

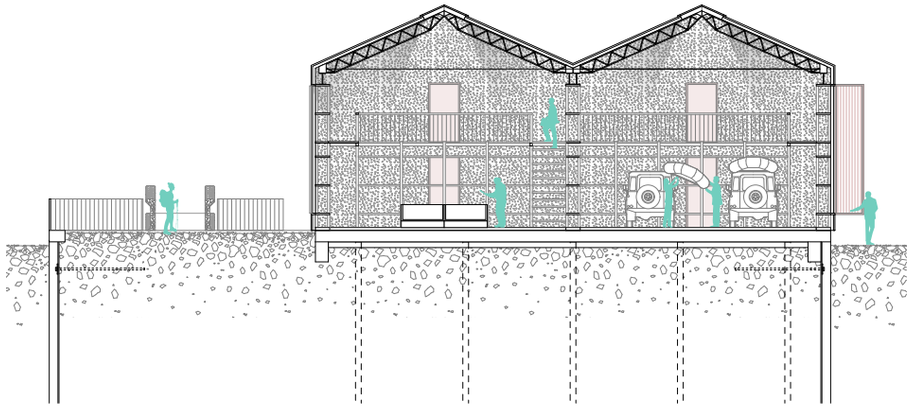
Plans

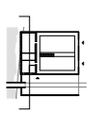
Expedition Hall



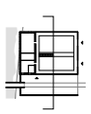




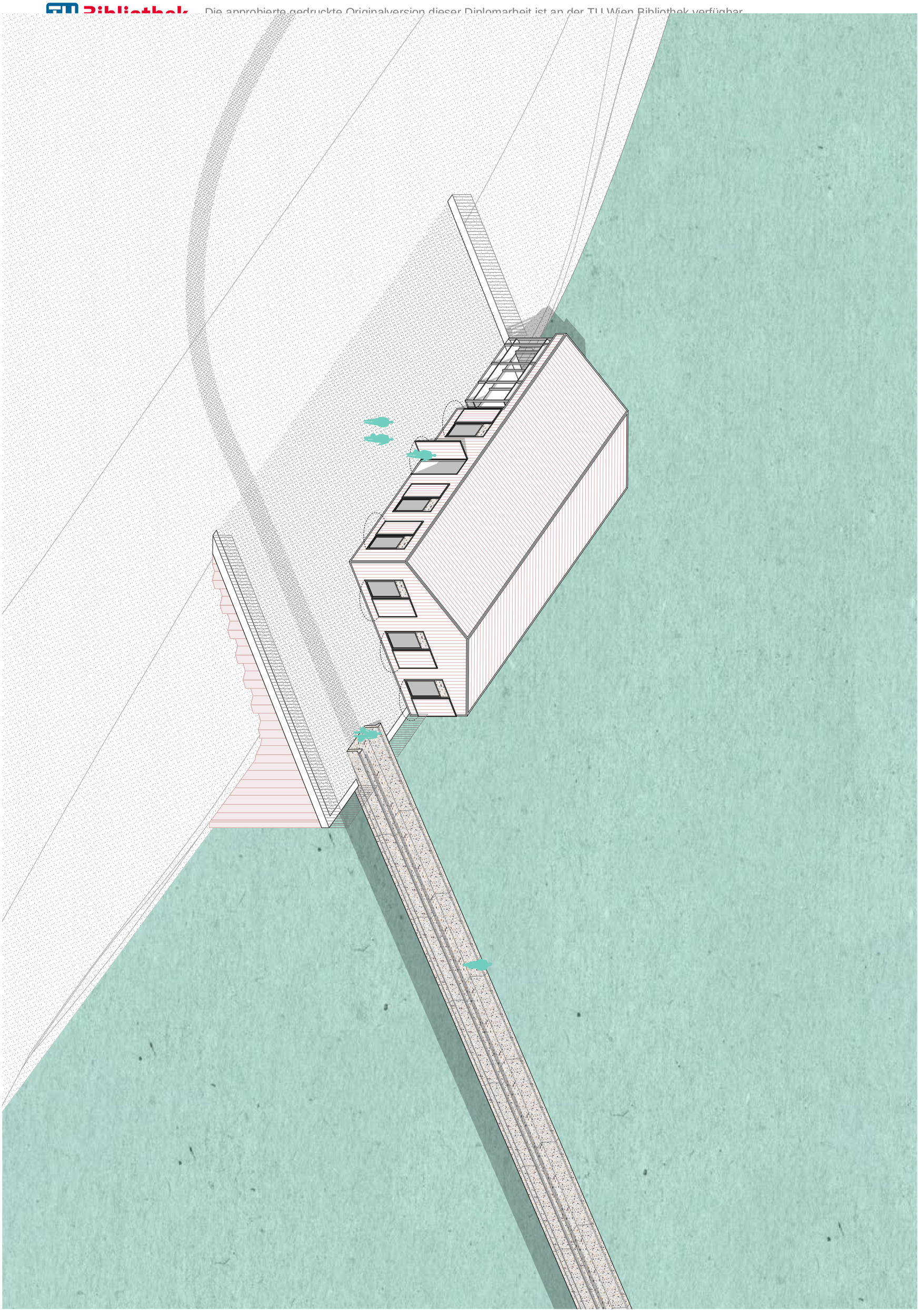




Section and elevation
Scale 1:250 0 2 5

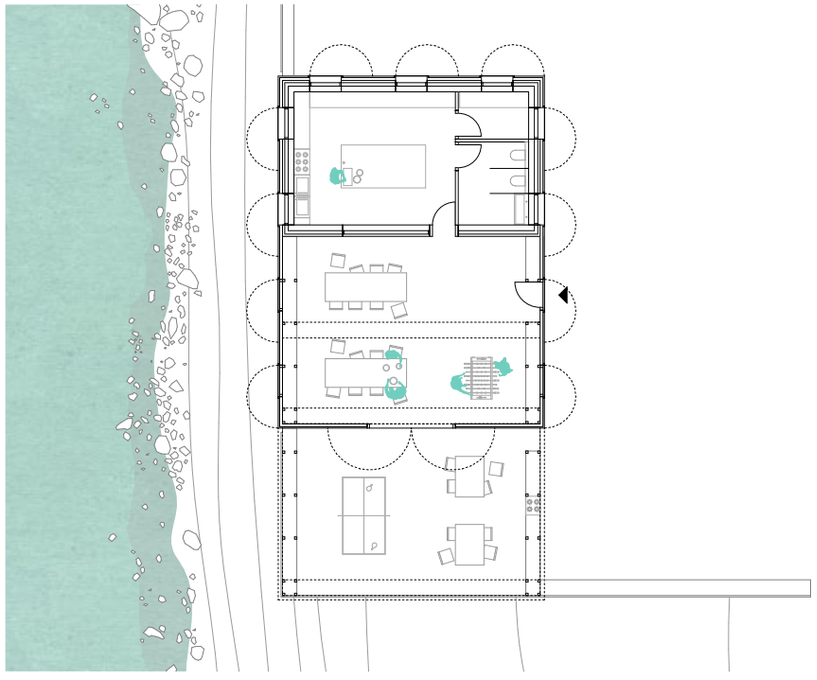


Section and elevation
Scale 1:250 0 2 5

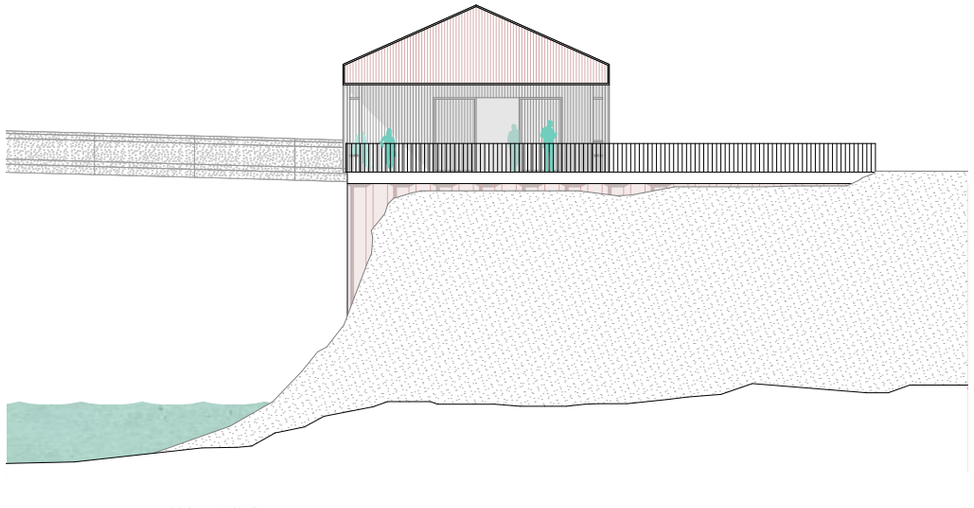


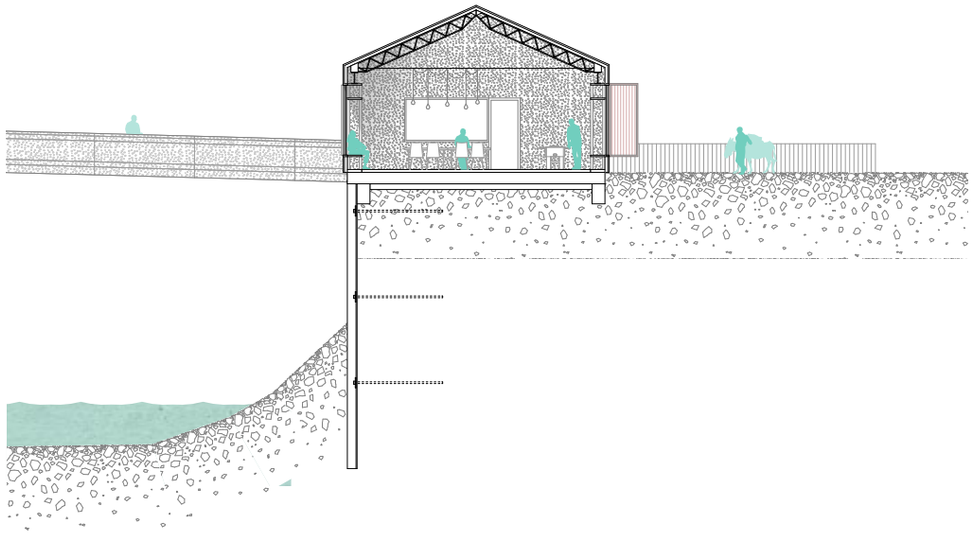
Plans

Community Building

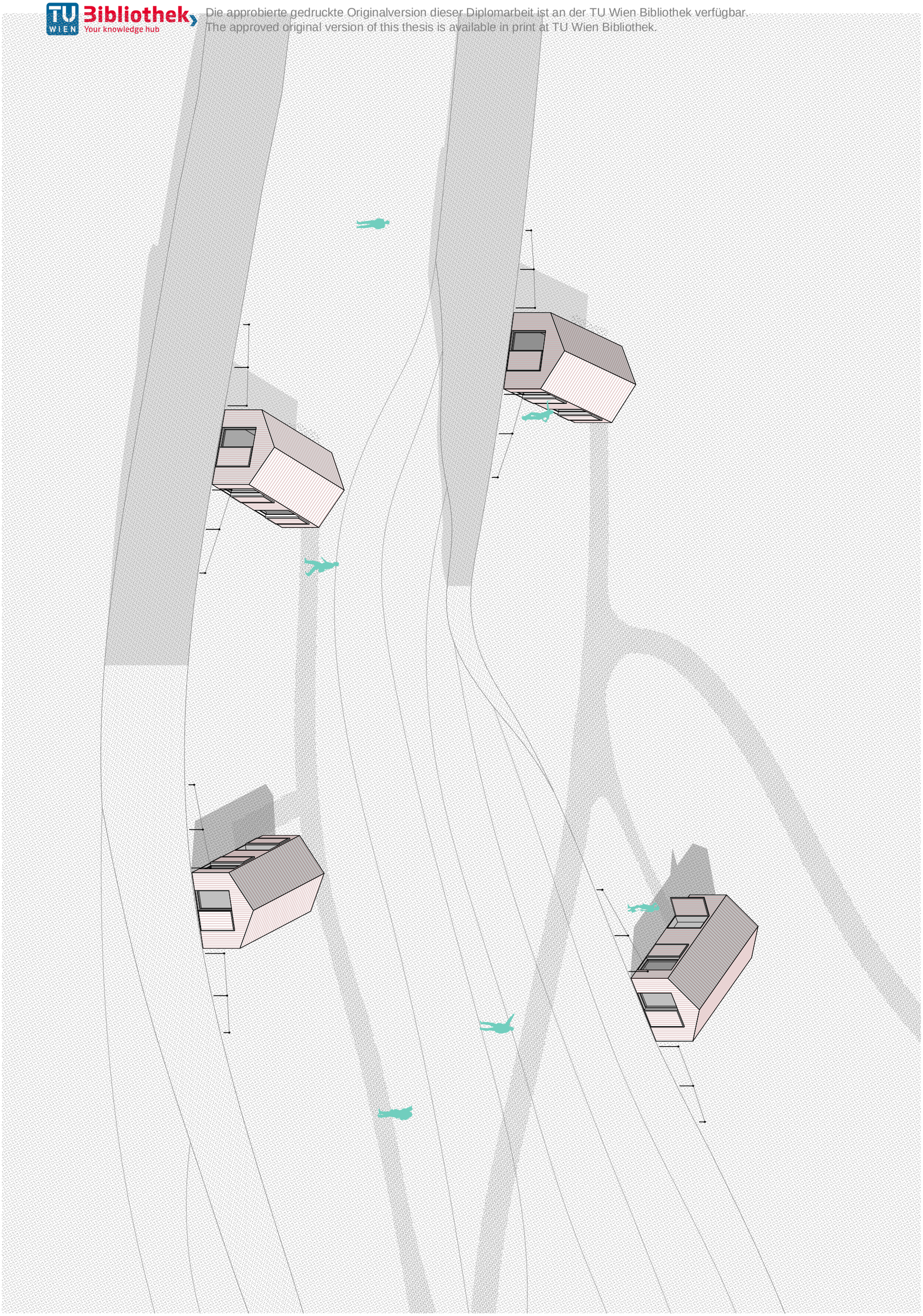


Floor plan
Scale 1:250 0 2 5



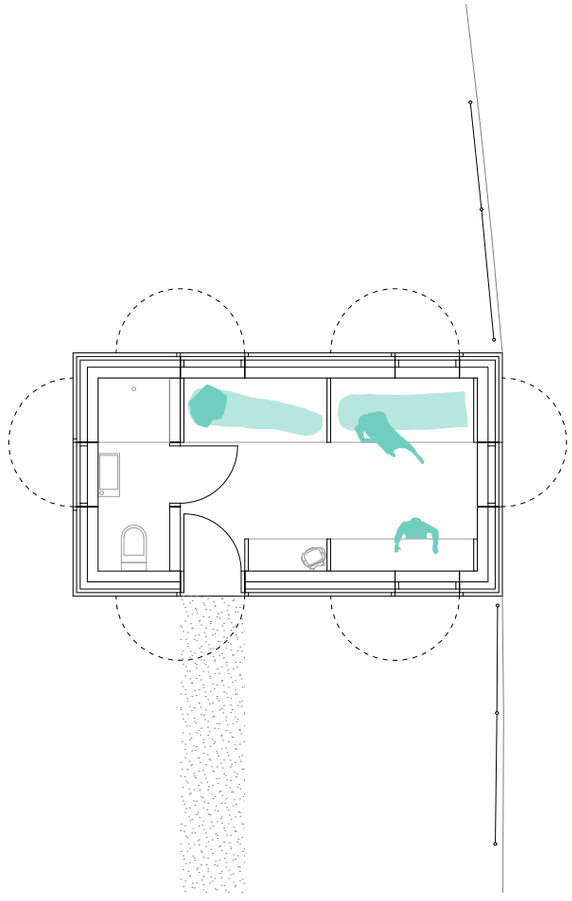


Section and elevation
Scale 1:250 0 2 5

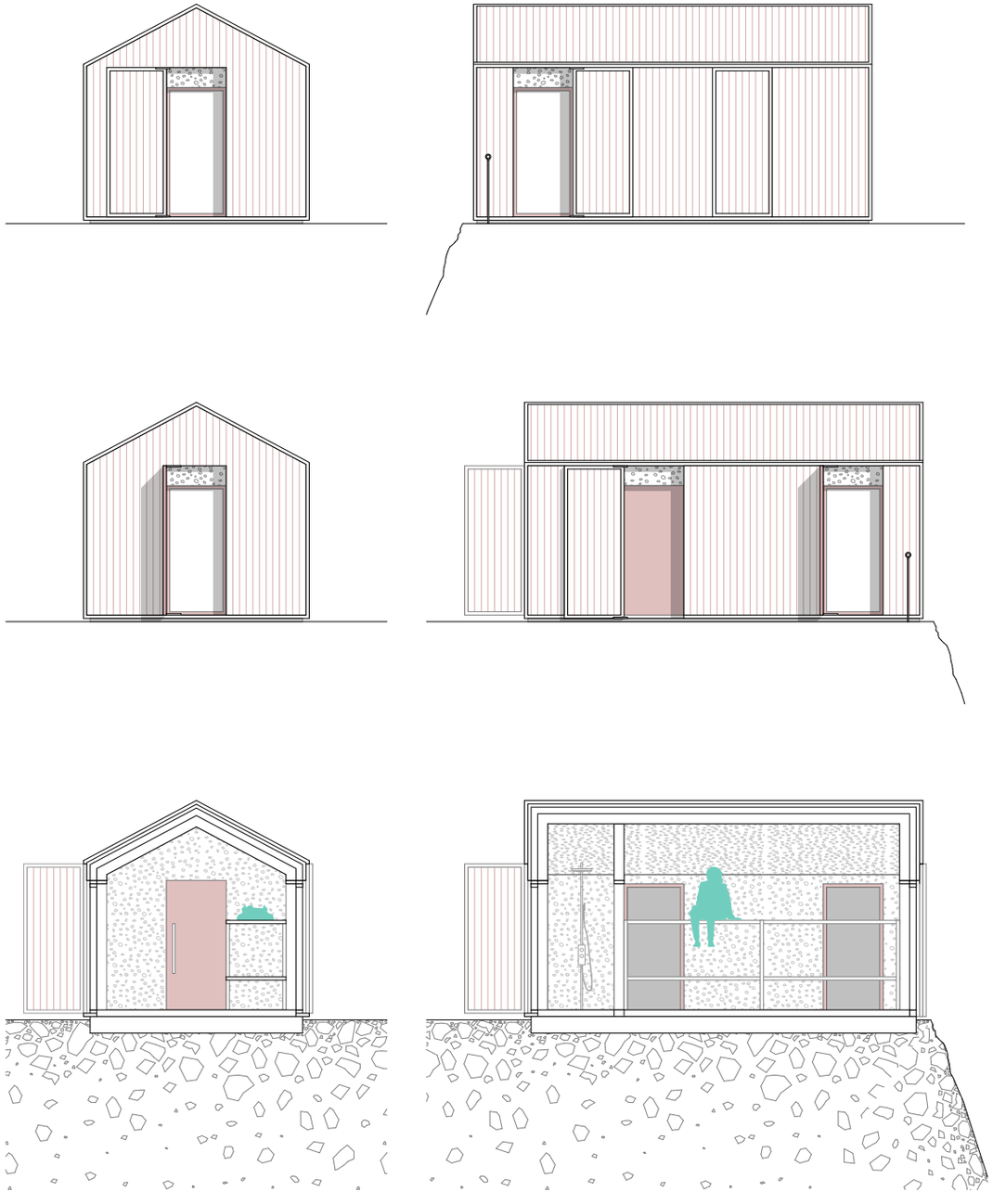


Plans

Lodges



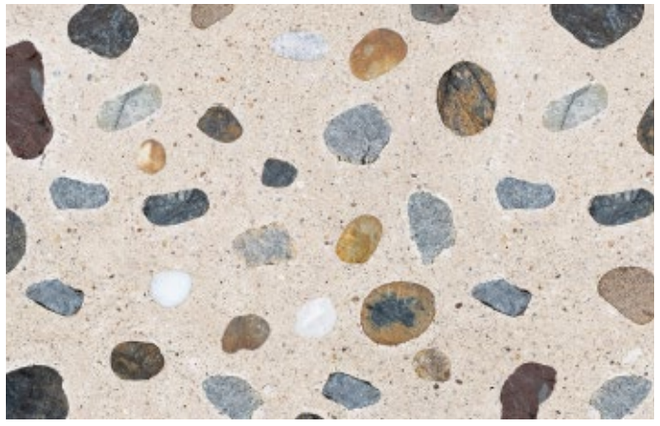
Floor plan
Scale 1:250 0 2 5



Section and elevation
Scale 1:250 0 2 5

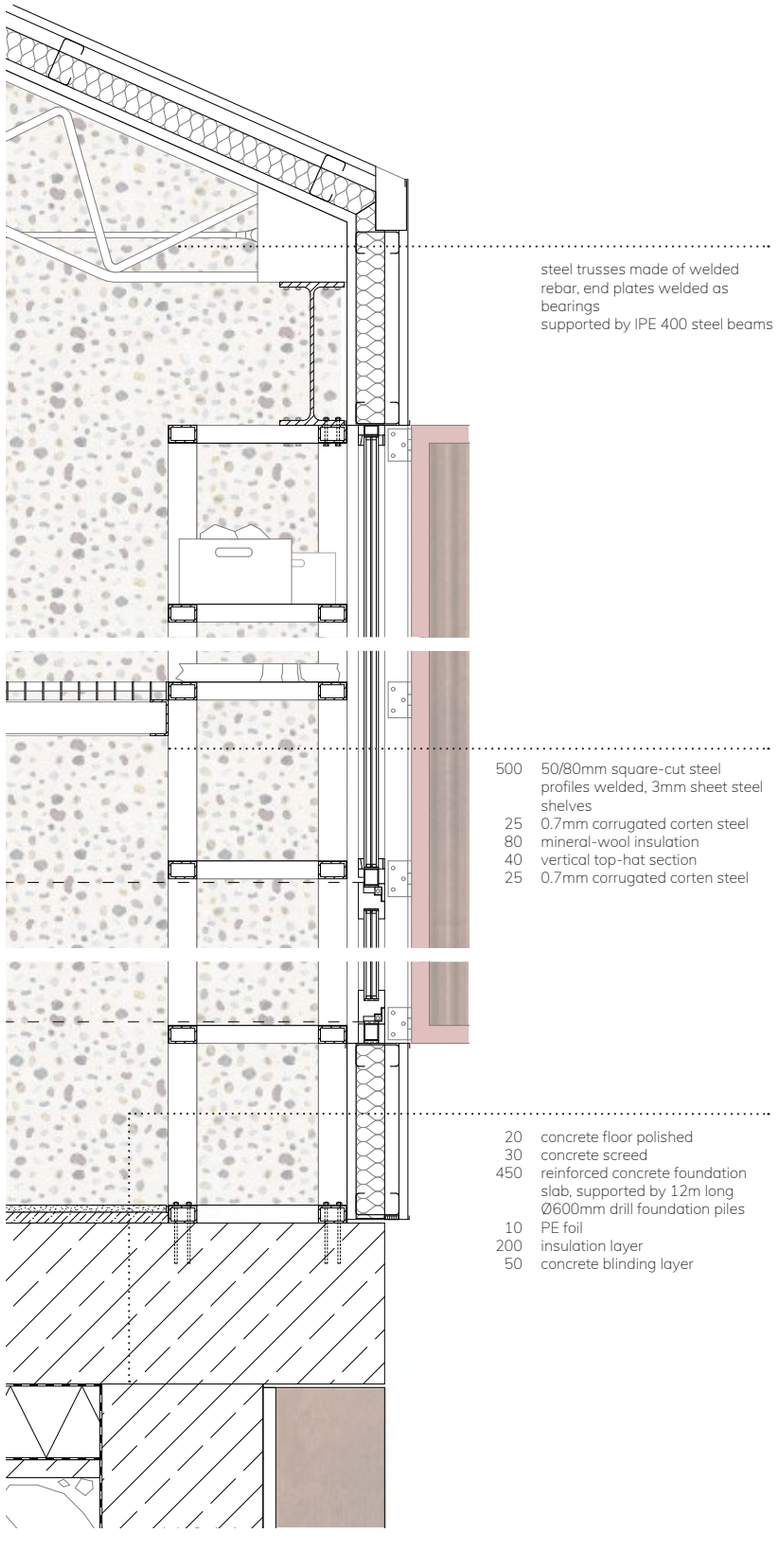
Detail

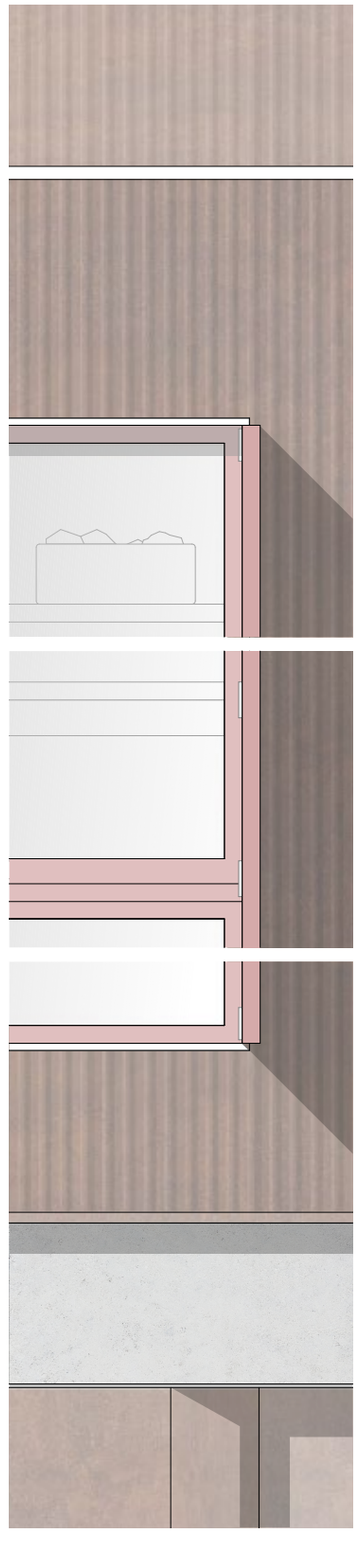
Expedition Hall



Corten steel as facade material refers to the roughness of the building site. Ground *Riverstone Concrete* will be used for the bridge and the interior core

