STITCHING LIJIAO

Towards the reintegration of urban villages in the landscape of the Pearl River Delta

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Landscape Architecture MSC 2020

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This thesis is the result of my fascination in landscape architecture and public spaces which has been strengthened by virtue of the Master study in the Landscape Architecture track in the Faculty of Architecture and the Built Environment at Delft University of Technology.

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Grazie

Structure

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PART II: Research by Design

Abstract

During the last four decades, China experienced the fastest urban population growth in the world. After the establishment of the Special Economic Zones (SEZ) in 1979, due to the tremendous demand for new construction land, cities authorities expropriated farmlands to establish new urban developments. However, in order to minimize compensation costs, they left the housing plots of the former villages untouched. Hence, those were encroached into the city's structure becoming urban villages (villages-in-the-city). The SEZ began to attract more and more migrants from all over China. The demand of housing in the villages kept on rising and the expansion of the plots became extreme and illegal. The spatial results of this process are overpopulated but also lively, active, mixed-used, and human-scaled environments. Since most of them are located in valuable locations for the real estate market, the Chinese government deals with the "issue" with their demolition. Diversity and variety of the built environment diminish with each bulldozing, slowly authorizing the loss of a unique urbanism.

Historically, villages were located in strategic points according to the characteristics of the landscape, and closely related to the blue system. This relationship has gradually diminished. The water infrastructure within the entire Pearl River system is now extremely polluted, mostly due to industries. As a result, nowadays water is seen as an issue and a threat rather than an opportunity. In Lijiao village, the chosen design location situated in Haizhu District (Guangzhou, Guangdong Province), the high demand for housing made possible the demolition and replacement of numerous cultural landscapes along with the underground canalization of watercourses. Only the main stream is still uncovered but the water is polluted and it serves as linear parking lot for the villagers.

The aim of the thesis project is to highlight and eventually exploit the positive aspects and the values of urban villages, through the process of research by design. In such manner, Lijiao is re-integrated into the city's structure and the lost connection with the water landscape is re-defined, serving as a carrier into the urban village while strengthening its identity. The expected result is an improvement in quality of both the public space and the water sanitation system.

1

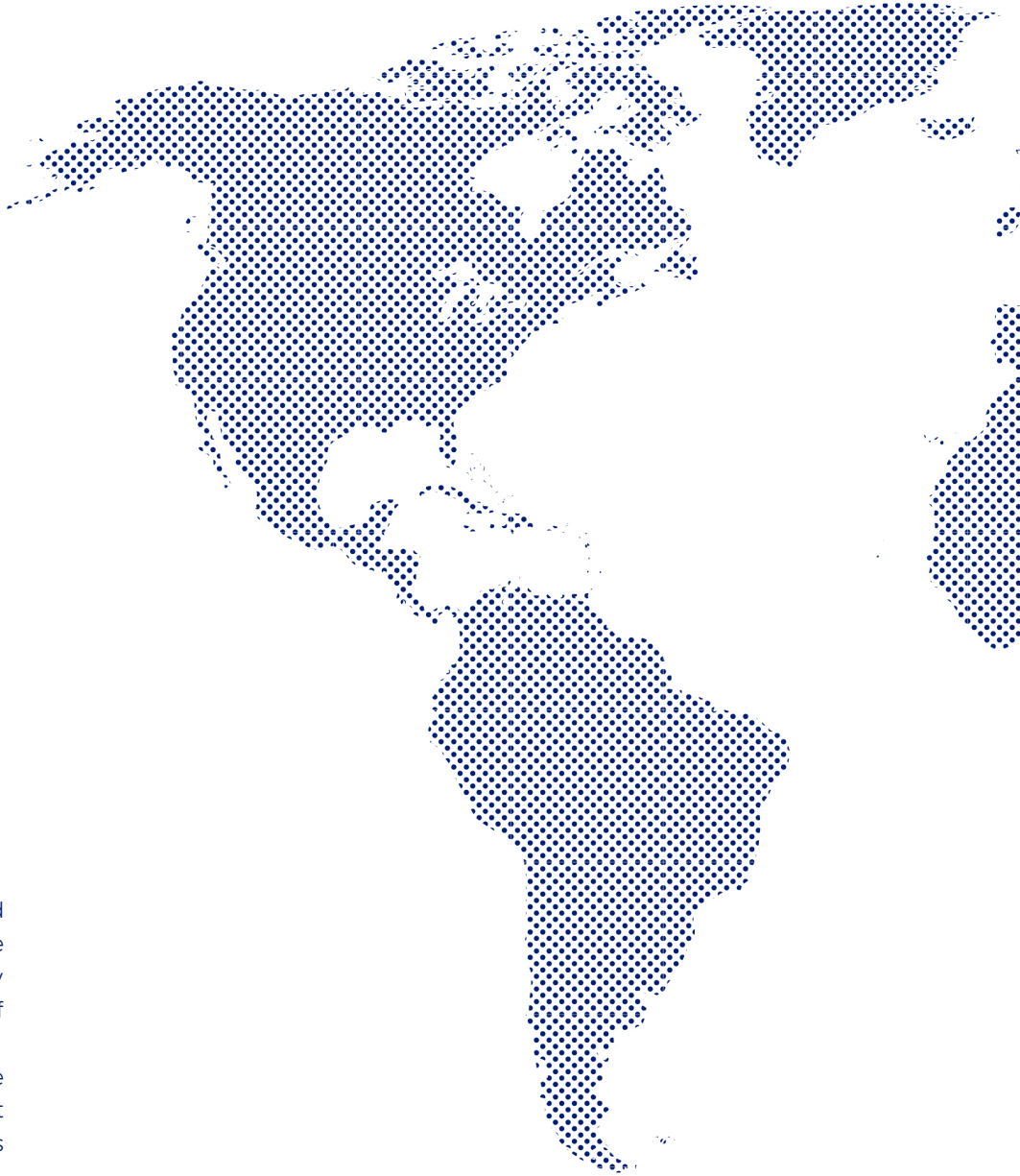
INTRODUCING

The chapter presents an overview of the overall framework of the graduation projects “Stitching Lijiao”.
Starting from the geographical location up to the historical and socio-cultural evolution. In fact, the dimensions and complexity of the Pearl River Delta area offers a wide range of opportunities and challenges that will be later further tackled by both the analysis and the design on different scales.

Figure 1–1 Historical city center of Guangzhou.
Captured by the author

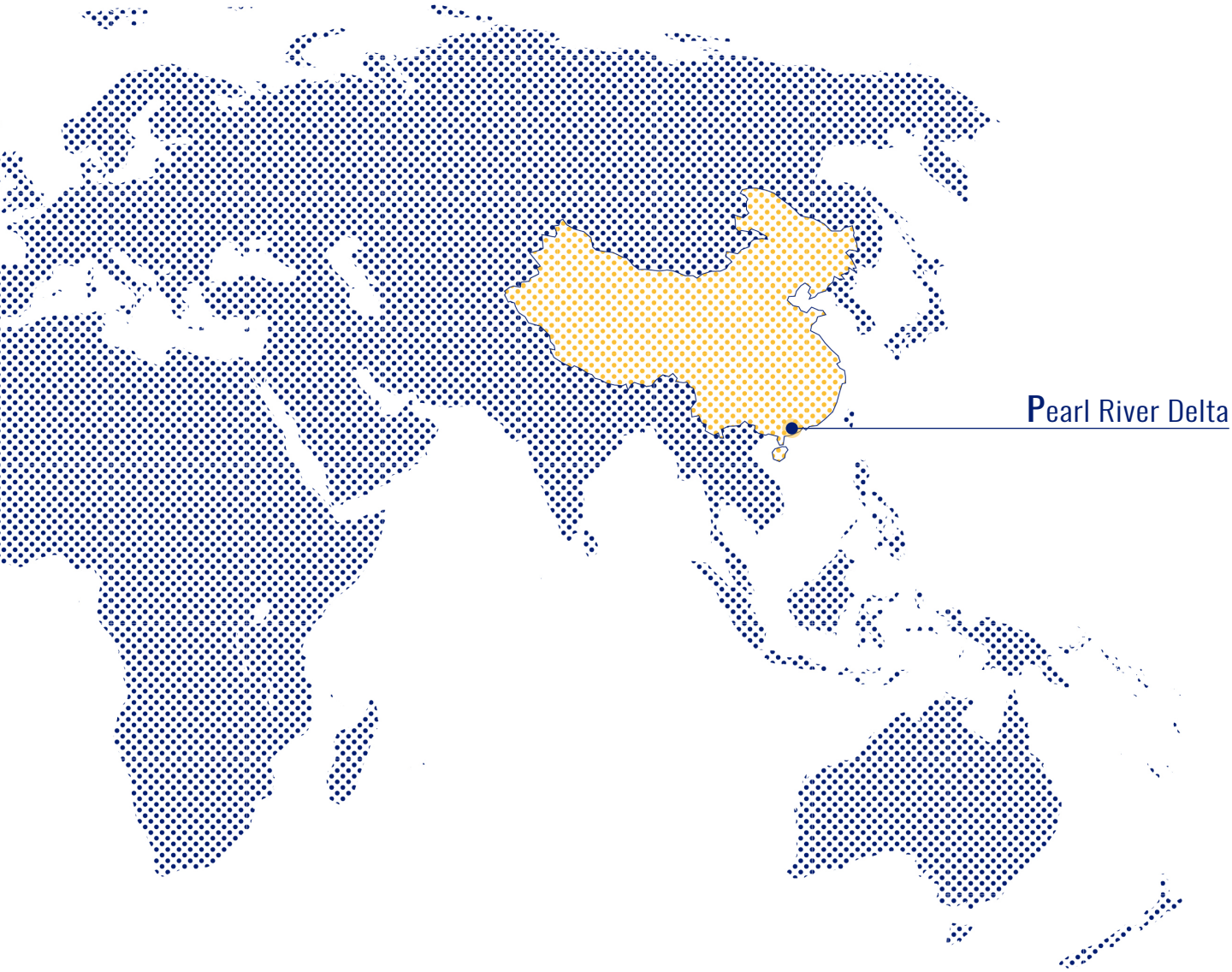
1.1 framework

1.1.1 geographical framework



The Pearl River Delta is located in the South of China and is one of the fastest and most densely urbanized large scale deltas of the world.

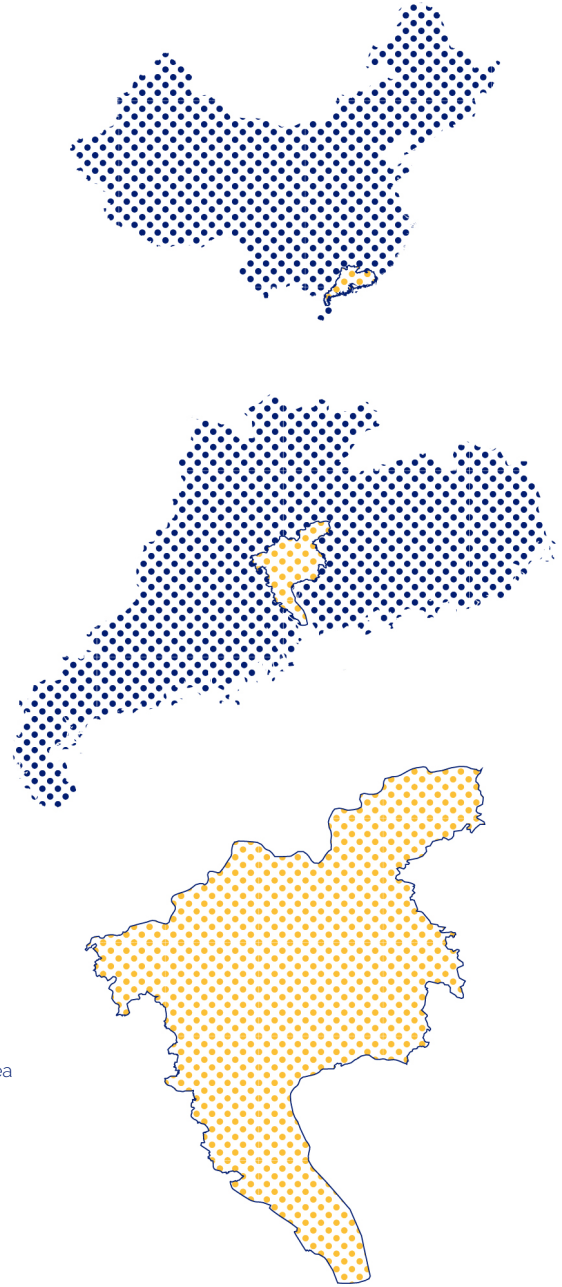
This region is the driving force in South China, being the most prosperous metropolitan regions of China (Li, Lin, Li & Wu, 2014).


Pearl River Delta

China

Guangdong Province

Guangzhou metropolitan area

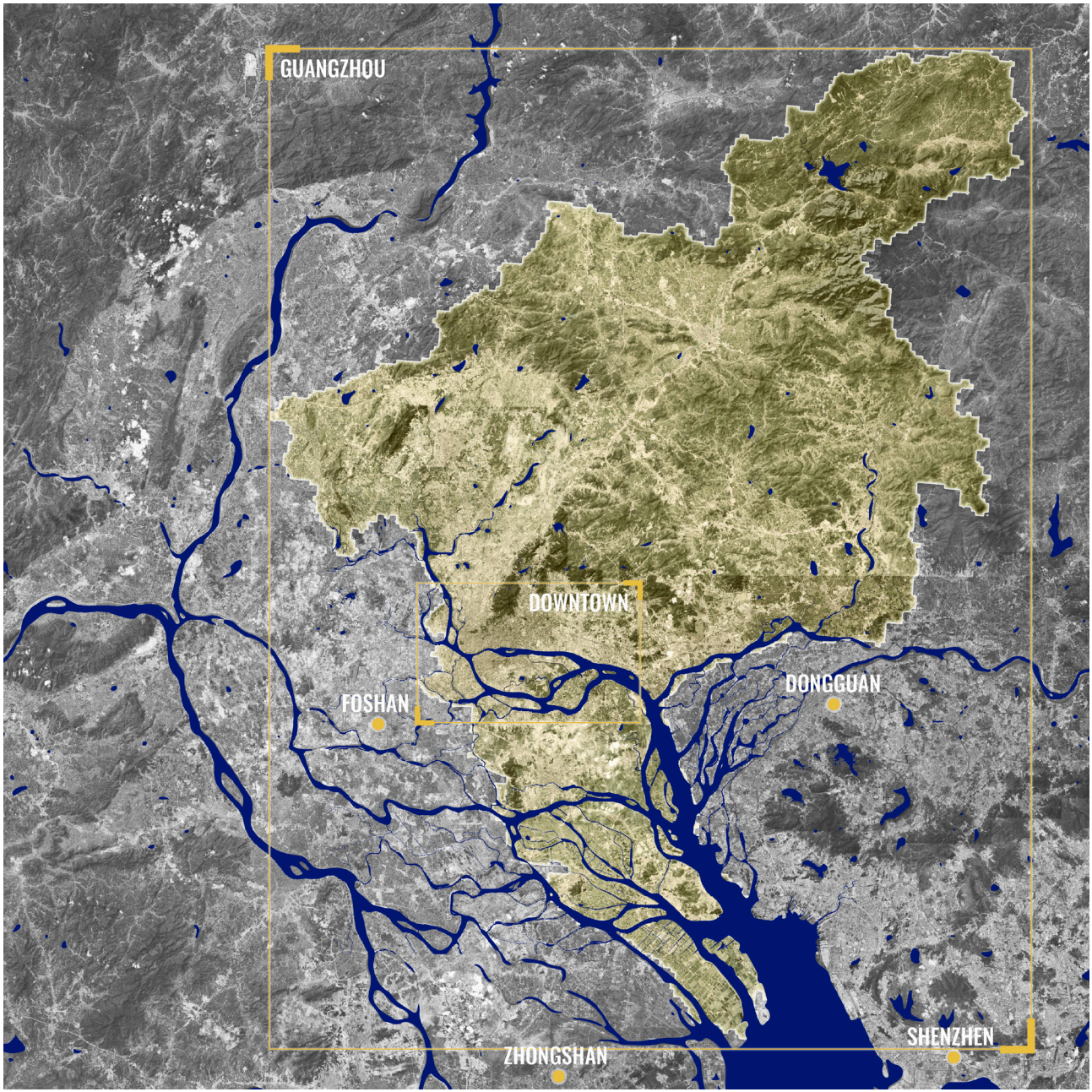


Guangzhou is the capital city of the Guangdong Province as well as the most important industrial city in the Pearl River Delta region.

Guangzhou is geographically located in a favorable position. It is situated at the node of two development corridors of the Pearl River Delta region:
1. Guangzhou - Shenzhen - Hong Kong
2. Guangzhou - Zhuhai - Macau

This convenient location along with the historical developed business networks and services made possible the major flourishing and expansion of the city over the past forty years (Xu & Yeh, 2003).
Here the total built-up area has increased from 170 km2 in 1980 to 990 km2 in 2011 (Hin, Lin, Li & Wu, 2014). Moreover, according to the National Bureau of Statistics of China, population increased from less than 2 million inhabitants in 1980 to above 13 millions in 2020.

Figure 1–2 Geographic context of Guangzhou. China - Guangdong Province - Guangzhou metropolitan area. Redrawn by the author
Figure 1–3 Satellite image adapted by the author (right)


GUANGZHOU
DOWNTOWN
FOSHAN
DONGGUAN
ZHONGSHAN
SHENZHEN

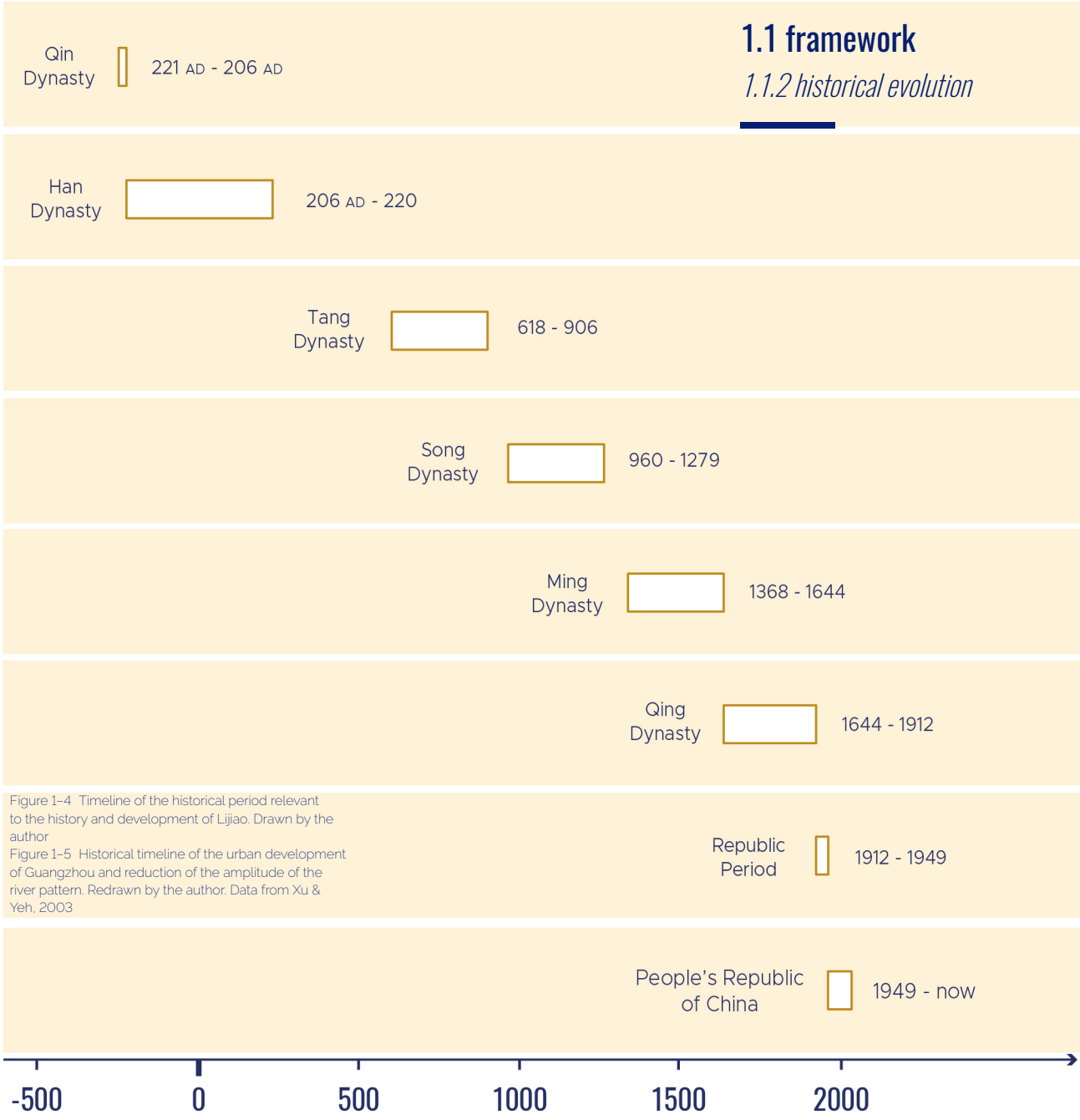


Figure 1-4 Timeline of the historical period relevant to the history and development of Lijiao. Drawn by the author
Figure 1-5 Historical timeline of the urban development of Guangzhou and reduction of the amplitude of the river pattern. Redrawn by the author. Data from Xu & Yeh, 2003

214 AD - the first administrative boundary of Guangzhou was formed
Built in close proximity with today's old city centre

Guangzhou was already known as a commerical port

Sea transport developed quickly
Guangzhou is the largest port city in China,
known as the "Silk Road on Water"

Guangzhou's developments is on hold
It did not become an important port till the Qing dynasty

Guangzhou's decline around 1600
the central government sealed off the coasts to avoid pirate's invasions

1757 Guangzhou re-opened as the only port
The monopoly lasts till the Opium war when Guangzhou declines again

Guangzhou did not re-gain prominence until 1949
In 1948 the built-up area is around 15,2 km2
accomodating 1,4 million inhabitants

1949 to 1978 socialist city promoting public ownership and heavy industrial production, unregulated development guided by economic planning
1979- 1987 Guangzhou repositioned itself thanks to the nation's new economic reform and the "open door" policy - rapid economic boom along with growth of population and extensive new urban development

1.1 framework

1.1.3 socio-economic evolution

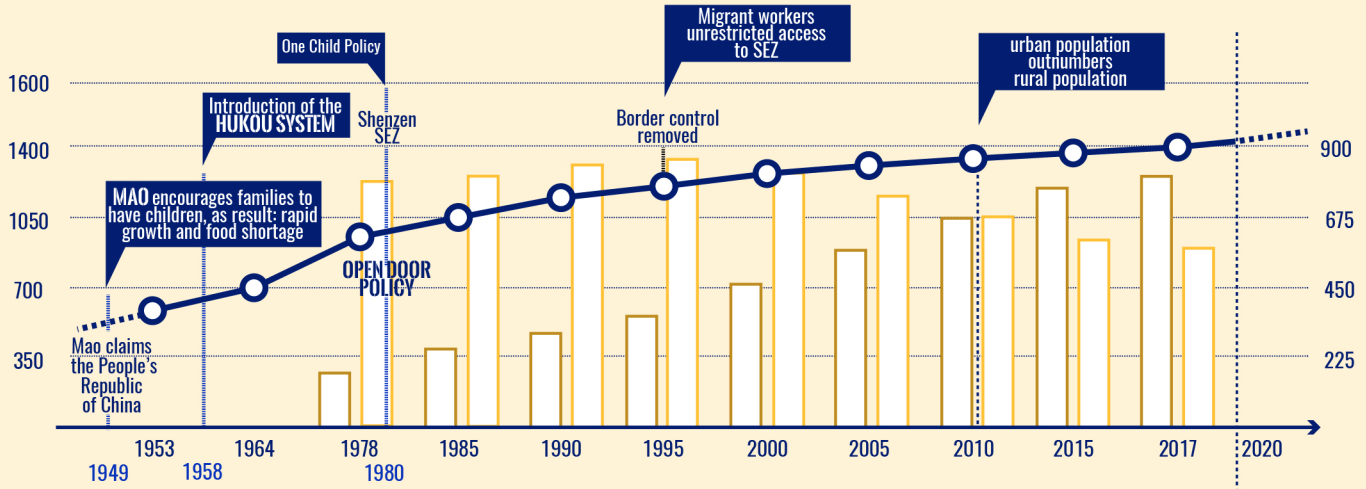
China experienced the fastest urban population growth in the world. According to the National Bureau of Statistics of China the urban percentage raised from 17.92% in 1978 to 58.52% in 2017. (Xiao, Song & Wu, 2018). In Guangdong Province in the same year it almost reached 70%. Moreover the number of migrant workers increased from 19.12 million in 1978 to 286 million in 2017 (China's statistics).

