

HYDROLOGICAL HERITAGE LANDSCAPE

Designing a resilient landscape framework to ensure preservation of the cultural history, and sustainable development of the Ningshao Plain

Resilient coastal landscapes

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01 INTRODUCTION

02 METHODOLOGY

03 LANDSCAPE SYSTEM ANALYSIS

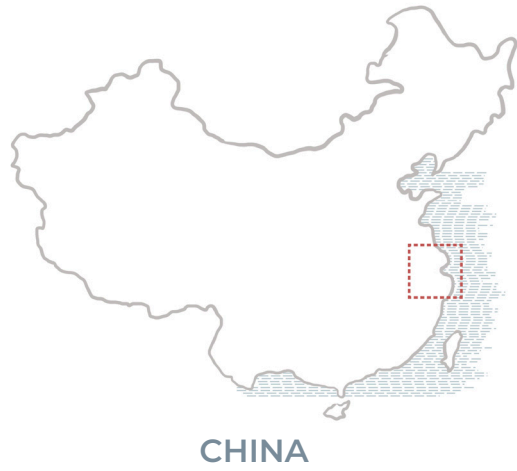
04 EXPLORING SHAOXING STRIP

05 DESIGN EXPLORATION

06 DISCUSSION & CONCLUSION

01 INTRODUCTION

INTRO | LOCATION

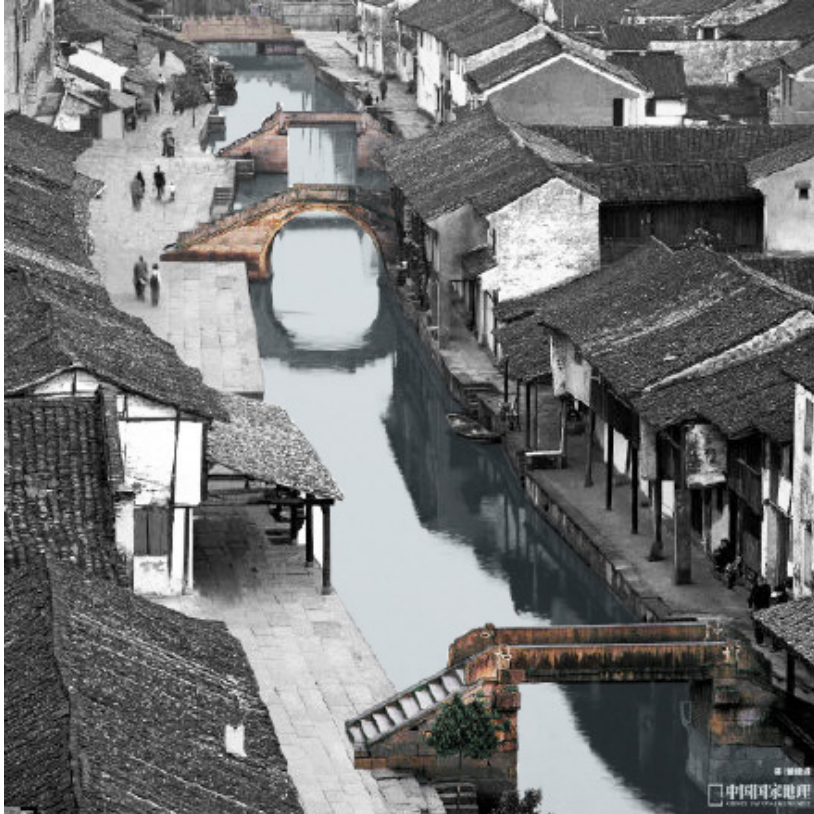


WATER-FORMED POLDER LANDSCAPE

the landscape records the influences by human and nature

agricultural heritage

Source: http://img-arch.pconline.com.cn/images/upload/upc/tx/photoblog/1010/22/c10/5603245_5603245_1287749



water town

Source: https://www.sohu.com/a/150458552_6736945603245_5603245_1287749355718.jpg



historical manual lake

Source: https://photo.gmw.cn/2019-06/22/content_32939732.htm?s=gmwreco&p=2

FASCINATION

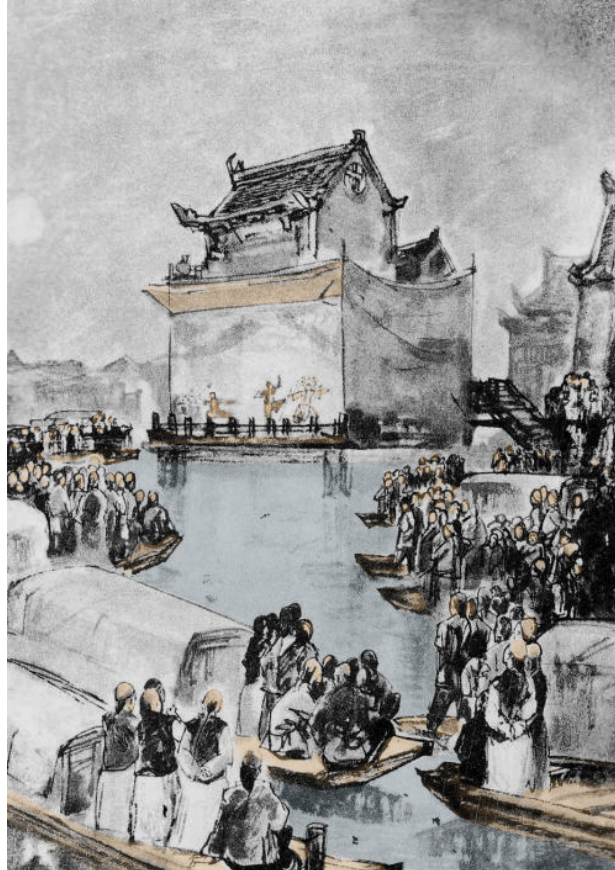
LIVE BY WATER

cultural identity



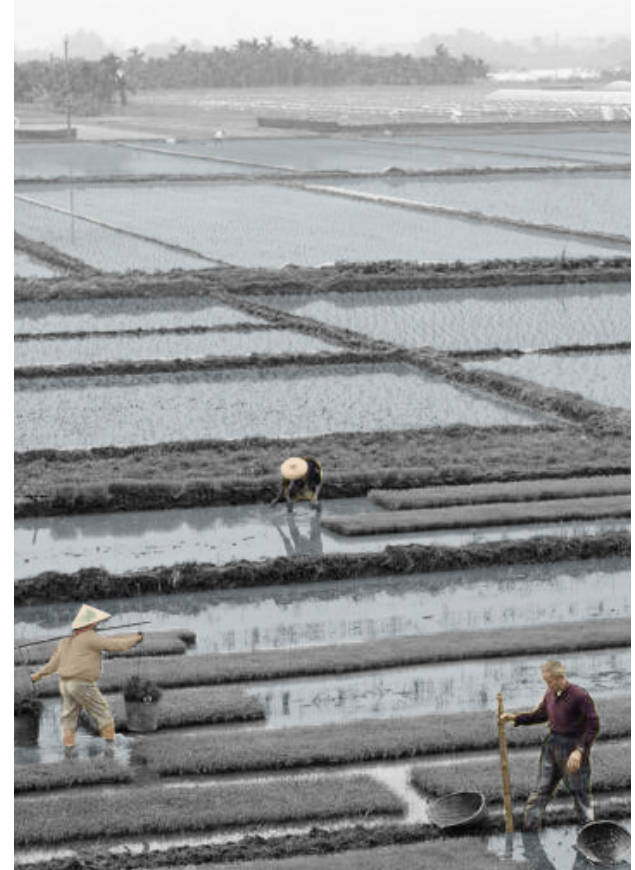
leisure time near water

Source: https://www.douban.com/note/772811846?ivk_sa=1024320u



opera performance on water stage

Source: https://www.sohu.com/a/116583765_498199



rice planting

Source: <https://www.photophoto.cn/show/08993628.html>

PROBLEM FIELD | 1/3 LOSS OF CULTURAL HISTORY

The polder structure is being deconstructed...

“Demolition and building a new house and infrastructure are good things, but retaining a little local scenery can feel hometown”

agriculture field is being urbanized



Source: <https://www.163.com/dy/article/EEHTI2MQ05370ELS.html>



waterway was interrupted by infrastructure

Source: <https://www.163.com/dy/article/EEHTI2MQ05370ELS.html>

PROBLEM FIELD| 2/3 WATER SAFETY

WATER SHORTAGE



Source: <https://www.chinanews.com.cn/tp/hd2011/2014/07-31/384228.shtml>



WATERLOGGING

台风前夕暴雨致浙江绍兴多地积水 多方力量紧急救

Heavy rain on the eve of the **TYPHOON** caused water to accumulate in many places in Shaoxing, Zhejiang

2021-07-24 17:14



Source: <https://baijiahao.baidu.com/s?id=1706246489199848845&wfr=spider&for=pc>

PROBLEM FIELD | 3/3 FRAGILE ECOLOGY

LOW WATER QUALITY

industrial pollution



Source: https://www.sohu.com/a/111405569_362163

domestic pollution



Source: https://www.sohu.com/na/483012004_99959988



eutrophication

Source: https://www.e0575.cn/read.php?tid=1122405299959988na/483012004_99959988



siltation

Source: <https://jx.news.fang.com/2015-09-07/17253503.htm>

LESS BIODIVERSITY



deforestation destroys the mountain ecology

Source: https://www.sohu.com/na/483012004_99959988

PROBLEM STATEMENT

The polder landscape is being disappearing...

“People often only pay a lot of energy and money to repair the environment problems urgently, but ignore the potential value of the polder landscape to build a more robust framework which is more beneficial to long-term sustainable development of the Ningshao Plain.”

Highly urbanized city: Ningbo

Source: https://www.sohu.com/a/316585508_330740



LOSS OF CULTURAL HISTORY

Polder structure destruction
Heitage loss of value/fuction

Flooding in Ningbo

Source: http://blog.sina.com.cn/s/blog_3df170610102vjos.html



WATER SAFETY

water shortage
water logging

Deforestation for agriculture

Source: https://www.thepaper.cn/newsDetail_forward_4432955



FRAGILE ECOLOGY

low water quality
less biodiversity

OBJECTIVE

WATER SAFETY

FRAGILE ECOLOGY

LOSS OF CULTURAL HISTORY



"Designing a **resilient landscape framework** taking hydrological heritage **landscape as the basis** to ensure preservation of **cultural history** and **sustainable development** of Ningshao plain."

RESEARCH QUESTIONS

How to build a **resilient landscape framework** taking *hydrological heritage landscape as the basis* to ensure the preservation of cultural history, and sustainable development of Ningshao plain?



UNDERSTANDING

1. What are the landscape structure of the hydrological heritage landscape of Ningshao plain?

- What are the natural conditions and hydrological structure of the polder landscape of Ningshao plain?
- What is the ecological and cultural value of the polder landscape regarding to landscape design?

2. What are the key factors influence the change of the polder landscape of Ningshao Plain ? How they influence landscape through time?

PRINCIPLES

3. What are design principles based on polder landscape? What strategies and principles are more resilient for the development of Ningshao plain?

APPLICATION

4. How to apply the principles in a more adaptive to the local way?

REFLECTION

5. Does the design provide new practices for the protection of cultural landscapes? Is there any other relevance value for society?

02 METHODOLOGY

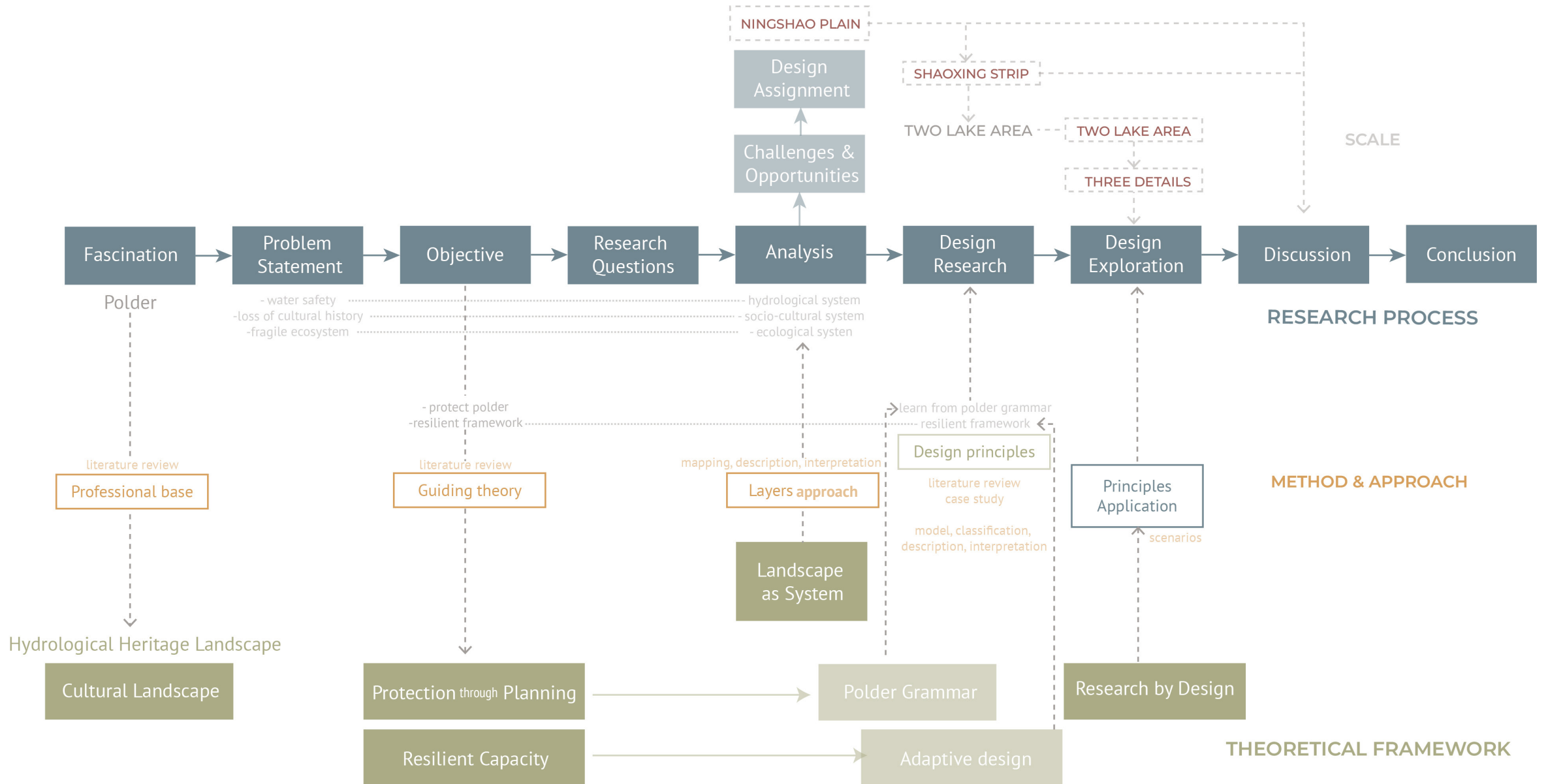


PROTECTION THROUGH PLANNING

"The interaction between cultural history and spatial planning, and the recognition of stakeholders, can create the conditions for discovering a new balance between retaining cultural heritage and developing it."

(Belvedere, 1999)

METHODOLOGY



03 LANDSCAPE SYSTEM ANALYSIS

In order to understand the landscape structure as the basis of the framework, the polder landscape of the Ning-Shao Plain was apprehended by a layers approach consisting of three sub-systems: hydrology, ecology, and socio-culture.

LANDSCAPE SYSTEM ANALYSIS | NATURAL BASE



Qiantang river



Source: http://tuchong.com/1511806/103242191/na/483012004_99959988

Plain area



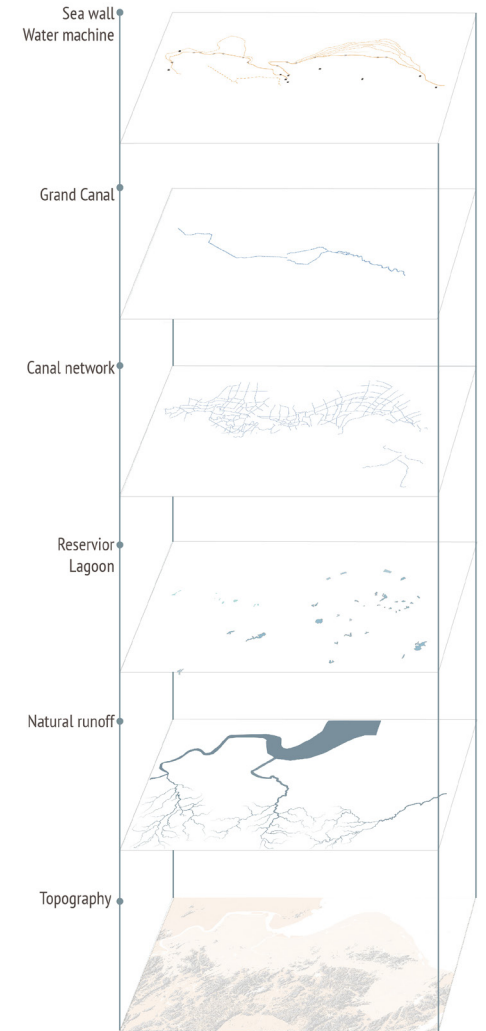
Source by Feiyan Zhang: https://www.sohu.com/a/420725440_120220911na/483012004_99959988

Mountain area



Source: https://www.baik.com/wikiid/5363724094438783262?prd=mobile&view_id=3ztp91015fo000

LANDSCAPE SYSTEM ANALYSIS | 1/3 HYDROLOGICAL LAYER



LANDSCAPE SYSTEM ANALYSIS | 1/3 HYDROLOGICAL SYSTEM

- systematic water system facing water safety issues

sea defence system

witness the reclamation history

watercourse network

dense and systematic

river

go to the sea

lagoon

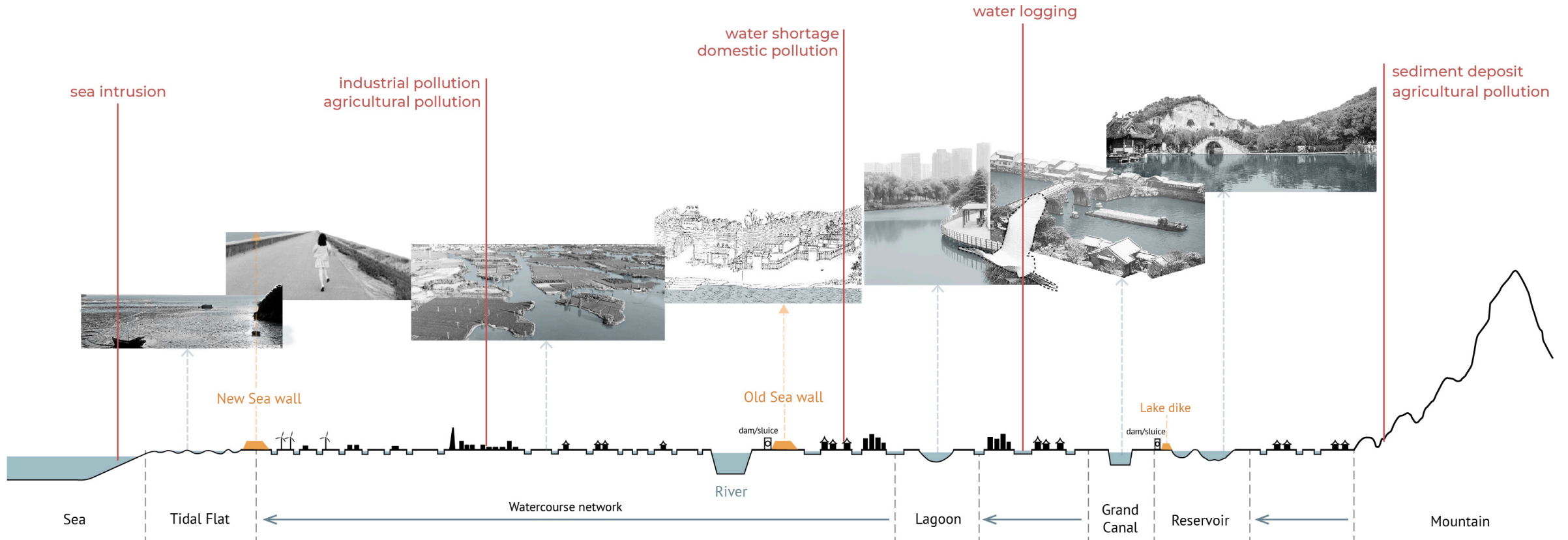
lake remain after being reclaimed

Grand Canal

oldest canal in China

Reservoir

common water storage



LANDSCAPE SYSTEM ANALYSIS| 2/3 ECOLOGICAL LAYER



● Needleleaf forests in subtropical zone



Pinus massoniana

● Bamboo forests in subtropical zone



Phyllostachys pubescens

● Broadleaf evergreen forests in subtropical zone



Cyclobalanopsis glauca *Castanopsis scierophylla*

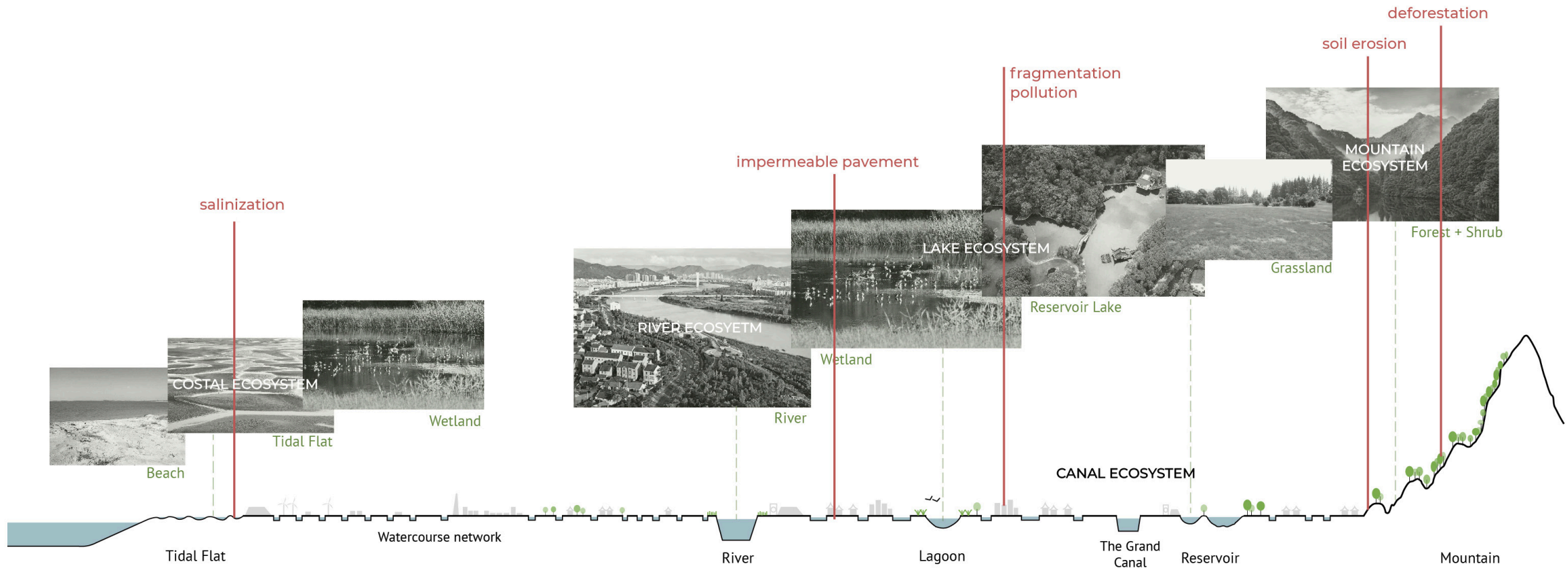
● Broadleaf evergreen and deciduous scrubs in subtropical zone