The lightly insulated panels clad with corrugtated metal create the building's outer layer, while on the inside the *Riverstone Concrete* core becomes visible

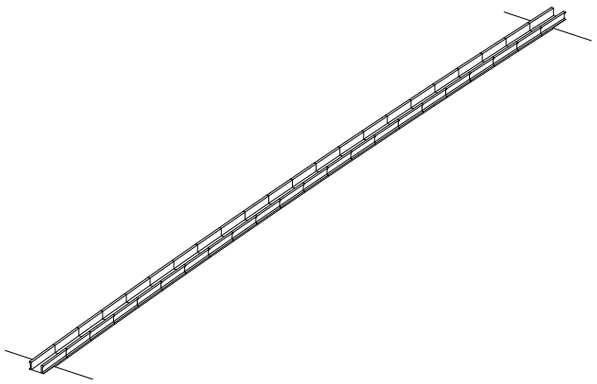




Detail section
Scale 1:20

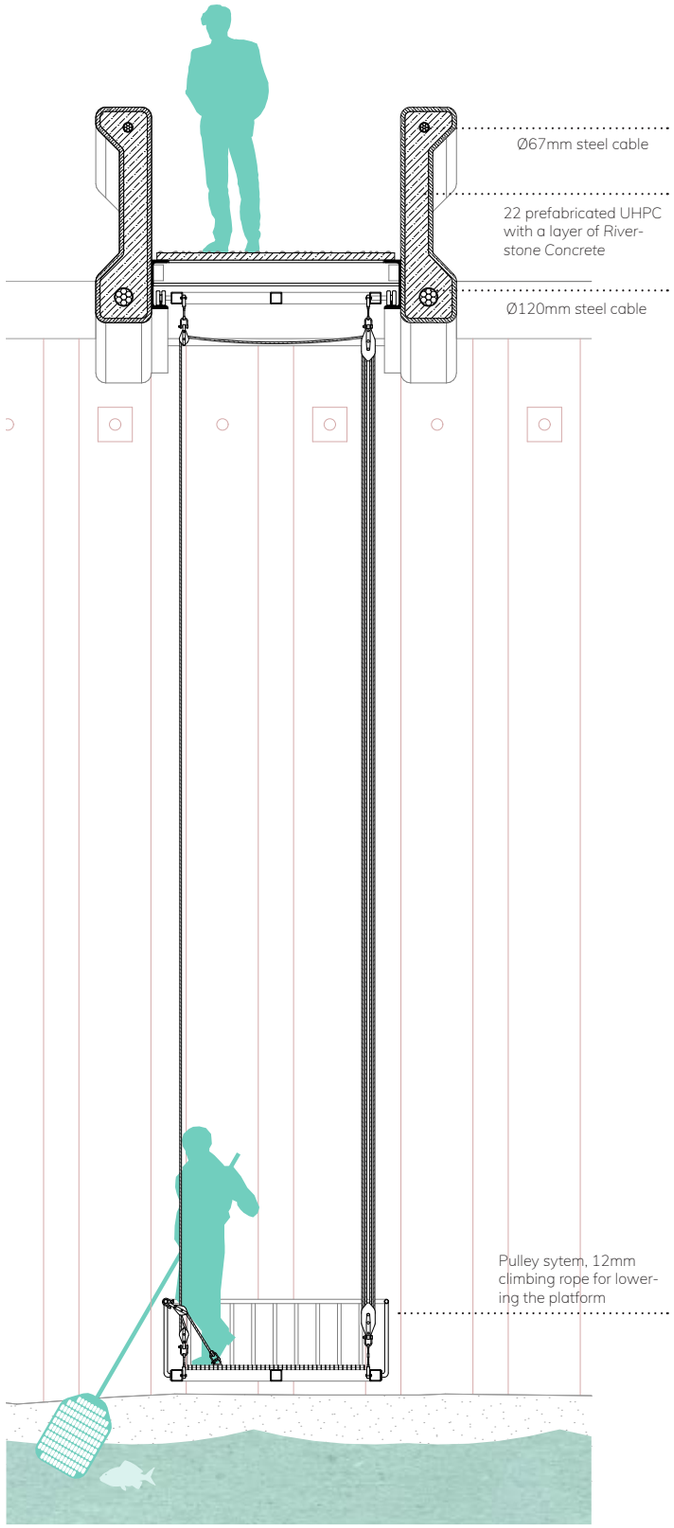
Detail

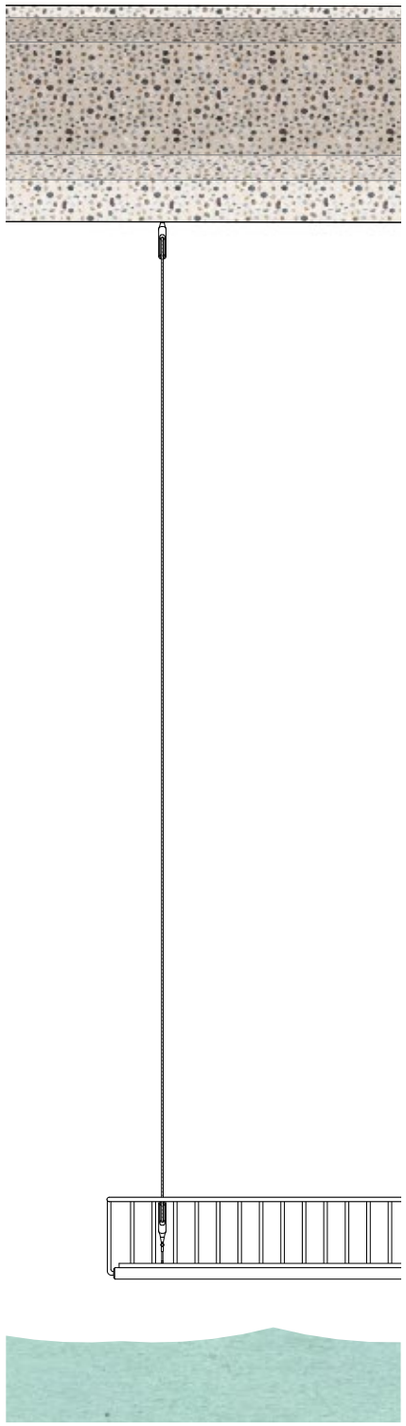
Bridge



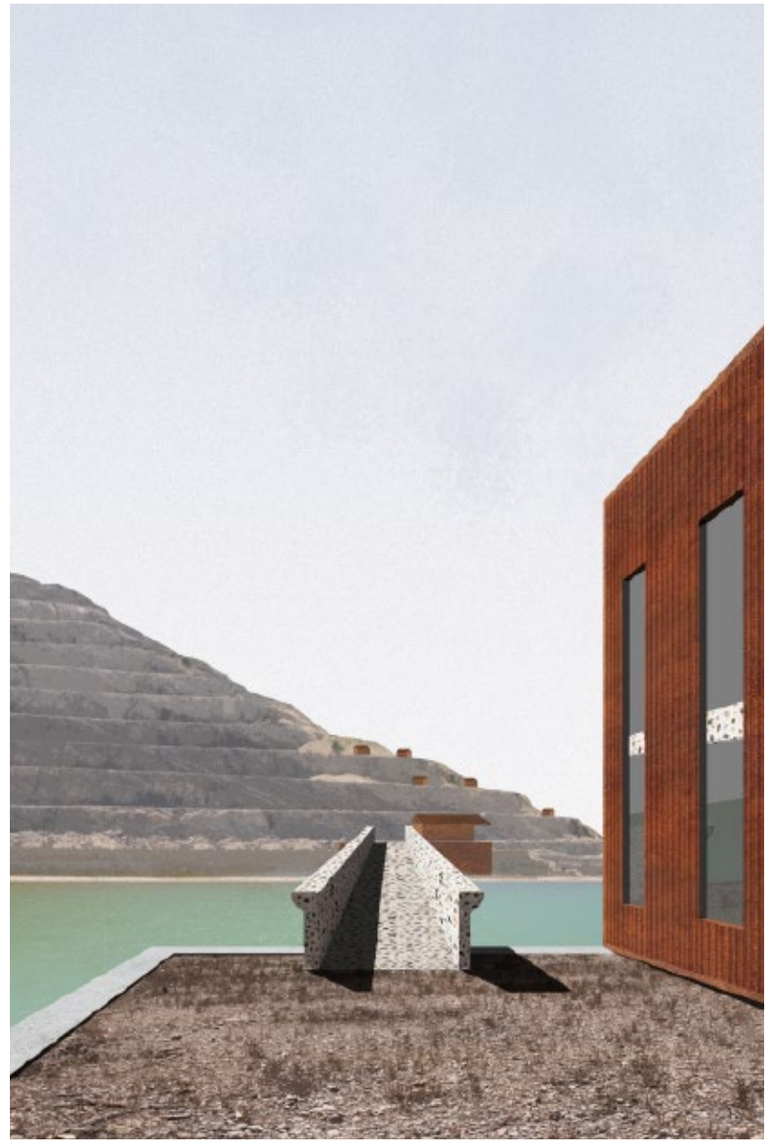
22 pre-fabricated UHPC elements enable the 110m to keep an elegant, simple form. A pitch of one meter creates a slightly curved form that improves stability

The underside of the bridge supports a mobile research platform that can be lowered to the water to facilitate measuring and collecting of samples





Bridge section and elevation
Scale 1:50

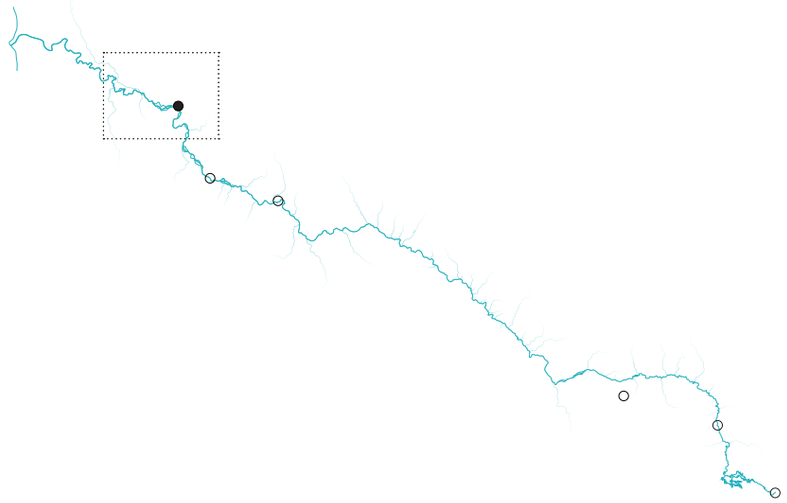


Material collage showing the use of the *Riverstone Concrete* material. Additionally to the bridge, the material appears when opening the window panels

The Kiosk

Project 6

The existing temporary container is turned into a permanent kiosk in the form of a functional wall.