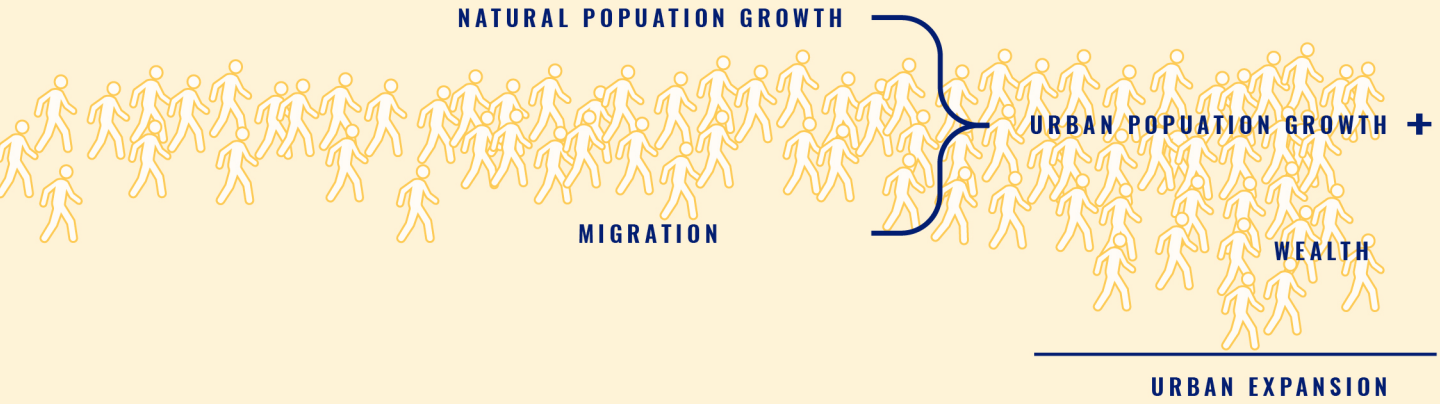
In only twenty years, between 1978 and 1998, China realized more than 400 new cities. China's urban landscape is concentrated on one-third of the nation's surface (Mars 2006). Rural population has been moving to the cities and urban population has outnumbered the rural one in 2010.

" The world is urbanizing, China fastest"

Neviille Mars

Figure 1-6 Timeline of the total population growth from 1949 to 2019 with the increase in urban population and the decrease in the rural one. With relevant episodes. Drawn by the author.





2 DEFINING

The problem field in which the project is developed consists of two parts. On one side urban villages are being demolished, loosing unique urbanism along with diversity and sense of place. On the other side the historcal tight and intimate relationship between rivers and human settlements is deteriorating, together with rivers and canals water conditions, which are progressively been polluted.

These two dilemmas led me to the choice of Lijiao as the project site and originated the research question of the thesis.

Figure 1–7 Water canal in Lijiao,
Captured by the author

2.1 problem field

2.1.1 loss of unique urbanism

As explained briefly in the previous chapter, China experienced the fastest urban population growth in the world. After the establishment of the Special Economic Zones (SEZ) in 1979 the municipal governments had a tremendous demand for new construction land. As a consequence, cities authorities expropriated farmlands to establish new urban developments but, in order to minimize compensation costs, they left the housing plots of the former villages untouched *(stage 2)*.

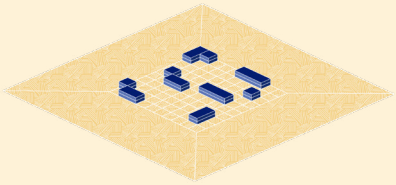
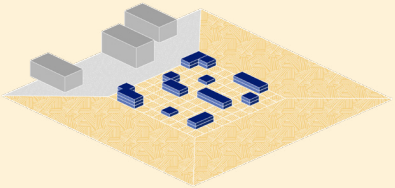
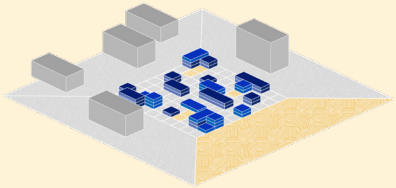
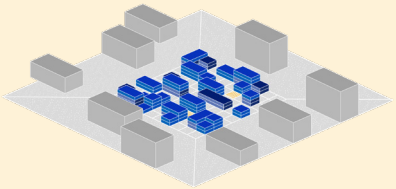
Stage 1	Stage 2	Stage 3
		
traditional village settlement	sale of agricultural land, contact with urban area, expansion of village housing (2-3 floors)	beginning of illegal development and leasing

Figure 1-8 Typical Urban Villages Stages (Seven Siwen Qi, 2014). Redrawn by the author

Hence the villages were encroached into the city's structure becoming villages-in-the-city (or urban villages) starting from the early 1980s and 1990s *(stage 3-4)*. The SEZ began to attract more and more migrants from all over China. Since the hukou registration system precluded the legal settlement of migrants inside the cities, the result was the establishment of non-hukou migrants in urban villages, which were the only places within the cities without government's management. The demand of housing in the villages kept on rising and the expansion of the plots became extreme and illegal *(stage 5)*.

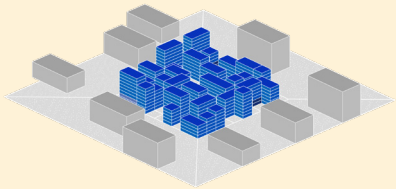
Since most of the urban villages are located in valuable positions, the city's governments trend is to *"transfer the collective village-held land use rights back to the state"* (Stefan Al, 2014). As soon as those rights are handed over the urban village is then demolished and redeveloped into a new urban complex. By doing so *"the city as a whole loses unique histories and places in exchange for the relentless repetition of cookie-cutter office blocks and residential enclaves. It is poignant that Chinese city planners, desperately pondering ways to infuse identity into their newly built homogeneous cities, overlook the urban village. Their unique urbanisms, histories, spatial experiences, culture and cosmopolitanism could bring a more diverse texture to the future of the city."* (Stefan Al, 2014).

Stage 4



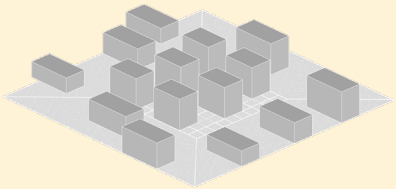
gradual expansion of
village housing
(4-6 floors)

Stage 5



further expansion of village housing (7-15 floors),
conflict between city
and urban village

Stage 6



disappearance of
urban village into city

Figure 1–9 Daily life in urban villages in Guangzhou, Captured by the author

In November 2020, during my field trip to Guangzhou I was able to experience the spatial results of this process.

Urban villages are indeed extremely lively places. Around the streets people live the public spaces as if it were their common outdoor living room. Going around you can spot many markets, old people playing mahjong or kids running around.

They are truly mixed-use, most of the ground level has in fact a commercial function. The community has easy access to stores and restaurants, which often also provide a lunch break to white collars workers in the proximity.

Moreover, because of their narrow streets, are pedestrian friendly and human scaled.

> “Their unique urbanisms, histories, spatial experiences, culture and cosmopolitanism could bring a more diverse texture to the future of the city.” Stefan Al

Figure 1–10 Dark alleys and one line sky buildings in Shipai urban village in Guangzhou, Captured by the author

There is also a dark side of urban villages. They are overpopulated places. In the specific the 138 urban villages in Guangzhou covers around 20% of the total urban area of the city, while they host approximately 70% of the population (Lin, De Meulder & Wang, 2011b).

For this reason the buildings are so close to each-other that they are called “handshake buildings” or “kissing buildings”.

The secondary streets usually lack daylight and they are deficient in the necessary services. “Over time, they are soon stigmatized as areas of crime and all other conceivable social evils.” (De Meulder & Shannon, 2014)

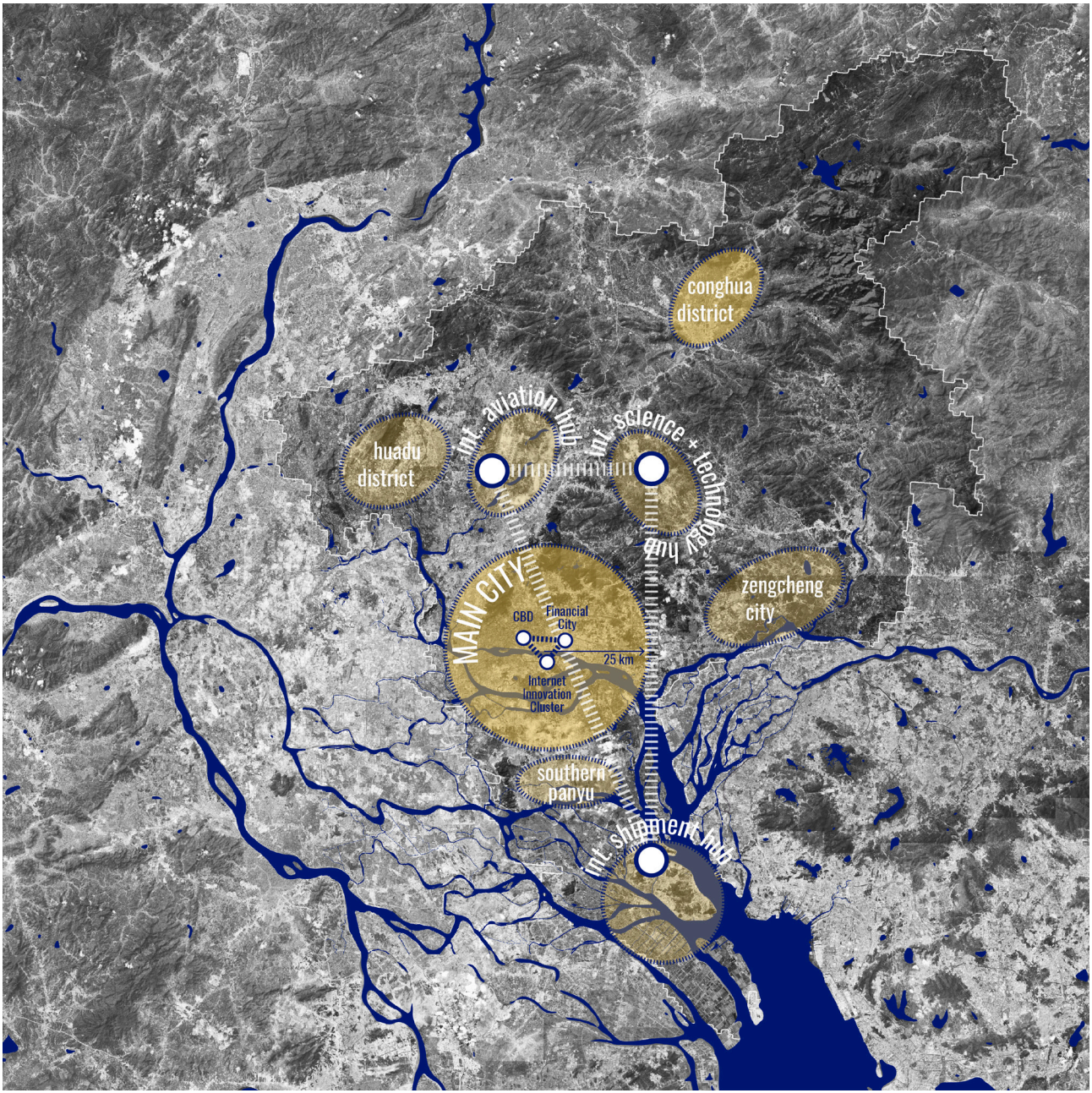
> “Dirty messy and inferior spaces that degrade city’s form and harbor urban ills such as crime and vice.”
>
> Stefan Al

The dark side of urban villages along with their valuable locations for the real estate market are the causes for the government to opt for demolition.

On the right side is shown a schematic diagram of the city governemnt's plan for Guangzhou 2035. The development of the main core of the city will encroach Lijiao as well as other urban villages, which are therefore been pressured to be demolished.

Xian Cun urban village, here represented in the pictures, was located in the new urban axis developed in Guangzhou. Its demolition started last year in order to redevelop it into these homogeneous and standardized housing and office blocks. The fall of those unique places symbolize the loss of diversity through the Pearl River Delta.

Figure 1–11 Bulldozing of XianCun urban village in Guangzhou, Captured by the author


conghua district
huadu district
int. aviation hub
int. science + technology hub
MAIN CITY
CBD
Financial City
25 km
Internet Innovation Cluster
zengcheng city
southern panyu
int. shipment hub

2.1 problem field

2.1.2 loss of relation between urban village and water landscape

To understand the process of development of urban villages, the starting point is historical mapping In fact, analyzing an historical map dating 1857 it is extremely recognizable a pattern of villages, developed in close relation with water along the streams and the coasts. These were strategic points for both having the resource of fresh water for agriculture and the possibility of transportation via water.

Moreover overlapping the contours of the blue infrastructure through a time period of little over 150 years is evident a reduction on the amplitude of the river pattern, which has been dominated by the increased necessity of land for urbanization.

Water used to be a vital element, exploited for agriculture but also for transportation and common daily activities.
Due to the rapid urban expansion and the increasing development of industries, the demand for more land led to the canalization of some water streams underground. Moreover the new urban development took place replacing the former villages. The water streams which are still open are now extremely polluted therefore seen as an issue and a threat rather than an opportunity.

Figure 1–12 Historical timeline of the urban development of Guangzhou and reduction of the amplitude of the river pattern. Redrawn by the author

Qin Dynasty
221AD - 206 AD

Tang Dynasty
618 - 906

Song Dynasty
960 - 1279

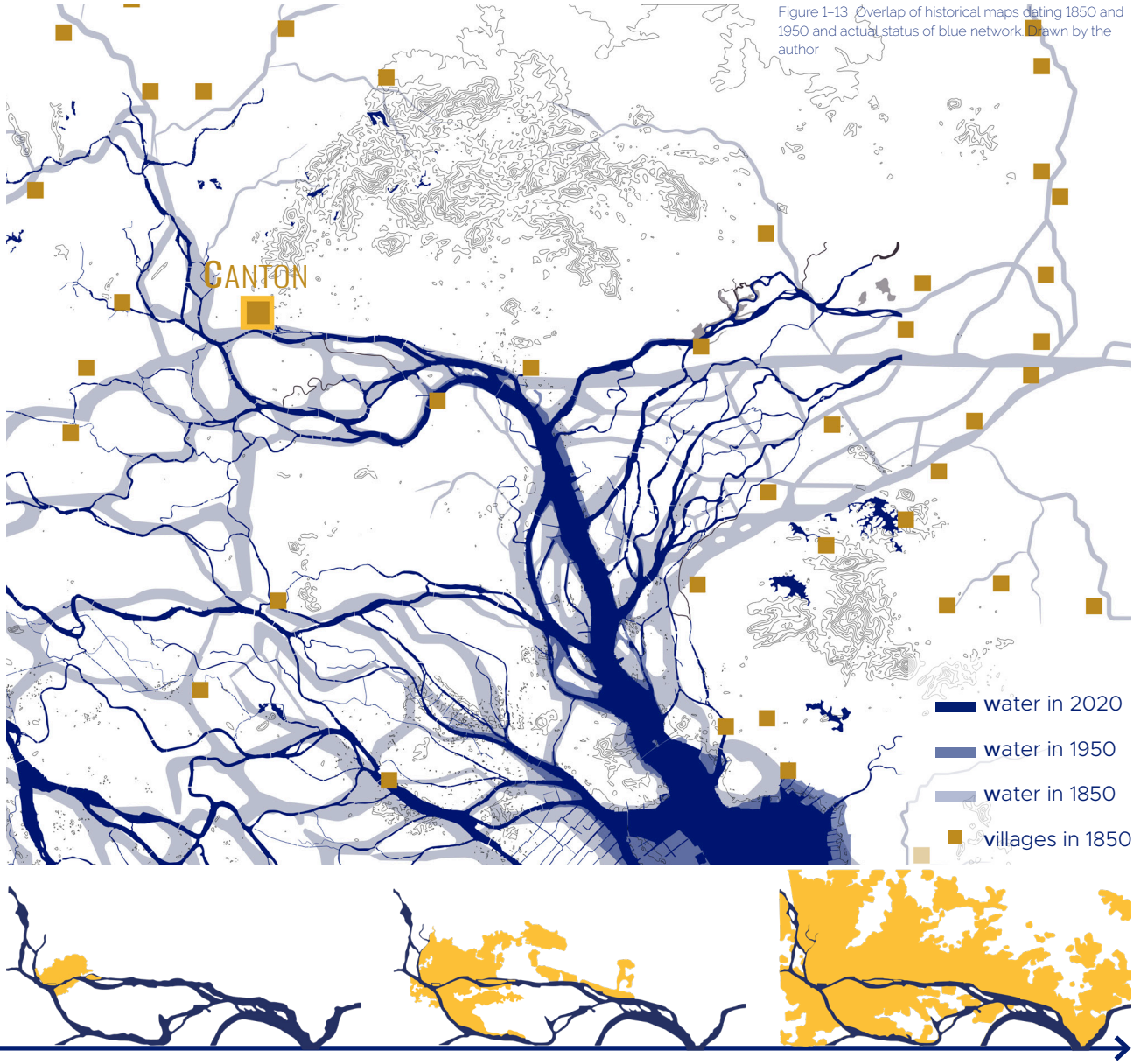


Figure 1–13 Overlap of historical maps dating 1850 and 1950 and actual status of blue network. Drawn by the author

2.2 research question

research question & sub-research question

> how to **preserve** and **strengthen** the **identity** of the **urban village of Lijiao**, by **re-defining** the historic relation between the **village** and the **water landscape**?

sub-research question	methodology	theoretical approach
what are **strategic urban villages** to preserve, in order to strenghthen the identity of the Pearl River Delta?	Analysis historical and regional mapping	Urban Acupunture
how to **develop urban villages under the pressure of top-down demolitions**?	Analysis site visit, literature review	Case study Foshan Lignan Tiandi (Foshan), Treasure Island (Taipei)
how to **turn Lijiao into an attractive district** for both residents and the city as a whole?	Research by Design site visit, master-plan studies, scenario studies, design through scales	Case study Foshan Lignan Tiandi (Foshan)
how to **improve water pollution** in a nature based way, in order to then **revitalise the public space**?	Analysis & Research by Design literature review, master-plan studies	Urban River Corridors Case study Cheonggyecheon River (Seoul)

3

RESEARCH FRAMEWORK

The research framework of this thesis can be divided in three main stages. In the first phase the field trip to Guangzhou, with empirical data, along with literature studies and regional analysis were fundamental to arrive to the articulation of the research question. In order to then develop the design along with its strategies, the research by design method was applied. Trials and errors were a concrete part of the design process, but one overall hypothetical project will be further explored from the scale of Lijiao up to the architectural one. Theories and case studies were investigated in order to build up on the story and the project itself.

The P4 status it is been investigated up to this second phase, which will be further implemented during the time period between P4 and P5. Consequently will follow the evaluation and the conclusions.

