

REDEVELOPMENT LANDSCAPE OF TO LICH RIVER

Design a restoration and renovation plan to To
Lich river - Vietnam

REDEVELOPMENT LANDSCAPE OF TO LICH RIVER

Design a restoration and renovation plan to To
Lich river - Vietnam



**POLITECNICO
DI TORINO**

Politecnico di Torino
Master of science program in Architecture Construction City
Academic Year 2020/2021

Supervisor: Prof. Arch. Ingaramo Roberta

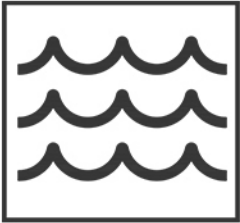

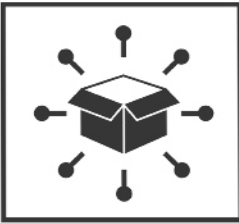



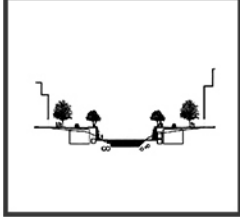

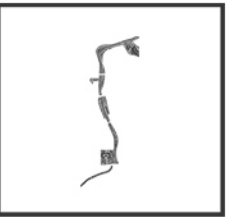
Student: Dao Ngoc Tuan s251213

ACKNOWLEDGE

First and foremost, I want to thank my parents. They gave advice and navigated my way through this life. None of this would be possible, without them. I wish to extend my special thanks to my primary supervisor, Prof. Ingaramo Roberta, who guided me throughout this thesis. I would not have been able to complete this thesis without her precious advice and indication. I also want to thank my girlfriend -Luong Hoang Phuong Thao. Thank you for always being with me, providing hope and encouragement to me during my moments of despair. Once again, a heartfelt thanks to the professors who taught and instructed me through studying at Politecnico over the past time. Thank you to the friends I have been fortunate enough to meet and work with. And the last thing, I want to thank Italy. This beautiful country has given me so many things. When I look back, I find no matter what I have experienced, all experiences become precious when I cherish my life and strive to make each day worthwhile.

TABLE OF CONTENT

ABTRACT

<div>10</div> <div>INTRODUCTION</div> <div></div>	<div>14</div> <div>LITERATURE REVIEW</div> <div></div>	<div>16</div> <div>METHOD APPROACH</div> <div></div>
<div>18</div> <div>THE CITY WATER SYSTEM IN HANOI</div> <div></div>	<div>20</div> <div>TO LICH RIVER</div> <div></div>	<div>38</div> <div>POLLUTION DUE TO URBANIZATION</div> <div></div>
<div>46</div> <div>CASE STUDIES</div> <div></div>	<div>64</div> <div>TO LICH RIVER POTENTIALS</div> <div></div>	<div>74</div> <div>TO LICH ENVIRONMENTAL RESTORATION</div> <div></div>

REFERENCES

ABSTRACT

The water system plays an important role in the landscape in Hanoi metropolitan area. In particular, the To Lich River plays the most important role, it used to be an important river with historical spiritual significance and used to bring the functions of traffic and agricultural irrigation to the city. However, under the impact of urbanization over the years, the river becomes polluted and no longer useful. Over 500 years of mutual human interaction, the river became an outdoor drainage sewer. It has been neglected and buried in people's minds.

Research project on the To Lich River to explore the potential of To Lich River and devise strategies to develop and create a variety of public spaces around the river. Initially, the project focuses on analyzing the general importance of rivers to their urban area in general and To Lich river for Hanoi city in particular. Based on literature reviews, To Lich River and learn of the spiritual historical values that the river carries through the history of the city. In addition, analyze the negative consequences and impacts of the city's urbanization on the river. Finally, based on studies similar to the To Lich river case in terms of context and space, to propose plans and strategies for the improvement of To Lich River, creating a river park that can not only solve the problem of flooding but also Create a new landscape in the city. Delivering the inherent value of the river to the city, it is the environmental condition that the river brings to its people.

INTRODUCTION

The river is the cradle of civilizations. it is an indispensable factor in the history of human development in general and in urban history in particular. The river is present in almost every stage of the human journey. thus. rivers were always transformed to meet various human demands. it was a source of transportation and power over which make city was born.

History has shown that rivers have a multifaceted relationship with urban planning and design. They are one of the main factors that directly affect the development of the city and urban areas. Pierre Donnadieu (2002) describes that that the watercourse in urban environment. of natural or artificial origin and urban rivers have been the source of wealth and development of cities in his book "Words of Landscape and Garden" (Pierre Donnadieu. 2002). Jean Bethemont (1993). in his book "Society at the Mirror of the River". emphasizes that the attachment of man to water has at final well evolved over the centuries. At each stage. rivers are like mirrors reflecting the society in which it resides. They carry the imprint of that society in the flow of time (Jean Bethemont. 1993). While the city is expanding. the urban rivers remain there and not change. It's become a historical carrier of the city soul. The soul reflects the identity and history of the territory through the ecological environment and human activities surround it. our ancestors. it is in our instinct. This proves that rivers in particular and water spaces in general are indispensable factors for human life.

The river also increases the aesthetic beauty of the city. making it more romantic and give a distinct identity. like Turin with Po River. Paris with Seine... And the most special thing on all the natural functions that the river brings to the urban components of the city such as public space. open space. natural ecological stabilizer of the surrounding environment is that being alone with the presence of water in the landscape gives people a lot of positive relaxing emotions. Through human development. through literary works as well as artistic paintings. we can see that the human aesthetic view of nature is always associated with the river space together with the abundance of surrounding nature. Denis Laurence Dutton (2010). an American philosopher. art critic. has introduced his perspective of beauty in his TedTalk 'A Darwinian Theory of Beauty'. Dutton chose the theory of natural selection of Charles Darwin as a reference to demonstrate that beauty is a trait passed down from our ancestors. it is in our instinct. This proves that rivers in particular and water spaces in general are indispensable factors for human life.



The Architect's Dream. 1840. Thomas Cole.
Source: en.wikipedia.org/wiki/The_Architect's_Dream



A Sunday Afternoon on the Island of La Grande Jatte. 1884. Georges Pierre Seurat. Source: en.wikipedia.org/wiki/A_Sunday_Afternoon_on_the_Island_of_La_Grande_Jatte.

River in works of art and painting is always representative of natural elements. when placed next to humans or artificial things it creates a sense of harmony. increasing poetic looks.



Shoes on the Danube Bank. 2005. Can Togay & Gyula Pauer.
Source: en.wikipedia.org/wiki/Shoes_on_the_Danube_Bank



First Generation. 2000. Chong Fah Cheong.
Source: [en.wikipedia.org/wiki/First_Generation_\(sculpture\)](https://en.wikipedia.org/wiki/First_Generation_(sculpture))

River when combined with works of art. They have a multidimensional relationship. enhancing local identity and history. Emotional inspiration and educational value.



Skyscraper (the Bruges Whale). 2018. Studio KCA.
Source: kickstarter.com/projects/studiokca/skyscraper-the-bruges-whale

In addition. the river's art works also play a fundamental role to convey and educate the community on social issues.

INTRODUCTION

However, under the impact of urbanization, as the urban population is increasing, while the land fund is limited, many rivers in the city are leveled and buried for human purposes. Other urban rivers suffered many negative influences on ecosystems as a result of the multiple and exponentially growing human activities. Their appearance and natural evolution were altered. They turned into polluted banks, they were occupied, covered & buried underground.

Over time, some urban rivers become undesirable and sink into oblivion. Besides that, In the Era of Globalization, when technology and infrastructure were improved, the role of the historical context as well as the eco-spiritual context of the river in the city seemed to become less important and forgotten. In most developing countries, all urban rivers are covered and channeled with concrete floodwalls create more distance between human life and natural elements. Recovering rivers seems to be the most recent trend in urban design and most major cities are working on this.

River recovery projects proved to be a very important tool for a complete urban renovation while stimulating the creation of functional community spaces (DQI, ATA2019). According to the UN report in 2014, more than half of the global population living in cities in particular and in urban areas in general. Under the pressure of their growing populations, cities must make changes in land use and continual improvements in their infrastructure to keep pace, which generally puts pressure on urban river systems and its ecosystem leads to imbalance. In reality when humanity is facing many crises: population explosion, exhaustion of fossil energy also like climate change. The need to design and plan cities to become more sustainable, efficient, and more resilient becomes more crucial and urgent.

River pollution is one of the most concerned environmental problems in Vietnam. This issue is shared by Vietnam with other developing countries throughout Asia, it is the consequence of economic development policies regardless of the environmental aspect.

To Lich is one of the most polluted rivers in Hanoi, it is considered an open-air sewer rather than a river, people living in Hanoi are too familiar with the saying 'As dirty as To Lich river'. In the past, when it was not polluted, it was an important position and value for the city. It was once a vibrant waterway with many passing ships connecting many communities in economic trade and transportation. It was also a source of irrigation for agriculture. To Lich is responsible for the lives of more than 3 million people. By now this river has long been so polluted that it is considered a dead river. The purpose of this thesis project is to synthesize information on rivers, consider the crucial role of urban rivers in general and To Lich river in particular for urban communities. And finally, it is proposed to establish a renovating plan for To Lich river based on the revitalization methods of other rivers.



Citarum River, Jakarta, Indonesia.
Source: en.wikipedia.org/wiki/Citarum_River



LA River, California, United States.
Source: en.wikipedia.org/wiki/Los_Angeles_River



Tiete River, Sao Paulo, Brazil.
Source: en.wikipedia.org/wiki/Tiet%C3%A9_River



Dora Riparia River, Torino, Italy.
Source: en.wikipedia.org/wiki/Dora_Riparia



To Lich River, Hanoi, Vietnam.
Source: en.wikipedia.org/wiki/T%C3%B4_L%C3%ACch_River

RIVER LITERATURE REVIEW

Urban rivers and its impact on cities and metropolitan areas are a broad topic. Therefore, a large amount of literature exists on the role a river plays in the city. Their roles are often in a multidimensional relationship with urban structural spaces. The study by Silva JB (2006) and colleagues 'Urban rivers as factors of urban integration' on the relationships between population size and urbanity of the cities and the size of the rivers that flow through them shows that River is an important factor constituting urban structure, contributing significantly in the emergence of societies.

According to Alexander Ch (1977), in his book 'A Pattern Language: Towns, Buildings, Construction', he emphasizes the crucial role of river to the city and the need for correlation between the people and the water element in the city is important and essential, the river along with the two river banks are open and spacious public spaces (Alexander Ch, 1977)

Konstantinas Jakovlevas-Mateckis (2006), a Lithuanian architect, emphasized the importance of the river in 'Problems of urban green areas and their social function' that the river from an ecological perspective is the conservation and essential ecological balance. In the city and urban areas, the water space along with the riverside green space acts as the lungs, providing a source of clean air for the city (Jakovlevas-Mateckis, 2006).

Richard Forman (1995) have similar ideas about the function of river, in his book 'Land Mosaics: the ecology of landscapes and regions', he addressed the concept of Land Mosaics to provide sustainable solutions in land use of society while protecting the natural living environment. He emphasized the importance of urban rivers in particular and rivers in general, they are the element that binds the plates of Land Mosaics. The rivers not only provide drinking water and irrigation for agriculture, they are also places for transportation, operate hydroelectric dams to generate energy. All human activities are carried out around river corridors, asserting its social role (Richard, 1995), of the urban form as well as the size of the cities (Čakarić, 2010)

In addition, according to Clément Pierre and Lancet Nathalie (2001), the role of the river also contributes to the formation of unique characteristics for their cities. They mentioned in 'Hanoi: The cycle of metamorphoses. Architectural and urban form' that these characteristics are based on the natural properties of the river and the natural environment that surrounds it and the way people utilize and interact with the river (Clément P, 2001). Moreover, according to Čakarić (2010) in 'Water phenomenon: urban morphology transformation', the river also has an impact on the artistic aspect of the urban form as well as the size of the cities (Čakarić, 2010).

Philippe Papin (2001) in his book 'History of Hanoi', mentioned that Hanoi is a city born of water, which he summarized from his historical studies of this city. (Philippe Papin, 2001) Christian Pedelahore (2010), in his article 'Hanoi and the figures of water', describes that water present everywhere in Hanoi. It is dominated by water and amphibians, surrounded by rivers and lakes. Moreover, with the average annual humidity rate frequently high and heavy rainfall all year round, he adds that Hanoi is aquatic, bathed several months a year by this veil specific. (Christian Pedelahore, 2010) Truong Quang Thao, (2001), affirms the crucial role of the river in general and ancient river in particular, that in order to give back to the city the sources of life, like the historical and cultural landmarks of the course, to save and restore for succeeding generations in the city. (Truong Quang Thao, 2001). France Mangin(1996), described Hanoi in his article 'A historical reading of the plans of Hanoi: 1873-1951'. Through his study of the urban movements in Hanoi, He determined that the first people arrived and settled in Hanoi around 10, 200 years BC, in the Neolithic period. Water was present everywhere in this space. The blue of the water harmonized with the green of the plants. The life of the fishermen and farmers inhabitants was linked to these rivers in a suitable place. The villages were then formed alongside them to promote agricultural and commerce activities. These elements created the typical images of an ancient village in the Hanoi region, described the ancient city de Hanoi was previously only a simple village on the banks of the To Lich River. (France Mangin,1996). In a book 'Geographic Domination of Dai Nam', it is a large volume of geography and history of Viet Nam, written in Chinese by an office of historians of the Nguyen era (1802 -1945) who wrote during the reign of King Tu Duc(1847-1883).

It is considered to be the most important work in relation to the geography and history of Vietnamese under the Vietnamese feudal regime. In the book, it describes the territory of ancient Thang Long is located in a territory of several rivers, lakes, ponds, streams, rice-growing areas, food crops in the dry earth. Vegetation is governed everywhere and occupies the major part of the terrestrial space of the region of Ancient Hanoi. Researcher Hoang Thieu Son (1965), determined in his article 'Manual of Natural Geography', that West lake- the biggest lake in Hanoi was actually a course of the original Red River and To Lich River was his big arm with a meandering stream. When the West Lake still belonged to the Red River, it was often flooded so much that the water came out in a big arm, this river remained a fairly wide stream, meandering. After West Lake was separated due to the rambling of the Red River. The water went down, causing the lowering of the stream in the To Lich river, almost become a dead river (Hoang Thieu Son, 1965). Tran Huy Lieu (1960), extracted the notes of the missionary Marini who was at the Citadel of Thang Long at the beginning of the XVII century, in his article 'History of the capital of Hanoi', that To Lich River surrounds Thang Long Citadel, with the shape of a wide elbow, the activities of transporting goods and commercial business are very lively. This is why the market is not only presented as a place for the exchange of goods between the local and the outside world, as the place of sale and purchase of the necessary products of life daily, but also the environment for meetings, communications, making contacts that reveal all the mores and customs, the way of life, and still a destination of visits and leisures for people, with their tastes reflecting the daily life of Hanoians around the river from To Lich.

METHOD

Study objectives

In order to understand how urbanization has affected the Tô Lich river landscape, the study aims to seek answers to questions?

1. What is the landscape of the Tô Lich river?
2. What are the fundamental values of this landscape?
3. The impacts of the current urbanization on the Tô Lich river?
4. What is the role of the Tô Lich river in the landscape and urban morphology of Hanoi in its metropolitan scale?
5. What are the plans for reviving and enhancing the functions of the Tô Lich River to the city?

From there, I will find and identify typical landscape values of Tô Lich today. It is these landscape values that will have to be promoted, revive and integrate into urban life. After that, it will be a matter to represent them and to implement this project on the planning and elevation of the urban landscape of the river, incorporating socio-cultural needs on the two banks of the river: the form of Tô Lich and heritages surrounding have spiritual, cultural and historical values. Tô Lich environment and ecology, rural agricultural space in the city, commune space Assembly, the city's space of worship and entertainment, aesthetics, local economic and commercial activities compared to river traffic and traditional crafts, etc., benefit Hà Nội City.

Methodological approach

Step 1:

- Research and collect documents and information on the theme and on the site.
- Current situation of the Tô Lich river.
- Findings of variable and invariable elements

Method: fieldwork, map, plan, diagram, section, sketch, perspective, photographs.

Step 2:

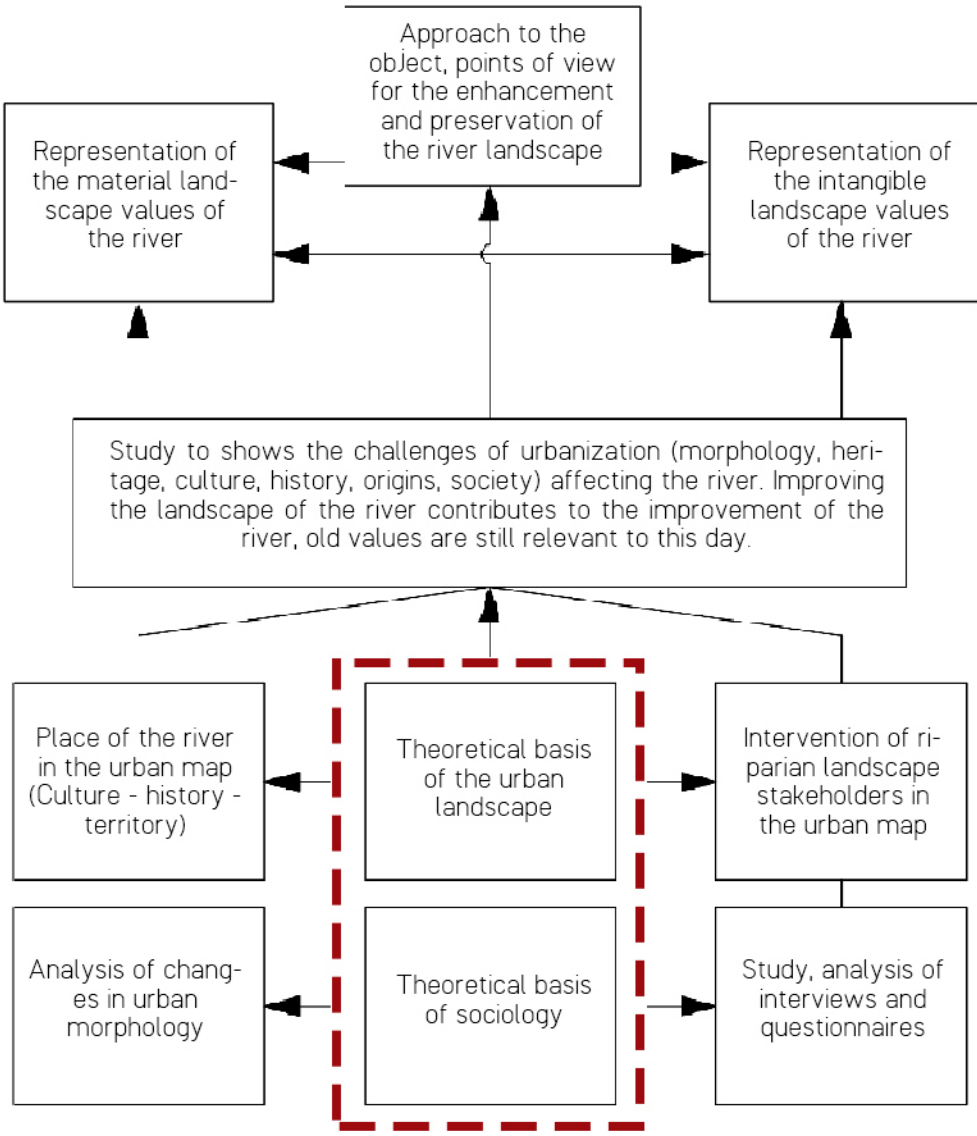
- References to theoretical bibliographic resources on the theme of the river in the city.
- Analyze, from cartography, the history of the development of Hanoi linked to the river, to raise transformations of the structure of the urban space and the Tô Lich River.
- Analyze the original sources linked to the history of the formation of the river and the heritages to find the elements
- Analyze the inventory, find the crucial points of its landscapes and its ecology to enhance the functions of the Tô Lich River.
- Study, analyze social issues in the territory of the river, stakeholders in the river landscape, show conflicts within the corresponding actors in action to find the current social reasons that have the landscape of Tô Lich River.
- Determine the study problem, the study questions.

Step 3:

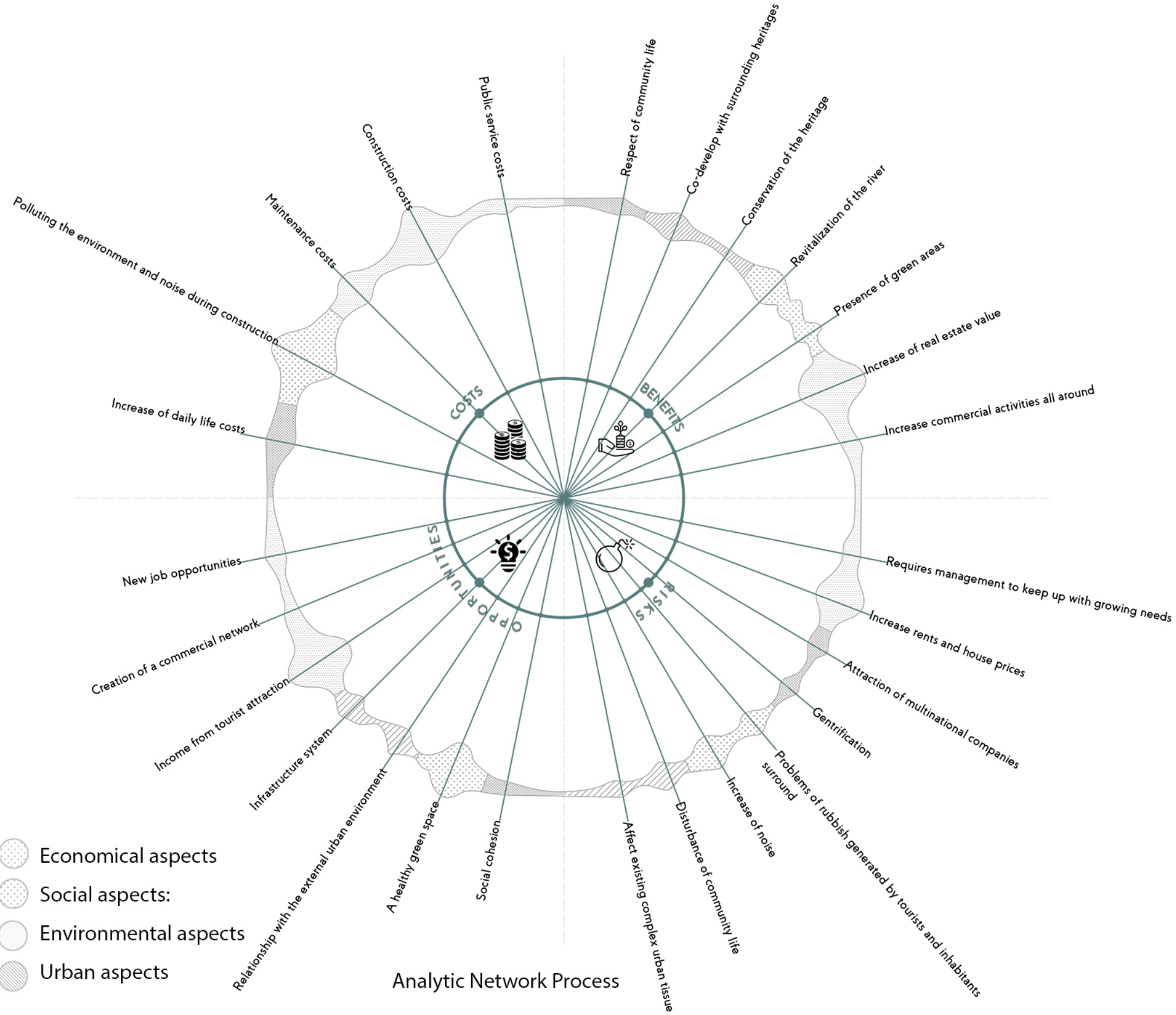
- Summary of results
- Propose plans to improve architecture and landscape for the river.

Expected results

Increase knowledge of the Tô Lich river in terms of the urban landscape (history, culture, daily activities related to the river). Understand all current issues related to morphology, heritage, ecology, and sociology of the river landscape. Highlight the landscape of the Tô Lich river, and the heritages along the river. Proposal of an urban project model, conservation, restoration, and management and implementation value of the urban landscape of the Tô Lich river. Suggest, orient view points and solutions for urban planning, conservation, restoration, and enhancement of the landscape of the Tô Lich river for the city of Hanoi.



Schematic methodological organization of research on landscape development

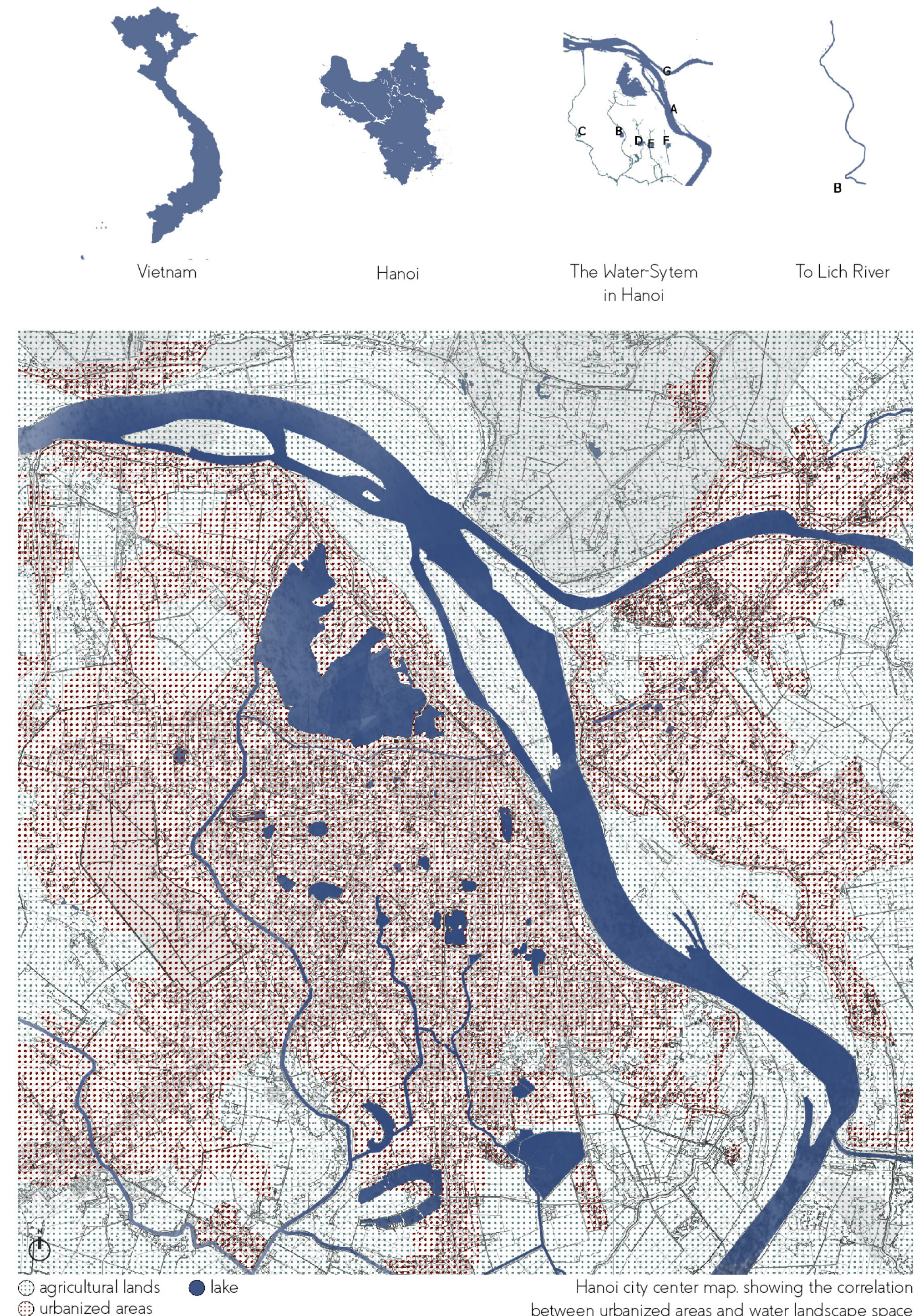


THE CITY- WATER SYSTEM IN HANOI

The territory now known as Hanoi is known to be a city born of water (Philippe Papin, 2001). Hanoi is a special city with a system of lots of natural rivers and lakes. Hanoi was found and became the capital and administrative center of Vietnam for the first time in 1010 under the name of Thăng Long. The city is first and foremost a territory favorable which was chosen for its physical, landscape and geomantic qualities, which testifies to the intimate and conflicting relationships between land and water over the long term, in a delta with unstable contours where the very course of the river has moved. The shore is tirelessly pushed back by the deposit of alluvium which today elevates the level of the course above that of the city. The hydraulic developments which were necessary for this domestication of the territory: lakes, ponds, dikes, dike routes, canals bear the traces and traces of this adventure of more than two thousand years, which set their limits and give shape to future urban outlines.

The architecture of the city in place, constructions can then succeed one another, be renewed by substitution, density, verticalize, and expansion. Researches on the city of Tran Quoc Vuong have shown that Hanoi is a city of rivers and lakes: 'the urban form of Ha Noi was the water triangle-quadrilateral' with its network of basins, arroyos, lakes, ponds etc (Tran Quoc Vuong, 1998). Water present everywhere in Hanoi. When it comes to the urban symbol of Hanoi, it immediately refers to the water (Garnier, 1995). Hanoi is bordered by the Red River and the To Lich River, to the east and west by the Great West Lake and the imposing chain of lakes of the Thanh Tri basin, in the North and in the South. With an average annual humidity rate of 80% frequently observed, Hanoi is an aquatic, bathed several months a year by this veil specific, this floating rain which gulps the air with liquid and spicy from the cold winds from China. Hanoi is an area dominated by water and species amphibious, surrounded by rivers and canals, barred by dikes, embellished by lakes and ponds like a rag of brocade maintained and watered (Christian Pedelahore De Loddis, 2010).

Thus, water is omnipresent in Hanoi, and this in the three dimensions of space. No wonder that it has shaped and still does today the collective and social imagination of this city. There are no artificial lakes in Hanoi, those that exist are of natural, organic origin, of essences topographic and geographic, even if some were later transformed, modified, redesigned. On the contrary, at all times, rivers and streams have been organizers identity, but also places of resistance to human and urban transformations.



TO LICH RIVER

The To Lich River is part of Hanoi's network of rivers, lakes, and ponds. It runs along the center of Hanoi city, connecting the four central districts of the city: Cau Giay district, Thanh Xuan district, Hoang Mai district and Thanh Tri district. The entire river line has more than 280 domestic wastewater discharges of more than 2 million people in 4 districts. In addition, industrial wastewater from factories in districts is also discharged into rivers, directly or indirectly through the municipal wastewater system. The To Lich river has an important meaning for Hanoi from past to present.

It is an ancient river in the heart of Hanoi, a place of memory and history. It is a witness, a historical element of urban development of the city to which are linked several major historical events of decisive importance in the destiny of the capital and from the country. To Lich was a natural river that has been a picturesque first-class site in the capital where locals came to admire the beautiful landscape. It was also a river circulation line of first importance connecting the old capital to the surrounding areas. Urban or landscape planning must reconcile in its approach the need for development and the peculiarity of a heritage of water, and of the architecture of the city and the landscape, by introducing specific protection requirements for these water surfaces, in order to preserve the values of landscapes by including them in a general plan for the conservation of natural heritage, as well that to give an important role to the reception of rainwater, its evacuation, and its purification.

In order to understand the changes in the landscape of To Lich river, it is good to take up the geography and Thang Long-Hanoi cultural history through the river's relationship with the capital. In the historical period of feudalism, To Lich river is, with the Red River and the network of rivers-arroyos-lakes-ponds, in the heart of the planning and construction of ancient Hanoi, from its origin to the present day (in particular the old imperial citadel of Thang Long and its villages on both banks).

The river occupied a place center of the capital Thang Long and was one of the essential factors from a geographical point of view and geomantic of the imperial city. These are the founding elements that people took into consideration the crucial elements in the establishment of the imperial citadel of Thang Long and their villages. The To Lich river and its hydrological network constitute the characteristic of landscape geography Thang Long water has always been there. The configuration of To Lich lent itself to this protective role since it formed an arc of a dozen kilometers which extended from the Red River, passing through Ha Khau (the mouth of the river) to the town of Ha Lieu, before jumping into Nhue river.



TO LICH RIVER

In the town and villages of Thang Long, you could see cultivated agricultural landscapes everywhere, where water was regulated (controlled) by lakes and canals, or rivers for agricultural cultivation. For the villages of trades approved by the king, rice was cultivated everywhere, enjoying a mastery thorough irrigation and drainage (rivers, lakes, and canals...). It was a town of merchants, with local productions and traditional crafts, products transported from the villages of Thang Long and peripheral places to the citadel. Local farmers were often merchants who traded between the villages and the citadel, along the river. It was a city with several well-known traditional trades, including tools and materials for production directly or indirectly concerns water elements, particularly To Lịch. We often saw talented traditional artists and merchants in market stalls in the citadel Thang Long; these often came from traditional craft villages. They thus transported to the citadel, the landscape image of the traditional trades of the villages (the goods are indirectly related to the image of the To Lịch river). Another important dimension not to be missed of this watercourse was established from its values main studied above to form a landscape of the river with its spaces where man could rediscover his childhood, his past; making this river a witness of history. Moreover, this landscape was a space of leisure but also it constituted a space of premonition, a space for research, and local cultural and historical contemplation. In order to understand the landscape values of the To Lịch and its landscape problems, I would like to quickly address the cultural and historical eras, characterized by spaces important landscapes, environmental morphological evolutions of the landscape, and roles of individuals from the Thang Long rivers:



To Lịch River, Hanoi, Vietnam



To Lich River in feudal times, period 1428-1527

In this period, To Lich River represents a central and constitutive element in the formation of the city and the villages. It intervenes in the urban composition and contributes to the formation of social spaces, spaces of beliefs, and leisure along the river as well as on its two banks. The river embraces the imperial citadel in the North and North-West. It has a military value by playing the role of a natural wall in the face of external attacks. To Lich was a source of safe water for several villages formerly settled along its banks. The water from the river nourished its residents and their agricultural crops. It also used for different jobs of traditional crafts, and for fishing and breeding aquatic. Moreover, The river was a main traffic lane for boats between the old city and the villages. It was an important place where took many activities trade and economic and social exchange. Concerning the environment, the river and its agricultural space in the city were considered to be an ecological space and as a place of water drainage for the imperial city during the season floods. Place of relaxation preferred by the inhabitants, it was also considered as an important element for maintain the balance of the hydraulic system.

To Lich River in colonial times, period 1858-1954

In the XIX century, with the occupation of the citadel imperial under French colonization, the section of the To Lich crossing the old citadel disappears upstream at the Rice Market in the Buoi district (the part crossing the old quarter). The French had also backfilled the confluence of To Lich River and Red River around the years 1885-1886. From now on, the river is abandoned and falls into oblivion. The To Lich is more often presented as a large open sewer because of the bad behavior and habits of locals. The river no longer plays an important role in the life of local populations.

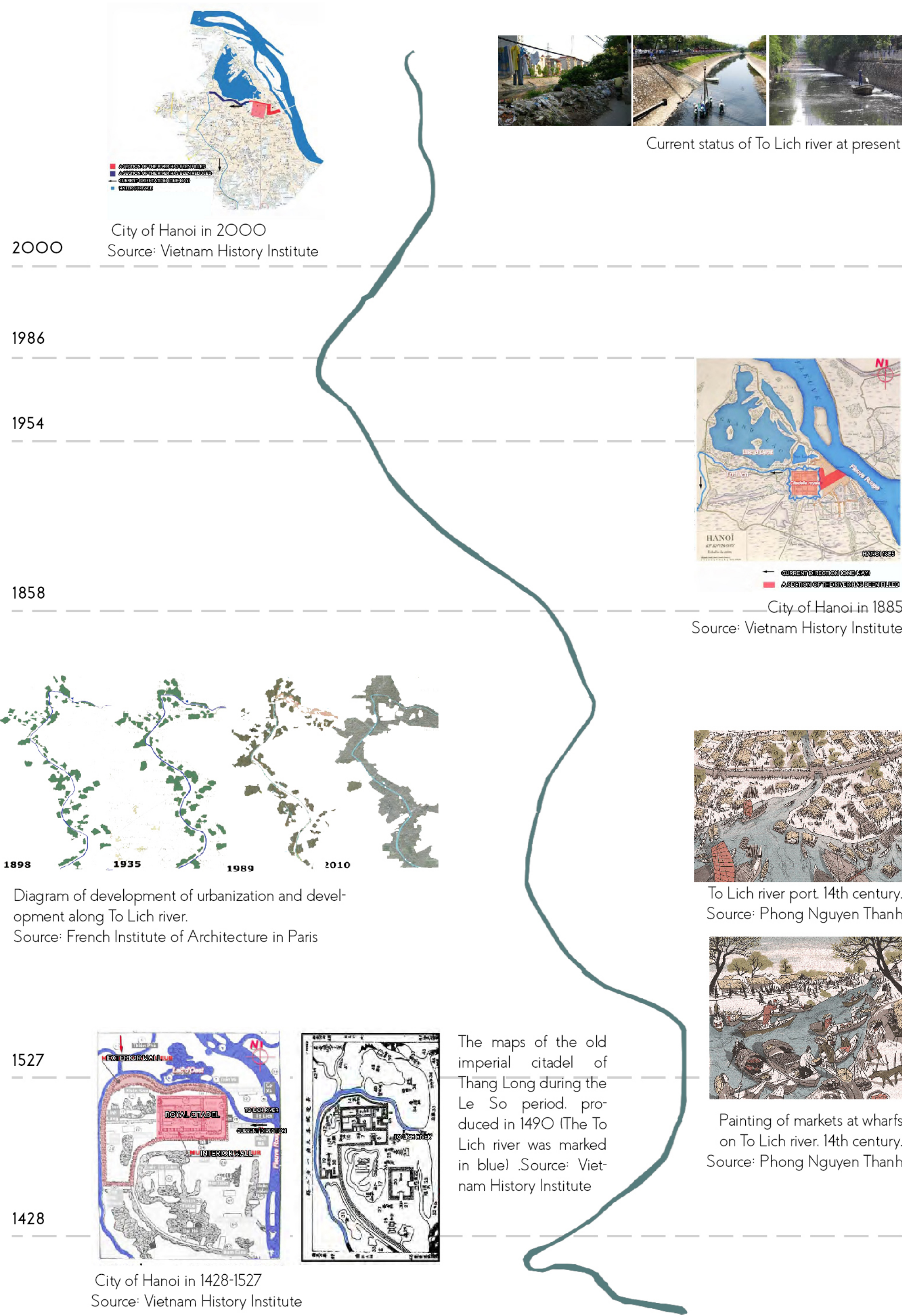
To Lich River in "Doi Moi" period 1986-2000

The 'Doi Moi' in 1986 - 'innovation-reform' inaugurated an opening period, triggering a massive urbanization process. Vietnam is entering a period of industrialization and modernization at the same time as a period of strong urbanization begins.