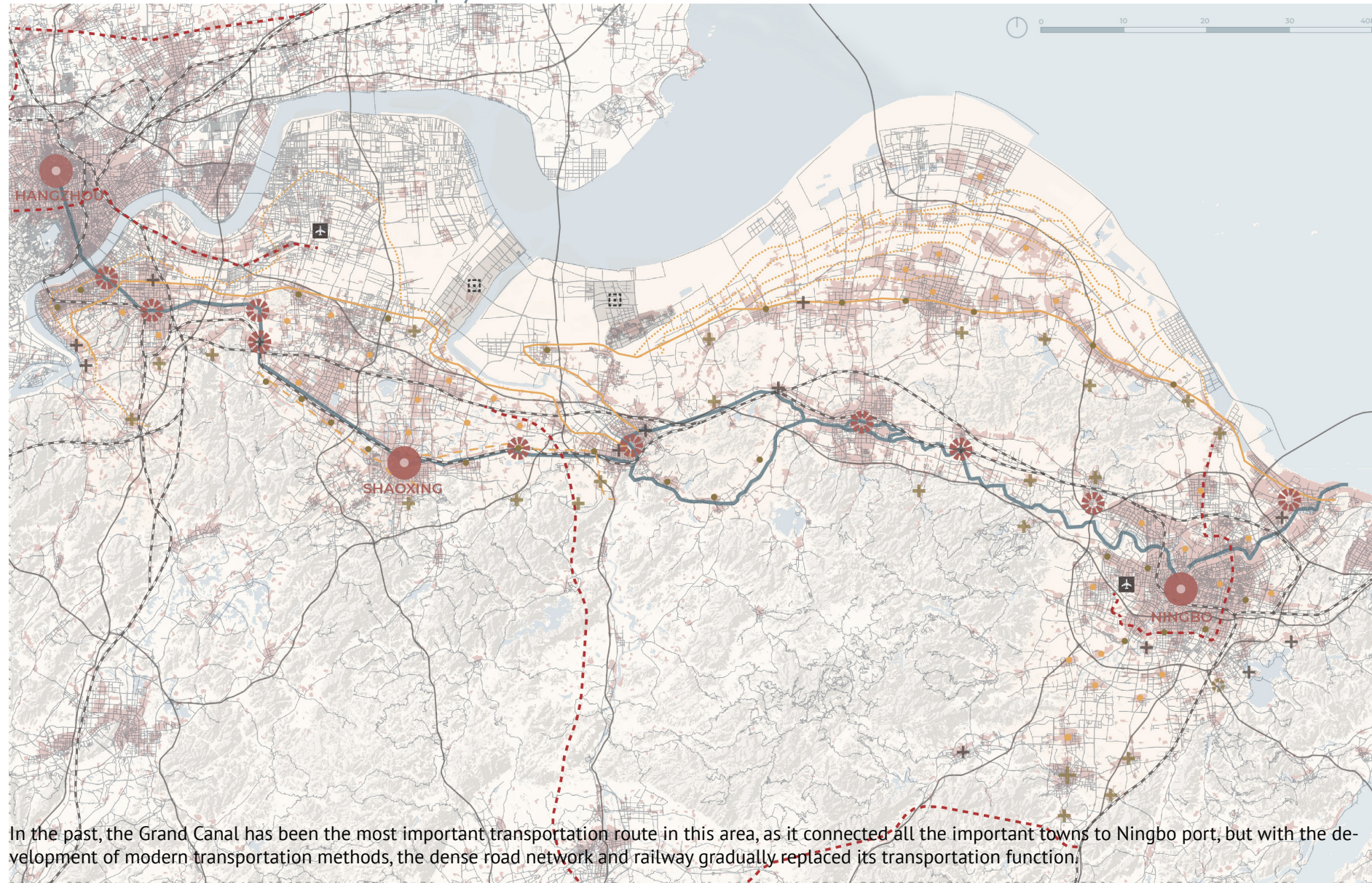
Rhododendron simsii *Loropetalum chinense*

LANDSCAPE SYSTEM ANALYSIS| 2/3 ECOLOGICAL SYSTEM

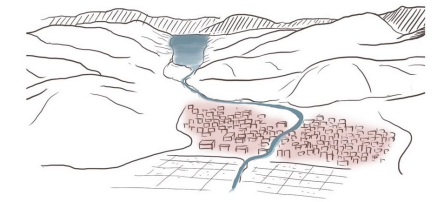
"The ecological elements of the Ningshao Plain are closely related to water, but relatively independent with each other."



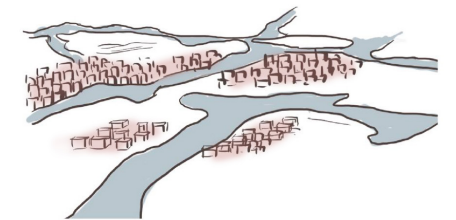
LANDSCAPE SYSTEM ANALYSIS | 3/3 SOCIO-CULTURE LAYER



In the past, the Grand Canal has been the most important transportation route in this area, as it connected all the important towns to Ningbo port, but with the development of modern transportation methods, the dense road network and railway gradually replaced its transportation function.



+ Hill settlement



● Port settlement



+ Dike settlement



● Sluice/dam settlement

CONCLUSION | LANDSCAPE STRUCTURE



A: lake polder



BDEF: port polder



C: vally polder



G: silt polder



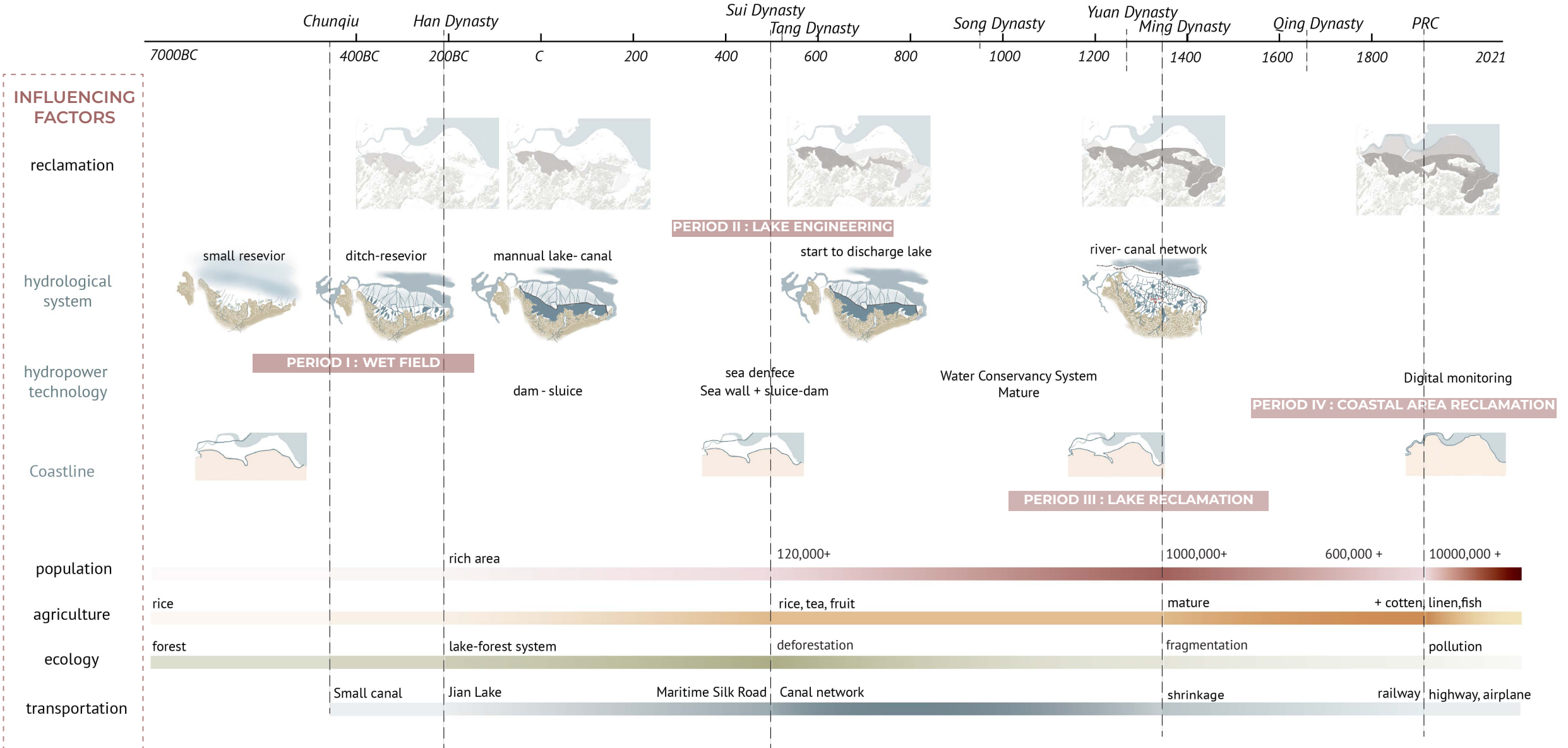
HI: sand polder



DEVELOPMENT OF THE SYSTEM

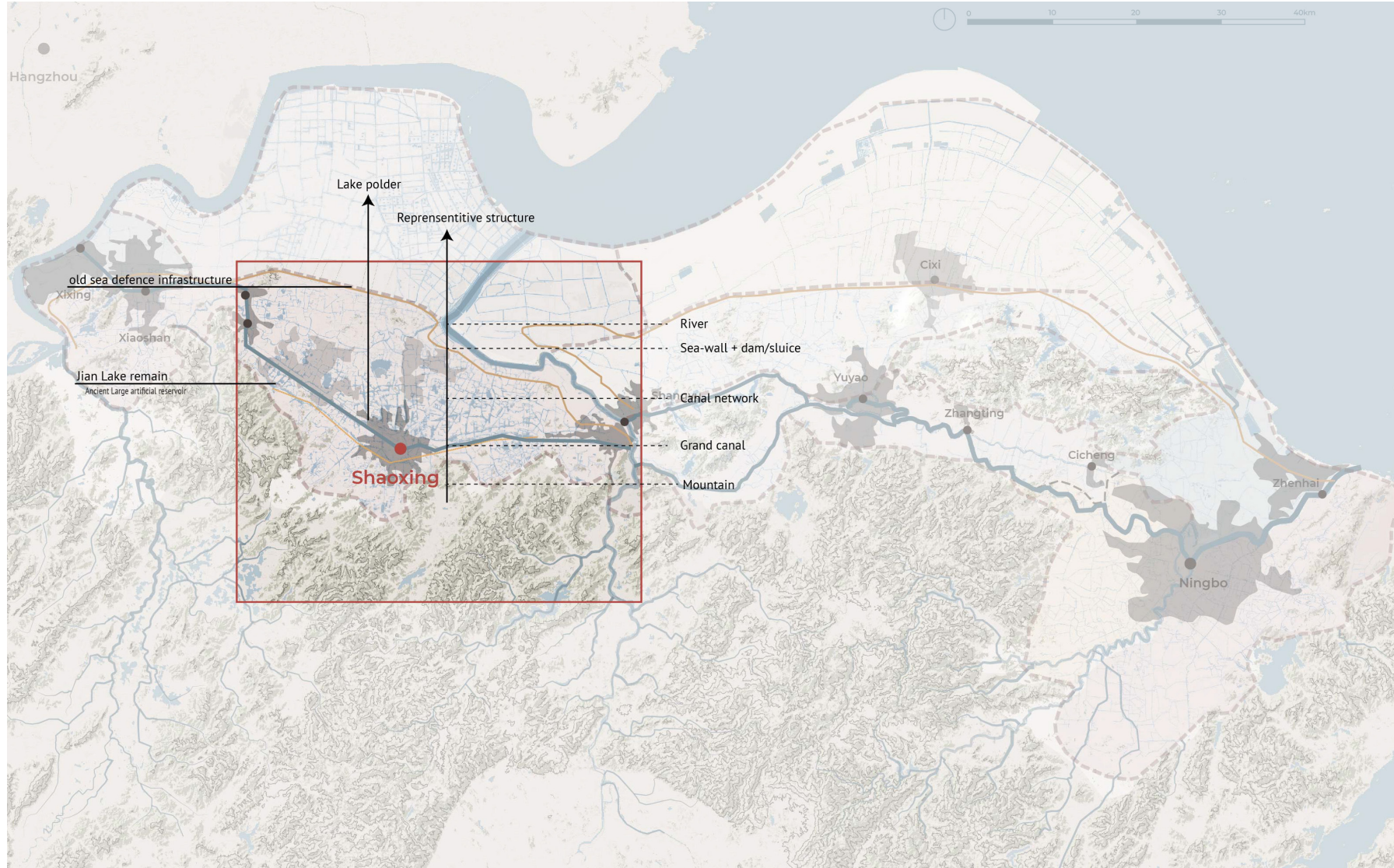
Early time natural factors dominate, later human factors dominate the dynamics

Part based on Xiujing, Shi.(2020). Study on Water Conservancy Landscape in Xiaoshao Region. [Dissertation for the Degree of Master]. Zhejiang A&F University.



DESIGN RESEARCH SCALE

taking one type of polders as an example to do further research on the structure



01 oldest polder area

02 representative structure

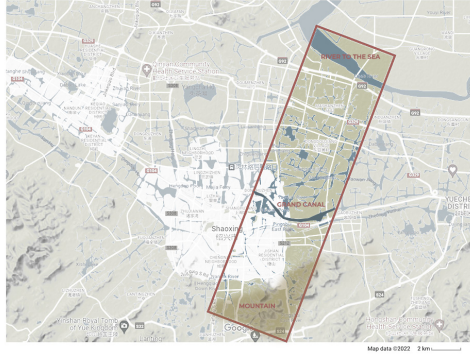
03 diverse settlement

04 splendid heritage

04 EXPLORING SHAOXING STRIP

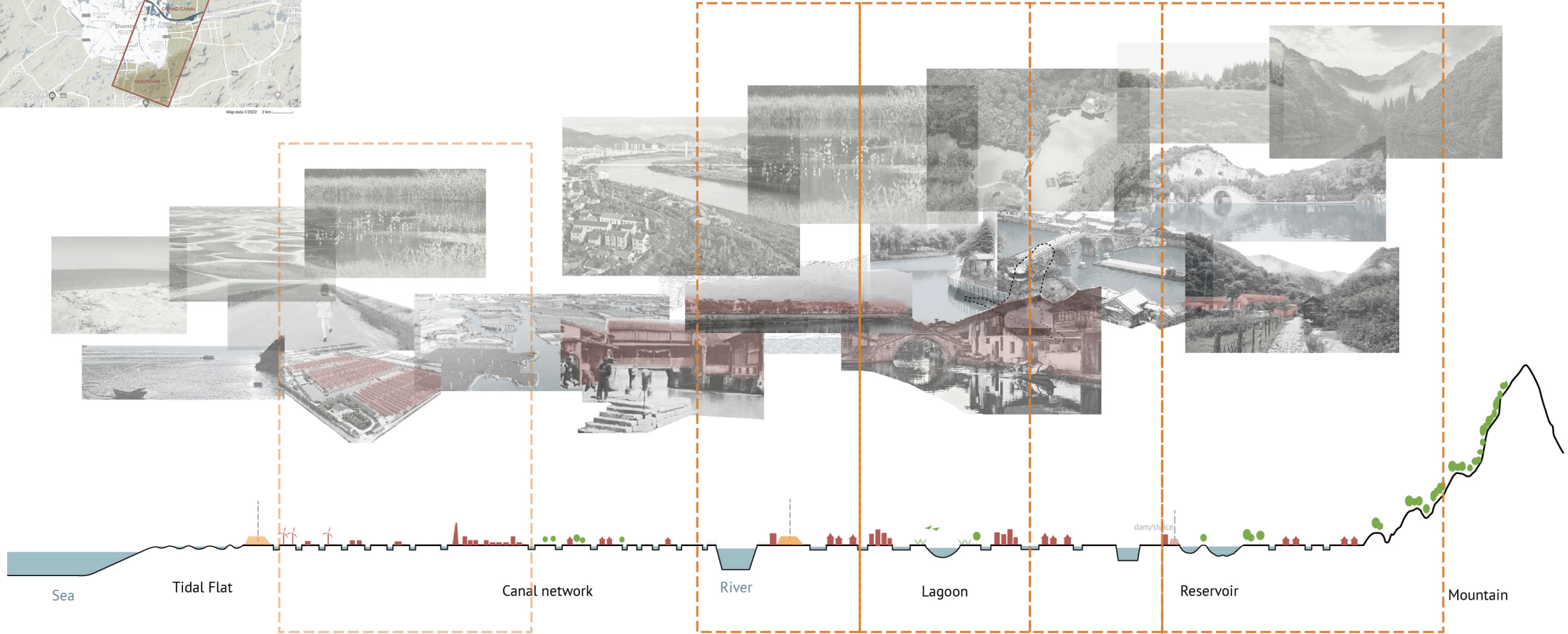
On the basis of the general landscape structure, further research on the "polder grammar" of the Shaoxing area.