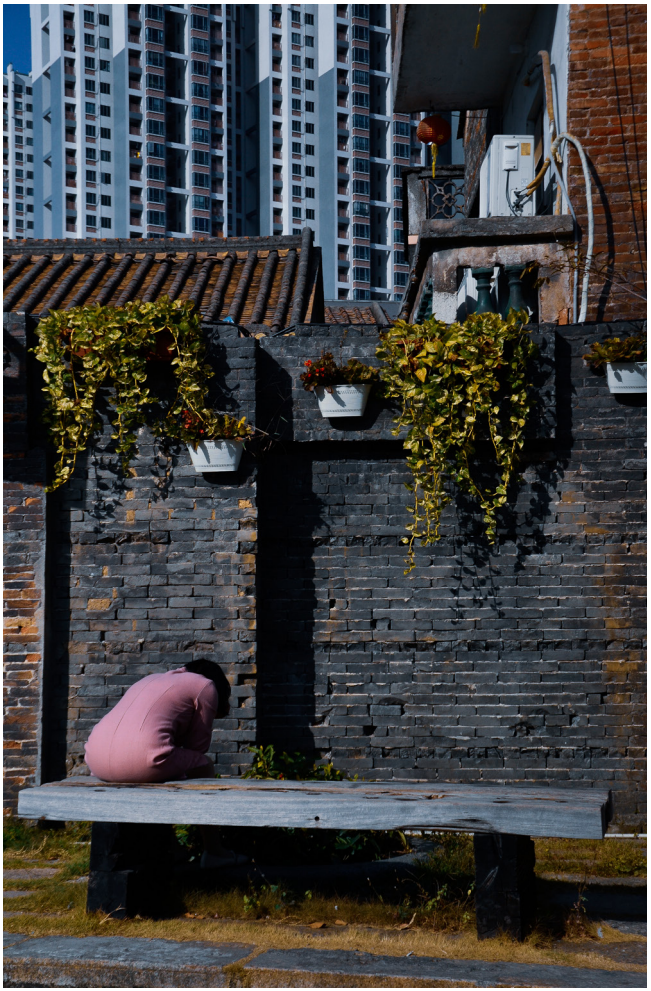
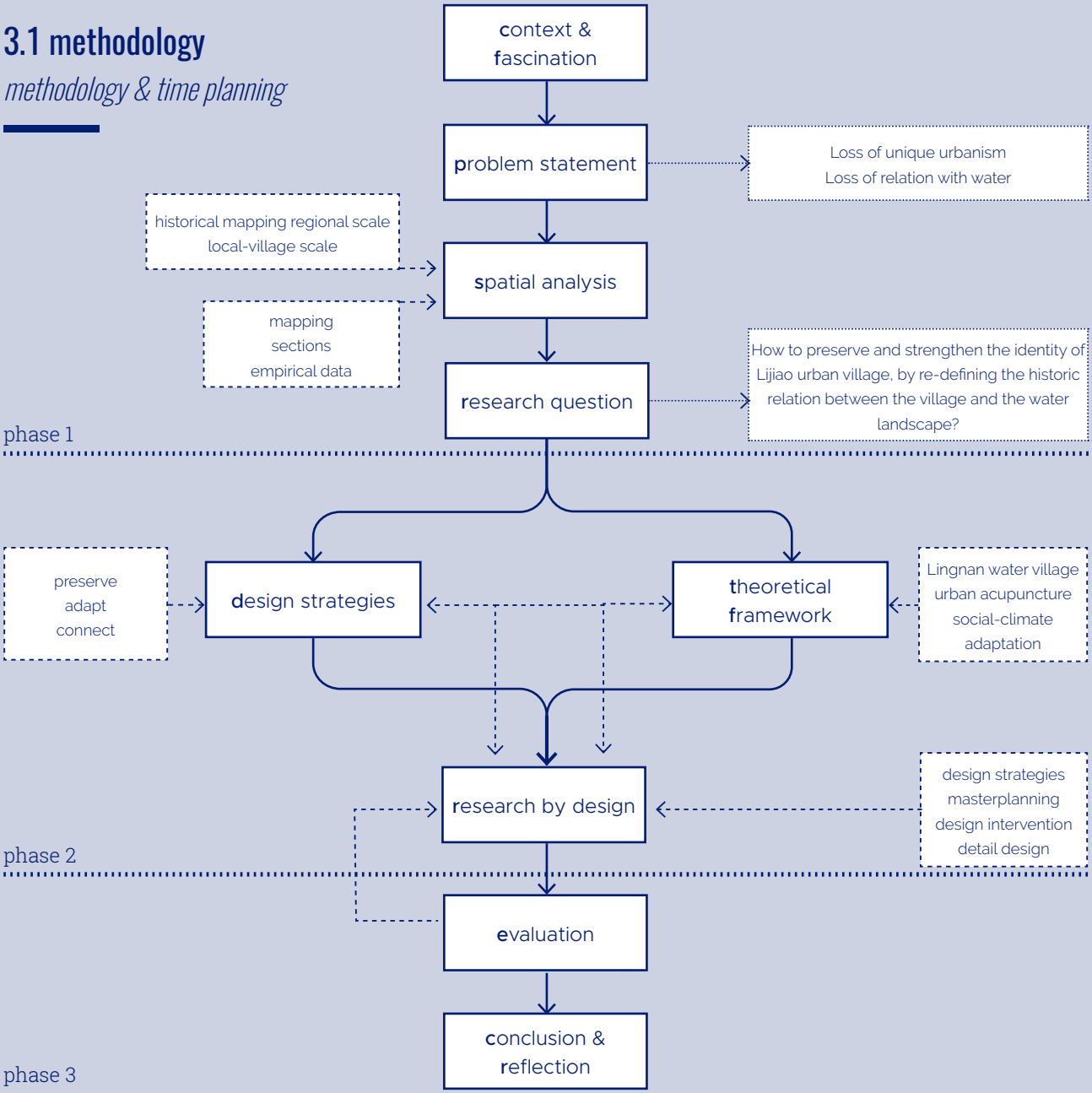


Figure 1–14 Foshan, Guangdond Province,
Captured by the author

3.1 methodology

methodology & time planning



sep

oct

nov

dec

jan

feb

mar

apr

may

jun

jul

investigation

deliveries

P1 theme & project hypothesis

site visit: Guangzhou
literature study: urban villages, urbanization & water management
historical mapping: Guangzhou
regional scale analysis: Haizhu District
site choice: Lijiao
village scale spatial analysis

fascination
problem field
initial structure proposal

P2 diagnosis & concept design

literature study: urban acupuncture & the third generation city, integrated urban river corridors, density
case studies: river regeneration & urban villages development
typological studies built and public space

problem statement
research questions
historical mapping
regional analysis
design vision on 3 scales
concept design on village scale
strategies

P3 exploration & elaborated design

design elaboration on village and architectonic scale
literature study: Lingnan water villages, water pollution & purification systems

theoretical framework
south Haizhu District scale land use
masterplan
public space toolbox
village scale initial design of the public space

P4 final design

further polishing of design on the 3 scales
design reflection
presentation
final model

south Haizhu District final masterplan
village scale final design
architectonic scale details

P5 public presentation

finalization of P4

4

THEORETICAL FRAMEWORK

In this chapter are explained theories and case studies that help support the second part of the thesis, the research-by-design. With Lingnan Water Village is intended a typology of villages where is present a deep connection with the water bodies, and it was the historical typology of village where Lijiao can be placed in. This can also be related to the first generation city, where cities are still in close connection to nature. Although the actual status of Lijiao belongs to the Second generation city, here the relation with the green and blue infrastructure is lost, due to urbanisation. The design will develop Lijiao according to the Third generation city, where the link between village, public space and water is explored and re-defined. The case studies investigate examples on both the development of urban villages and the adoption of water bodies within public spaces.

Figure 1–15 Yongqing Fang development area, Guangzhou, Captured by the author

4.1 Lingnan Water Village

literature study

Public life in Lingnan water villages is the link that connects villagers. Therefore, as explained by Wang and Zhou, the creation of good public spaces is fundamental to shape a harmonious and healthy living environment as well as to improve villagers' quality of life.

Lingnan water villages retain characteristics, but because of the impact of urbanisation, some traditional activities and public spaces have been affected by cities and are declining.

Generally, the author states, there are public spaces with a long history and traditional characteristics in the village. Therefore those are an important part of the public life of the village and have a greater impact on the life oh the inhabitants.

Due to the pressure for high density and economic interests, buildings are becoming denser and streets narrower, resulting in scarce public space, which is now often outdated and poorly maintained or managed.

Dong and Yong define "rural public space, the material space open to all people which at the same time also include the elements of 'non-physical'".

Public spaces in Lingnan water village are mainly located in:

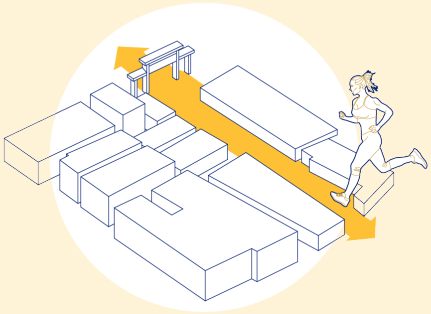
1. Village entrance. Here the space is relatively wide, with signs of village entrances like archways. It will concentrate public service facilities, such as commerce, education and medical treatment.
2. Squares in front of public buildings, such as ancestral halls and temples; "These buildings have a special position in the minds of local villagers, especially the ancestral hall occupies an important position that cannot be replaced by other buildings. It is not only the core public space in the village, but also the psychological center of the local villagers. It plays a role in maintaining clan unity and promotion. The role of clan spirit. Villagers gathered here to discuss family events, worship ancestors, and hold collective activities such as sacrifices, dinners, trades, competitions, and rallies at specific times. Many water villages have ancestral temples and gates in front of them. There is also a combination of wind pools and squares. The space is open. It is often the largest public space in the village. It meets the needs of people of the same ethnic group. The main place for daily spontaneous activities." (Wang)
3. Main streets, usually those have various small shops on the first floor of residential buildings to meet the needs of villagers.

"Many water villages have ancestral temples and gates in front of them. There is also a combination of wind pools and squares. The space is open. It is often the largest public space in the village. It meets the needs of people of the same ethnic group. The main place for daily spontaneous activities."

Figure 1–16 Schematic diagrams of public spaces in Lijiao. Drawn by the author

4. Water bodies and surrounding water facilities; The public spaces around water bodies and water facilities are special public spaces in water villages. In the past, these water bodies were closely related to the villagers' life. Now, with the improvement of infrastructure, villagers basically di not need to rely on natural water systems to live, but people's dependence and closeness to water are inherent, and the water bodies and the space around the water body facilities are still public activities of villagers. One of the important places. The surroundings of water bodies are often wider, with better scenery, and close to nature, which is conducive to various spontaneous activities. Therefore, the surrounding water bodies and water facilities can often attract villagers at all levels in the village. The public spaces in Lingnan water villages are often closely related to water bodies, and have both landscape features and spatial structure features. In the villages of Lingnan Water Town, many public activities are also closely related to water bodies."

Public spaces typologies of Lignan Water Village in the case of Lijiao



1. Village Entrance

2. Squares in front of public buildings

3. Main streets

4. Water bodies

4.2 Urban Acupuncture

literature study

“Urban Acupuncture is a biourban theory , which combines sociology and urban design with the traditional Chinese medical theory of acupuncture. As a design methodology, it is focused on tactical, small scale interventions on the urban fabric, aiming in ripple effects and transformation on the larger urban organism. Through the acupuncture points, Urban Acupuncture seeks to be in contact with the site-specific Local Knowledge. By its nature Urban Acupuncture is pliant, organic and relieve stress and industrial tension in the urban environment - thus directing the city towards the organic: urban nature as part of nature. Urban Acupuncture produces small-scale, but ecologically and socially catalytic development on the built human environment.” (Marco Casagrande)

“Urban Acupuncture is a biourban healing development process connecting the modern man with nature”.

& the Third Generation City

1 - The First generation city (fig. 1) refers to the former or to a modest typology of urban development, where the human settlements are in close relation with nature and dependent on it.

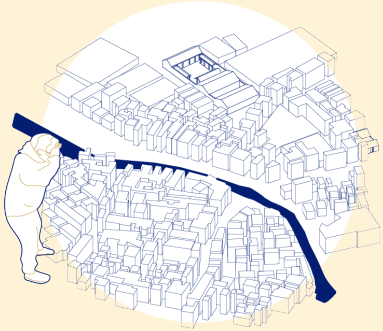
2 - The Second generation city (fig.2) indicates the industrial city. It is a city that exploits nature and natural resources to drive its expansion. In this generation nature is seen "as something unnecessary or as something hostile." Guangzhou like many other cities can be placed in this category. The former connection with nature and especially with water is lost. The former robust green and blue infrastructure has been replaced by urban expansion and industries.

3 - The Third generation city (fig.3) should therefore be an alternative to the aggressive urban development. As Marco Casagrande explains "the Third generation city is the organic ruin of the industrial city." It should be a layer that provides different ways of living.

"The Third Generation City is a city of cracks. The thin mechanical surface of the industrial city is shattered, and from these cracks emerge the new biourban growth which will ruin the second generation city. Human-industrial control is opened up in order for nature to step in. A ruin is when man-made has become part of nature. In the Third Generation City we aim in designing ruins. Third Generation City is true when the city recognizes its local knowledge and allows itself to be part of nature."

(M. Casagrande, 2015)

1. First generation city, Lijiao



2. Second generation city, Lijiao

3. Third generation city, Lijiao

Figure 1–17 Schematic diagrams of First, Second and Thirds generation city in the case of Lijiao. Drawn by the author

4.3 case studies

4.3.1 Cheonggyecheon River project

Location: Seoul, South Korea
Landscape Architects: Mikyoung Kim studio

The Cheonggyecheon, throughout Seoul's history had been a polluted river prone to frequent flooding. The answer of the government to the problem was to cover it in 1961, transforming the former stream into an arterial road.

The rapid urbanization further increased the need of infrastructure and for this reason it was also built an elevated highway in 1971.
In 2000 severe structural problems were found on the highway by the Korean Society of Civil Engineering. In addition the intense traffic create bad air quality and the city was lacking in green spaces.
For these reasons in 2003 the Seoul Metropolitan Government decided to finally uncover the Cheonggyecheon river and renovating it into the new central riverfront in downtown Seoul.
It was primarily designed to serve as a linear public space, with river-walks and water plazas. It has been transformed into the core area and the heart of downtown area, catalyzing redevelopment of the properties along its stretch.
Moreover it facilitates in carrying floodwaters during the rainy season, and it is for this reason set below street level.
Through the project the quality of life was improved, residents as well as visitors have now green public spaces to enjoy and where they can gather and attend to cultural events and traditional festivals.
Also air and noise pollution were reduced in the city, improving ecological sustainability.

4.3 case studies

4.3.2 Yongqing Fang

Location: Guangzhou, Guangdong Province, China
Landscape Architects: Lab D+H
Design/construction: Sept 2016 / Jan 2017

Figure 1–18 Yongqing Fang development area, Guangzhou, Captured by the author
Figure 1–19 Diagrams by Lab D+H Architects

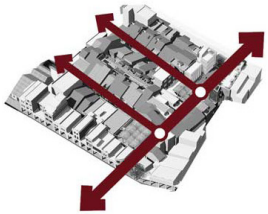
Yongqing Fang is located in the old town of Guangzhou but after the 1950s was left to decay. Till 2016 when Vanke Group initiated a redevelopment and refurbishment process.

The development project involve three abandoned alleyways, which now create a unique space for people to linger.

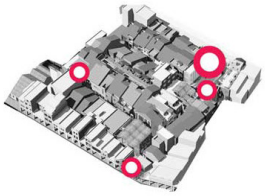
The idea is to maintain the original residents in order to preserve the community.

The architects propose a structure compose of 3 layers to be able to connect different elements as well as different architecture styles: linkage system, culture system and eco system.

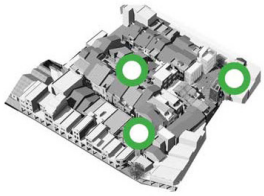
The linkage system provides a continuous path connecting the different buildings. The culture system is represented by the nodes which create bigger public spaces where people can gather. Ultimately trees are implemented on the roof top, representing the eco system layer.



Linkage System



Culture System



Eco System

4.3 case studies

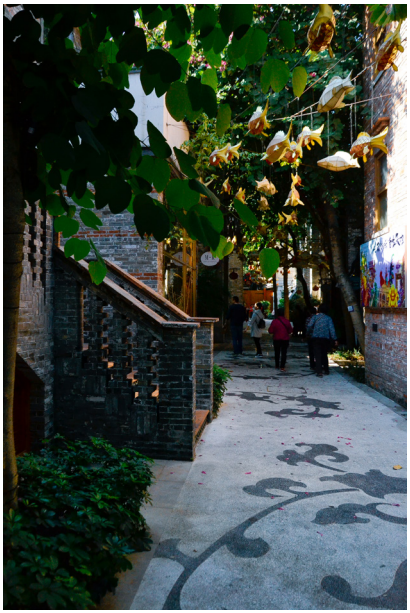
4.3.3 Foshan Lingnan Tiandi

Location: Foshan, Guangdong Province, China
Landscape Architects: Mikyoung Kim studio

Figure 1–20 Foshan Lingnan Tiandi development area, Foshan, Captured by the author

This development project is situated at the center of Foshan. Foshan Lingnan Tiandi includes residential and office buildings, retail, hotel, entertainment, tourism and cultural facilities. Here the traditional Lingnan-style architectures have been preserved and have been given a new and more contemporary function and identity.
This project preserves the traditional elements and in the same time combines cosmopolitan elements. Foshan Lignan Tiandi overall elevated the city's profile and attracted a cosmopolitan crowd.

Most of the ground floors of the district have been transformed into modern commercial spaces. The development is pedestrian friendly and maintains the human-scale characteristic of villages. The public spaces are well curated and green and water are integrated at a small scale. They offer a kids moments to play and to elderly quiet places to gather and relax.



4.4 lessons learned

literature study and case studies

Five main lessons can be extrapolated from the literature and case studies:

1. In Lingnan water villages the creation of good public spaces is fundamental to shape an harmonious and healthy living environment as well as to improve villagers' quality of life.

2. In Lingnan water villages a special attention in designing needs to be given to: village entrance, squares in front of public buildings, main streets, water bodies and surrounding water facilities.

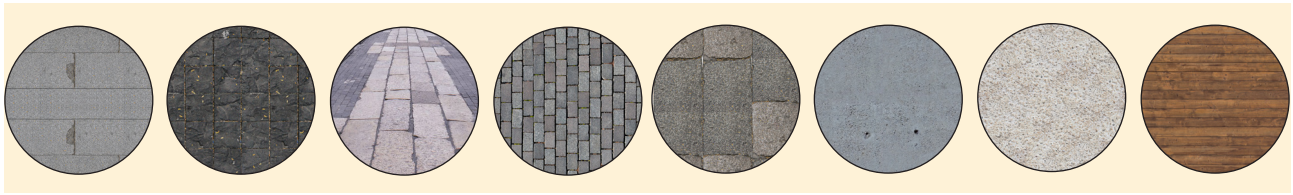
3. Punctual and small scale interventions can improve the overall larger urban organism.

3. The organic ruin of the industrial city, can be a layer which provides different ways of living.

4. The (re-)introduction of water bodies can, on one hand be functional in carrying extra water capacity during the heavy rain season, on the other hand improve the overall quality of public spaces.

4. Maintaining the original residents, therefore not carry out a top-demolition, can facilitate to preserve the local community and its habits and customs.

5. Giving hierarchy to public spaces helps the visitor orientating inside a urban village. The application of different materials specially serve this purpose. Underneath are shown a series of materials extrapolated from the case studies analyzed, which will be later applied in the design.

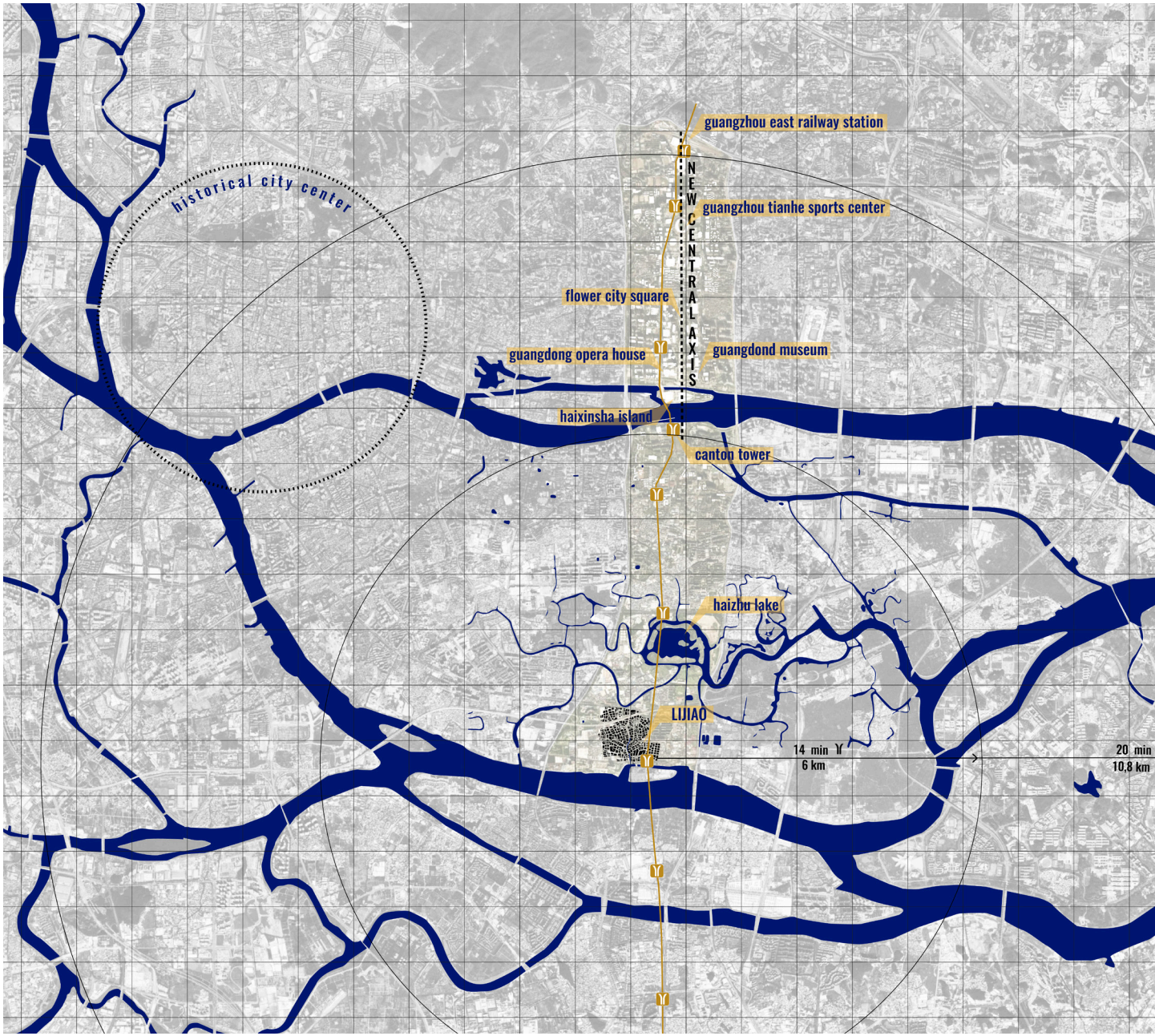


5

SPATIAL ANALYSIS

The spatial analysis chapter gives an overview of the current characteristics on three different scales: regional scale, South Haizhu District scale and Lijiao village scale. Throughout the thesis development the most difficult aspect was collecting data. The government of China provides little and restricted open spatial data and geographical maps. Therefore the understanding of the area was not accurate, especially in the small scale. All the drawings and map produced were redrawn through satellite images, which limited their precision and detailing.