Hanoi is one of the first cities to be affected by this change. As a result, at least 90% of the surface area of water surfaces (rivers, ponds, lakes) has disappeared between the time of French colonization and the end of the 'Doi Moi' period. Inevitably, the streams of the To Lich river as they crossed the various villages have been severely degraded by urbanization, its surface reduced and part of the city center have been backfilled. In the transition from an ancient city to a modern city has caused the extent of agricultural land and green space has been considerably reduced in favor of the development of the road network and massive constructions of houses and buildings. The density of construction and population are increasing more and more on both banks of the To Lich. The river water is very polluted by the waste thrown by the inhabitants. The water from the river cannot use for agriculture and aquatic production, or even for traditional crafts. Transport and traffic, as well as the commercial activities on the To Lich no longer exist, it's very dirty waters exhaling an odor nauseating. In social memory, To Lich river no longer existed, the behavior and habits of the villagers having changed the residents forgot the To Lich. For all these reasons, the river is now closed and receives waste directly. In one century, from a romantic, healthy and fresh river became polluted and dead.

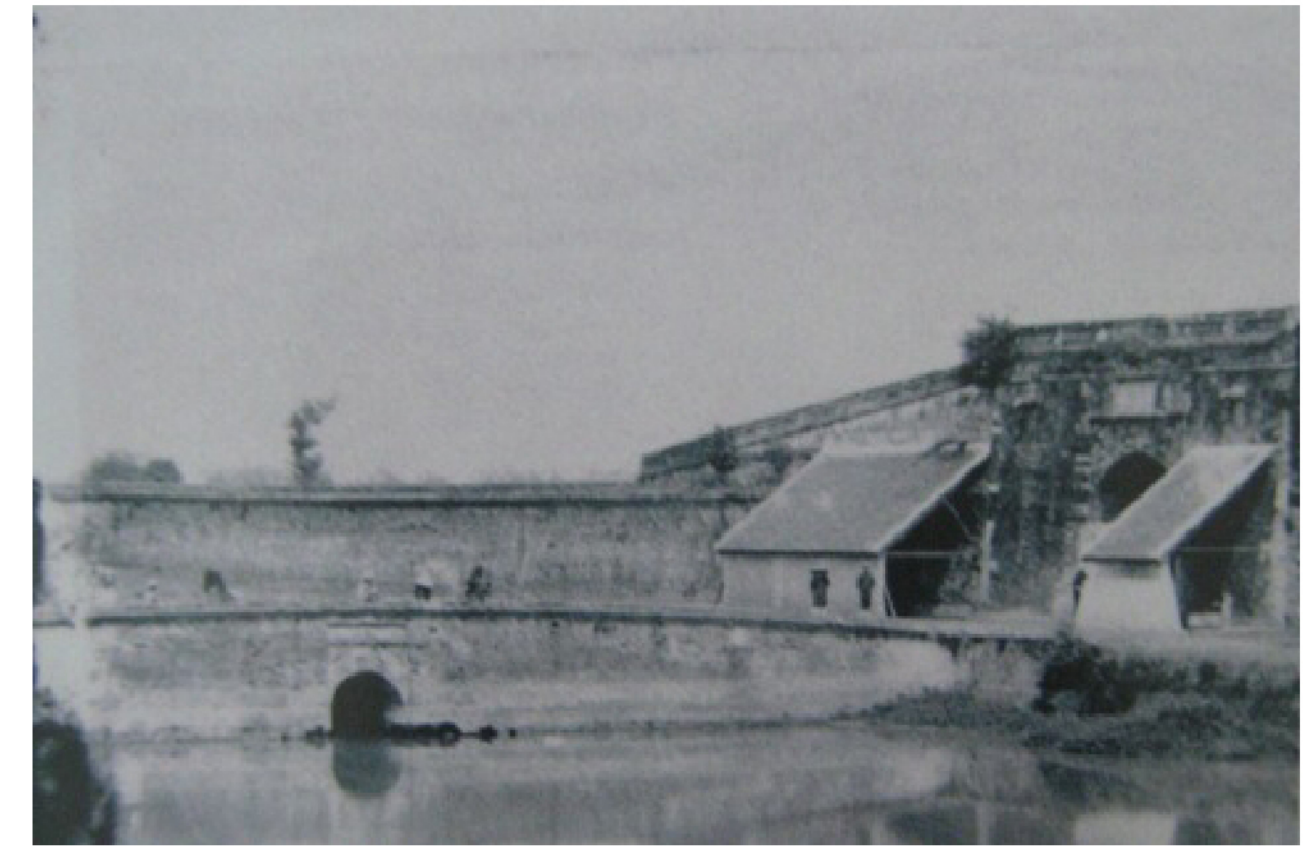
To Lich River from 2000 to present

River landscape problems remain always the same, except for a few urban environment renovation projects along the river. From 2001, Hanoi adopted a few projects aimed at to improve hygiene and the environment of the river. These were cleaning-up projects, pipeline and road construction along of its two banks aiming to make river a transition and access space, and a public space, accessible to all. Some projects have been carried out and others are in progress: the precarious houses occupying the banks from where the garbage was directly thrown into the stream, have been moved. These projects have made it possible to redevelop a modest part of green spaces on its banks, but the problem of water pollution remains of actuality.





To Lich River 1885
Source: Hanoi's Ancient Features. 2012



To Lich flows through the north gate of Thang Long citadel after the French attack in 1882
Source: Hinhanhvietnam.com



The paper-making village also has many other craft villages located beside To Lich flowing water
Source: Hinhanhvietnam.com



To Lich River 1976
Source: Hanoi's Ancient Features. 2012



A village located beside To Lich River
Source: Hinhanhvietnam.com



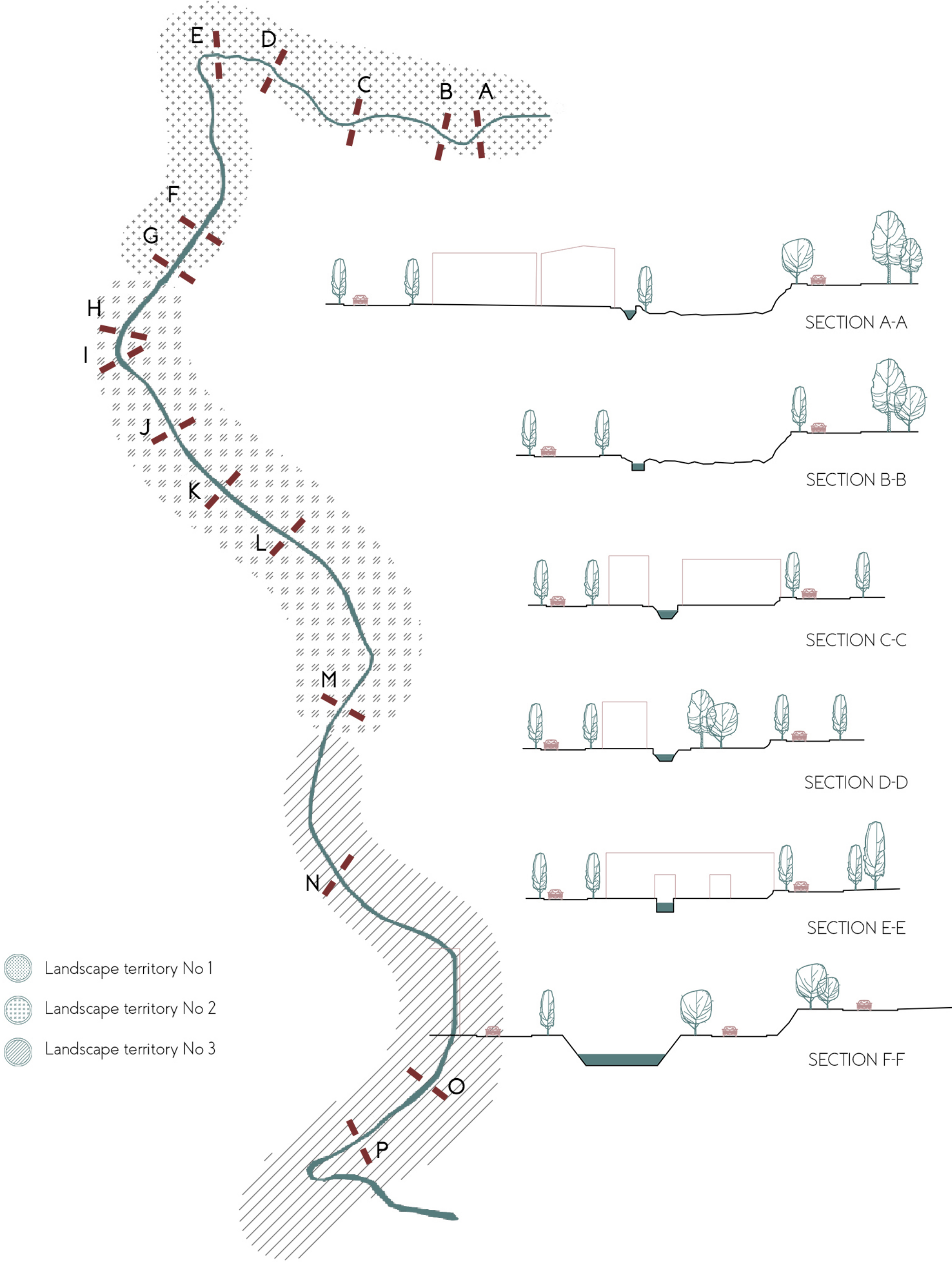
To Lich River 1990
Source: Hanoi's Ancient Features. 2012

On a landscaped territory, it has been observed that the To Lich flows from the center of the citadel on the outskirts of Hanoi. In accordance with the rules of urbanization in the city center, the further away from the center, the more the pressure of urbanization on the landscape of To Lich decreases. The development of Thang Long - Hanoi has now started. After more than 1500 years. The city grew and expanded in scope, but still connecting it to the historic river. However, specify the main periods of development to note the important stages, concerning the extensions of the city, of the citadel of Thang Long of feudalism, the French colonization which brought about changes in boundaries and position of the To Lich, the last time in 2007 when Hanoi was attached to a few peripheral regions. The Tô Lịch was then extended to the old Ha Tay province, communicating with the Nhue river for a route of almost 40 km before going out into the Day river. Thus, in order to understand the impacts of urbanization on the natural landscape of the river, the landscaped are divided temporarily according to the historical and developmental logics, as follows:

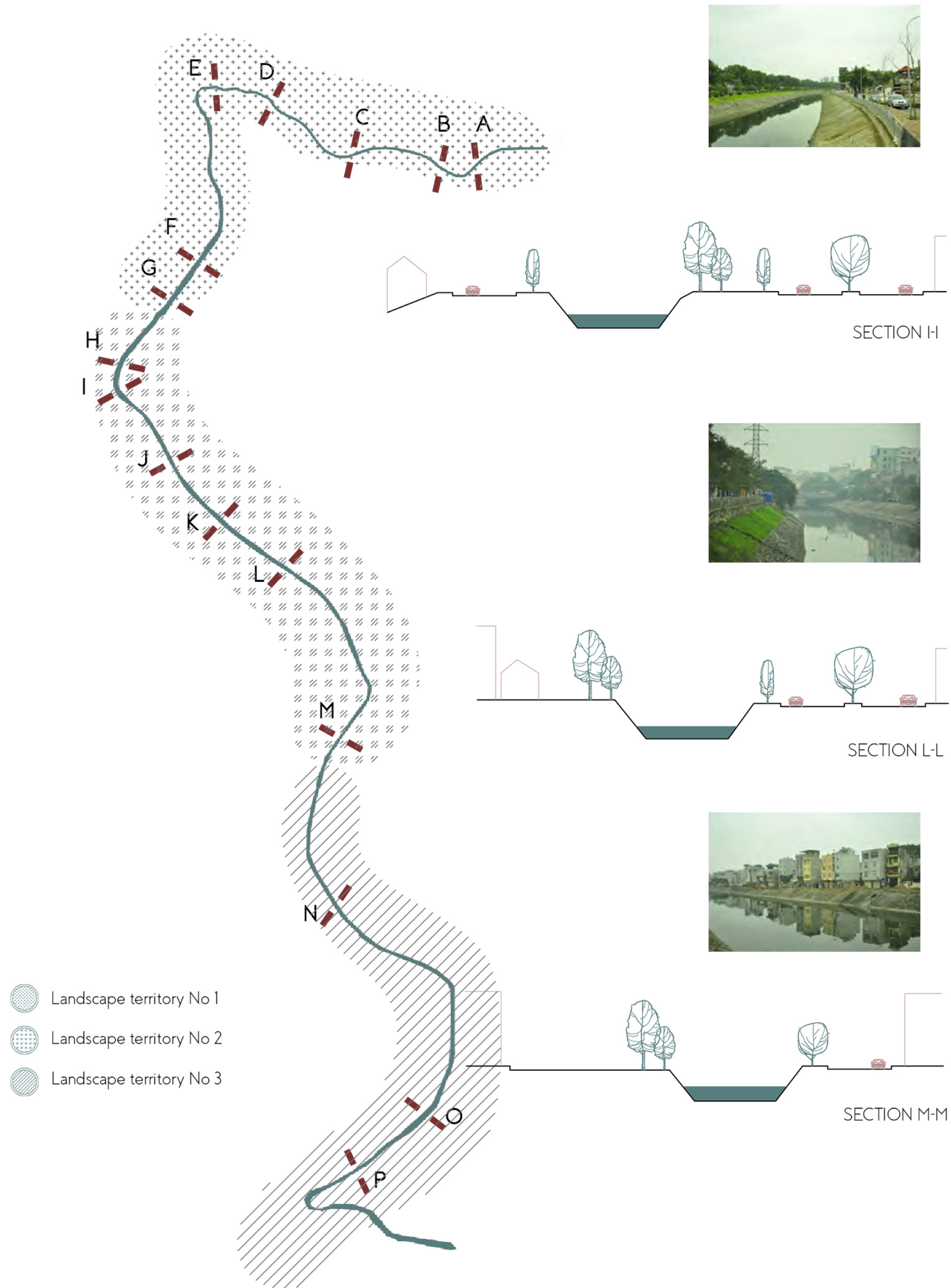
The To Lich river - Landscape area No 1: it surrounds the Citadel like a cycle ring road outside the imperial canal, is limited by the ancient earth wall of the Thang Long citadel, the Giang Khau estuary at the Giay bridge during the period of the North-South dynasty under the reign of King Le Trung Hung, then extended further, starting from Nhat Tan, along the way to the west, passing Buoi, the Giay bridge, following Giang street Vo - La Thanh, crossing the door of Dua market, Kim Lien, arriving at Dai Co Viet street, Den bridge, Tran Khat Chan Street, Dong Mac gate to finish at the foot of the river embankment Red. The cycle of the new rampart is larger than the old Dai La, surrounding the West Lake in the citadel of Thang Long. This landscaped area links to a period feudal history of Vietnam, based on a thick history and culture of Thang Long - Hanoi, in particular the 36 streets of the old quarter characterized by the traditional craft trades of the territory from Kinh Ky (the citadel). In conclusion, the pressure of urbanization on the landscape urban and that of the river is very strong in this area

The To Lich river - Landscape area No 2: in view of the development plan for the Hanoi extension after 1943 by the French, this city extended to the area of Thuong Dinh - Khuong Thuong, on another route of the To Lich. It also formed the boundary west of Hanoi, the course of extension of the area No 1 to Khuong Dinh - Thuong Dinh, marking the landscape area No 2, belonging to the urbanized area as the innovative trend in European design and then the French colonial period in Vietnam. This river area (No 2) was quite far from the center of the citadel, then less influenced by urbanization relative to the central (No 1) in the same time during French colonization and the period against American imperialism in Hanoi, as it was at the limit with the suburbs. However, since 2007, the urbanization process has begun to expand and move away from the center of Hanoi, where the land fund is not much. So area 2 has many implications for improvement and development.

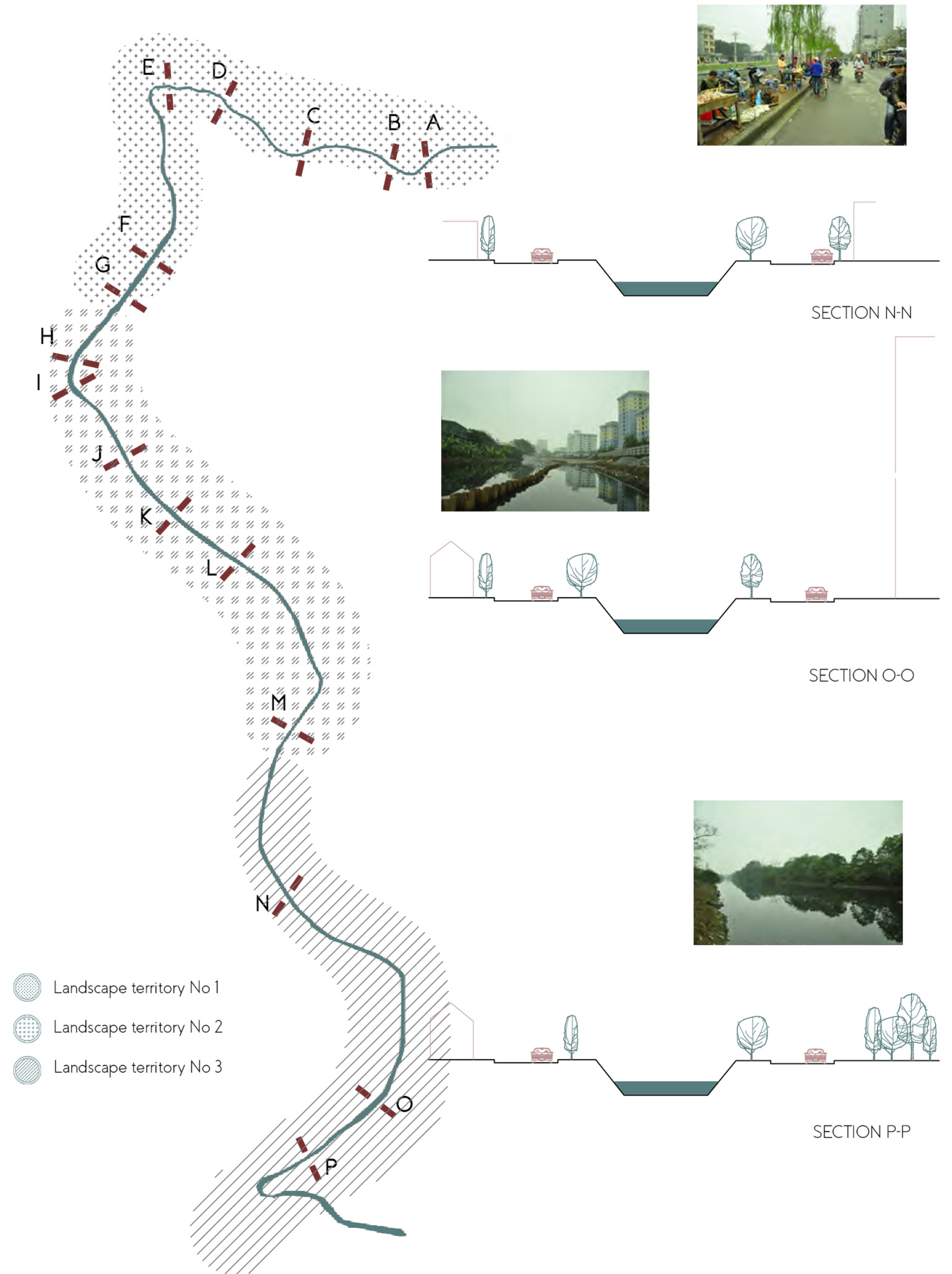
The river To Lich - landscaping Territory No 3: This zone begins at the end of the second zone, from Khuong Dinh to the Buou bridge. During the two great wars with France and the United States, it was considered an area of the rural villages which moved away from the city center, less urbanized. The area only suffered an impact significant of urbanization that after the reunification of the country in 1975, about 30 to 40 years ago, especially after 1986, when Hanoi experienced socio-economic development, urbanization following the "Doi moi" experienced the great development of big cities like Hanoi and Ho Chi Minh city. The landscape area No 3 is then influenced more or less. However, the speed of urbanization from here is slower, 10 to 15 as the area No 1 and 5 to 10 years than No 2.



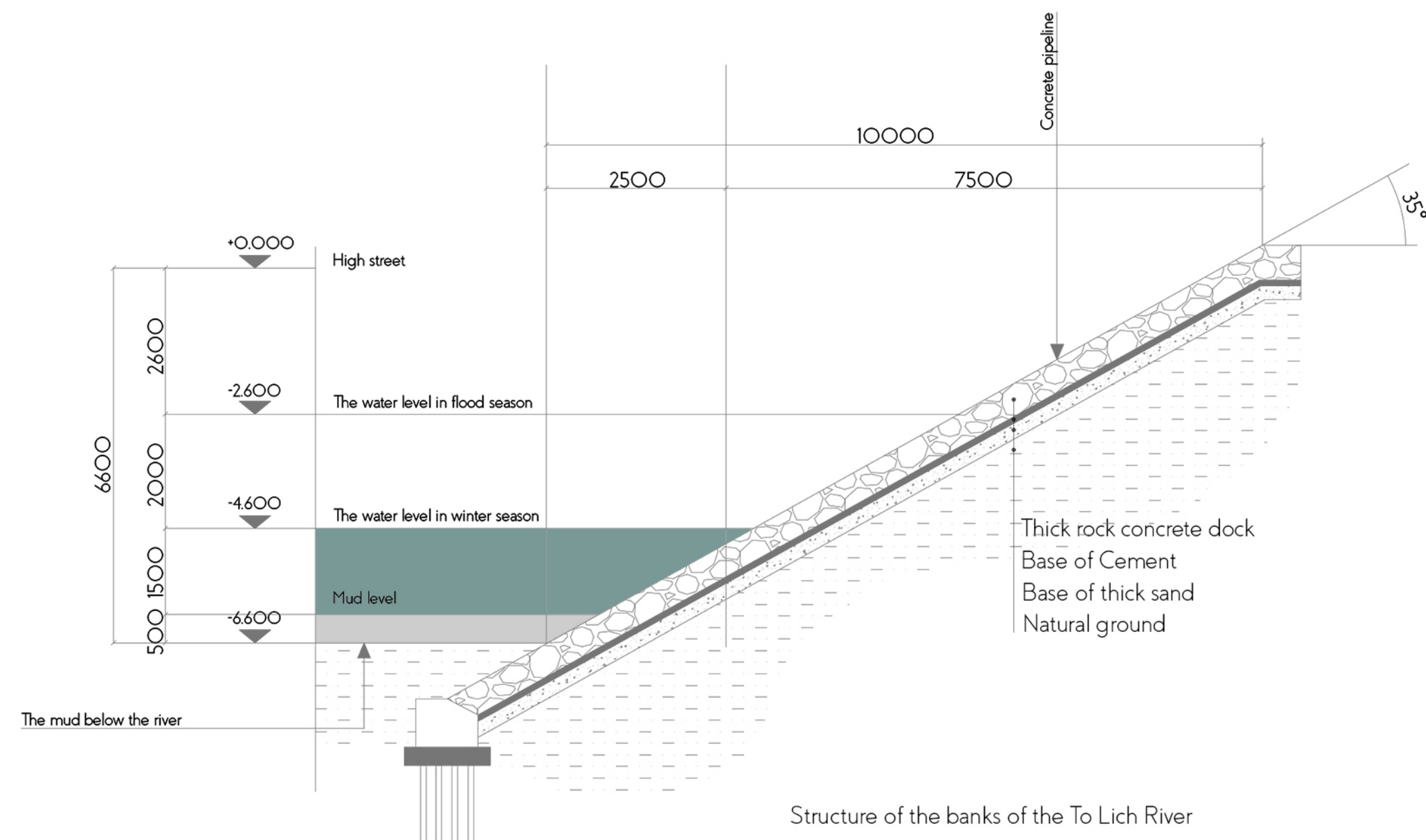
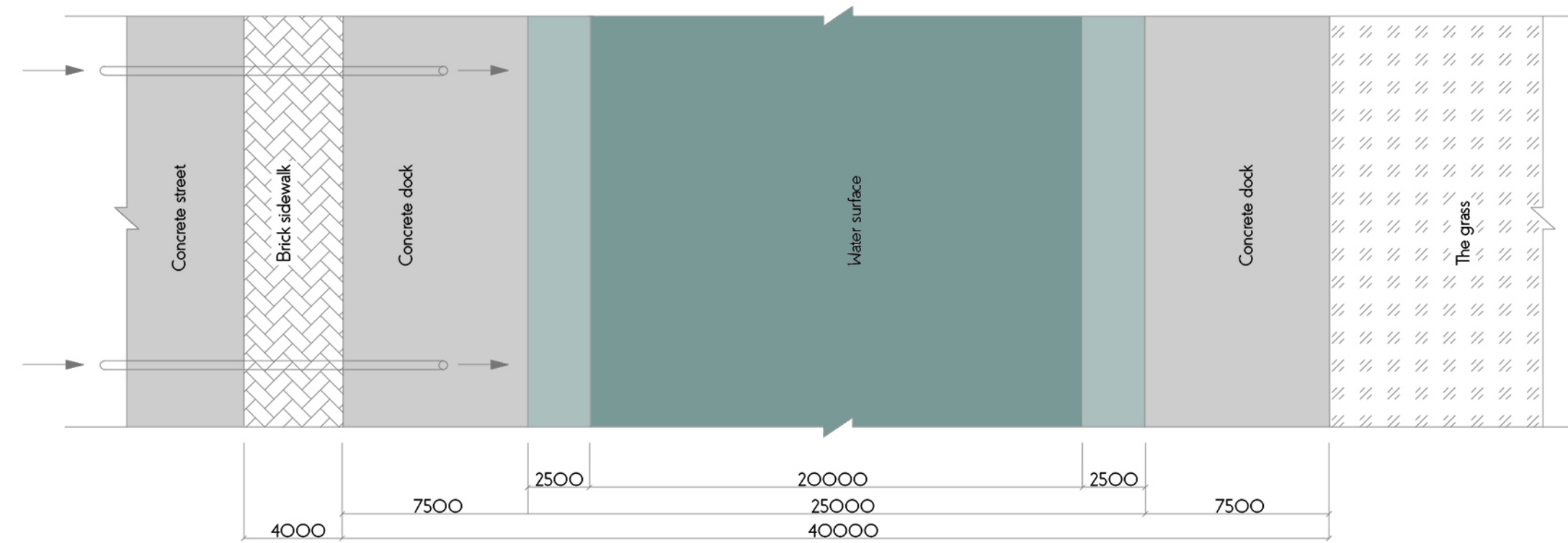
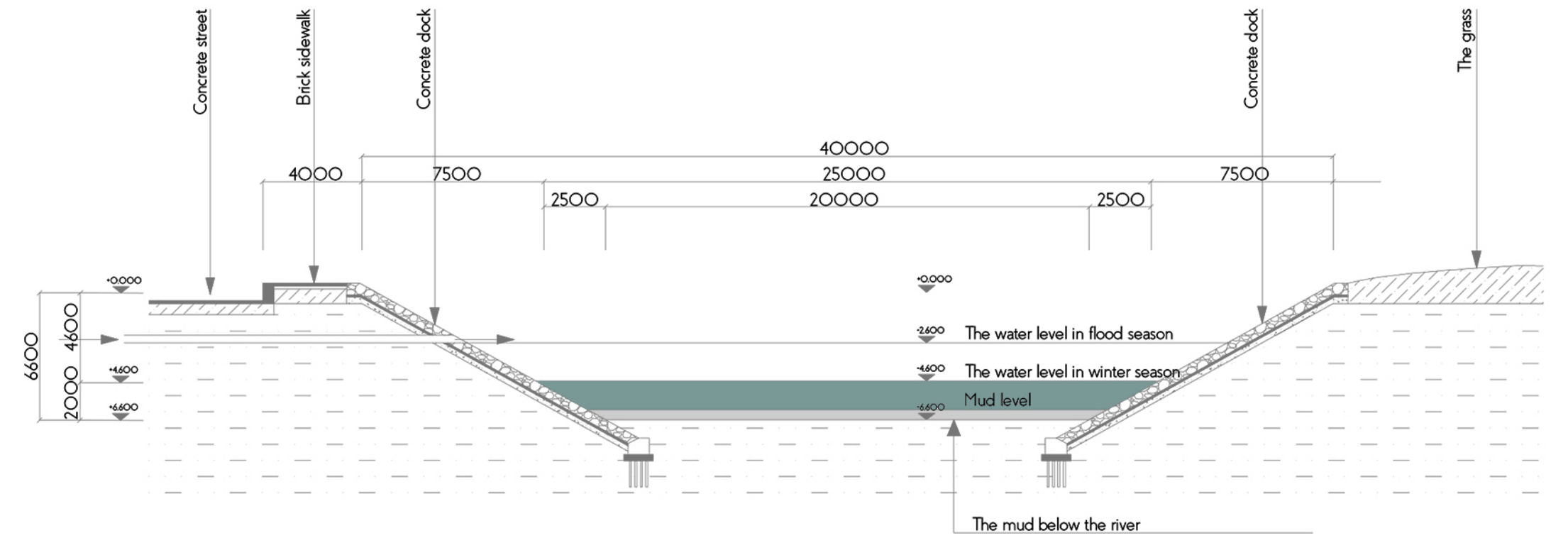
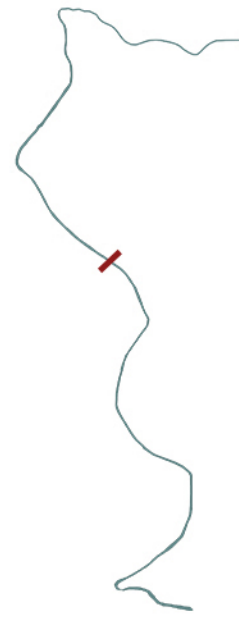
Landscape sections along To Lich River
Landscape territory of zone 1



Landscape sections along To Lich River
Landscape territory of zone 2



Landscape sections along To Lich River
Landscape territory of zone 3



Structure of the banks of the To Lich River

To Lich River has an important position when flowing through and adjacent to many central districts in Hanoi city.

HOANG MAI DISTRICT

Surface: 41.04 km2
Person: 423.100
Density: 10.309 ab./km2

DONG DA DISTRICT

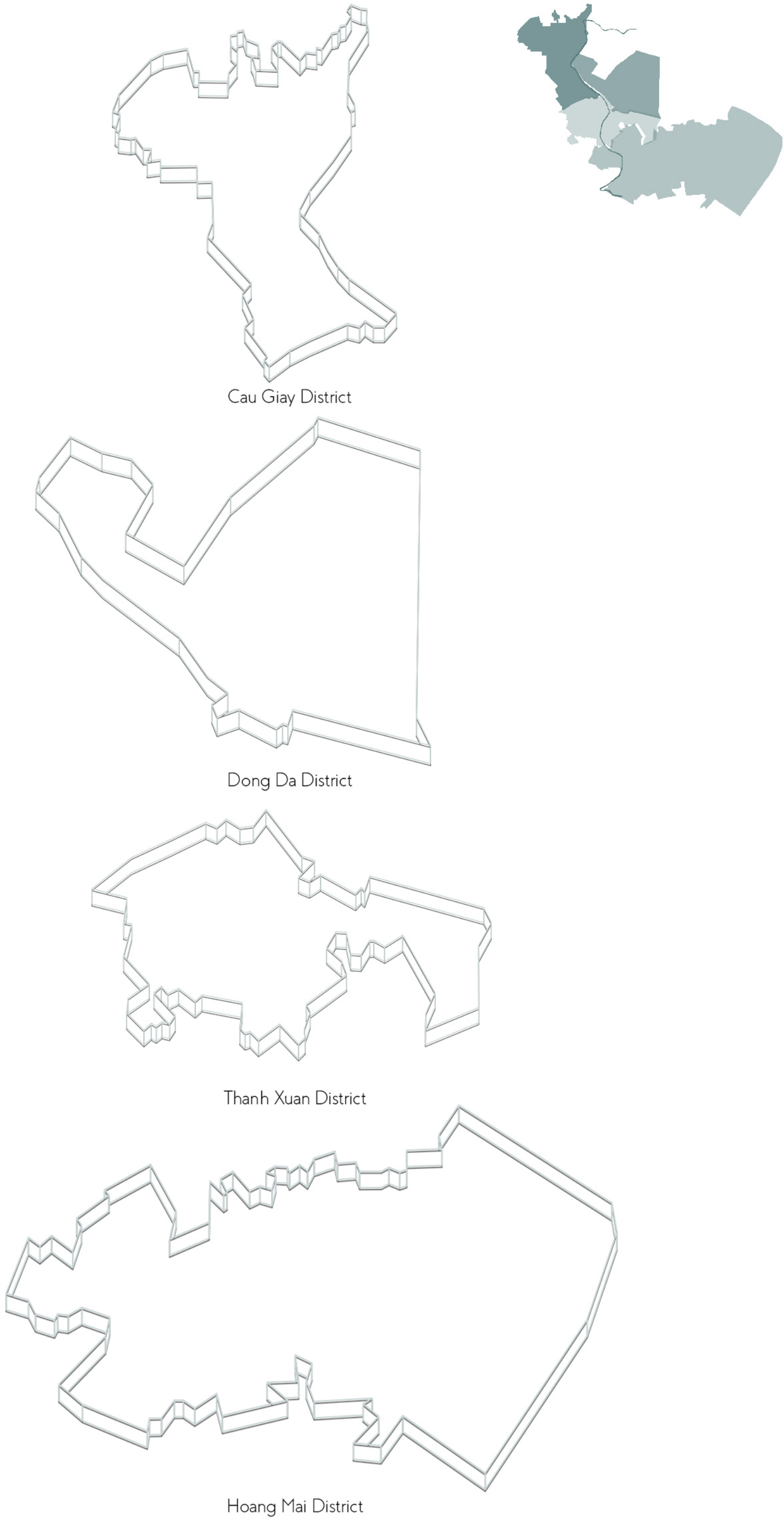
Surface: 9.95 km2
Inhabitants: 430.050
Density: 43.178 ab./km2

THANH XUAN DISTRICT

Surface: 9.11 km
Inhabitants: 292.800
Density: 32.140 ab./km

CAU GIAY DISTRICT

Surface: 12.04 km
Inhabitants: 269.637
Density: 22.177 ab./km

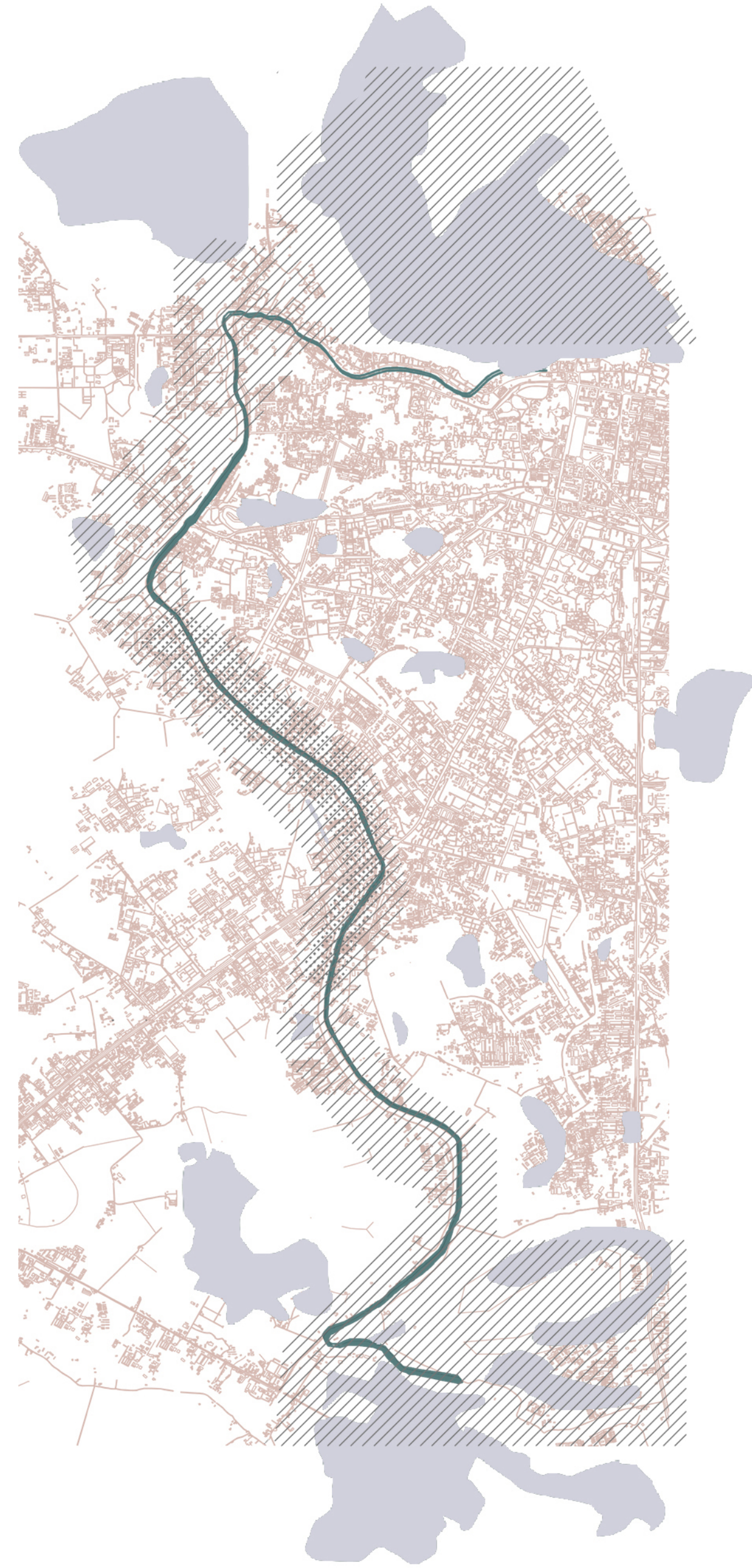




Map of the main green areas and water surfaces
along the To Lich river



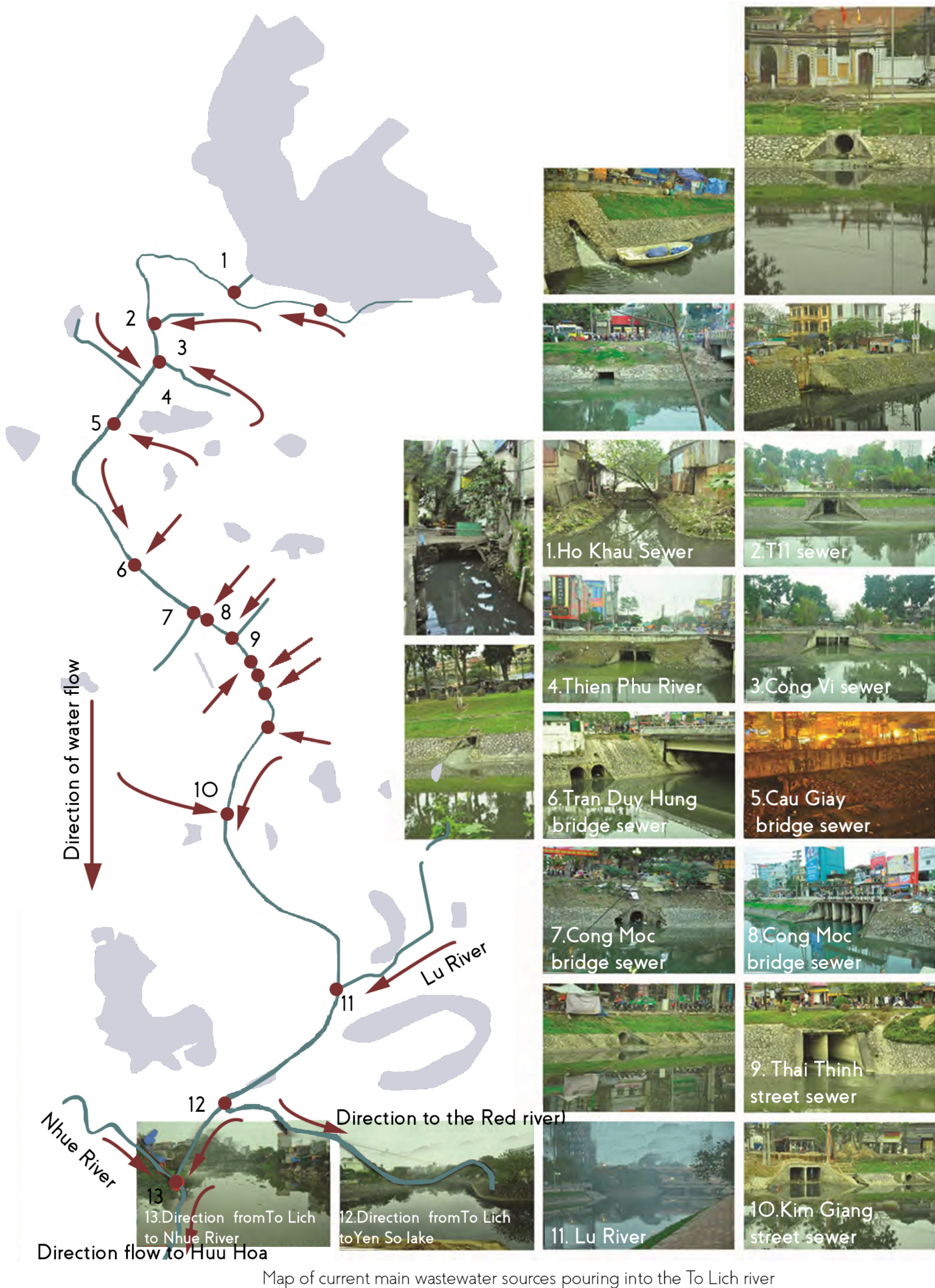
Map of the residential surfaces
along the To Lich river



Potential areas
along the To Lich river

The transformation of the river into the sewer in the context of urbanization. Through the timeline of the To Lich river, we can see that urbanization is already changing the river, several sections are backfilled, concreted, the sacred river named To Lich of the city of Hanoi becomes an open drainage sewer of stinky and toxic water. Hundreds of small family sewers drain into the river, for ten years the Hanoi residents had transformed the river into a real sewer (2000-2010). According to VietBao.vn, they note that 'Preliminary statistics show that along the river To Lich (12.6 km in length) are more than 10 large outlets that contain sewage, about 200 round sewers with diameters of 300 - 1.800mm and hundreds of sewers families flowing to the river. It is the main source that pollutes the To Lich river'. Being one of the four rivers draining water from the city, but it is the To Lich river which is the mother river of three remaining rivers (Kim Nguu River, Lu River, Set River). This is why, for years, the environment of the To Lich river is seriously polluted and considered to be the dead river because it must endure a large amount of waste water that is not yet treated.