SHAOXING STRIP | INTRODUCTION



04 SEA WALL AREA

02 GRAND CANAL AREA



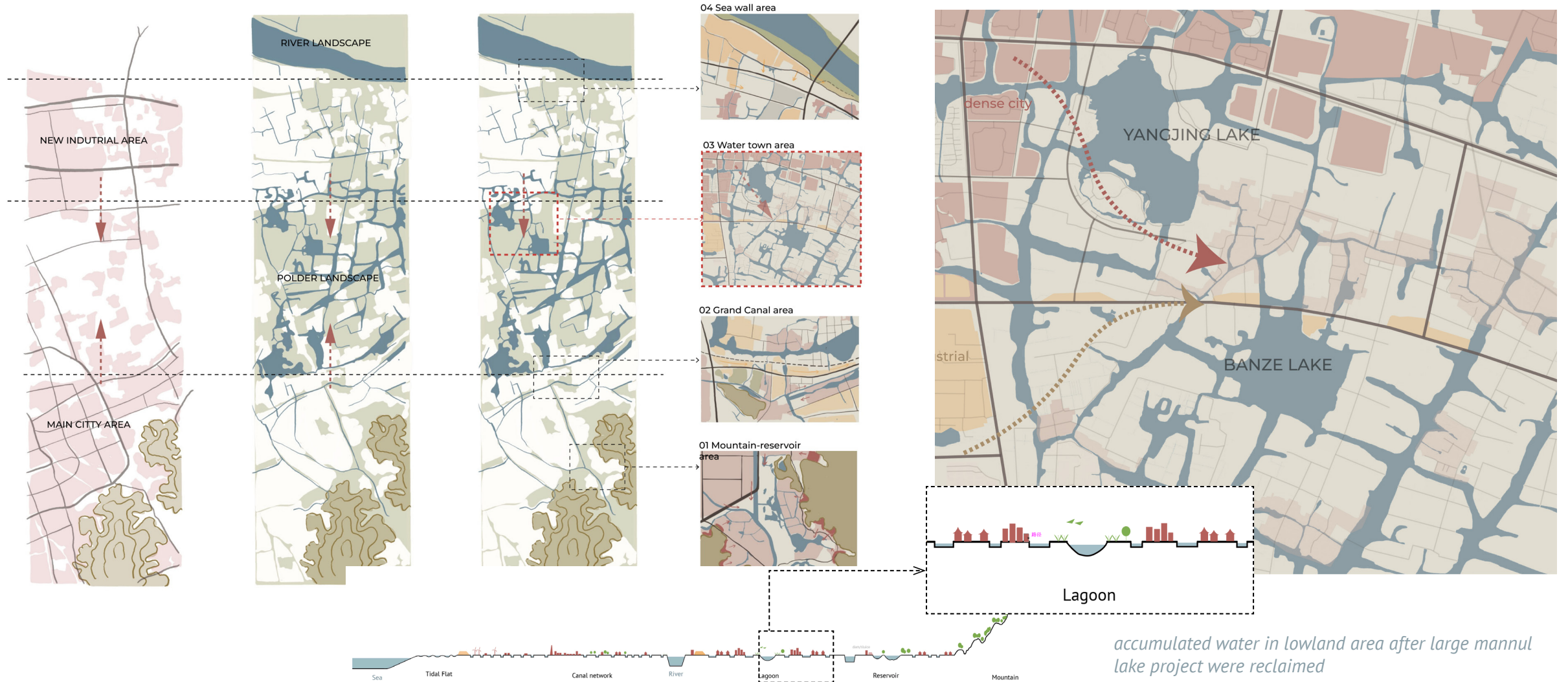
NEW SETTLEMENT

03 WATER TOWN AREA

01 MOUNTAIN-RESERVIOR AREA

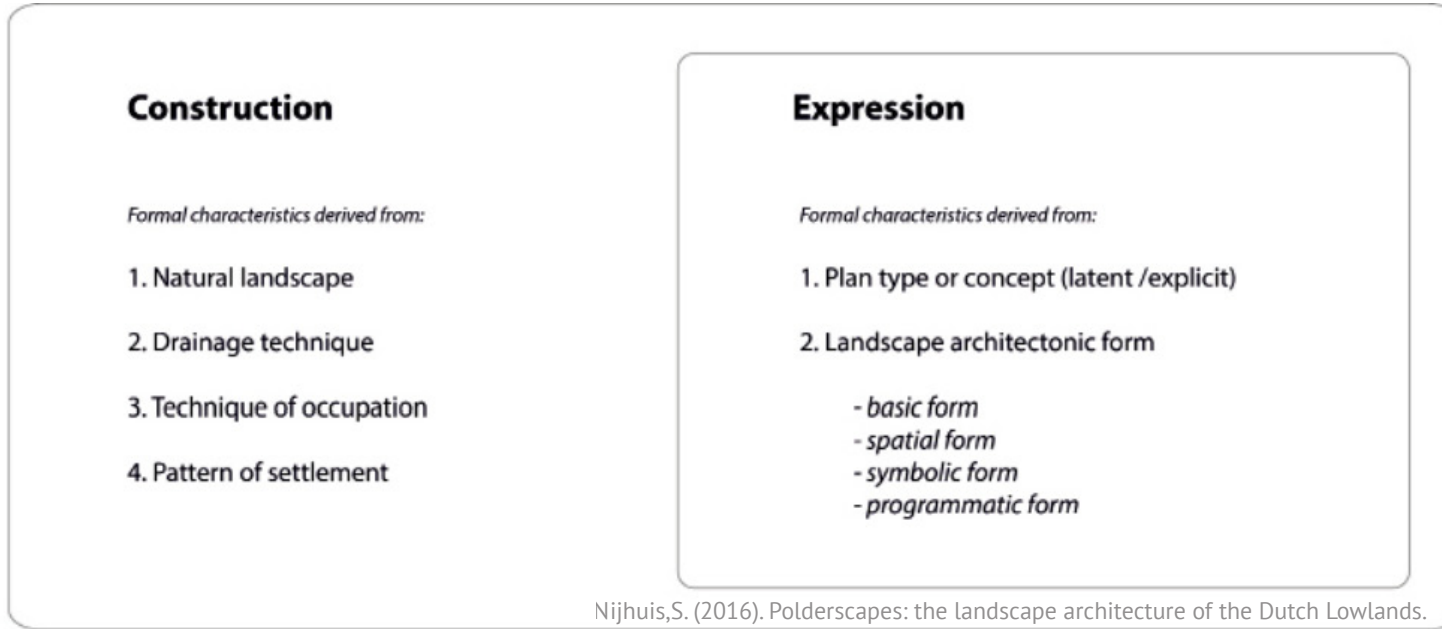
as an urbanization example

SHAOXING STRIP | TWO-LAKE AREA



RESEARCH APPROACH | POLDER GRAMMAR

"A planning tool that can guide design and landscape changes"

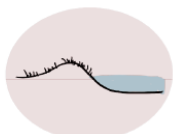


"Polder grammar" is a set of structural rules and principles that determines the characteristic composition of the landscape: the complexity of the pattern, the morphology, the visual qualities—and with that, the cultural identity of the polder while providing clues for spatial development in the form of design principles (Nijhuis 2020).

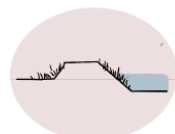
Water structure form



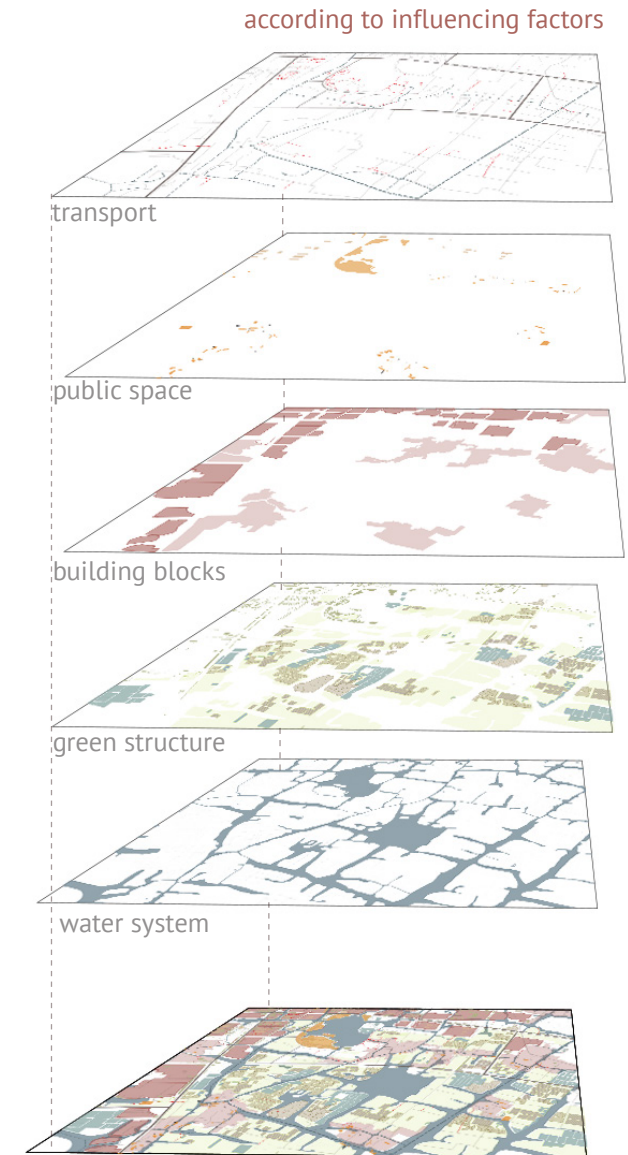
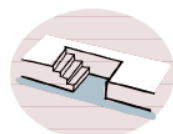
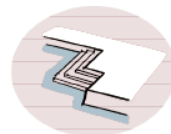
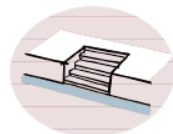
irregular shape



natural embankment



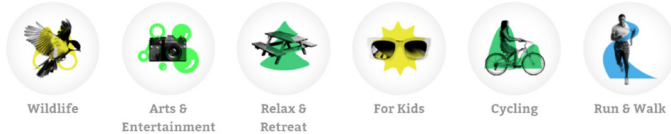
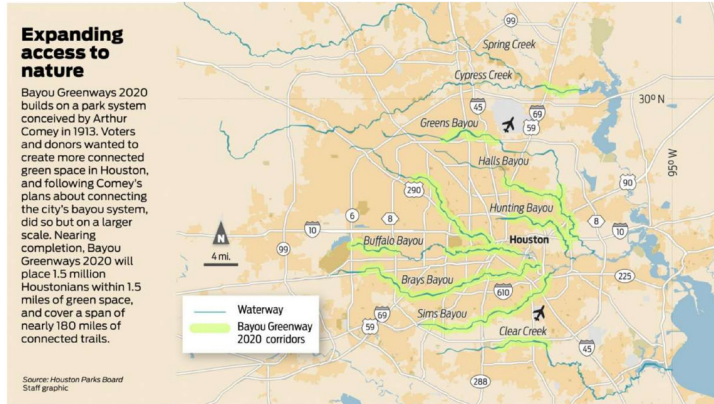
diverse interface



RESEARCH APPROACH | CASE STUDY

"From the case study, some resilient design principles can be learned and summarized as supplement to design principles of the polder grammar."

(Bayou Greenway 2020 (n.d.) Houston Park Board. <https://houstonparksboard.org/about/our-story>)
Bayou Greenway 2020, Houston, USA

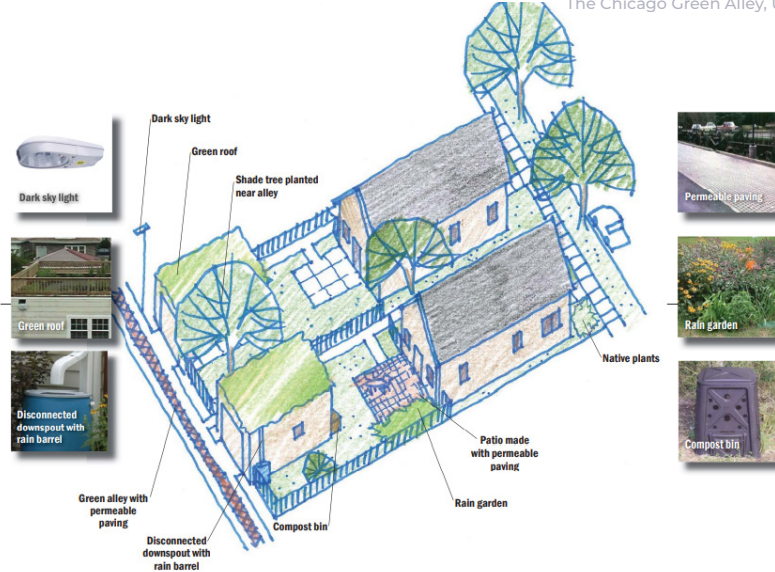


GREENWAY

build green park system along water

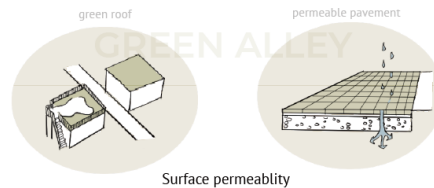


Richard M. & Thomas G. (2010). The Chicago Green Alley Handbook—An Action Guide to Create a Greener, Environmentally Sustainable Chicago.
The Chicago Green Alley, USA



GREEN ALLEY

sustainable alley design



Surface permeability

From Jing Hu. (n.d.). Shaoxing Jing Hu Wetland Park Masterplan. <https://wenku.baidu.com/view/1c4c7e533169a4517723a38e.html>
Shaoxing Jing Hu Wetland Park, China



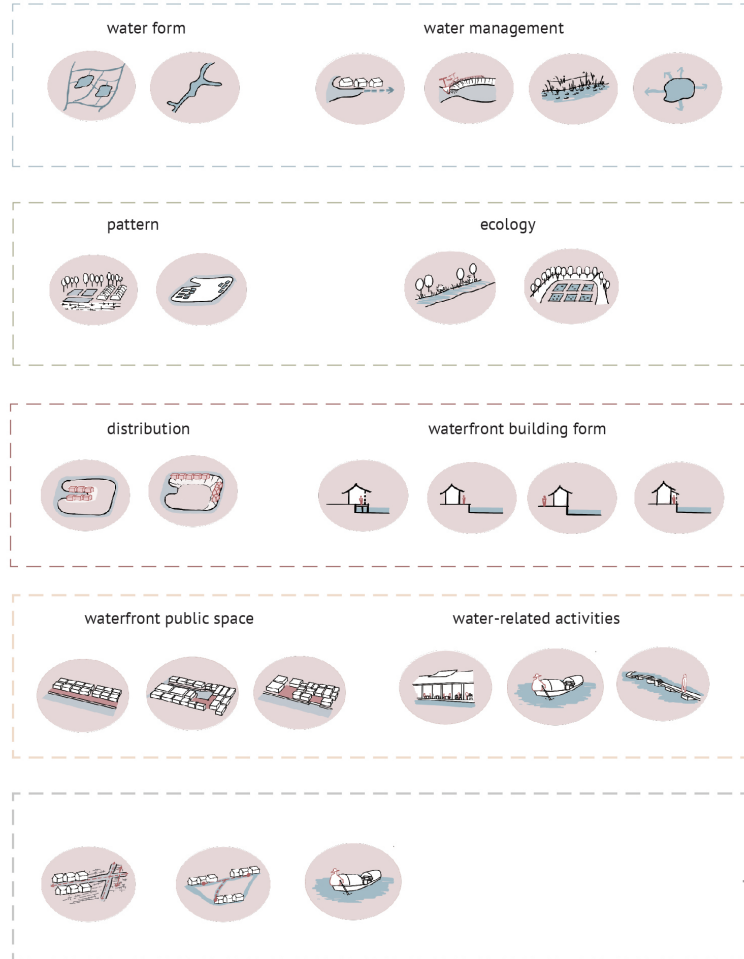
WETLAND PARK

Lake transformation design in Shaoxing

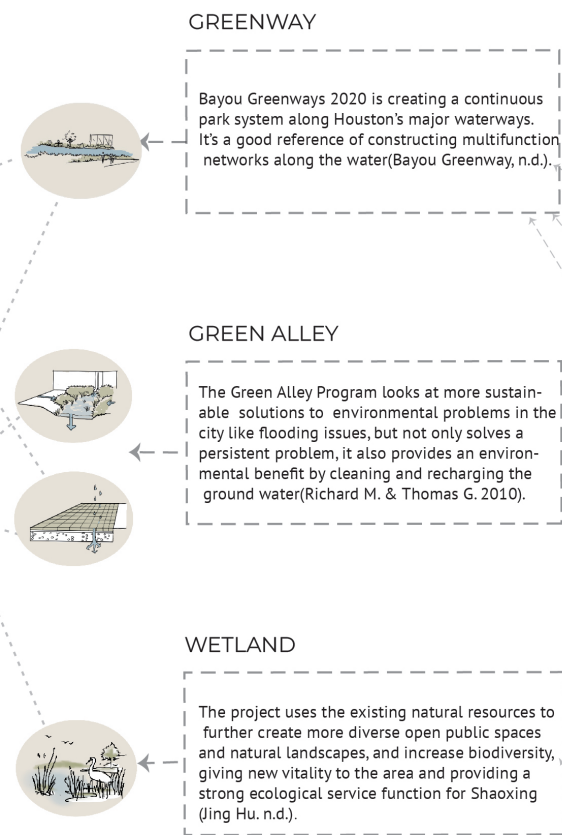


RESEARCH APPROACH OF DESIGN PRINCIPLES

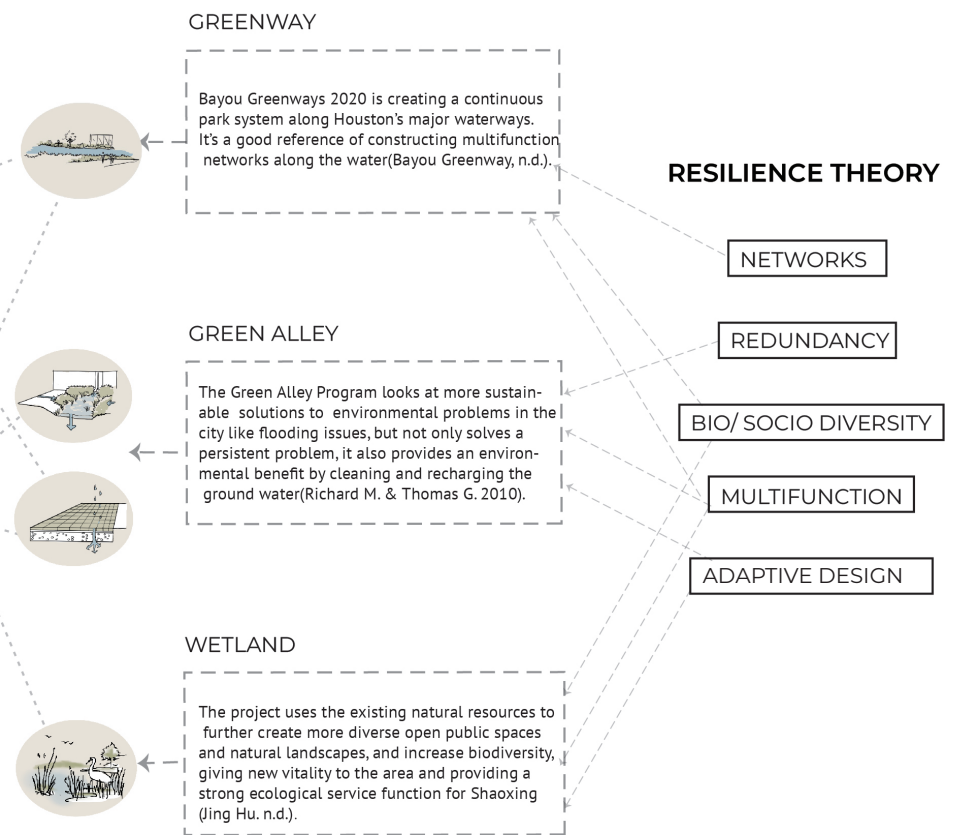
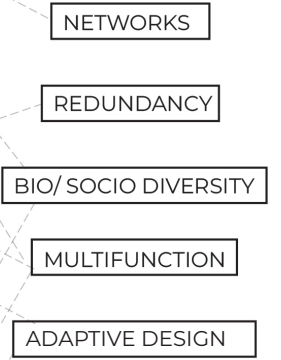
POLDER GRAMMAR