Figure 1–21 urban village in Guangzhou, Captured by the author

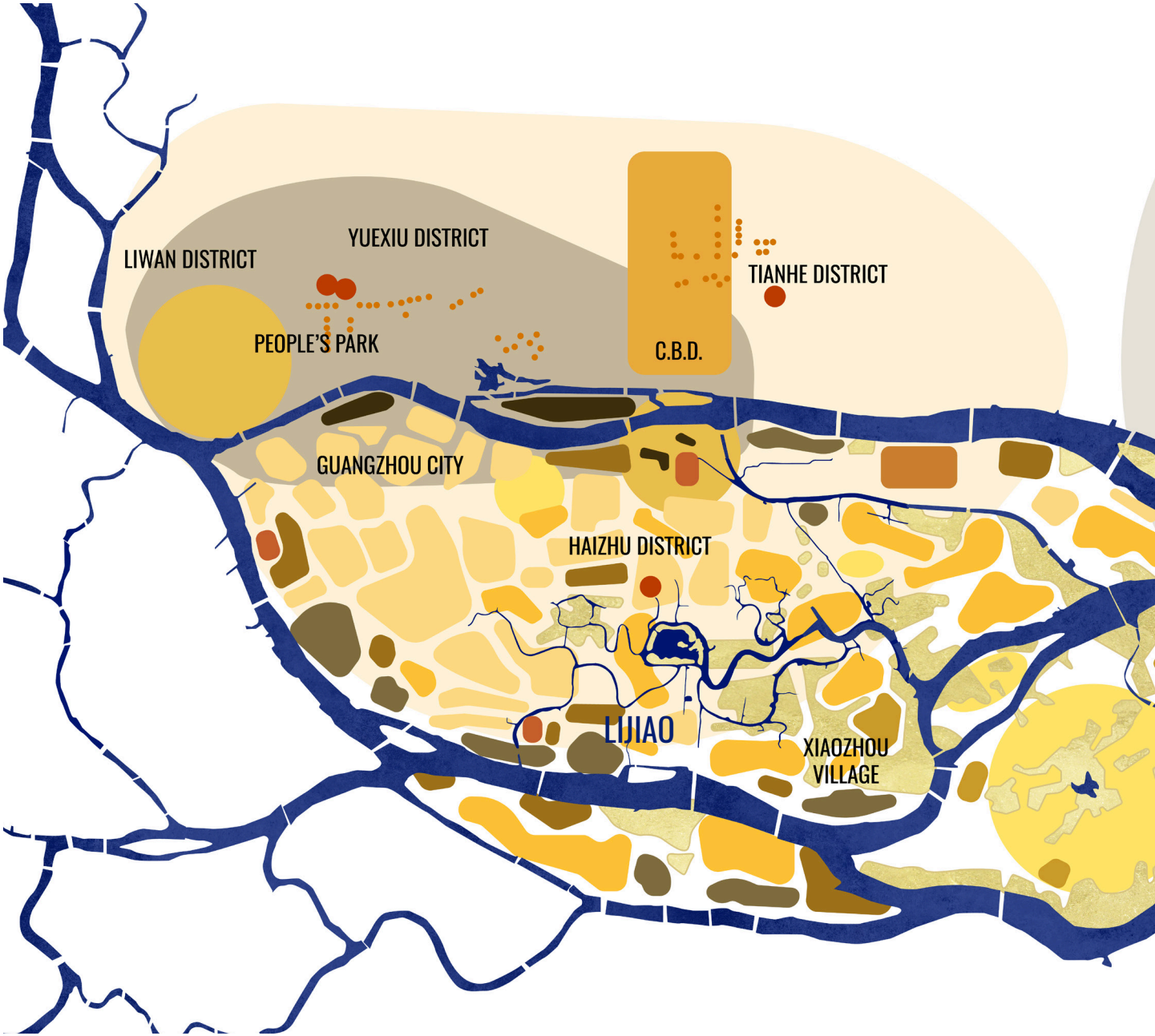

historical city center
guangzhou east railway station
NEW CENTRAL AXIS
guangzhou tianhe sports center
flower city square
guangdong opera house
guangdond museum
haixinsha island
canton tower
haizhu lake
LIJIAO
14 min
6 km
20 min
10,8 km

5.1 regional scale mapping

5.1.1 Lijiao as the south pole of the new urban axis

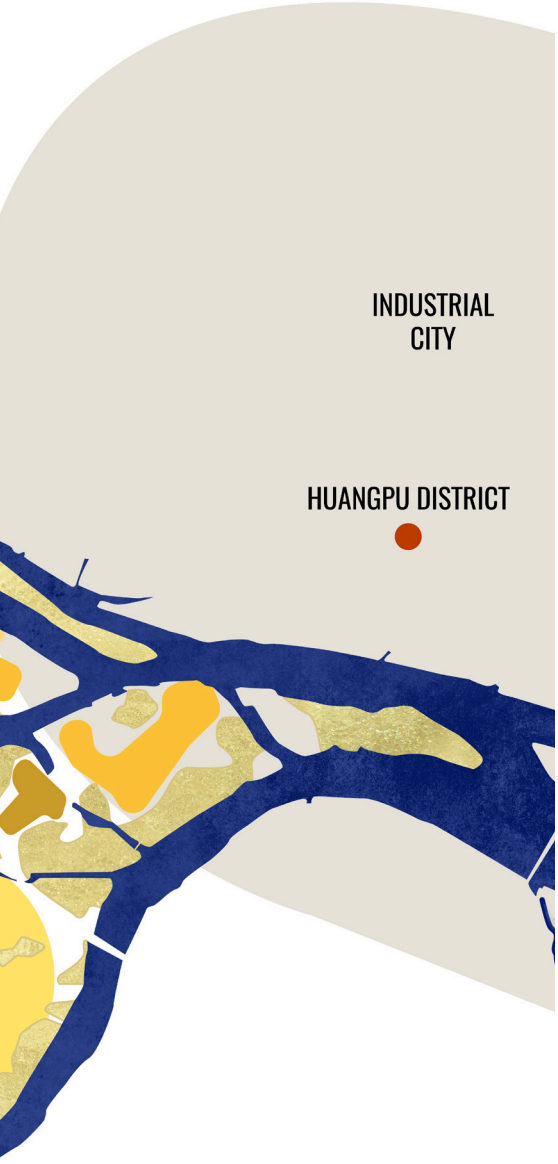
Figure 1-22 Analysis at the regional scale. Drawn by the author

Lijiao is located at the south of Haizhu District and it is positioned at the bottom of the new central axis of the city of Guangzhou. This urban village is well-connected to the downtown area through the metro line 3, which connects the village to the Guangzhou East railway station in 20 minutes, passing through the Canton Tower, the museums and the central business district area.


LIWAN DISTRICT
YUEXIU DISTRICT
PEOPLE'S PARK
C.B.D.
TIANHE DISTRICT
GUANGZHOU CITY
HAIZHU DISTRICT
LIJIAO
XIAOZHOU
VILLAGE

5.1 regional scale mapping

5.1.2 functional Guangzhou from "The potato plan collection"



- central districts
- normal districts
- big settlements
- traditional settlements
- multi-functional settlements
- cultural center
- central business district
- industrial city
- contemporary city
- compact city Guangzhou
- fair & exhibition centers
- creative districts
- research & education centers
- industrial area
- green
- water
- administration buildings
- retail concentration

Figure 1–23 Functional Guangzhou from "*The potato plan collection*". Redrawn by the author

The map here shown has been redrawn by the author and taken from the book "The potato plan collection". It uses the method by Abercrombie of mapping cities.

Guangzhou is characterized by a polycentric urban development.

The plan displays how the city is fundamentally subdivided into three main functional areas, the historical urban districts on the northwest; a contemporary city on the north, which is undergoing many transformations and redevelopment; and a mainly industrial area on the east.

These sub-regions are further fragmented into specialized districts. (Zugen & Christiaanse, 2018)

Lijiao is indicated as a multi-functional district, it is in fact mostly residential but has the presence of industries, house-factories and commercial spaces on the ground floor. Furthermore it is located within different functional districts (industrial area, big settlement) and in close proximity to an abundant green zone.

5.2 south Haizhu District mapping

5.2.1 District functional analysis and government's land use proposed masterplan for 2035

Total population: 183,000
Permanent residents: 52,000
Floating people: 131,000
Total land area: 8.07 km^2
Total volume increase: 47 million m^3

Source: Guangzhou Daily

The plan underneath highlights the total area of Guangzhou government's development plan for South Haizhu district.
Lijiao urban village is located at the core of the overall proposal. It is here represented in the map with the color black and each pattern represents a functional area.

Figure 1–24 Current functional mapping of South Haizhu District, Draw by author
Figure 1–25 Haizhu Innovation Bay government's masterplan for 2035, Redrawn by the author (Guangdong Urban & Rural Planning and Design Institute)

The masterplan at the bottom of the right page represents Guangzhou's development plan: *Haizhu Innovation Bay*.

According to the government's plan the bay should aim to become an ecological waterfront along with the technological innovation district of the southern section of the new city axis, introducing built volume equal to 47 million cubic meters.

In order to achieve this goal is evident that a top-down demolition will occur on Lijiao urban village. The former landscape and urban structure is not taken in consideration in the new urban plan, a new and regular grid is here over-imposed.

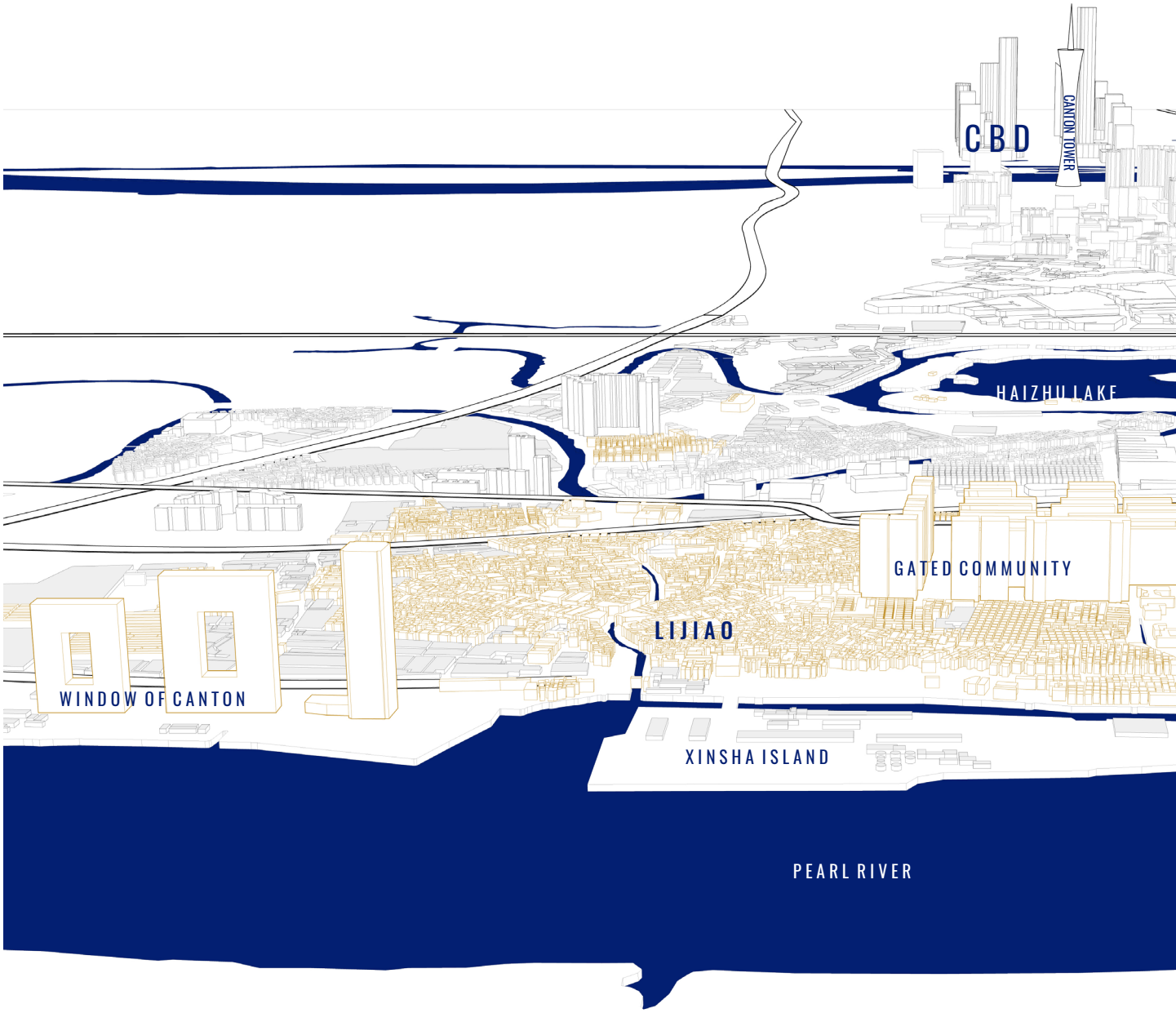
There are several important points to consider further in the design proposal.

1. Almost all the industries currently present in the area, except for the ones on the West, will be dismantled by 2035. This indicates that they will be relocated or not needed.

2. A landscape corridor that runs from Haizhu Lake to the Pearl River will be created.

3. Xinsha Island, south of Lijiao, is now owned by Guangzhou Port Group. In the plan it is represented as ecological area to create an important landscape node.

4. In terms of historical and cultural protection, several buildings are considered immovable cultural heritage, and 12 are historical relics.


CBD
CANTON TOWER
HAIZHU LAKE
GATED COMMUNITY
LIJIAO
WINDOW OF CANTON
XINSHA ISLAND
PEARL RIVER

5.2 south Haizhu District mapping

5.2.2 the north axis and south Haizhu District

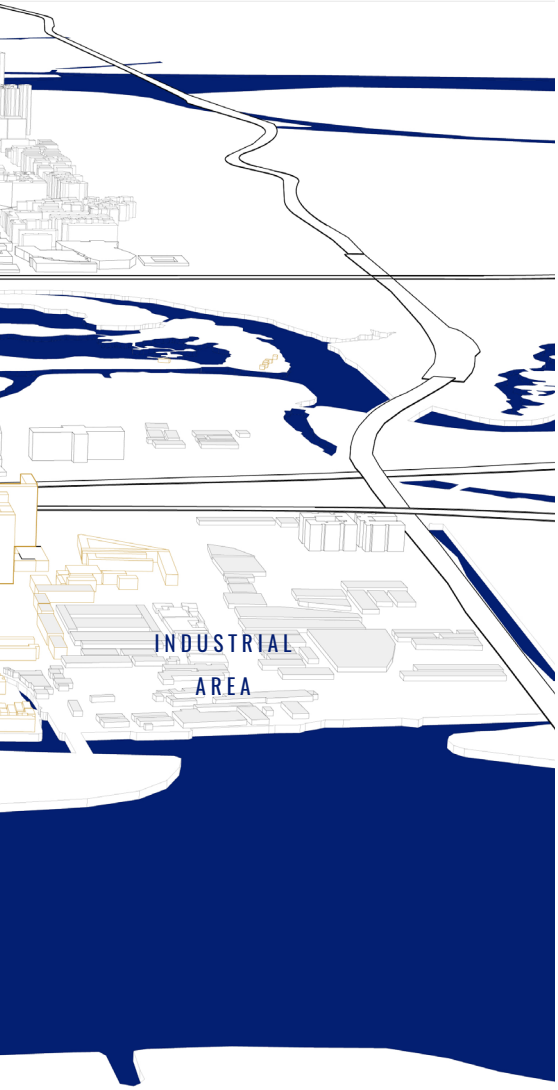


Figure 1–26 Bird's eye-view of the current situation of Lijiao and the South Haizhu District, with Guangzhou's new axis on the North. Drawn by the author

Lijiao is situated in a strategic position, having the Haizhu Wetland in the East, Haizhu Lake in the North and the Pearl River in the South.

The village is very well connected and easily accessible through both a strong network of highways and a metro line connecting it all the way to the Central Business District, in the North, in approximately 20 minutes.

It is noticeable the small scale of the urban village buildings typologies compared to the CBD in the North, the recently built *Windon of Canton* office tower, and also Lijiao's gated community.

The village has been encroached from both East and West by industries and is very densely built.

Xinsha Island, situated right South of Lijiao is currently owned by Guangzhou Port Group and comprises a big industrial area.

5.3 Lijiao mapping

5.3.1 Lijiao and its lost veins: historical mapping

Figure 1–27 Lijiao in 1920. Redrawn by the author.

Figure 1–29 Historical bridge in Lijiao, Guangzhou, Captured by the author

Lijiao's history can be traced back to over 900 years ago, for this reason there is still a number of historical buildings and temples within the urban village.

The village's natural environment was originally a typical Lingnan water town scenery with more than 30 shrine buildings. Now many of those relics have been demolished, and only 12 of them are still remaining. Among them the most impressive is the Wei Ancestrall hall, which was completed in 1615.

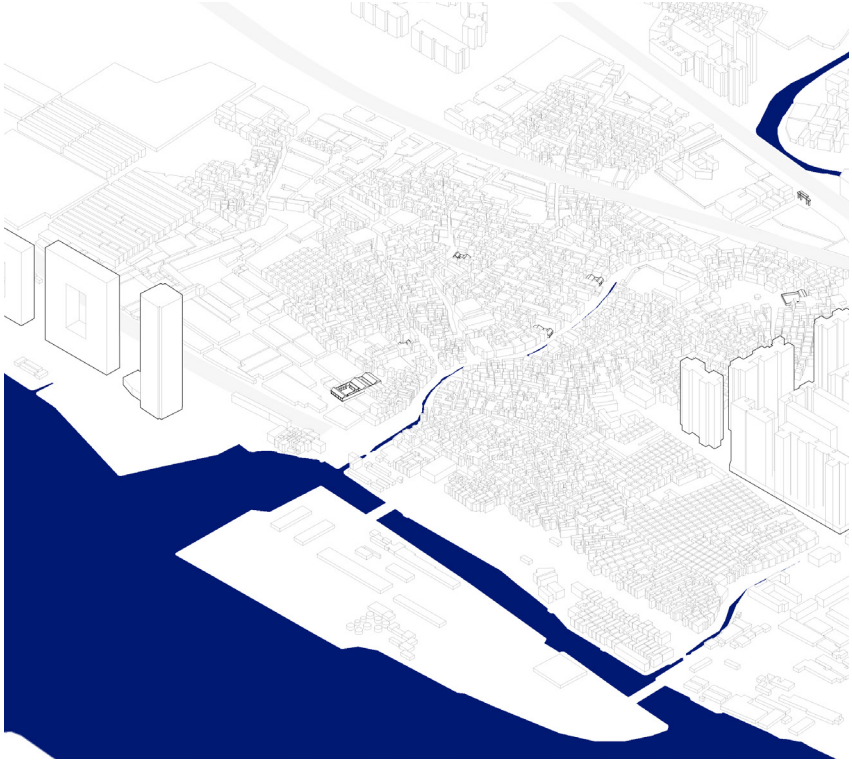
Figure 1–28 Collage of some of the existing historical relics in Lijiao. Captured and assembled by the author


Rong' en
Temple Site
gated community
Heart and Wei
Gong Temple
Chengzhai Wei
Gong Temple
Lai Weiwei
Temple
Weishi
Ancestral Hall
500 m
A
F
E
Window of
Canton

5.3 Lijiao mapping

5.3.2 village scale analysis

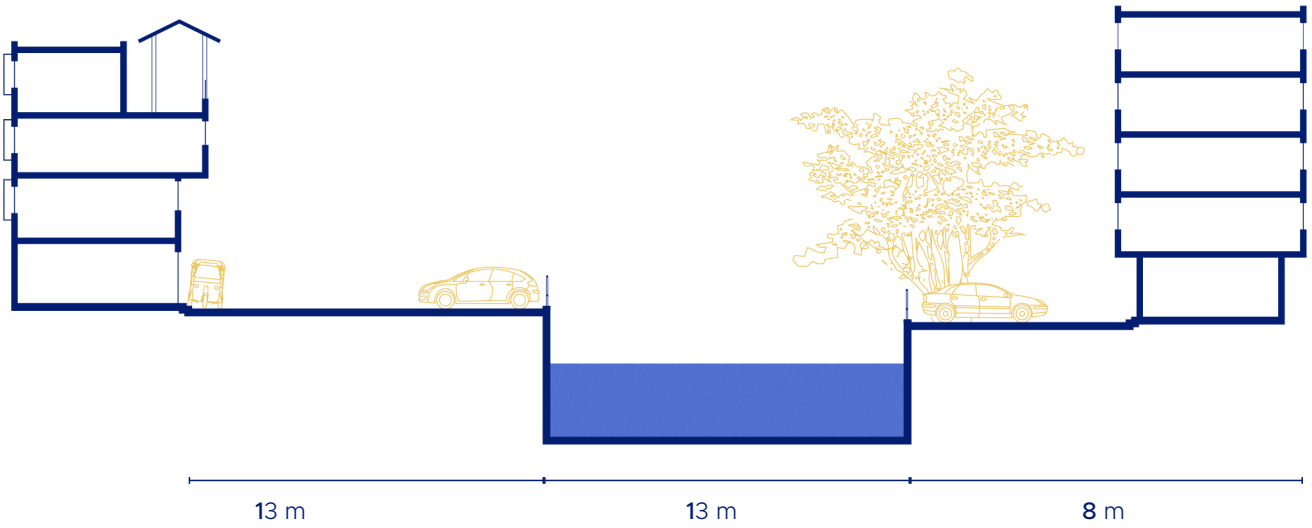
- built
- industries
- heritage
- education
- window of Canton
- public space

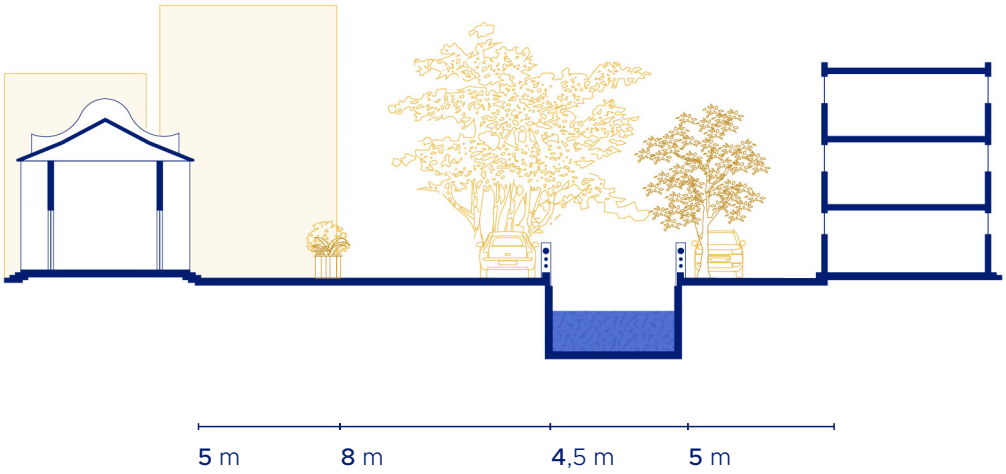


Lijiao village compared to many other urban villages has a greater allowance of space and less of a claustrophobic atmosphere and because of the fact that the majority of the buildings are between three and four stories, even the alleyways have better lighting. The village spreads from a tributary of the Zhujiang River in a branch-like manner. The larger avenues are the mark of the formerly present canals that have now been canalised underground. The river is the focal point of the village both physically and socially, and together with the larger avenues give directionality to the routing.

5.3 Lijiao mapping

5.3.2.1 street profiles





The only remaining water stream has different width along its stretch, but it is currently serving as the back bone of the village, creating a linear parking lot.
This is deriving from the fact that the water is very polluted and not pleasing to stand close to.