In 2010, Le Van Duc, vice-director of the Hanoi Construction Service, announced that he estimates the volume of soil used illegally dumped along the entire line of the To Lich river at approximately 28.000 m3. In addition, there are 14 establishments that sell construction materials, 33 parking lots that have a vehicle washing and repair service, and used water containing oil and grease industrial flows directly into the To Lich River. According to the Resources and the Hanoi Environment on an average day, the To Lich River must receive more than 100.000 m3 of domestic and industrial wastewater. Untreated industrial wastewater constitutes 1/3 of wastewater. Amount of waste from industrial oil and its residues, solid waste, and a large amount of machine oil prevents organic matter from breaking down and increases residues difficult to decompose located at the bottom of the river. Regarding construction waste, entrepreneurs don't hesitate to dump tailings, wastewater, and mud into the river without treatment. During the construction of the Royal City urban area next to the To Lich river in 2011, the investor repeatedly dumped construction waste into the riverbed. However, the company violated the regulations and the fine was too light, only about 4 million VND (150 €). It shows that the management policy is still loose and flawed, the sanctions are not enough to deter.



The sources of noise in the To Lich river come from vehicles and some noise from machinery, construction activities along the river, and social activities such as production or trade exchanges. There are two types of noise:

Unpleasant noise: Understanding the noises coming from the sounds of road traffic activities, and the construction. With a length of about 13.5 km along the river means that there is about 27 km of motorized traffic along the river. Because the road parallel to the riverbank has high traffic density and narrow width of the river and fewer trees, separating the traffic space from noise, the noise level will be greater than the limit many times.

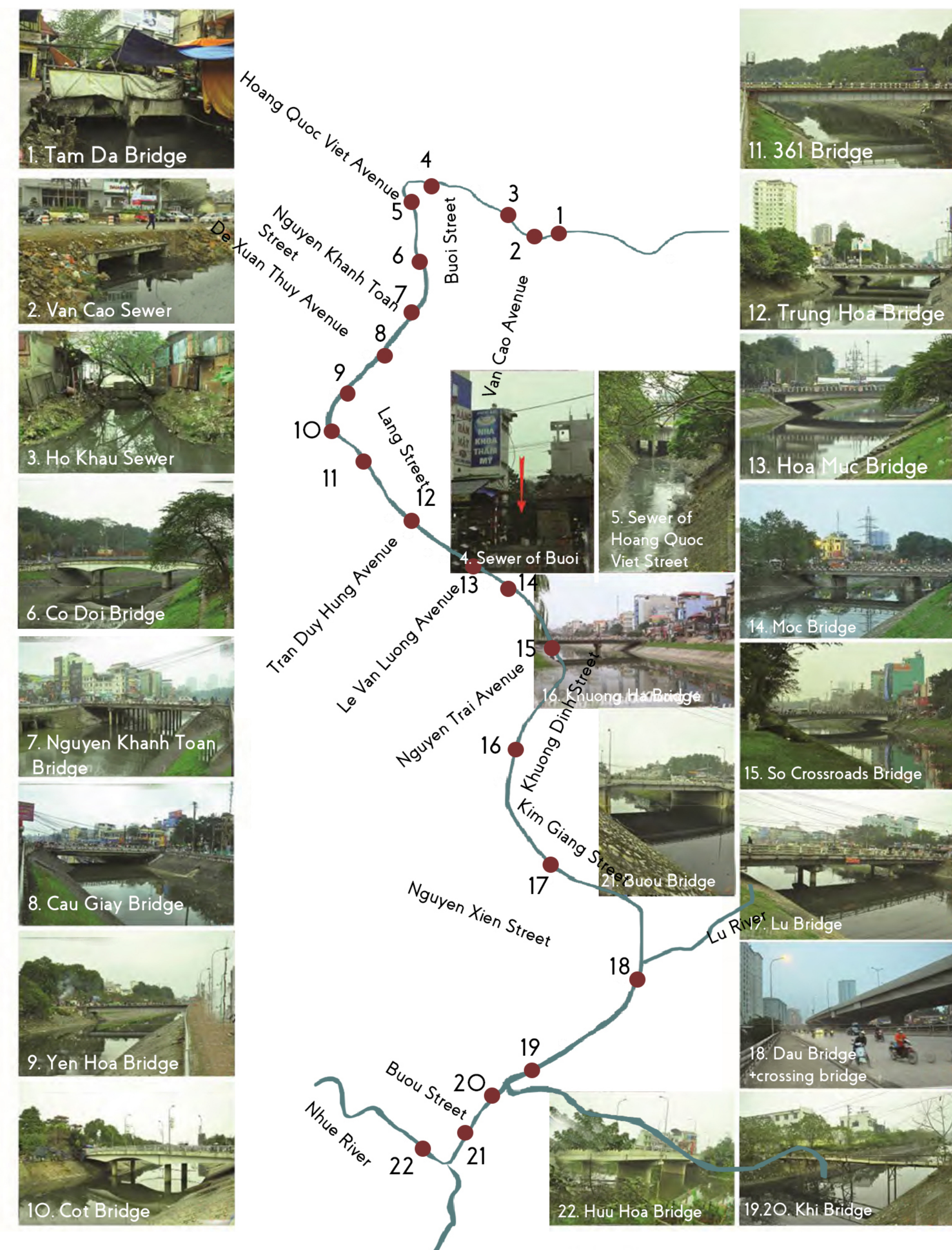
In space along the To Lich River, noise pollution, as well as air pollution, occurs at the same time, and from the same cause because this pollution is due to the participating vehicles traffic, construction activities but also production facilities. Currently on the river are about 23 bridges equivalent to 23 intersections of all sizes and where the sound intensity depends on the size of these traffic nodes. For example, in large traffic nodes at Cau Giay Bridge and Cau Moi. Le Van Luong Bridge and at the bridge Tran Duy Hung see finds a high traffic density, with the resonant noises of the vehicles from morning to evening. And the traffic nodes at the crossroads of three paths where the axis of traffic along the To Lich River, the traffic density is normal but this density makes increases the flow for the To Lich circulation line, and obviously, this increases the noise for the space of the river.

In space along the To Lich River, noise pollution, as well as air pollution, occurs at the same time, and from the same cause because this pollution is due to the participating vehicles traffic, construction activities but also production facilities. Currently on the river are about 23 bridges equivalent to 23 intersections of all sizes and where the sound intensity depends on the size of these traffic nodes. For example, in large traffic nodes at Cau Giay Bridge, at Cau Moi, in the avenue and at the bridge Le Van Luong, in the avenue and at the bridge Tran Duy Hung see finds a high traffic density, with the resonant noises of the vehicles from morning to evening.

And the traffic nodes at the crossroads of three paths where the axis of traffic along the To Lich River, the traffic density is normal but this density makes increases the flow for the To Lich circulation line, and obviously, this increases the noise for the space of the river.

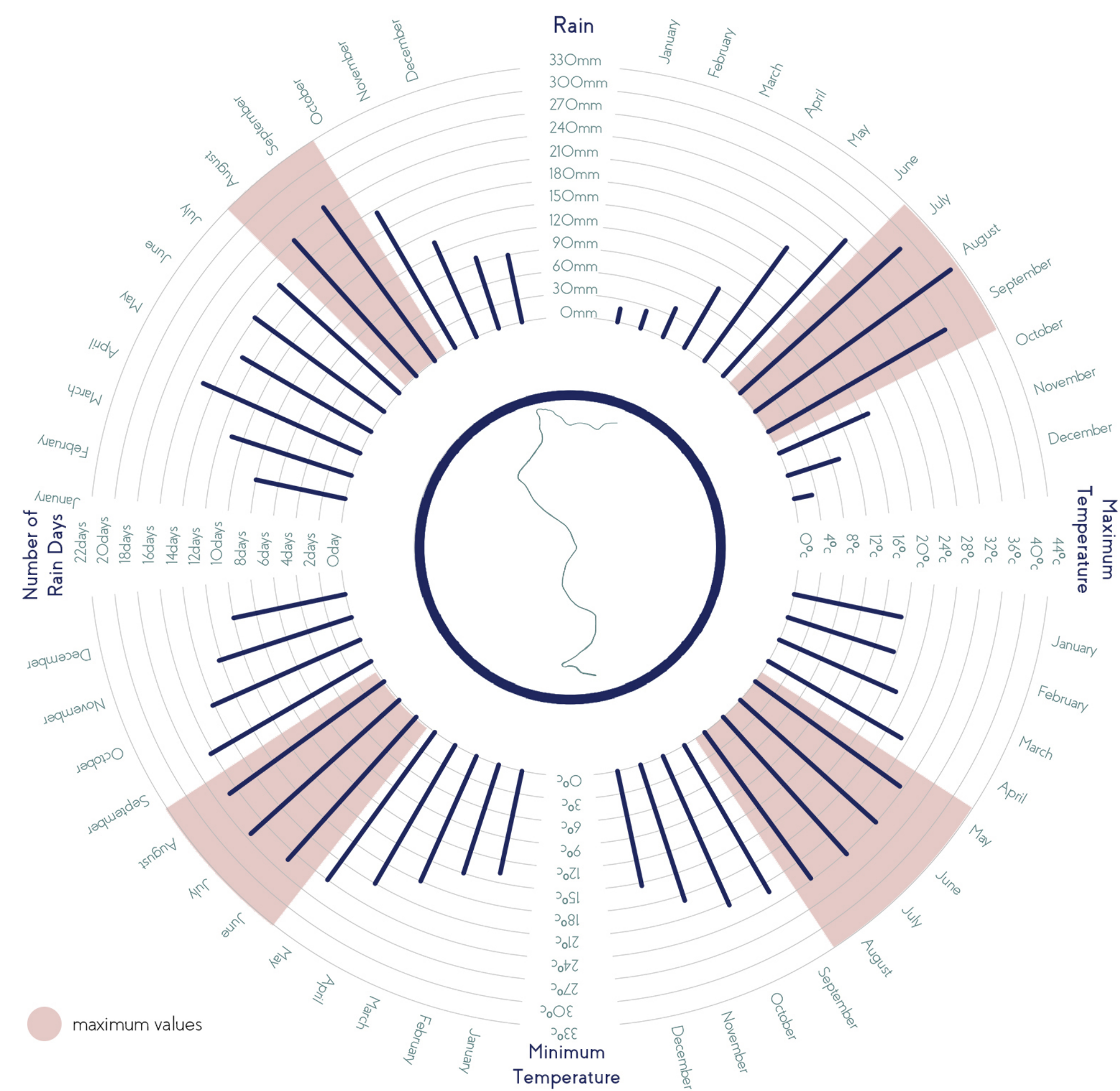
The most unpleasant sound occurs at times when the flow of traffic in the node as well as on the line suddenly increases, these are the times when workers, students and pupils return home (like when air pollution concentration is highest in a day), especially around 10 a.m. - 12 p.m. and 3 p.m. - 6 p.m., then the flow gradually decreases. It is also the general phenomenon of noise unpleasant for the inhabitants of here, and also for all those who participate in traffic in large traffic nodes on the current To Lich river as Cau Giay bridge, Cau Moi bridge (Nga Tu So), avenue and bridge Le Van Luong, avenue and bridge Tran Duy Hung... and in the other nodes of traffic in Hanoi. The inhabitants have to adapt to the environment, even though this environment affects their health because they have to work for live by moving on these lines. It's a bad culture of the road Vietnamese in general and Hanoians in particular, drivers like to honk their horns to play or signal their presence even in cases where it is not really necessary to honk the horn.

Acceptable noise: sounds from communication and work activities, public spaces (the small market, temporary market, boutique, restaurant, cafeteria, shopping center, leisure center), and daily social activities. This space located along the river, the line separated into several branches, but the closer you are to the intersection with the crossing bridge, the more the noise level increases: people become unpleasant. In general, we can say that this noise is a cultural product, a habit of the city dwellers of Hanoi when they feel normal like every day.

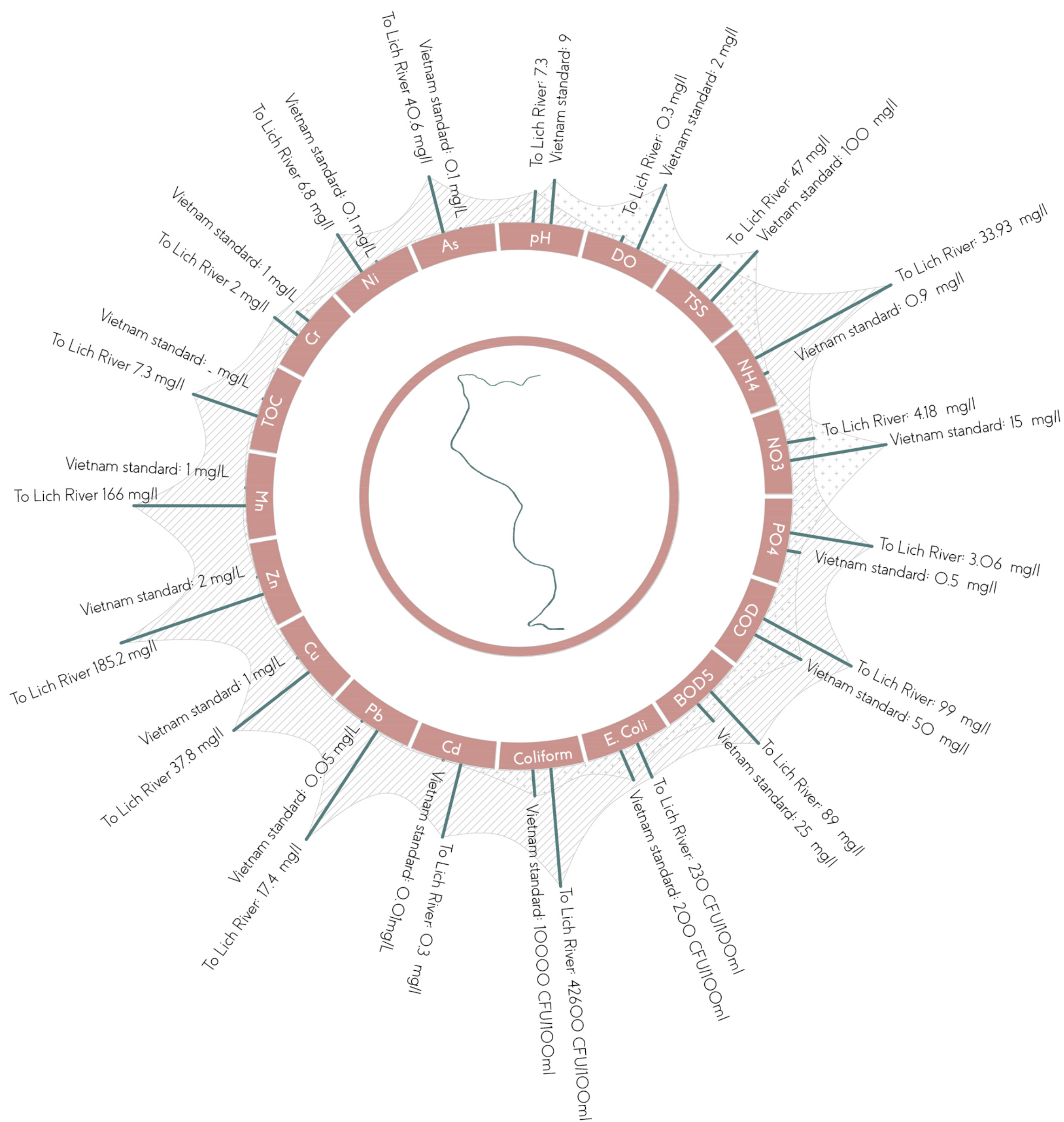


Current state plan on the nodes and main-secondary traffic lines along the To Lich river which influence the state of noise pollution

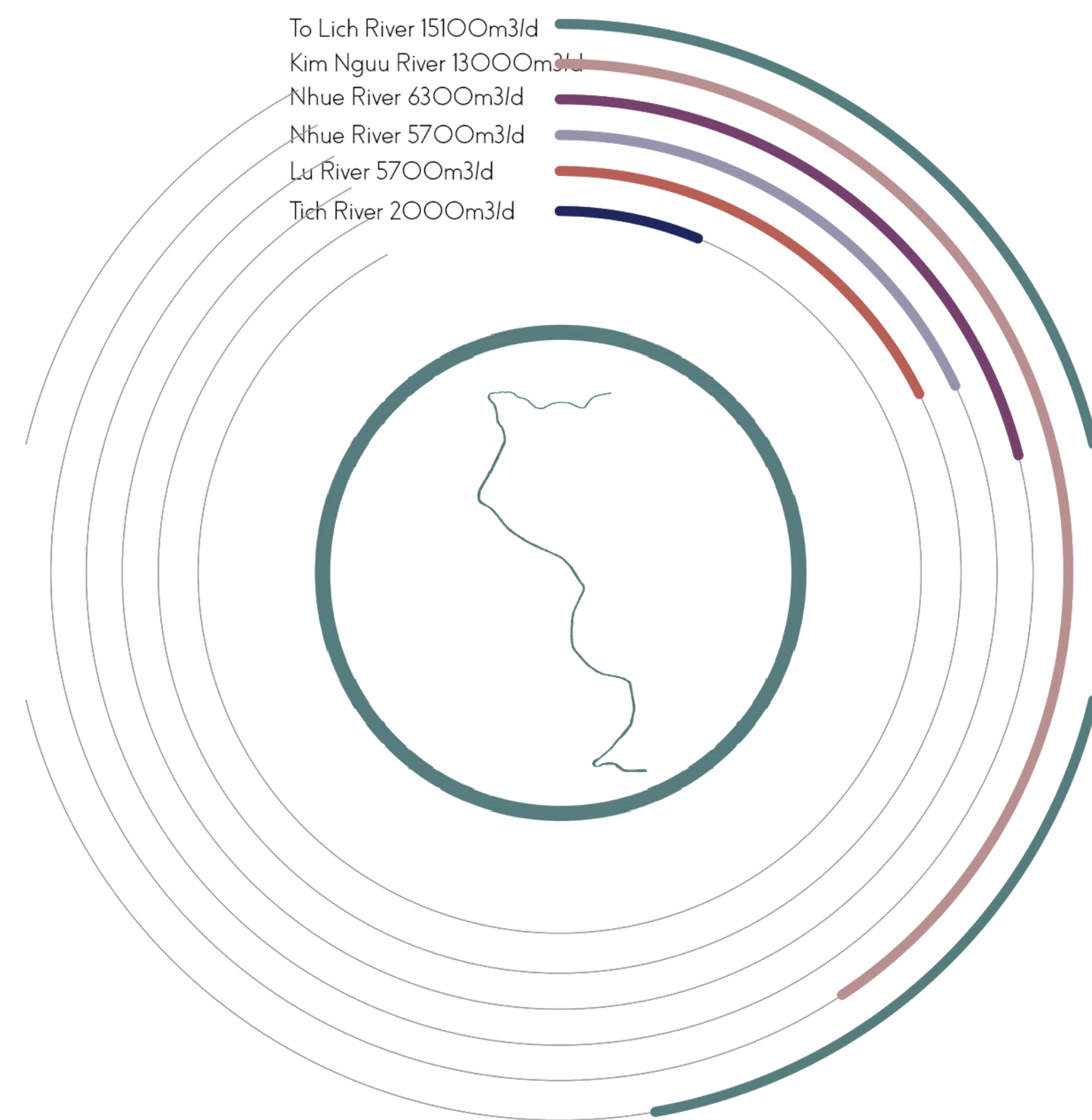
Observe the diagram of the rainwater and the average air temperature each month. the rains fall in Hanoi from May to October. for 6 months. especially in July and August. stormy season. the rains appear in large numbers and with great frequency. In this season. the To Lich river and all the arms of other Hanoi rivers support a large amount of rainwater. Sometimes happens a flood along the To Lich river. water floods the edge. waste invades the drainage systems. and the riverside vegetation cover due to the stagnation of drainage waters. The river. at this moment. is less polluted because the rains constantly change the water in the river. but another problem is emerging. the pollution of organic waste which is present everywhere in the river on both banks after each rain. During the summer. the air temperature in Hanoi is the highest in the whole year. after each heatwave. there is a big rain and after this rain. the whole river experiences air pollution because of the influence of temperature change and water vapor. the concentration of ammonia is high in the mud and this gas smells at the bottom of the riverbed. The dry season starts from November to April. for 6 months. there is less rain in December and January. At this time. the To Lich river is only a city wastewater ditch. that is to say. that the water in this river is severely polluted because there is no rainwater to purify this river.



Statistical diagram distribution of rainfall and monthly temperatures in Hanoi.
Source: world weather



Statistical diagram of Vietnamese standard for river water quality compared to To Lich River



Statistical diagram of the quantity of wastewater in Hanoi's rivers

CASE STUDIES

Case study no 1: Cheonggyecheon Stream

Project Location: Seoul, South Korea.

Project Classify: Landscape/ Restoration

Project Scale: 5.84 km

Year: 2005

Designer: SeoAhn Total Landscape

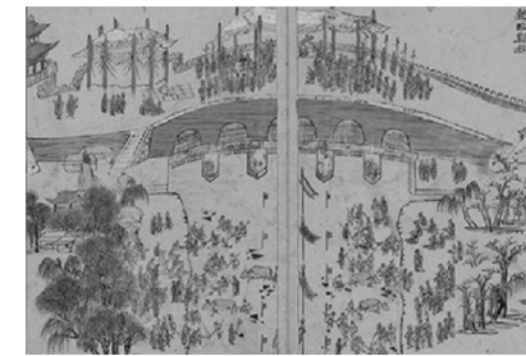
Award List: Sustainable Transport Award 2006.

The 10th Veronica Rudge Green Prize in Urban Design.

Client : Seoul Metropolitan Government

The object of the study is the Cheonggyecheon Stream restoration project by SeoAhn Total Landscape, Seoul, South Korea, 2005. In the heart of Seoul, the Cheonggyecheon Stream nowadays is a famous tourist destination that every visitor who has come to Seoul must visit. It is a green waterfront park where people can mingle with nature with diverse vegetation and become a space of rest and entertainment, a social space playing an important role in the lives of the people of Seoul, giving them a good quality of life. But in the past, before putting on this new look, Cheonggyecheon was a beautiful stream in the past. However, in the process of urbanization in the mid-20th stature, the river has suffered many negative impacts and gradually changed, becoming polluted. Forgotten by the citizens, by the back turned to the stream, it became polluted and backfilled. Cheonggyecheon is a stream with an estimated length of 5.8km, flowing through downtown Seoul from west to east. It begins at the Jongno-Gu commercial district then flows into the Jungnangcheon stream and joins the Han river to finally flow into the sea. The original name of Cheonggyecheon is Gacheon- which means the way water should flow. Cheonggyecheon river appeared for the first time in history in the effort to control the flood for the imperial capital at the time of the Joseon dynasty in the 15th century. With over 200,000 people were mobilized to widen the Gye Cheon, they widen both sides of the bank and made straight lines of the Cheonggyecheon waterway. In the early 19th century, the creek, clean, was a place where Seoul residents bathed and did their laundry, for children it was a playground.

Old bridges and old one-story houses were built along the stream. However the constructions did not invade the banks. Since World War II, Gacheon has changed his name to Cheonggyecheon which means means 'clear water stream' but when the Japanese colonizers began the invasion of Korea, they started covering tributaries in concrete, creating an underground sewage system for the city. The stream started to become polluted. After the Korean War (1950 - 1953), refugees moved to Seoul marking the beginning of the problem of increased urbanization. They created shanty towns along Cheonggyecheon and continued its pollution. The consequences of this period of crisis: garbage, waste and waste from daily activities almost destroyed the landscape. The river has been transformed by environmental pollution and social scourges of the city. It became a symbol of poverty and filth. After the Korean War (1950 - 1953), refugees moved to Seoul marking the beginning of the problem of increased urbanization. They created shanty towns along Cheonggyecheon and continued its pollution. The consequences of this period of crisis: garbage, waste and waste from daily activities almost destroyed the landscape. The river has been transformed by environmental pollution and social scourges of the city. It became a symbol of poverty and filth. In the period under President Lee Sung-man, for 12 years from 1958 to 1970, the function of the river has changed. The river was backfilled and concreted to build a road in the process of strengthening Seoul's economic development. Clear evidence that the river was forgotten and deeply buried. In 1970, in the period under President Park Chung-Hee, an overhead highway was built over the river. The river area has been vivid and explicit evidence of the phenomenon of urbanization - process remarkably intense and flourishing industrialization and modernization in Korea in general and Seoul in particular. However, it generated the tensions due to the pressures of urbanization: noise, dust pollution, tension for the mental health of residents of this axis.



Cheonggyecheon during feudal period.
Source: didacticdiscourse.wordpress



1700



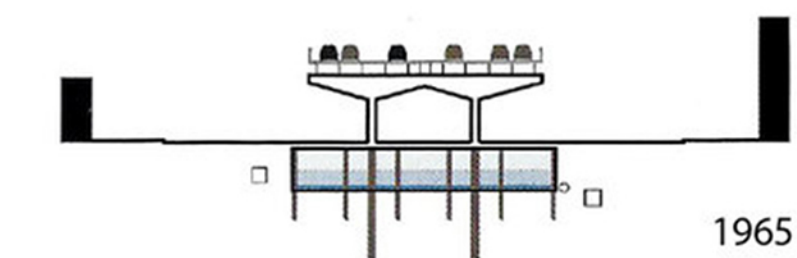
1800



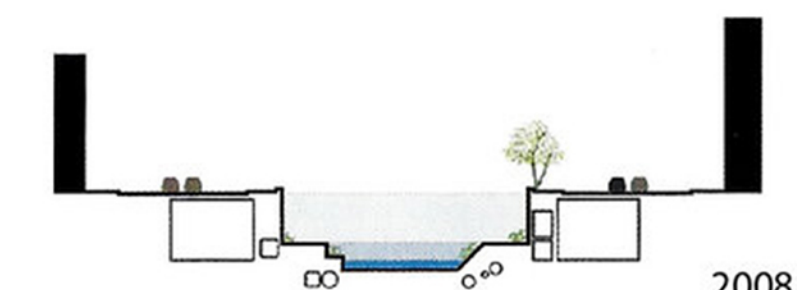
1900



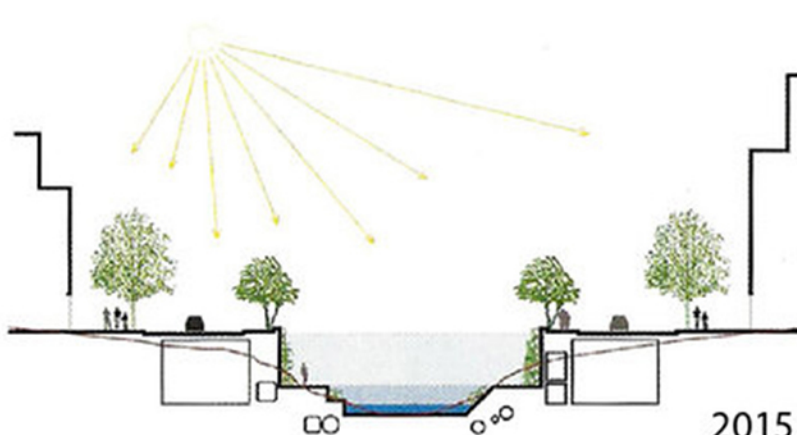
1950



1965



2008



2015

Evolution of the territory Cheonggyecheon Territory section through the period of time
Source: Deconstruction/ construction of the Cheonggyecheon restoration project in Seoul



Cheonggyecheon during World War II
Source: ICLE 2006



Cheonggyecheon after the Korean War (1950 - 1953).
Source: didacticdiscourse.wordpress



Cheonggyecheon under restoration in 2005 . Source: en.wikipedia.org/wiki/Cheonggyecheon



The river nowadays after being renovated . Source: en.wikipedia.org/wiki/Cheonggyecheon

However, towards the end of the 80s, people gradually realize that if the goals of economic development must be reached as quickly and at all costs should not accept sacrificing the living environment. Thus, the destruction of the environment will have unfortunate consequences for human health and long term, on society, execrable corollaries of unsustainable socio-economic development. The progressive reflections aim to change the landscape urban stream, to return it to nature. In 1970, in the period under President Park Chung-Hee, an overhead highway was built over the river. The river area has been vivid and explicit evidence of the phenomenon of urbanization - process remarkably intense and flourishing industrialization and modernization in Korea in general and Seoul in particular. However, it generated the tensions due to the pressures of urbanization: noise, dust pollution, tension for the mental health of residents of this axis. However, towards the end of the 80s, people gradually realize that if the goals of economic development must be reached as quickly and at all costs should not accept sacrificing the living environment. Thus, the destruction of the environment will have unfortunate consequences for human health and long term, on society, execrable corollaries of unsustainable socio-economic development. The progressive reflections aim to change the landscape urban stream, to return it to nature.

In 2000, the Cheonggyecheon road and expressway has shown signs of serious degradation, only small cars were allowed from 1997. A lot of toxic gas accumulated over the years under the sewer and drain bellow the road have led to the foundation's corrosion.

In July 2003, the mayor of Seoul- Lee Myung-bak, who eventually became the President of the Republic of Korea, led the project, a bold decision for the social environment in Seoul to start the project of the removal of the highway and restoration of the Cheonggyecheon River. It is a great decision, unprecedented and revolutionary because on the one hand, Seoul had to destroy a highway, and on the other hand, interest in the environment and the urban landscape had been abandoned in favor of development urban.

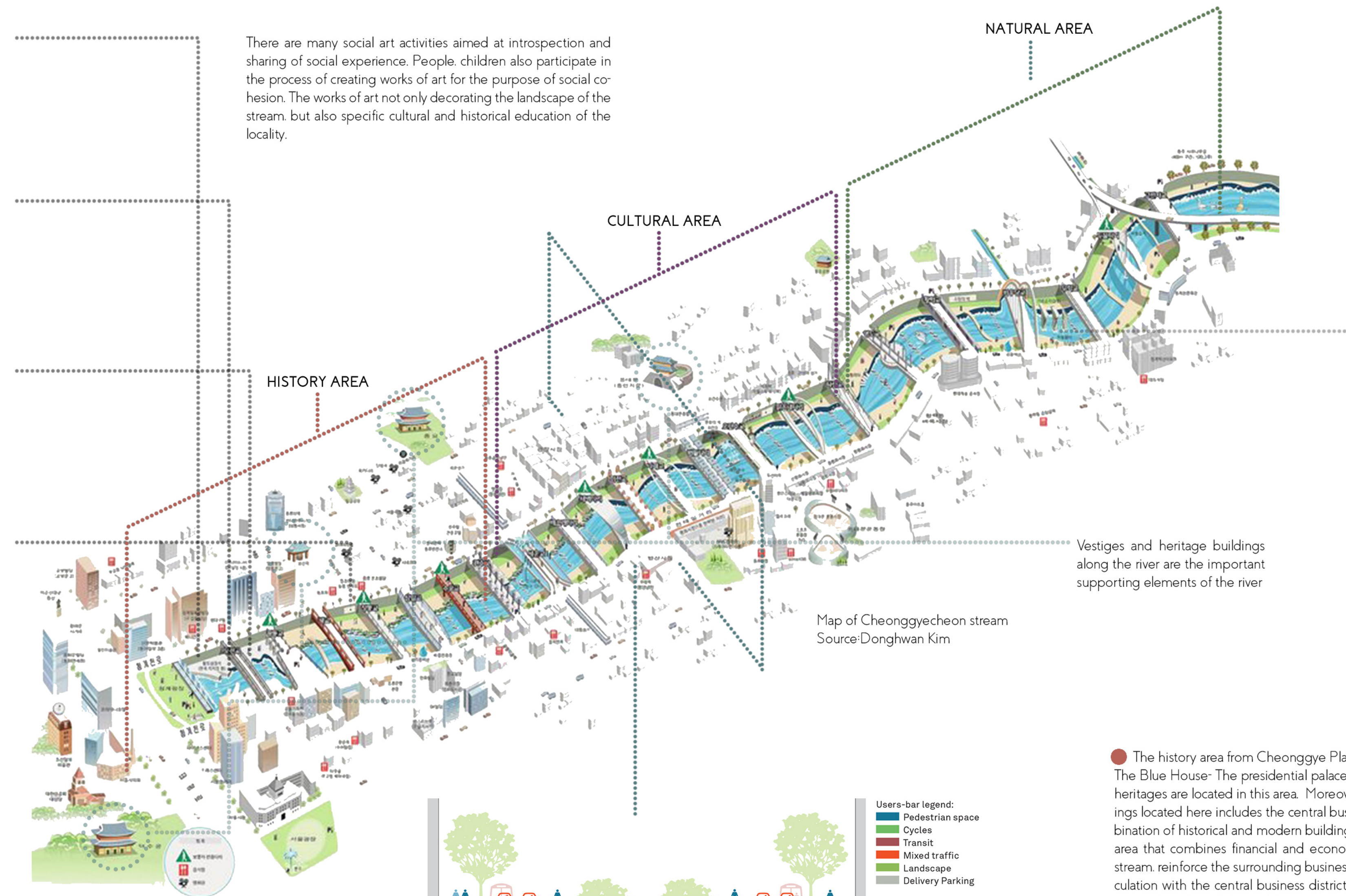
Developing the transportation system is an asset for economic development: That raises a big question for the development of human society. Maintain the balance of the landscape environment and developing the economy sustainably are two conditions today inseparable. During this time, the Cheonggyecheon spring was almost exhausted of its vitality How can it be assured that the source of Cheonggyecheon will revive the urban environment? It was, at the time, an arduous question for the policy of Seoul, and, more generally, for the society. The project focuses on removing the old highway and the vehicles passing through it to improve air quality and minimize noise pollution in the city. Restore and renovating the Cheoggyecheon Stream to turn it into a green corridor of the city, developing biodiversity to alleviate the urban heat island effect, harmonizing and regenerating the atmosphere and climate of the city. Furthermore, encouraging people to use public transport instead of private vehicles contributes to reducing environmental pollution. In the process of implementation, the project faced many challenges. Some certain social concerns were linked to the insecurity of the constructions: thus, the 35 years old structure, a work made up of a huge quantity of concrete, was to be destroyed. In addition, the volume of traffic of the bridge is about 170.000 vehicles per day, this pressure will directly impact and cause traffic congestion or overload on other surrounding roads and areas during project implementation. During the construction process, the project also encountered some obstacles from the local residents and merchants due to the construction of the project leads to an increase in dust and noise, difficult access led to a stalled business. Despite all the difficulties, the city government has gradually removed the problems and difficulties encountered. . On the one hand, the city government ensures that not only the outcome of the project but the whole process to its implementation should also fully respect the people and the environment

The demolition process generated 872.400 tons of waste of concrete and asphalt, 96% of this was reused and recycled. On the other hand, the city government has organized many consultations and answered questions for stakeholders from residents and traders. They explain the value and benefits that the project brings. Restore Cheonggyecheon, restore history and culture through preserving monuments and beautifying streets. In particular, the government provided financial assistance and subsidies to business owners and special arrangements for street vendors. They also improved the parking system for loading and unloading to stimulate commercial activity. In September 2005, the stream was opened to the public. When the Cheonggyecheon stream has been renovated and its real old values have been found. Once again affirming its role in nature, history, culture and proposing an integrated landscape, made up of traditional and historical values, in the contemporary city. The stream became famous and attracted not only locals but also tourists. It has historical, cultural and natural values

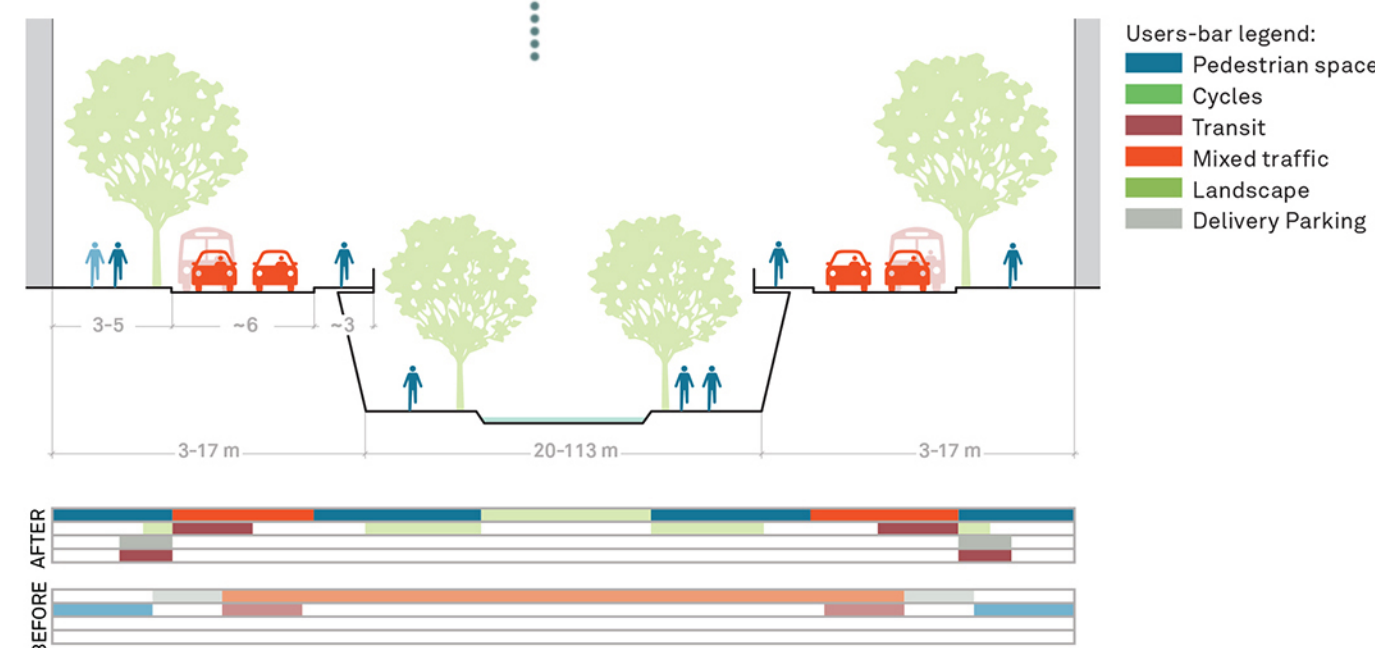


The system of 22 bridges connects two banks of the river, each with a style, content and form different. While some preserve historic values, they become a tangible heritage of the river. Others have modernized, using modern architectural and plastic arts as a work of art.