Impressions

– Drone footage from from Aragosta Muzik looking downstream

– The floodplains offer a unique habitat for vegetation and animals

– View from Byllis upstream

Varibop
12.8km | 2.5h

Gorishovë
12.8km | 2.5h

Ballsh
14.2km | 3.0h
7657

Selenica
20.6km | 4.5h
2235

The Kiosk

13
200m
150m
100m
50m
67m
8m

Stage 13
25.4km | 6.5h
▲98 ▼160

lodging
bus stop
bridge
shop
church
restaurant
view
landmark

Hiking map
Scale 1:70.000
0 1km 2km

Aragosta Muzik

Shortly after passing Memaljaj, the highway takes a detour through the hillside, leaving the river in the distance. Right below the old Ilyrian ruins of Byllis, the road meets the river once again, and opens up to a spectacular view of the Vjosa plains. At this particular point, a small yellow kiosk catches the eye.

In 2011, with the road construction works on the E853 highway fully underway, Joni Mehmetaj saw a business opportunity he could put into motion on the strip of land he owned along the river banks. He knew that the development of the highway which connected Tirana to Gjirokaster and the Greek border would mean an increase in traffic along this route, with more tourists and locals coming this way. As such, he decided to consolidate a platform on the side of the highway and build a kiosk to cater the needs of the passersby, offering coffee, local products and an eclectic collection of music CDs. Aragosta Muzik was born. Being the only such enterprise along the way the idea worked very well and combined with his good mood and friendliness, made him quite famous in the region. The amazing views from the platform, especially at sunset, might have also helped his cause.

Because of its popularity, he decided to expand the offer and built a stair to access the riverbank on the west side, where a small beach allows swimming, sunbathing and camping during summertime. In 2019, he consolidated a series of smaller platforms on the east side of the main one, where he built a swimming pool and planted a small grove of trees to protect the customers from the beaming sun. Locals seem to enjoy this new and cosy development as well, often gathering here to grill and sing polyphonic music. A small new pavilion, containing toilets and showers, was the last addition to the ensemble.

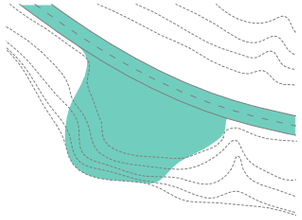
The current situation is characterized by an enormous gravel platform with two singular volumes placed on it. The absence of shading elements makes it very unpleasant to use during midday, as heat and brightness of the sun create an almost unbearable environment. The side towards the river is limited by the steep slope while the margin on the opposite side is created by the highway passing by. Cars stopping for refreshment thus arrive with high velocity only to stop a few meters short of the building, creating a feeling of unease when sitting in the kiosk, in close proximity to the arriving cars.

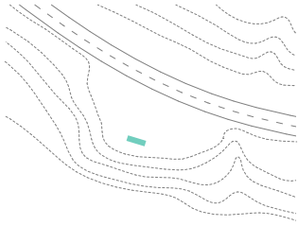
From April to September, Mr. Mehmetaj and his employees are there every day and tend to the visitors stopping by. Each night, he shuts up shop, rolls down the blinds of his kiosk and takes a 40km taxi ride back home to Fier. The small, temporary container, which houses the kiosk, seems to have served its purpose well. However, due to the success of the business, the owner is planning to build something permanent instead.

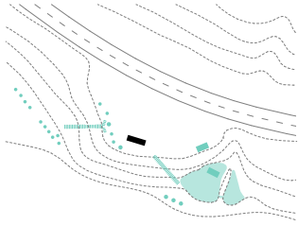
Aragosta Muzik is located at an outer bend of the Vjosa on top of a raised platform

The owner of Aragosta Muzik, Joni Mehmetaj

While stopping at Aragosta Muzik, one can enjoy a spectacular view and beautiful sunsets along the Vjosa







The site of Aragosta Muzik has been gradually expanded over the years. In 2011, an artificial platform was created during construction works for the highway. In 2013, a temporary kiosk was added. Until 2019, the site has been enriched by new trees and straw umbrellas for shading. It now includes a beach on the river bank, a camping, sanitary facilities and a swimming pool

The large gravel platform is exposed to incoming traffic and gives the impression of a parking space

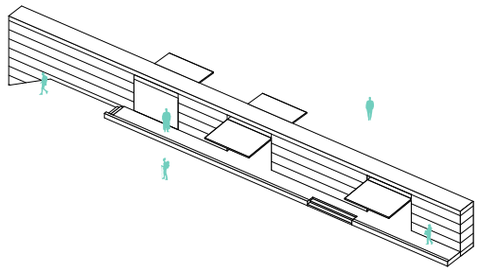
The Kiosk

The *Kiosk* is the proposal for a new permanent pavilion at the grounds of Aragosta Muzik. It replaces the old temporary container and adds new programmes to the site.
The intentions of the owner are very clear. In the new building, a coffee shop should continue tending to the visitors stopping by briefly and a barbecue should satisfy the needs of those who want to stay longer. Storage space is needed for the outdoor furniture and camping equipment and he should have a place to spend the night, occasionally. The design also takes other parameters into consideration, such as the loud highway and the danger of approaching cars, the limited business hours and the possibility of closing during the night and off-season, the view, the warm climate, the beaming sun and the need for shadow.

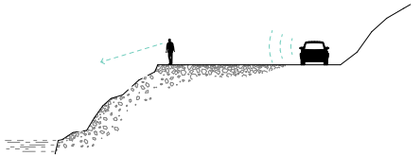
In order to respond to all these requirements, we came up with the concept of a functional wall, which is oriented parallel to the river and divides the site in two parts: the louder highway-side, for parking and short stops and the more private riverside, for longer stays. Raised on a pedestal on seating height, to protect the visitors from incoming traffic, the wall incorporates a barbecue, a coffee shop, a storage room and a viewing platform. On a lower level, embedded partly into the terrain and more private, a small room offers a place to sleep, if needed. Because of the warm climate, activites usually happen outdoors, so the building is just wide enough to house the bar and barbecue elements as well as anything that needs to be locked. Large panels offer shade and enable air circulation during daytime while allowing the closing of the *Kiosk* during the night.

The material used here is rammed concrete, cast in 45cm high layers, because the costs are lower and it is easy to manufacture, while also adding a participative component to the building process. Aragosta's staff can help out and get involved in the condensing process of each layer. This type of material underlines the monolithic appearance of the building and the stacked, irregular layers, peppered with river stones are a representation of the funky and cheerful character of both the owner and the building's programmeme.

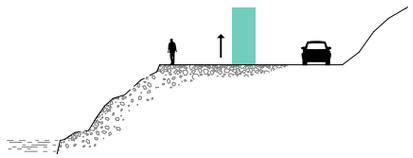
The shutters are attached on metal pivots and consist of two elements of similar weight but contrasting dimensions. The larger, lower part is a steel frame, covered by yellow painted plywood sheets, while the upper counterweight is made from a smaller, *River-stone Concrete* slab. This way, the panels can be easily opened and, secured by a rope, remain in balance afterwards.



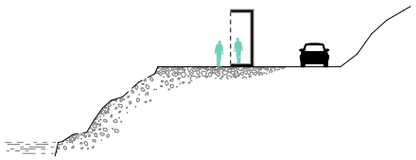
Design Concept



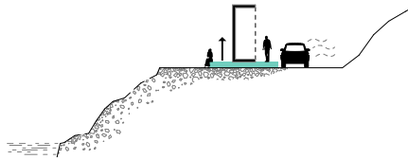
View is disturbed by close proximity to the road



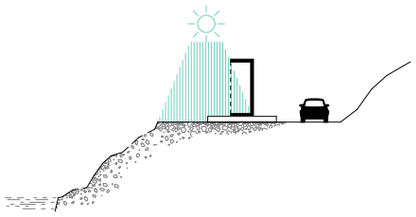
Wall is raised as barrier between visitors and cars



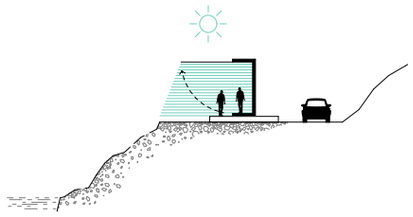
Functional wall



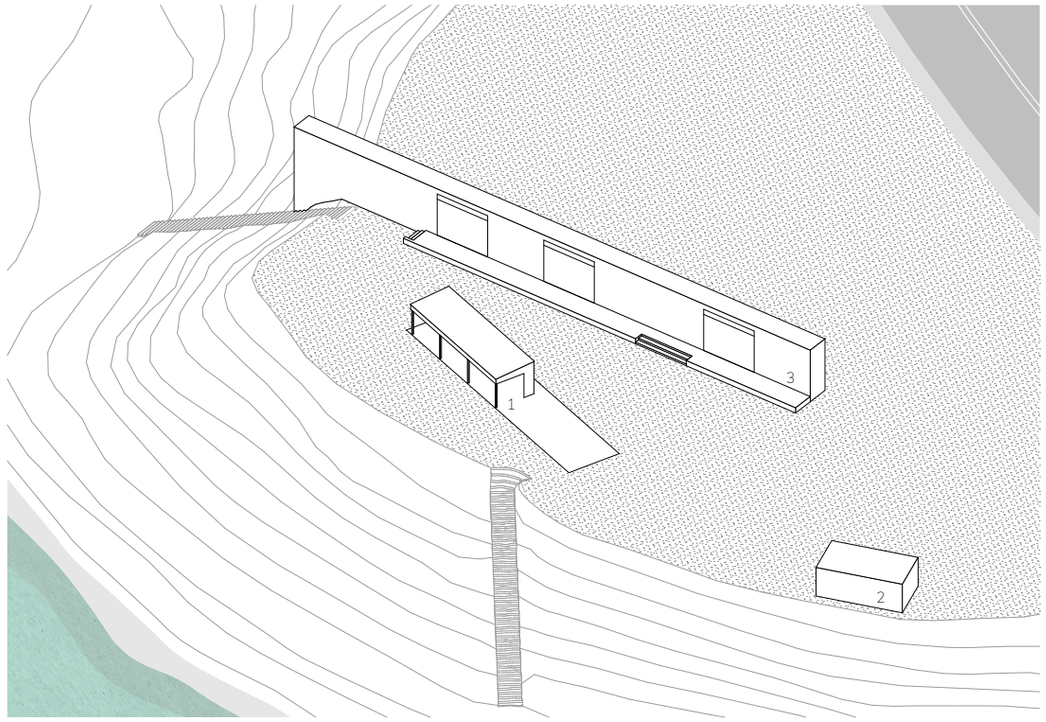
Platform is raised to add protection against ap-proaching cars



Exposure to the sun



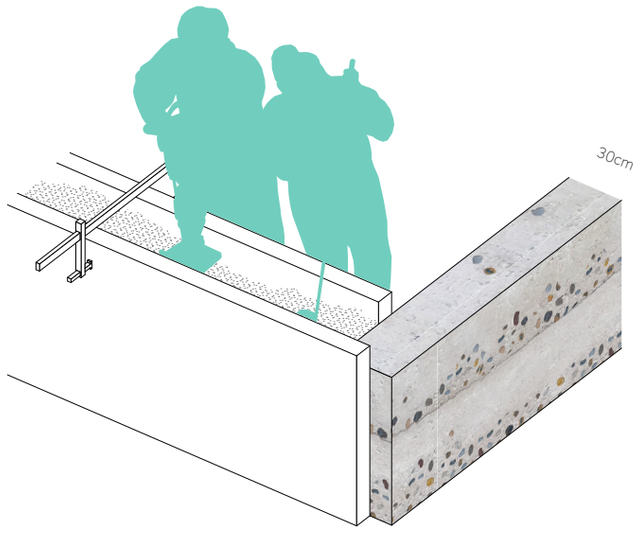
Tilting panels create shade and enlarge the useful area



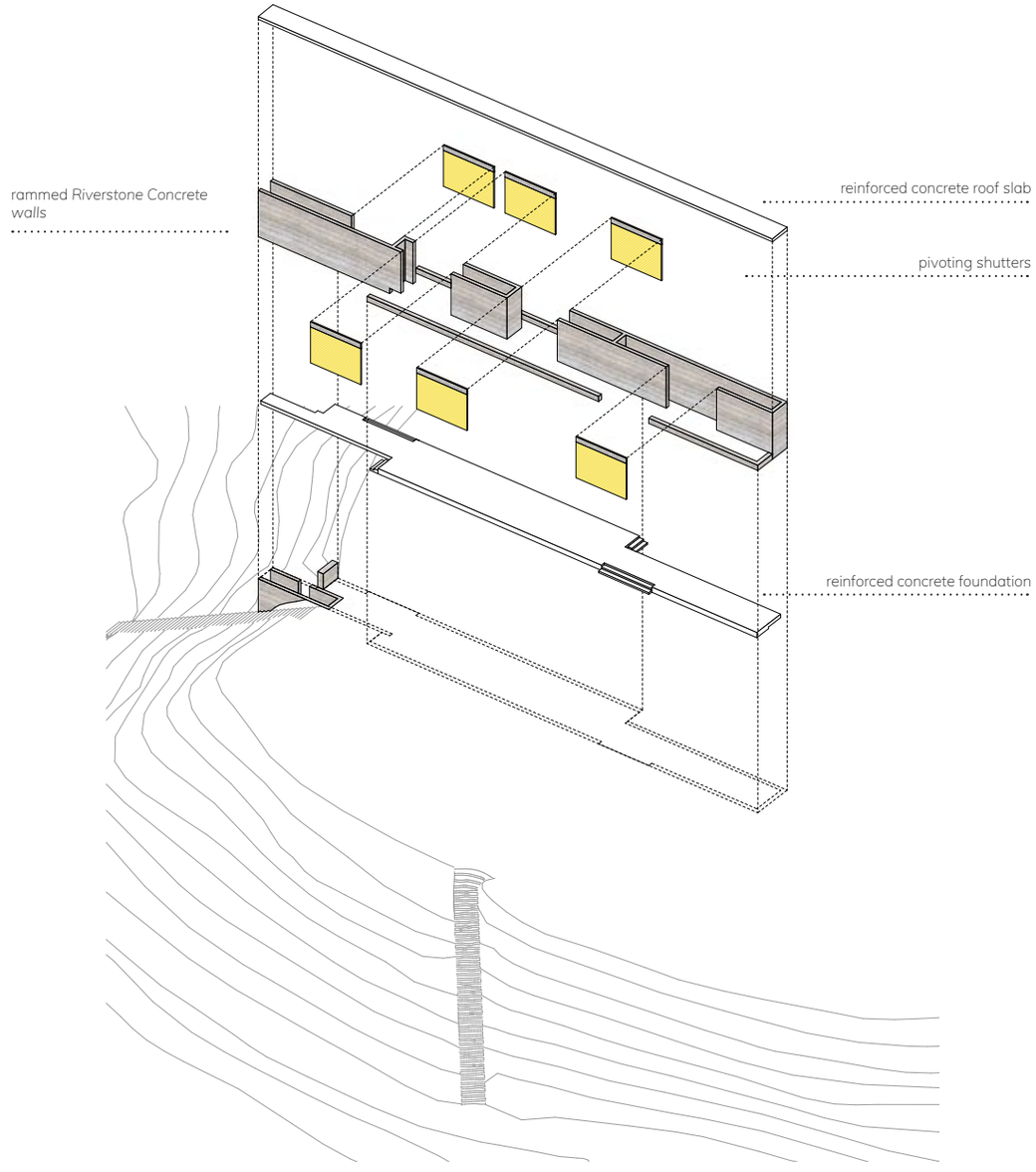
The building ensemble consists of the old container, retained as a shading element, a pavilion for sanitary facilities and the new *Kiosk*