Figure 1–30 Water edges typologies in Lijiao, Guangzhou, Captured by the author

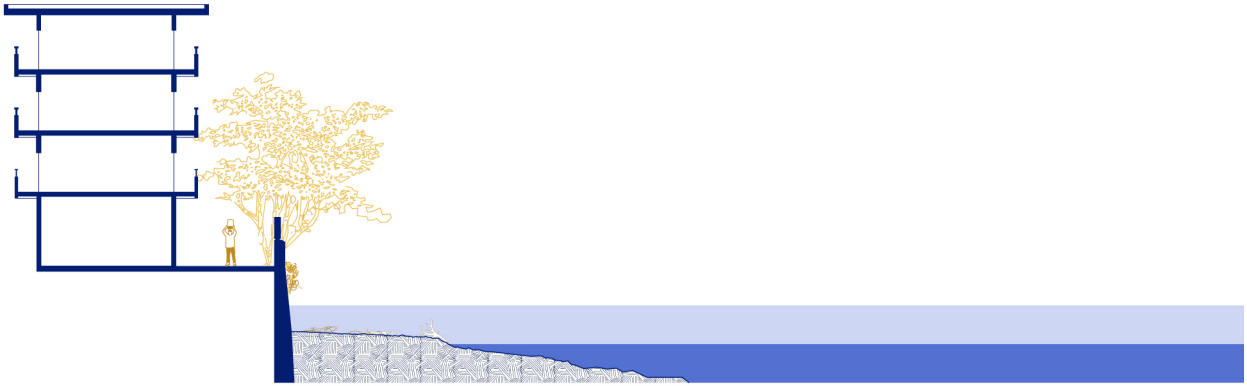
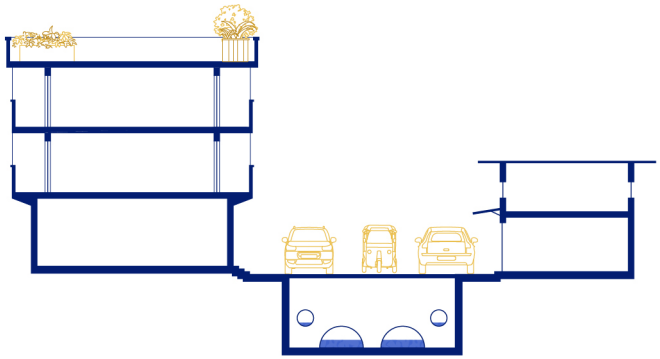


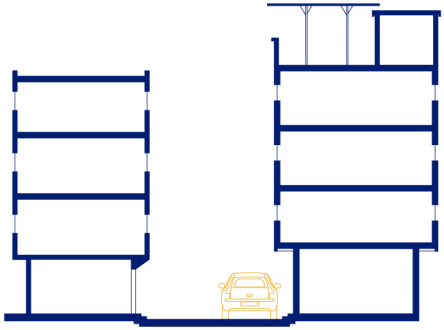
Figure 1-31 Watefront in Lijiao, Guangzhou,
Captured by the author

The street profiles can be cataloged in three main typologies.



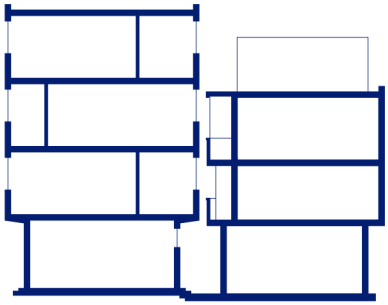
1. Main street profiles.

Those are the ones were the former canals were located and they are between 8 and 10 meters wide. It often has cars parked on both sides of the street.



2. Regular street profiles.

The dimension can vary between 4 and 7 meters. They usually have cars parked at one side of the road.



3. Narrow street profiles.

Those are the secondary streets and they can be as narrow as 1 or 2 meters on the ground floor and almost be touching in the upper floors, due to the presence of balconies.

6 DESIGN STRATEGIES

Overall three main conceptual strategies are adopted:

1. **Preserve**, intended not only in the physical sense of maintaining the structure of Lijiao to safeguard diversity within the regional urban fabric, but also by cultural means;

2. **Adapt** Lijiao to the new urban development aiming to a longer time perspective, as well as designing climate adaptive spaces;

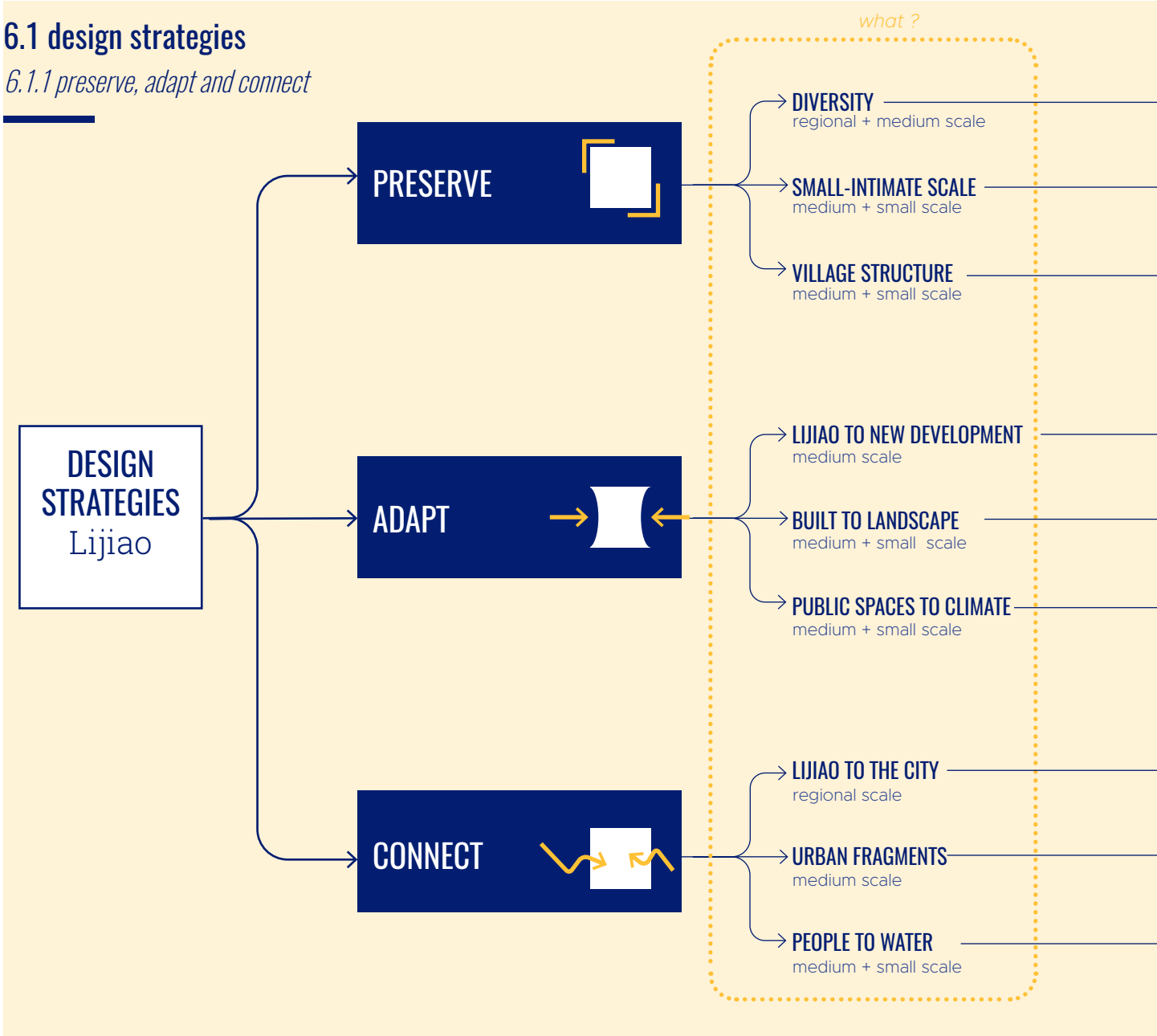
3. **Connect** from within the village and with itself and the outskirts, and re-connect people to water.

The strategies are then applied to a toolbox of different public spaces.

Figure 1–32 Lijiao, Guangzhou, Captured by the author

6.1 design strategies

6.1.1 preserve, adapt and connect



how ?

preserving Lijiao +
different atmospheres +
mix used

medium densification on the edge
+ healthy environment

reopening canals

punctual medium scale densification

demolishing punctual houses

climate adaptive design

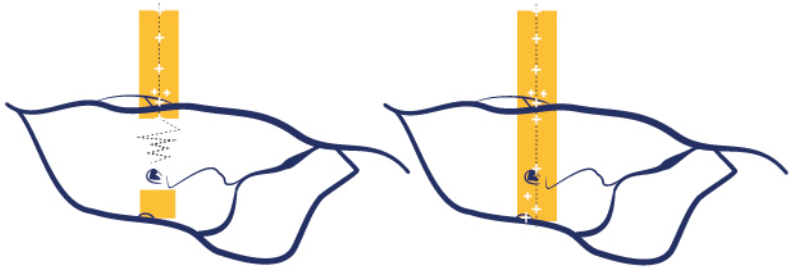
green & blue structure
+ south axis

reopening Lijiao canals (green&blue)
+ medium scale densification

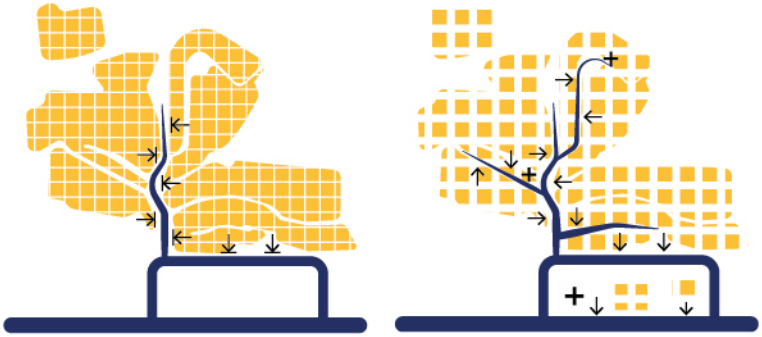
routings

before

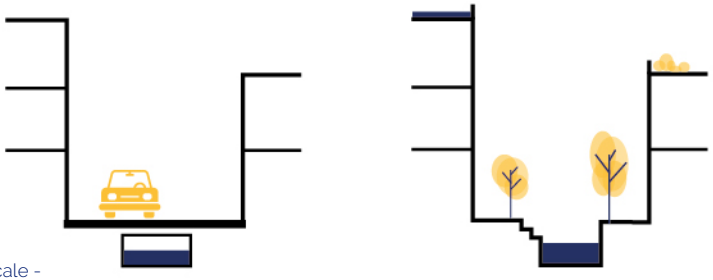
after



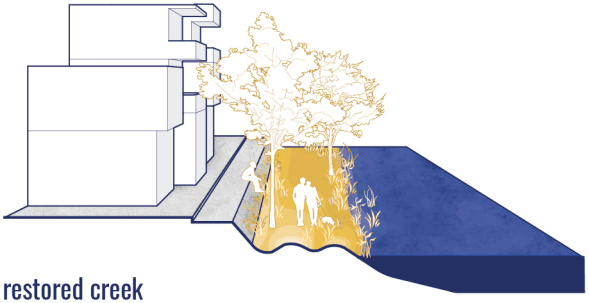
Regional scale -
Haizhu District and new urban axis



Medium scale -
South Haizhu District and Lijiao

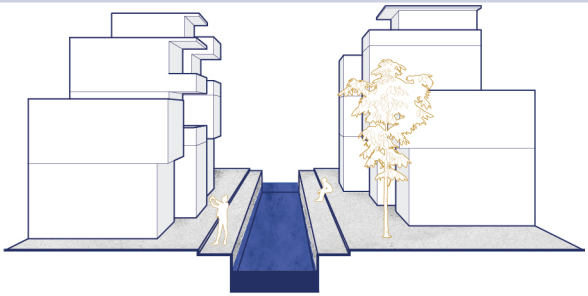


Small scale -
Architectural level



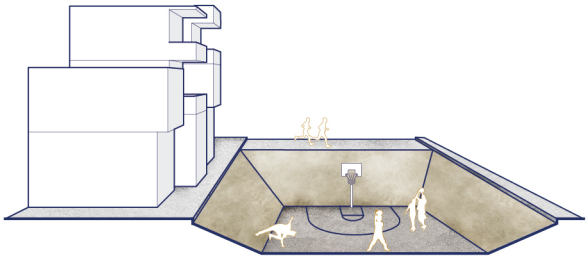
restored creek

to connect green and blue system at a bigger scale
increasing biodiversity



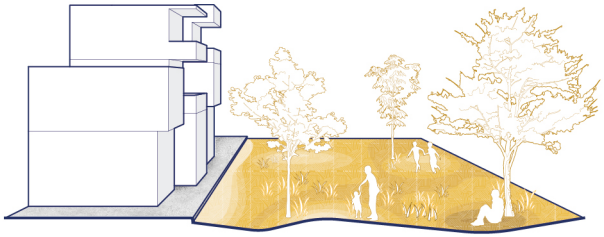
re-opened water stream

to revive the identity of Lijiao as water-village
to benefit the legibility of the routings



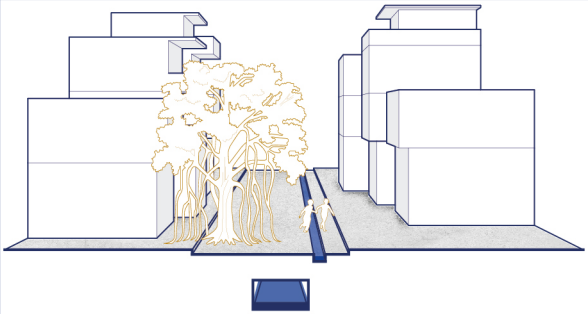
water plaza - sports court

to introduce bigger and multifunctional public spaces that could store water during heavy rainfall



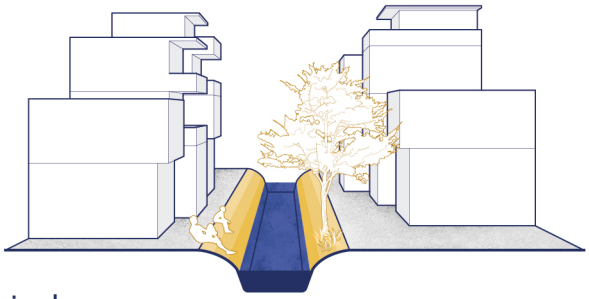
park

to retain water
attractive and multifunctional green spaces



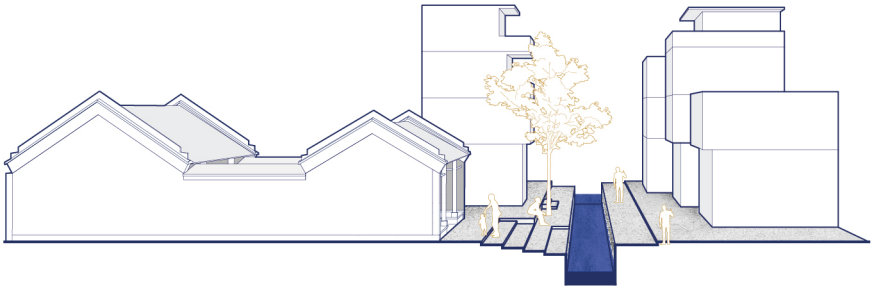
open water network

to guide rainwater to main canals
as a reminiscence of the former streams



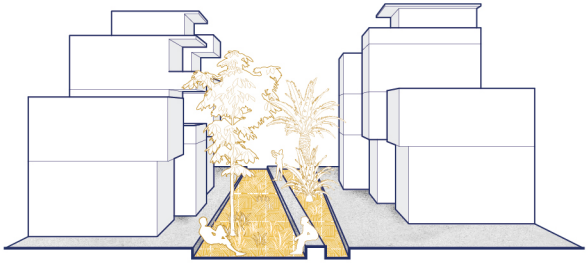
singel

to create a nature-like typology of routing
to retain and guide water



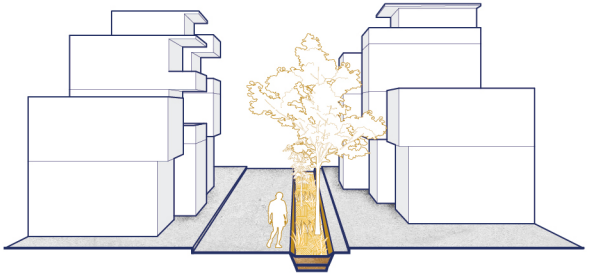
urban water canal
to re-connect heritage to water and to people

PRESERVE



green retention
to retain water in the streets
to greenify and increase attractiveness

ADAPT



bioswale - wadi
to retain water
to greenify the streets of Lijiao

CONNECT

6.1 design strategies

6.1.3 releasing the current combined sewage system

In the current state the urban village of only counts of a single water body, which survived the landfilling operation that characterized the modernization of the village.

Moreover, in the current water drainage system the residential waste sewer is connected to the surface water drain, this results in combined sewage outflow during extreme downpours. The overflows of the combined sewer system, along with the many industries, causes the water stream to be polluted.

The previous state of Lijiao was enriched by an abundant water network, which meliorated the stress of flooding during the heavy rain season.

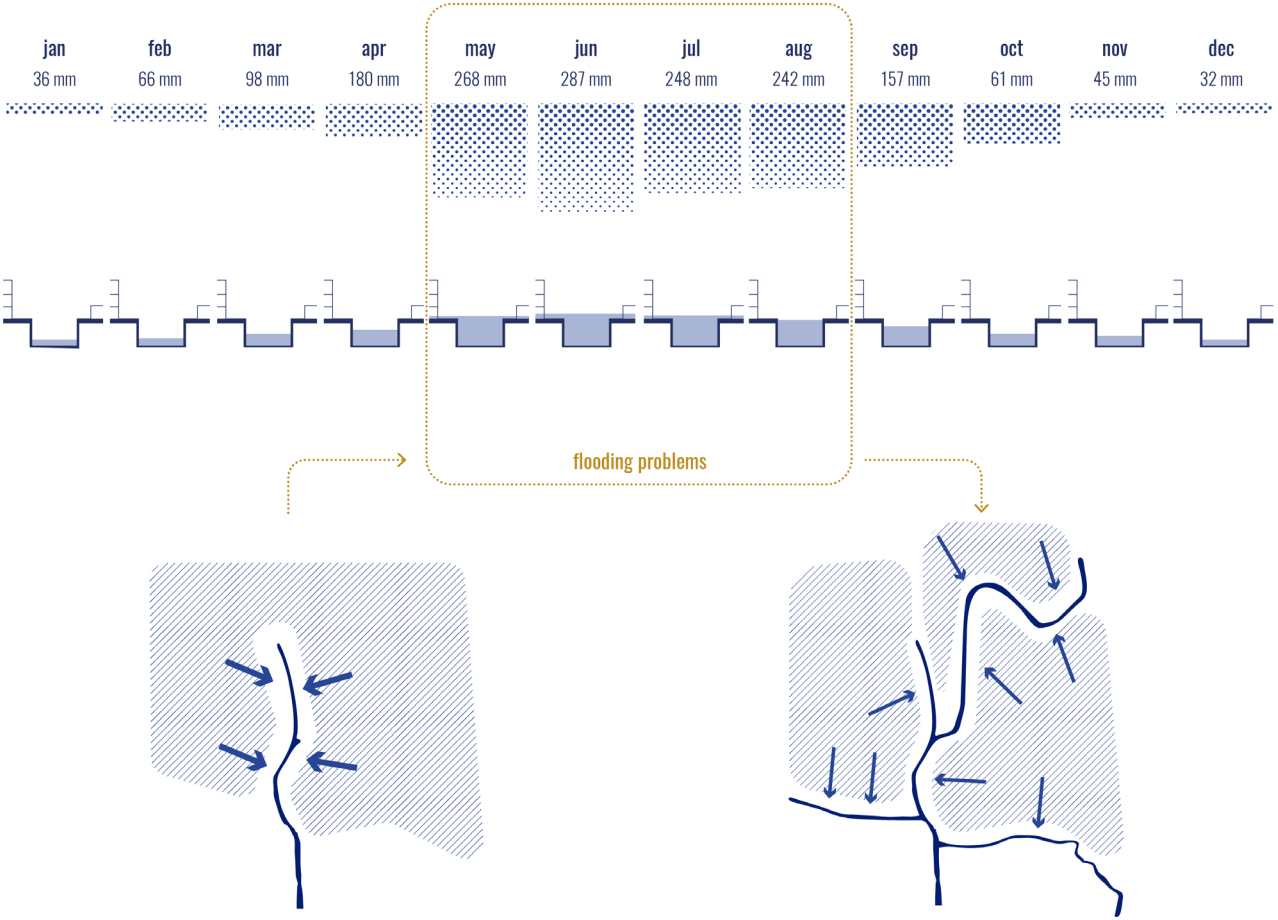
Introducing the climate adaptive toolbox, previously displayed (p.70-71), the new local detention strategy would decelerate the release of storm-water and the identity of Lijiao as water village will be re-established.

The toolbox proposes an overall flood mitigation infrastructure, which re-directs water away from the street surface and into the Pearl River. In such manner, the overall capacity of the blue network will be increased by 300%.

The bios-wales, the parks and the small green retaining areas will work as sponges for rainwater to infiltrate, absorbing the flowing water, relieving existing storm pipes and avoiding this way the overflow of the mixed drainage system.

The water plaza will increase the amount of water storage to be used during the dry season.

To make room for these green and blue public spaces the design will make use of the locations which will be available once the industries inside Lijiao will not be in used (before 2035). Moreover the removal of some of the existing housing will be stock on site vertically through the introduction of a medium scale typology.


jan
36 mm
feb
66 mm
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98 mm
apr
180 mm
may
268 mm
jun
287 mm
jul
248 mm
aug
242 mm
sep
157 mm
oct
61 mm
nov
45 mm
dec
32 mm
flooding problems

6.1 design strategies

6.1.4 public spaces hierarchy and edge definition

Lijiao is located in a strategic position, been accessible by both metro and cars, as expressed in the spatial analysis chapter (5),

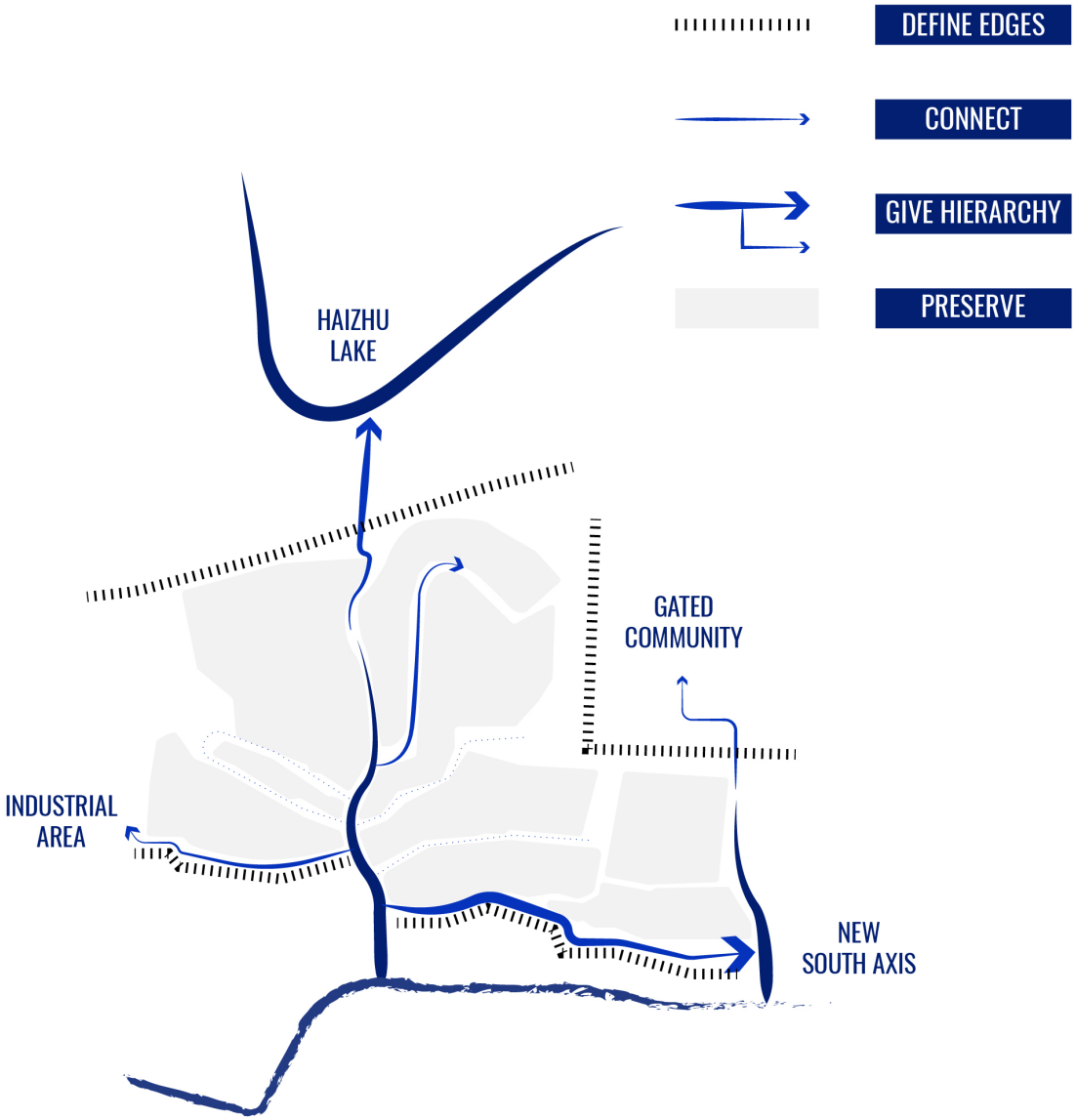
The pedestrian accessibility within the urban village and its surroundings it is although more critic. The current setup of the public space assumes in fact a labyrintgihic form. The densely built fabric does not easily allow the visitor to find its way in the village.