There are many social art activities aimed at introspection and sharing of social experience. People, children also participate in the process of creating works of art for the purpose of social cohesion. The works of art not only decorating the landscape of the stream, but also specific cultural and historical education of the locality.



Map of Cheonggyecheon stream
Source: Donghwan Kim



The cross-section shows the above traffic diagram before and after on Cheonggyecheon Stream
Source: globaldesigningcities.org



Heritage preserved and partially restored from the post of the once noisy highway on the riverbed.



Restitution of the slums built along the stream and harming the landscape and the environment of the 50s and 70s previous century, constituting part of the landscape value current.

Vestiges and heritage buildings along the river are the important supporting elements of the river

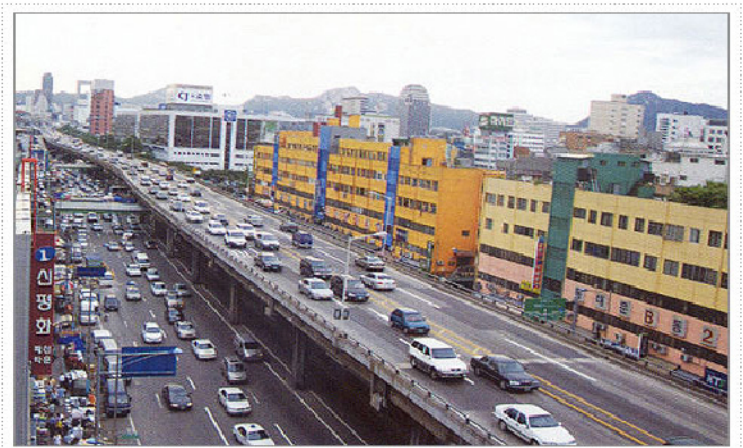
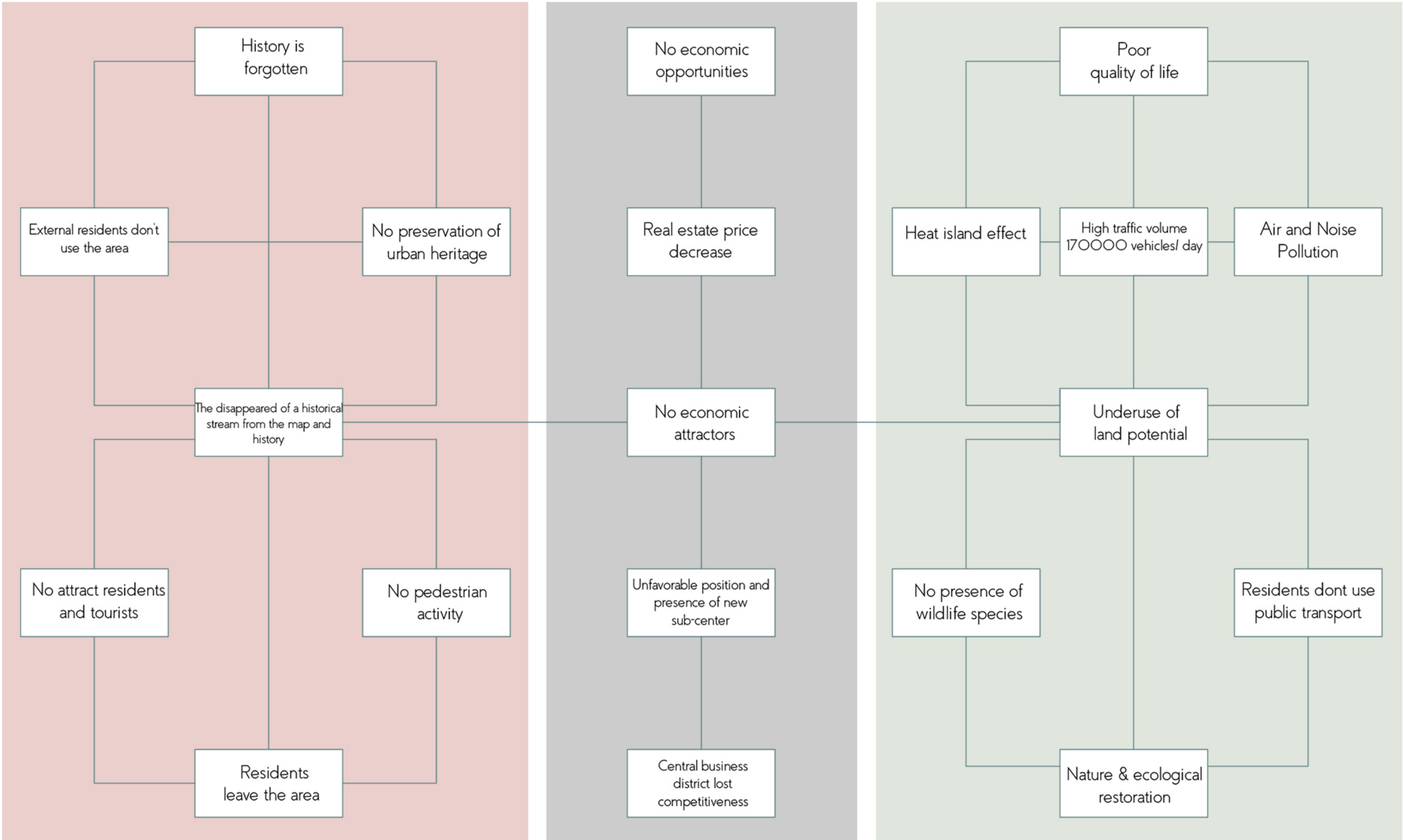
● The history area from Cheonggye Plaza to Baeogaedari Bridge (1.8 km). The Blue House- The presidential palace and many historical buildings and heritages are located in this area. Moreover, a lot of modern high-rise buildings located here includes the central business district. In this area, the combination of historical and modern buildings in the development of a historic area that combines financial and economic development along with the stream, reinforce the surrounding business area, which facilitates efficient circulation with the central business district. In the meantime, we can also increase the value of the world and preserve and preserve places of historical significance.

● Along the Cheonggyecheon Stream from the Baeogaedari Bridge to the Dasangyo Bridge (1.7 km) is a cultural area that includes large shopping and shopping centers and mostly fashion centers. This area is an attractive element, with all commercial, cultural and social activities, improving the spiritual life of the residents.

● The natural area ranges from Dasangyo Bridge to Gosanjagyo Bridge (2.0 km). This area has many residential apartments located in an environmentally friendly environment with lots of green space. The development of this area aims to focus on increasing biodiversity and ecology and increasing the availability of green space throughout the region.

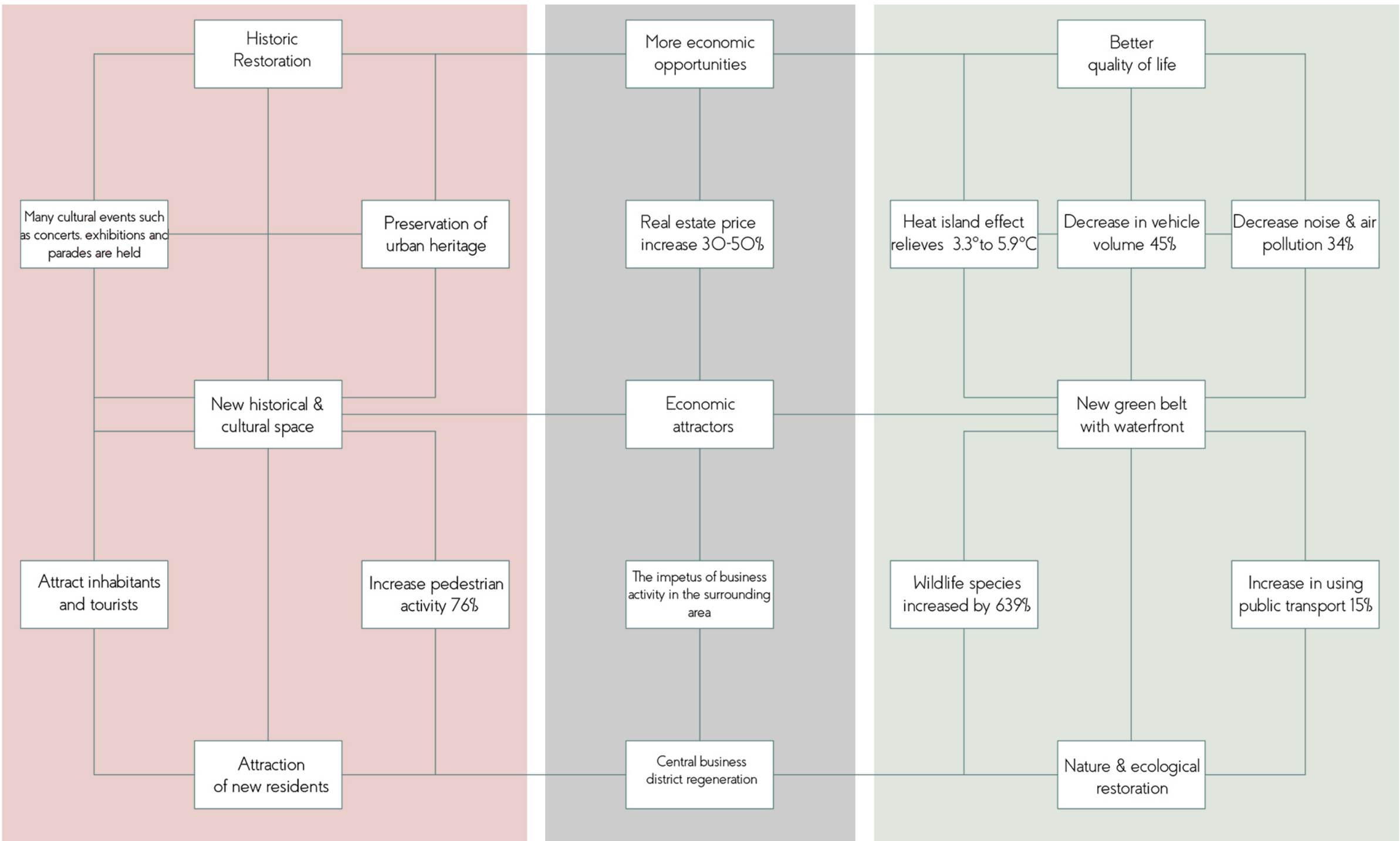
Problem Tree Cheonggyecheon Stream Before Restoration

- Social & Cultural Issues
- Economic Issues
- Environment Issues



Problem Tree Cheonggyecheon Stream After Restoration

- Social & Cultural Approach
- Economic Approach
- Environment Approach



Case study no 2: Yongning River Park
Project Location: China Taizhou City, Zhejiang Province, China
Project Classify: Landscape
Project Scale: 21.3ha
Year: 2004
Designer: Turenscape
Client: The Government of Huangyan District, Taizhou

Taizhou is located in the Southeast of China. This is one of the cities with the fastest urbanization rate in China. Land is used indiscriminately without a plan to meet the needs of infrastructure construction and urban development, with negative consequences on the environment. Severely polluted natural areas cause flood and drought hazards, biodiversity loss, cultural identity and riverside landscape neglected.

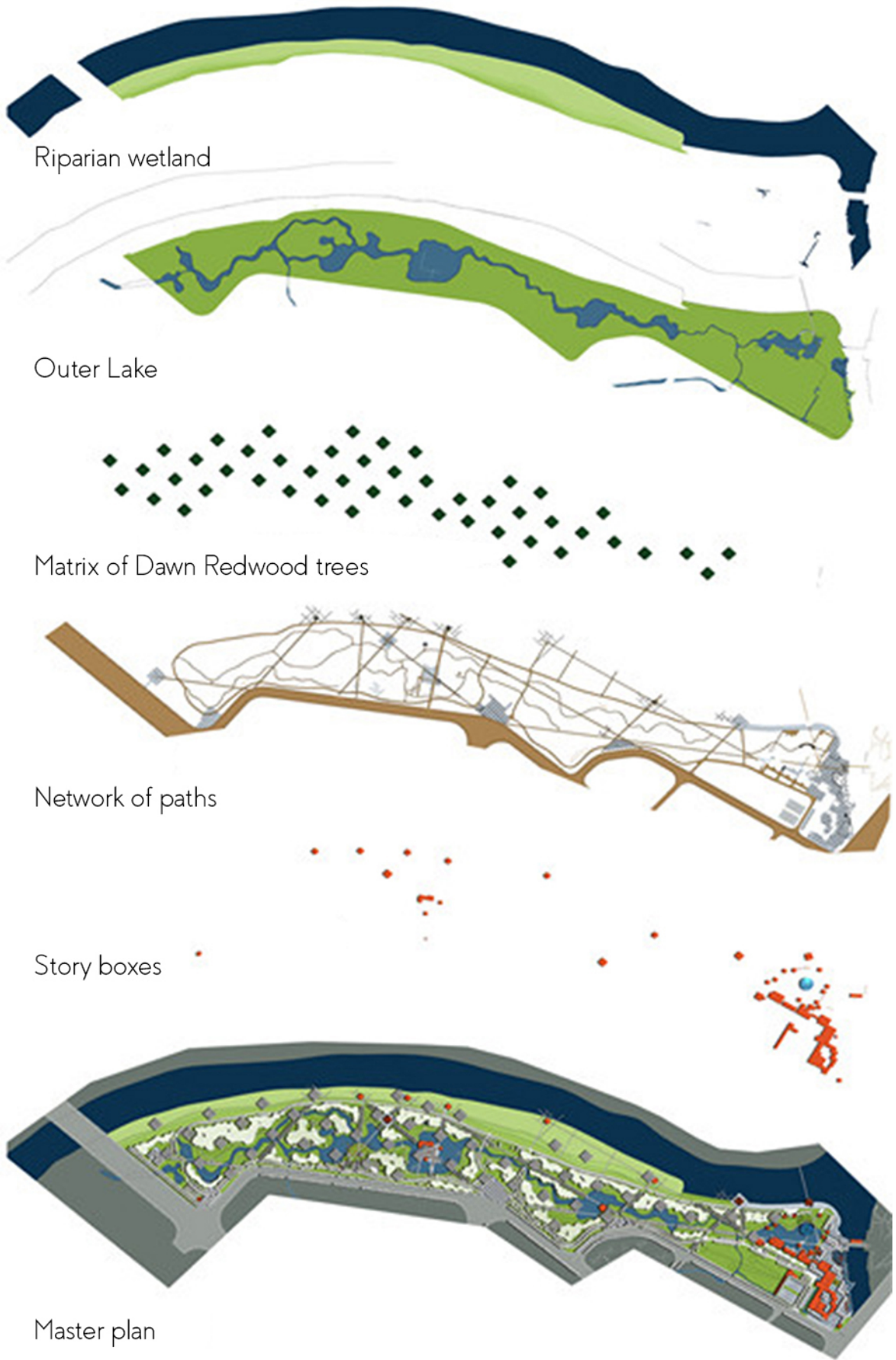
Yongning River is a historic river located in the East of the Taizhou city. In the past, the two banks of the river have been concreted to support the city's flood control policy. However, in 2002, the city government had a requirement to upgrade the area to a public park by the river to attract tourists and locals, while at the same time retaining its function in flood control and storm water management. The lead architect of the project - Kongjian Yu and partners, on the basis of designing a green space to protect nature, ensure the integrity and identity of the landscape, and provide a sustainable ecosystem for the residents bring the result are the floating gardens for the project. The project is a combination of a human matrixs where physical, cultural and social activities take place, mixed with a natural matrixs comprising wetlands and natural vegetation. Connect with simultaneously floating artificial gardens and story boxes. The design approach for the stormwater management of the architects was removed the old concreted area and proceed to persuade the local authorities to stop concreting the river in order to recovering the ecological of the whole rive. The concrete-lined is destroying the ecosystems along the river at the same time invisibly creates a distance between people and culture, history and traditional symbols of places of the river. The matrixs layer of nature is placed parallel to the outer river to help prevent flooding and manage stormwater.

During the monsoon season, the outer lake play a supporting role for the riparian wetland in flood control. While during the dry season, the outer lake keeps the water for the park. The human matrixs in the natural matrixs are areas that float or sink depending on the season. The matrixs of the story boxes are various contemporary works of art representing the culture and history of the homeland.

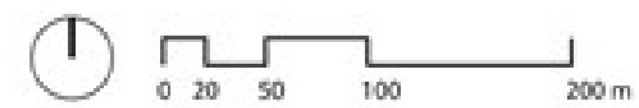
This project has a great significance in educating the community in environmental protection by demonstrating an ecological approach where human, natural and spiritual are in harmony with each other. Increasing cultural value and increasing biodiversity, while ensuring flood control and stormwater management functions.



The Yongning River shore has been concreted. Before being renovated
Source: turenscape.com/en/project/detail/4648.html



Layers of Landscape Elements
Source: turenscape.com/en/project/detail/4648.html



Master Plan Yongning River Park
Source: turedscape.com/en/project/detail/4648.html

- O1. Story Boxes (Scenery Tower)
- O2. Low Wetland Plantation
- O3. Floodable Area
- O4. North Entrance
- O5. Resting area under the trees
- O6. Story Boxes (Scenery Box)
- O7. Bicycle Path

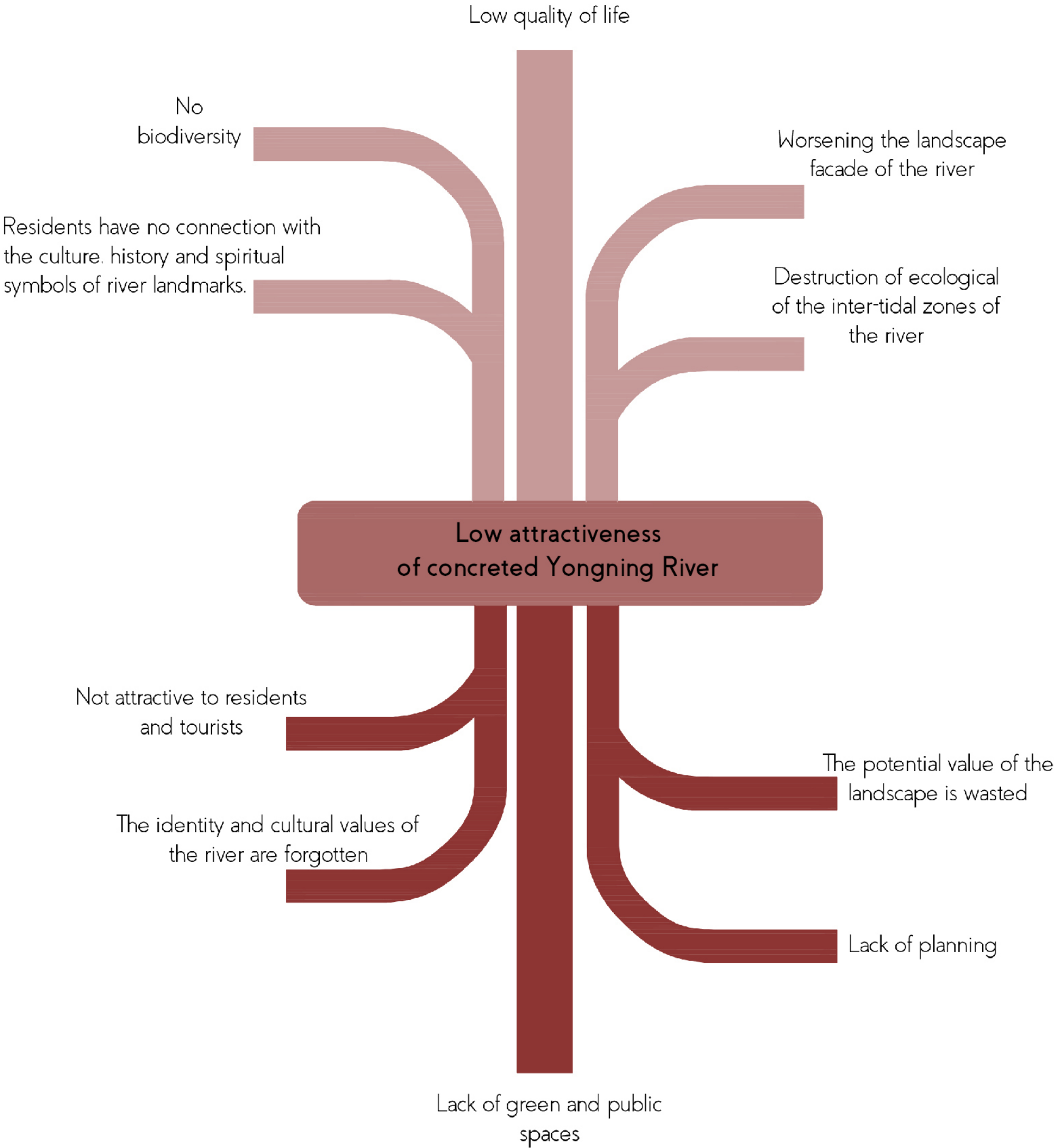
- O8. Secondary Entrance
- O9. Sports Field
- O10. Middle Entrance
- O11. Bicycle Parking
- O12. Villas
- O13. Event Field
- O14. Yacht Club

- O15. Fishermen's Dock
- O16. Skate Park
- O17. Commercial Area
- O18. Gate House
- O19. South Entrance

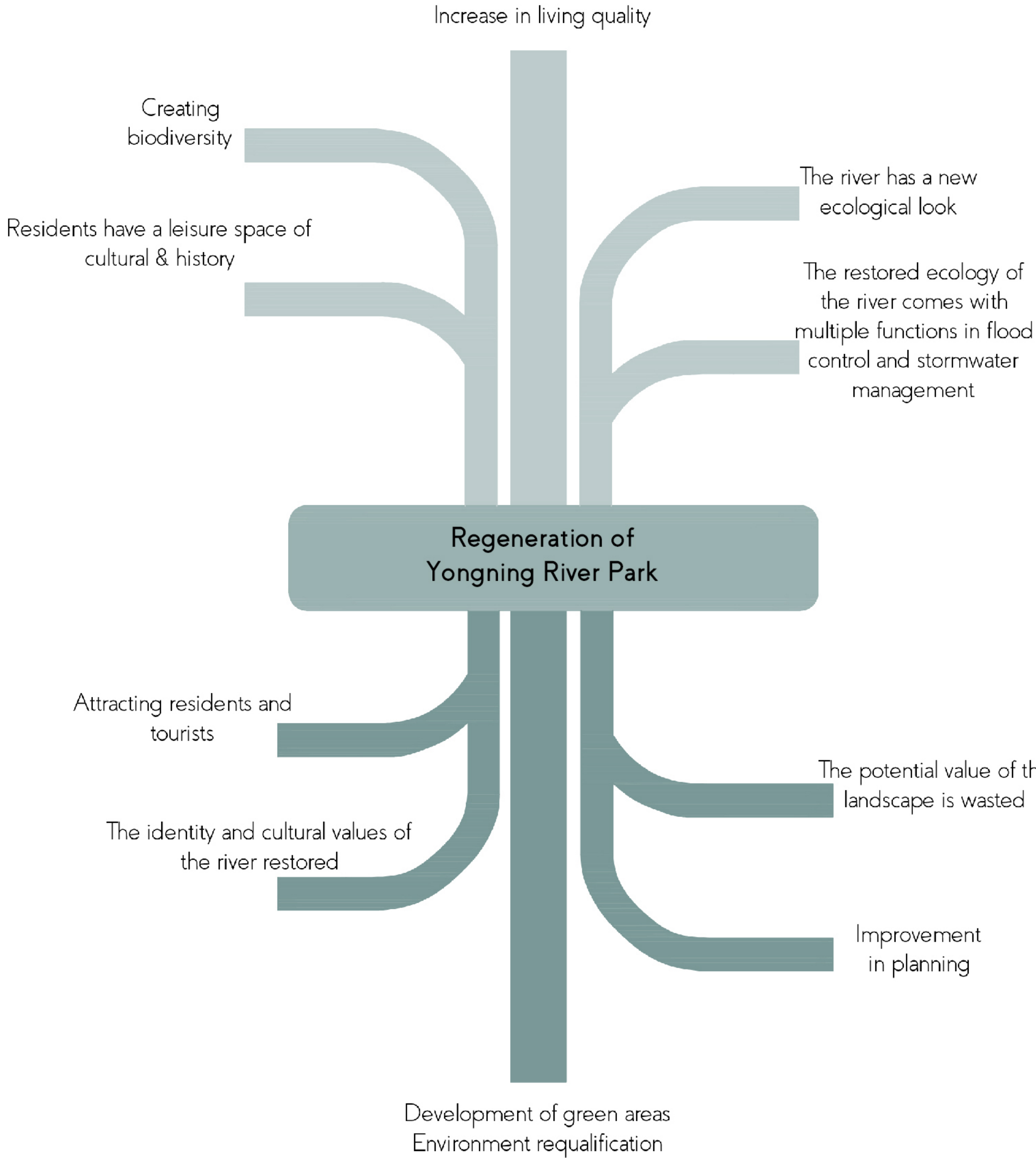
Landscape along Yongning River Park
Source: turedscape.com/en/project/detail/4648.html



Problem Tree Yongning River
Before



Problem Tree Yongning River Park
After Regeneration



Case study no 3: Madrid Río project Project Location: Madrid, Spain

Project Classify: Landscape Project Scale: 120ha Year: 2011

Designer: Urban Land Institute ULI Urban Open Space Award 2018, 12th Veronica Rudge Green Prize in Urban Design - Harvard GSD 2015, Zumbiel Group Award finalist in the Urban Developments & Initiatives Category 2014, Asprima-Sima Award for best urban development plan or urban renewal 2012 (Spain), COAM Awards to the Work of Architects 2012, FAD Award in City and Landscape 2012, Biennial Prize for Urban Project - XIII International Biennale of Architecture in Buenos Aires 2011, Finalist Dutch Design Awards 2011 (NL), Golden Swing Award 2010

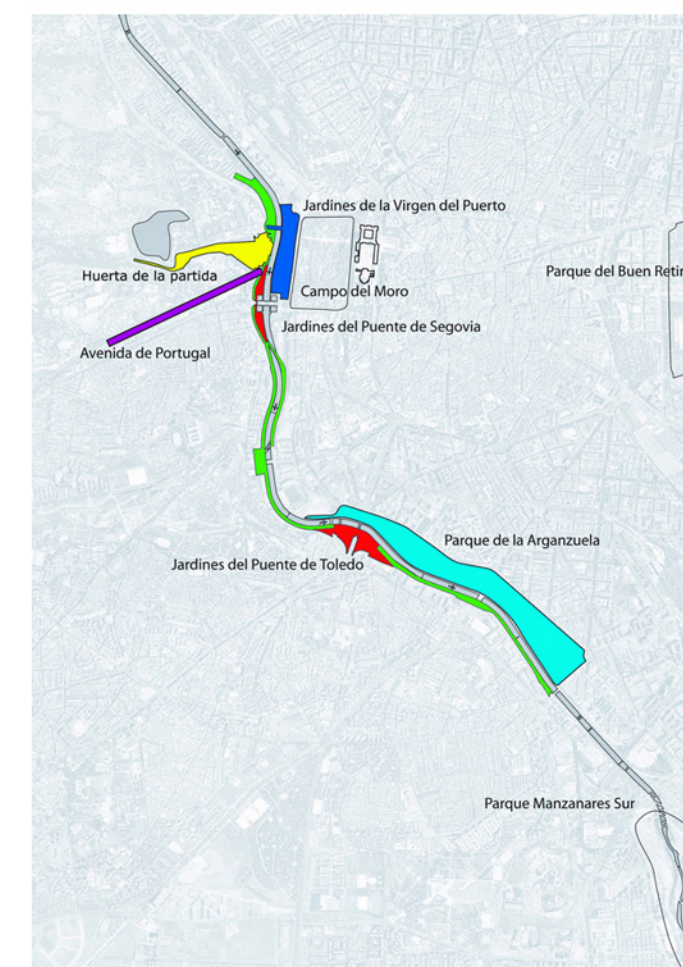
Client: Municipality of Madrid.

The context of the project is in 2003 when the Madrid city government decided to renovate the M30 ring road complex - a road that was formed and built over the past 40 years. In the process of designing the road, due to the lack of a long-term vision of the city planning, the road has caused many negative impacts on the overall urban planning of the city. It eliminates the city's connection to its river, providing an emotionless concreted space, noise and air pollution by 200,000 vehicles daily on the M-30 route, isolated communities and there is no tourism. The landscape value of the Manzanares River was completely wasted. The City Council and the West8 and MRIO design team have ambitions to rebuild the M30 route underground and replace it with a linear green space with a total area of 6,946,616 square meters. Intersecting with 6 central districts of the city, connecting the large green spaces already existing in the city. Making Madrid more balanced, sustainable and resilient, improving the quality of life for its inhabitants.

By relocating the ring road to the ground and providing underground parking for 1,000 vehicles, it is possible to convert this space into a garden to benefit local residents. The design team reorganized the space along the banks of the Manzanares River. This linear green space offers 11 newly footbridges for pedestrian and cyclist, many new artistic bridges were constructed and historical bridge were restored, connected with much old heritage make them useful again. 11 new children's play areas, 30kms for bike paths, 42kms for walkways, 21 new cafe, kiosks, and restaurants. Moreover, adding 53,000 square meters of open sports space with soccer, basketball, tennis, and skateboarding fields set up. Supplementing 4.29 ha of green space with more than 33,000 trees newly planted. The river's landscape value has been reclaimed, the water quality improved. Making it accessible to everyone and gradually becoming an indispensable part of the city, giving people around the area in general and visitors, in particular, a green space surrounded by rich vegetation also with a full range of sporting, recreational and cultural facilities. Mainly, the Madrid Río project not only provides a green ecological environment space for the city. It also builds an open community cultural exchange space, connecting communities together. Moreover, it increases the area of the urban frontage facing the river, making the urban structure and public spaces coherent. The project has been successful in creating a place where the landscape, architecture and urban infrastructure come together to create a diverse and sustainable environment. It becomes a shining example for other cities in order to develop urban sustainability and resilience.



Madrid Río Project Master Plan
Source: west8.com/projects/all/madrid_rio/



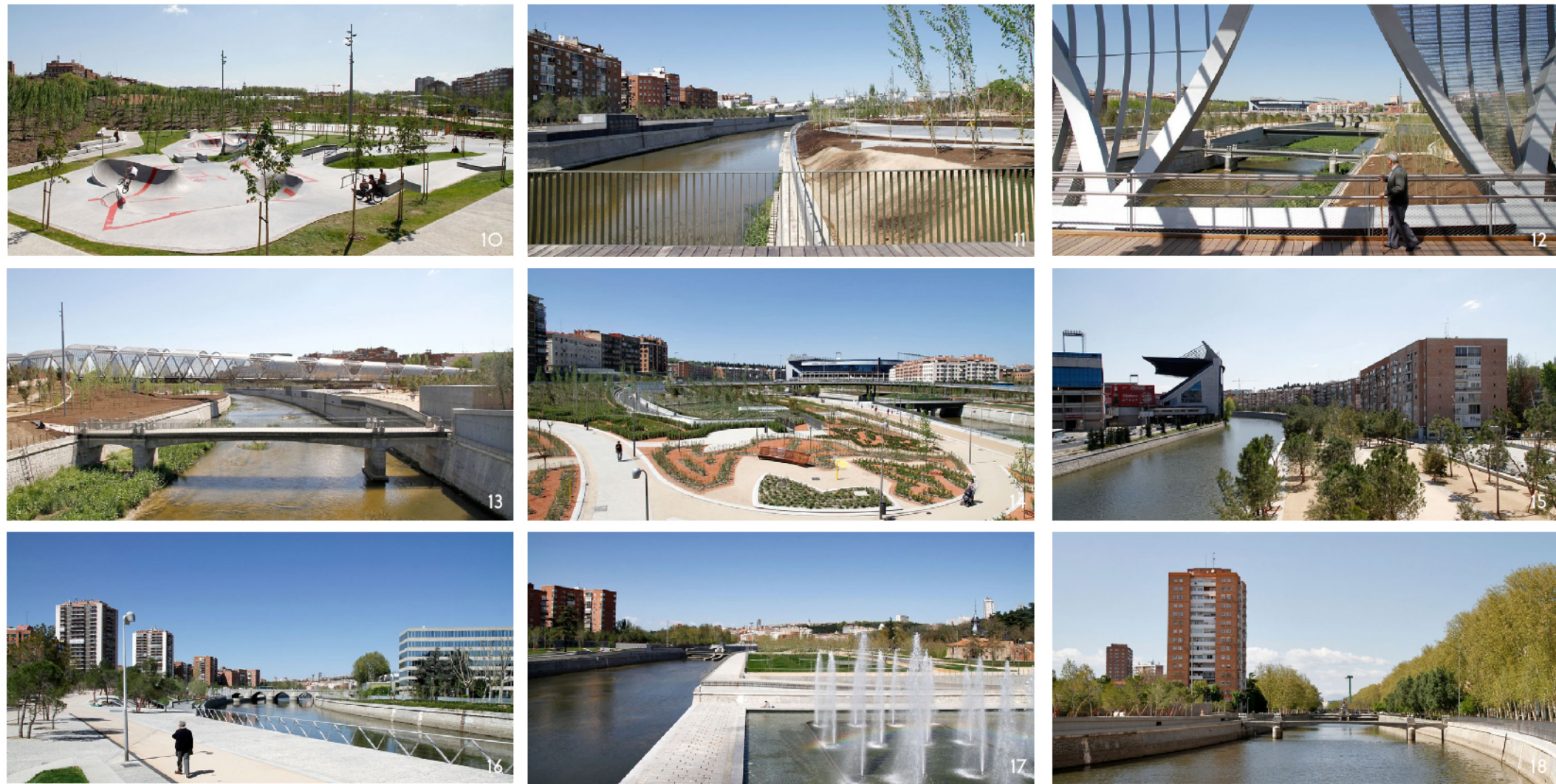
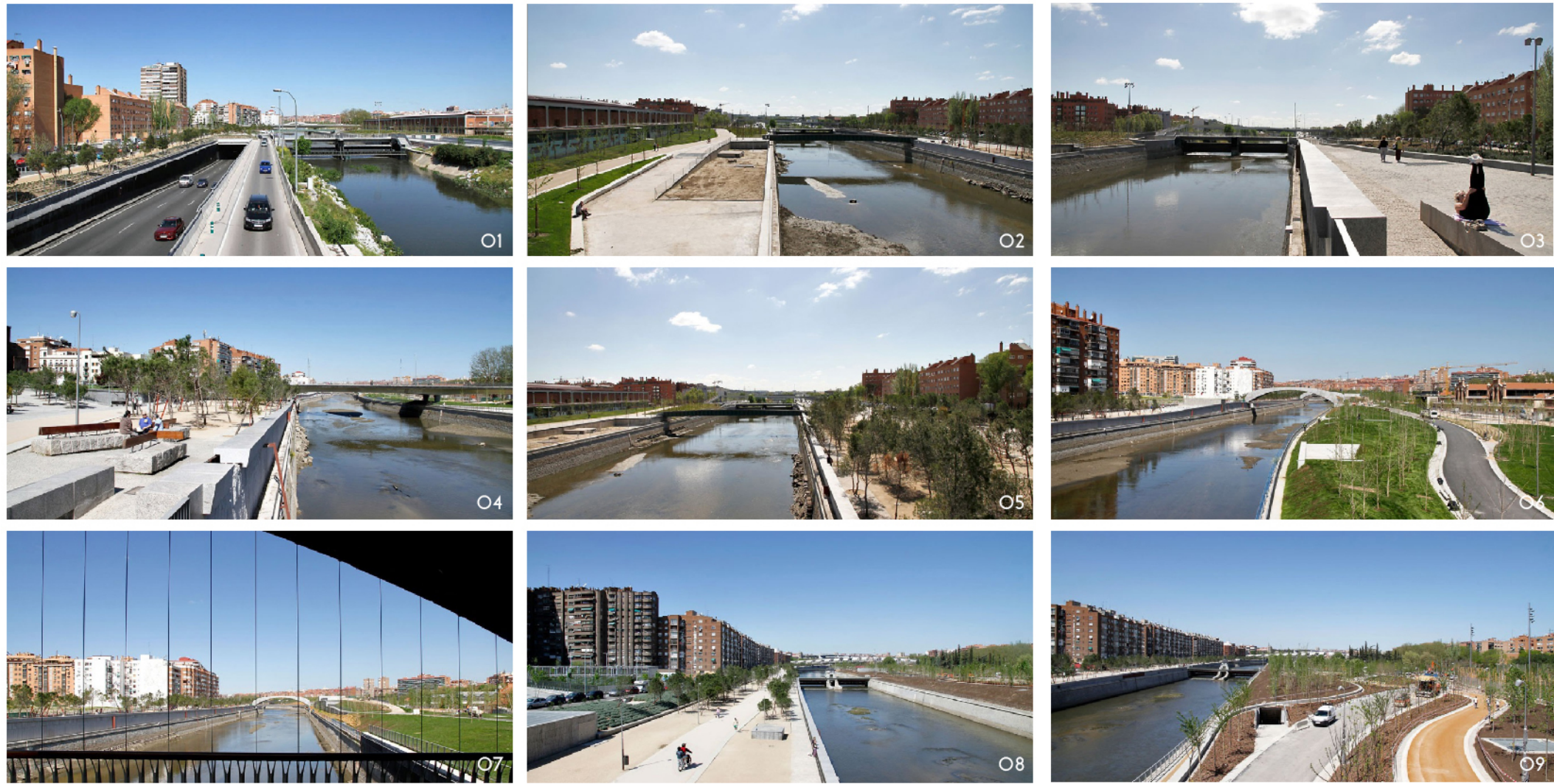
Map of functional subdivision Madrid Río project

Source: west8.com/projects/all/madrid_rio/

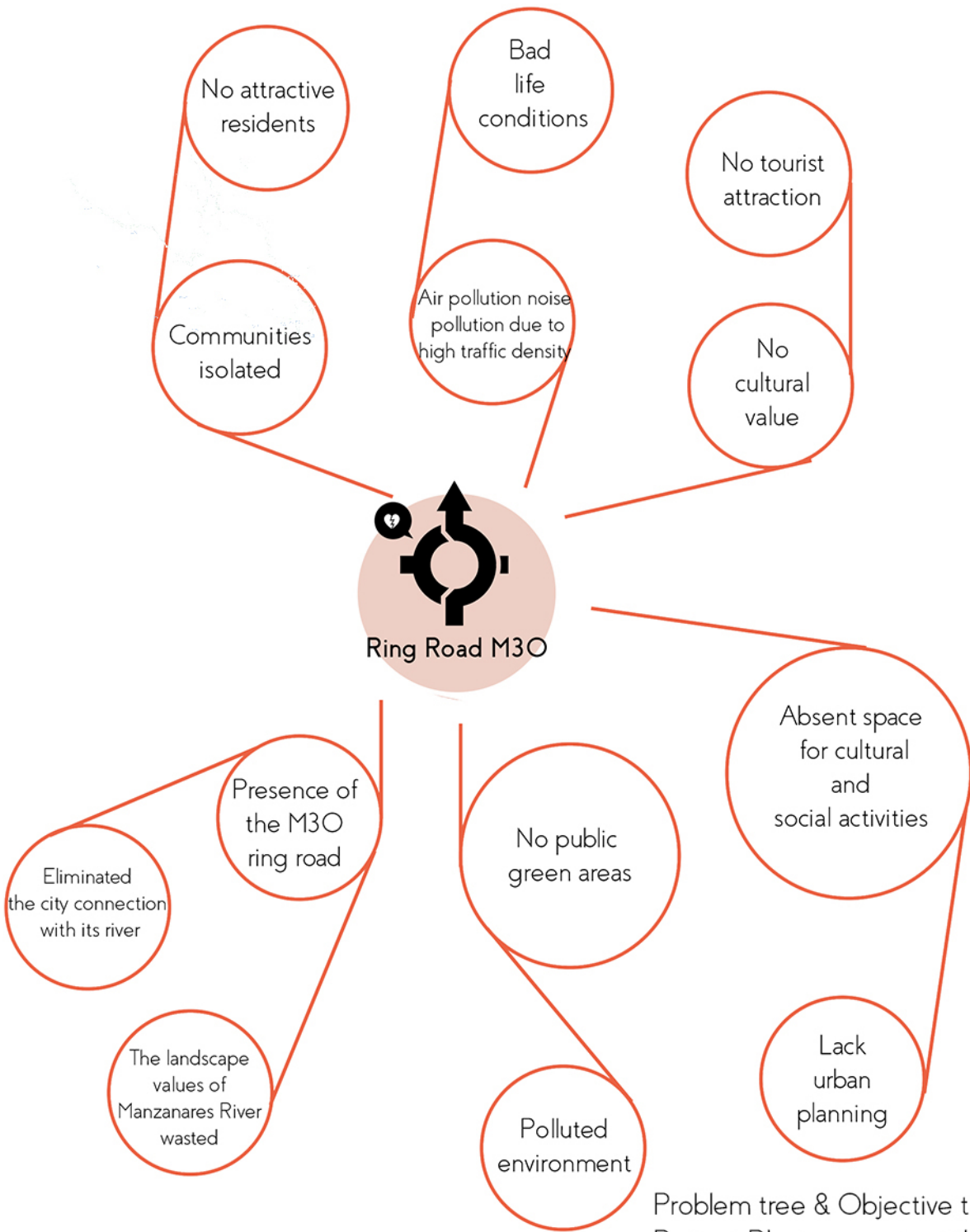
The Madrid Río project is divided into separate functional subdivisions: **Salón de Pinos**, **Avenida de Portugal**, **Huerta de la Partida**, **Jardines del Puente de Segovia**, **Jardines del Puente de Toledo**, **Arganzuela Park** and **Jardines de la Virgen del Puerto**. **Salón de Pinos** is a linear green space linking urban districts. Runs along the Manzanares river.