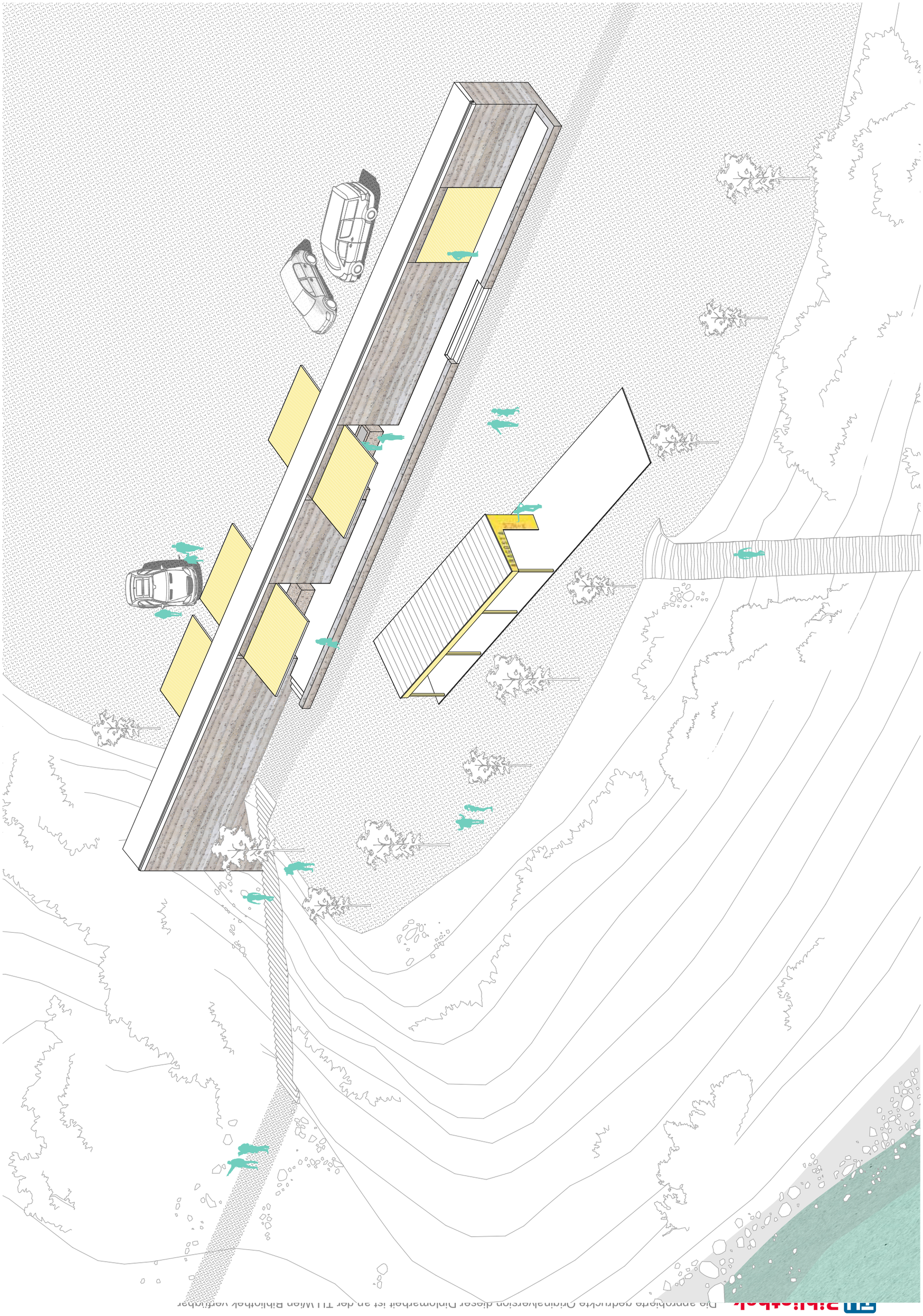
1 Existing container
2 Existing toilets/showers
3 New *Kiosk*

Material Concept



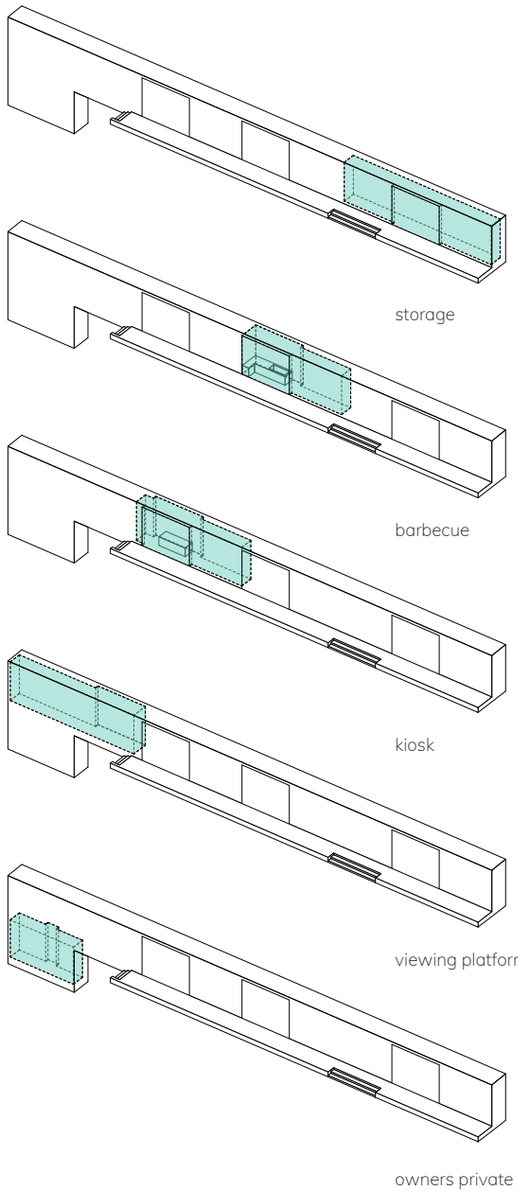
The *Riverstone Concrete* is cast in 45cm high layers and compacted by ramming

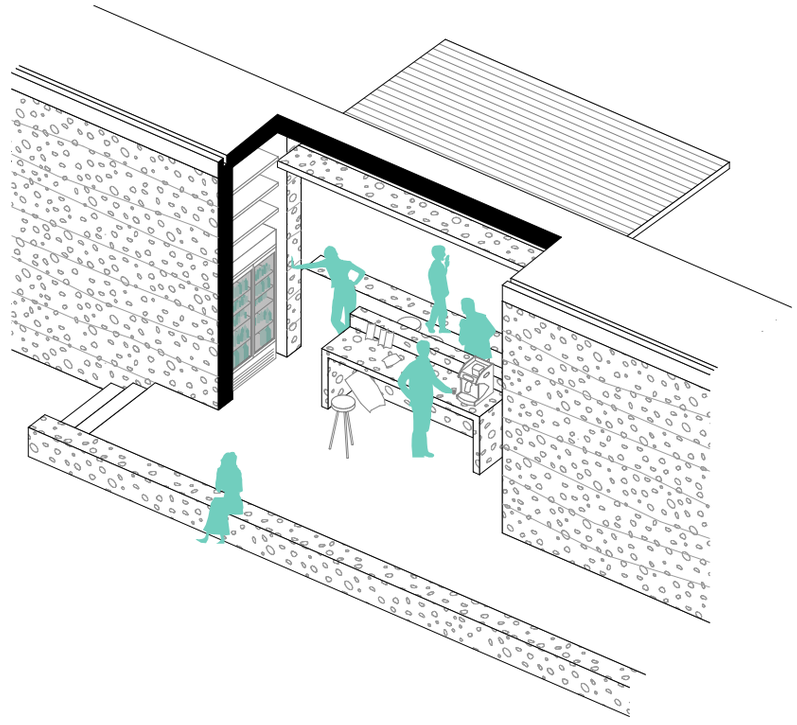




Die approximierte gedruckte Originalversion dieser Diplomarbeit ist an der TU Wien Bibliothek verfügbar

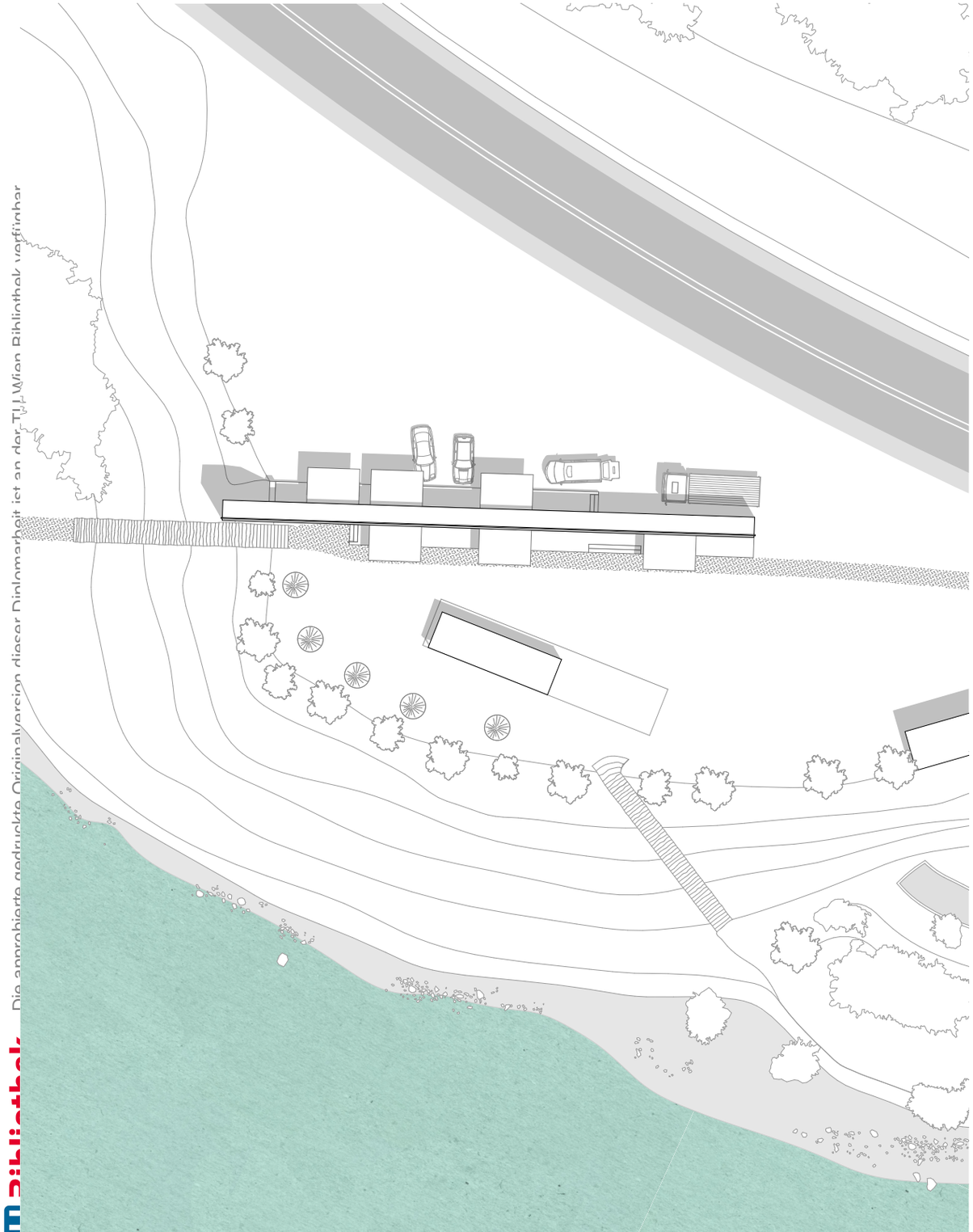
Programme



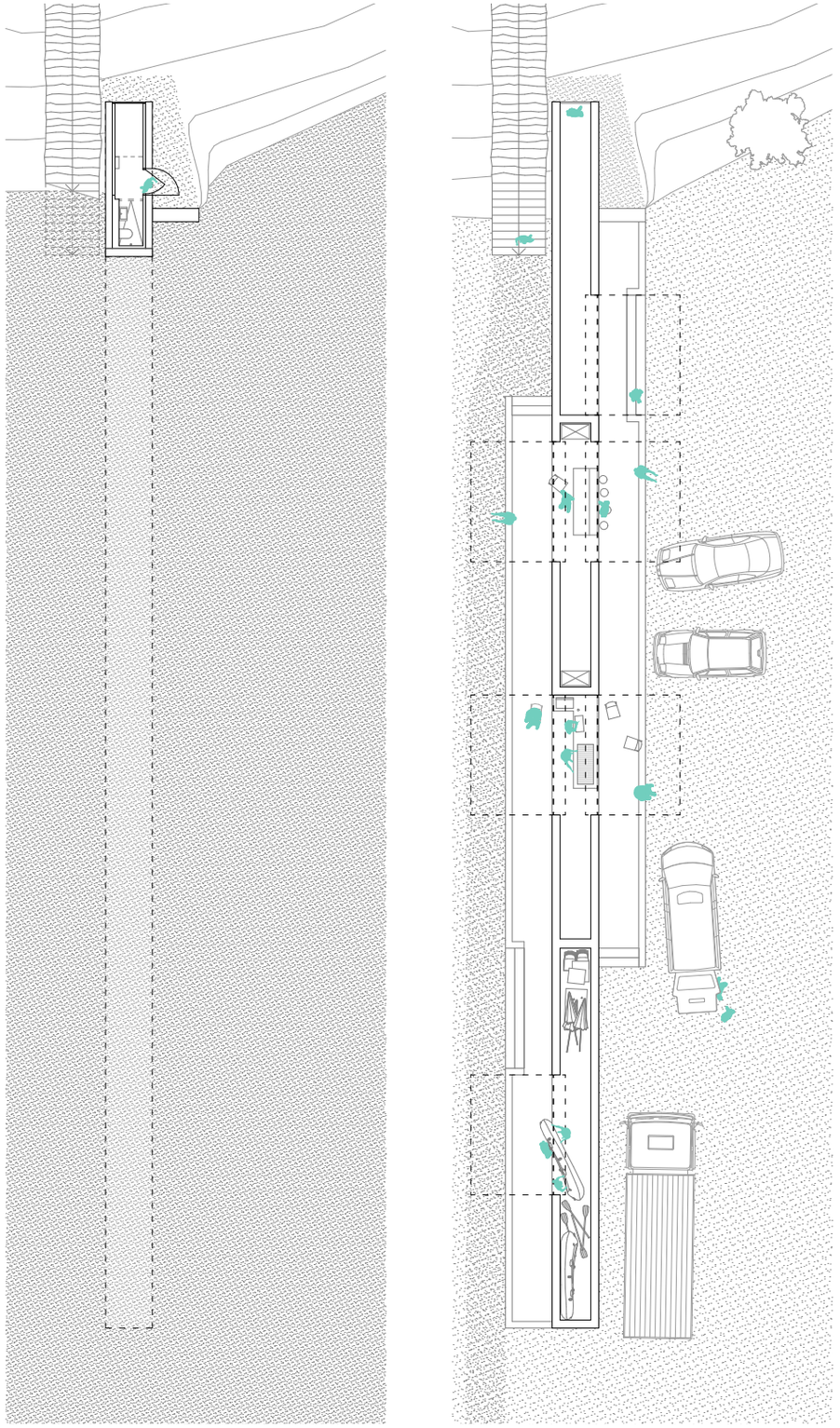


I Interior situation of the cafe. Inside the wall there is only place for the bar element and storage. The staff and visitors remain outdoors and enjoy the shade thrown by the shutters as well as the circulating air streams