The re-introduction of the lost water veins as a strategy will re-connect the different areas of Lijiao and also re-link the village with its outskirts; on the North with the branch of Haizhu lake and on the new water body on the East will guide the visitant towards the new ecological corridor.

In such manner the transitional spaces between districts will be more fluid and the whole area accessible as part of the green axis.

Adopting different typologies of street profiles and water edges as shown in the toolbox (p.68-69) will also help give hierarchy to the overall structure, helping villagers and visitors finding their way in the village.

By defining the edges of Lijiao the possible urban expansion from the surroundings will be controlled, assuring the preservation of the internal structure of the urban village.


DEFINE EDGES
CONNECT
GIVE HIERARCHY
PRESERVE
HAIZHU
LAKE
GATED
COMMUNITY
INDUSTRIAL
AREA
NEW
SOUTH AXIS

7

DESIGN PROPOSAL

The design proposal aims to solve the issues posed by the problem fields, along with answering the main and sub-research questions. The design is the outcome of a research by design process and is explored on three main scale. Regional (South Haizhu District), urban village scale (Lijiao) and architectural scale (detailed on the village). The design incorporates the three strategies from chapter 6: preserving, adapting and connecting to re-establish and strengthen the identity of Lijiao.

Figure 1–33 urban village in Guangzhou,
Captured by the author

7.1 South Haizhu District scale design

7.1.1 masterplan proposal

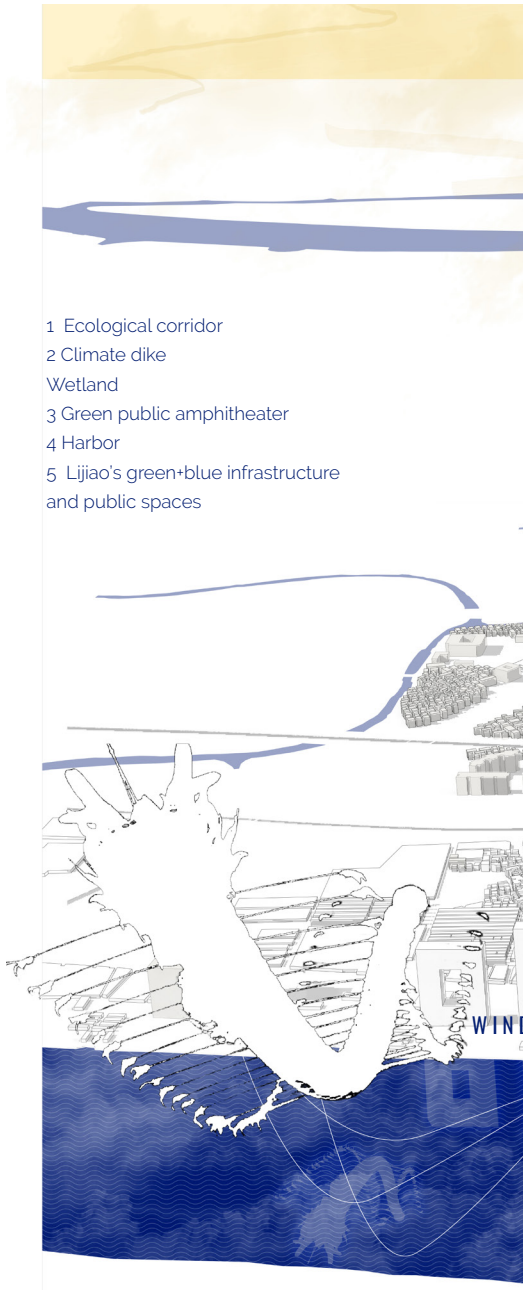
On the masterplan at the regional scale an ecological corridor is proposed as the South ending point of the North axis of the current Central Business District. Through the corridor the existing ecological area of the Haizhu Lake will be re-connected to the Pearl River. The area is currently occupied by industrial warehouses, but by 2035, as shown in the spatial analysis chapter, these are planned to be demolished and relocated, as indicated by Guangzhou's government. In fact, it proposes a green and blue connection in correspondence of the axis, while over-imposing a regular building grid to develop the area into a new Technological Innovation Bay.

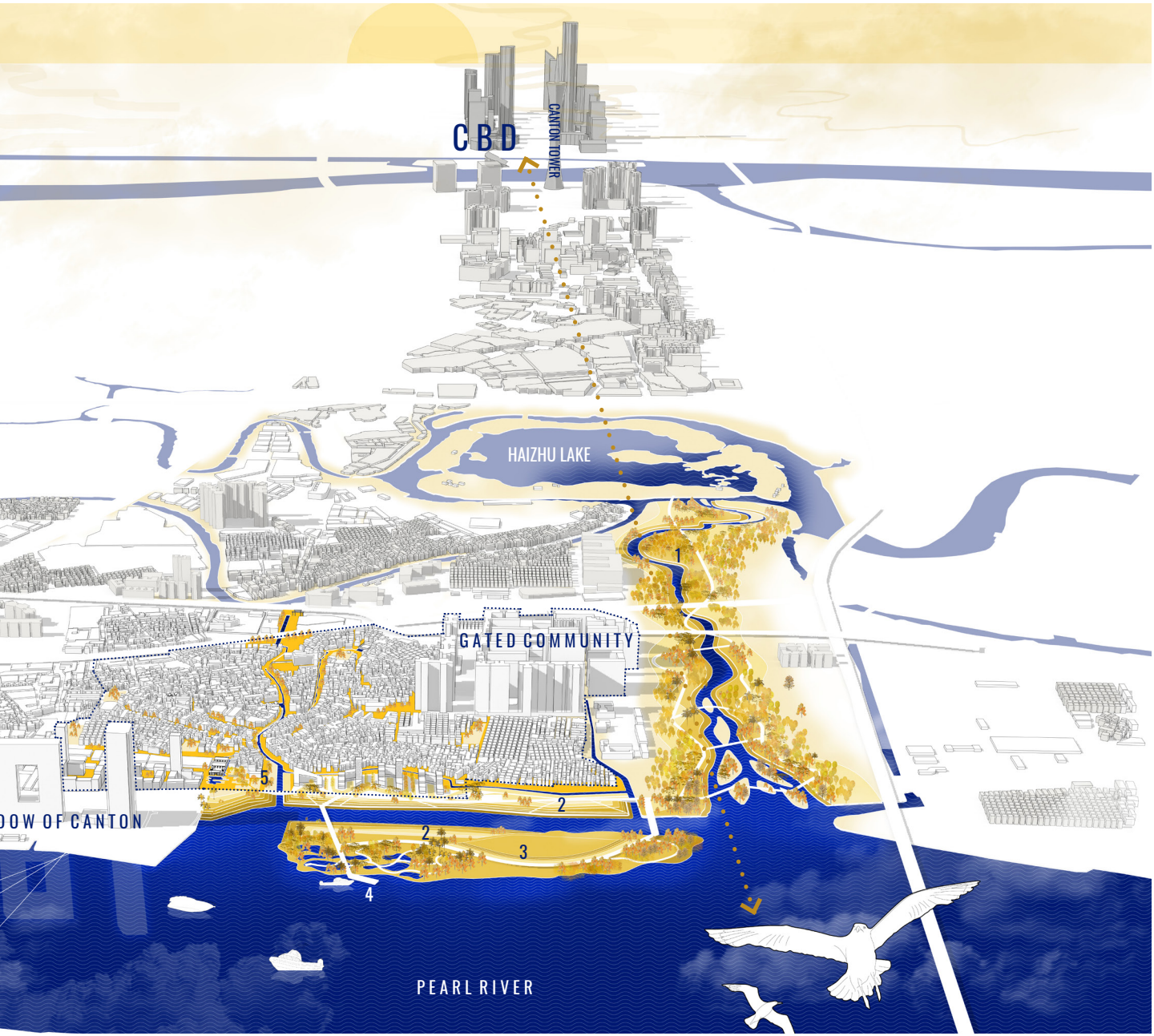
Vice versa, with the masterplan proposed, the ecological corridor is also intended to control the possible urban expansion from happening on the East side of the village, preserving the structure of Lijiao.

This blue system it is then expanded and re-introduced in the village itself, reviving its identity as a Lingnan water village.

In the larger context, maintaining the urban village will help preserve the diversity of the urban fabric within the metropolitan area of Guangzhou. Moreover by increasing its water-network not only the sponge-capacity of the district is increased, but also the identity of Lijiao as (former) Lingnan water village is revived. Water plays a crucial role in this typology of public spaces.

The waterfront of the village will re-adapt into a climate dike with wide recreational green public spaces. Moreover the former industrial island facing Lijiao on the South is designed as a new green pole, with both ecological and recreational function. Through the insertion of a new harbor Lijiao will return to be a docking point for boats, gaining new accessibility.




CBD
CANTON TOWER
HAIZHU LAKE
GATED COMMUNITY
1
2
2
3
4
5
DOW OF CANTON
PEARL RIVER

7.2 Lijiao scale design

7.2.1 masterplan proposal

The masterplan on Lijiao scale aims to connect the different districts of the village while improving the quality of both the public spaces and the water. The existing canal at the central axis of the village will connect the varied areas through the re-opening of three of the former water streams and via spacious public spaces.

The proposed water network re-links the heritage buildings in the routing. This helps highlighting the historical sites, giving them the attention they deserve.
The water bodies and the public spaces are treated accordingly to each location, in such manner the diversity of the districts is also preserved. The routing of either the inhabitants or visitors will be guided in fact through different atmospheres expressed by the proposed design.

The pocket parks, along with the various bios-wales, the green water front and the new water bodies will form a strong green and blue infrastructure, which will increase the overall sponge capacity by 300%, relieving the stress from the current combined water system.

In order to make room for these public spaces some housing blocks have been demolished, in correspondence to the main streets have been demolished. Those will be stock vertically on the medium scale design proposed at the South of Lijiao. The village overall organic structure will be although preserved and re-defined.

On the edges of the village the green area have also been enlarged, in order to safeguard Lijiao from a possible urban expansion from the outskirts.

1 Reopened canal
2 Open network small canals
3 Medium scale building
4 Green recreational spaces
5 Ancestral Hall's water-plaza
6 Industrial transformed area
7 Climate dike
8 Green amphitheater
9 Harbor

Connect

A Main canal connects Lijiao to the metro station and towards the ecological corridor
B Waterfront connected to the gated community
C Main canal connected to the former main public space and to the Ancestral Hall
D Main canal connected to a branch of the Haizhu Lake
E Industrial transformed area and Ancestral Hall connected to the main canal

Preserve

1 Weishi Ancestral Hall
2 La Weiwei Temple
3 Chengzhai Wei Gong Temple
5 Rong'en Temple site
6 Heart and Wei Gong Temple
7 Edges green to control expansion

Adapt

I Former industries turned into pocket parks to increase sponge capacity
II Former public space re-adapted into water retaining park
III Waterfront as a climate dike with soft edge
IV Former industrial island transformed into ecological wetland and public park with green retaining capacity


HAIZHU LAKE BRANCH
GATED COMMUNITY
WINDOW OF CANTON
PEARL RIVER
A
B
C
D
E
I
II
III
IV
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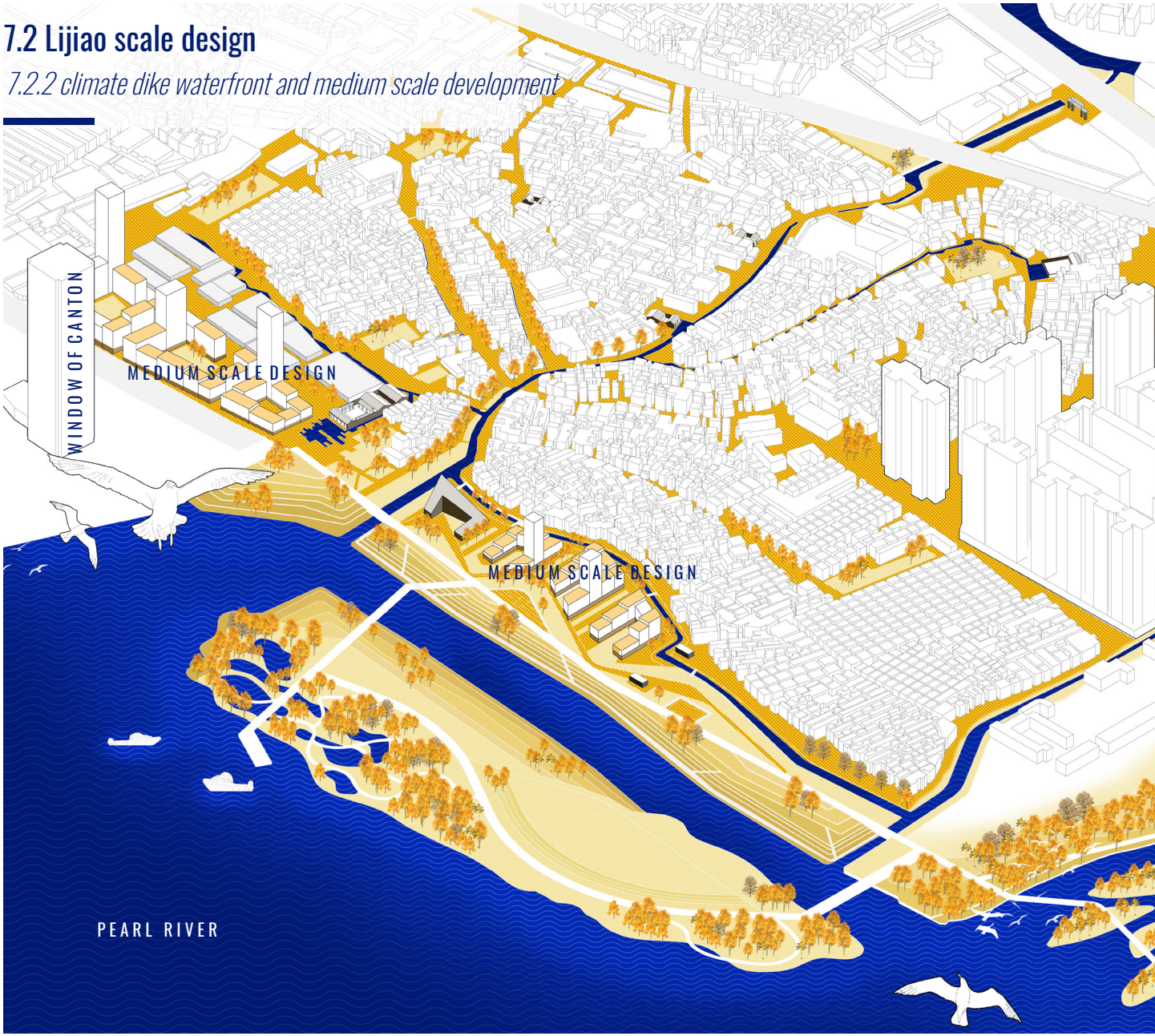
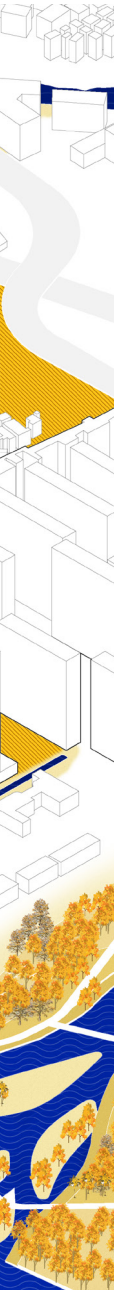
7.2 Lijiao scale design

7.2.2 climate dike waterfront and medium scale development





On the waterfront of the village towards the Pearl River three main strategies are applied:

1. Create public spaces in order to connect people and the village to the river;

2. Make Lijiao village climate proof for the rising water level designing a climate dike;

3. Develop an alternative medium scale urban development which mediates between the low scale of the urban village and the high scale given by the Window of Canton skyscraper.

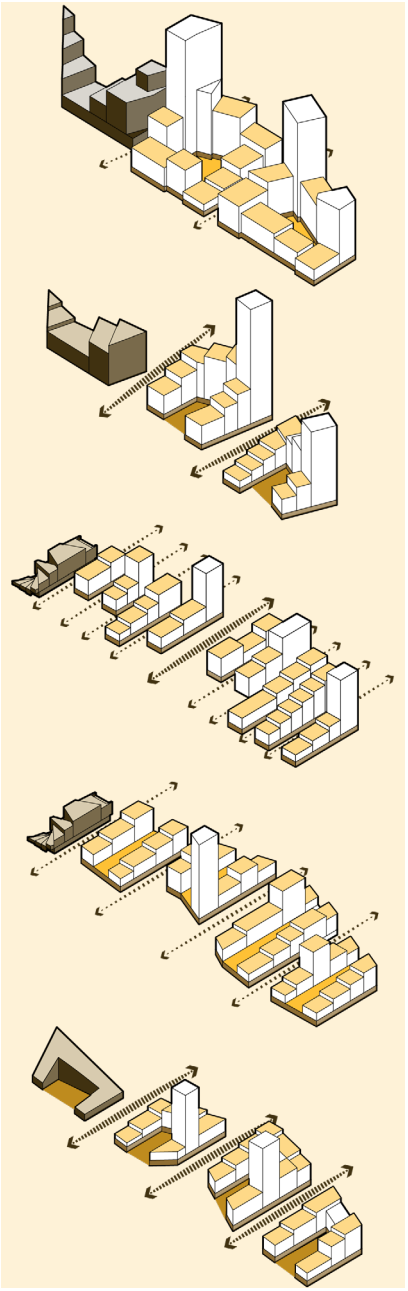
The medium scale proposed design plays a fundamental role in the re-integration of Lijiao urban village with the new urban development, which will eventually encroach the old urban fabric.

The functions of the buildings were fixed as: commercial on the ground space, given the close proximity to the metro station, residential on the upper floors to compensate the increasing need of housing in urban villages; and one public building to building where the main canal encounters the re-opened one which connects it to the metro station.

Via variant studies, and the research by deign method, the urban design was optimized to on one hand to create a distinct (medium scale) waterfront; on the other hand to restore the connection of the urban village with the riverfront, by virtue of open, green passages.

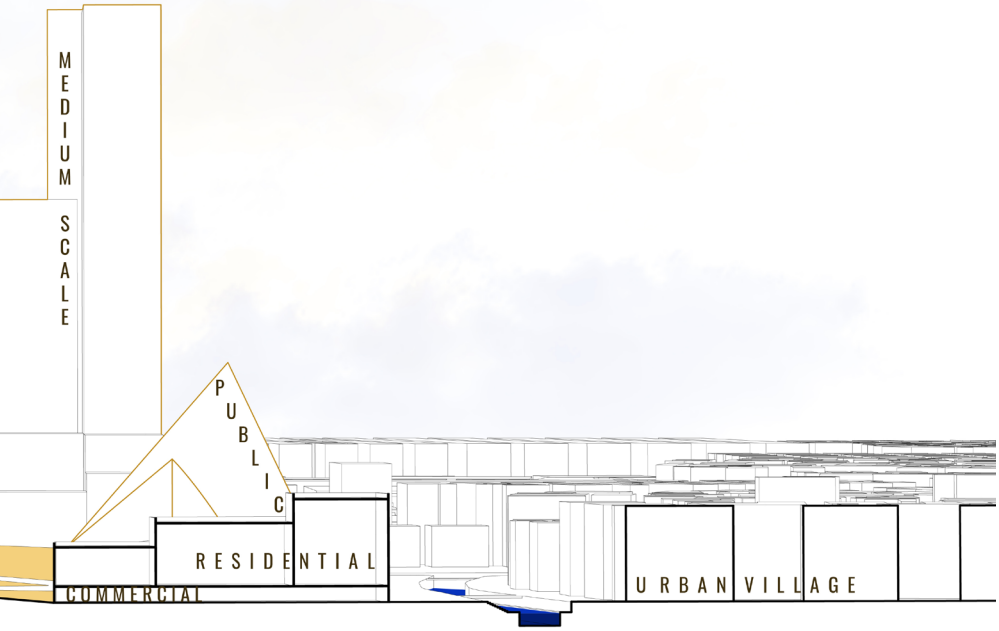
Some of these trials are showed on the right side of the page. Different built typologies have been placed: courtyards, linear blocks and C shaped buildings. The one chosen has been preferred because of the three clear and wide connections which create an intimate yet open, semi-public spaces formed by the C shaped blocks.

The most western of this row of C shaped building will function as a public building. It is a landmark building which on one side will create a skyline to Lijiao, and on the other side will work as orientation point from the labyrinthic canal streets back to the new waterfront.



7.2 Lijiao scale design

7.2.3.1 perspective section



The current waterfront has poor spatial qualitis and a wall has been raised above the dike in order to protect the village from river flooding. This embankment obstruct completely villager's view to the water.

Given the current striking necessity for flooding protection but the even more crucial future one, the existing dike has been raised with the design by 2 meters. By doing so the village waterfront is adapted to the changing climate conditions and to the rising water level. Lijiao will become climate- proof from the river side.