Avenida de Portugal is a green space decorated with cherry trees and cherry motifs. Below are old roads that are moved underground, as well as underground parking for more than 1000 vehicles.

Huerta de la Partida is an orchard that once belonged to the old Royal Palace, now renovated to form a closed space garden. **Arganzuela Park** along Manzanares canals, and the system of rivers flowing through the park enhances reciprocal value. **Puentes Cascara** is one of the main highlights of the project, aiming to increase the value of the experience for the park. The bridge is designed with a large concrete dome, inside the dome is decorated with art works by Spanish artist Daniel Canogar.



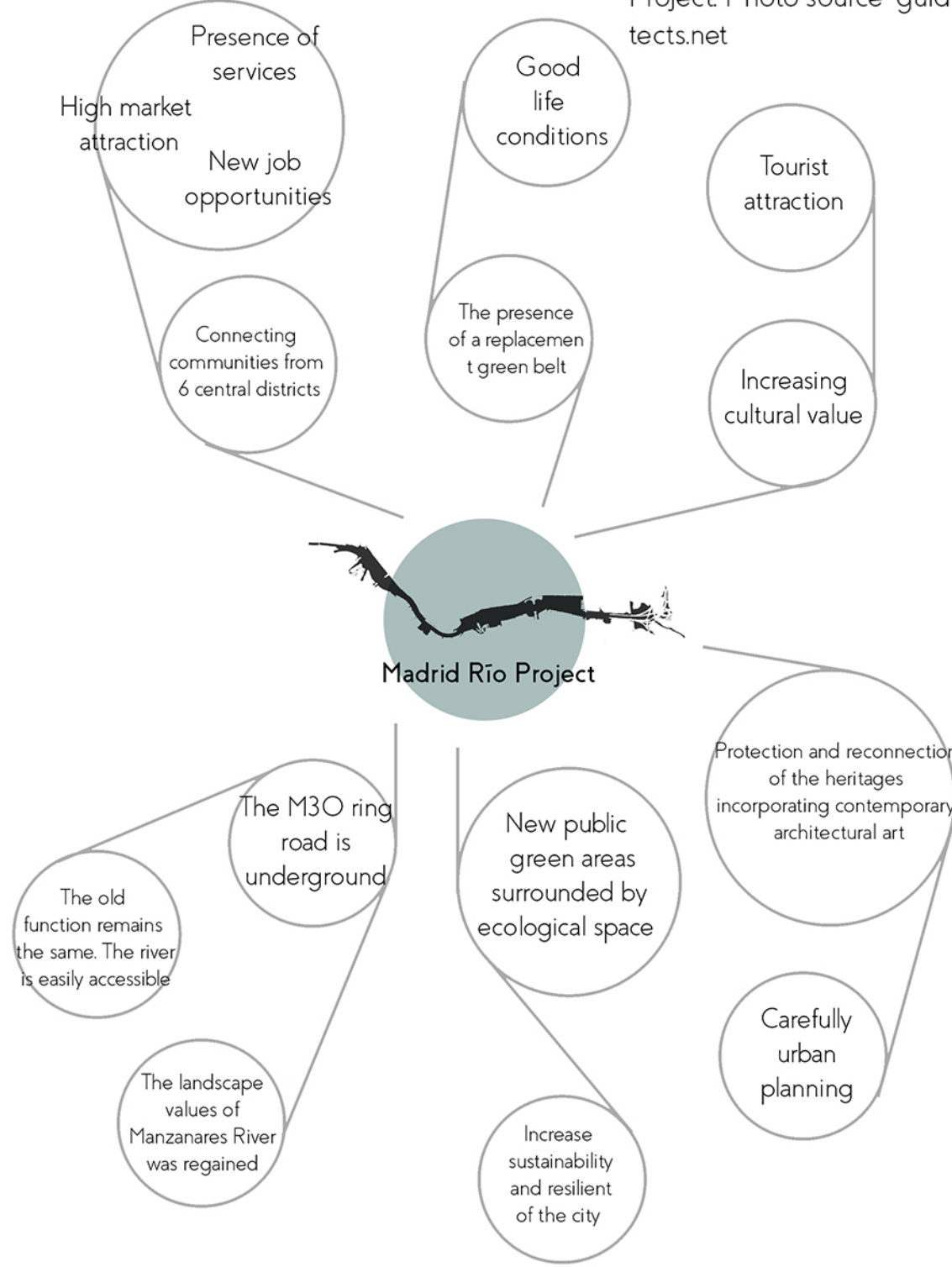
Problem Tree



Problem tree & Objective tree Madrid Río Project. Photo source: guiding-architects.net



Objective Tree



Master plan & Landscapes along Madrid Río. Source: idealista

Case study no 4: Shenyang Architectural University Campus

Project Location: China Shenyang City, Liaoning Province, China

Project Classify: Landscape

Project Scale: 21ha

Year: 2004

Designer: Turenscape

Award List: ASLA Design Honor Award 2005,

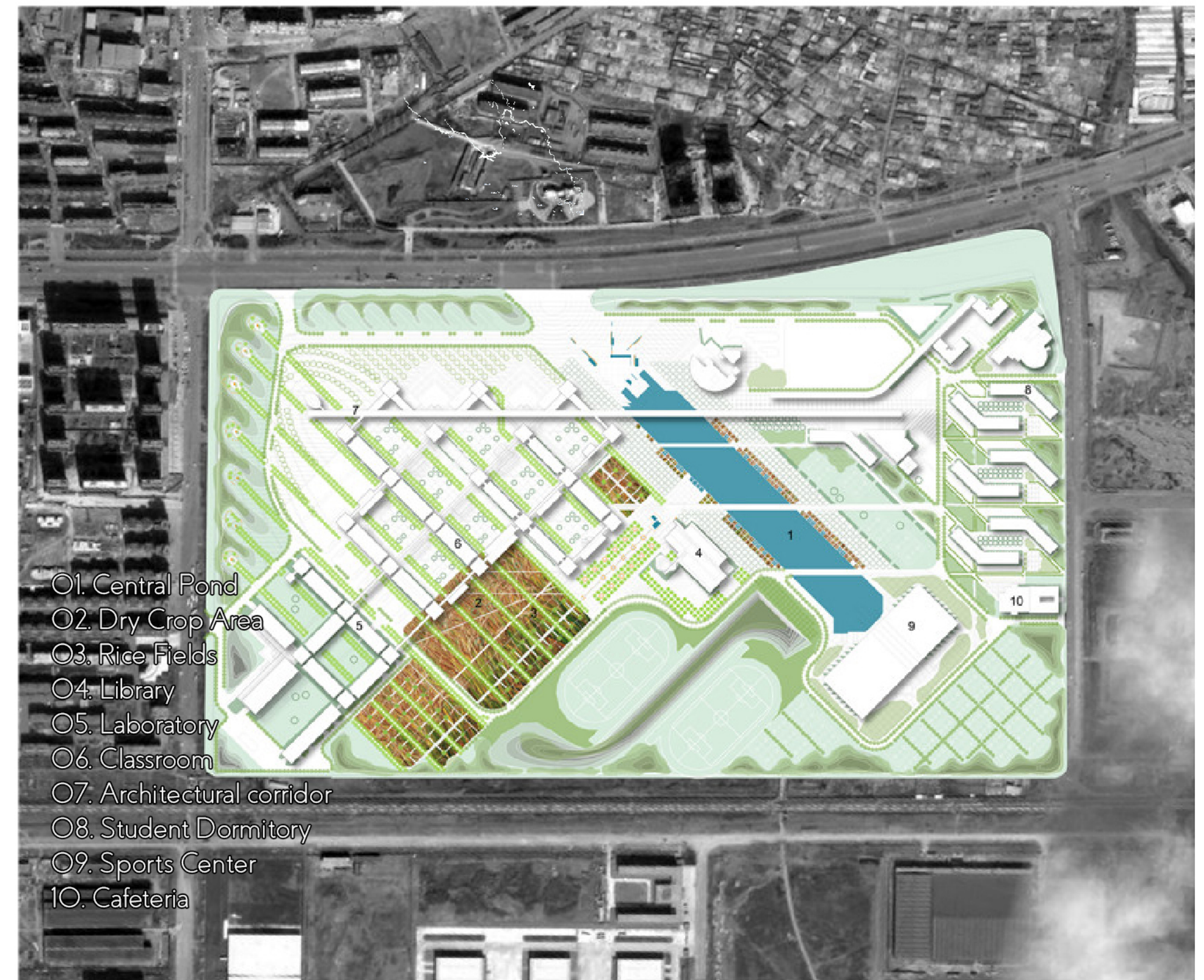
Ar Award Commended 2007 (The Architecture Review)

Client: Shenyang Architectural University

The context of the project in 2002 when the Shenyang city in Liaoning province in northern China under pressure of urbanization forced universities relocation to the suburbs to reduce congestion and overcrowding in the city center. The project is part of a campus on the southwestern side of the Shenyang Architecture University campus, which covers an area of about 3 hectares, with a limited budget with only 0.83eur per square meter allotted to the landscape because of the budget, book has been focused on building facilities for the new university building. In addition, the classes are scheduled to start in the fall of 2003, so the design and construction time is only one year.

The concept of this design is to use native agricultural plants for the landscape space. The aim is to increase students' awareness of land and agriculture. In addition, this is also an effective and inexpensive solution through design and management. The project selected rice because this is a typical and famous agricultural product of the locality. Especially because the characteristic cool climate can help the rice crop last longer (100 days) compared to rice crops in other regions, suitable for use as landscape material. In addition, other indigenous plants are also used intertwined such as buckwheat. Students and faculty are involved in farming and harvesting, and rice harvested and produced on campus with the 'Golden Rice' label is sold as a souvenir for visitors of the university. The landscape of rice and the Golden Rice label has become the symbol of the university.

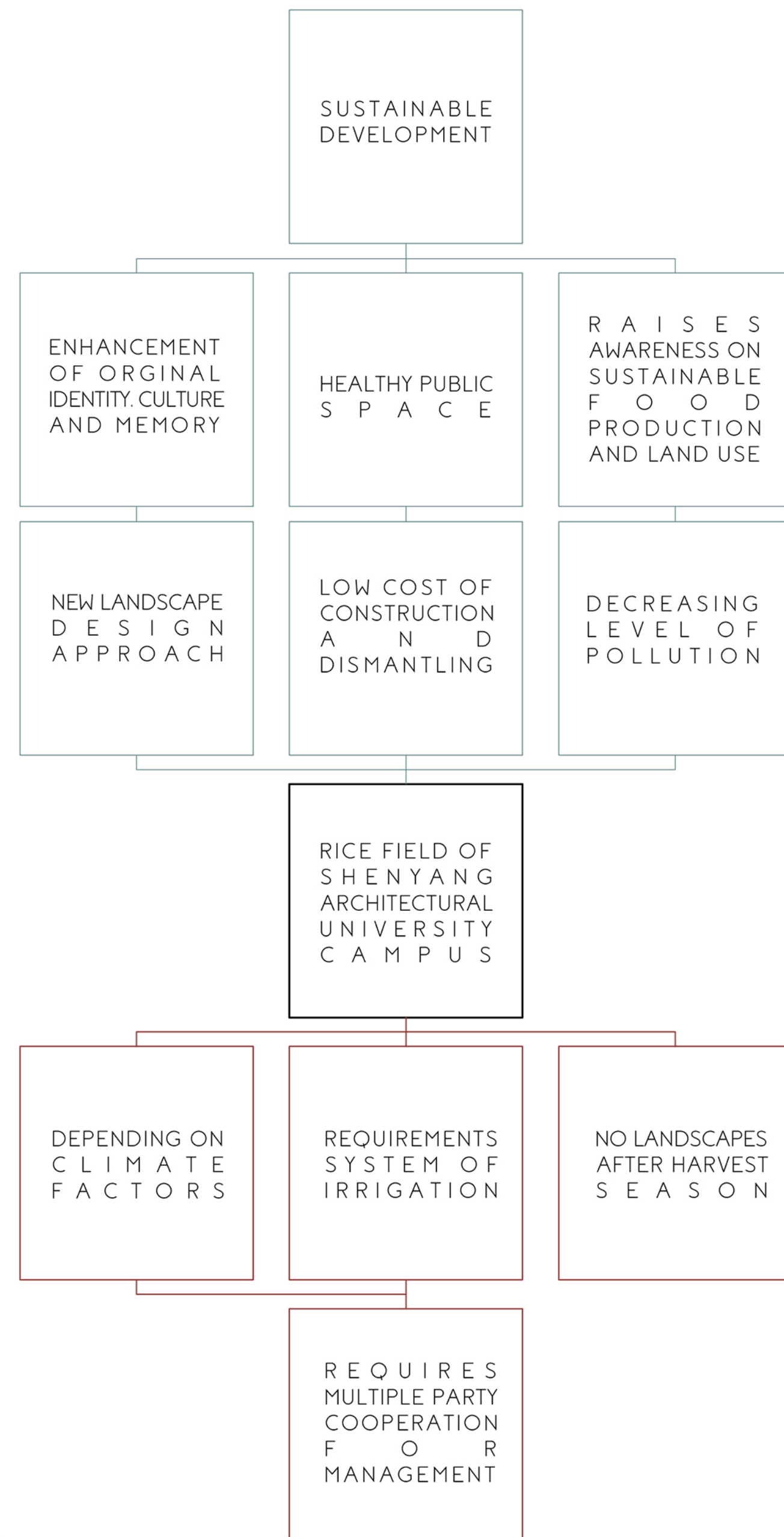
The inclusion of agricultural crops in landscape architecture means a lot. Firstly, it raises awareness of the people in general and students in particular about food production and sustainable land use. Rice is the main ingredient in every meal of the Chinese people, it brings cultural and historical significance to the land. Especially when rice fields are located in an architecture school, and each student is involved in the agricultural production process, that helps every new student have an overview of sustainable design.



Master Plan Shenyang Architectural University Campus
Source: turenscape.com/en/project/detail/324.html

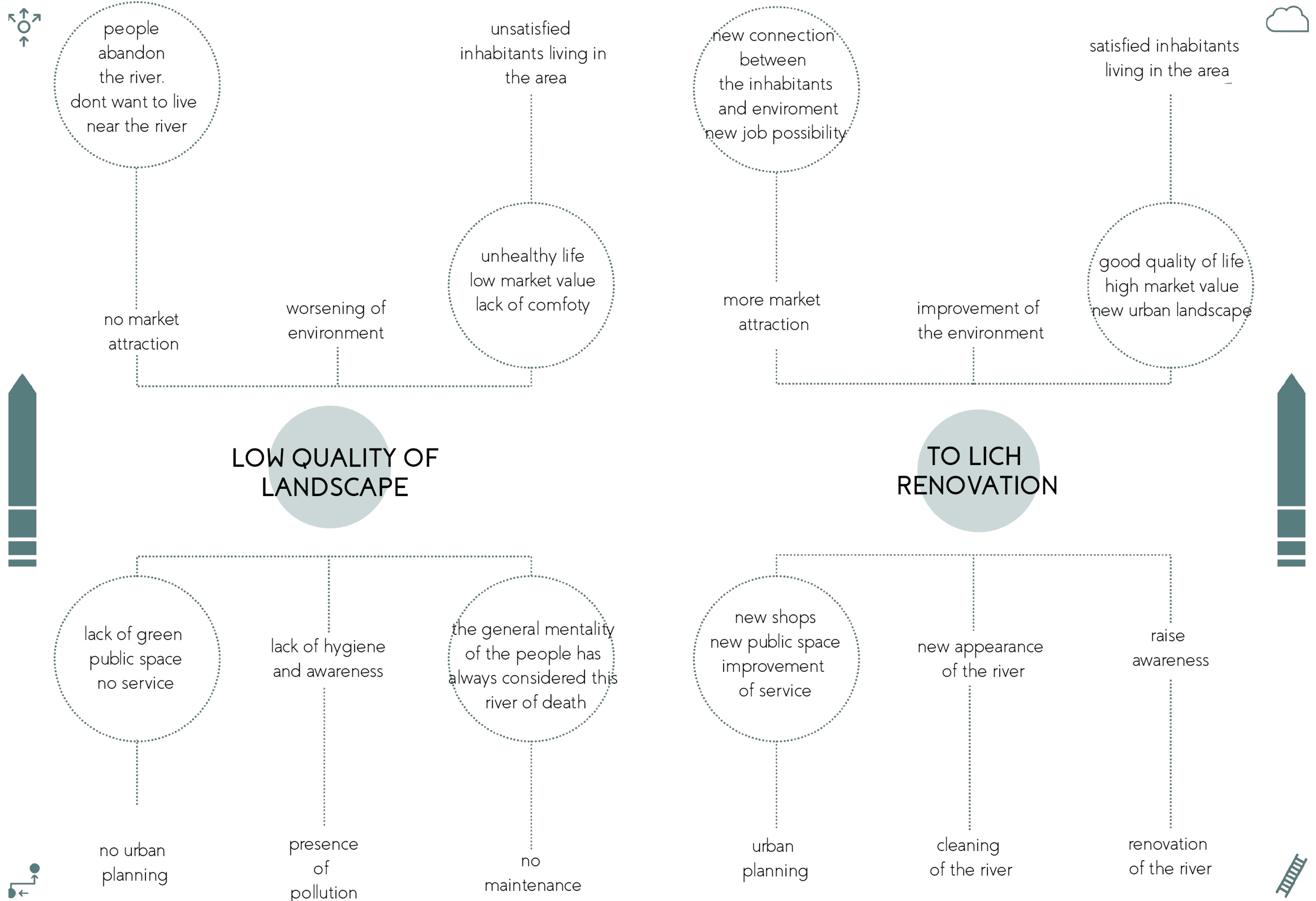


Shenyang Architectural University Campus
Source: turenscape.com/en/project/detail/324.html



In conclusion, through the analysis of those case studies, the objective was to understand the elements that build a landscaped space and to propose a project concrete redevelopment by defining the execution phases. In order to learn valuable in defining the objectives for the thesis which was thus confronted with projects real landscapes with their negative aspects and positive results. Case studies all have in common that projects always take into account the role of culture, history, territorial identity to turn it into major landmarks. The projects are always a combination of a landscape architecture with modern breath and a cultural environment rich in traditional identities. In addition, the sociological factor has always been the most important, in the Cheonggyecheon Stream landscape improvement project transformed independent social research institutions, with sociological approaches and processes. The section is researched, calculated with certainty and concretely, taking into account all problems, problems, conflicts of interest that may arise in the short or long term in the river space. The change in revolutionary consciousness and spirit leads to sustainable development, civilization and opens up to the identification of policies oriented toward renovation of social landscapes, and improvement of river landscape. Offering a sustainable design plan where the human city is open to the ecological environment, where flood risks are minimized, nature is introduced into the environment of social life, reducing noise and smoke, discharging harmful substances. A sustainable city and resilience. Sustainability factor is always considered on four aspects of society, environment, economy and cultural identity towards the sustainable development of society. The Yongning River Floating Garden projects and ShenYang Architecture University Campus's rice field feature designs that blend cultural and social elements harmoniously with environmental or agricultural factors in order to recover the cultural identity and rebuilding the spiritual connection between the people and their land. At the same time, condemning the special use of concrete in the cultural natural landscape, one of the problems of developing countries in particular and the world in general.

Problem Tree of Shenyang Architectural University Campus



SWOT Analysis

PRESENT



STRENGTHS

POLITICAL

- + Presence of green urban heritage

ECONOMICAL

- + Presence of lively commerce activities. next to the river

SOCIAL

- +The general desire for the renovation of the citizens
- +Presence of public space for social cohesion

ENVIRONMENTAL

- + Presence of interesting landscape features
- + Pedestrian quality
- + Hilling landscape that surrounds the area

WEAKNESSES



POLITICAL

- + Lack of urban design in the area
- + Disomogeneous development in the surrounding

ECONOMICAL

- + Lack of public space and public services

SOCIAL

- + Low accessibility due to pollution for many years
- + Lack of hygiene and street maintenance. low attention for the river

ENVIRONMENTAL

- + Air pollution and odor pollution

FUTURE



OPPORTUNITIES

POLITICAL

- + Integration in the transport network improving connections
- + Attraction of the new residents. new tourists
- + Improvement of the facilities

ECONOMICAL

- + Increase in tourism. because of restoration and integration of the heritage
- + Integration of shops and creation of a commercial network
- + Increase in property prices

SOCIAL

- + Improving the life quality of the current resident
- + Involvement of the community and social inclusion

ENVIRONMENTAL

- + Generation of new public spaces and green areas
- + Economic development following the use of the river

THREATS



POLITICAL

- + Lack of environmental policy

ECONOMICAL

- +The construction and maintenance cost requires costly

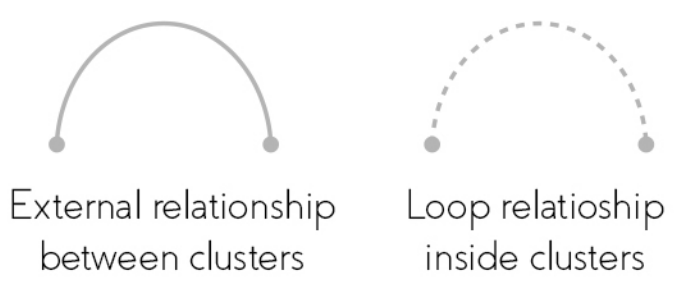
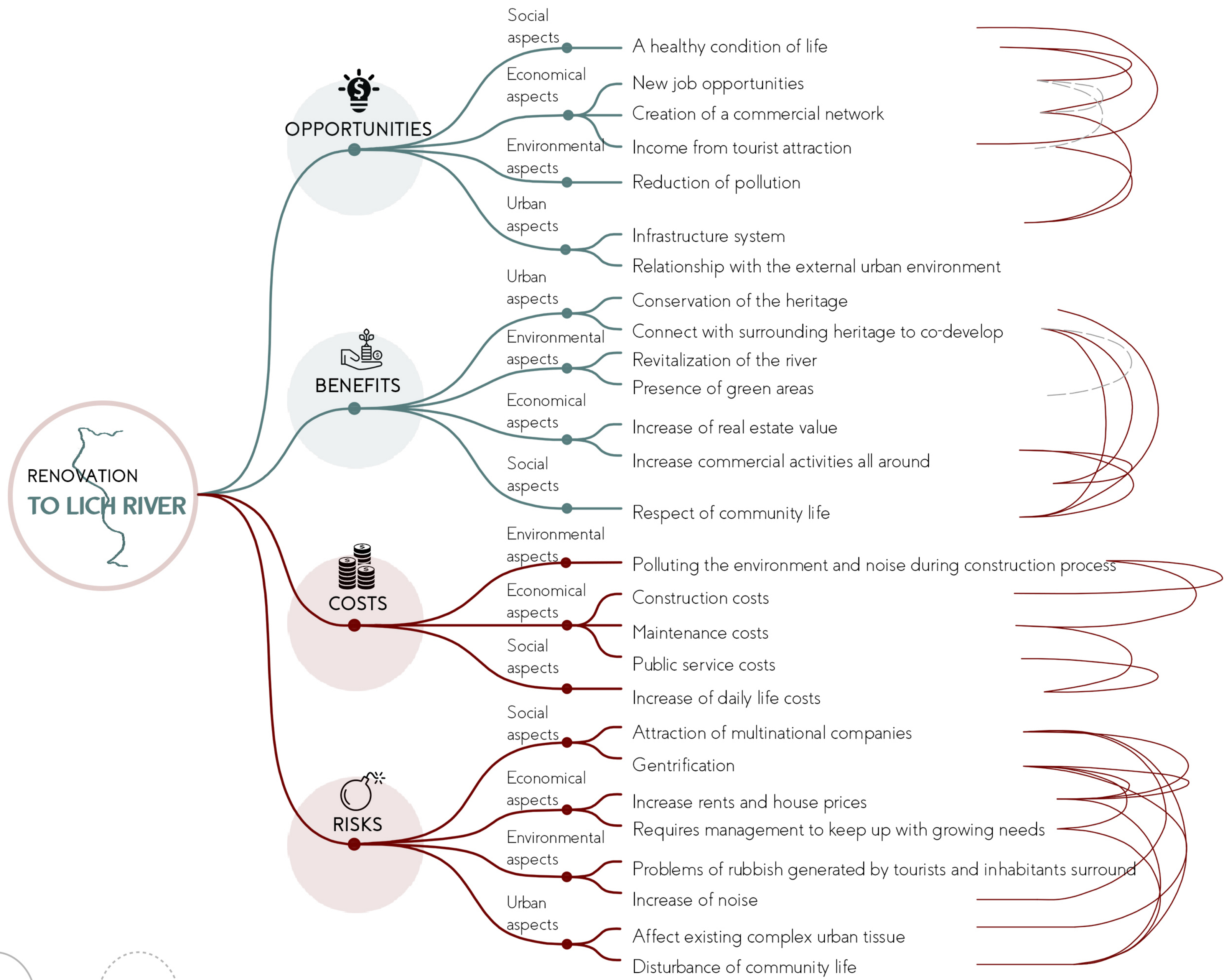
SOCIAL

- + Awareness of the people and visitors in keeping the river sanitary
- + Risk of creation of dormitory neighborhood reducing diversification of activity

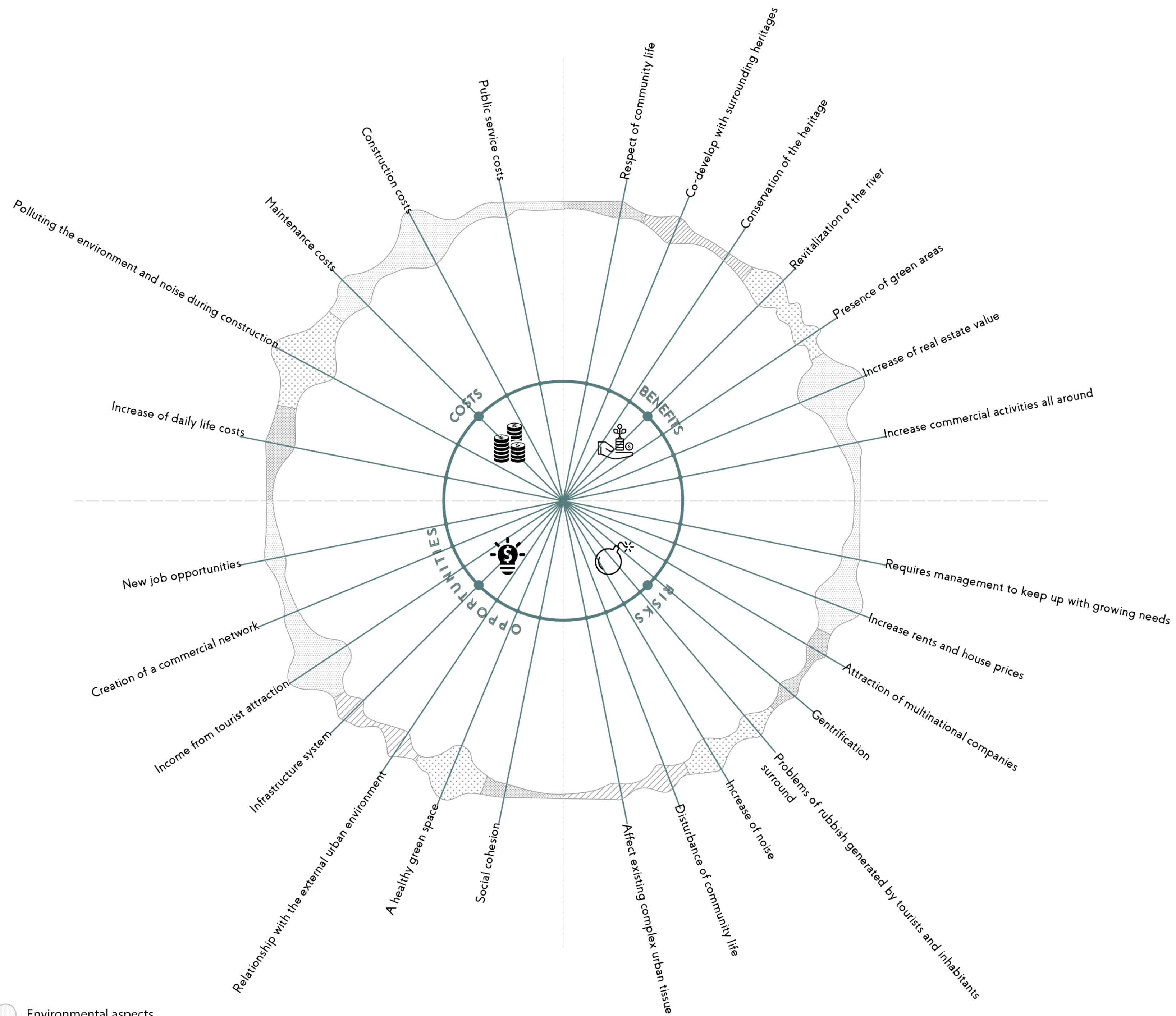
ENVIRONMENTAL

- + Lack of public-private coordination

SWOT Analysis



Priorities of the alternatives



- Economical aspects
- Environmental aspects
- Social aspects:
- Urban aspects

TO LICH RIVER POTENTIAL

The purpose of the topic is to find a suitable landscape design restoration plan for the river, where the old values associated with the river are restored and enhance them in To Lich's current life as well as the urban river in the city.

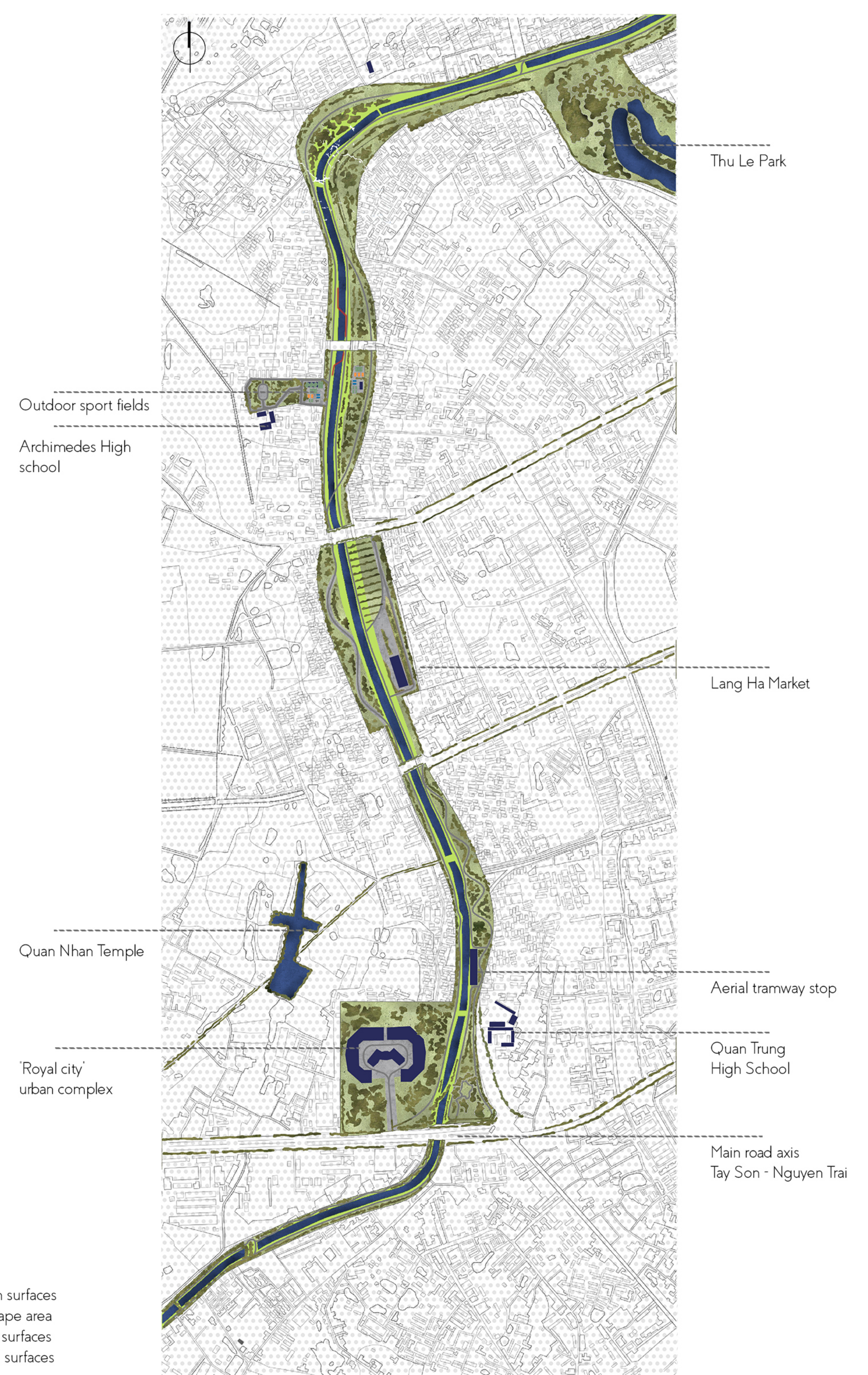
Roncalo (1995), in the article 'The river, bearer of urban images: forms and challenges' has described the value of the river as a race against the present that expresses the identity and image of the city. (Roncalo, 1995). With the same point of view, Girot (1999) talks about the value of the landscape not only in terms of the environment but also with regard to the identity and culture of the land. As a basis for connecting the spirit between people and their land (Girot, 1999). Thus, the values of To Lich River are the historical-cultural value, its value in the urban composition, its environmental value, and ecological. It is an agricultural and rural space in the city, having a value of social space with spiritual, religious, and entertainment activities. To Lich River is a natural component with water surfaces, vegetation, and the natural environment, a rural agricultural space in the city. The value of cultural activities constitutes the basic material for the development of tourism, and therefore the economy: the value of tourist activities, conversely, develops the economy, then culture. The opening of a pathway intended for socio-economic uses carrying a landscape project provides the benefits and potential of local economic development.