Plans



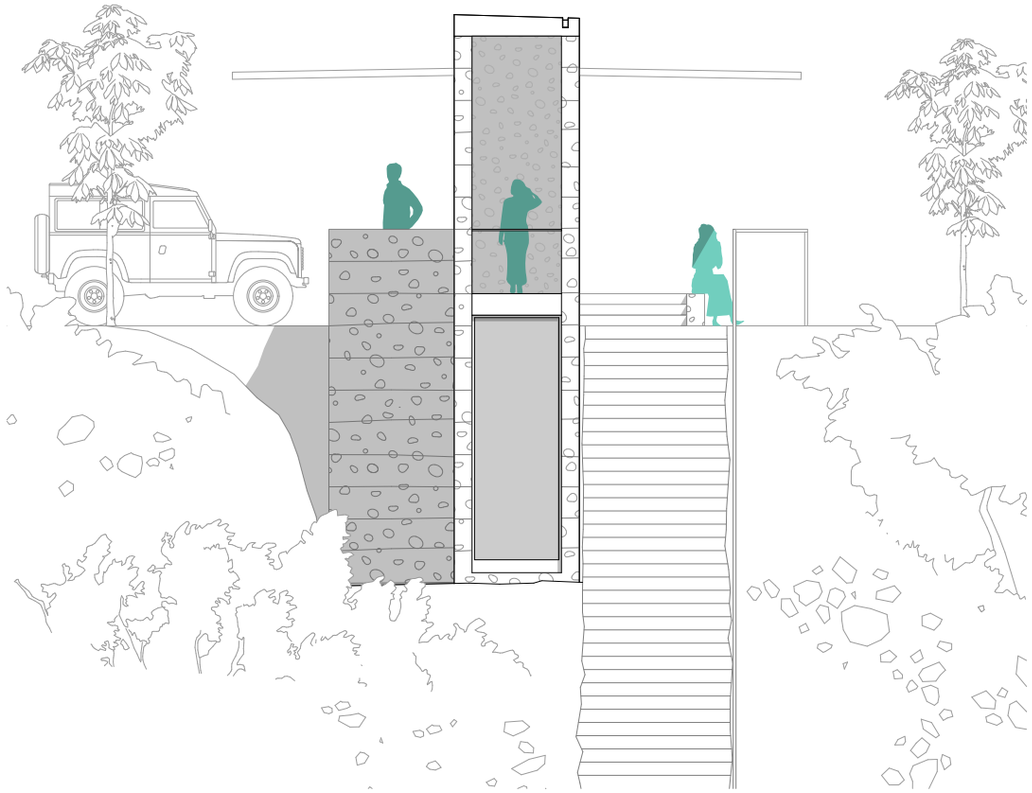
Site plan
Scale 1:500

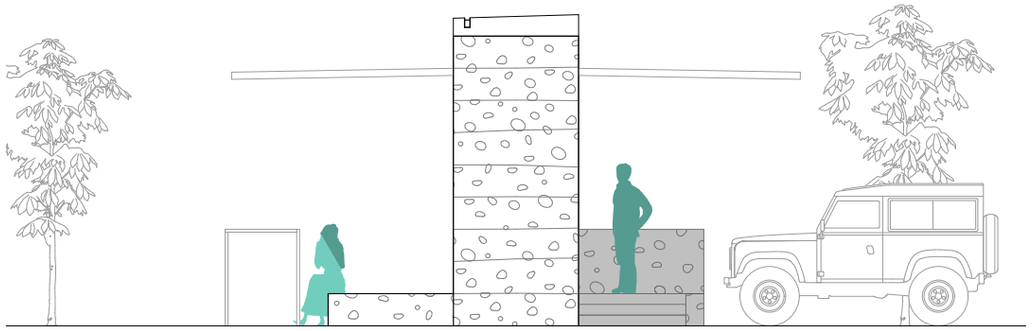


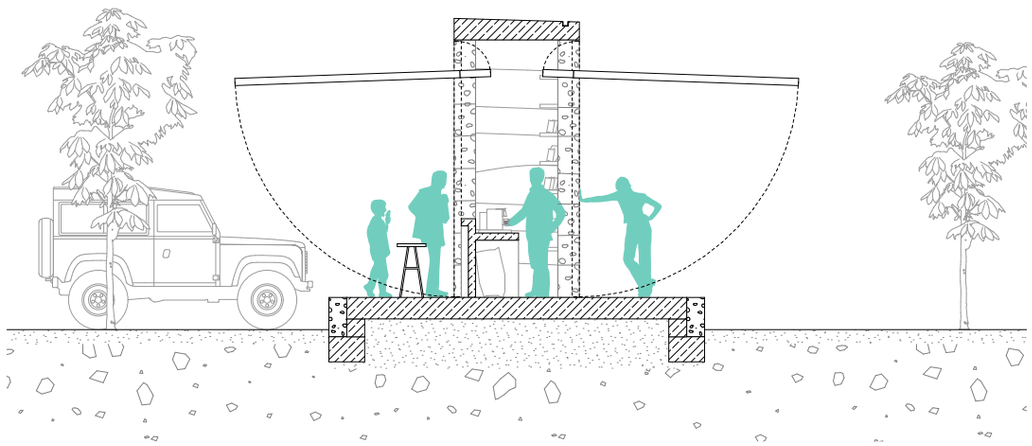
Floor plans
Scale 1:250

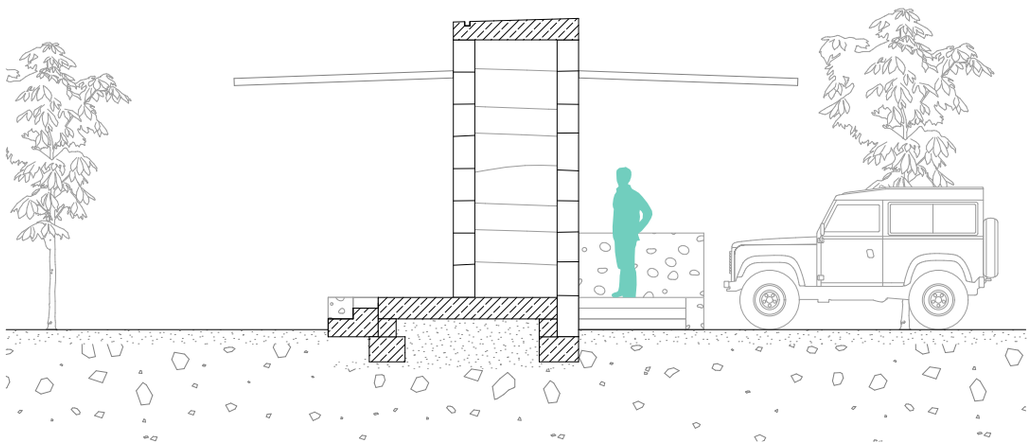
0 2 5

Plans





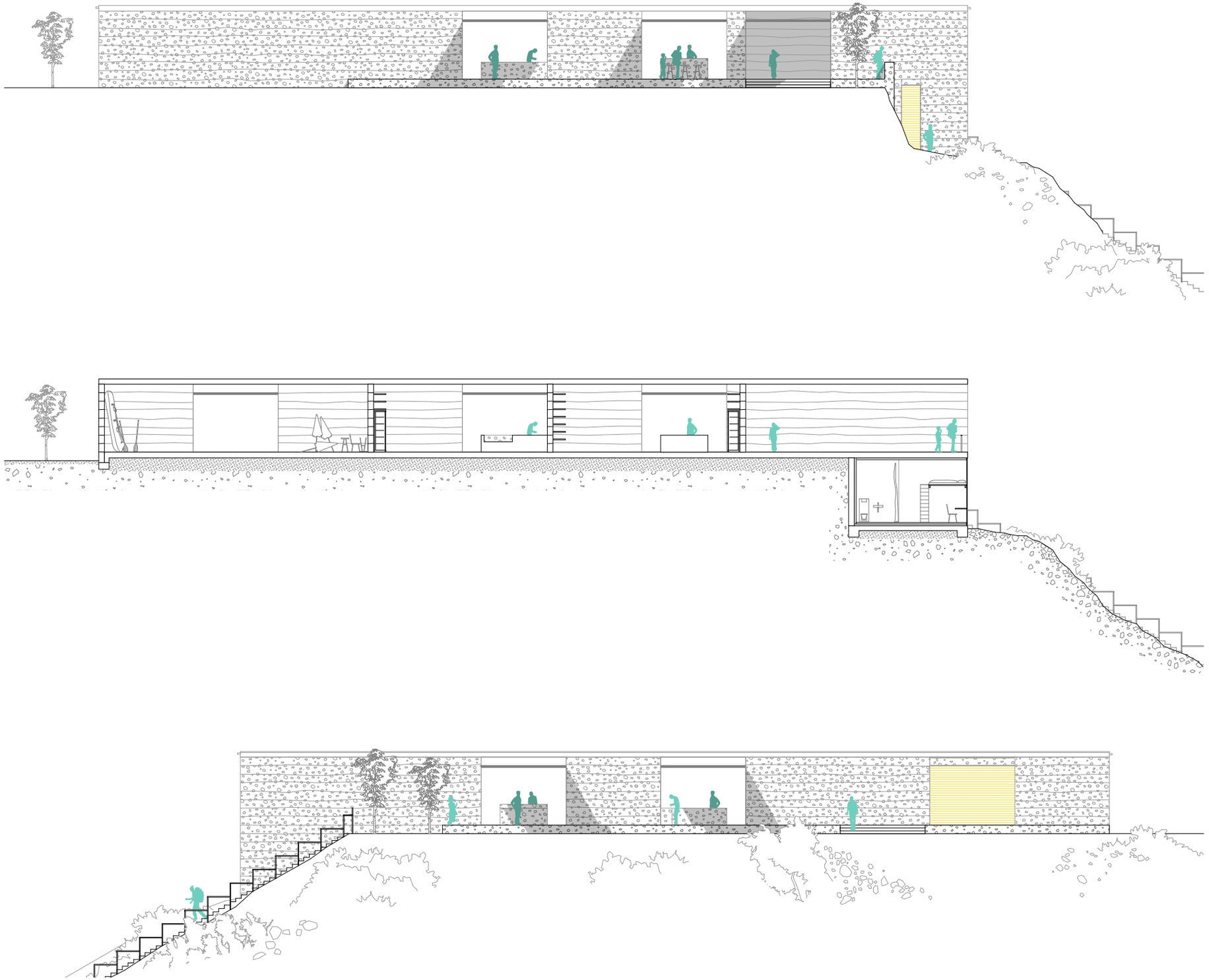




Section and elevation
Scale 1:100 0 1 2

Section and elevation
Scale 1:100 0 2 5

Plans



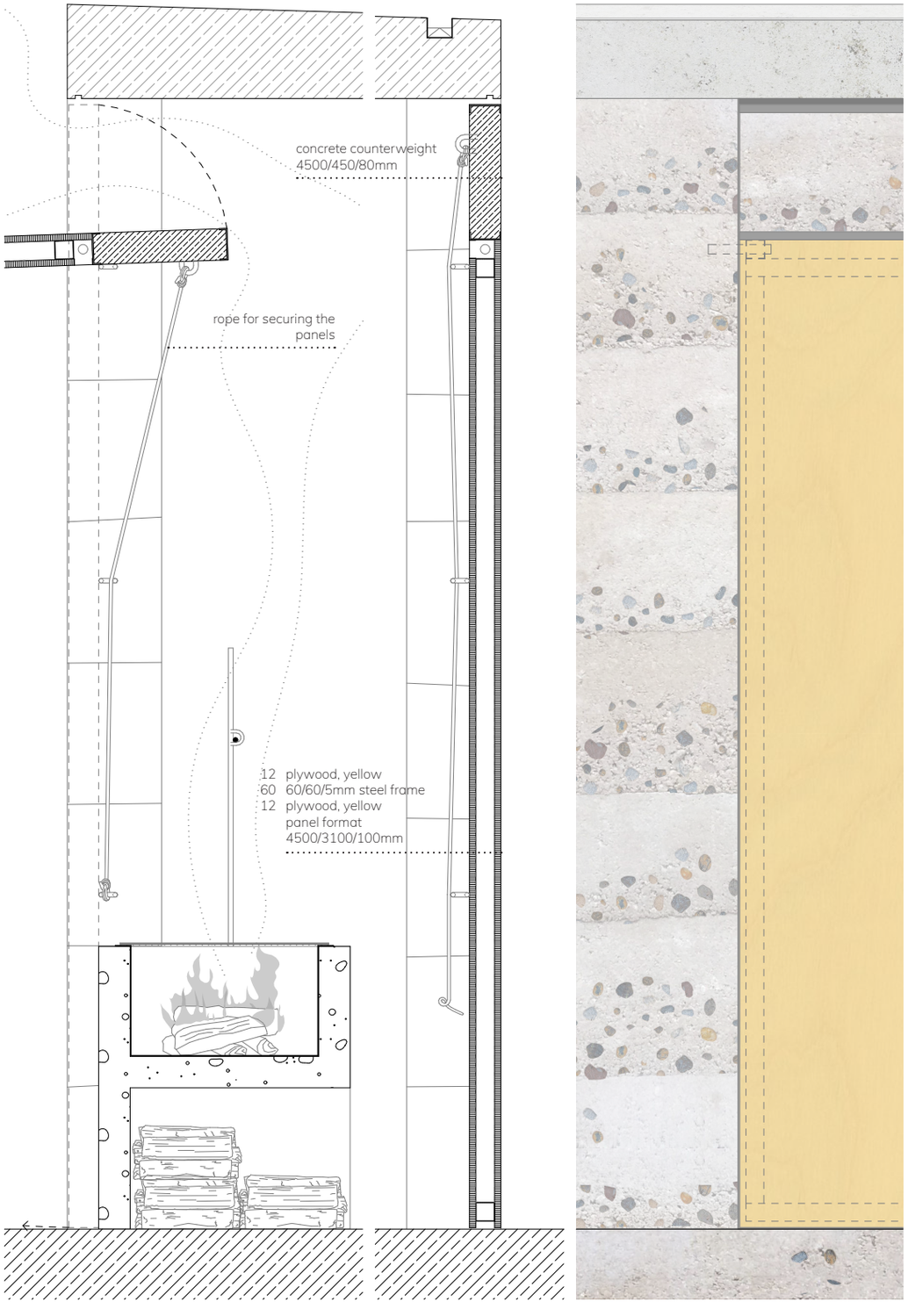
Section and elevation
Scale 1:250

0 2 5

Detail

Yellow plywood reminds of the old container cladding. On the wall surface, the river stones create a colorful gradient as they tend to gather on the base of each layer of rammed concrete

The counterweight of *Riverstone Concrete* keeps the shutter in balance when open. When closed they are flush with the wall

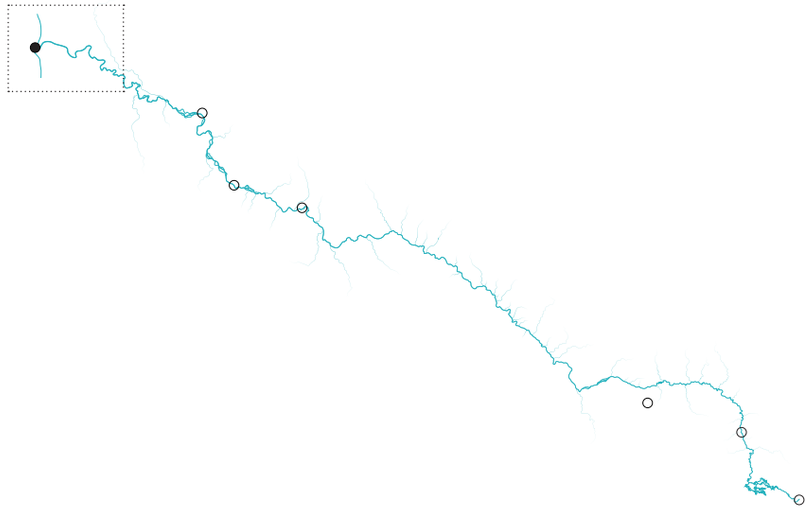


Detail section
Scale 1:20

The view of the Vjosa along the Kiosk wall –

The Lighthouse

The end of the trail is marked by the ruin of a former lighthouse located at the point where the river joins the sea.

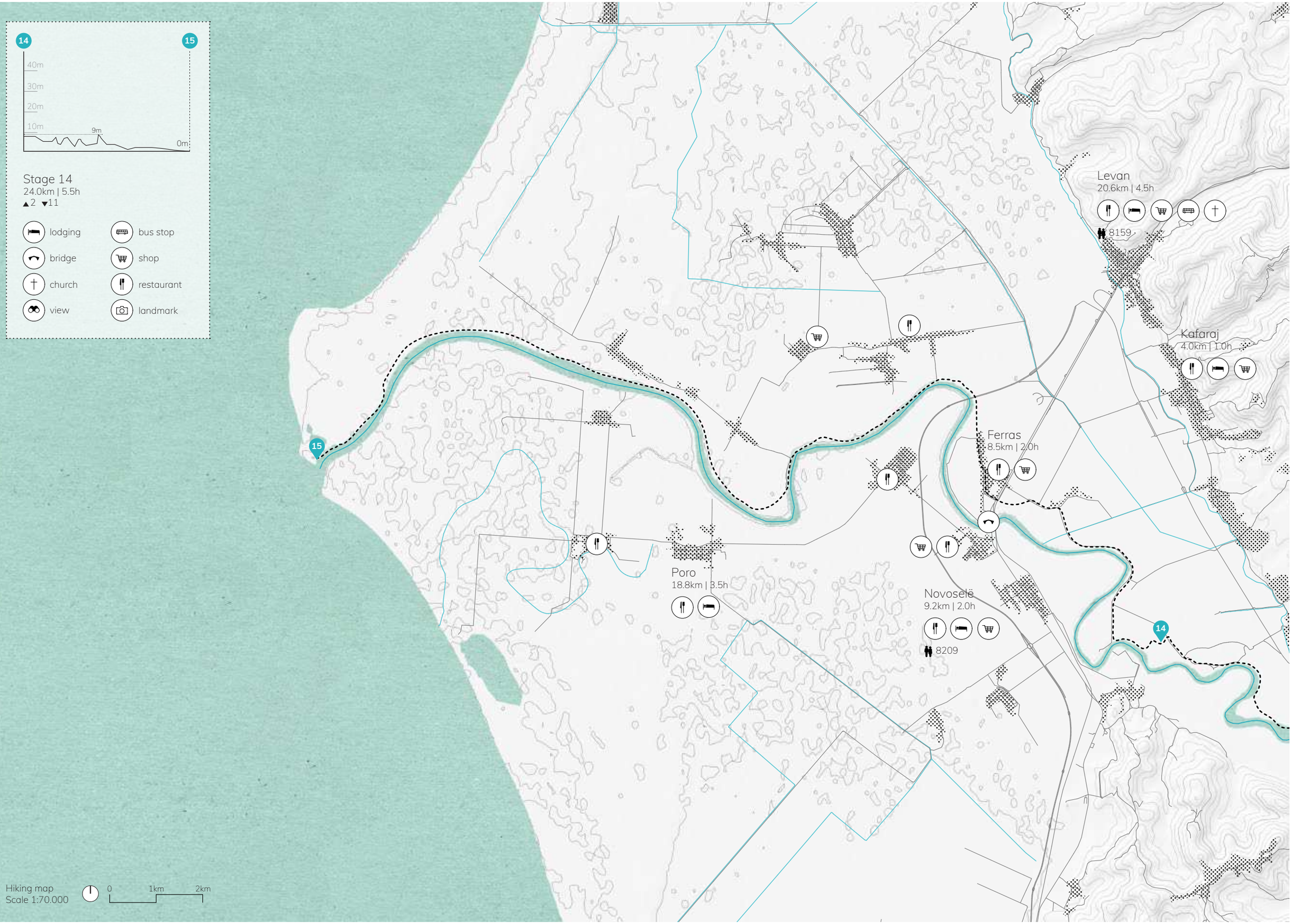


Impressions

– Passing through fields of reed in the river delta

– Local fishermen use-huge nets suspended on long poles

– The river here is up to 200m wide, meander-ing through flat terrain



Vjosa Delta

The last part of the trail takes the hiker along a sandy path, through the wetlands of the river estuary. The nutrient rich deltas are characterized by stunning, untouched nature and they provide an important habitat for wildlife and plants. Here, the sweet water of the Vjosa meets the salty sea, creating the biologically important brackwater part of the river mouth. As a transition zone between two water bodies, it provides a habitat for a variety of fish species, resulting in excellent fishing grounds. Huge fishing nets spanned over the river and held in place by towering wooden poles, stand out in the distance. Repurposed tractor motors are used to operate and lift the enormous nets. Although improvised, the method seems to work very effectively. Walking along, the travellers might buy fresh fish or crabs for a very humble price and cook them as a crowning meal, at the end of the day.