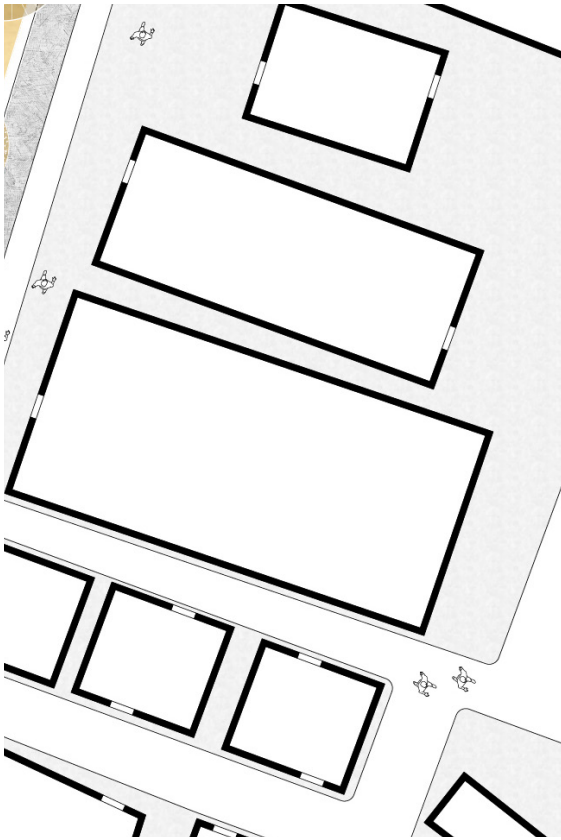
The climate dike creates terraces which can host public and recreational spaces, accessible by inhabitants but also visitors.
The waterfront it is also extremely accessible from the village, by virtue of the wide, green corridors between each C-shaped blocks of the designed medium scale.

In the cutaway perspective is also visible the smooth change in height from the skyscraper "window of Canton" to the medium scale proposed design and the low scale urban village.

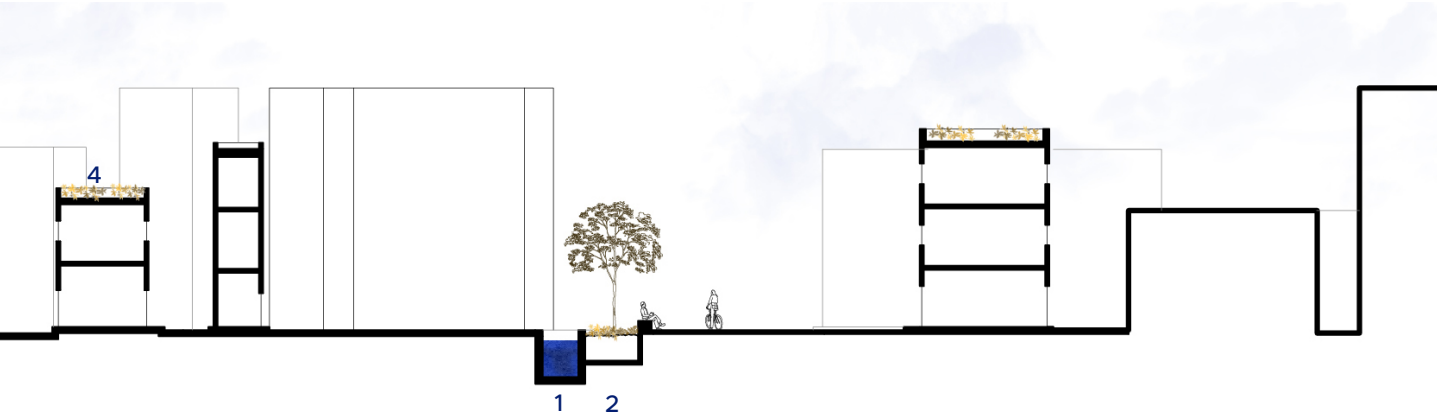
7.3 stitching Lijiao: architectural scale

7.3.1 adapting to climate change: the residential street

The proposed plan and section displays the residential street typology.
The profile of the new canal is urban with a series of small pedestrian bridges which are designed to guarantee convenient access to the inhabitants. Right next to the canal, a linear green space is designed as a bioswale. This functions as a sponge, retaining rain water and relieving the existing storm pipes, during downpours. In such manner the overflow of the mixed drainage system is avoided.
The canal has an irregular shape and the trees are positioned in groups in order to provide an informal atmosphere to the area.



1 Reopened canal
2 Pedestrian small bridges
3 Bios-wale
4 Green roofs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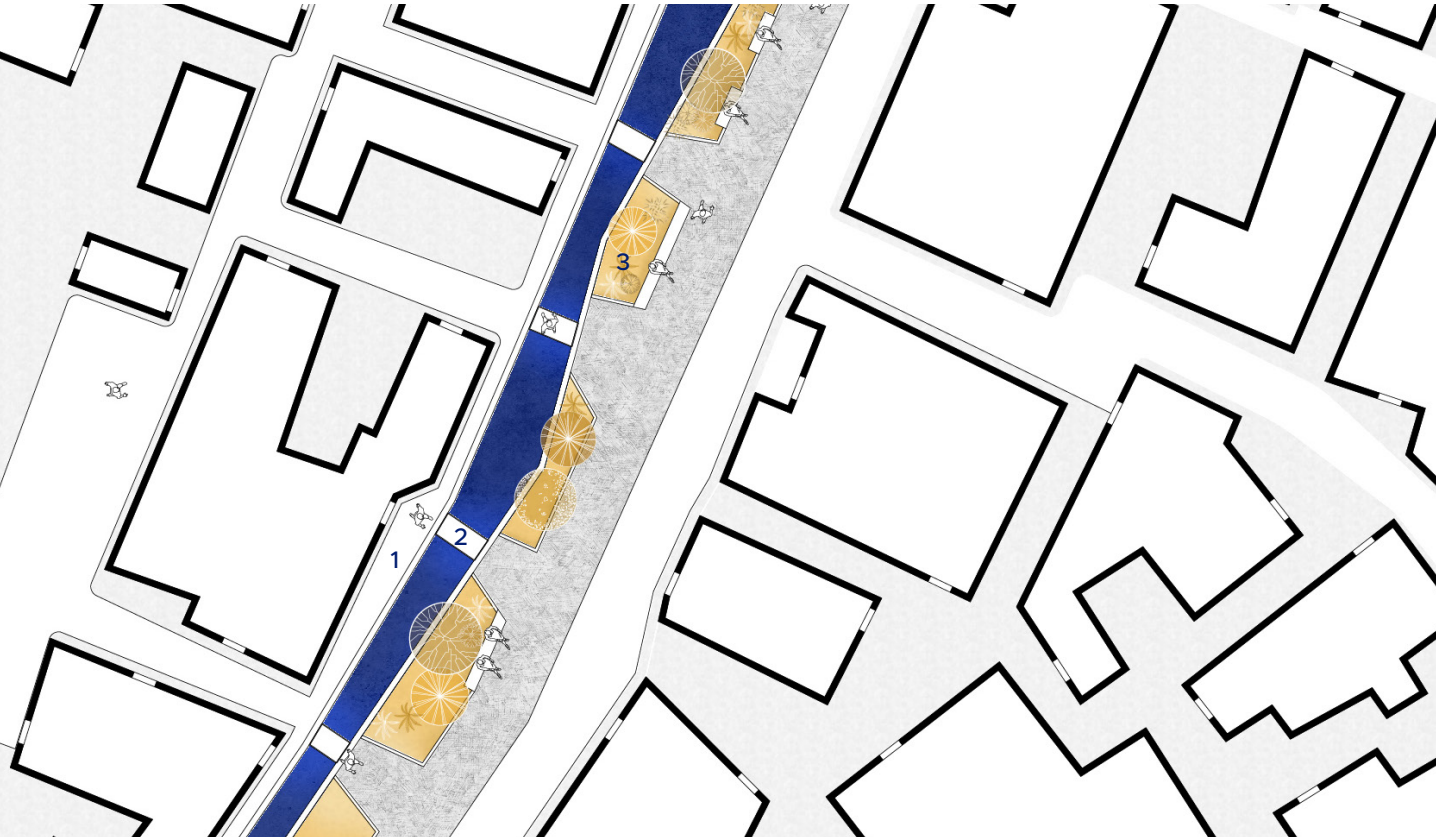
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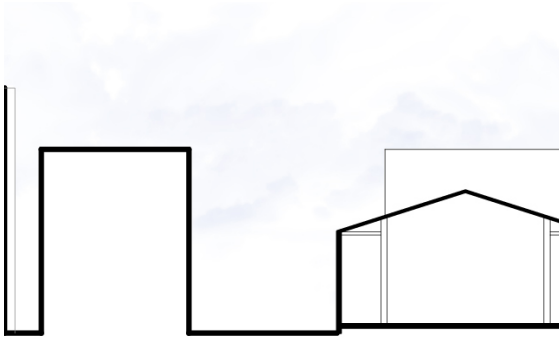
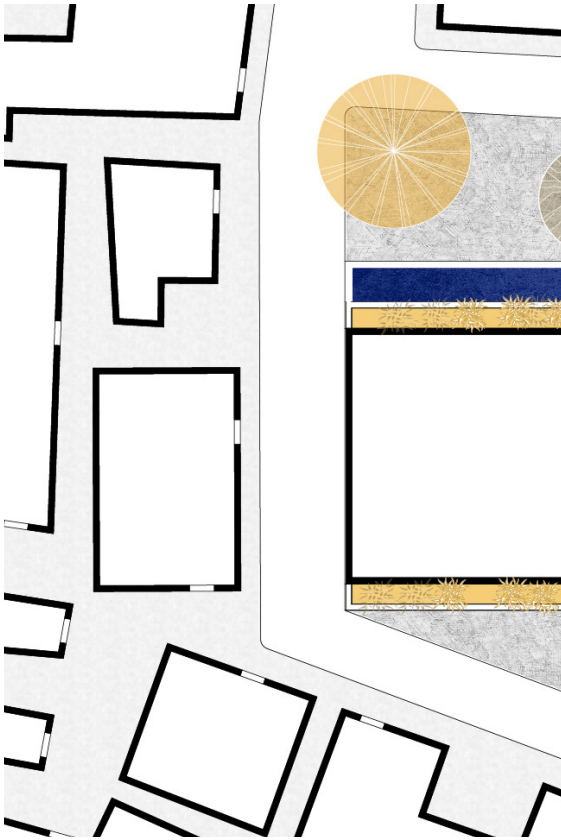
7.3 stitching Lijiao: architectural scale

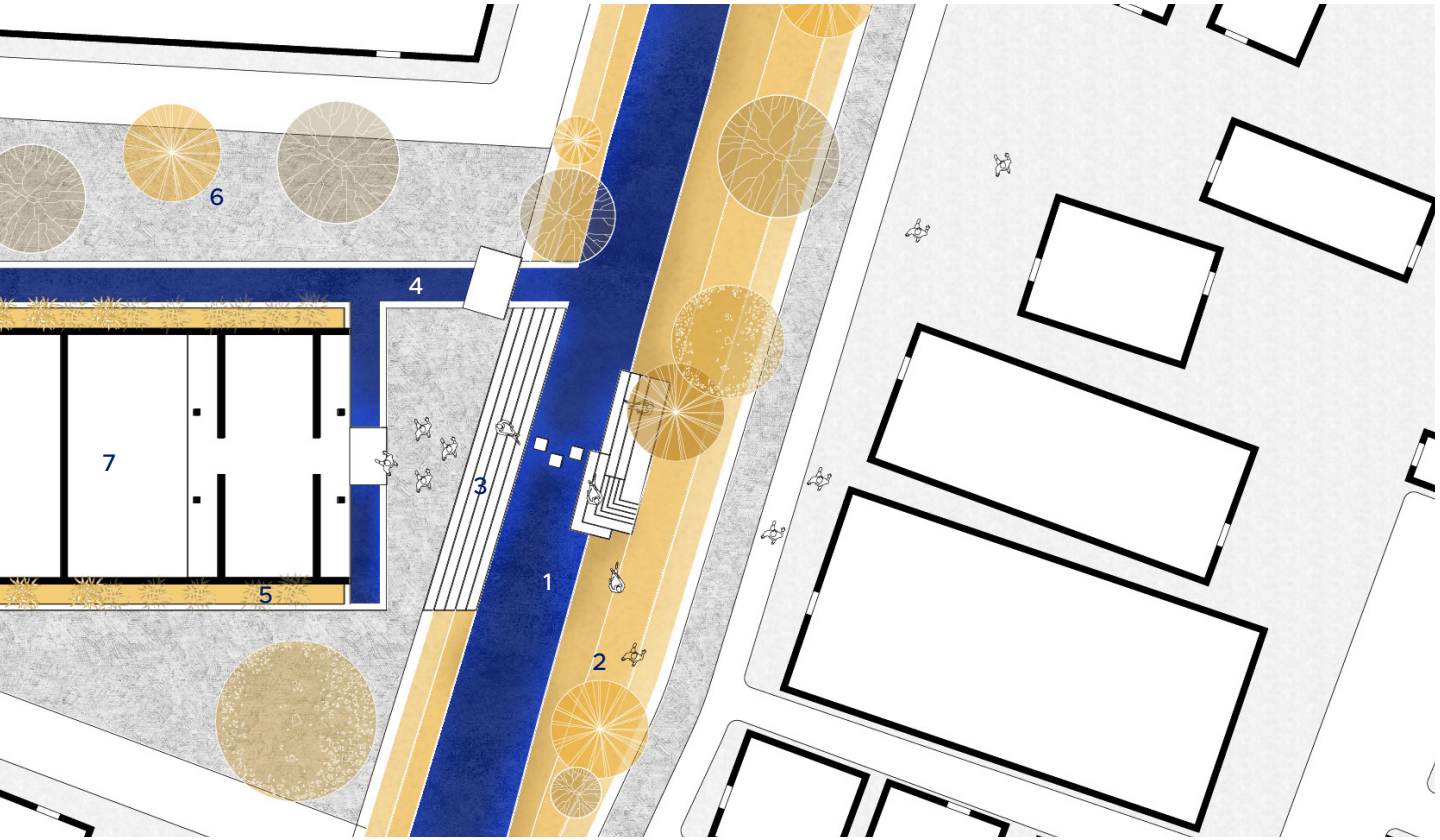
7.3.2 reviving heritage buildings: the temple

The designed plan and section here shown are located on the main canal and already existing canal. The canal profile is although modified, providing green spaces on the side of it. In such manner the edge will be widened increasing the water retaining capacity of the blue infrastructure. Wide stairs and steps will function as gathering spaces, expanding to stepping stones which allow the passage from one side to the other of the canal. The temple is currently encroached by housing, two blocks are been demolished creating room for improved public space. One of the longer side of the temple will be characterized by a blue stripe, the other one by a line of bamboos, typical vegetation of China.





1 Existing canal
2 Green soft edge
3 Steps
4 Design small stream
5 Bamboos
6 Extended public space
7 Historical temple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7.3 stitching Lijiao: architectural scale

7.3.3 reviving heritage buildings: the Ancestral Hall

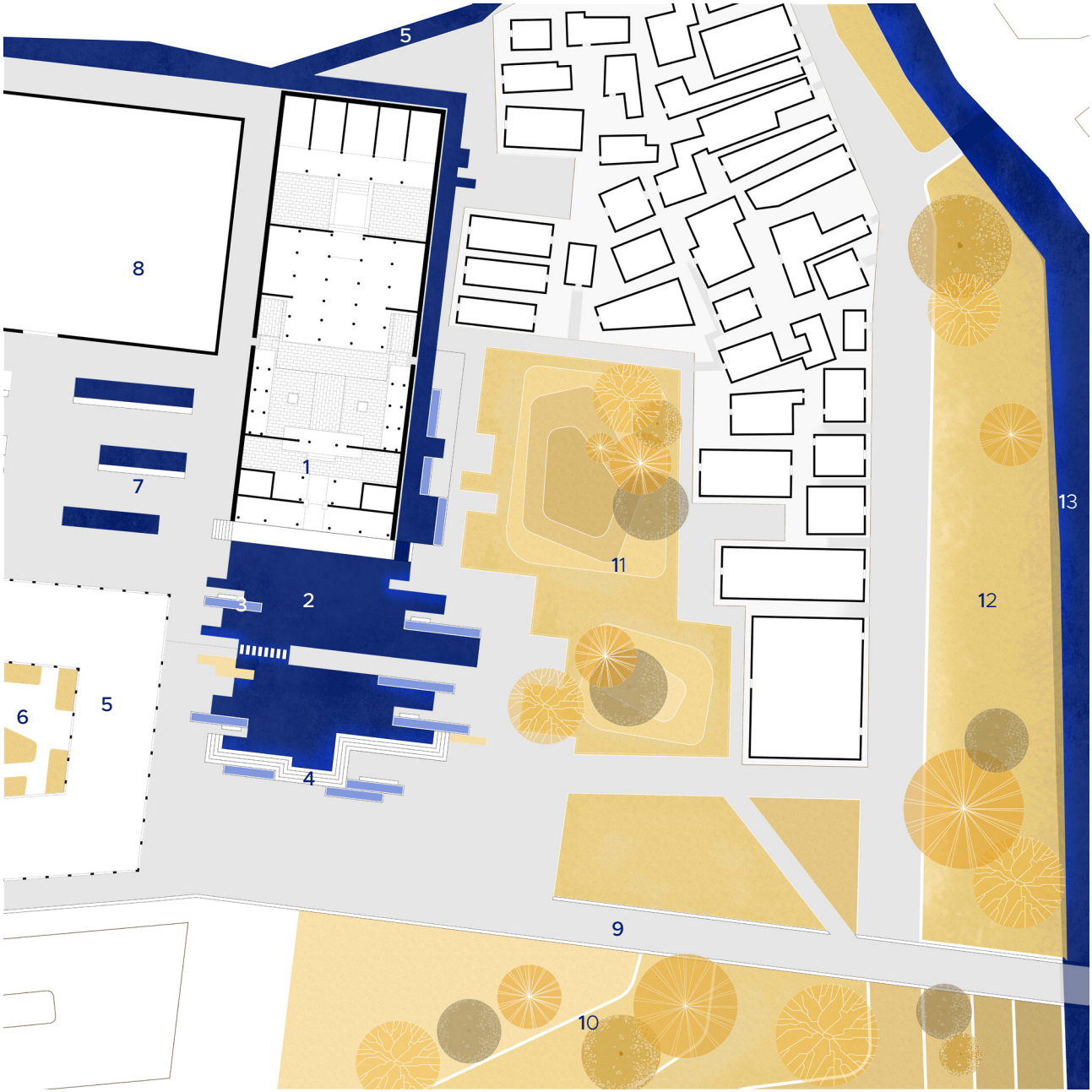
The detailed plan focus on the area of the Ancestral hall in the south of Lijiao village. This heritage building is currently strictly encroached by residential and industrial buildings. For this reason some of the buildings around it in the proposed design are demolished and replaced by new public space.

The Ancestral hall will be connected on both sides forming an important link between the urban village and Lijiao's new waterfront. The back side of it is connected to the main canal through a smaller and urban stream, while the front side is linked all the way to the metro station through the climate dike.

The water plaza designed can function as a regular public space where people can gather in the dry periods. While it can storage water during the heavy rain periods increasing the water capacity of the area. When the square is filled, it will be functioning as a mirror, reflecting and highlighting its beauty of the relic.

The green area is here also increased. The edge of the main canal are thought to be a singel typology and the pocket park will use the changing level to also retain water.

1 Ancestral Hall
2 Water plaza filled
3 Flower beds for aquatic plants
4 Steps
5 Designed medium scale
6 Semi public courtyard
7 Industrial transformed area with small pools
8 Industrial transformed building
9 Climate dike highest point - road
10 Climate dike green terraces
11 Green park - retaining area
12 Singel typology green area
13 Existing canal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7.4 stitching Lijiao: urban furniture

A series of urban elements have been designed one hand to give continuity through the application of recurring materials along the village; on the other hand to give hierarchy and recognizability to the different public spaces.

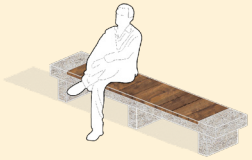
The two main materials employed in the design of benches, seating places and bridges are light and warm colored concrete and wood.
Concrete has been adopted to recall the current state of Lijiao, the urban village it is now in fact covered on concrete, but the warm and lighter color is chosen to signify the improvement of its public spaces.
Wood has been chosen has a reminiscence of the former identity of Lijiao as Lingnan water village. The village used to be an important trading point, therefore wood was widely used on the waterfront as docking point.

One main typology of benches is applied all through the urban village (fig. 1). Sitting places are also widely provided by steps along the canal, and the edges of flower beds or bios-wale around the districts.

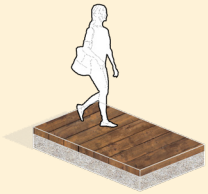
There are three typologies of bridges:
1- the smallest one (fig. 2) is 1.2 meters wide, and it is placed along the residential streets, where the atmosphere is informal and the width of the canal profile not too broad;
2- the most common typology (fig.3) is 3 meters wide and it hosts on one side of it a linear sitting in concrete. It is used on the more urban canals except along the nodes;
3- the third typology (fig. 4) is used on the nodes of the canals/streets which are the busiest location along the street profile sections. For this reason is 4.5 meters wide and has a wooden fence on both sides.
4- the last one is located on a special place for the village: on the water plaza in front of the Ancestral Hall.

The street lights also consist of three main typologies. They all recall the Asiatic culture, with simple and elegant elements composing them.
The double lights lamppost (fig. 5) is applied along the busiest or more commercial streets, the single one (fig. 6) in retail streets but with a smaller street profile, while the last and hanged lamppost (fig. 7) is located along more informal streets like the residential one.

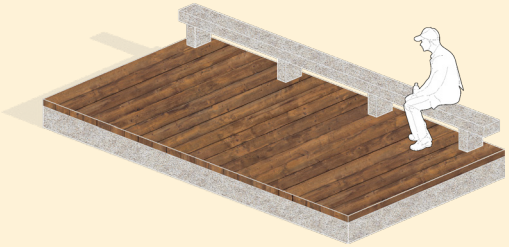
All the designed urban elements will be showcased in the perspectives coming in the next pages.