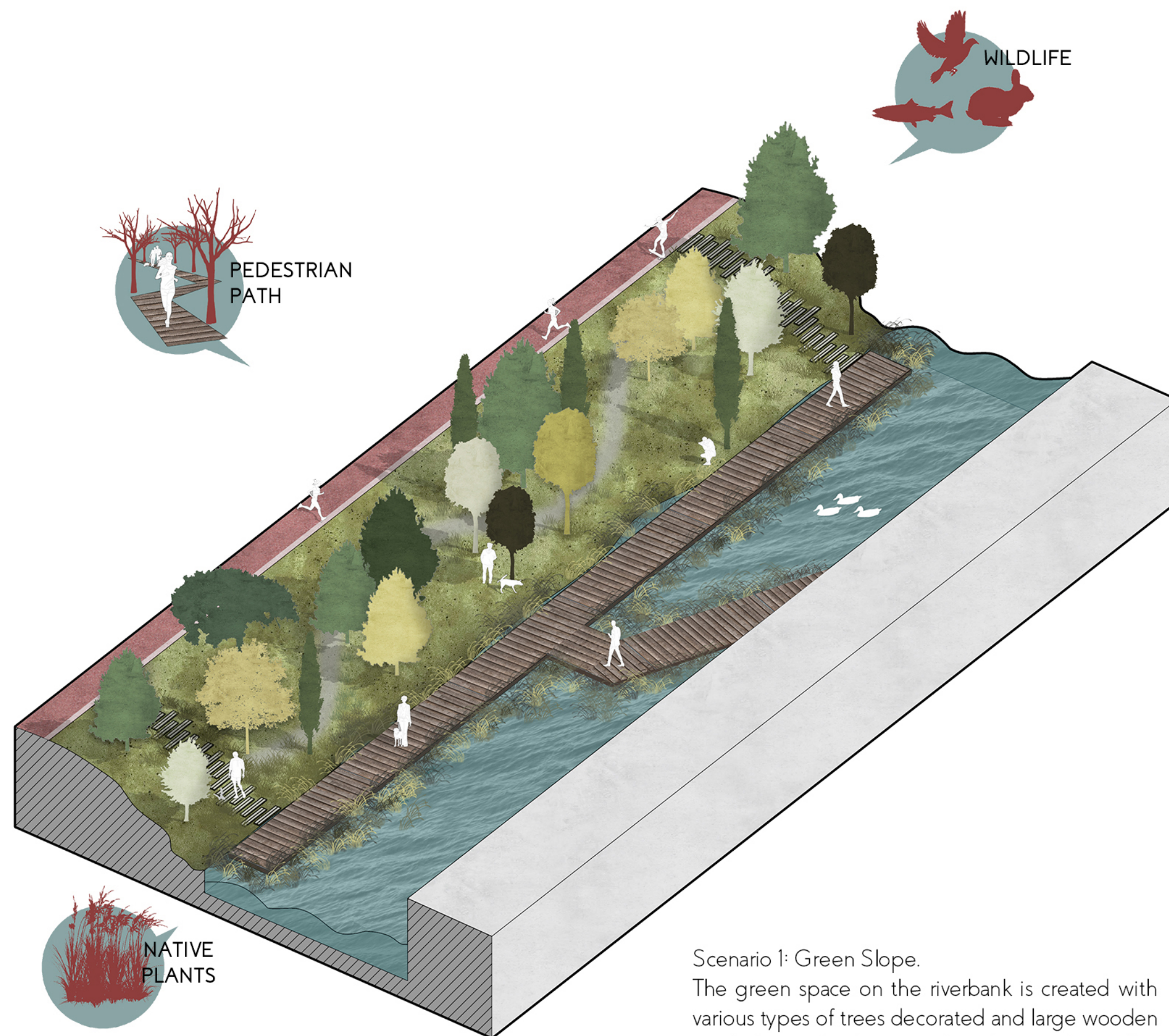
A socio-cultural space, leisure areas with green spaces, heritages, and heritage spaces along its course with spiritual, religious, and entertainment activities. The landscape and the aesthetic value of this landscape to the aesthetics of Hanoi city are essential as it can allow for balanced urban growth during today's rapid urbanization.

The proposed To Lich river improvement option is to develop a green park to turn it into a place of public living and a natural environment along the river. The buildings on the western side of the river would be removed to accommodate enough land, as the old green spaces on the banks of the river were too thin to fulfill its function.

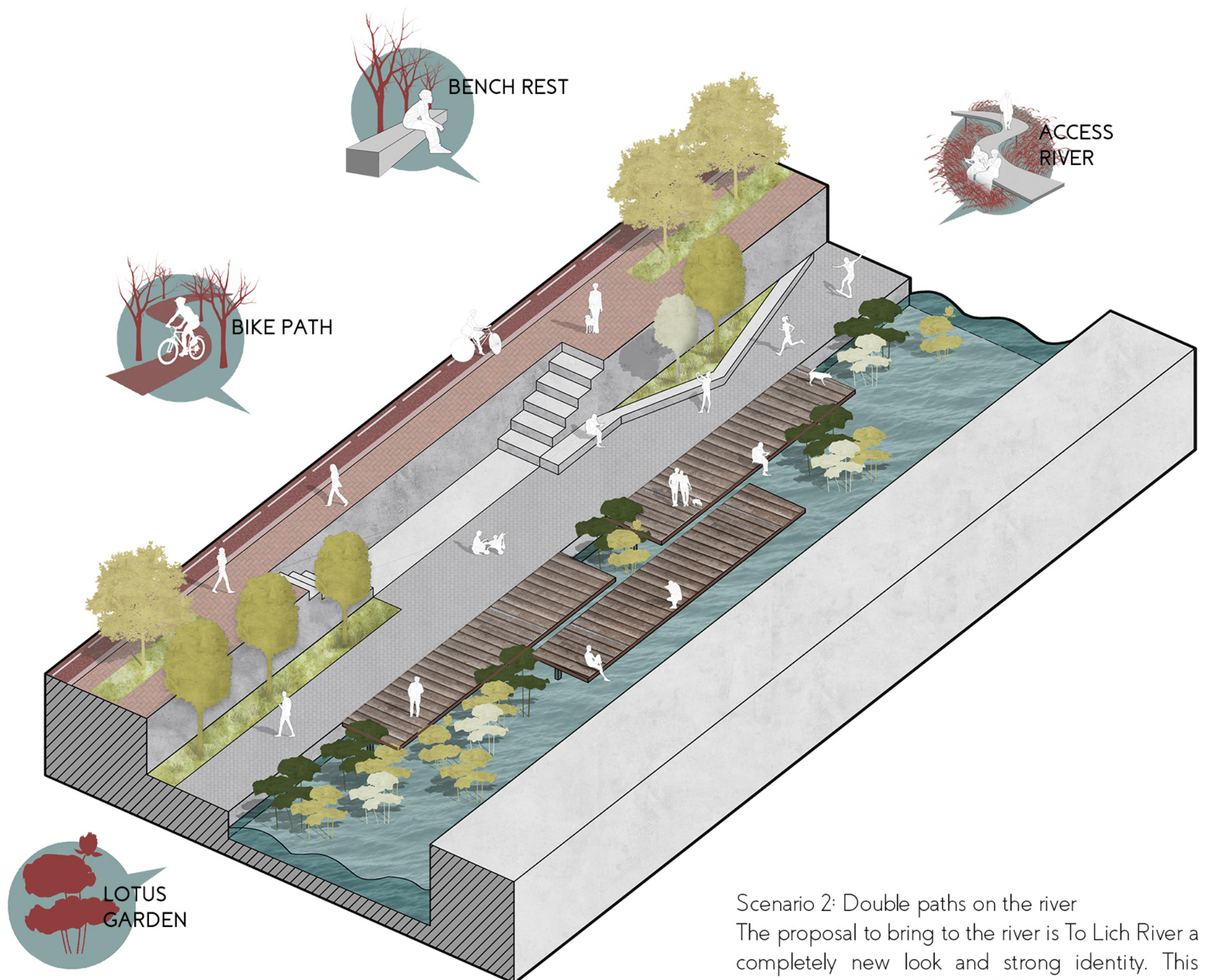
Based on the analysis of the landscape territory of the To Lich River, area 2 is a great unexplored potential, which is a suitable area for the rehabilitation option because there is enough water surface area appropriate and especially under the impact of urbanization, the area seriously lacks public green space. The alternative is not aimed at the detailed design of the sites but towards the formulation of design strategies. The bottom line is the creation of open public and service areas, although the outer park not only simple addition of green surface in the cementified conurbation but is a instrument to address a major number of topics. The first is to ensure ecological continuity along the To Lich river in the north-south direction of Hanoi city. Second, Create a green space to prevent floods, at the same time a space for plants, animals, and people to share with each other. The pedestrian and bike paths interspersed with green landscape spaces running along the river banks, encouraging slow mobilities, integrating cultural, entertainment and educational activities, urban agriculture. Old buildings such as the urban complex 'Royal City', Lang Ha market, Thu Le park ... are retained and combined with green space, reinforcing each other.

- Green surfaces
- Landscape area
- Water surfaces
- Paved surfaces

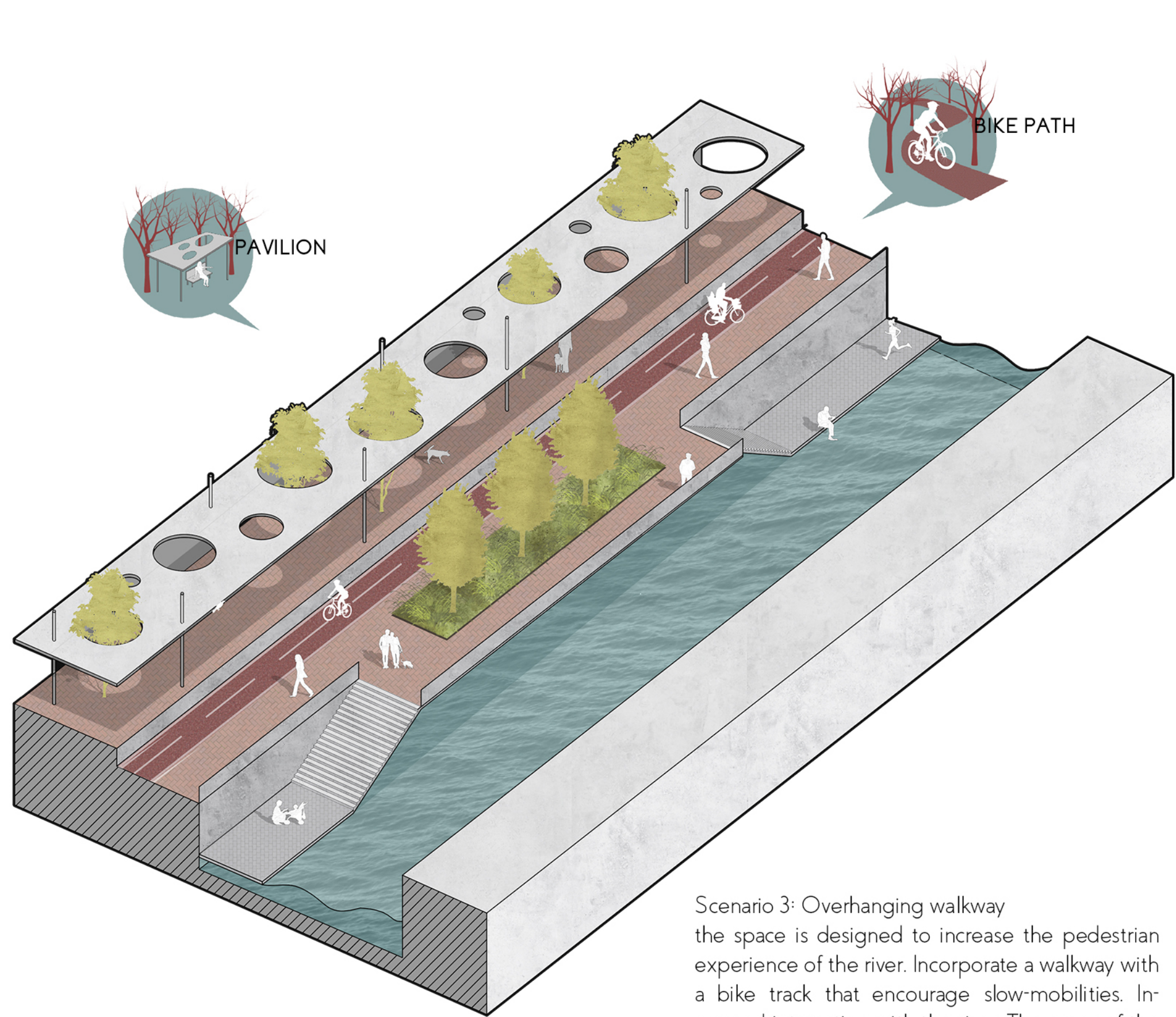




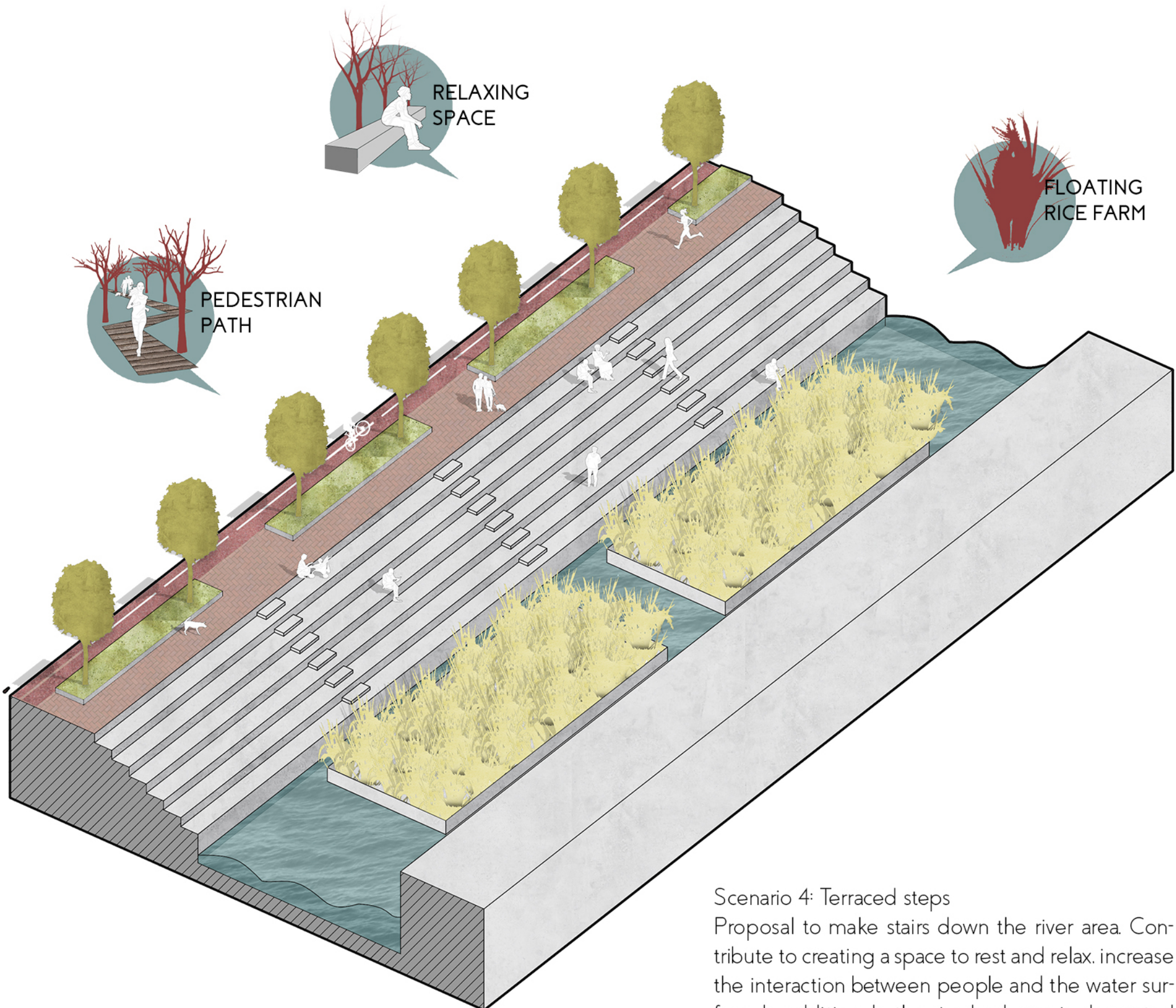
Scenario 1: Green Slope.
The green space on the riverbank is created with various types of trees decorated and large wooden trunks. located in the riverside is the wooden trail to increase interaction between people with the river. In addition, the two banks of the river interspersed with native aquatic plants. With the aim to create a favorable environment for natural vegetation as well as animals to develop. In order to increase biodiversity, sustainability, and climate adaptation for the space. This is a typical area of the project, with little human intervention in the architectural landscape design with the ambition to create a safe natural green space and attract people and tourists in the urban area. Moreover, this area also plays a role in keeping land for future conversion purposes



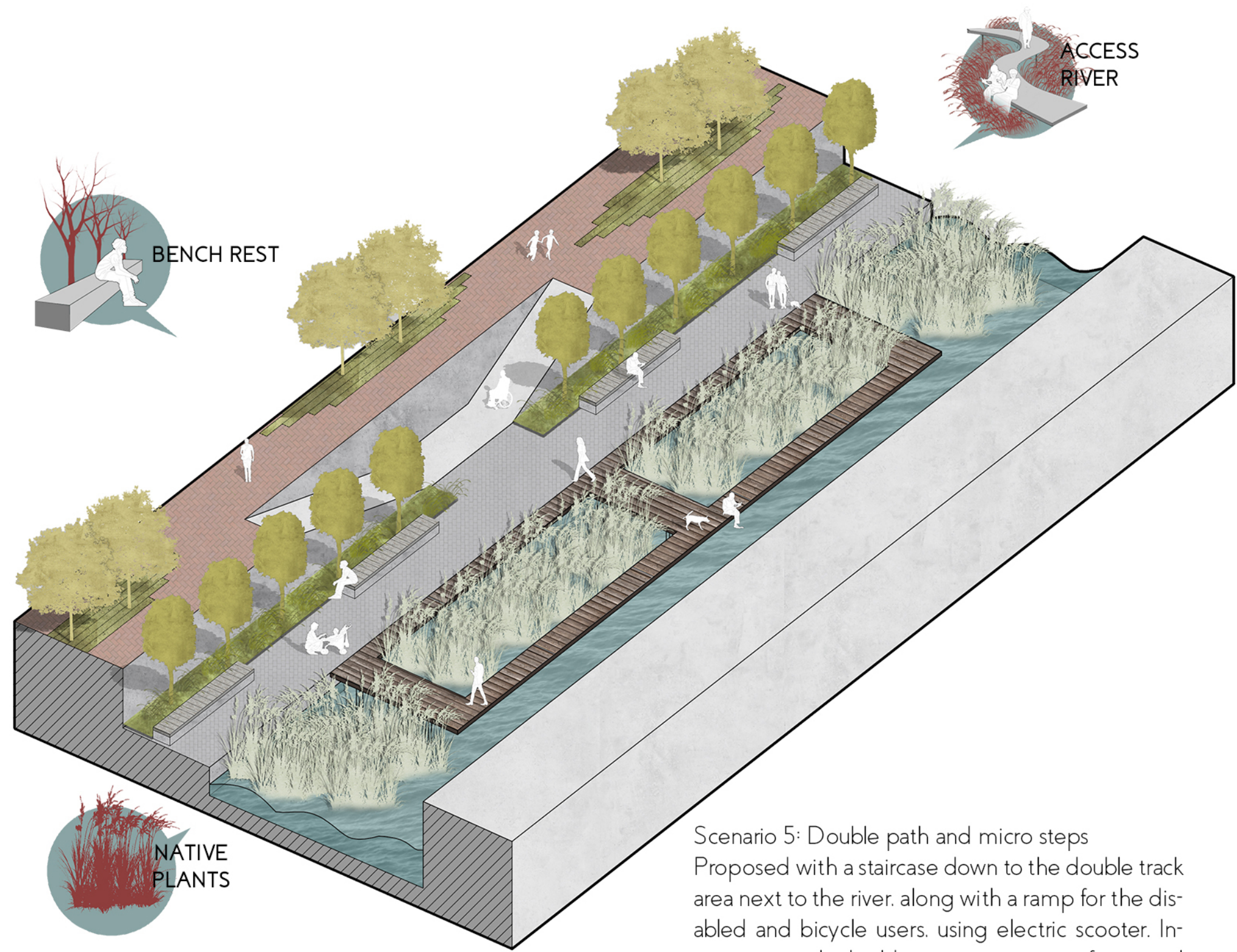
Scenario 2: Double paths on the river
The proposal to bring to the river is To Lich River a completely new look and strong identity. This design language will be used throughout the project. The space for pedestrians and cyclists is raised above, below the river is a walkway along both sides of the river to increase interaction between people and the river. On the riverbank is a large floating wooden trail combined with a lotus garden, to create a leisure space, helping people get closer to the natural element here is the river. The result is a completely new type of urban park that offers new safety and recreational opportunities for residents while adding more aesthetic, sensual, and human values that were not previously available.



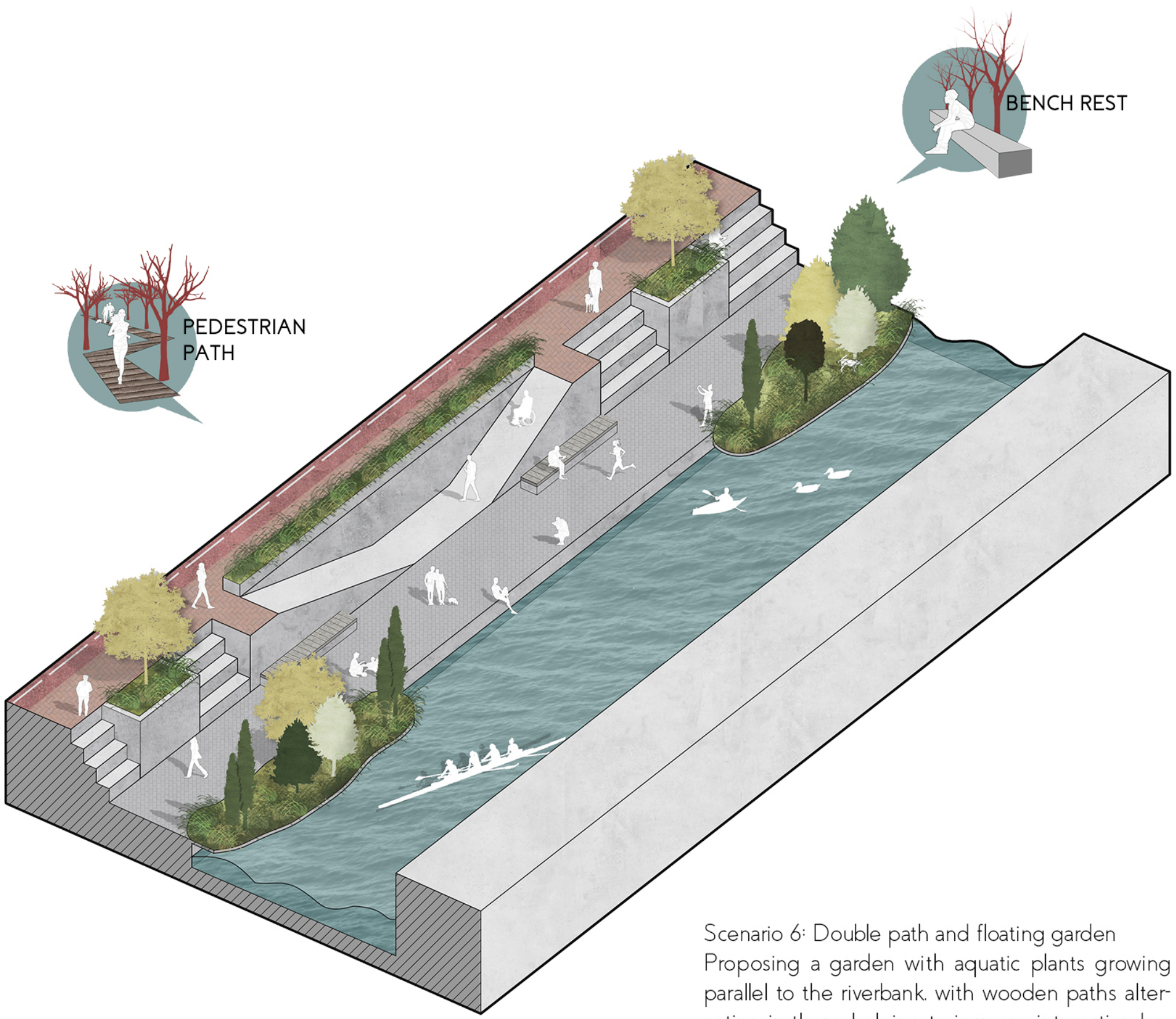
Scenario 3: Overhanging walkway
the space is designed to increase the pedestrian experience of the river. Incorporate a walkway with a bike track that encourage slow-mobilities. Increased interaction with the river. The cover of the street is designed with round holes that both protect the sun from the rain and increase the aesthetics of the project.



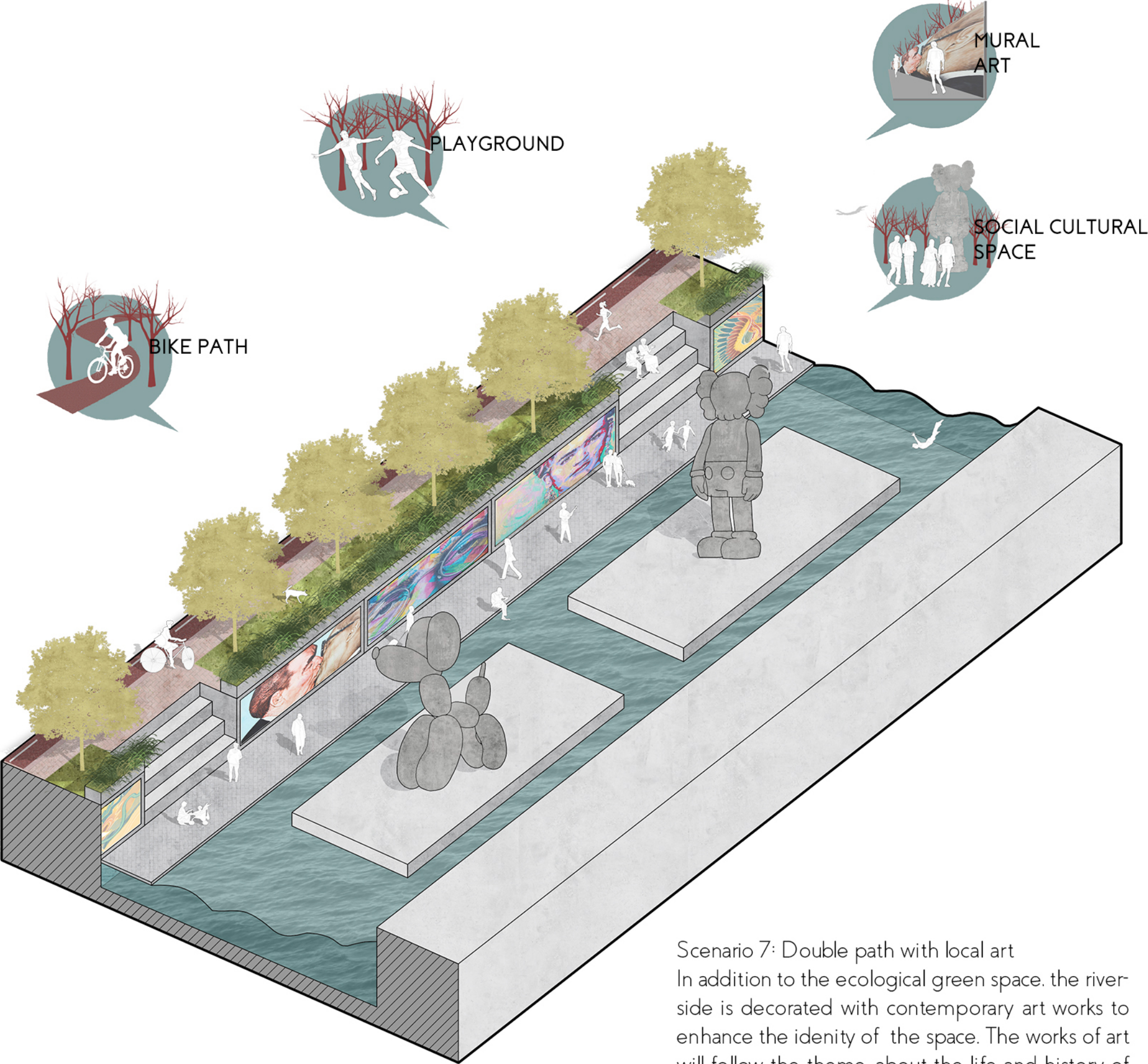
Scenario 4: Terraced steps
Proposal to make stairs down the river area. Contribute to creating a space to rest and relax. increase the interaction between people and the water surface. In addition. In the riverbed area is decorated with floating gardens with local rice varieties. contributing to increasing the aesthetics of the landscape and raising people's awareness of the surrounding landscape environment. Because in history. To Lich River used to be a commercial space. a busy market where the most famous commodity was rice. The exterior design concept brings landscape aesthetics to the building and contributes to people's awareness of the river's history and culture.



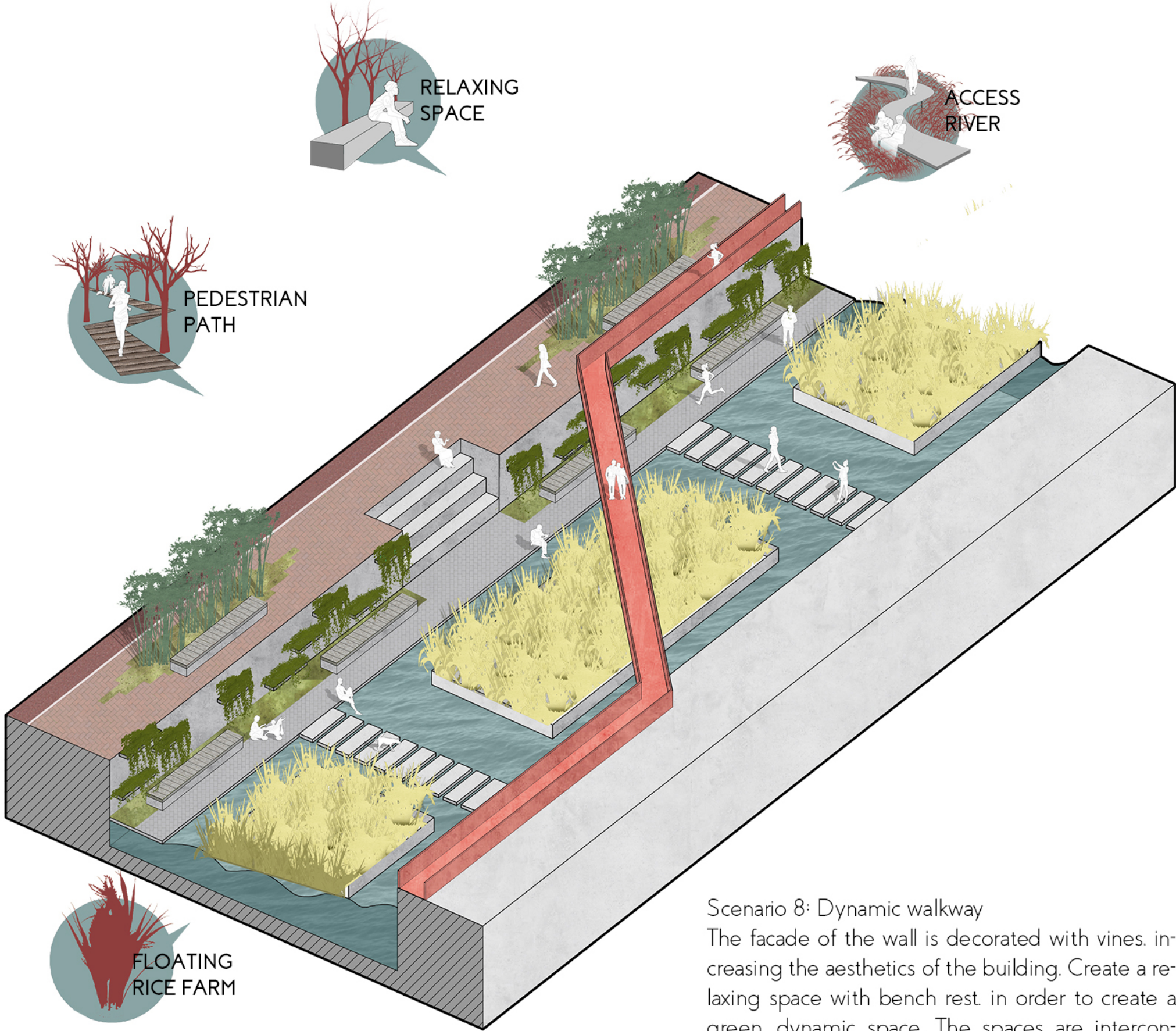
Scenario 5: Double path and micro steps
Proposed with a staircase down to the double track area next to the river, along with a ramp for the disabled and bicycle users, using electric scooter. Interwoven in the building are green areas for natural ecosystems. It is a relaxing and relaxing space, attractive with riverside sports activities such as boating.



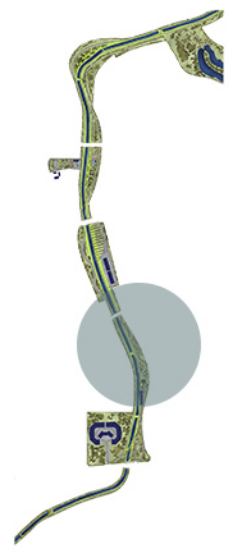
Scenario 6: Double path and floating garden
Proposing a garden with aquatic plants growing parallel to the riverbank, with wooden paths alternating in them, helping to increase interaction between people and nature. Creating an aesthetic, dynamic space where people and nature are balanced to relax and relieve urban pressure.

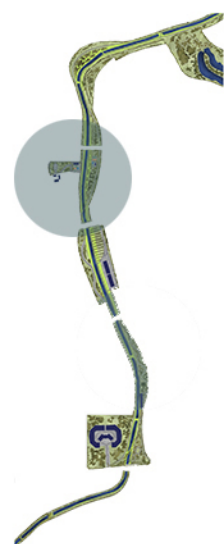


Scenario 7: Double path with local art
In addition to the ecological green space, the riverside is decorated with contemporary art works to enhance the identity of the space. The works of art will follow the theme, about the life and history of the river. Contribute to creating a relaxing space, socio-cultural exchange to increase awareness and understanding of social culture.