As the hikers approach the end, a distinctive figure appears on the horizon; lone, tall and slightly tilted. This abandoned, half-sunken, brick lighthouse - the Leaning Tower of Vjosa - guides the way to the end of the hiking trail and symbolises the completion of the journey.

The river finally reaches the Adriatic Sea and the two water bodies converge

Although the river estuary is very remote and difficult to access, garbage lines the river banks and the beaches

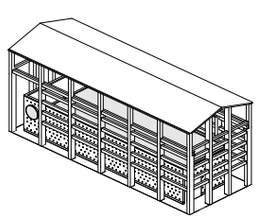
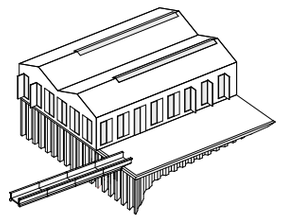
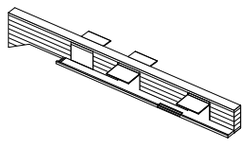
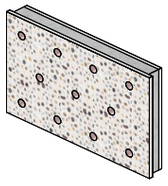
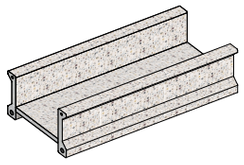
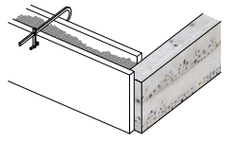
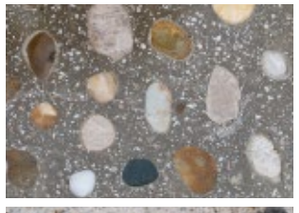
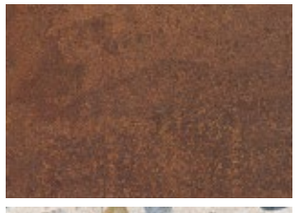
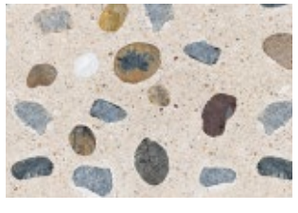
Fisherman collecting his catch from the hanging net

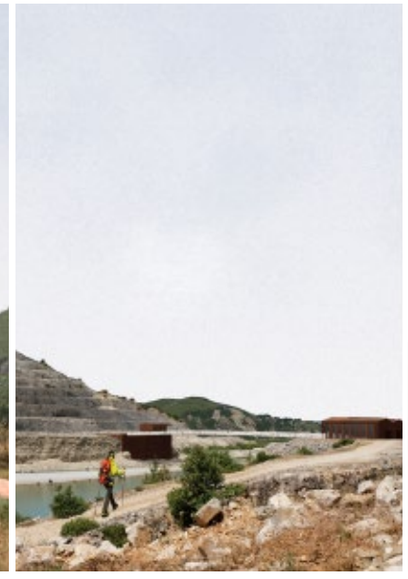
The End

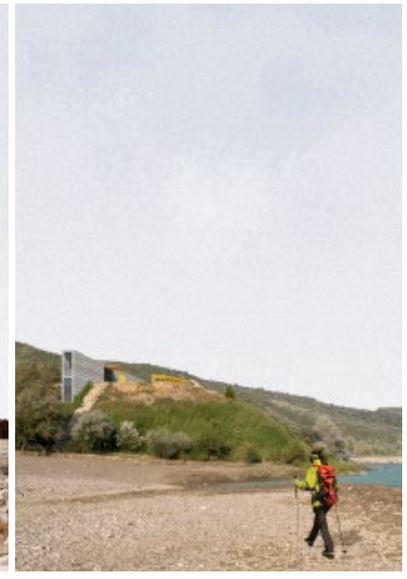
VI.

Conclusion

Project Comparison

The Old Factory	The Field Lab	The Kiosk
		
		
		
		
		





Conclusion

In the past years, global warming has become one of the major issues and biggest challenges of our time. The debate about climate change has been gaining momentum, sparking discussions about renewable energy and the sustainable use of resources available to society in general, thus challenging western society's way of life. In the wake of this development, the future of the Balkan rivers and of the Vjosa/Aoos has become tremendously relevant. It represents something that has been lost all over Europe and is thus of European and International importance.

The topicality of this issue means that the future of the river is continuously being debated by environmental organisations like Riverwatch, academic institutions or Albanian and Greek government agencies and as such new insights into the state of affairs surface frequently. In 2017 the European Parliament advised the Albanian government to consider the establishment of a national park along the whole length of the river.[59] Subsequently, while working on our diploma thesis, plans for the implementation of a Vjosa/Aoos National Park have been brought forward by Riverwatch and have been included in Albania's territorial plan for 2030.[60] [61] Although it remains to be seen what form the national park will take and how it will be implemented, it represents an important step in acknowledging that an alternative to the planned dam projects can be found.

Our proposal for the VA River Region can be seen as the visualisation of these alternatives. The resulting projects mirror the complexity and diversity of the region surrounding the Vjosa/Aoos. They take specific needs and potentials into consideration in an attempt to tackle local topics which affect the river, residents, visitors and the future development of the region. They are based on extensive research and initial input gathered during our travels. As the situation is constantly changing, it was important that our designs remain flexible enough to leave room for further development. The Hiking Trail was conceived with that in mind, as it allows the addition of new concepts and ideas along its way. Such additions can be identified, mapped and incorporated through a bottom-up planning process that ideally involves local stakeholders, municipalities and residents.

Similarly relevant for the implementation of our vision is the question of financing. Funding could be achieved through existing EU cross-border programmes between Greece and Albania as well as government initiatives directed towards sustaining national parks and protected areas. GIZ, the German agency for international cooperation, has been funding projects that promote tourism and hiking in Albania since 2006, creating a precedent for financing trails and infrastructure.[62] Additionally, many of the projects work in accordance to Albania's 2030 territorial plan and could try to receive funding within this framework.

In the context of this evolving environment, this thesis was conceived with the purpose of adding useful input to the discourse from an architectural perspective. It represents a foundation, upon which further discussion and development can be based.

59 Riverwatch and EuroNatur (2017).
60 Gjermeni E. (2017). p.91
61 Riverwatch (2019). 'A vision for the Vjosa: Europe's first Wild River National Park'
62 Jeska A. (2018).

VII.

Imprint

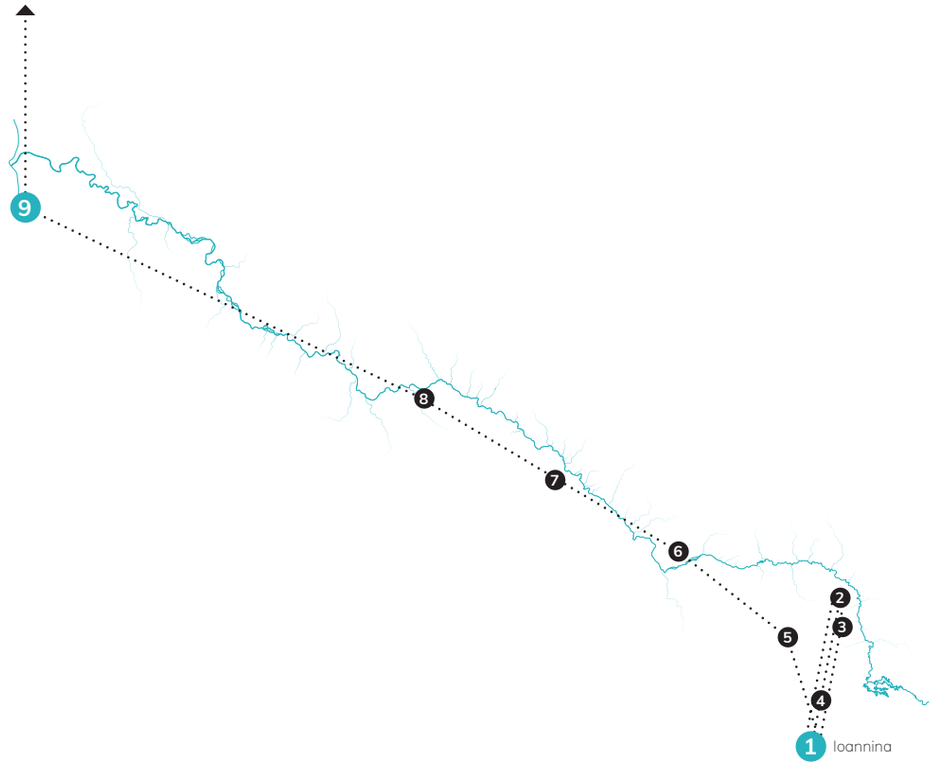
Trip I

A personal travel diary

The first visit was in late October, fall had just settled into the mountains and the region was ablaze with autumn colors. Travelling by car due to a tight time schedule, we completely underestimated the rough terrain of the Pindos mountains. Pushing the four-wheel-drive to the limit, we got stuck high up in the mountains where the towing car couldn't access and ended up ripping the underside of our car apart with the help of a local lumberjack, a hammer and a metal wedge to get to the emergency tire. For every day on the road we spent one day at the closest mechanic, fixing our tires and mending parts of the car.

Visiting in the off-season, the local residents mostly had time to spare and shared their stories and experiences with us. An older woman in the little town of Tsepelovo, left alone by her sons who were forced to leave to find work in the bigger cities of Greece, joined us for breakfast to talk about the catastrophic economic situation in Greece. At the same time, a whole class of the Department of Architecture at the Metsovian University of Athens flocked into the mountains to conduct a thorough analysis of the rich stone architecture and the history of masonry in the area. Helping them out by creating aerial photos with our drone, we in turn received access to their research. At the local hostel in Vovousa, the head of Pindos Perivalontiki connected us to an acquaintance in Permet where were able to stay for the night. Arriving there, we were spontaneously invited to a business dinner with a group of very hospitable business partners, sharing their insight into the local politics and the future of hydropower in the Vjosa/Aoos river basin. Continuing along the river, we decided to stop at a hotel near Kelcyra, where the owners shared their story, homemade tsipouro and an old goat for dinner. Further downstream Joni Mehmetaj, the owner of a roadside kiosk, known to everyone around the area as DJ Aragosta, told us of his big plans to turn his kiosk into a permanent café with an attached camping. Reaching the delta of the river, we were able to give some of the hospitality and kindness back by helping two local fishermen dig their car out of the sand.

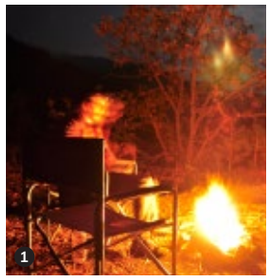
After 10 days on the road, all the while sleeping in the back of our van on a makeshift MDF bed with the regions map printed on it, we returned home with a lot of ideas, stories and a huge amounts of river stones, sand and water samples.



I For every day on the road we had to spend one day at the mechanic in Ioannina to fix tires