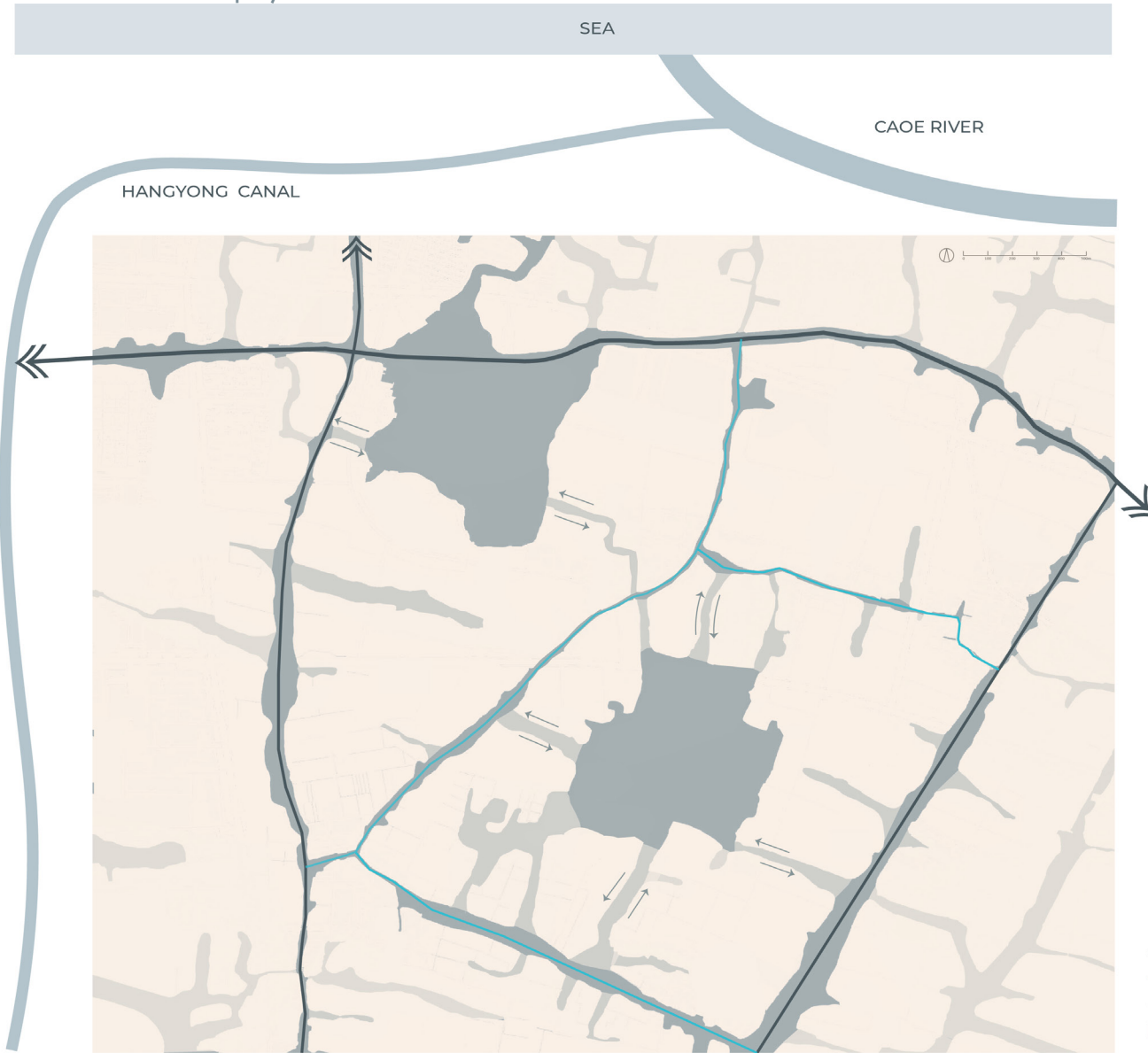
CASE STUDY



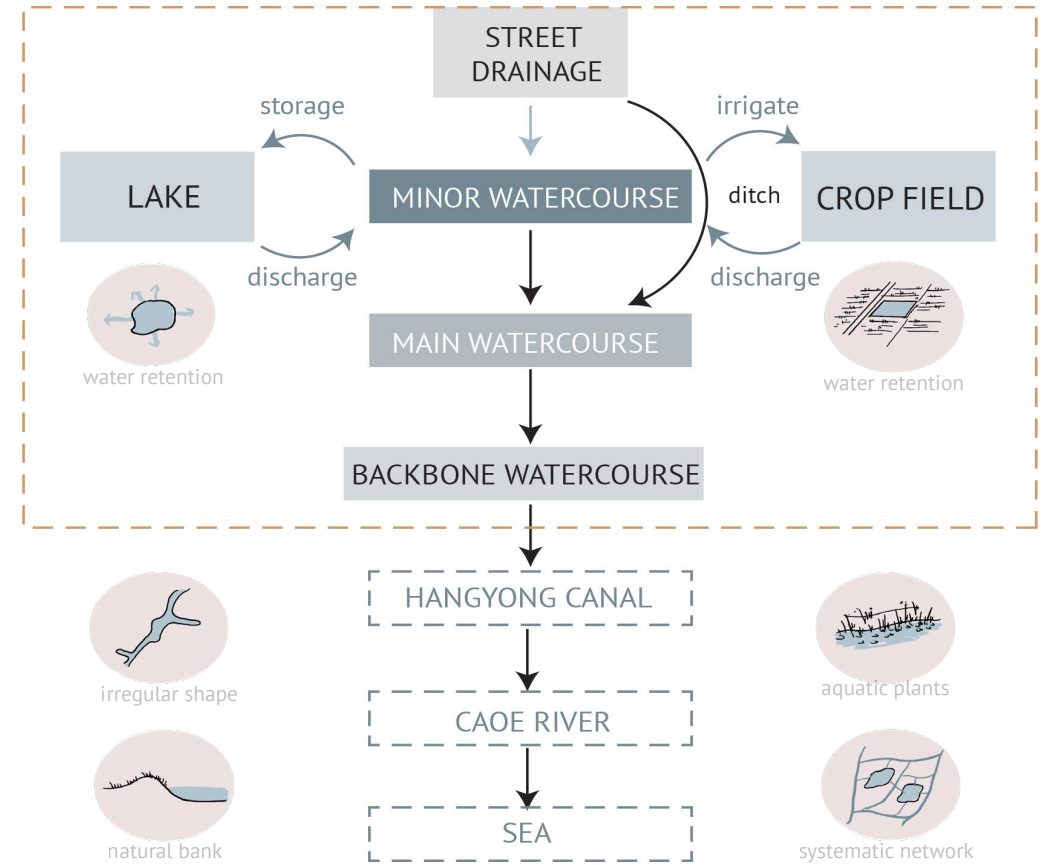
RESILIENCE THEORY



SITE ANALYSIS | 1/5 WATER SYSTEM

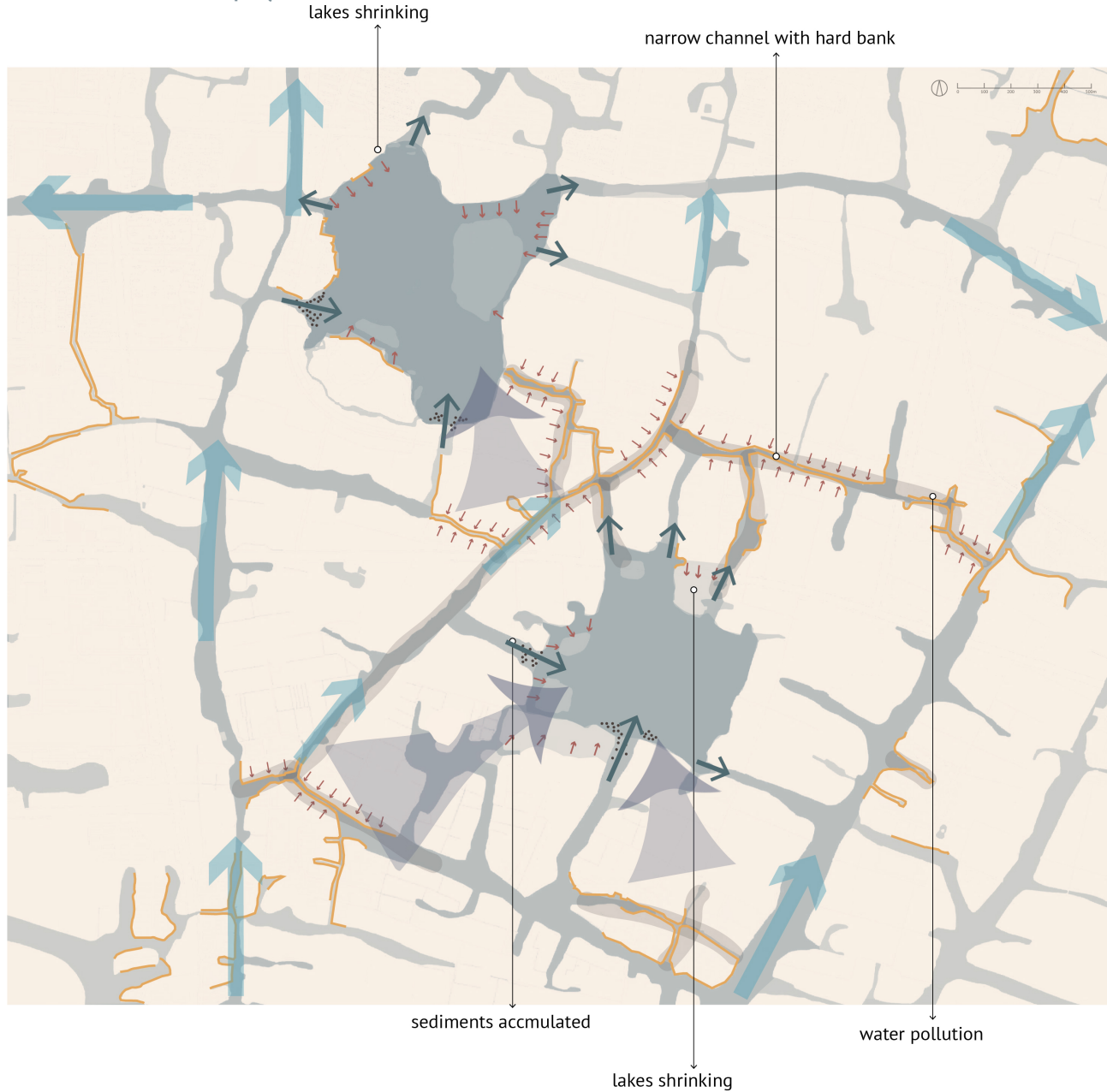


Systemetic Water Network



four hierarchies to discharge and irrigate

SITE ANALYSIS | 1/5 WATER SYSTEM



DECREASED WATER STORAGE CAPACITY



Source: Jing Hu. (n.d.). Shaoxing Jing Hu Wetland Park Masterplan.

POOR SURFACE WATER CIRCULATION



Source: http://k.sina.com.cn/article_2810373291_a782e4ab-020024i8f.html

LOW WATER QUALITY



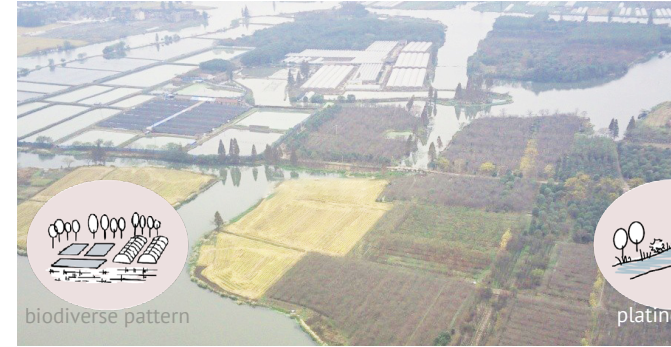
Source: Jing Hu. (n.d.). Shaoxing Jing Hu Wetland Park Masterplan.

SITE ANALYSIS | 2/5 GREEN STRUCTURE



AGRICULTURAL FIELD

Source: <https://www.e0575.cn/read.php?tid=11465434>



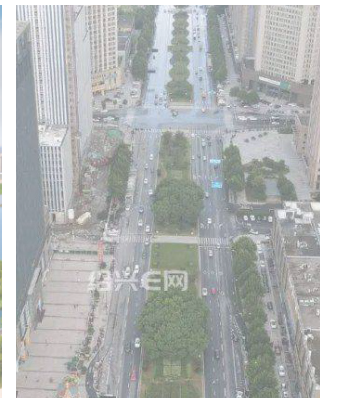
AQUATIC PLANTS

Source: <https://www.photophoto.cn/su-cai/09578607.html>



YANGJING LAKE

Source: <https://baike.baidu.com/item/%E5%88%99%E6%B0%B4%E7%89%8C%E6%9D%91>



GREEN STREETS

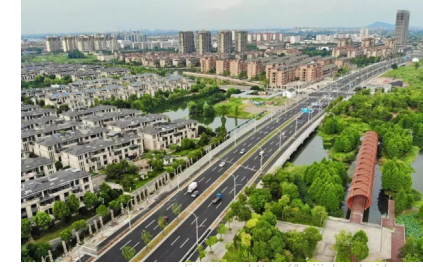
Source: https://www.sohu.com/a/489885432_121123888

-  planting bank
-  tree lines
-  fish pond
-  greenhouse
-  woods
-  cultivated field
-  city green space

SITE ANALYSIS | 2/5 GREEN STRUCTURE



SCATTERED GREEN SPACES



source: <https://baijiahao.baidu.com/s?id=1664205560238399102&wfr=spider&for=pc>

HARD BANK



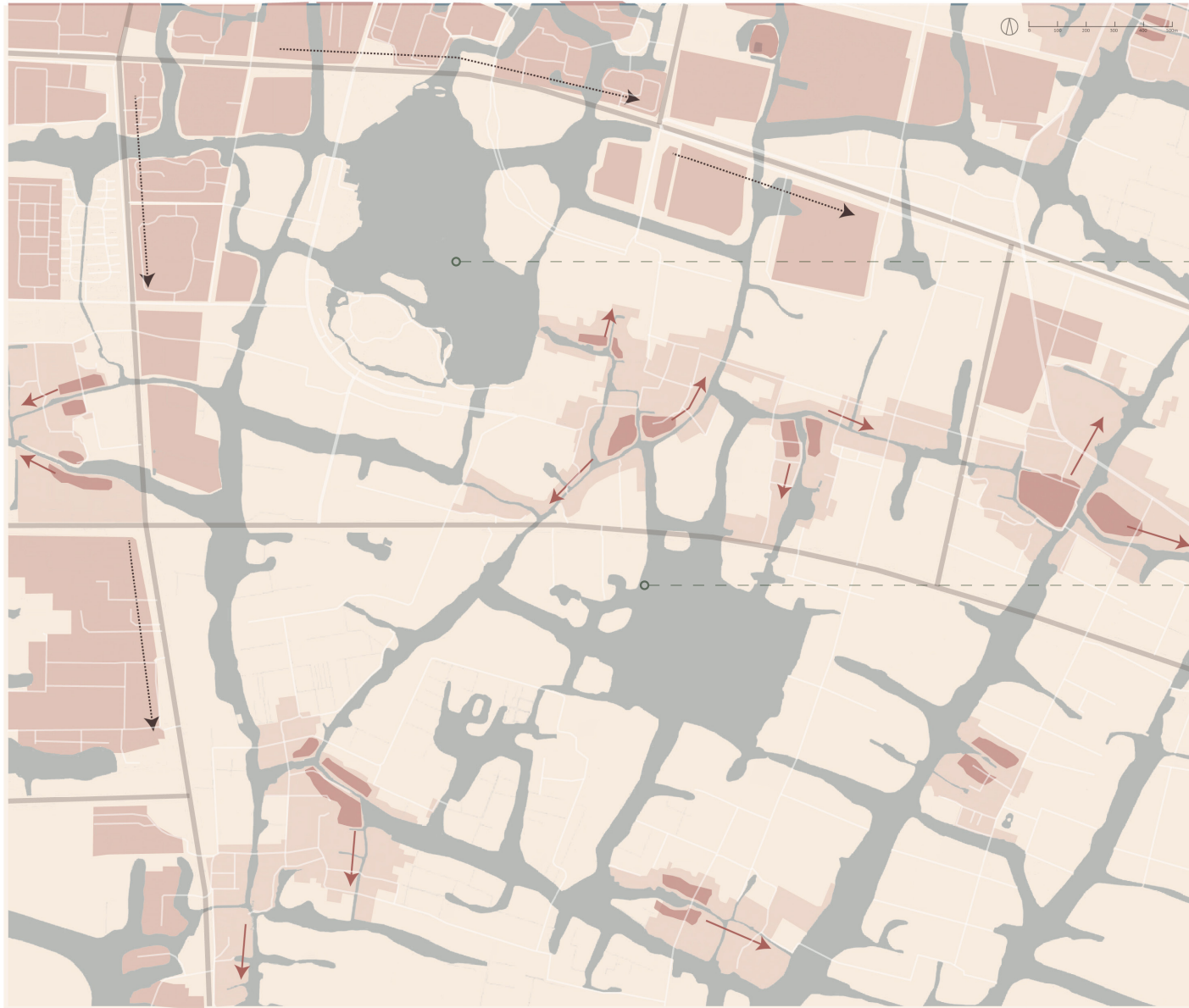
Source: <https://www.e0575.cn/read.php?id=558119>

VILLAGES LACK OF GREEN

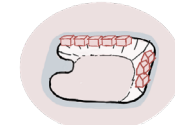


Source: <https://baike.baidu.com/item/%E5%88%99%E6%B0%B4%E7%89%8C%E6%9D%91>

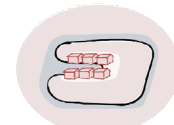
SITE ANALYSIS | 3/5 BUILDING BLOCKS



- past village
- current village
- current city building
- main road
- village development
- city development



living on the edge



living near port



develop along water

YANG JING LAKE



Source: https://www.sohu.com/a/438042105_594400

FIG2.1 natural analysis map

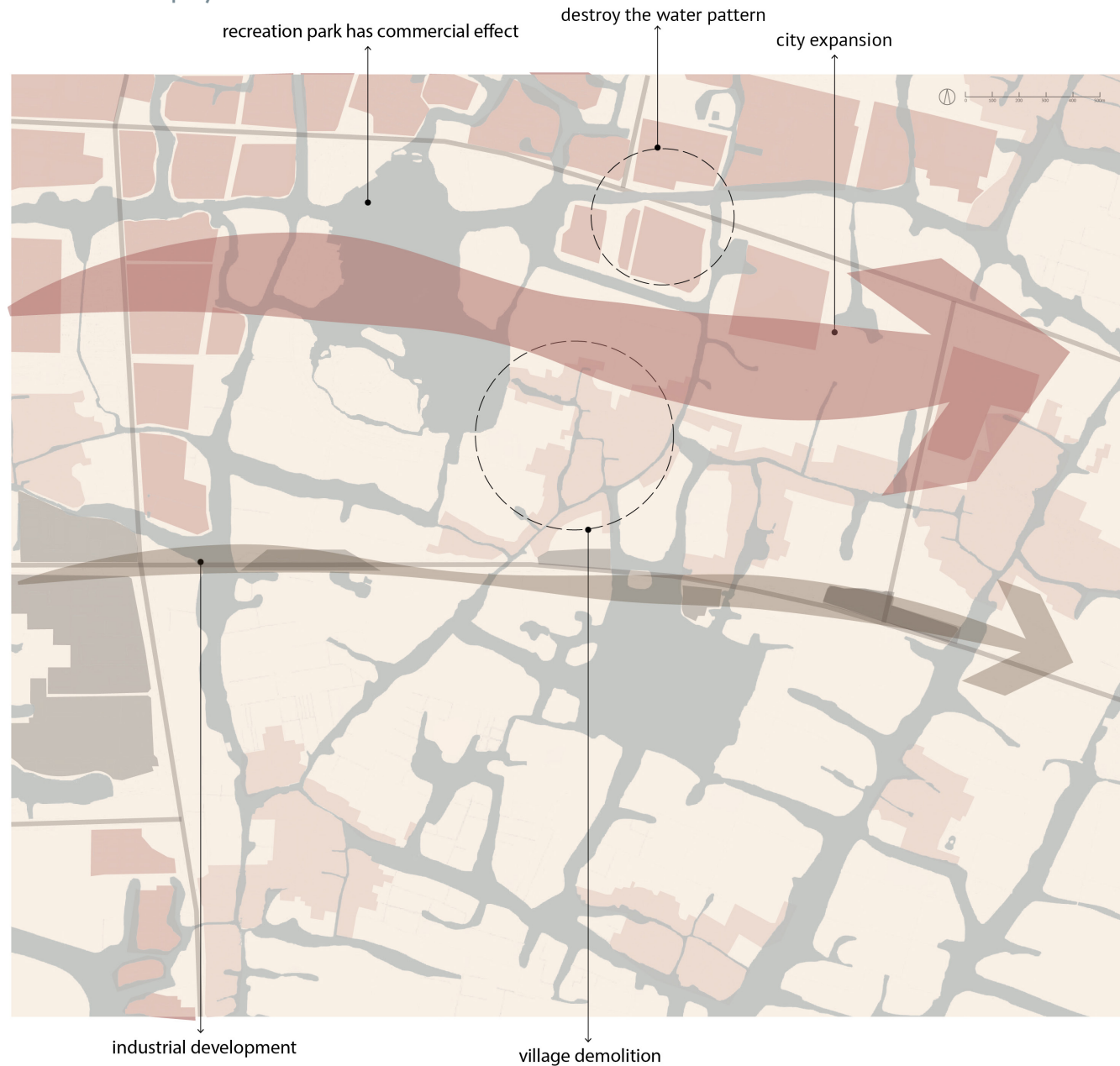
ZEBAN LAKE



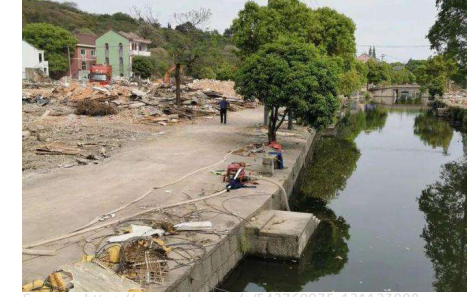
Source: <https://www.e0575.cn/read.php?tid=11465434>

FIG2.1 natural analysis map

SITE ANALYSIS | 3/5 BUILDING BLOCKS



INCREASING HOUSING NEED



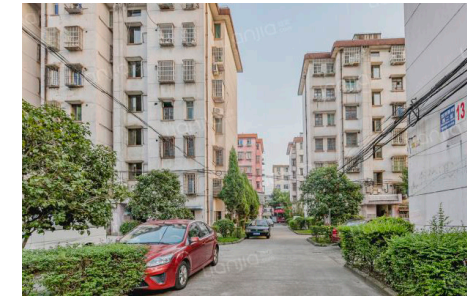
Source: https://www.sohu.com/a/542760975_121123888

INDUSTRIAL AREA BECOME AN INTERFACE BARRIER



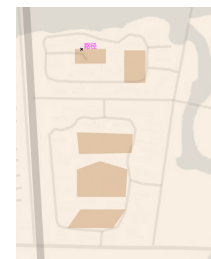
Source: <http://bbs.epday.com/forum.php?mod=viewthread&tid=78344&extra=page=1>

LOST CONNECTION WITH WATER



Source: <https://news.lianjia.com/sx/xiaoqu/8709129761107295.html>

SITE ANALYSIS | 4/5 PUBLIC SPACE



concentrated
keep distance with water



scattered
waterfront

- Bridge
- Park
- Community garden
- Village public space

COMMUNITY PUBLIC SPACE



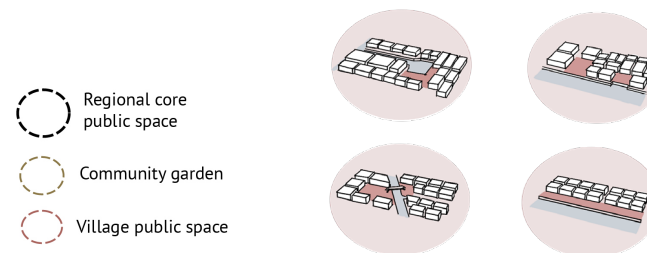
Source: <https://www.photophoto.cn/pic/27866289.html>



PUBLIC SPACE IN THE PAST

Source: https://www.sohu.com/a/438042105_594400

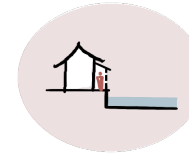
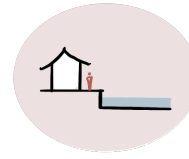
Waterfront public space