Scenario 8: Dynamic walkway
The facade of the wall is decorated with vines, increasing the aesthetics of the building. Create a relaxing space with bench rest, in order to create a green, dynamic space. The spaces are interconnected in various forms, up and down with stairs, bikers and pedestrian trails and pedestrian bridges. Helping the identity of the space becomes unique, enhancing the human experience with the space





Green Space

Playground
Relaxing leisure
Ecological garden
Orchard
Walkways



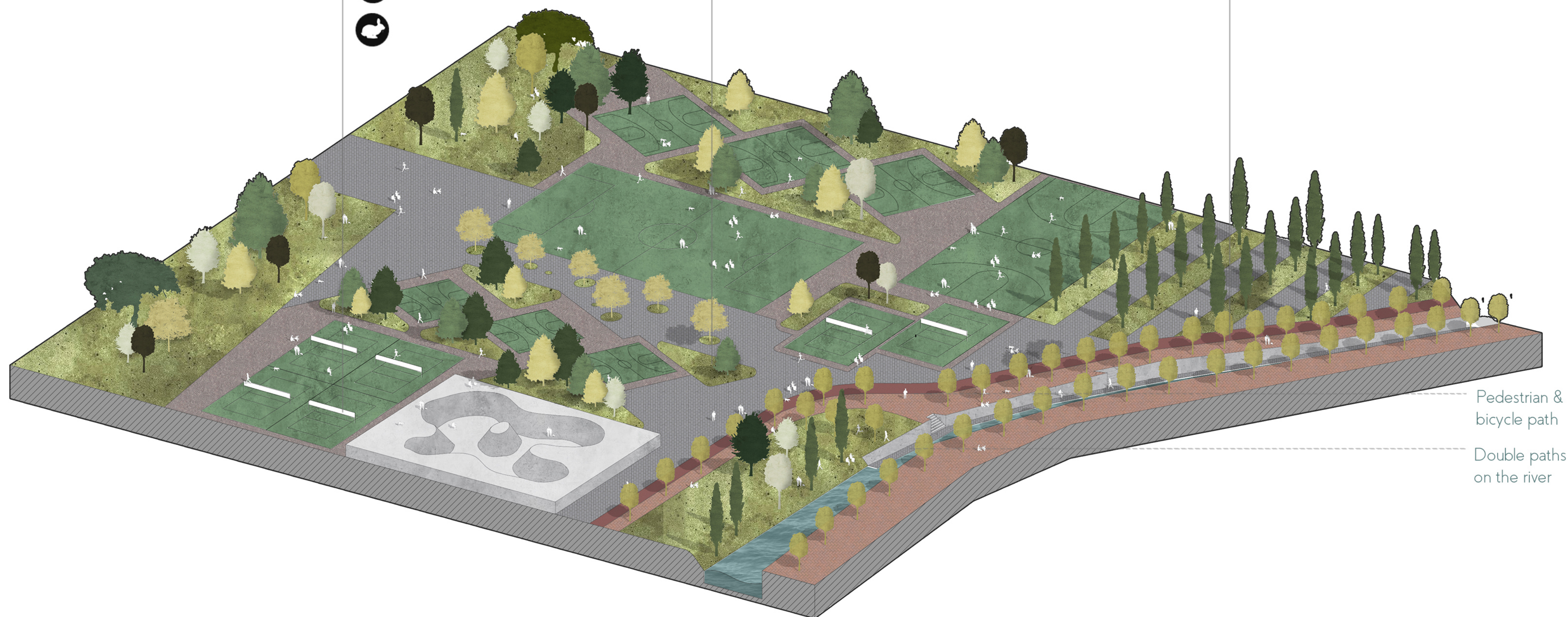
Fitness area

Sports courts
Flexible open space
Playground



Landscape Area

Access river
Perdestrian path
Bicycle path



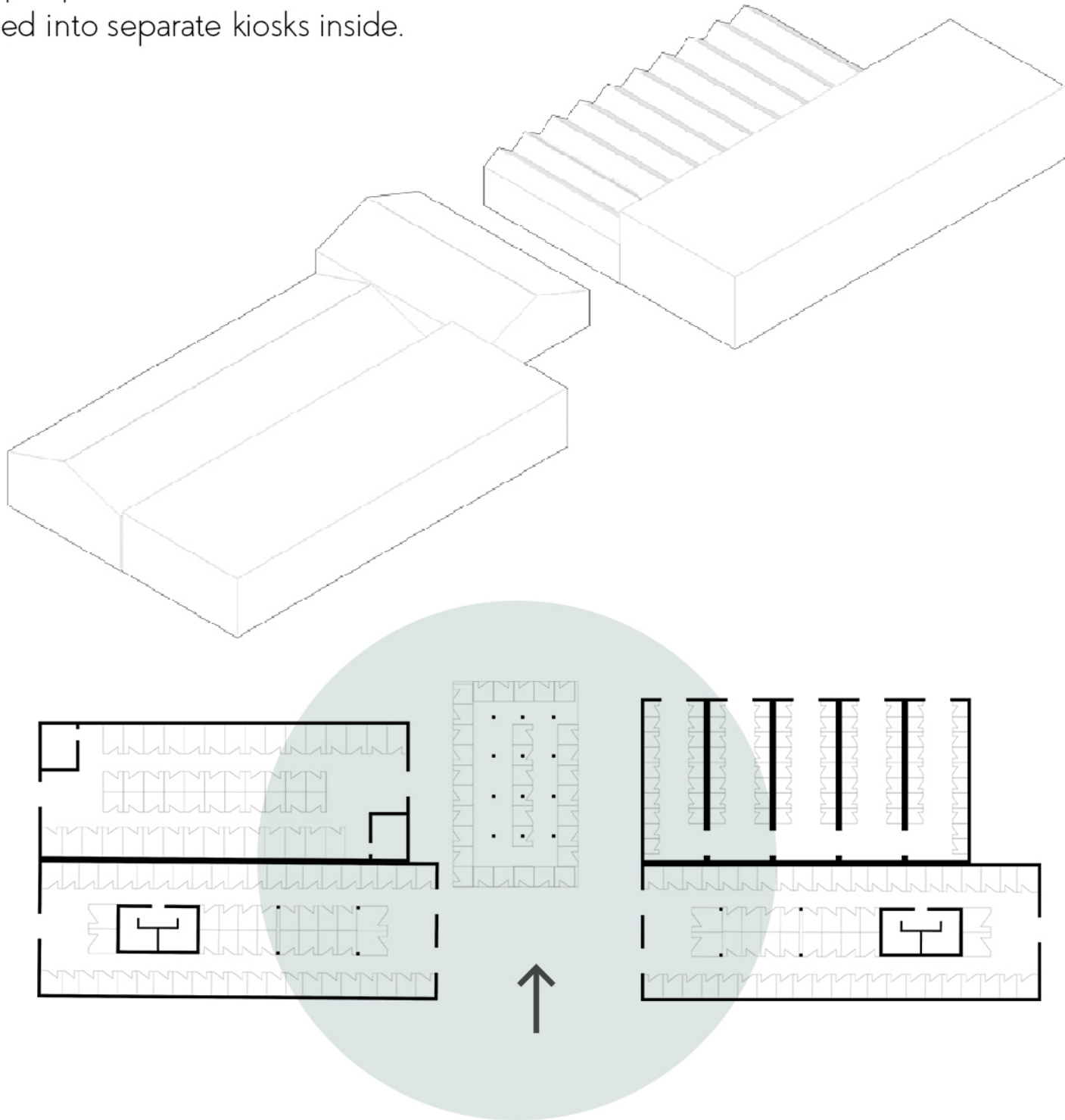
Pedestrian &
bicycle path

Double paths
on the river

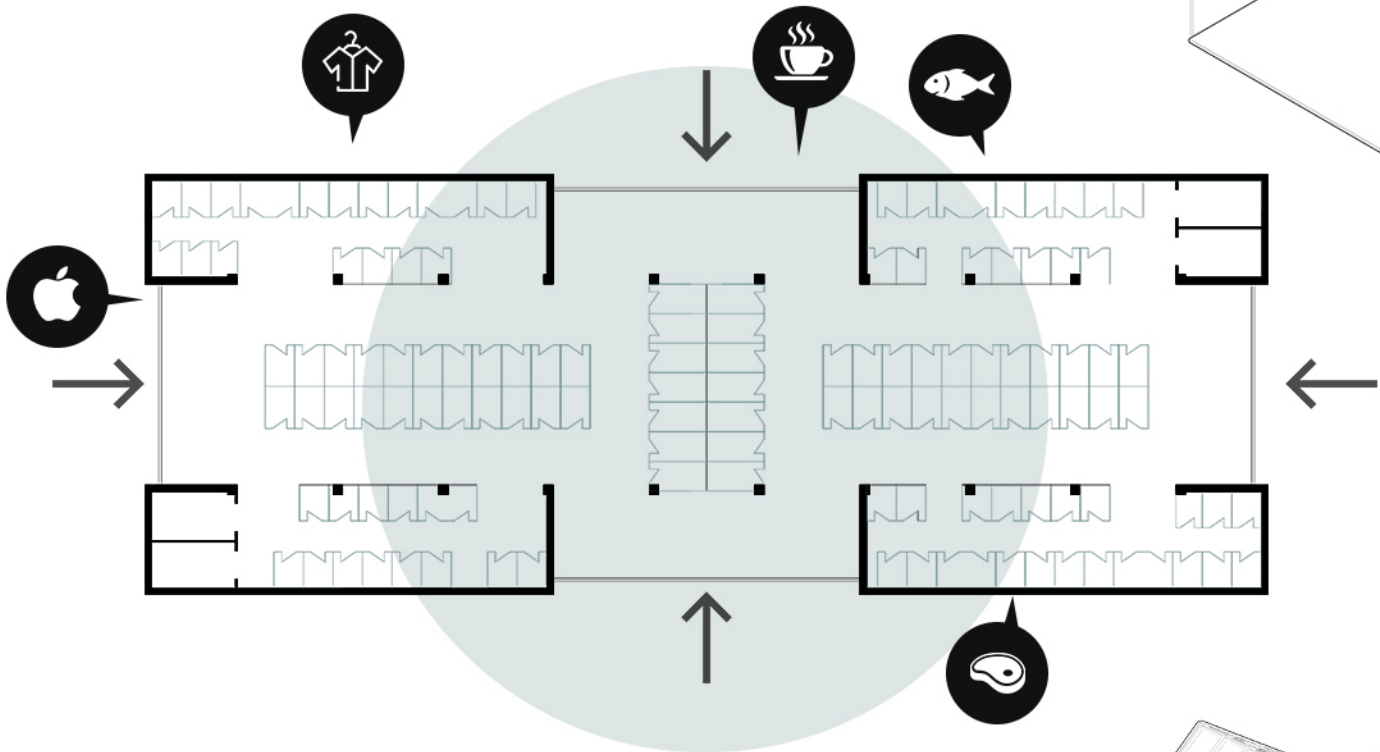
Today there is a physical change in the river. The environment damaged by water polluted. modern life and car traffic and transportation have greatly changed lives by compared to formerly. The market has changed. Some markets remain located near the space of the river. the public social space. the traffic node but they do not use river transport for the transport of goods. Lang Ha market Lang Ha market is one of them. the market is planned to use since the 90s to gather shops to do business. creating a commercial space for the surrounding people. The market is a collection of houses divided into separate kiosks inside.

However. the architecture of the inside sales kiosks is outdated. over the years. hygiene standards have not met the needs of reality. the shops have grown messy and spontaneous. There are no common color sizes. In addition. the fixed stores also take advantage of the surface of the sidewalks and the pavement to put tools in the service of trade. or expand the commercial area by encroaching on sidewalks where they use these spaces for parking vehicles.

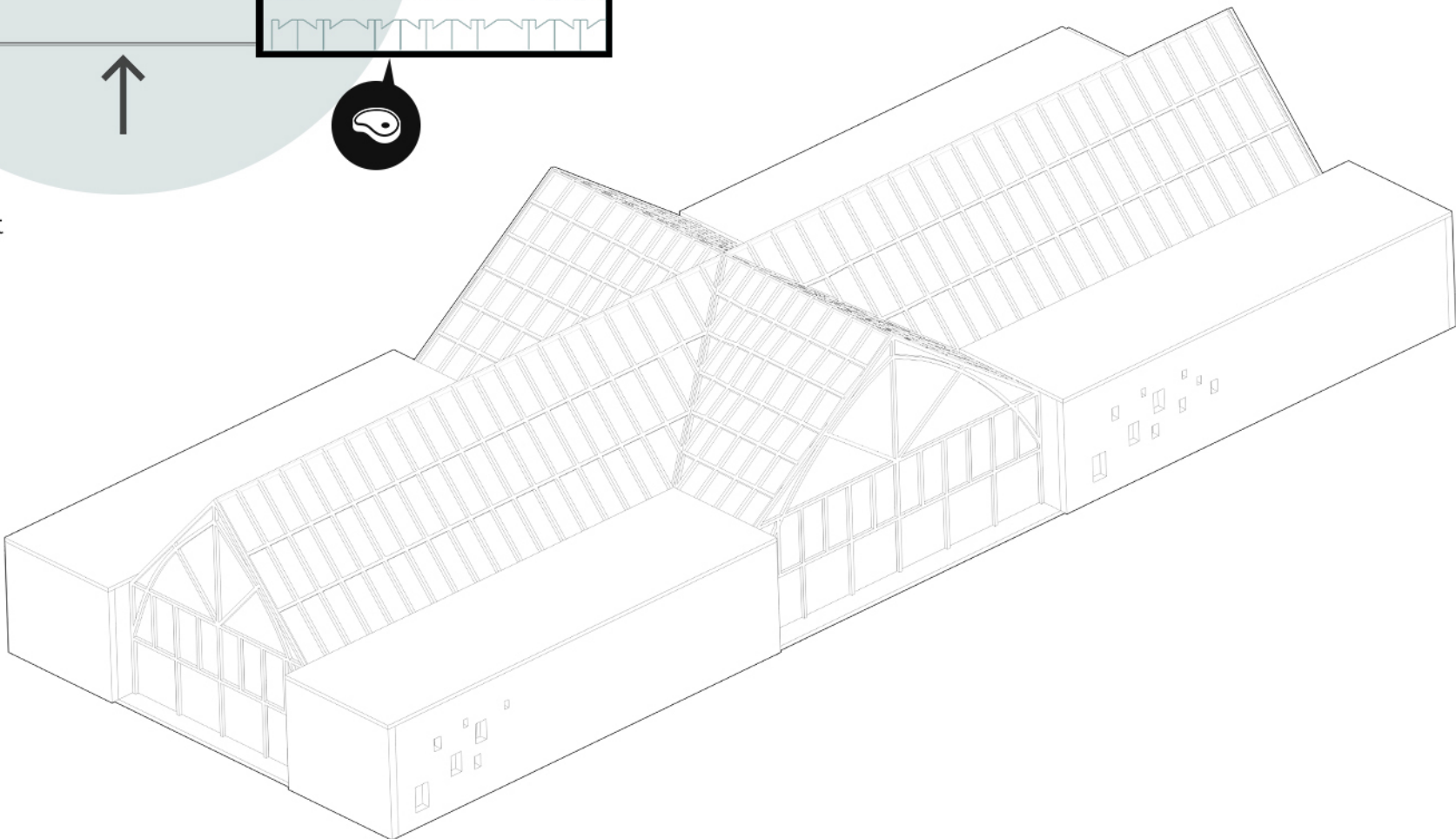
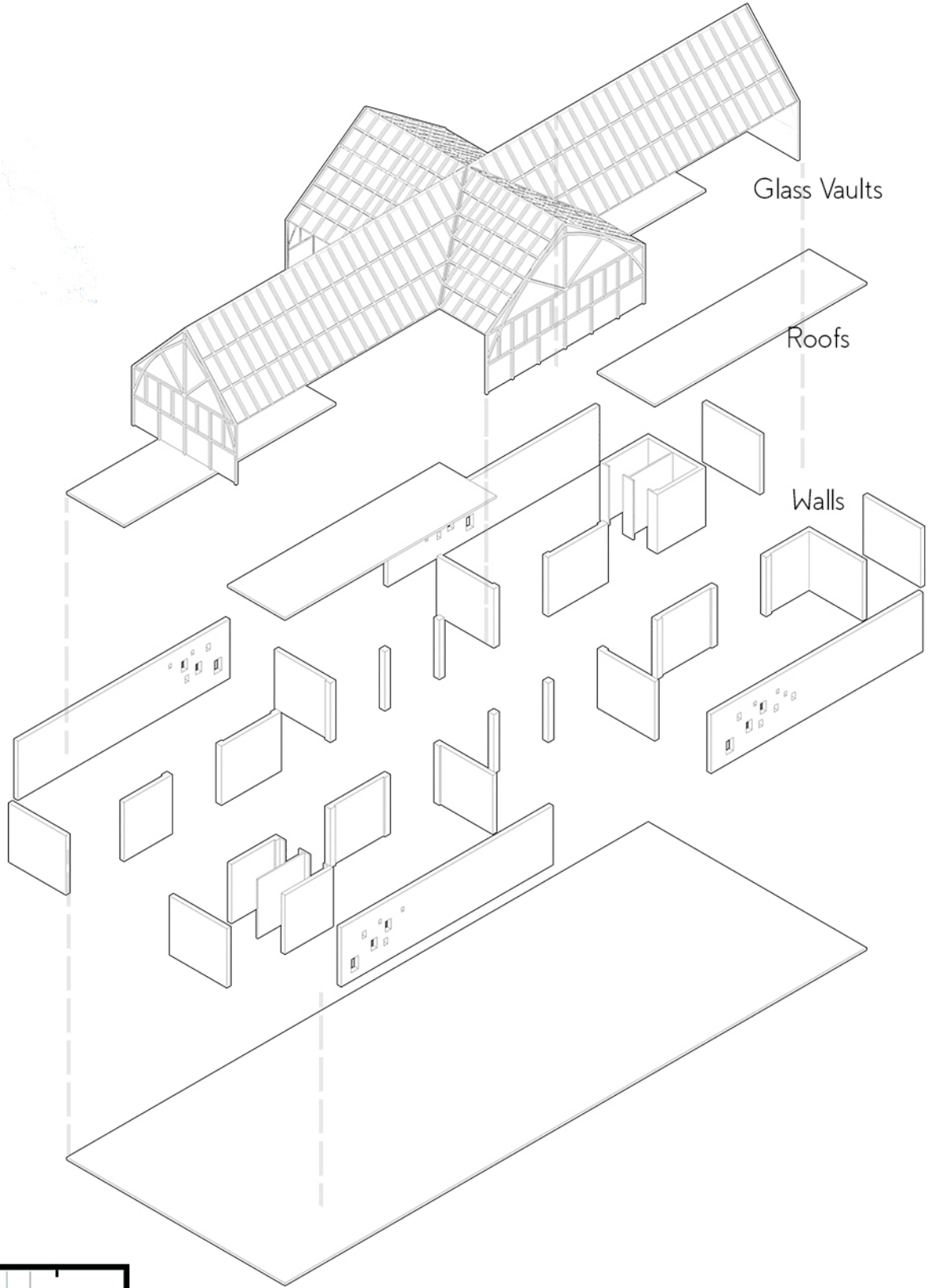
An amazing thing is that they consider the area of public sidewalks in front of their homes to be their own belonging to which they can dispose as they please and which the others cannot in any case question. Because of this. pedestrians must walk on the roadway. means of transport have difficulties to evolve. This contributes to the problem of traffic jams on the road axis along the river and on the main axes in the village. this creates a bad image of trade and means of transport. all of which contributes to ugly the architectural landscape of the street and also the face of the river. In order to match the renovation landscape of To Lich river. neighboring works require parallel development. Lang Ha Market will be renovated into a unified space with full functional space to form a large market with areas selling meat fish. vegetables and home appliances.

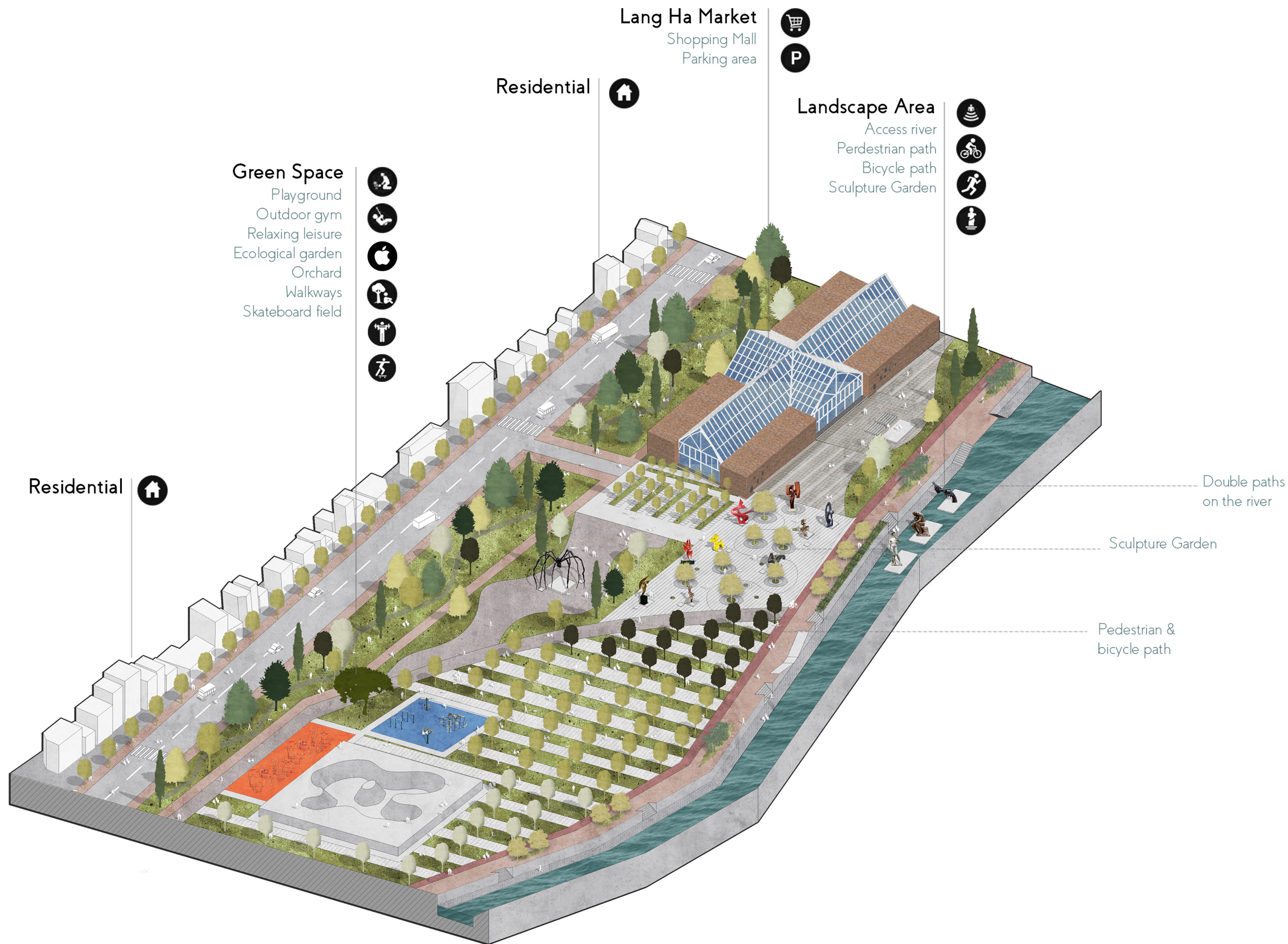
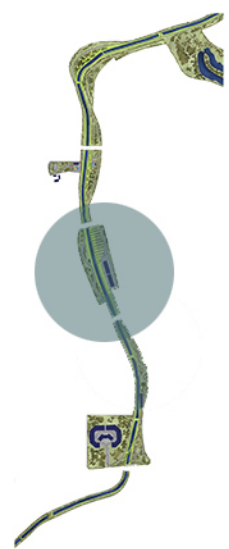


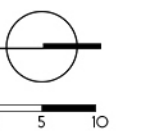
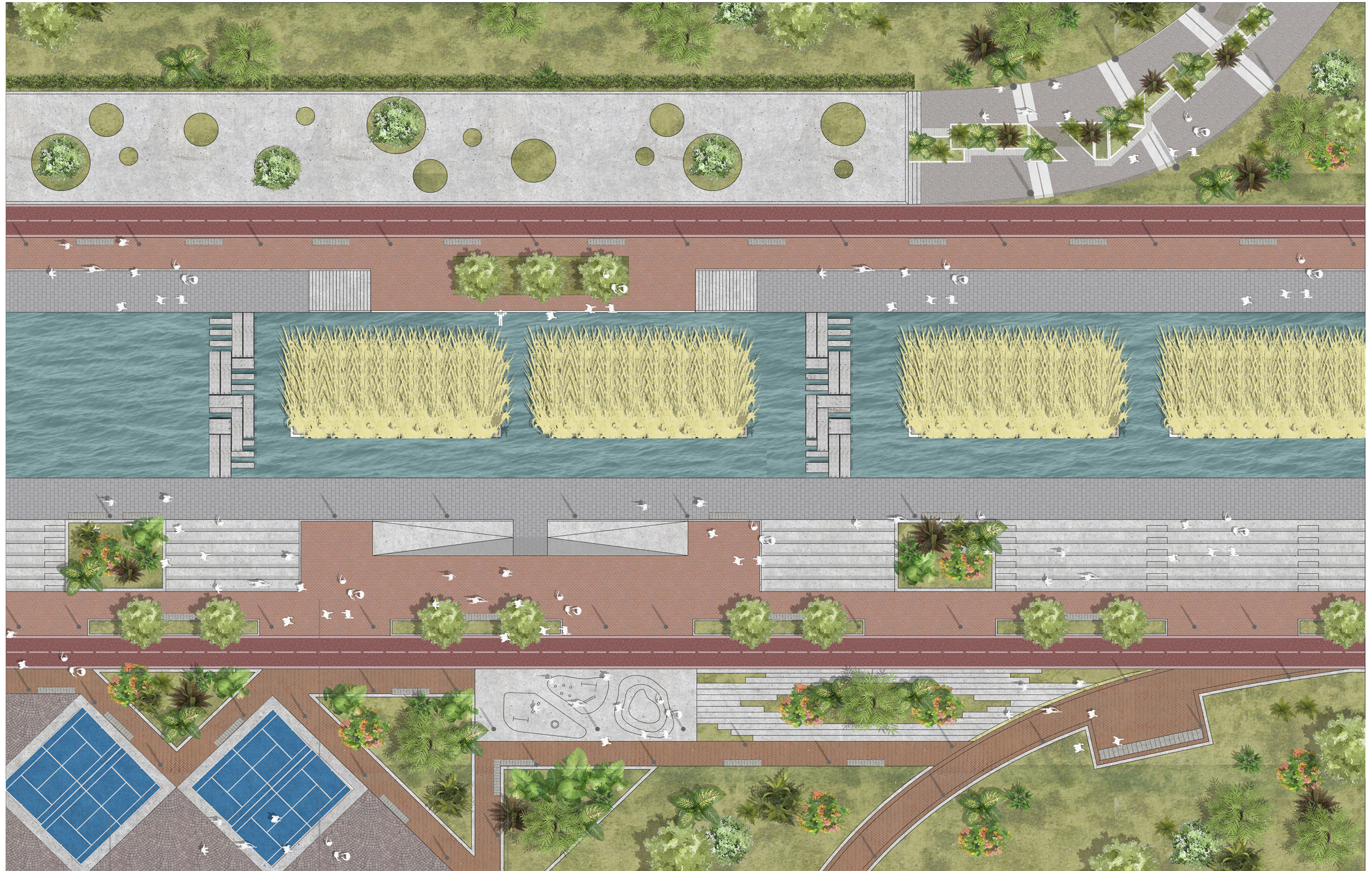
Lang Ha Central Market



New Lang Ha Central Market







Fitness area
 Playground
 Outdoor gym
 Tennis field



Landscape Area
 Rice field
 Access river
 Pedestrian path
 Bicycle path



Green Space
 Playground
 Outdoor gym
 Relaxing leisure
 Ecological garden
 Orchard
 Walkways



Brick Pavers



Cobble Stone
Pavers



Gravel Pavers



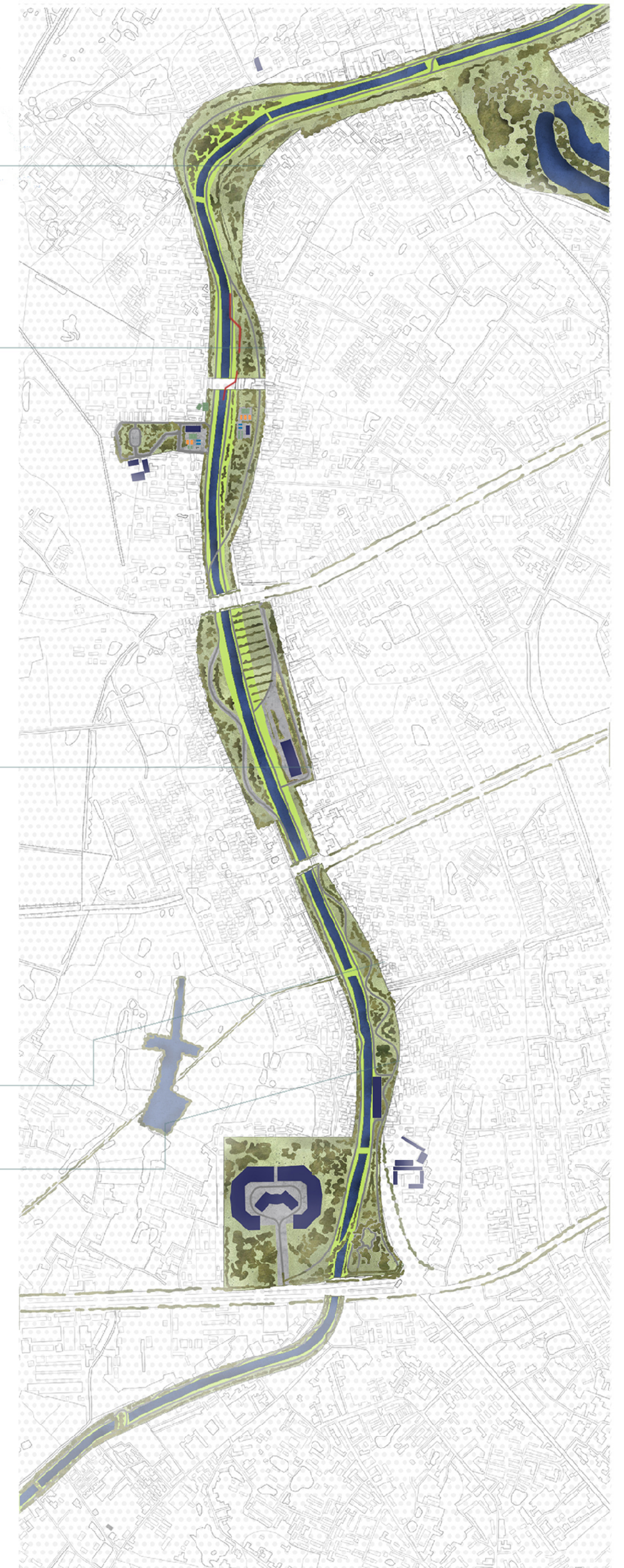
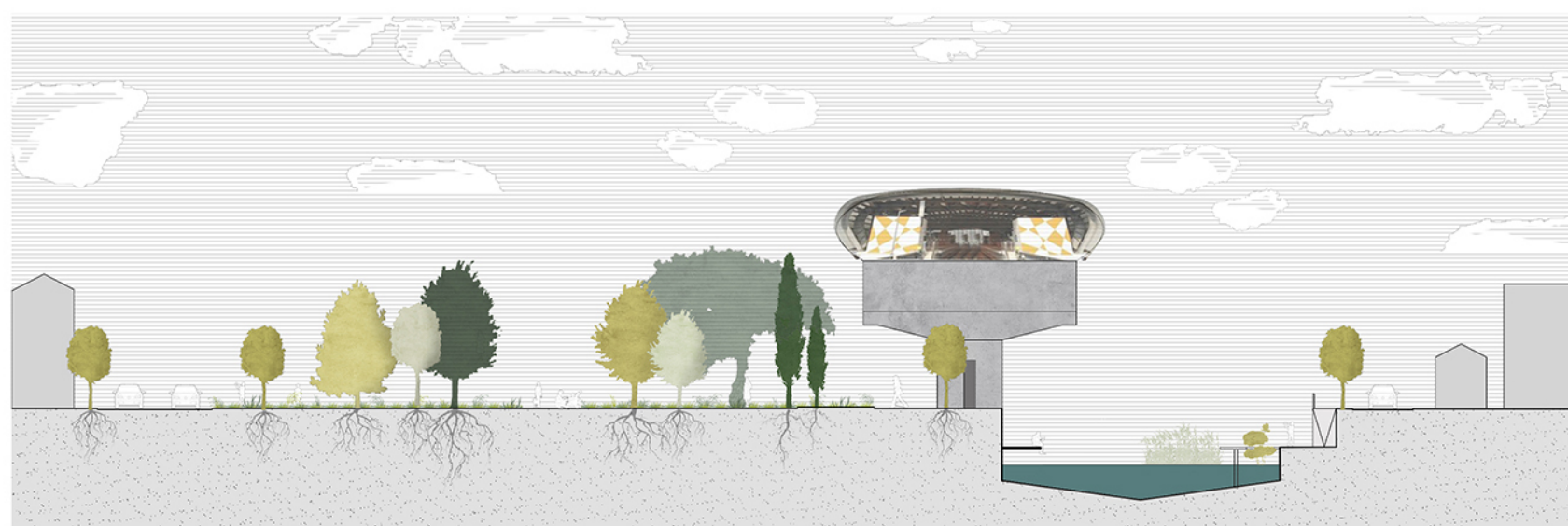
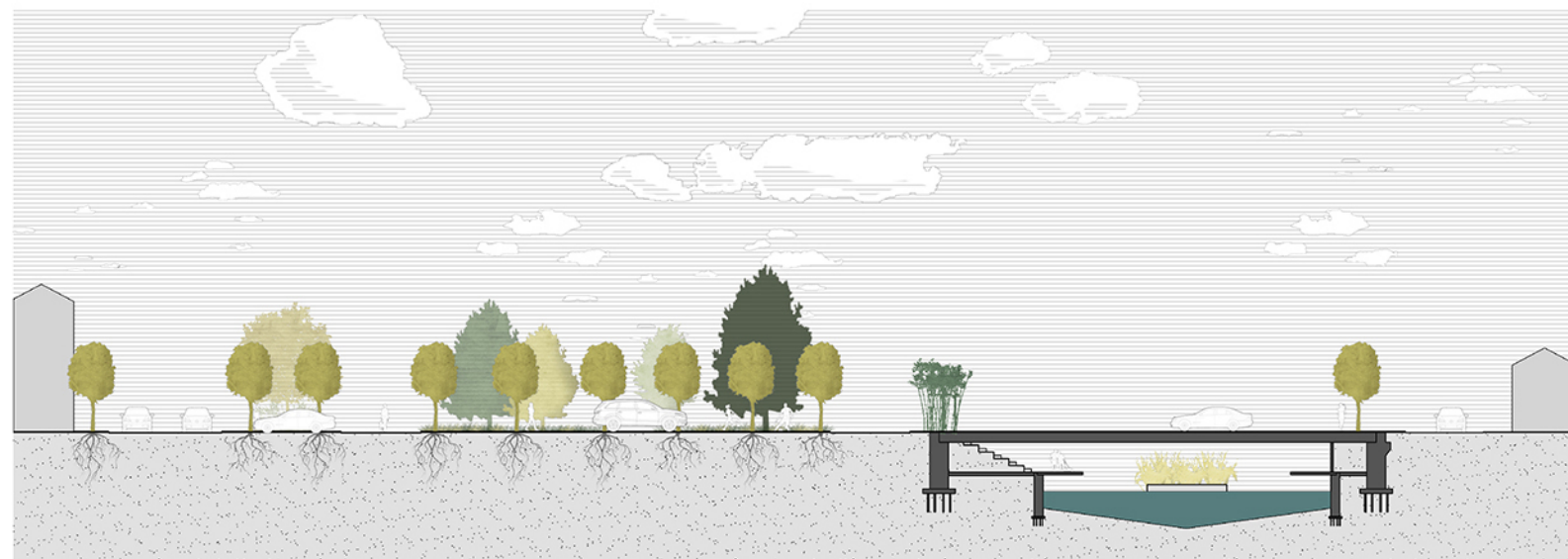
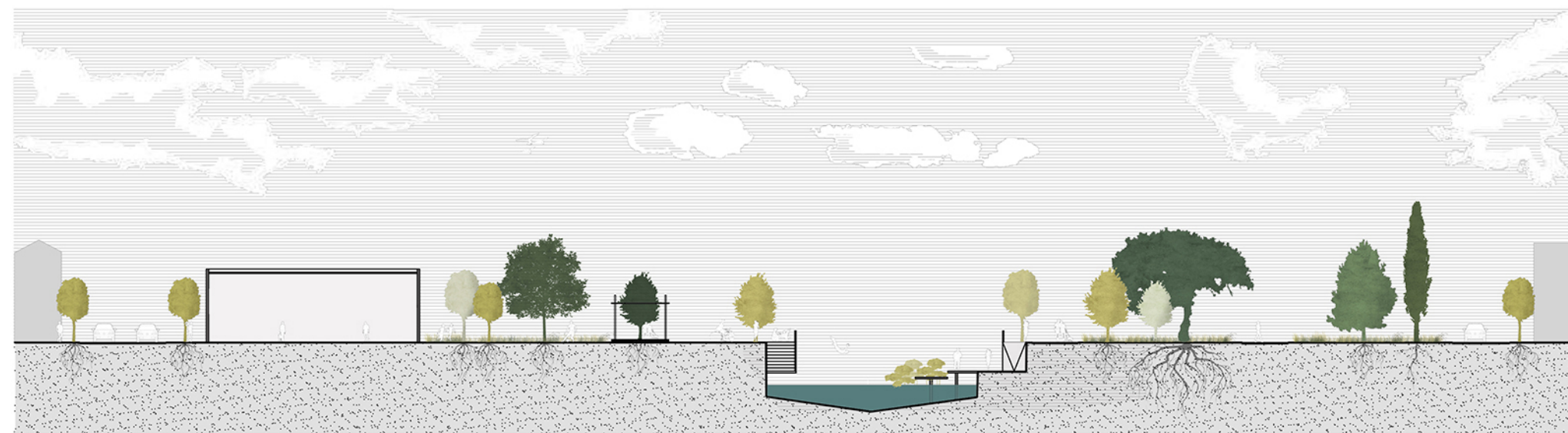
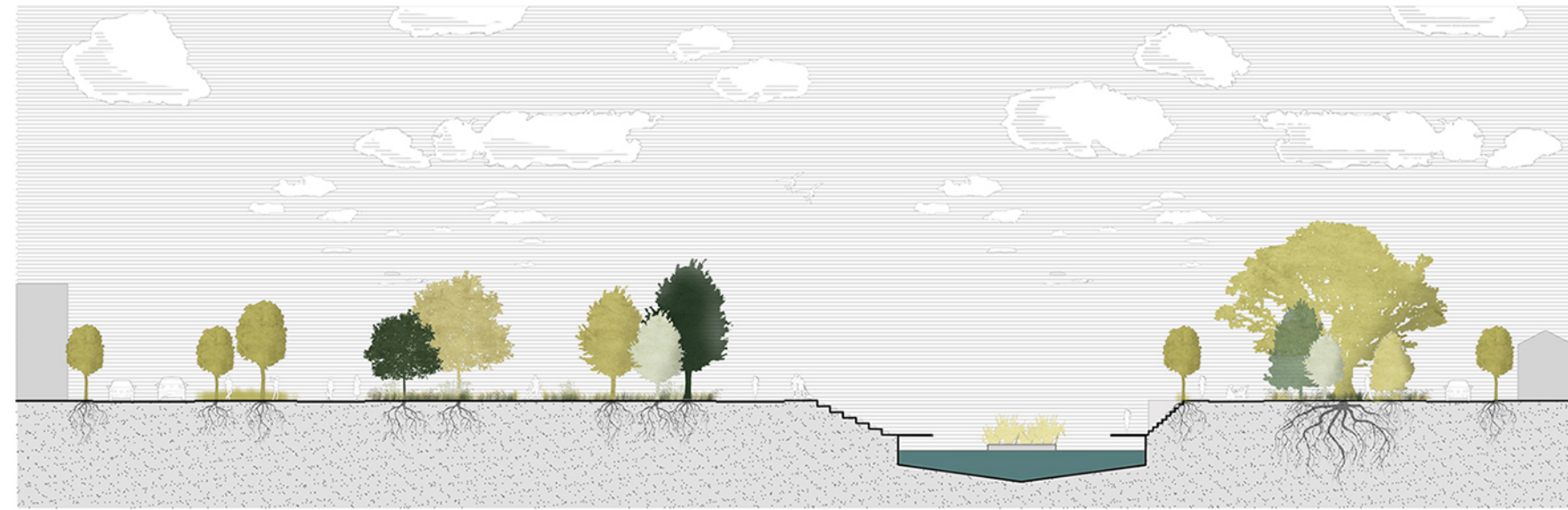
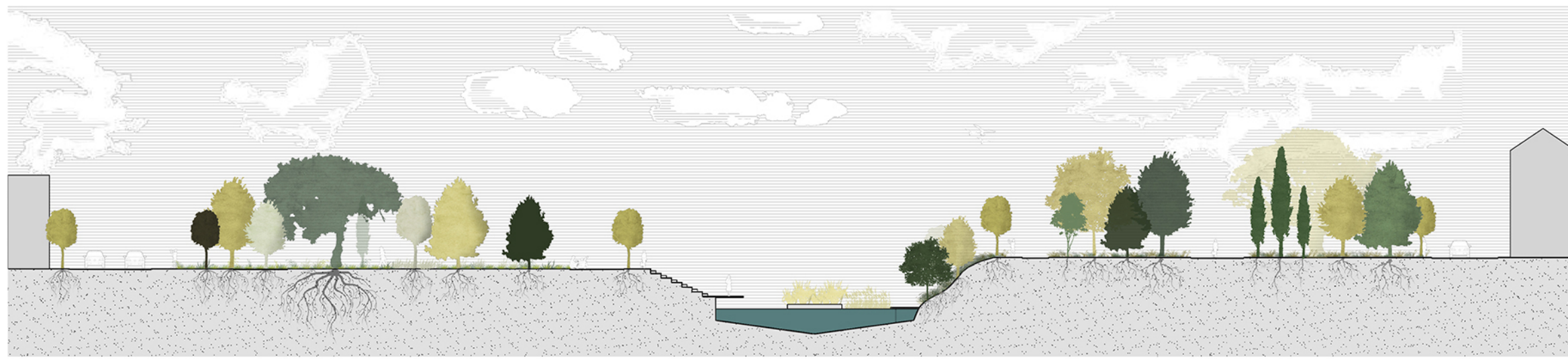
Custom Bench