Trip I

Travel impressions



campfire close to Vovousa

first stop at Aoos artificial lake

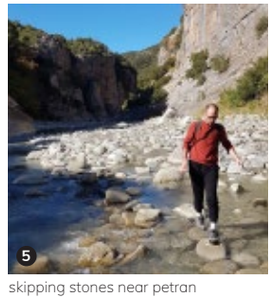
bridge at Kipoi

hotel in Vovousa

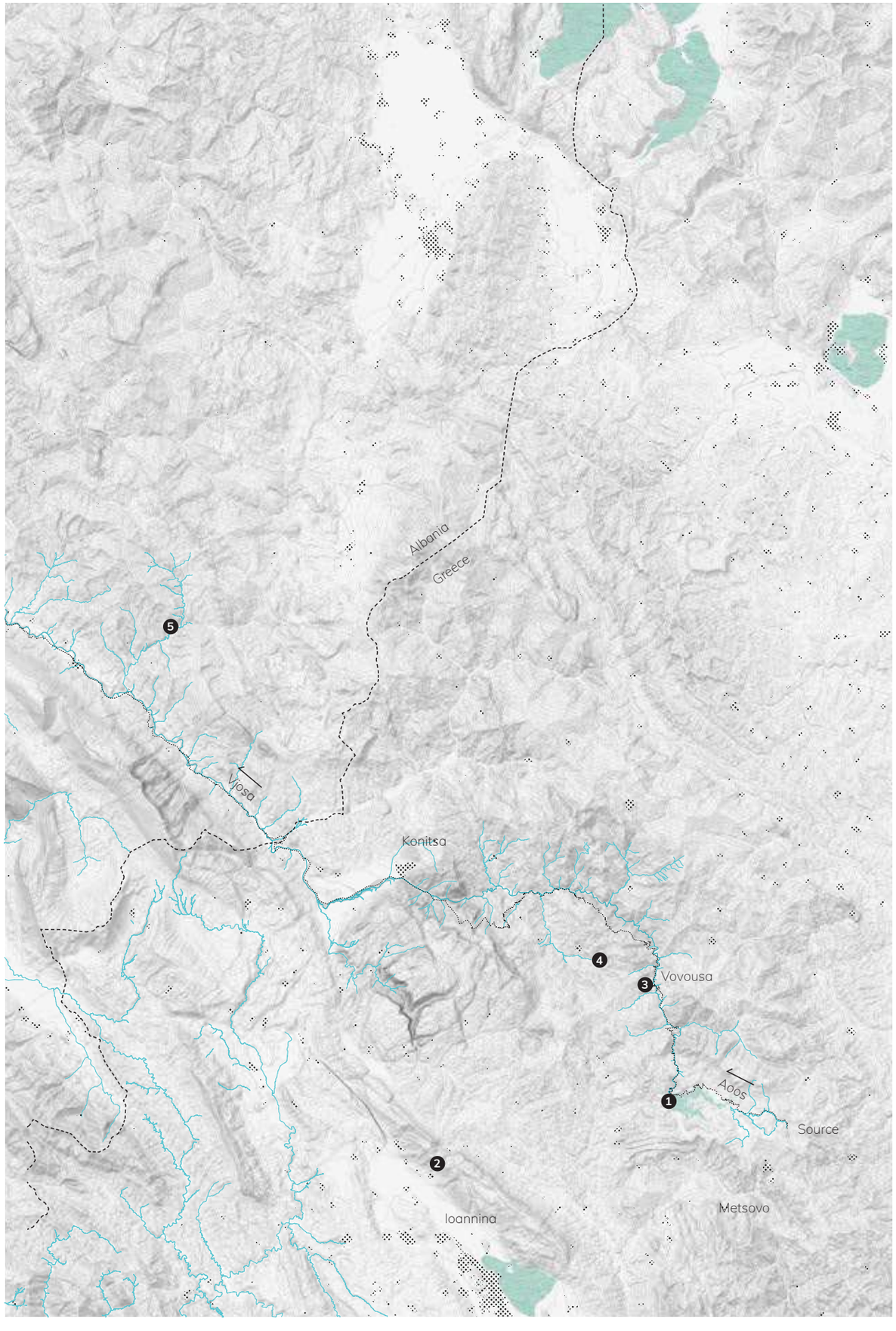
help from a local lumberjack

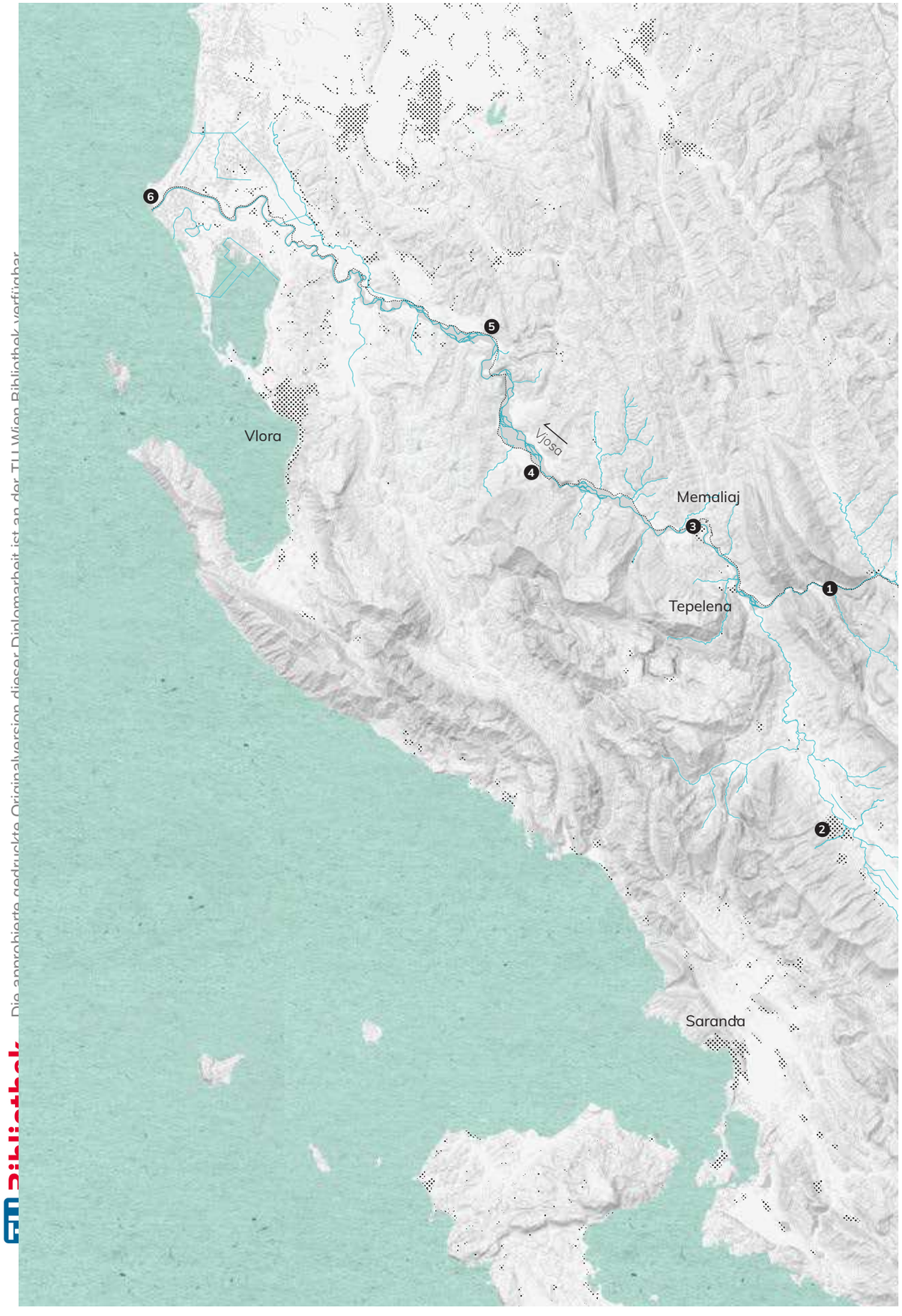
car breakdown in the mountains

exploring the canyon of the hot springs



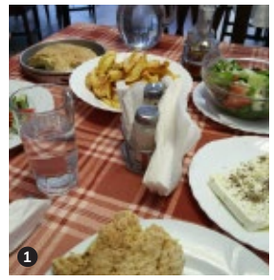
skipping stones near petran





Trip I

Travel impressions


1
Albanian hospitality


1
fly fishing at the river

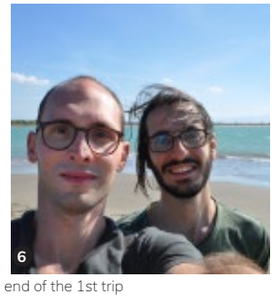

3
the factory at Memaliaj


2
visiting Gjirokastra


5
meeting Johny at his shack


4
visiting the dam at Kalivac


6
river meeting the Adriatic Sea


6
end of the 1st trip

Trip II

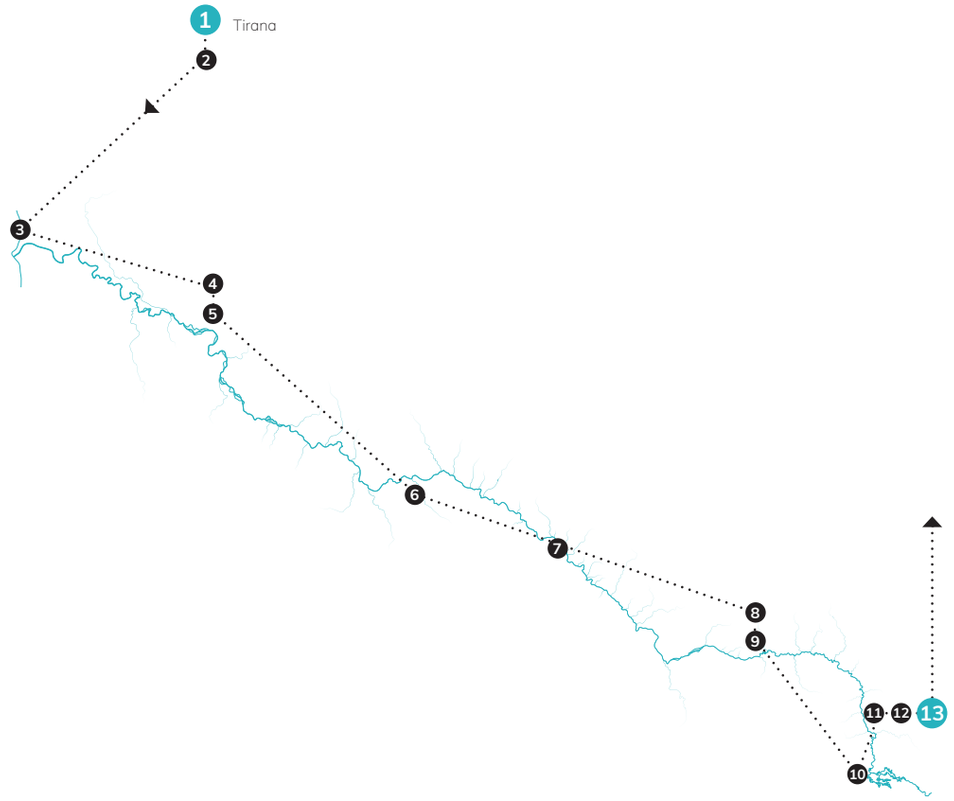
A personal travel diary

Our second visit was in July. Tourist season was fully under way, with many locals taking advantage of school holidays and visiting their own country. After a visit to the Department of Urban Planning at the Polis University in Tirana, the first stop was in the Vjosa delta. Approaching the river mouth from a different direction, we were able to talk to the fishermen of the Vjosa, who used a technique of lowering huge nets with a pulley system powered by old tractor engines into the river to catch fish. Ending up with a bag of fish, we cooked the fish over our campfire by the river for dinner before being forced to retreat into our car by the howling of roaming dogs. Further upstream, we had to politely refuse the advances of a fruit merchant who persistently tried to sell us ancient works of art found in the local Illyrian and Greek ruins and continued on with our figs. At Aragosta Muzik, we were surprised to find Gjoni in the middle of giving orders to a building crew he hired to build the toilets for his camping. We finished the day with dinner and polyphonic singing with a group of men who regularly met at Aragosta to practice their singing and fell into our hammocks right on the shores of the river. Visiting Kalivac to document a possible building site we spent the day by the river with an Albanian family, swimming in the fast currents and exchanging our stories in a mix of broken Greek, German and English.

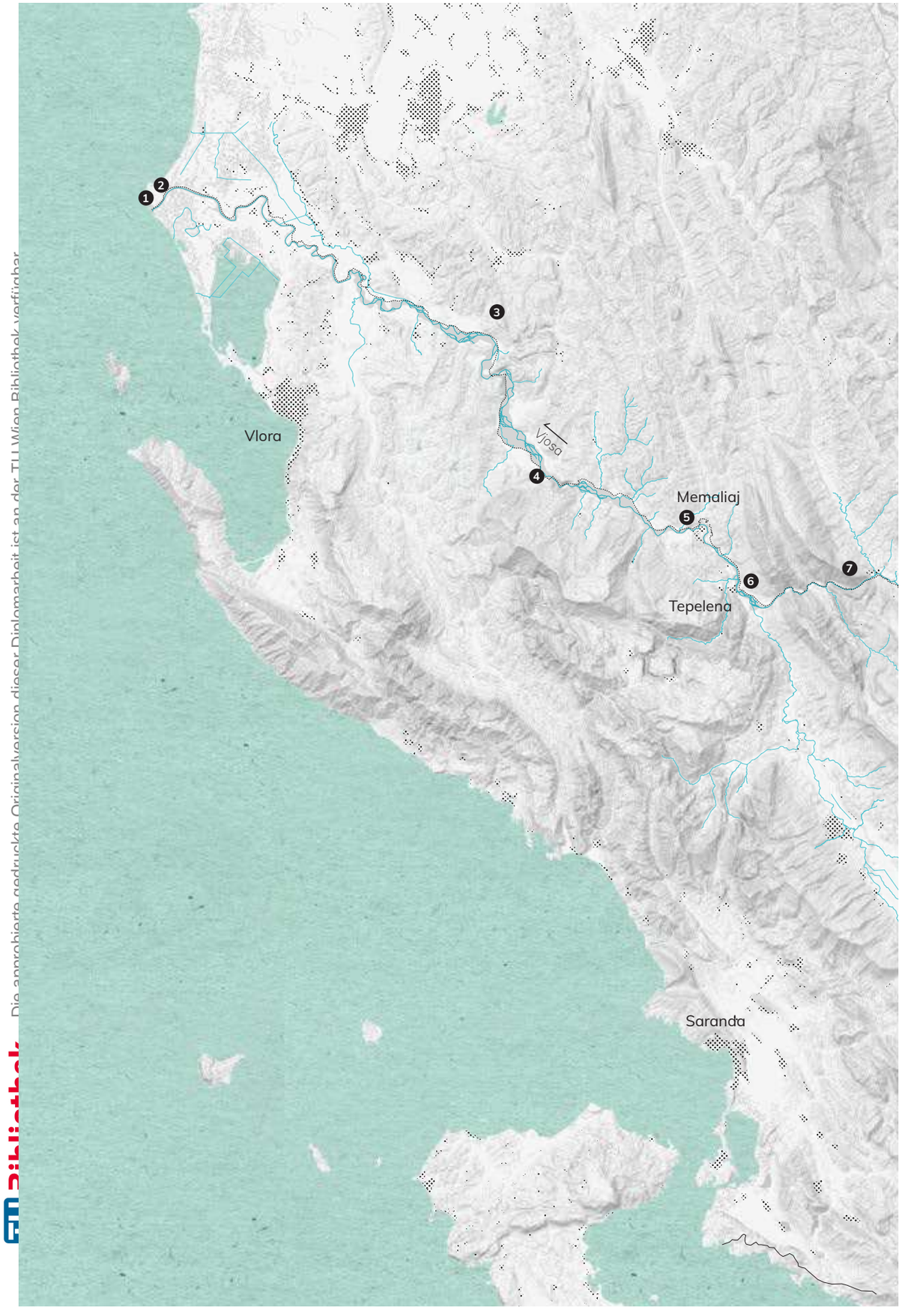
WContinuing upstream, we spontaneously decided to try out rafting, spending the late afternoon with two tourists from Sweden in a tight rubber boat. After the trip we were taken back to the camping that offered the water sport activities, only to find out that the owners, Donna and Robert were actively involved in the protection of the Vjosa and offered their support for our project.

After crossing the border to Greece, we tried to explore the more wild and inaccessible parts of the Aoos on foot. Our first stop was close to Vrysoxori, where we started our hike up an infrequently used hiking trail towards Tymfi mountain. Six hours later we were reminded of the fact that mountain weather is really unpredictable and had some time to think on it while holding onto our tent poles during a thunderstorm. Abolishing our plans to stay for the night above 2000 meter altitude we returned to the car to wait out one of the worst thunderstorms in the past decade in the relative safety of our van. With the weather drastically changed, we spent the next day in Vovousa, where the Vovousa festival was in full motion. Experiencing the festival first hand, we were astounded by what a small group of artists can achieve. During a photo exhibition we met and extensively talked with an American photographer who had published a collection of photos of the Vjosa as his contribution to save the last free-flowing river.

The last location on our list was the river source. Stumbling through the underbrush close to Metsovo, we were reminded of the fact that the source of a river is not easily found and GPS coordinates found in the internet can be highly inaccurate. After finally finding the little trickle and following it for a little while, we only barely escaped the charge of four shepherd's dogs with the help of loud curses from their Albanian shepherd.
With a lot of life lessons learned and hundreds of new experiences, we returned home with new inspiration for our project.



Arriving from Tirana we decided to start in the river delta and follow the watershed upstream, finishing the trip at the Vovousa Festival in Greece

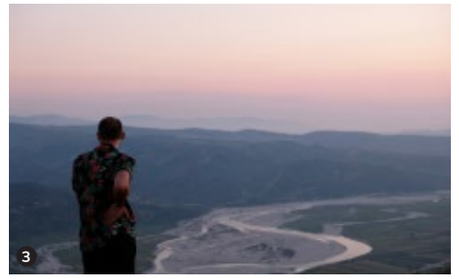


Trip II

Travel impressions

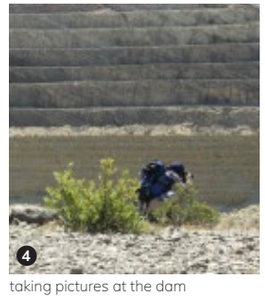
hiking in the delta

camping close to the river mouth



view from Byllis

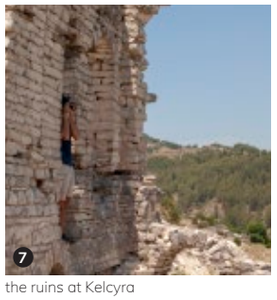
making camp close to Byllis



taking pictures at the dam

talking to Memaliaj residents

arriving late at Tepelena



the ruins at Kelcyra

Trip II

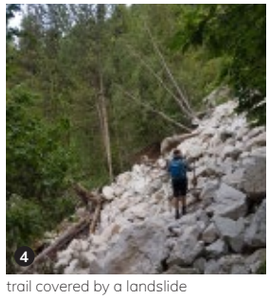
Travel impressions

floating in the river

rafting on the Vjosa

homebase in the mountains

confluence at the border

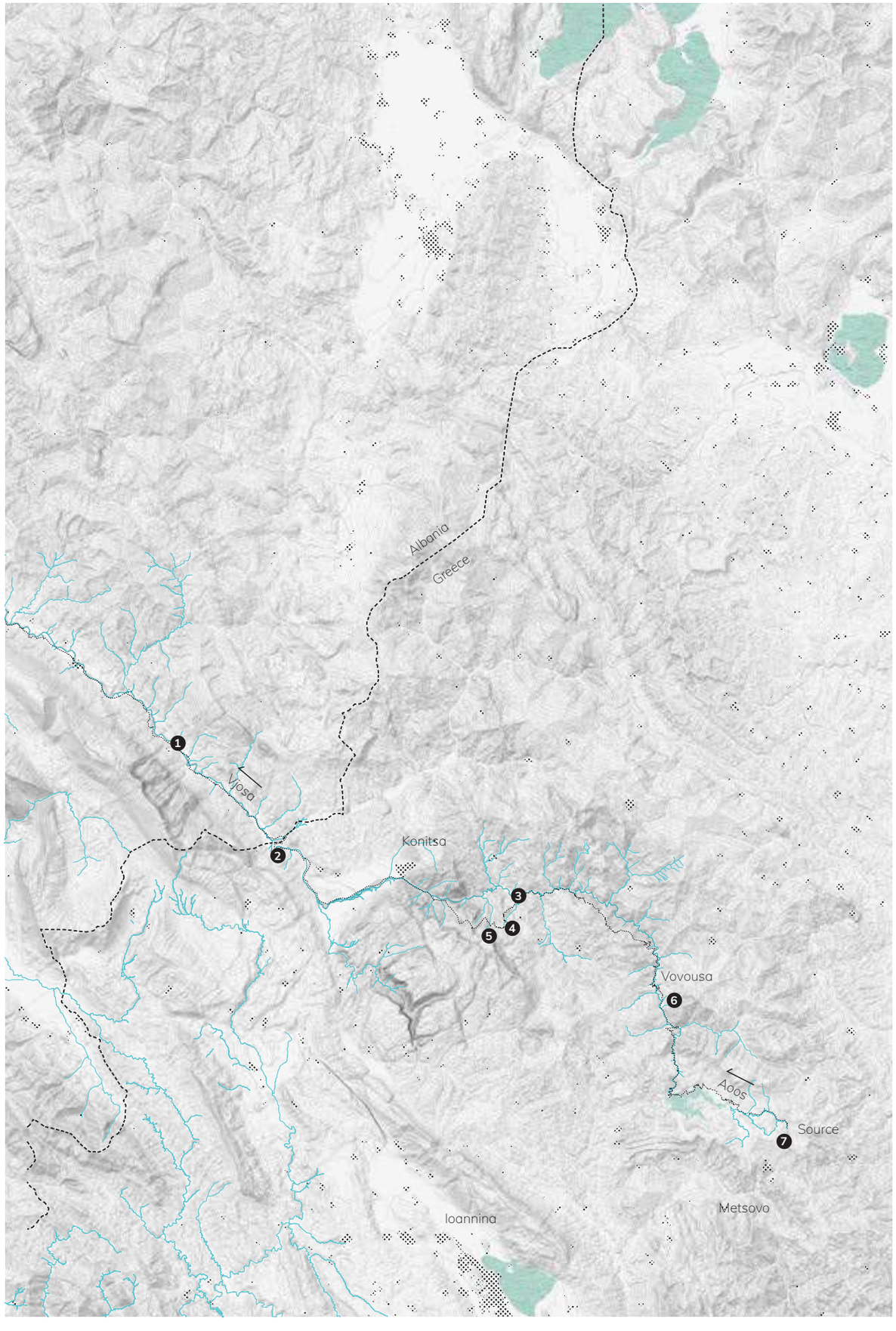


trail covered by a landslide

hiking after a thunderstorm at mount Tymfi

taking pictures in Vovousa

collecting water at the source



References

I. INTRODUCTION

Balkan River Defence (2019). 'The Undamaged Documentary'. Retrieved December 16, 2019, from: https://balkanriverdefence.org/news/the-undamaged-documentary-now-available-online/

Becatoros E. and Flesher J. (2019). 'One of Europe's last untamed rivers is threatened by dams' Retrieved December 16, 2019, from: https://apnews.com/f20445a5602c4793b722f9a015825b7a

Coates P. (2013). 'A story of six rivers: History, Culture and Ecology'. Reaktion Books Ltd., London.