SITE ANALYSIS | TRADITIONAL LIVING ENVIRONMENT



WATERFRONT BUILDING

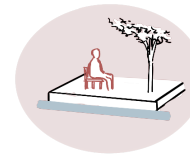


WATERFRONT ACTIVITIES

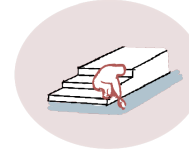
row



relax



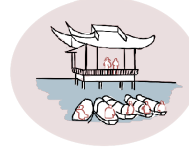
wash



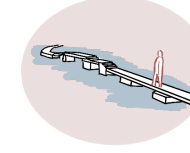
market



water stage



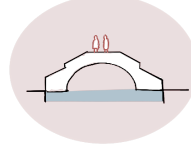
wander



dinning



meeting



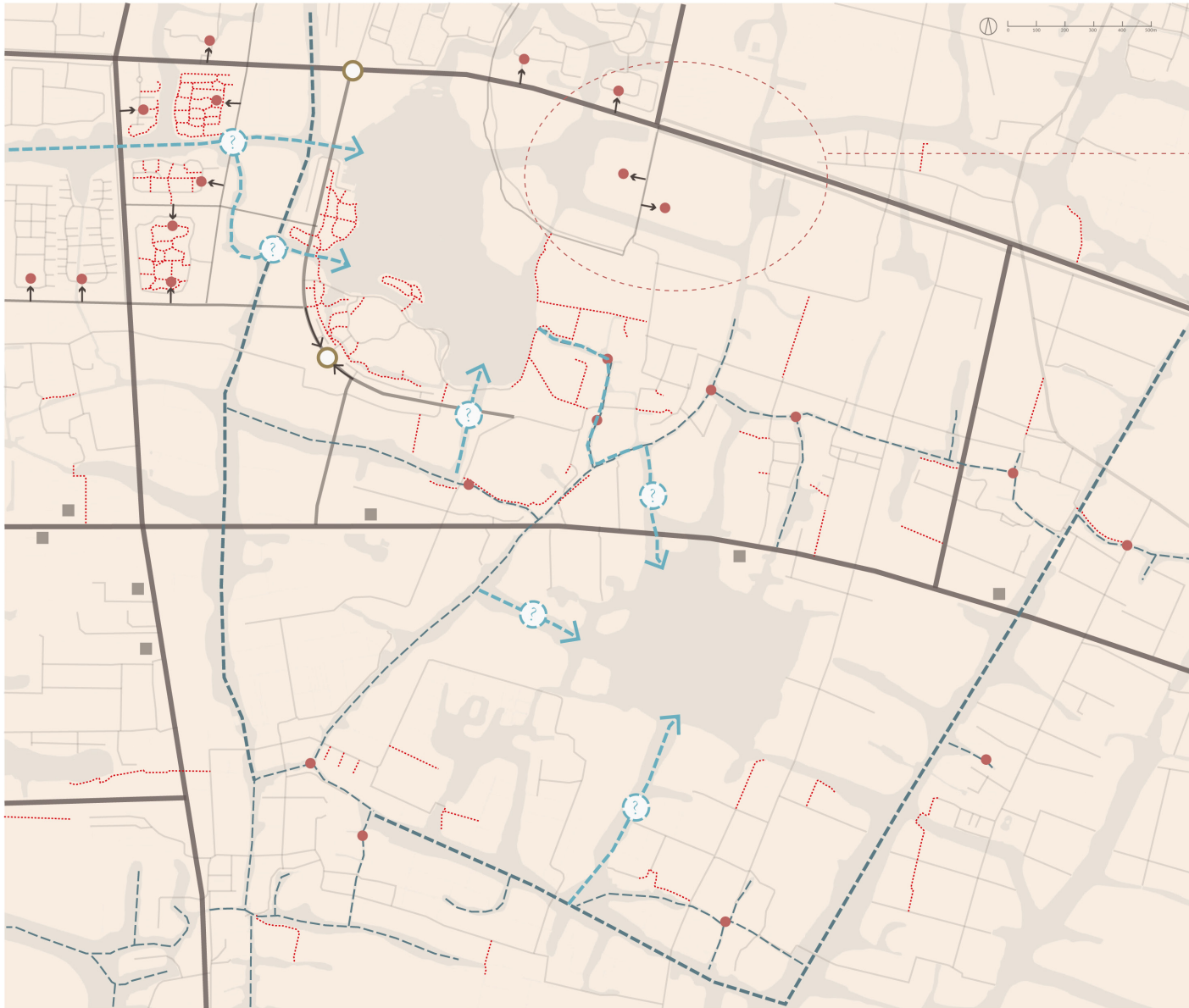
Source1: <https://baijiahao.baidu.com/s?id=1732973014209471036&wfr=spider&for=pc>

Source2: <https://baijiahao.baidu.com/s?id=1697555040175589415&wfr=spider&for=pc>

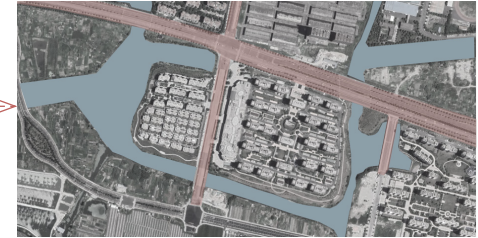
Source3: <https://www.meipian.cn/23h98bqb>

Source4: <https://www.meipian.cn/19qzlyib>

SITE ANALYSIS | 5/5 TRANSPORTATION



NEW TRANSPORT DEVELOPMENT DEMAND DESTROY THE WATER STRUCTURE



Source: Google Earth

ROADS REPLACED THE WATERWAY



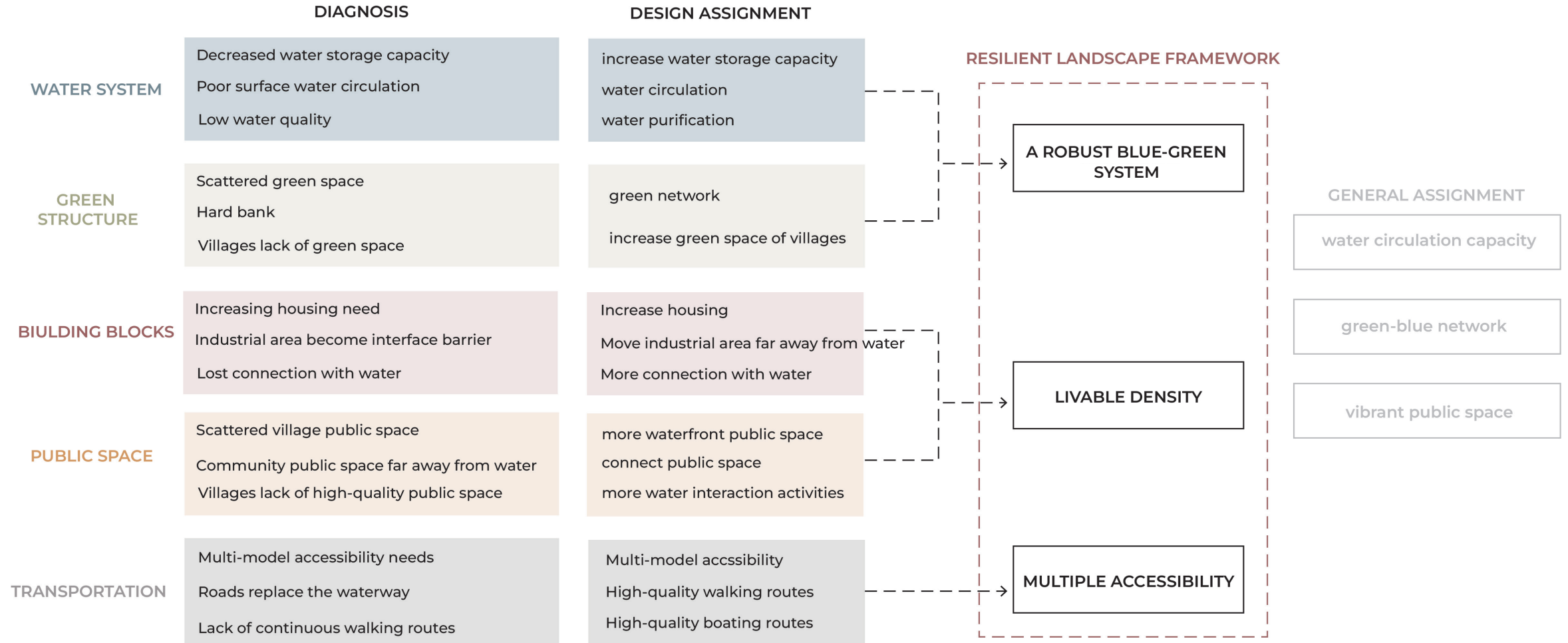
Source: Jing Hu. (n.d.). Shaoxing Jing Hu Wetland Park Masterplan.

LACK OF HIGH-QUALITY SLOW ROUTE



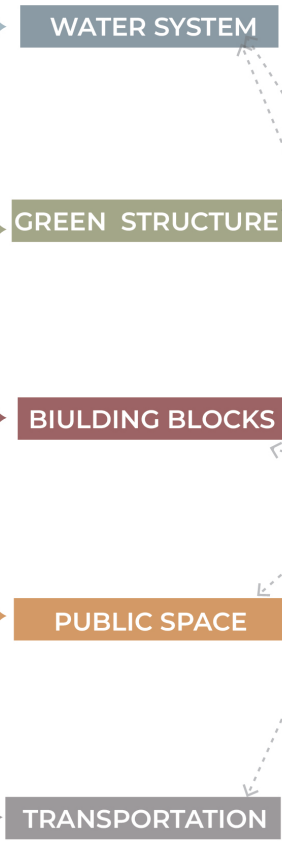
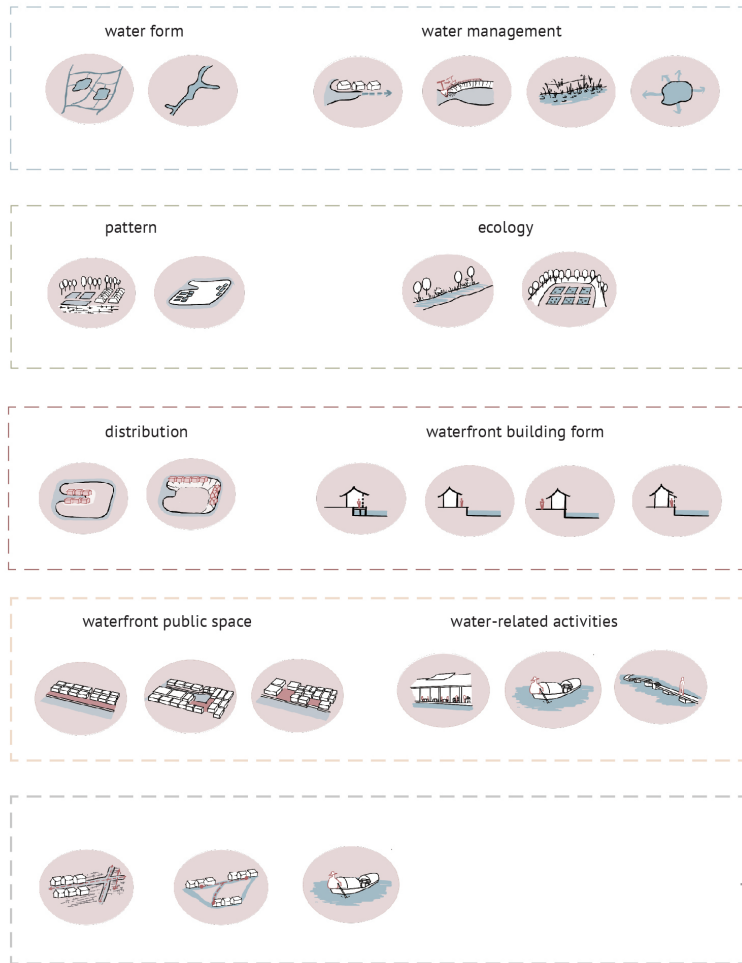
Source: <https://baijiahao.baidu.com/s?id=1685476905239126121&wfr=spider&for=pc>

DIAGNOSIS

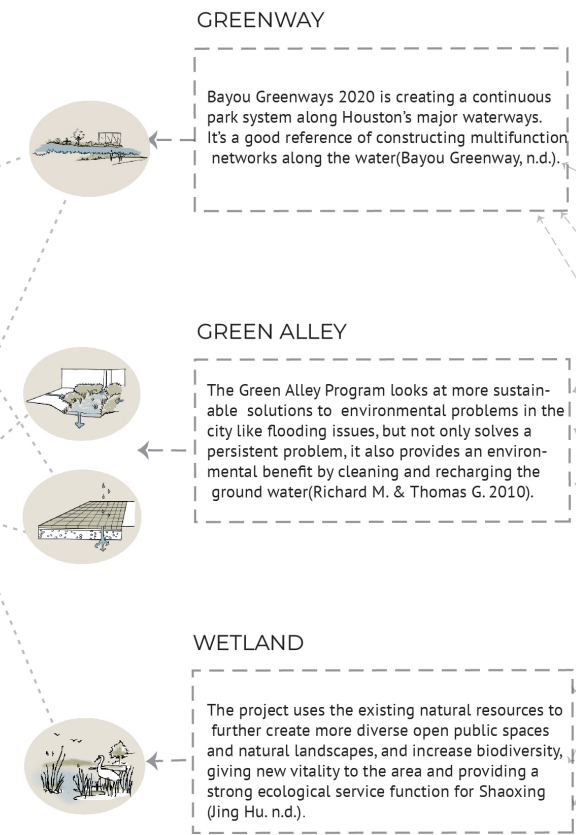


CONCLUSION

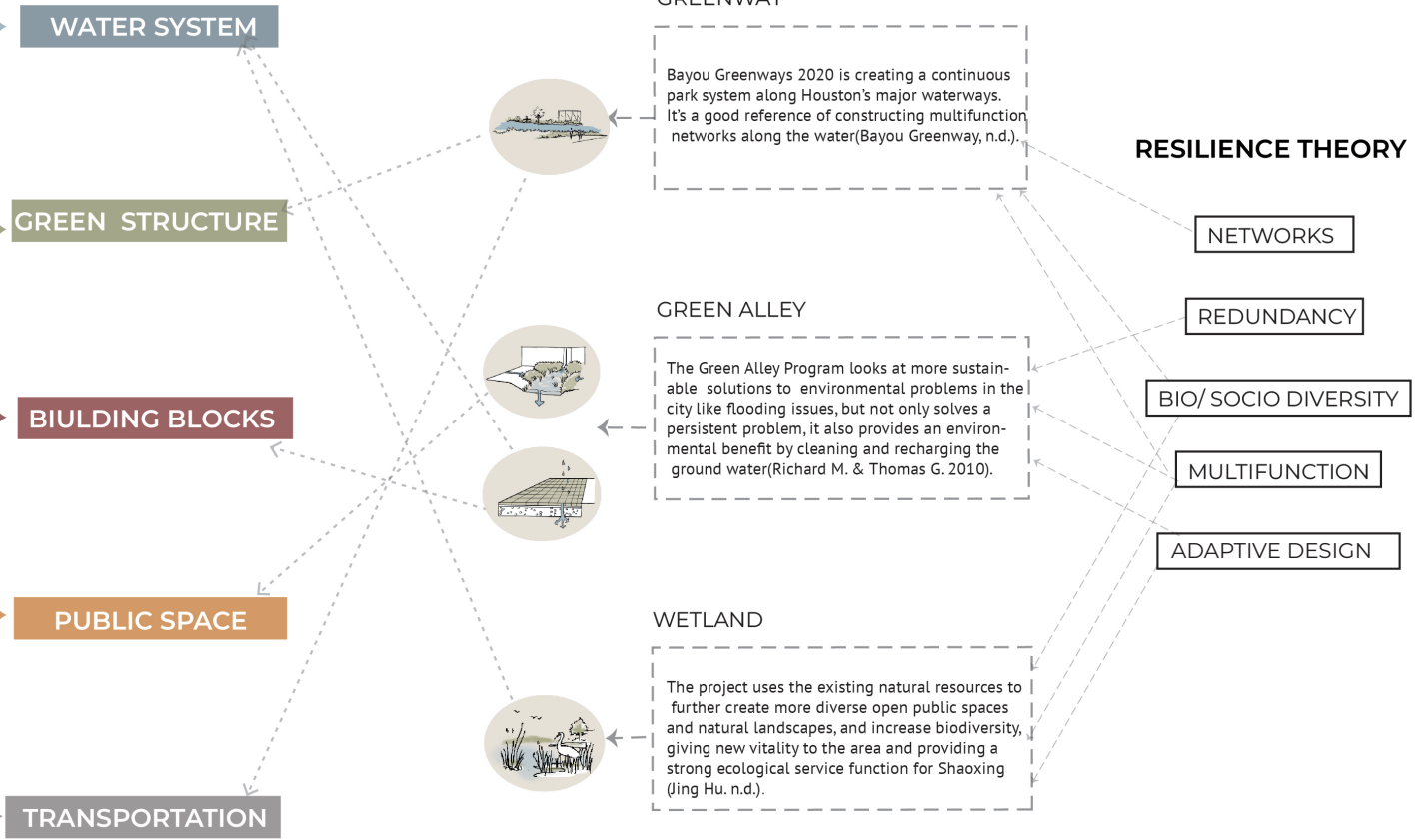
POLDER GRAMMAR



CASE STUDY



RESILIENCE THEORY



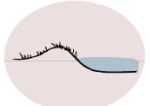
DESIGN PRINCIPLES

WATER SYSTEM

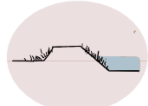
Water structure form



irregular shape

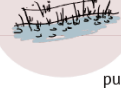
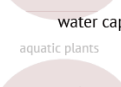
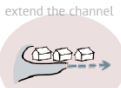


natural embankment



Water management

systemetic network



enhance dike



lake



pond

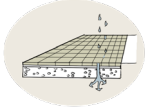


rain garden



bioswale

permeable pavement



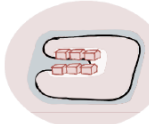
BUILDING BLOCKS

Distribution of settlements

living on higher edge



living near ports

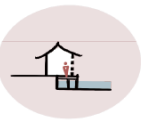
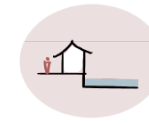
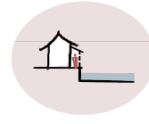
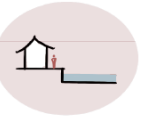


Development of settlements

develop along water



Relationship between building blocks & water



GREEN STRUCTURE

Pattern

fish pond near the canal



biodiverse agriculture

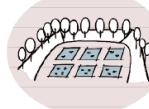


Ecosystem

local species



fish-orchard ecosystem



wetlands



green roof



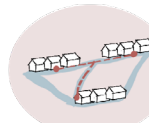
green courtyard



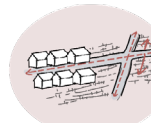
greenway



TRANSPORTATION



waterway connects waterway-based functional places

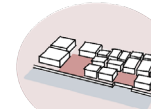


network

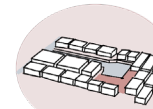


high-quality walking routes along water

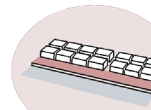
PUBLIC SPACE



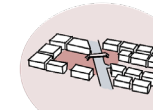
waterfront square



square around port



waterfront street



square near bridge



trade

waterfront activities

row



relax



wash



market



water stage



wander



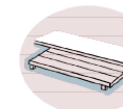
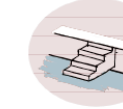
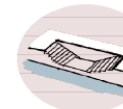
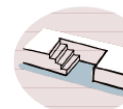
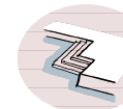
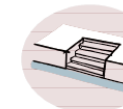
dinning



social



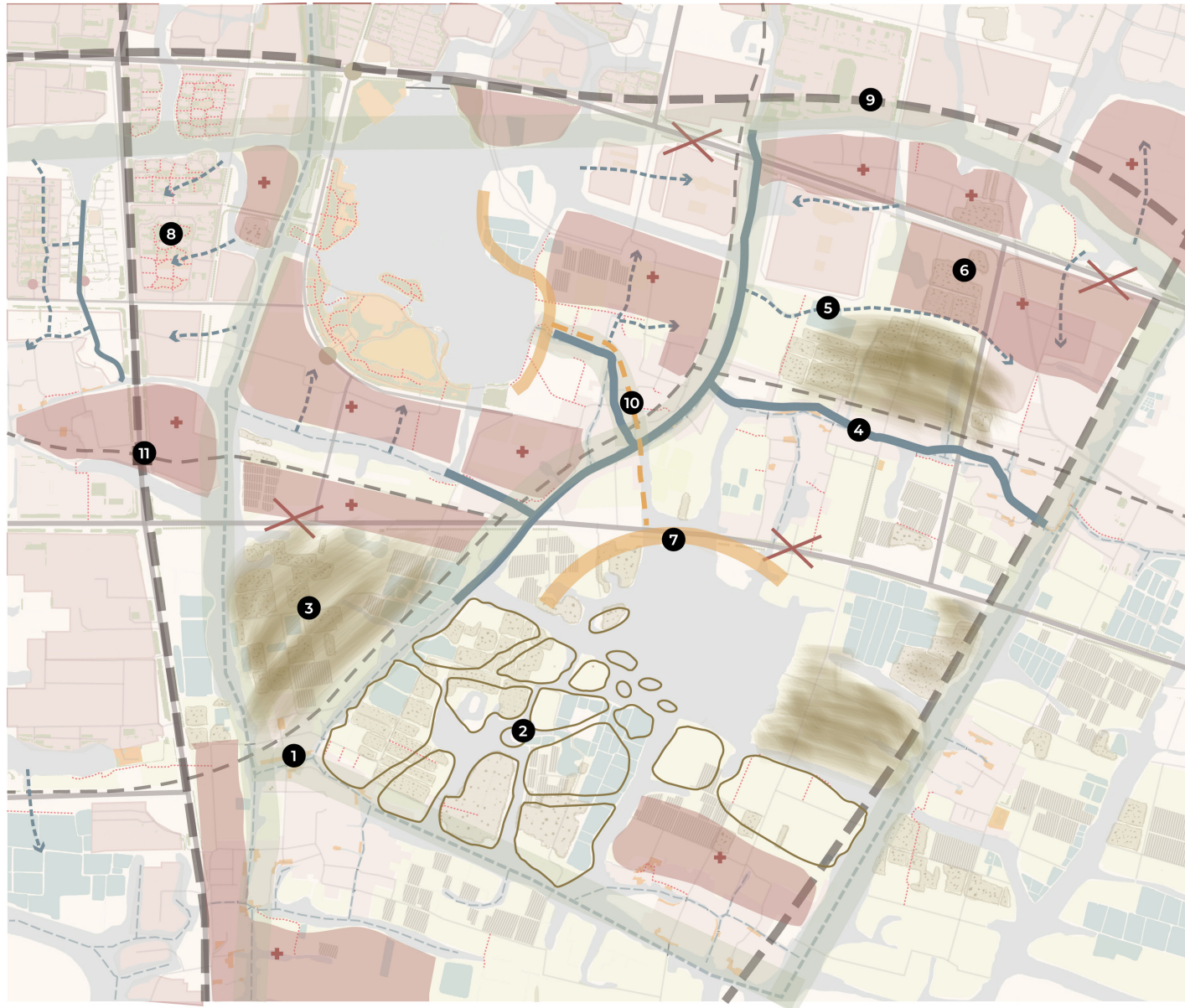
diverse interface



05 DESIGN EXPLORATION

- HOW TO APPLY THE DESIGN PRINCIPLES IN TWO-LAKE AREA -

SPATIAL STRATEGY



A ROBUST BLUE -GREEN SYSTEM

- ① build green corridor
- ② transform the lake to wetland
- ③ expand woods area
- ④ increase channel capacity
- ⑤ divert water to the community