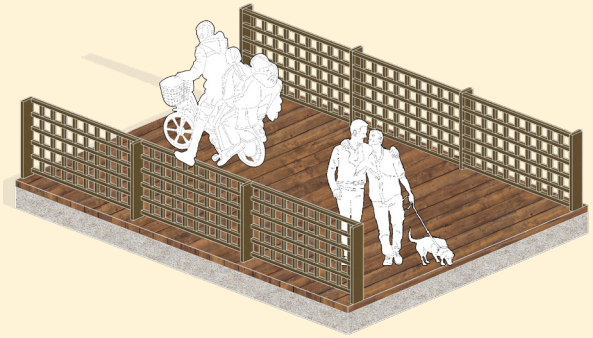
1 bench



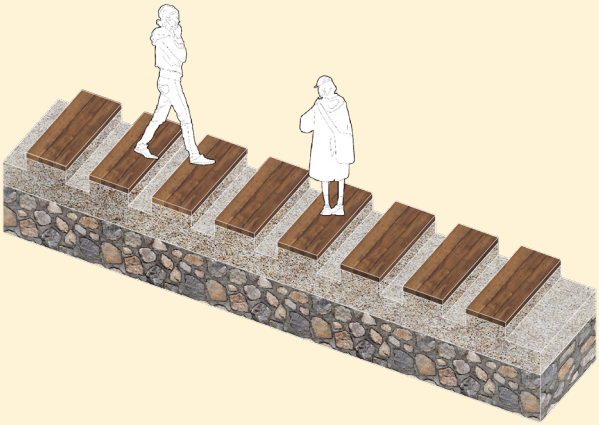
2 simple bridge



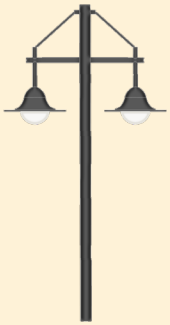
3 bridge with linear sitting



4 bridge with wooden fences on both sides



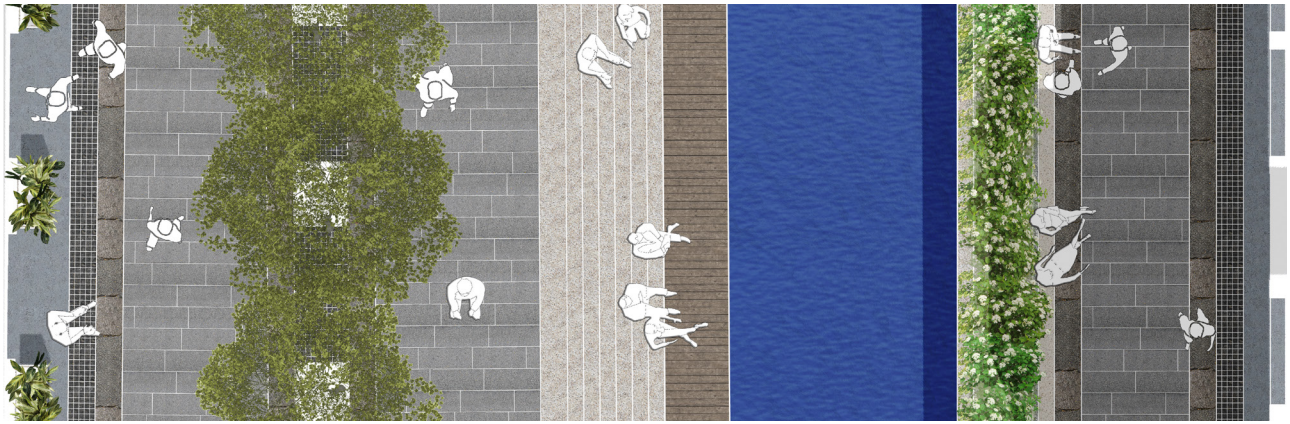
5 water-plaza bridge



5 double lights lamppost

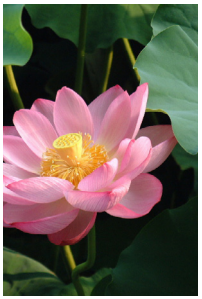
6 single light lamppost

7 hanging lamppost

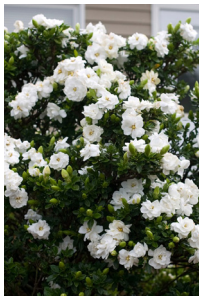


7.5 a walk into Lijiao: water for transformation

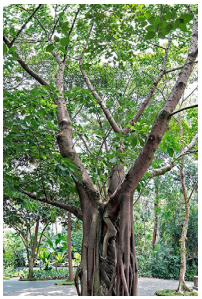
7.5.1 urban canal and commercial street



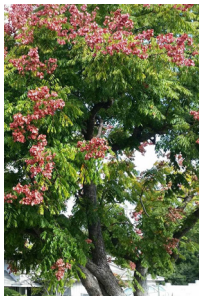
Scientific name:
Nelumbo nucifera
Height: 70 - 80 cm.



Scientific name:
Gardenia jasminoides
Height: 30 - 35 cm.



Scientific name:
Ficus Benjamina Linn
Height: 6.5 - 7 m.



Scientific name:
Koelreuteria bipinnata
Height: 6.5 - 7 m.

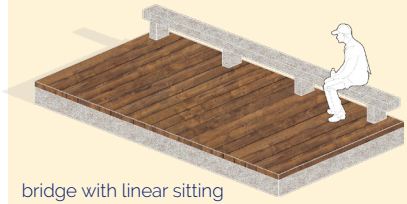
The prospective shows the new canal which connects the metro station to the central axis of Lijiao.
On the left side of the canal street is visible the designed new medium scale while on the right side the existing houses of Lijiao. On the ground floor of both sides are located commercial spaces.
Along the stripe the edge of the canal takes different forms, adapting to both the dimensions of the street and to the functional necessity. The edge has been designed with large steps that can accommodate both villagers and visitors, creating gathering points.
The paving chosen is characteristic of this area of China along with the trees and vegetation.

A line of *Koelreuteria bipinnata* is positioned to give continuity to the canal and at the same time distinguish it from the other streets. Those trees are characterized by pink flowers. On the right side of the perspective a *Ficus Benjamina Linn,* highlights a small plaza.
The materials used as paving are natural stones, typical of this area of China, while the front step of the buildings is in smooth grey concrete.

Designed urban elements

double lights lamppost

bench in concrete and wood



bridge with linear sitting

7.5 a walk into Lijiao: water for transformation

7.5.2 climate dike

The new proposed waterfront consists on a climate dike, which has been risen of 2 meters respect the existing one. This allows the safeguard of Lijiao from possible future flooding.

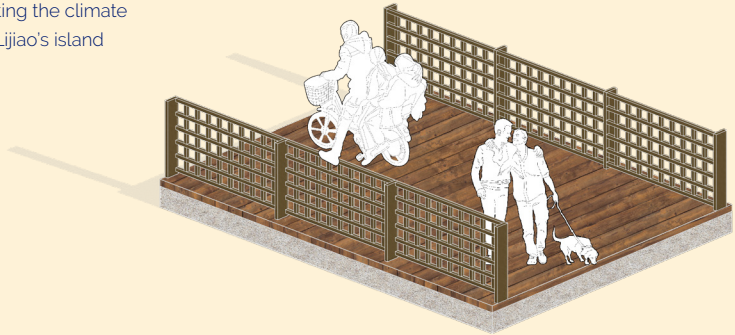
The climate dike is designed as wide green steps that can accommodate recreational spaces to be colonized by both villagers and visitors.

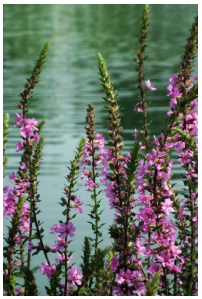
The edge of the waterfront is soft but hosts a wood pedestrian pathway in order to let people in close proximity to the water. The structure also helps to stabilize the dike and keep the shore clean and organized in times of flooding

On the top of the dike a route is designed which connects the Ancestral Hall on the West to the ecological corridor o the East side of the village.

The water edge is soft and consists of aquatic plants which have beneficial purification qualities.

pedestrian bridge typology connecting the climate dike to Lijiao's island





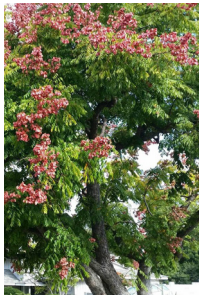
Scientific name:
Lythrum salicaria
Height: 50 - 60 cm.

Scientific name:
Thalia dealbata
Height: 60 - 70 cm.

Scientific name:
Typha orientalis
Height: 50 - 60 cm.

Scientific name:
Tamarix chinensis
Height: 4 - 6 m.

Scientific name:
Salix matsudana
Height: 6 - 8 m.



Scientific name:
Koelreuteria bipinnata
Height: 6.5 - 7 m.

7.5 a walk into Lijiao: water for transformation

7.5.3 singel canal

Coming from the climate dike the visitor will be here offered the view to the central axis of Lijiao. The water edge typology is a singel with a wide green mantle and a line of trees to provide shadow.

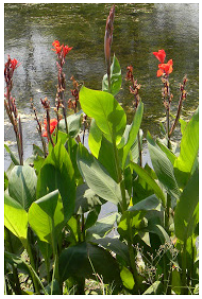
The reeds placed along the soft edge will help the water purification.

On the opposite side wide steps are designed. It is visible the transition from the wider green area of the climate dike to the urban atmosphere at the core of Lijiao.

The hierarchy and differentiation of public spaces is expressed through the usage of different landscape and architectural elements.

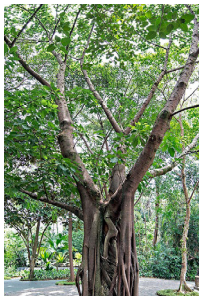
The green mantle offers a smooth transition from the green water front to a more urban green typology; the large steps correspond to the most commercial street, where seating can serve as resting places for people.

Scientific name:
Eremochloa ophiuroides
Height: 5 - 10 cm.

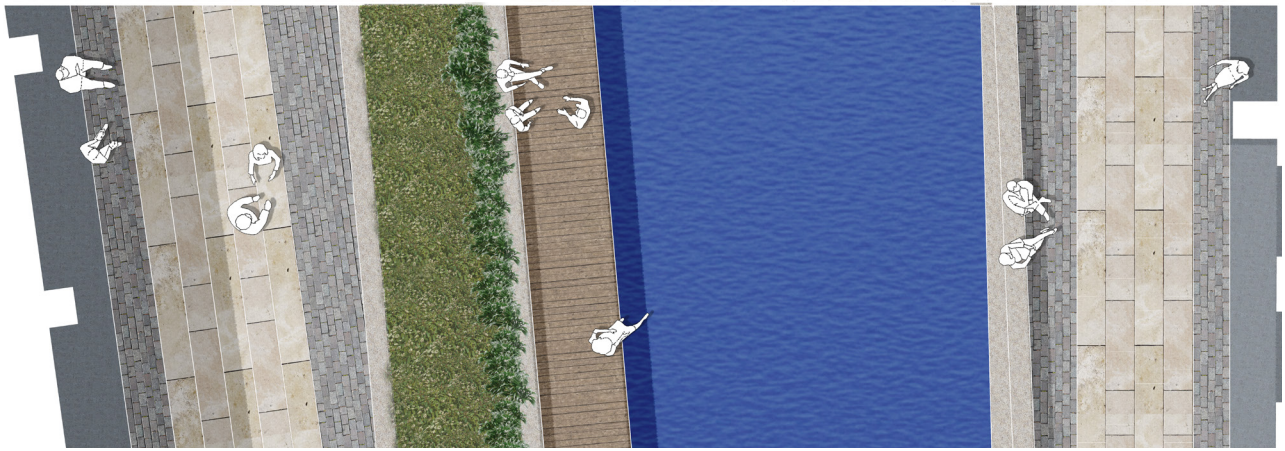


Scientific name:
Canna indica
Height: 10 - 15 cm.

Scientific name:
Cyperus alternifolius
Height: 50 - 60 cm.



Scientific name:
Ficus Benjamina Linn
Height: 6.5 - 7 m.



7.5 a walk into Lijiao: water for transformation

7.5.4 central node

The view is located at the core of the village, here the main and existing canal divides into a new one the right side of the image.

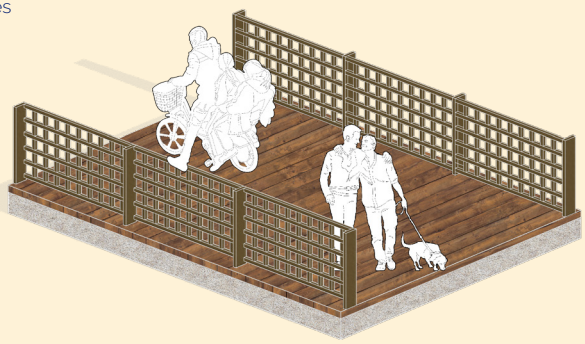
Three typologies of water edges can be noticed, all three of them are key shaped. On the left side a green stripe is inserted which can provide further water retention capacity but do not have a recreational function. On the right side a linear bench is designed and on the center of the image further green is implemented.

On both sides two old existing buildings have been renewed and can now host commercial functions.

Designed urban elements

single light lamppost

bridge with wooden fences on both sides



Scientific name: Cyperus alternifolius
Height: 50 - 60 cm.

Scientific name: Philodendron bipinnatifidum
Height: 40 - 50 cm.

Scientific name: Axonopus
Height: 10 - 15 cm.

Scientific name: Terminalia Mantaly
Height: 5 - 6 m.

7.5 a walk into Lijiao: water for transformation

7.5.5.1 residential street: dry season

A different atmosphere is here present, we are in fact located on a more residential street.

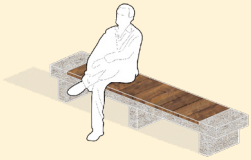
The canal has a narrow section with a series of small pedestrian bridges which connect the street to the entrances of the houses on the left side of the image.

A bios-wale with diverse vegetation and trees accompanies the canal creating cooling and shadows during the warmer months.

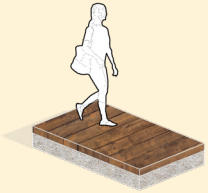
The lighting also differs, the street lights are here hanging creating a more informal ambiance.

Designed urban elements

hanging lamppost



bench in concrete and wood

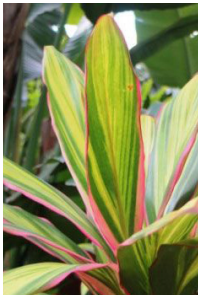


simple bridge

Scientific name: Aspidistra
Height: 40 - 50 cm.

Scientific name: Philodendron bipinnatifidum
Height: 40 - 50 cm.

Scientific name: Monstera deliciosa
Height: 40 - 50 cm.



Scientific name: Cordilyine Fruticosa
Height: 40 - 50 cm.

Scientific name: Exoececaria
Height: 50 - 60 cm.

Scientific name: Terminalia Mantaly
Height: 5 - 6 m.

7.5 a walk into Lijiao: water for transformation

7.5.5.2 residential street: heavy rain season

During the heavy rain season both the canal and the bios-wale can be filled. Water can infiltrate into the green bios-wale and fill completely the canal, alleviating the stress of water logging from the street, and the pressure off of the combined sewage system .

The paving is gently sloping from the center of the pedestrian street to the side, in order for the water to be gather on the edge of the walkway, through a gutter which runs underneath the bios-wale profile. On the same edge a low light is placed to highlight the sides of the street.

Neon lights are also placed on the sides of the small pedestrian bridges: in this way those elements appear to be well indicated.
Hanging lampposts irradiate informal and cozy light along the stretch of the residential street.

7.5 a walk into Lijiao: water for transformation

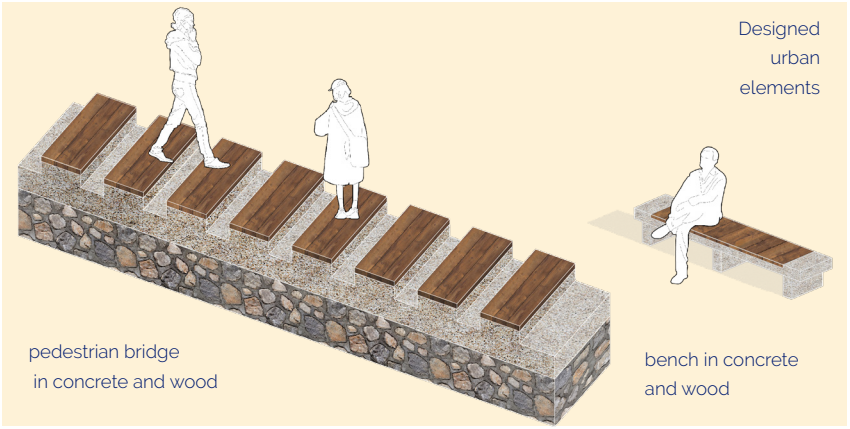
7.5.6.1 Ancestral Hall water plaza: dry season

The ancestral hall formerly played a very special role in Lijiao's public life. Although currently has been completely encroached by buildings and the remaining space serves as a parking lot.

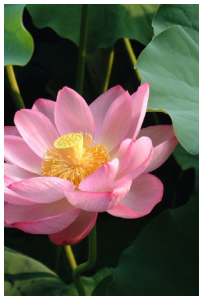
The design proposes a water-plaza to give new light and a better quality front public space to this magnificent historical building.

During the dry season can be used by people as a regular public space to gather, play or by elderlies to perform Tai Chi.

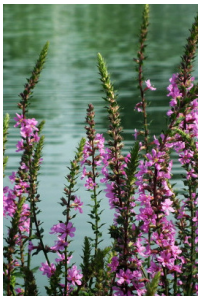
A wide balcony is designed to point at the temple entrance and the bridge also serve as a sluice to fill one side only of the water square when the water level is low.



Scientific name: Cyperus alternifolius
Height: 50 - 60 cm.



Scientific name: Nelumbo nucifera
Height: 70 - 80 cm.



Scientific name: Lythrum salicaria
Height: 50 - 60 cm.

Scientific name: Thalia dealbata
Height: 60 - 70 cm.

Scientific name: Myriophyllum aquaticum
Height: 10 - 20 cm.

Scientific name: Terminalia Mantaly
Height: 5 - 6 m.

7.5 a walk into Lijiao: water for transformation

7.5.6.2 Ancestral Hall water plaza: heavy rain season

During the heavy rain season the plaza can be filled with water, increasing the water capacity of the surrounding area and releasing the stress from the combined sewage system. Water will function as a mirror to reflect the beauty of the historical relic.

Flower beds of aquatic plants are designed to add a green layer to the water plaza. The vegetation is chosen from widely used species in South China as Nelumbo nucifera, Canna indica and Cyperus alternifolius, which have the additional benefit of purifying water.

This water square well represents all the strategies applied throughout the urban village of Lijiao: connect, preserve and adapt.

The water on the back side of the relic connects it to the central axis of the village (plan p. 89).

The water-square is here used not only to preserve this monumental building but also to enhance its beauty and strengthen its identity and importance within the urban fabric of Lijiao.

Lastly, the water-square has the functional aim of retaining water during the heavy rain seasons. Each intervention is in fact designed to embrace seasonal changes.

8

CONCLUSIONS & REFLECTIONS

This last chapter presents the reflections of the graduation project: “STITCHING LIJIAO. Towards the reintegration of urban villages in the landscape of the Pearl River Delta”.

The discussion will ponder on societal relevance, relationship between research and design, limitations, the outcome and its relationship with the graduation studio.

Figure 1–34 Lingan water garden in Foshan, Guangdong province, Captured by the author

8.1 Reflections

8.1.1 academic and societal relevance

The initial aim of this thesis project is to explore urban villages as the spatial consequences of the social phenomenon in China, and in particular in the fast urbanizing delta of the Pearl River. The current top-down planning strategy poses a great threat to the loss of diversity and variety in the Pearl River Delta. Therefore, the desired outcome is defining an alternative approach for the development of urban villages and their reconnection to the city's built and natural environment. Hence, in the academic field, a discussion over possible solutions and a long-term perspective on urban villages is needed in order to create awareness and to preserve both cultural and landscape heritage.

8.1.2 research and design

By reviewing the process from the beginning to the final outcome, it can be described as research-by-design. In different phases, the research exceeds the design method and vice versa, but the two practices are deeply interrelated. Starting from the establishment of the main research question up to the design exploration, there lies a process of optimization between functional, spatial and representational demands, consistently supported by literature studies. In fact, a deep understanding of the context and the cultural living of people is strongly required for contributing to a pertinent and coherent graduation project on the development of urban villages.

Fundamental to design a consistent development project for Lijiao was historical mapping, which served to trace back the identity to its origins as a Lingnan water village. Each urban village has in fact its own built and landscape character, and it is of great value to support the design choices with clear references to its genesis.

Case studies on the development of urban villages are then crucial to

extrapolate principles in order to re-integrate the village-in-the-city considered with its metropolitan area:

1. **connecting** its structure with the surrounding districts;
2. **preserving** its built and landscape morphology re-defining its edges;
3. **adapting** public spaces to climate change, aiming on one hand to safeguard the urban village on a long-term perspective and on the other hand to convert water from an issue to deal with to a quality public element to benefit from.

Therefore, the relationship between research and design has been expressed as just outlined throughout the whole process of this graduation project.

8.1.3 outcome

> "*How to preserve and strengthen the identity of the urban village of Lijiao, by re-defining the historic relation between the village and the water landscape?*"

The main research question of the graduation project "Stitching Lijiao" aims to re-integrate the urban village with the metropolitan area of Guangzhou while preserving and reviving its former urban and landscape identity.

The three proposed design strategies (connect, adapt and preserve) aim to this initial goal through the aid of a general toolbox. The landscape and its lost water veins are reintroduced, re-establishing the historical identity of Lijiao as a Lingnan water village. Furthermore, the re-defined identity helps to preserve and maintain the morphological structure of the village, and to highlight the heritage buildings and landscape.
The landscape elements, as the re-opened canals, the climate dike waterfront, the pocket parks and bios-wales, function as public spaces.

In fact, they are meant to connect both the village within itself, while, at the same time, expand outside the edges, networking with the surrounding context both physically and socially.

Therefore, the three main lessons learned are:

1. **water as a restructuring element**. Tackling issues as flooding and water-logging can help to restructure urban villages, not just to increase their sponge capacity and release the combined sewage system, but also to increase and create quality public spaces. Both the requalified existing and the designed blue structure can help to better define clear routings and connections.

2. **definition of the village edge as preserving element.** Defining clear, wide and possibly green edges to the urban village can help control the expansion from happening from the outskirts of the village. When possible, the use of medium scale buildings typology can mediate between the surroundings built fabric, which is usually big scaled.

3. **heritage buildings as integral part of public space.** Reviving and linking the heritage buildings of each urban village can help preserve the architectural identity of it, but also habits and customs of the community.

8.1.4 relationship with the graduation studio

The topic of urban villages is closely related to the Pearl River Delta graduation studio as it is a peculiar urban typology and phenomenon that was first seen in South China. In this graduation project landscape architecture is valued as a powerful tool to re-connect Lijiao to both the local and regional built and environmental system.

8.1.5 limitations

At the beginning of the research process, it has been complicated to identify the true carriers of identity from remote distance. Before visiting Guangdong Province, the preliminary comprehension of the cultural and societal aspects was the result of a long process of just literature study and desk analysis. Indeed, the field trip has been, for this reason, crucial to acquire a clearer and thorough interpretation over socio-cultural behaviors. Although, due to the language barrier, the collection of interviews has not been possible; this could have enriched to a greater extent both the research and the design outcomes.

Hence, with the limitation of time and travel distance, there are still several issues that the project can explore further. In the case of urban villages the inhabitants are skilled in the “diy” (do it yourself) method. Keeping this competence in mind while introducing a participatory design would have brought a deeper social strategy, which as of now still needs to be investigated deeper. Also it would have educated and empowered both villagers and migrants in the process, creating a better social cohesion.

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