Encyclopedia Britannica vol.26 (2007). 'River'.

Gore J.A. and Petts G.E. (2018). 'Alternatives in Regulated River Management'. CRC Press, Boca Raton.

Mauch C. and Zeller T. (ed. 2008). 'Rivers in History: Perspectives on Waterways in Europe and North America'. University of Pittsburgh Press, United States of America.

McCully P. (2001). 'Silenced Rivers: The Ecology and Politics of Large Dams'. Zed Books, New York.

Petts G.E. (1999). 'River Regulation'. In: Alexander, D.E. 'Encyclopedia of Environmental Science'. Chapman and Hall, London.

Riverwatch – (2019). 'Campaign'. Retrieved December 11, 2019, from: https://www.balkanrivers.net/en/campaign

Riverwatch (2019). 'Vjosa River'. Retrieved December 16, 2019, from: https://balkanrivers.net/en/key-areas/vjosa-river

Schiemer F. (2017). 'Save the Blue Heart of Europe: Scientists for Vjosa'. Retrieved December 16, 2019, from: https://www.patagonia.com/blog/2017/09/save-the-blue-heart-of-europe-scientists-for-vjosa/

Wittfogel K. A. (1956). 'The hydraulic civilizations'. In: Thomas, W. L. (ed.). 'Man's Role in Changing the Face of the Earth'. Chicago, Ill.: University of Chicago Press, Chicago.

II. WATER

Hammond N. (1992). 'The Relations of Illyrian Albania with the Greeks and the Romans'. In: Winnifrith T. (eds) Perspectives on Albania. Warwick Studies in the European Humanities. Palgrave Macmillan, London

Lambridis I. (1870). 'Ζαγοριακά'. Τυπογραφείον Αυγής, Athens.

Leontaritis A.D.1 and Baltas E (2014). 'Hydrological analysis and investigation of the Aoos (Vjose) – Voidomatis hydrosystem'. Greece.

Malte-Brun, C. (1827). 'Universal Geography - volume IV'. A. Finley, Philadelphia.

Pokorny J. (1959). 'Indogermanisches etymologisches Wörterbuch'. A.Francke, Bern.

Rössler N., Egger G., Drescher A. (2018). 'Fluvial processes and changes in the floodplain vegetation of the Vjosa river'. Acta ZooBot, Austria.

Schwarz U. (2009). 'Rapid Assessment of proposed Hydropower Plants on Drin River'. FLUVIUS, Vienna

Vickers M. (2005). 'The Albanians: A modern History'. Bloomsbury Academic, London.

Wikipedia (n.d.). 'Drin River'. In: Wikipedia: The Free Encyclopedia. Retrieved December 11, 2019, from: https://en.wikipedia.org/wiki/Drin_River

III. LAND

Ahmedaja A. and Haid G. (2008). 'European Voices: Multipart singing in the Balkans and the Mediterranian.'. Böhlau Verlag Ges.m.b.H. und Co. KG, Vienna.

Bowden W. (2003). 'Epirus Vetus: the archaeology of a late antique province'. Duckworth, London.

Elsie R. and Destani B. (ed. 2013). 'The Cham Albanians of Greece: A documentary History'. I.B. Tauris & Co. Ltd., London.

Instat (2014). 'Migration in Albania'. Report Retrieved December 11, 2019, from: https://unstats.un.org/unsd/demographic/sources/census/wphc/Albania/04-analysis.pdf

Isto R. (2019). 'Rebirth and Absence'. Retrieved December 11, 2019, from: https://debatikcenter.net/texts/rebirth_and_absence

Kavas (n.d.). 'Destination Epirus', Retrieved December 11, 2019, from: https://www.kavas.com/blog/epirus

Knight D. (2015). 'History, Time and Economic Crisis in Central Greece'. Palgrave Macmillan, New York.

King C. (2018). 'Lament from Epirus: an odyssey into Europe's oldest surviving folk music'. W.W.Norton & Company, New York.

National Technical University of Athens (2019). 'Περιγραφή Τοπικού Δομικού Συστήματος'. Retrieved December 11, 2019, from: http://5a.arch.ntua.gr/project/17064/18138

Naturally Zagori (2013). 'Traditionally with Stones'. Retrieved December 11, 2019, from: https://naturallyzagori.gr/traditional-stone-houses-bridges/

Oculus News (2017). 'How are Albanians scattered in foreign countries? 40% live abroad'. Retrieved December 11, 2019, from: https://www.ocnal.com/2018/03/how-are-albanians-scattered-in-foreign.html
Papadimitriou D. and Gibson J.H. (2008) 'Benefits Sought and Realized by Active Mountain Sport Tourists in Epirus, Greece: Pre and Post-Trip Analysis'. In: Journal of Sport & Tourism, Vol.13.

Potts J. (2010). 'The Ionian Islands and Epirus: A cultural history'. Signal Books Limited, Oxford.

Riverwatch – (n.d.). 'Europe's Unknown Wild Jewel'. Retrieved December 11, 2019, from: https://www.balkanrivers.net/en/key-areas/vjosa-river

Sorotou A., Katsaros A., Dedej Z., Christou V., Capullari M., Elton I. (2014) 'The Vjosa / Aoos River Ecomuseum: talking about our place'. Mediterranian Institute for Nature and Anthropos, Athens.

Stefa E. and Mydyti G. (2012). 'Concrete Mushrooms'. dpr-barcelona, Barcelona.

Tuppen H. (2019). 'Greece's Zagori Region'. Retrieved December 11, 2019, from: https://adventure.com/greece-zagori-region-mountain-wonderland/

Wulfenia (2007). 'The genus Pinguicula (Lentibulariaceae) in Albania – a critical review'. In: Wulfenia 2007.

IV. DEFINING THE REGION

Baunetzwissen (n.d.). 'Stampfbeton'. Retrieved December 11, 2019, from: https://www.baunetzwissen.de/beton/fachwissen/betonarten/stampfbeton-1070141

Bögl M. and Gierer A. (2012). 'Betonfertigteile im Hochbau'. In: '6 Vorfertigung'. Detail (52. Serie).

Hall J.D. (ed. 2010), The American Institute of Architects. 'Architectural Graphic Standards for Residential Construction'. John Wiley & Sons Inc., New Jersey.

Hudson J.A. and Cosgrove J.W. (2019). 'Understanding Building Stones and Stone Building'. Taylor & Francis Group, London.

Reeves R.M., Sims I. and Cripps J.C. (ed. 2006). 'Clay Materials Used in Construction'. The Geological Society, London

Schmidt (2003). 'Ultra-hochfester Beton: Planung und Bau der ersten Brücke mit HUPC in Europa'.
kassel university press, Kassel.

V. THE JOURNEY

Del Bene D. (2017). 'Poçem hydropower dam stopped, Albania'. Retrieved December 11, 2019, from: https://ejatlas.org/conflict/pocem-hydropower-dam-albania

Elena T. (2019). 'Tsepelovo'. National Technical University of Athens. Retrieved December 11, 2019, from: http://5a.arch.ntua.gr/

Food and Agriculture Organization of the United Nations (2015) 'FAO Country Planning Framework in the Republic of Albania 2015-2017'.

Gjermeni E. (2017). 'SHQIPERIA 2030: General National Spatial Plan', Shtypshkronja PEGI, Tirana.

Nollas K. (2015). 'Vovousa Mountain Festival'. Retrieved December 11, 2019, from: https://www.indiegogo.com/projects/vovousa-mountain-festival#/

Pavlaki D. (2017). 'FESTIVAL: Vovousa Festival – It's time to take the Greek mountains personally!'. Retrieved December 11, 2019, from: http://epitome.xyz/join/vovousa-festival-its-time-to-take-the-greek-mountains-personally/

Riverwatch (2019). 'Vjosa Science Expedition'. Retrieved December 11, 2019, from: https://balkanrivers.net/en/content/vjosa-science-expedition

Skreli E., Halbrendt C.C. and Balliu A. (2008). 'Competitiveness of Albanian agriculture: Value chain analysis'.

Sutton B.S. (ed. 2000). 'Contingent Countryside: Settlement, Economy, and Land Use in the Southern Argolid since 1700'. Stanford University Press, Stanford.

Tsombos P. (2009). 'Vikos-Aoos and Surrounding Area'. Retrieved December 11, 2019, from: https://hm46700.fr/Publications/Cpt-Rendus-Vikos-Aoos/VikosGeopark.pdf

UNESCO (2014). 'Zagorochoria – North Pindos National Park'. Retrieved December 11, 2019, from: https://whc.unesco.org/fr/listesindicatives/5868/

Weigand G. (reprint 2014). 'Die Aromunen – Erster Band: Über das Volk der sogenannten Makedo-Romanen oder Zinzaren'. Fachbuchverlag-Dresden, Dresden.

Wilson L. (2015). 'The High Mountains of Crete'. KHL Printing, Singapore.

VI. CONCLUSION

Gjermeni E. (2017). 'SHQIPERIA 2030: General National Spatial Plan', Shtypshkronja PEGI, Tirana.

Jeska A. (2018). 'Tourism in the Balkans: Welcome to the world.' Retrieved December 11, 2019, from: https://akzente.giz.de/en/artikel/welcoming-world

Riverwatch (2019). 'A vision for the Vjosa: Europe's first Wild River National Park'. Retrieved December 11, 2019, from: https://balkanrivers.net/en/news/vision-vjosa-europe%E2%80%99s-1st-wild-river-national-park

Riverwatch and EuroNatur (2017). 'European Parliament demands National Park for Vjosa and stop to hydropower projects'. Retrieved December 11, 2019, from: https://balkanrivers.net/en/news/european-parliament-demands-national-park-vjosa-and-stop-hydropower-projects

Photo Credits

All photos and illustrations not mentioned in this credit section were created by the authors Basilis Neururer and Vlad Popa.

Photos by K. Viktor Vahdat: p.36 'Gorge Opening'. p.37 'Gorge'. p.37 'Valley', p.116, p.127, p.146, p.185, p.234

Satellite images: p.150, p.200, p.201 © Google Maps.
Created using QGIS Geographic Information System by Open Source Geospacial Foundation Project.

p.13 'Map of Europe's rivers'. Graphic by unknown author. © vladgrinch. Retrieved December 11, 2019, from: https://www.mapmania.org/map/73254/europe_map_drawn_by_rivers

p.15 'Übersichtskarte Wiener Donaukanal'. Drawing by Rauchmüller von Ehrensteiner (1931). Retrieved December 11, 2019, from: http://www.freudenauer-kulturverein.at/images/historisch/vor1900/karte_rauchmueller2.jpg

p.17 'Vjosa, no dams!'. Photo by Oblak Aljaz (2016). Retrieved December 11, 2019, from: https://riverwatch.eu/de/general/news/internationaler-protest-gegen-zerst%C3%B6rung-von-europas-letztem-wildfluss

p.23 'A gorge on the Vjosa River'. Painting by Edward Lear (1848). Retrieved December 11, 2019, from: http://www.albanianart.net/painting/lear/lear037.htm

p.42 'Vjosa in spring'. Photo by Paul Meulenbroeck.

p.43 'Vjosa in summer'. Photo by Paul Meulenbroeck.

p.49 'Northern Epirus declaring its autonomy'. Photo by unknown author (1914). Source: National and historical museum in the Old Parliament House, Athens. Retrieved December 11, 2019, from: https://en.wikipedia.org/wiki/File:AutonomyDeclaration1914.jpg

p.49 'WWII: troops on the slopes of Pindos'. Photo published in LIFE magazine front cover. Retrieved December 11, 2019, from: https://greece.greekreporter.com/2013/10/27/oxi-day-iconic-images-of-greece-in-wwii/

p.49 'Regime of Enver Hoxha'. Photo by unknown author. © Ghetty Images. Retrieved December 11, 2019, from: https://www.spectator.co.uk/2015/05/the-museum-which-once-displayed-enver-hoxhas-pyjamas-now-houses-a-pro-democracy-radio-station/

p.49 'Border conflict today'. Photo by unknown author (2019). Retrieved December 11, 2019, from: https://www.newsbomb.gr/kosmos/story/267276/polemiko-klima-metaxy-ellinon-alvanon-stin-periohi-ag-saranton

p.55 'Mountain Scene Epirus'. Engraving by unknown author (1890). © Alamy Stock Photo. Retrieved December 11, 2019, from: https://www.alamy.com/mountain-scene-in-epirus-1890-creator-unknown-image259688653.html

p.57 'Epirus through the lense of Margaret Hasluck'. Margaret Hasluck (1920), collection of photos. Retrieved December 11, 2019, from: https://www.lifo.gr/articles/photography_articles/260562/ta-xoria-tis-ipeiroy-ti-dekaetia-toy-1920-mesa-apo-ton-fako-tis-margaret-hasluck

p.59 'The City of Tepelena'. Edward Lear (1848). Retrieved December 11, 2019, from: http://www.albanianart.net/painting/lear/lear038.htm

p.61 'Southern Albania through the eyes of Edward Lear'. Edward Lear (1848), collection of photos. Retrieved December 11, 2019, from: http://www.albanianart.net/painting/lear/

p.67 'Bridge in Konitsa'. Photo by George Plakidis (2018). https://www.flickr.com/photos/georgeplakides/45063150934/

p.67 'Vikos gorge'. Retrieved December 11, 2019, from: http://www.greece-is.com/5-reasons-papigo-zagori-springtime-mountain-paradise/

p.67 'Saranda'. Retrieved December 11, 2019, from: http://m.msckreuzfahrten.at/Images/Assets/MSC16007878_Sarande_640x380_46151_701_600-724.jpg

p.67 'Gjirokaster'. Photo by Alice D. Retrieved December 11, 2019, from: https://www.bigstockphoto.com/de/image-200343292/stock-photo-gjirokastra-castle-albania-travel-tip-europe

p.105 'Mountain trail'. Photo by Ivalgaerts (flickruser). Retrieved December 17, 2019, from: https://www.flickr.com/photos/7871400@N03/44275447525

p.147 'Olive tree map Albania'. Graphic by USAID (2011). Adapted by authors. Retrieved December 11, 2019, from: https://www.semanticscholar.org/paper/Olive-Oil-Sector-in-Albania-and-Its-Perspective-Kapaj-Kapaj/88daf15b0fa12ef8a1c40560db428a1035e2b75a

p.189 'Kalivac Dam drone footage'. © Google Earth

p.189 'Dam 2005 and 2018'. © Google Earth

p.197 'Vjosa science expedition'. Photos by Thuile-Bistareli, Singer, Vitecek (2018). Retrieved December 11, 2019, from: https://balkanrivers.net/en/content/vjosa-science-expedition

p.242 'Aragosta Muzik 2011 and 2013'. © Google Earth

Architectural References

The Factory

'Ricola Kräuterzentrum'. Herzog & de Meuron (2014). Laufen, Switzerland.

The Field Lab

'Industrial building in Don Benito'. José María Sánchez García (2006). Don Benit, Spain.

'MuCEM'. Rudi Ricciotti (2013). Marseille, France.

'C.I.D (center of interpretation of the desert)'. Emilio Marín + Juan Carlos López (2015). Antofagasta, Chile.

The Kiosk

'Toilettenhäuschen II'. Berschneider + Berschneider (2012). Lauterhofen, Germany.

'Kiosk at lake Staufensee'. Wellmann Ladinger (2005). Dornbirn, Austria.

'Boathouse'. TYIN tegnestue (2011). More og Romsdal, Norway.

THANK YOU

I would like to thank everyone who
helped me along this journey.

My mentor
Tina Gregoric

My jurors
Helmut Schramm
Andreas Hofer

My family
Elena, Alois, Michalis, Nepheli, Roisin,
Saibh, Fionn

Joana, Didier, Georg, Diana, Andreea,
Paul, Viktor, Ergys, Ioannis, Ledio, Rob-
ert, Donna, Joni

Vlad ... for staying sane.

Marlies ... for keeping me sane.