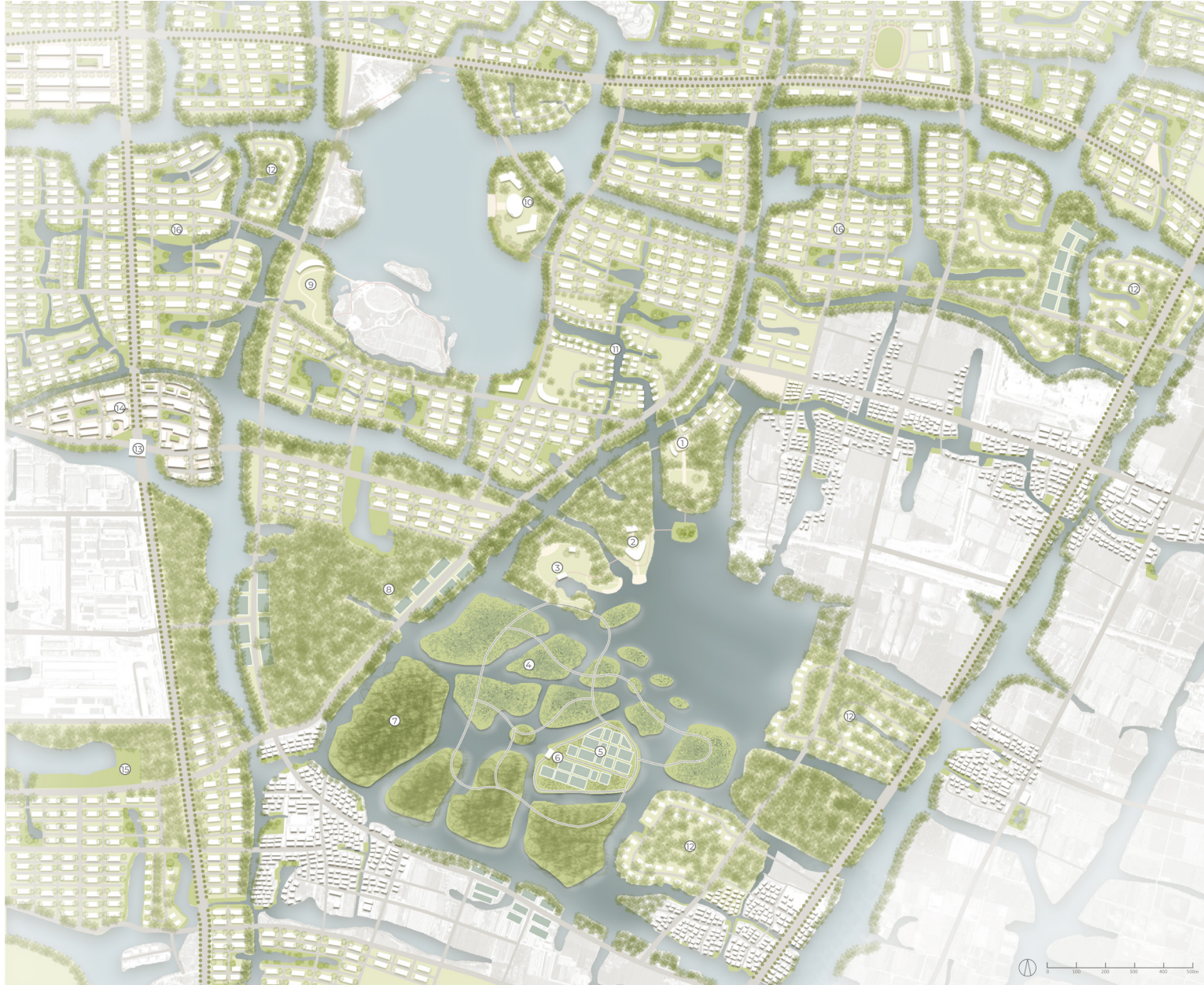
LIVABLE DENSITY

- ⑥ increase housing
- ⑦ increase waterfront public space
- ⑧ improve community public space

MULTIPLE ACCESSIBILITY

- ⑨ road redesign
- ⑩ connect public space
- ⑪ mutiple routes design

GENERAL PLAN TOWARD LANDSCAPE FRAMEWORK



- ① Wetland park entrance square
 - ② Wetland park visitor center
 - ③ Wetland park port
 - ④ Wetland area
 - ⑤ Educational fish-pond reserve
 - ⑥ Wetland education center
 - ⑦ Forest reserve area
 - ⑧ Ecological agriculture
 - ⑨ City park entrance, sport area
 - ⑩ Recreation center
 - ⑪ Commercial water town
 - ⑫ Ecological community
 - ⑬ Transportation hub
 - ⑭ Central business district
 - ⑮ Community park
 - ⑯ Residential Community
-
- City main road
 - Secondary road
 - Tertiary road
 - Neighborhood road



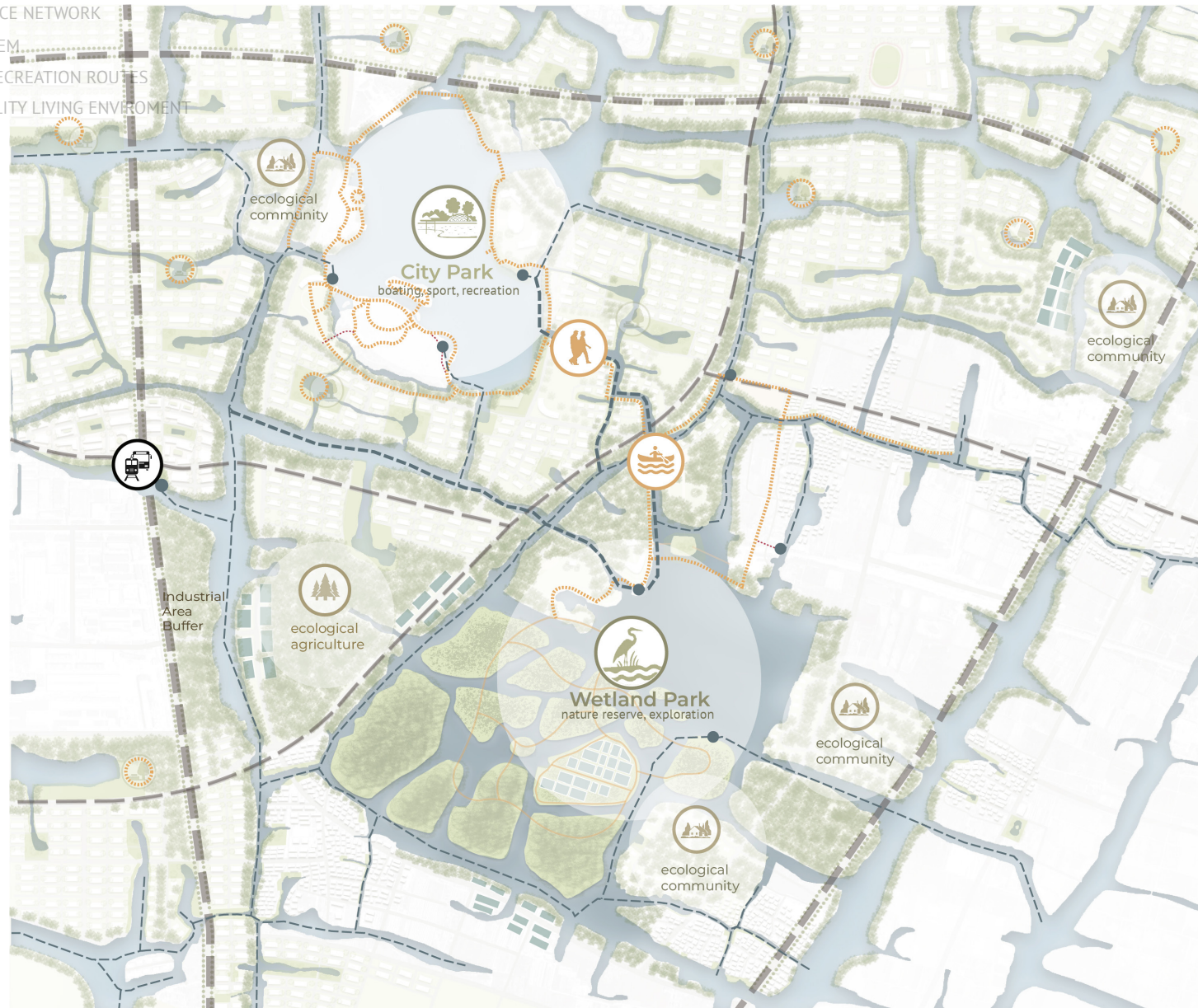
RESILIENT LANDSCAPE FRAMEWORK

GREEN SPACE NETWORK

PARK SYSTEM

DIVERSE RECREATION ROUTES

HIGH-QUALITY LIVING ENVIRONMENT



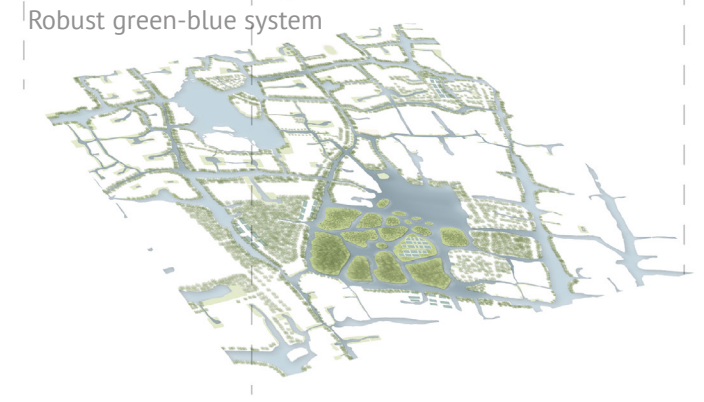
Multiple-accessibility



Livable density



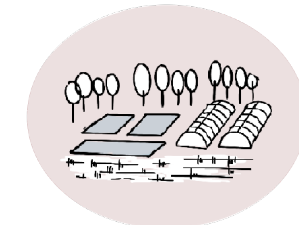
Robust green-blue system



RESILIENT LANDSCAPE FRAMEWORK | A ROBUST BLUE-GREEN SYSTEM



KEEP THE BASIS PATTERN



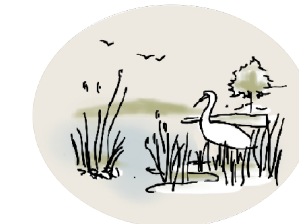
biodiverse pattern

CREATE MULTI-SCALE NETWORK



build green network along water

DEVELOP THE POTENTIALS OF LAGOON

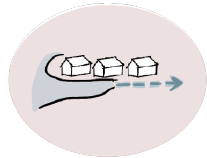


wetland

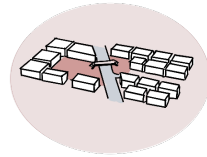
RESILIENT LANDSCAPE FRAMEWORK | LIVABLE DENSITY

SOCIAL DIVERSE HOUSING HIGH-QUALITY WATERFRONT PUBLIC SPACE

middle-rise community reference: <https://www.cgmodel.com/model/220362>

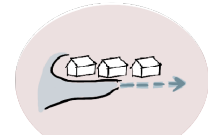


extend the canal along the settlement

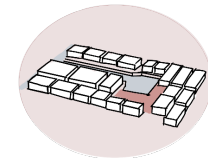


square near bridge

low density ecological community reference: <https://www.pena-architecture.com/wp-content/gallery/eco-villas/eco-005.jpghtml>



extend the canal along the settlement

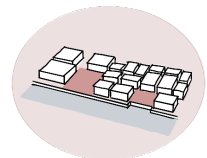


square around port

dense village reference: <https://a.app.qq.com/o/simple>

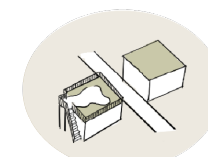


plants along water

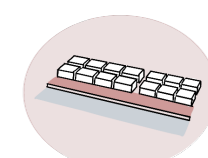


pocket public space

high-rise mix-used area reference: <https://www.designboom.com/architecture/oda-new-york-bayshore-proposal-lakeshore-toronto-03-17-2016/htmlhtml>

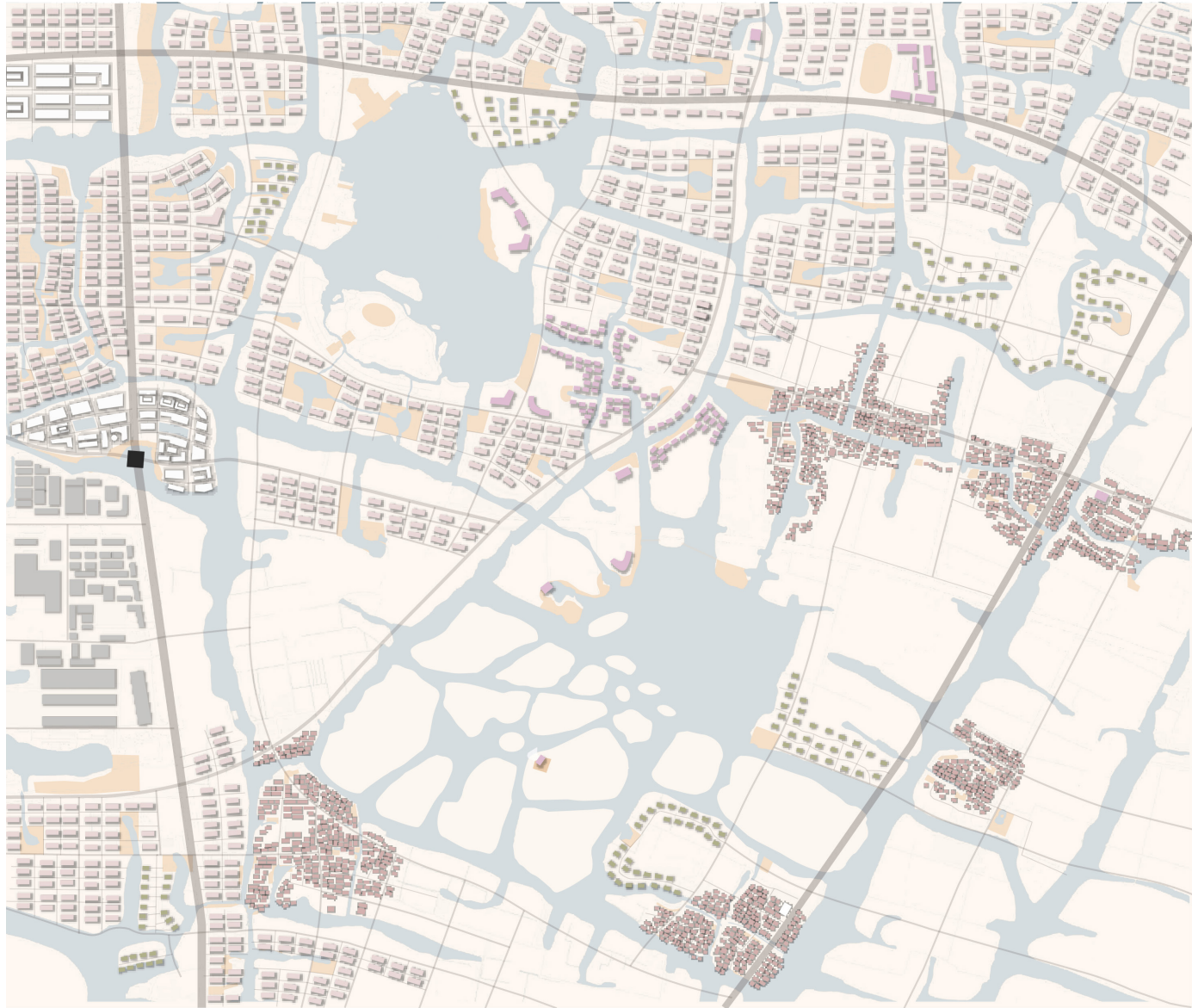


green roof

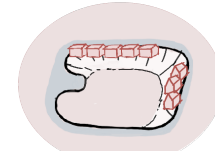


street along water

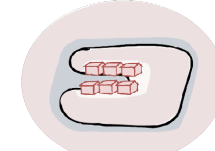
RESILIENT LANDSCAPE FRAMEWORK | LIVABLE DENSITY



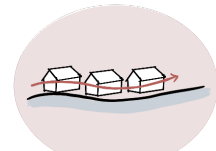
BUILDING BLOCKS



living on higher edge

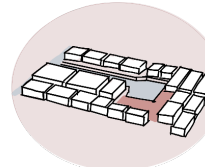


living near ports

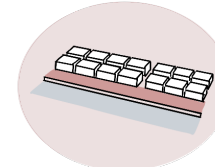


develop along water

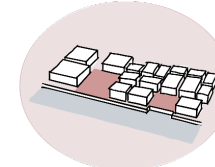
PUBLIC SPACE



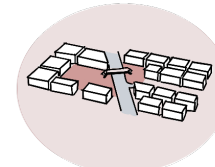
square around port



street along water



pocket waterfront square



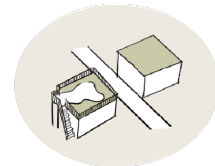
square near bridge

- Transition hub
- Dense village
- Mix-used building
- Mid-rise building
- Low-rise building
- Culture & Recreation
- Industrail building
- Public space

GREEN SPACE



green courtyard



green roof

RESILIENT LANDSCAPE FRAMEWORK | 2/3 LIVABLE DENSITY

mid-rise community plot ratio: 1.5 %



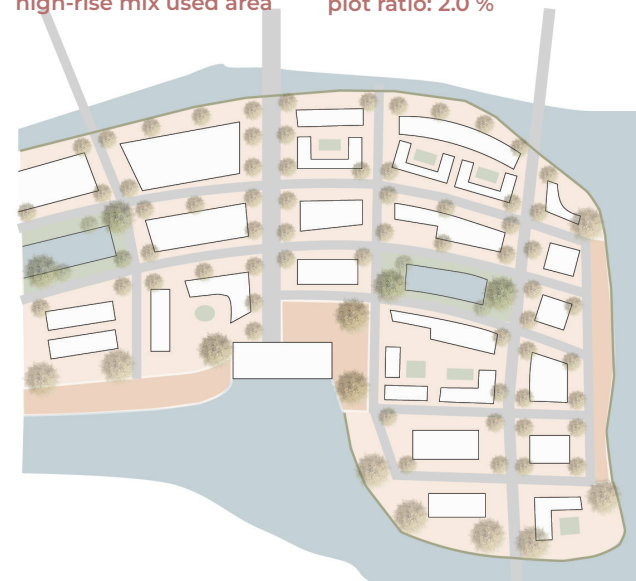
low density ecological community plot ratio: 0.5 %



dense village plot ratio: 1.2 %

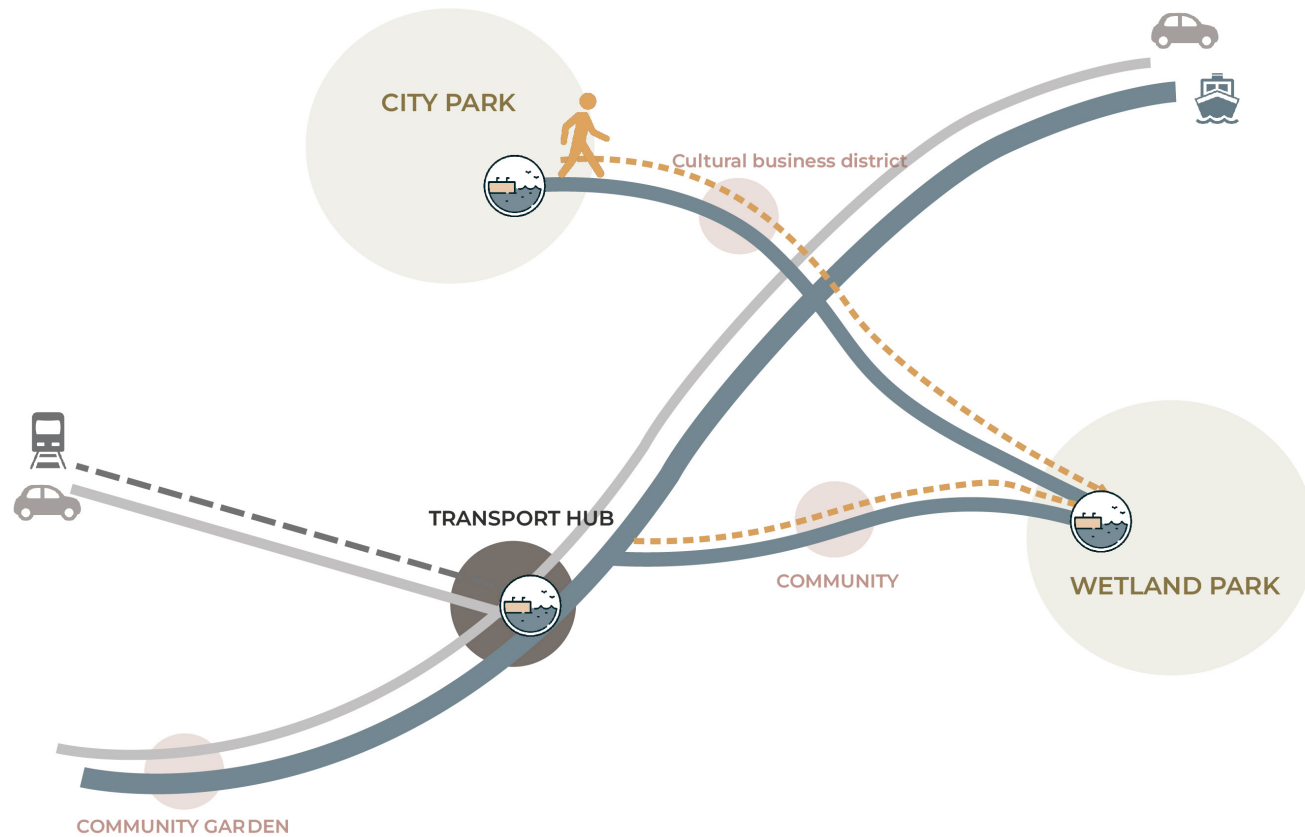


high-rise mix used area plot ratio: 2.0 %



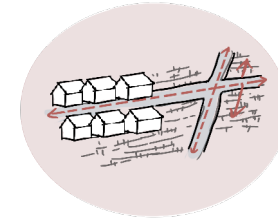
RESILIENT LANDSCAPE FRAMEWORK | 3/3 MULTIPLE ACCESSIBILITY

Multiple accessibility means there are both high-speed route and high-quality slow travel routes to meet economic development and recreation needs.