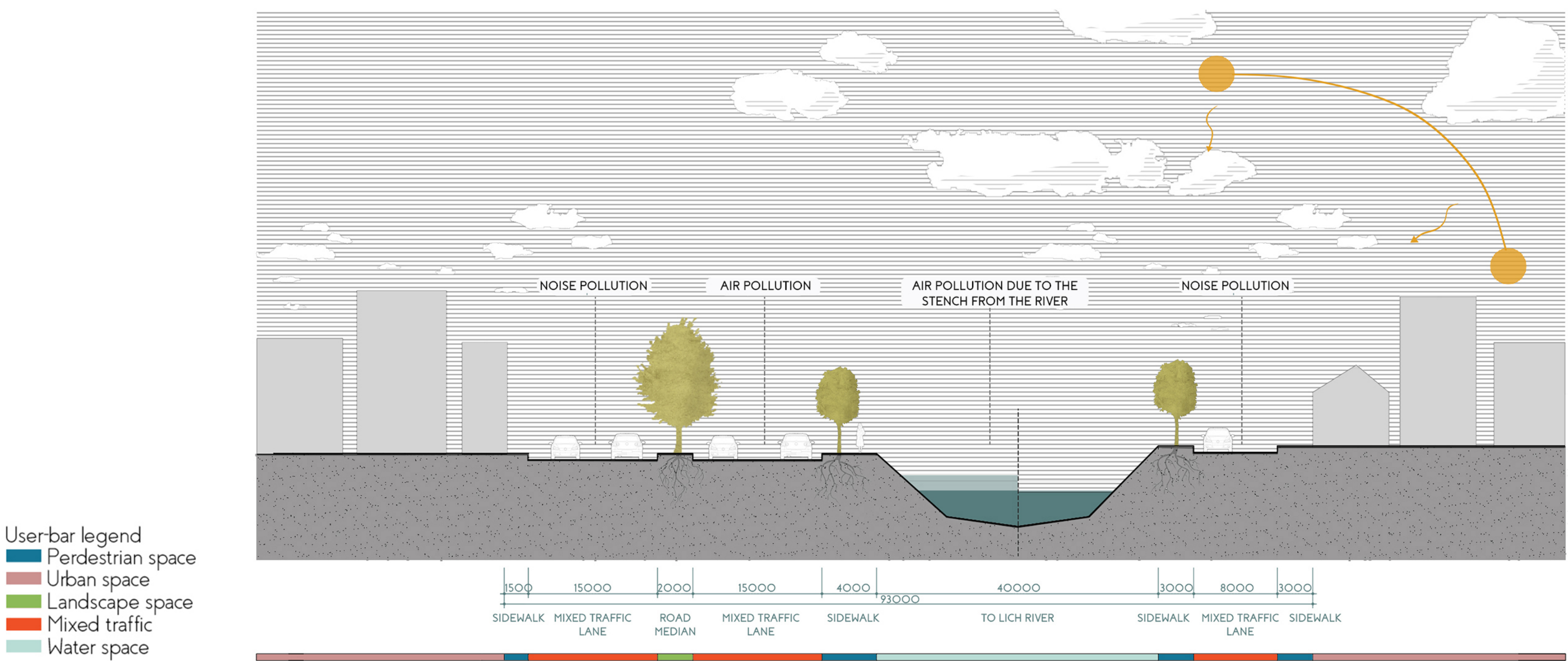
Native Plants



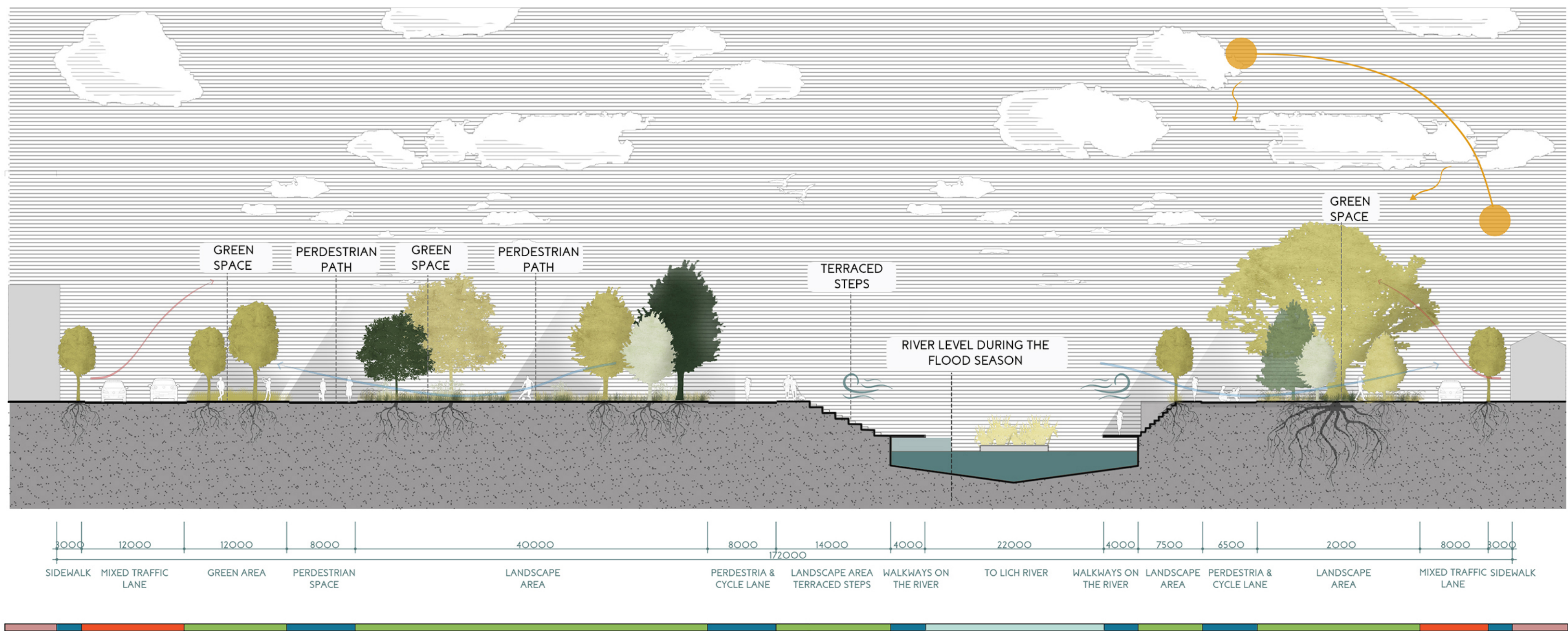
Covered
pedestrian path



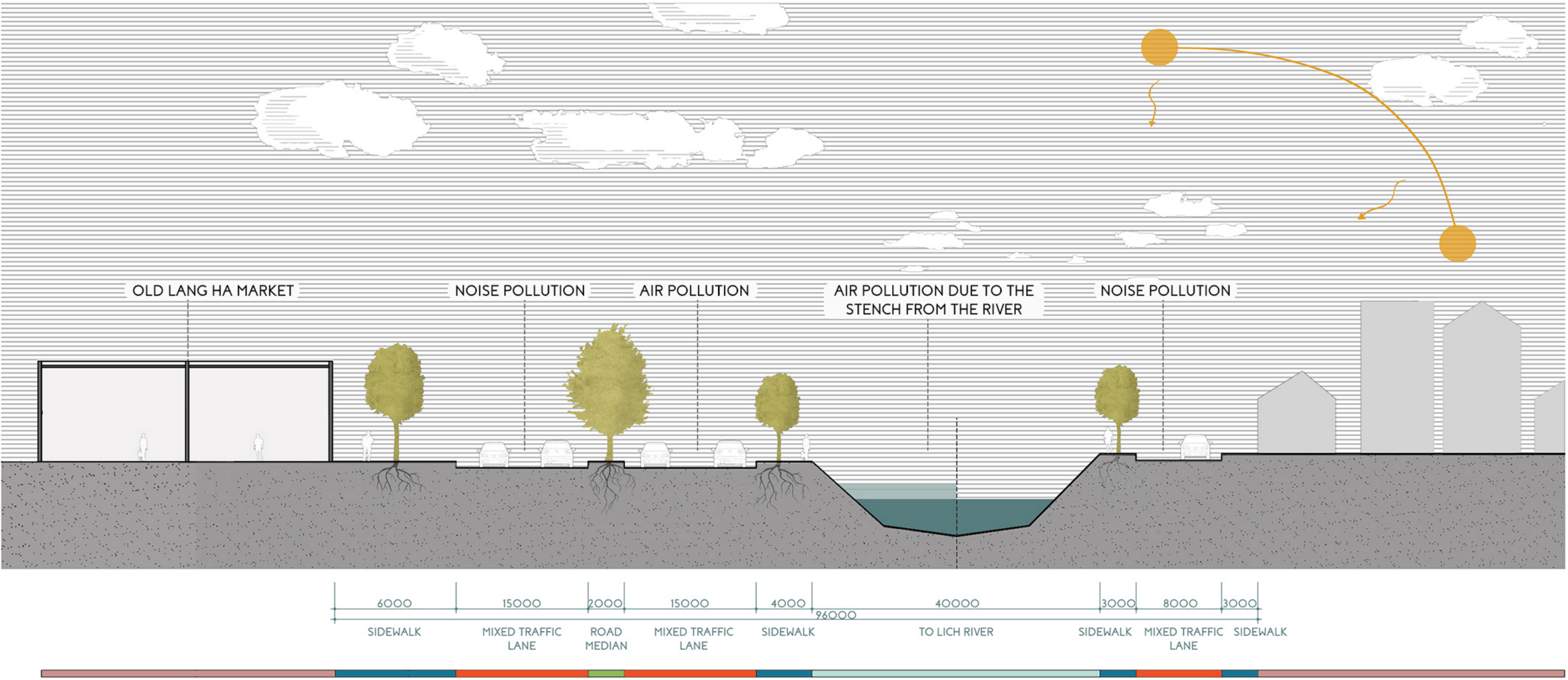
BEFORE



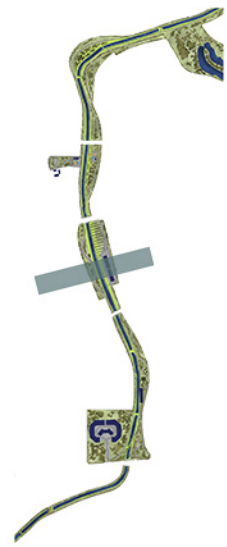
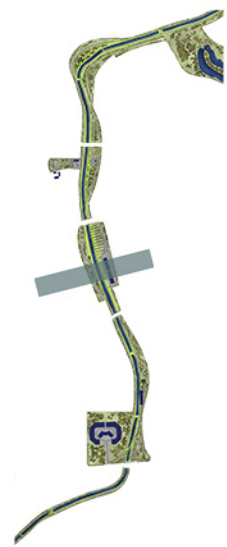
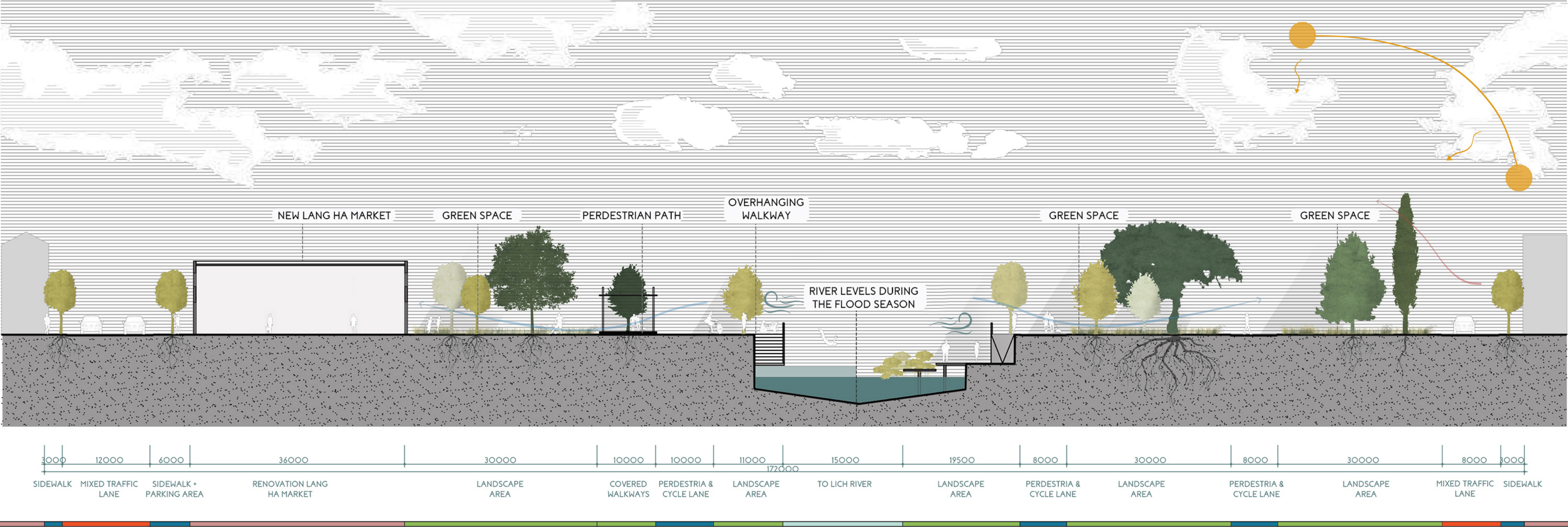
AFTER

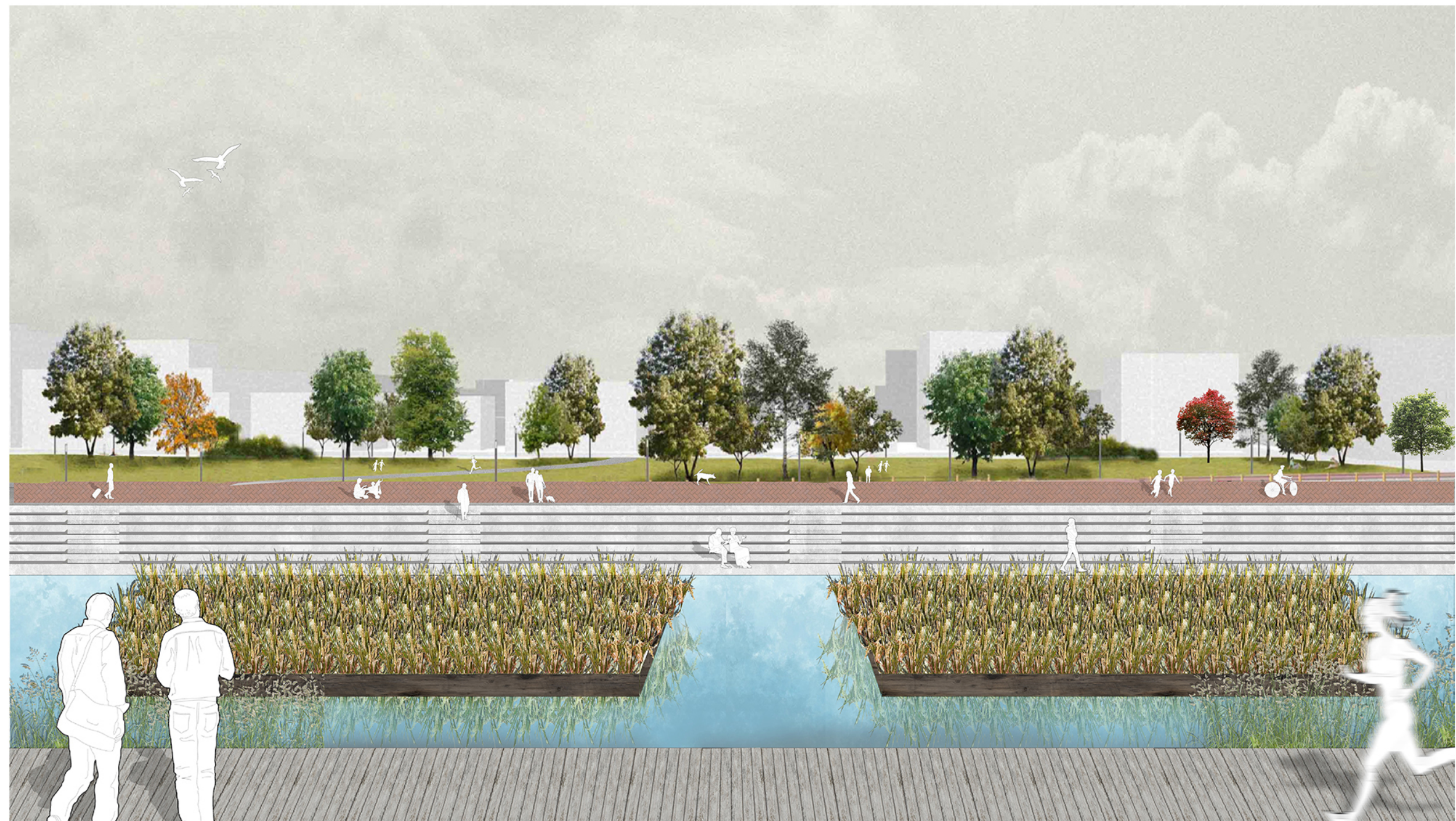


BEFORE



AFTER





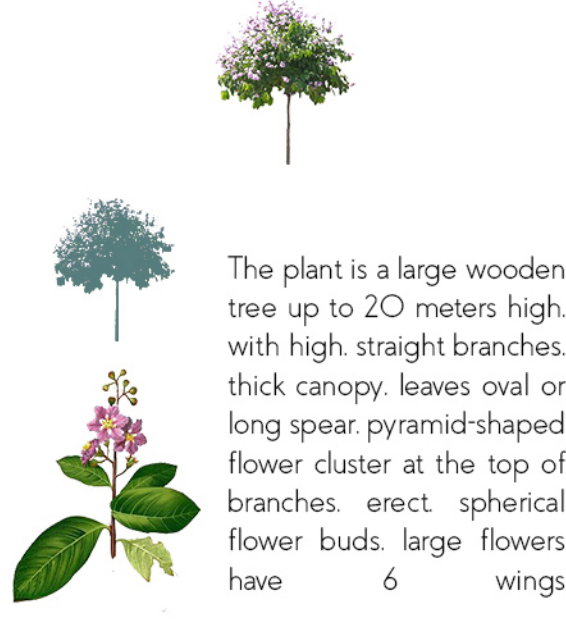


Terminalia Catappa
3-5m



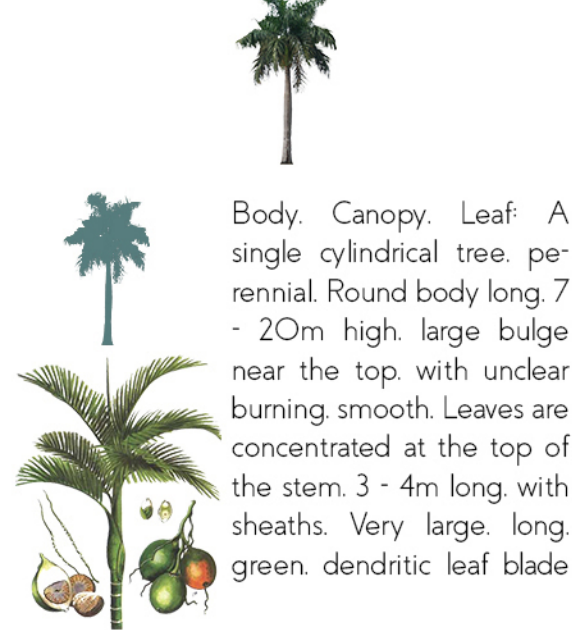
This plant can grow up to 35m tall with an erect symmetrical and The branches are horizontal. When the tree gets older then its foliage becomes flatter to form a female-like appearance bowl spread. The leaves are large, about 15-25 longcm and 10-14 cm wide, ovoid, dark blue and glossy.

Lagerstroemia Speciosa
12-15m



The plant is a large wooden tree up to 20 meters high, with high, straight branches, thick canopy, leaves oval or long spear, pyramid-shaped flower cluster at the top of branches, erect, spherical flower buds, large flowers have 6 wings

Roystonea Regia
6-8m



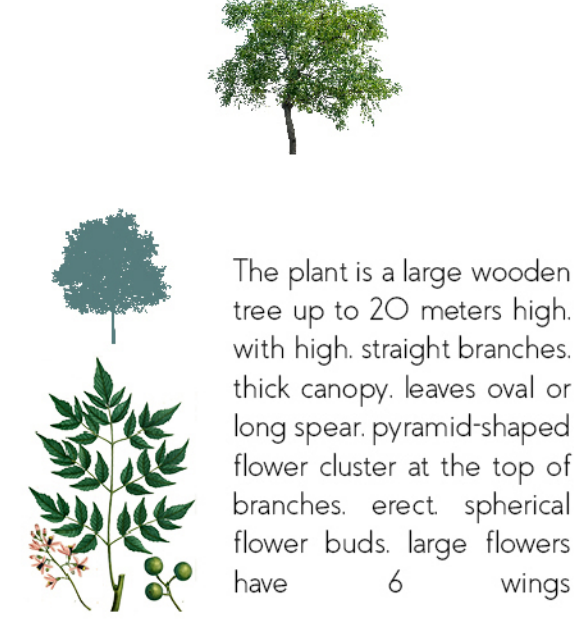
Body, Canopy, Leaf: A single cylindrical tree, perennial. Round body long, 7 - 20m high, large bulge near the top, with unclear burning, smooth. Leaves are concentrated at the top of the stem, 3 - 4m long, with sheaths. Very large, long, green, dendritic leaf blade

Bambuseae
3-10m



Bamboo is also a flowering plant, but only blooms once at the end of life. Usually bamboo blooms every 5-60 years. Bamboo flowers have a strong scent and pale yellow color like earth color.

Lagerstroemia Speciosa
12-15m



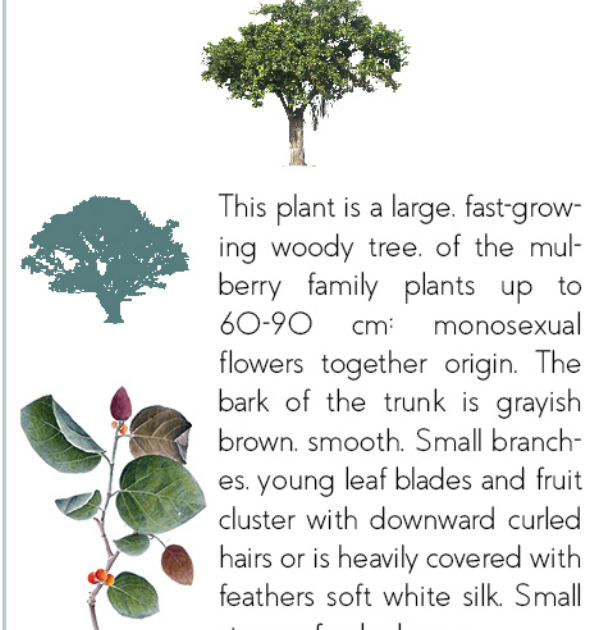
The plant is a large wooden tree up to 20 meters high, with high, straight branches, thick canopy, leaves oval or long spear, pyramid-shaped flower cluster at the top of branches, erect, spherical flower buds, large flowers have 6 wings

Sabina Chinensis
3-4m



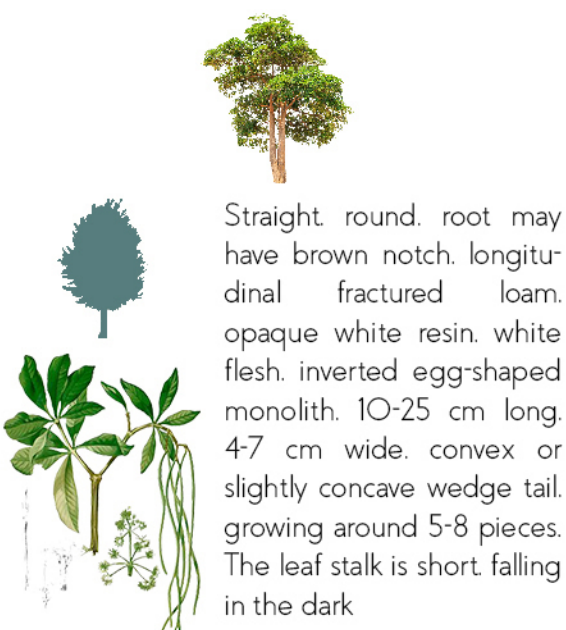
The tree is native to Asian countries. The tree has small round or slightly square branches, the bark is light red. Young leaves are needle-shaped, pointy, musty green, old, scaly leaves in the middle of the back with oval gland, growing close to the opposite, dense.

Ficus Benghalensis
5-10m



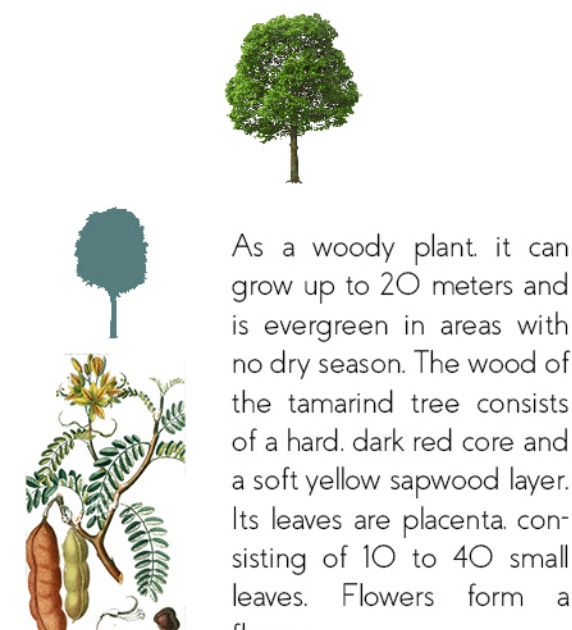
This plant is a large, fast-growing woody tree, of the mulberry family plants up to 60-90 cm; monosexual flowers together origin. The bark of the trunk is grayish brown, smooth. Small branches, young leaf blades and fruit cluster with downward curled hairs or is heavily covered with feathers soft white silk. Small stems of color brown

Alstonia Scholaris
6-8m



Straight, round, root may have brown notch, longitudinal fractured loam, opaque white resin, white flesh, inverted egg-shaped monolith, 10-25 cm long, 4-7 cm wide, convex or slightly concave wedge tail, growing around 5-8 pieces. The leaf stalk is short, falling in the dark

Tamarindus Indica
6-8m



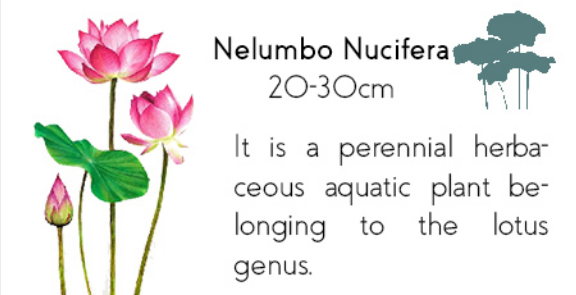
As a woody plant, it can grow up to 20 meters and is evergreen in areas with no dry season. The wood of the tamarind tree consists of a hard, dark red core and a soft yellow sapwood layer. Its leaves are placenta, consisting of 10 to 40 small leaves. Flowers form a flower

Oryza Sativa
35-50 cm



Rice is a plant species of a group of domesticated grass species. Originated in tropical and subtropical regions of Southeast Asia and Africa.

Nelumbo Nucifera
20-30cm



It is a perennial herbaceous aquatic plant belonging to the lotus genus.

Areca Palm
1.8-2.1m



The plant is a flowering plant species of the Arecaceae family. Its scientific name is *Dypsis lutescens*

Chinese Evergreen
30-90cm



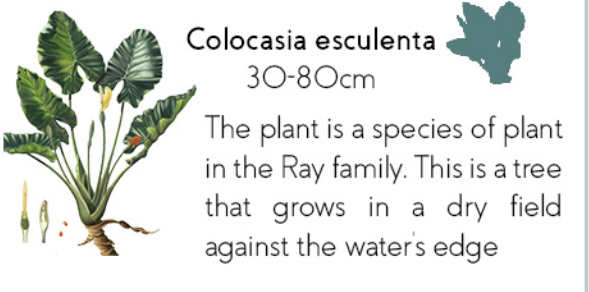
The plant is a genus of flowering plants in the arum family, Araceae. They are native to tropical and subtropical regions of Asia

Aloe Vera
30-90cm



Aloe vera is a succulent plant species of the genus Aloe, it originates from Western Asia.

Colocasia esculenta
30-80cm



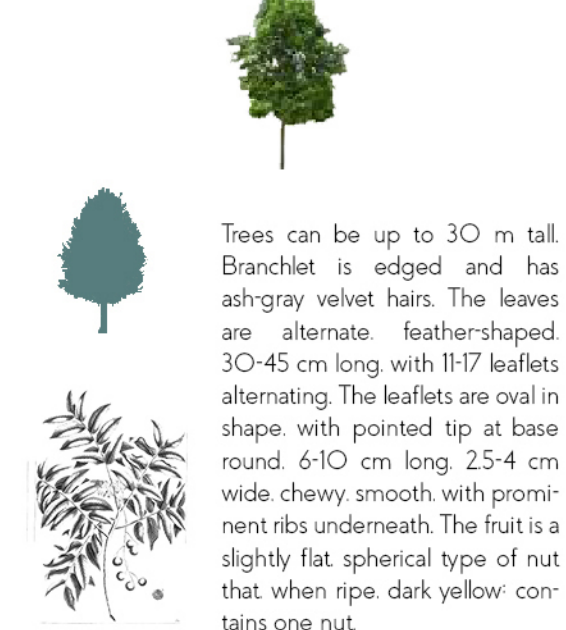
The plant is a species of plant in the Ray family. This is a tree that grows in a dry field against the water's edge

Ficus Benghalensis
5-12m



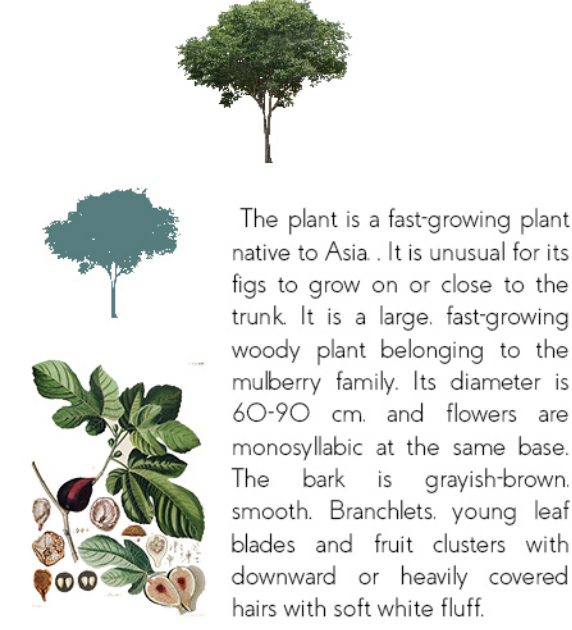
Delonix regia is a flowering plant in the bean family Fabaceae, subfamily Caesalpinioideae native to Madagascar, phoenix tree 5,12. In addition to its ornamental value, it also acts as a shade plant in tropical conditions, as it can normally grow to a moderate height (about 5 m, although it can sometimes be tall, up to 12 m) but has broad spreading foliage and its dense foliage provides shade.

Dracontomelon Duperreanum
12-15m



Trees can be up to 30 m tall. Branchlet is edged and has ash-gray velvet hairs. The leaves are alternate, feather-shaped, 30-45 cm long, with 11-17 leaflets alternating. The leaflets are oval in shape, with pointed tip at base round, 6-10 cm long, 2.5-4 cm wide, chewy, smooth, with prominent ribs underneath. The fruit is a slightly flat, spherical type of nut that, when ripe, dark yellow, contains one nut.

Ficus Racemosa
10-20m



The plant is a fast-growing plant native to Asia. It is unusual for its figs to grow on or close to the trunk. It is a large, fast-growing woody plant belonging to the mulberry family. Its diameter is 60-90 cm, and flowers are monosyllabic at the same base. The bark is grayish-brown, smooth. Branchlets, young leaf blades and fruit clusters with downward or heavily covered hairs with soft white fluff.



CONCLUSION

The goal that the thesis set out is the study and evaluation of the constituent elements of the landscape of To Lich River. The evolution of socio-urban development, and the physical transformation of the landscape of the To Lich River under the impact of the urbanization process. Each river plays a crucial role in its urban structure, in the case of To Lich River, it is a place of heritage, cultural landscape, landscape cultural and natural heritage, the natural landscape in rural areas or the agricultural landscape, an urban and ecological landscape of the city from which it was the energy source to regenerate urban life or urban leisure spaces.

Vietnam is one of the fastest urbanizing countries in the region. The unsustainable development causes negative consequences for the environment, especially affecting the water surface in urban areas. Research thesis shows the potentials and opportunities available in the use of water space in urban areas. The To Lich River renovation plan makes the river more accessible to residents and tourists alike, providing a green public space that Hanoi city is looking for. Promote social cultural activities, sports and entertainment connecting the community.

In addition, the floating gardens on the river's surface contribute to the biodiversity of green spaces, and at the same time contribute to raising awareness about the environment in general and urban agriculture in particular.

In conclusion, the To Lich river reclamation thesis completely addresses urban objectives:

1. Healing one of the festering wounds of Hanoi caused over 30 years by pollution of To Lich River. The river was forgotten by the people. The river's landscape values were wasted. The city lost its connection with the river, which in the past was an indispensable vital element of the city.
2. Design and construct an open public space covered with greenery. Connect residential areas. Increasing the continuity of green spaces for the city contributes to relieving urban pressure, minimizing air pollution and noise pollution. Positive influence on all socio-cultural as well as economic aspects

REFERENCES

Alexander Ch., Ishikawa S., Silverstein M., Jacobson M., FiksdahlKing L., Angel Sh (1977). 'A Pattern Language: Towns, Buildings, Construction'. New York. Oxford University Press.

Balogh, P. I., & Takács, D. (2011). The significance of urban open spaces and green areas in urban property developments. In First International Conference 'Horticulture and Landscape Architecture in Transylvania' Agriculture and Environment Supplement (Vol. 110, p. 121).

Chen, C. (2011). A Study on Sustainable Riverfront Landscape Design: On Design Strategy Based on Ecological Recovery and Context Protection (Doctoral dissertation, University of Florida).

C Pedelahore De Loddis. (2010). 'Hanoi and the figures of water'. Hanoi the cycle of metamorphoses. Les Cahiers de l'ipraus

Čakarić J (2010). 'Water phenomenon: urban morphology transformation'. Facta Univ Ser Archit Civ. 375-388.

Clément Pierre, Lancret Nathalie (2001). 'Hanoi: The cycle of metamorphoses. Architectural and urban form'. Research/IPRAUS.

Christian Pedelahore De Loddis. (2010). article 'Hanoi et les figures de l'eau . Hanoi le cycle des métamorphoses' (Hanoi and the figures of water ' . Hanoi the cycle of metamorphoses) . Les Cahiers de l'ipraus

Do, X. S., & Thomas, D. E. C. (2017). Urbanization and Urban design in sustainable development. Case study of the ToLich River regions in Hanoi. UPLanD-Journal of Urban Planning, Landscape & environmental Design. 2(2). 37-52.

Deng, X., Xu, Y., Han, L., Song, S., Yang, L., Li, G., & Wang, Y. (2015). Impacts of urbanization on river systems in the Taihu Region, China. Water. 7(4). 1340-1358.

Diagram of the isosceles water triangle of Hanoi by Tran Quoc Vuong (quadrilateral. 04 water doors: they include the Buoi Gate (Hong Tan), door Cau Giay (Tay Duong), door Dong Nam (Dong Lam), door Dong Mac - door Dong (Gao Market), Tran Quoc Vuong, Thang Long - Hanoi, duoi goc nhin van hoa. (Thang Long-Hanoi, under the gaze of culture). The edition of information & institute of culture. 1998, pages 339, 495. E. Morin (1977). The method. 1. La Nature de la Nature . Paris. Seuil.

Efroyimson, D., Ha, T. T. K. T., & Ha, P. T. (2009). Public spaces: How they humanize cities. Dhaka: Health-Bridge-WBB Trust.

Forman, R. T. (2014). Land mosaics: The ecology of landscapes and regions 1995. The Ecological Design and Planning Reader: IslandPress: Washington, DC, USA. 217-234.

Garnier, 1995. Source: The river, bearer of urban images: forms and challenges, Fanny Romain. Gēocarrefour.revues.org / 8001? Lang = en. page 274.

Georges Bertrand (1978). 'Le paysage entre la Nature et la Sociêt' (The landscape between nature and society) . Op. Cit .. Pages 96-97.

Hoang Thieu Son.(1965). 'Manual of Natural Geography'. Educational Edition. 1965. page 196.

Huong, H. T. L., & Pathirana, A. (2013). Urbanization and climate change impacts on future urban flooding in Can Tho city, Vietnam. Hydrology and Earth System Sciences. 17(1). 379-394.

Houghton Mifflin Harcourt. Ndubisi, F. O. (2014). The ecological design and planning reader. Island Press.

Hanson, A. (2012). Reconnecting to a Forgotten River: An Ecological Solution.. A Design Thesis Submitted to the Department of Architecture and Landscape Architecture of North Dakota State University.

Ingaramo, R., & Voghera, A. (2016). From the River to the Project. In Topics and Methods for Urban and Landscape Design (pp. 1-9). Springer, Cham.

Jean BETHEMONT. Society in the mirror of the river. in Actes de Colloque International. Lyon. 1993. pages 13-16

Jean Bethemont (1993) 'La société au miroir du fleuve' (Society at the mirror of the river). Dans Actes de Colloque International. Lyon. Joel.

Jakovlevas - Mateckis K. (2006). 'Miesto želdynų problemos ir jų socialinė paskirtis' (Problems of urban green areas and their social function). Urbanistika ir architektūra. 1(30). 3-14

Kongjian, Y. (2006). Art of Survival: Positioning Contemporary Landscape Architecture Design IJ. Architectural Journal. 10. 39-43.

Lin, M. O., & Kongjian, Y. U. (2012). Structure the Urban Green Sponge: Study on Planning an Ecological Storm-water Regulation System IJ. Urban Studies. 5. 130-134.

Mumford, L. (1961). The city in history: Its origins, its transformations, and its prospects (Vol. 67).

Nguyen, M. (2018). To Lich River: A research studies.

Pierre Donadieu, Elisabeth Mazas (2002). 'Des mots de paysage et de jardin' (Words of landscape and garden). Op. cit. page 262.

Philippe Pannerai. 1980. 'Elements d'analyse urbaine' (Elements of urban analysis). page 118.

Pierre Merlin and Françoise Choay.1988. 'Dictionnaire de l'urbanisme et de l'aménagement' (Dictionary of town planning and development) . Op. Cit .. Page 643.

Philippe Papin (2001) . 'Histoire de Hanoi' (History of Hanoi) . Fayard.

Roncayolo. (1990). Source: 'Le fleuve, porteur d'images urbaines: formes et enjeux ' (The river, bearer of urban images: forms and challenges). Fanny ROMAIN. Gēocarrefour VOL 85-3 / 2010. geocarrefour.revues.org

Silva JB, Serdoura F, Pinto P (2006) 'Urban rivers as factors of urban (dis) integration'. In 42nd IsoCaRP Congress. Istanbul, Turkey.

REFERENCES

Šarapatka, B., & Štěřba, O. (1998). Optimization of agriculture in relation to the multifunctional role of the landscape. *Landscape and urban planning*, 41(2), 145-148.

Shahhosseini, E. (2015). The role of urban sculpture in shaping the meaning of identity in contemporary urban planning. *International Journal of Science, Technology and Society*, 3(2), 24-26.

Shahhosseini, E. (2015). The role of urban sculpture in shaping the meaning of identity in contemporary urban planning. *International Journal of Science, Technology and Society*, 3(2), 24-26.

Truong Quang Thao (2001). 'Đô Thị học Nhập môn' (Urban project in primary knowledge). Editions de construction, page 42

Tran Huy Lieu (1960). 'History of the capital of Hanoi'. Op. Cit. , page 72.

Yue, J. (2012). Urban rivers: a landscape ecological perspective. *Hydrology: Current Research*, 3(1).