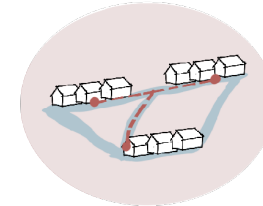


WATER-BASED TRANSPORT

Waterway-based transportation network



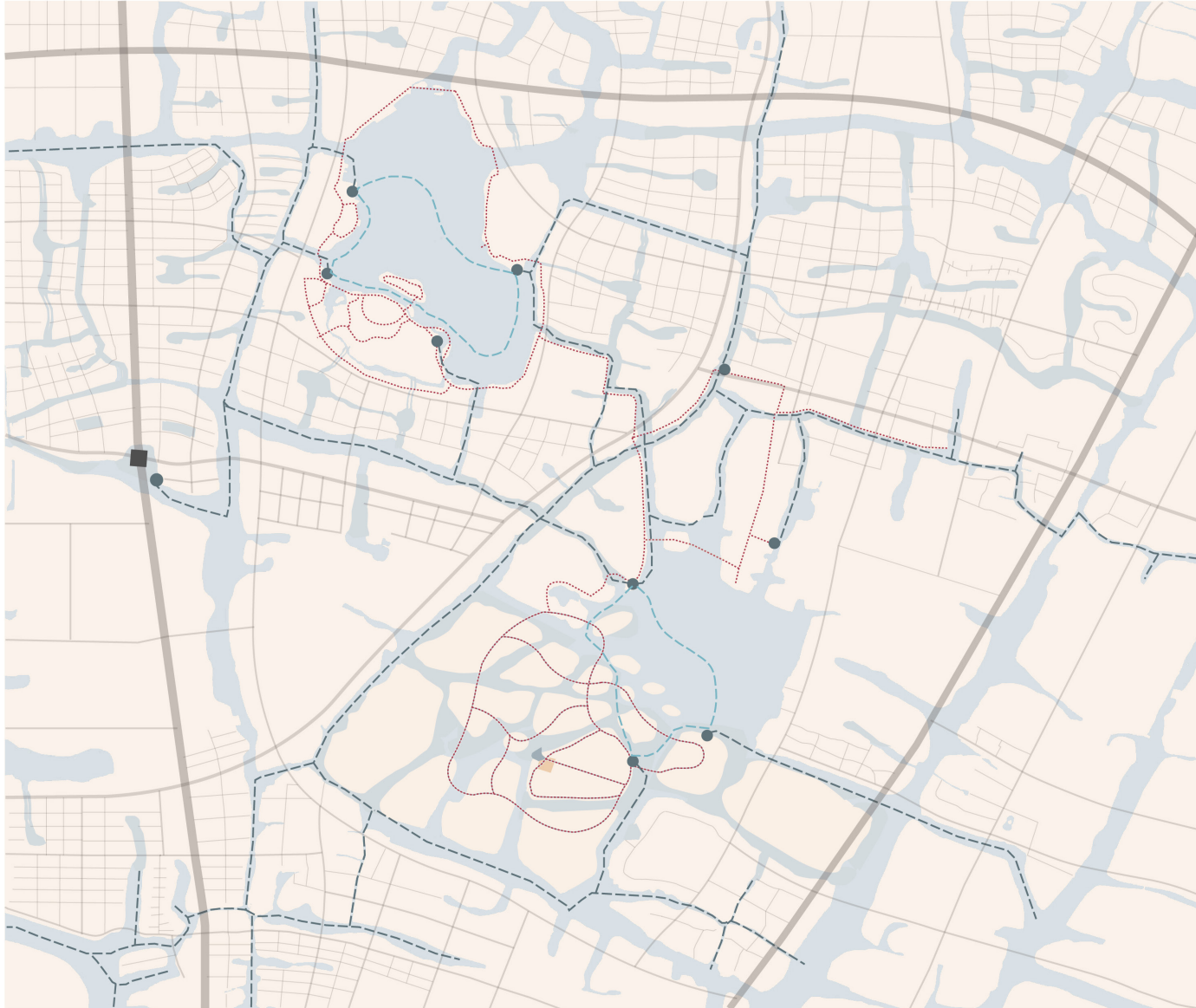
waterway connect functional places



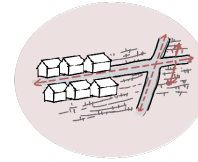
high-quality walking routes along water



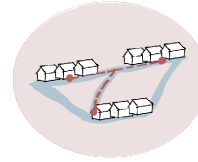
RESILIENT LANDSCAPE FRAMEWORK | MULTIPLE ACCESSIBILITY



Waterway-based transportation network



waterway connect functional places

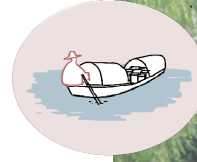


high-quality walking routes along water



- Pier
- Transport hub
- City main road
- Region main road
- Secondary road
- Community road
- Walking route
- - - Rowing route
- - - Boat route

boating as the main transport way

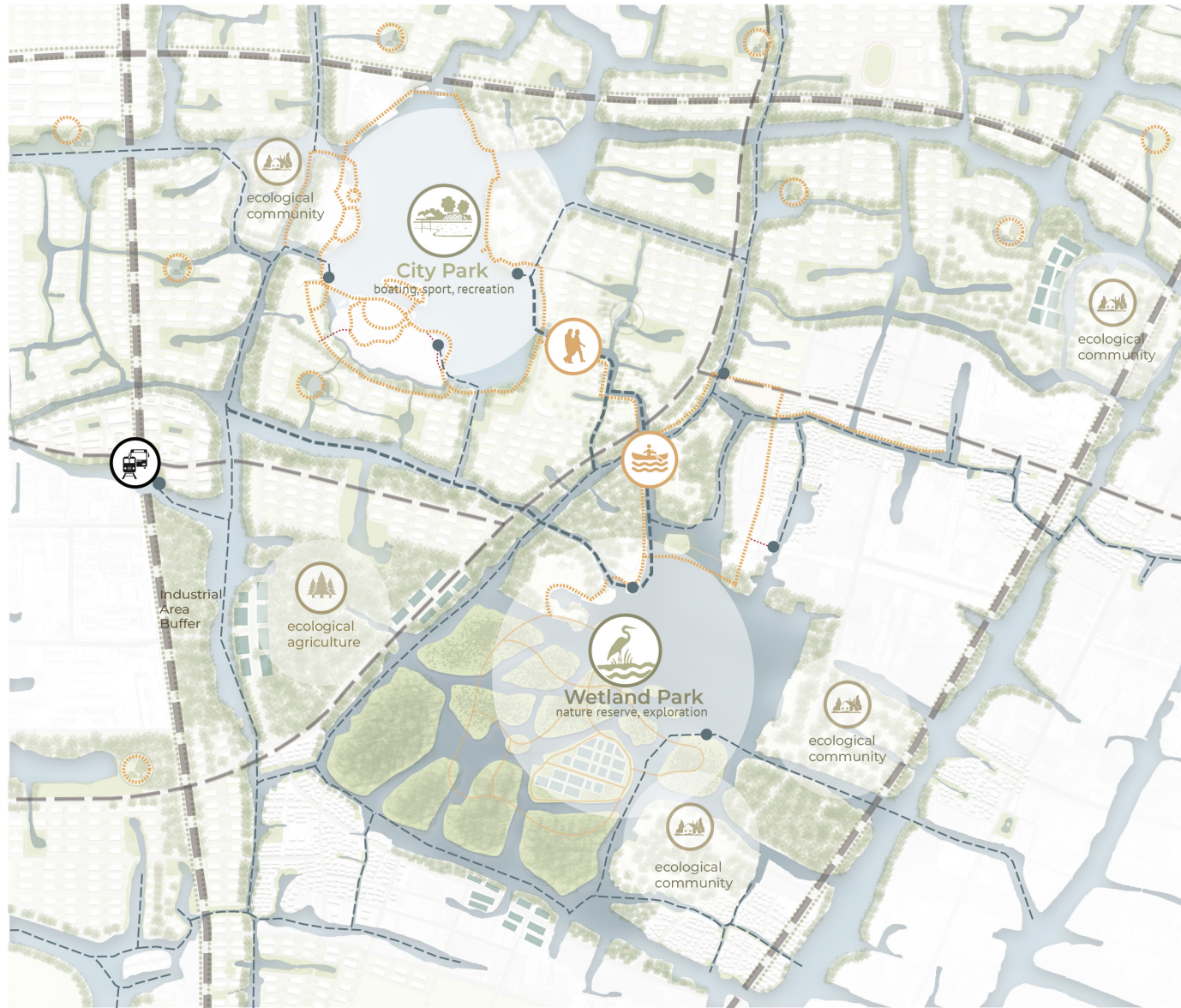


WU PENG BOAT

乌篷船

Source: https://www.sohu.com/a/481953622_121106832

RESILIENT LANDSCAPE FRAMEWORK



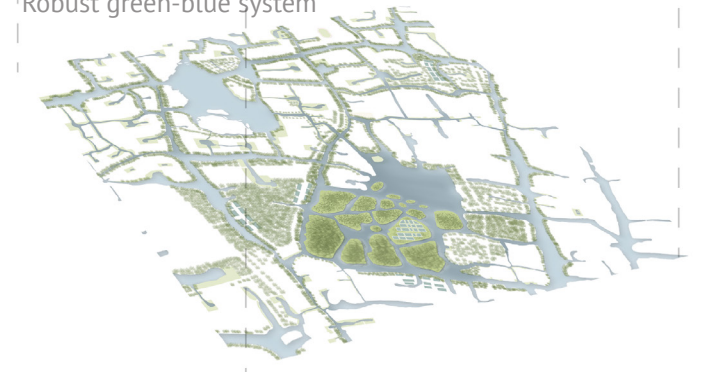
Multiple-accessibility



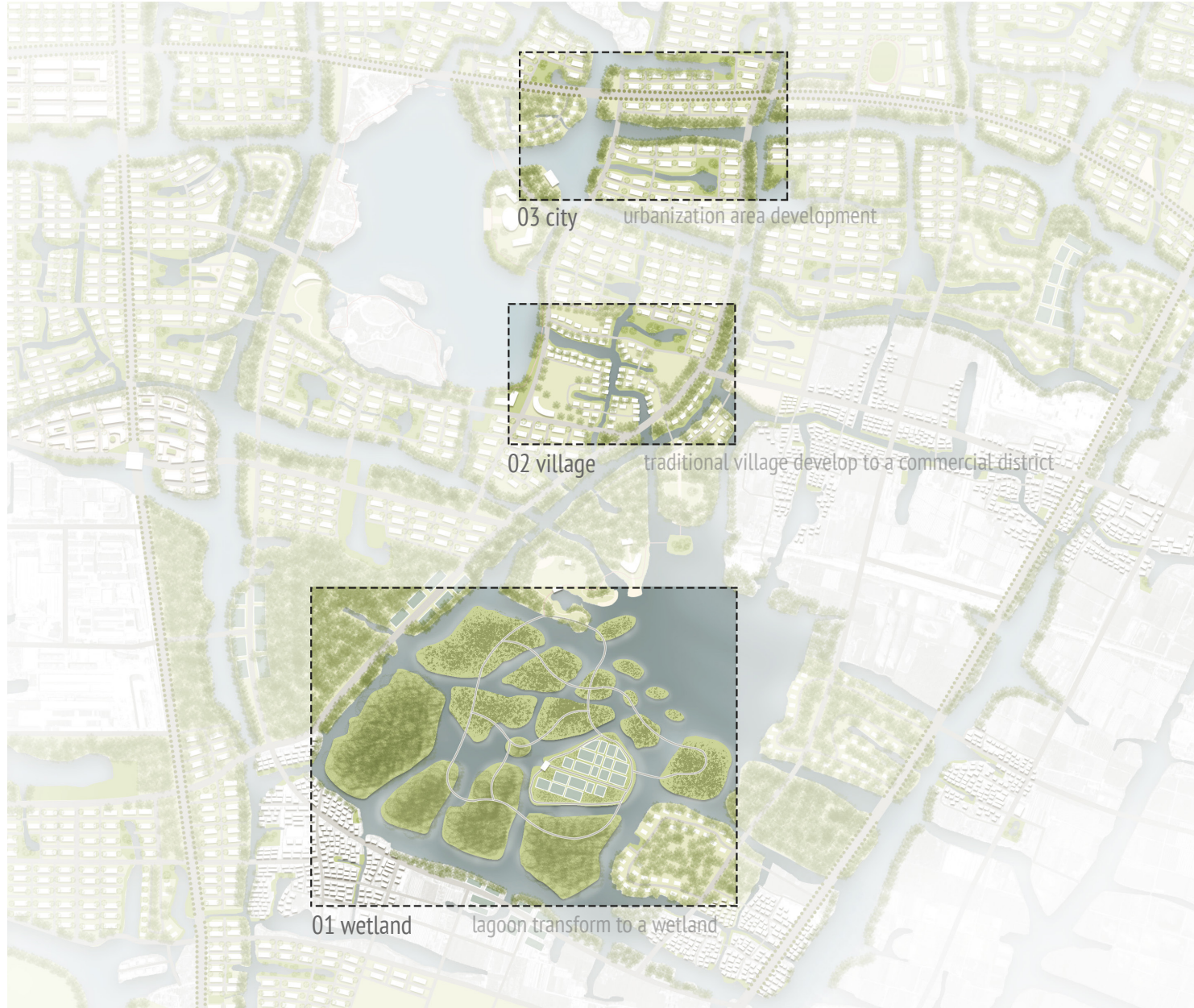
Livable density



Robust green-blue system



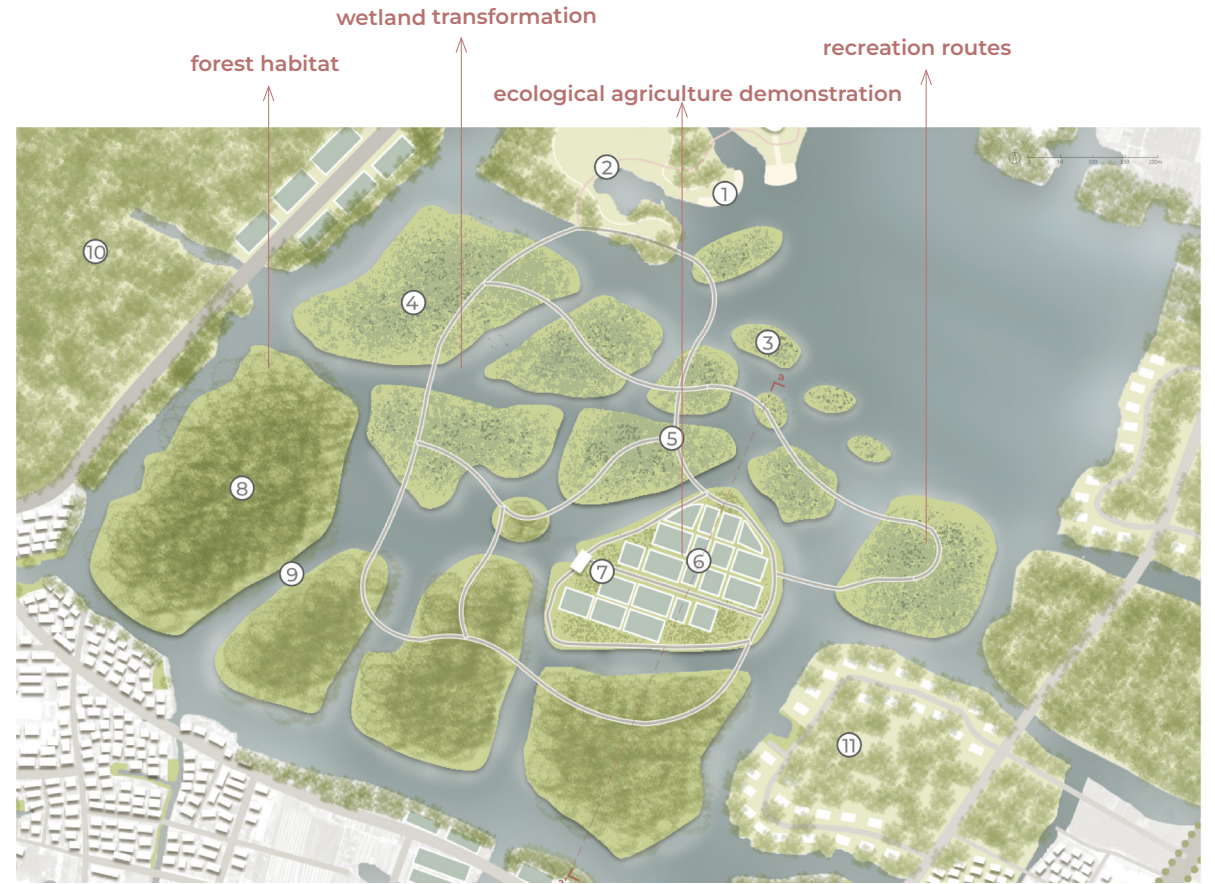
THREE LOCAL IMPLEMENTATION EXAMPLES



EXAMPLE 1/3 | DEVELOP A WETLAND



FIG5.14 Current situation of Banze Lake (from Google Earth)



- | | | |
|------------------|---------------------------------|-------------------------------|
| ① Boat dock | ④ Wetland plant beds | ⑦ Wetland exploration center |
| ② Wetland port | ⑤ Walking path | ⑧ Wetland forest |
| ③ Habitat island | ⑥ Educational fish-pond reserve | ⑨ Wetland creek |
| | | ⑩ Ecological agriculture area |
| | | ⑪ Ecological community |

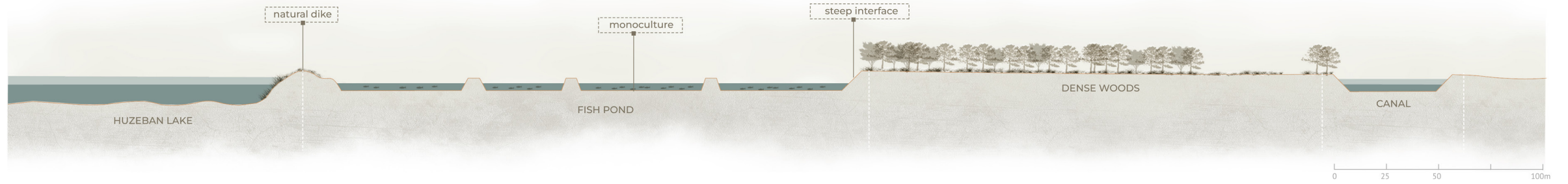
EXAMPLE 1/3 WETLAND| LOCAL IMPLEMENTATION

WATER SYSTEM

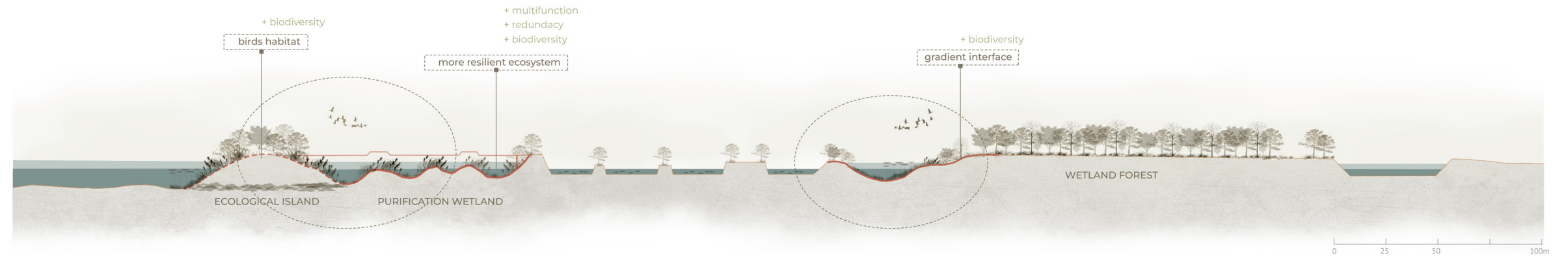
GREEN STRUCTURE

contextualize the wetland to polder landscape

CURRENT SITUATION

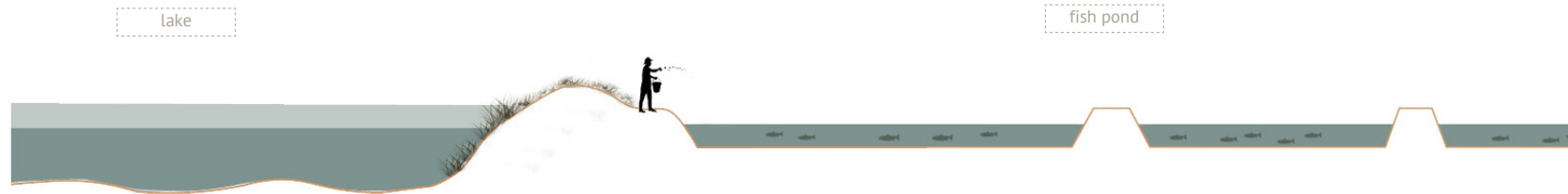


DESIGN PROPOSAL

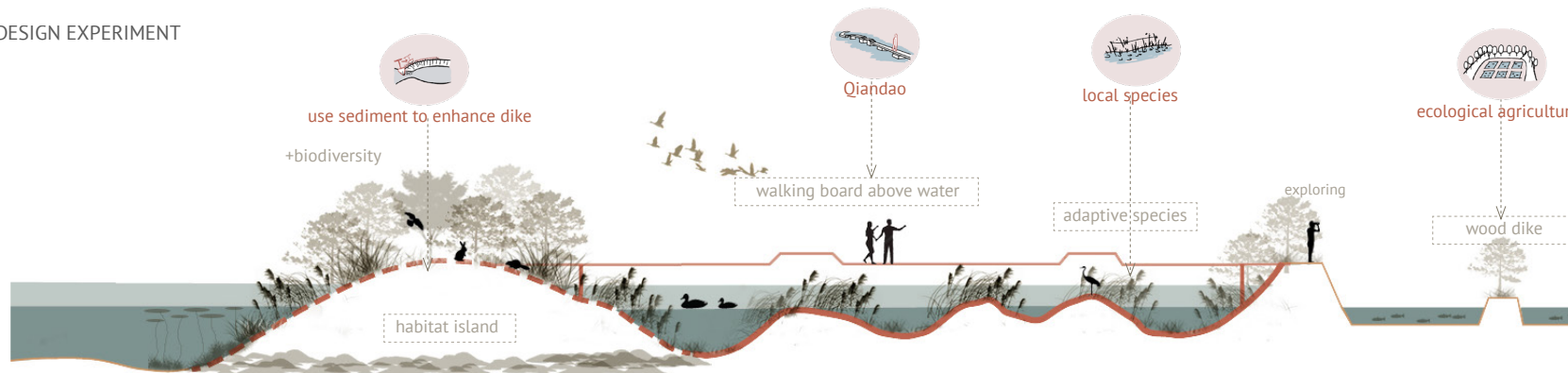


EXAMPLE 1/3 WETLAND| APPLYING POLDER GRAMMAR TO CREATE WETLAND

CURRENT SITUATION



DESIGN EXPERIMENT

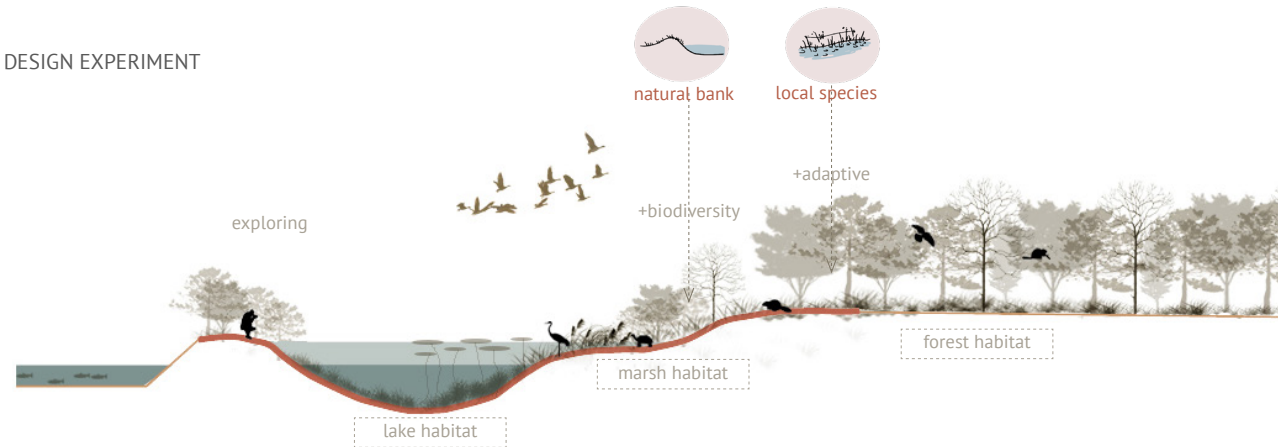


EXAMPLE 1/3 WETLAND| APPLYING POLDER GRAMMAR TO CREATE GRADIENT

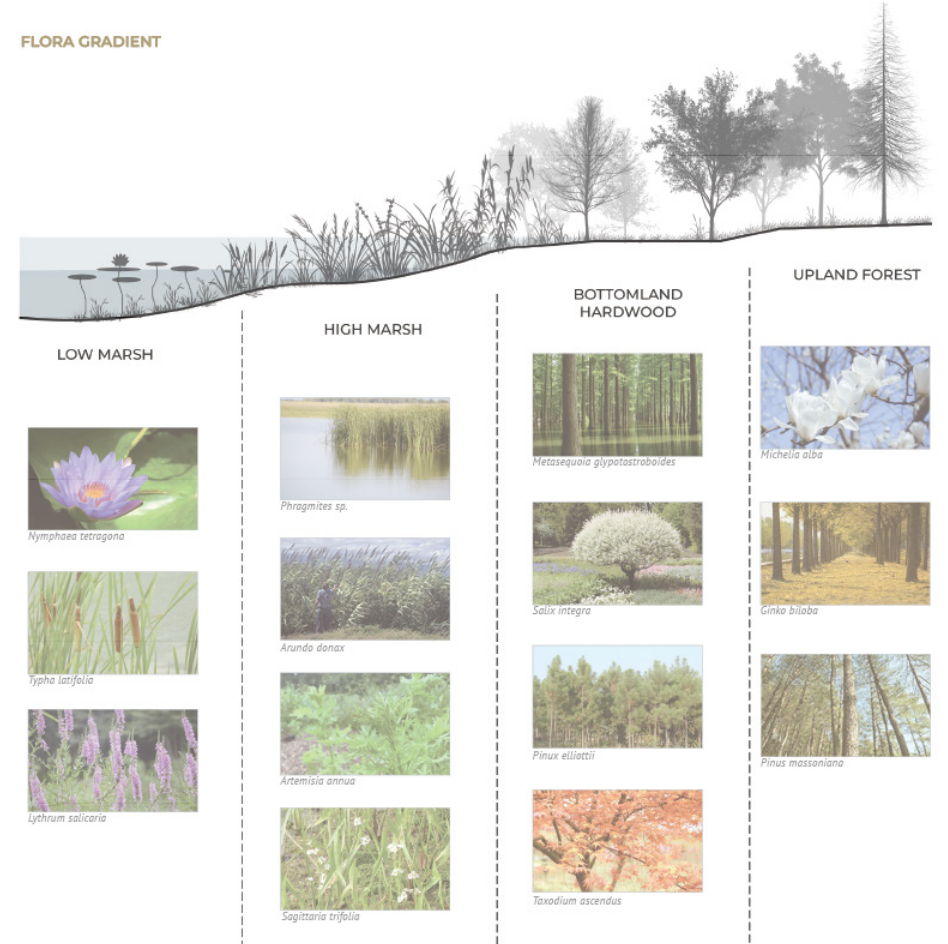
CURRENT SITUATION



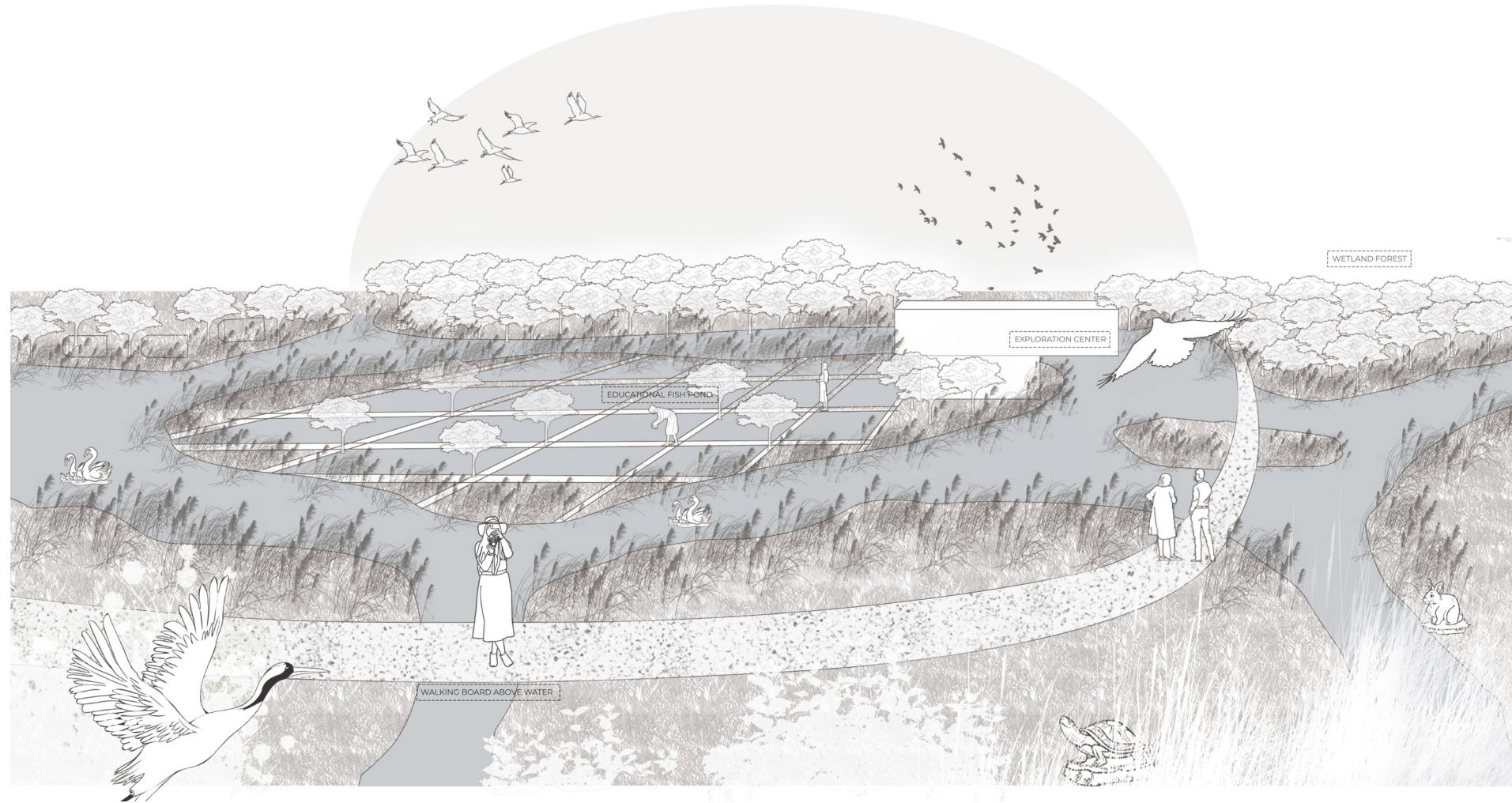
DESIGN EXPERIMENT



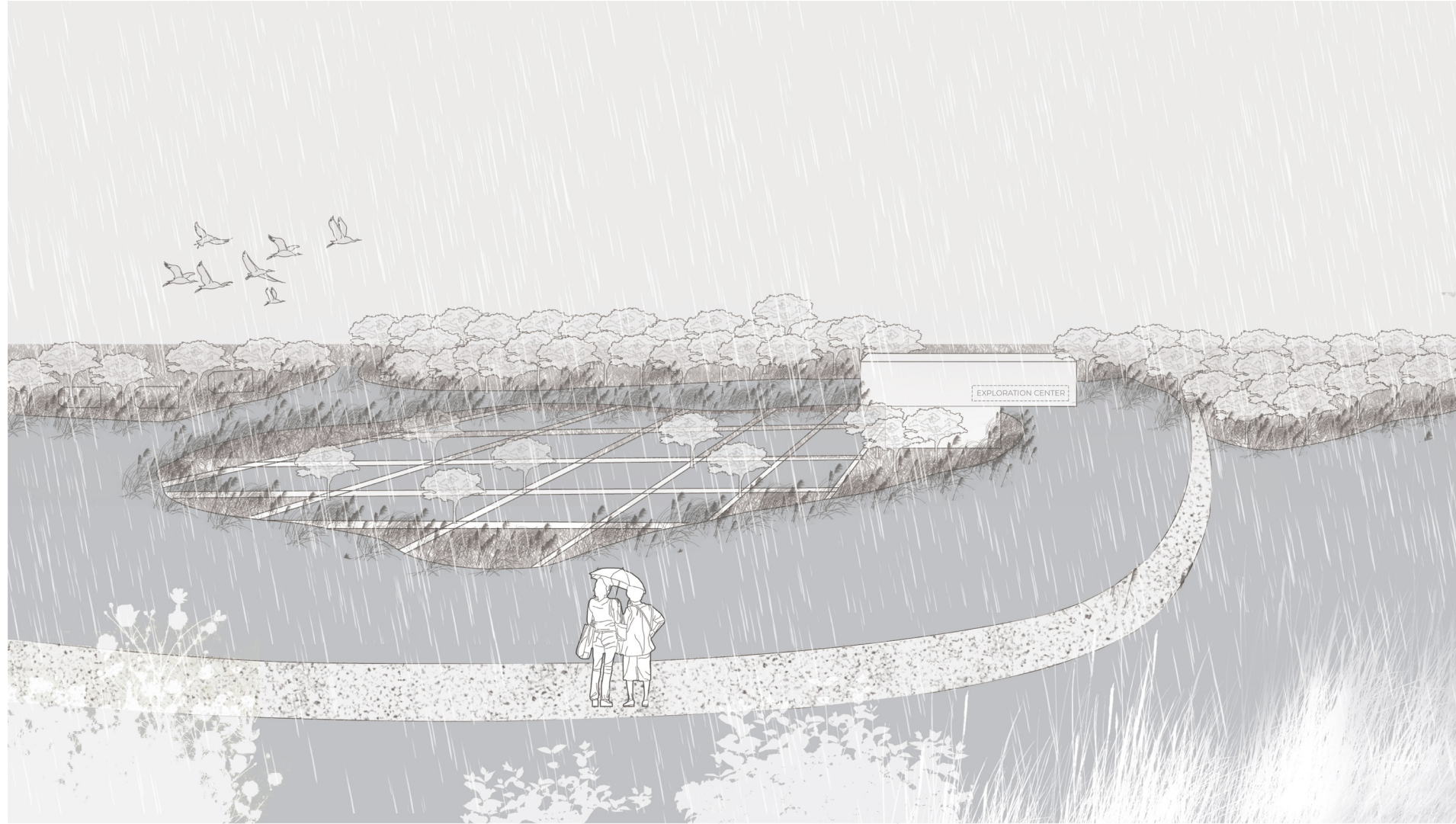
FLORA GRADIENT



EXAMPLE 1/3 WETLAND| DRY SEASON



EXAMPLE 1/3 WETLAND| RAIN SEASON



EXAMPLE 2/3 | TRADITIONAL VILLAGE DEVELOPMENT



- ① City park port
- ② Walking path
- ③ Widened canal
- ④ Commercial and cultural district
- ⑤ Secondary road
- ⑥ Wetland park entrance
- ⑦ Community park

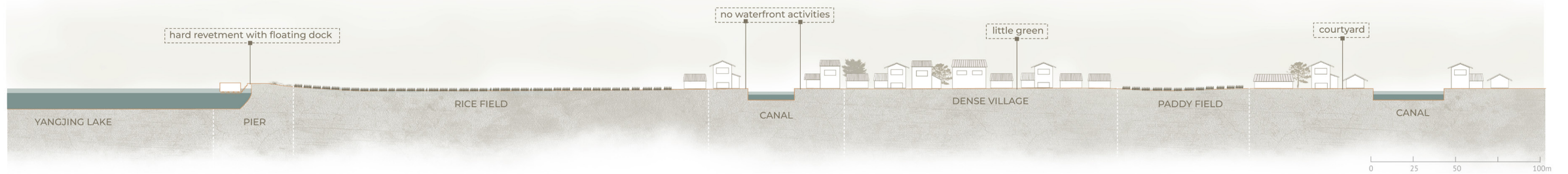
EXAMPLE 1/3 VILLAGE | LOCAL IMPLEMENTATION

BUILDING BLOCKS

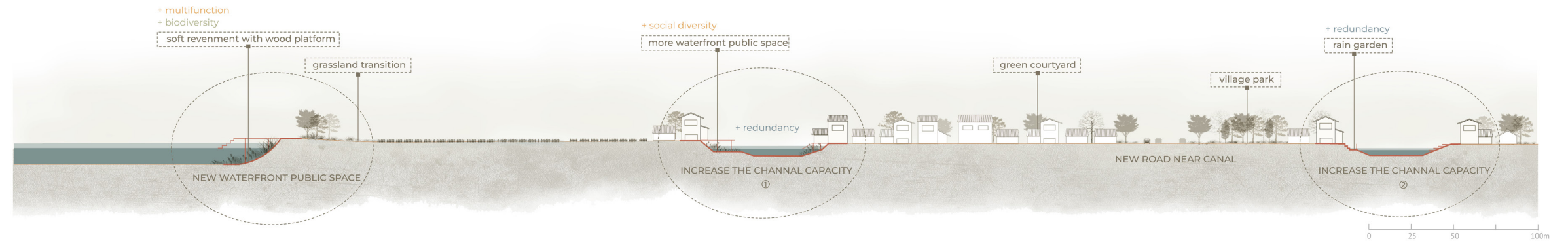
PUBLIC SPACE

preserve the cultural identity, and develop its commercial and resilient potentials

CURRENT SITUATION



DESIGN PROPOSAL

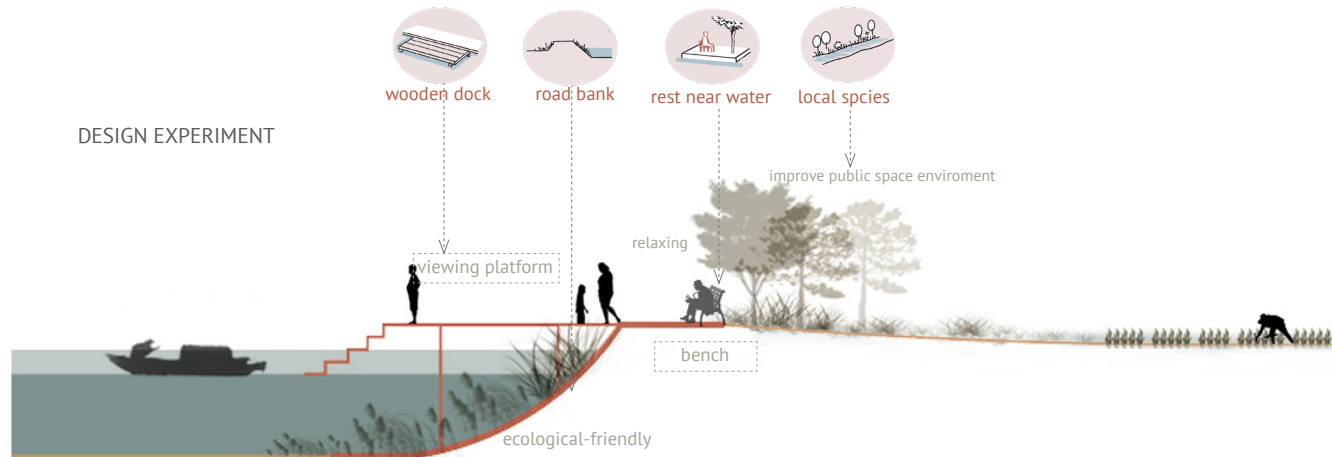


EXAMPLE 1/3 VILLAGE | APPLYING POLDER GRAMMAR IN DESIGNING BOAT STOP SPACE

CURRENT SITUATION

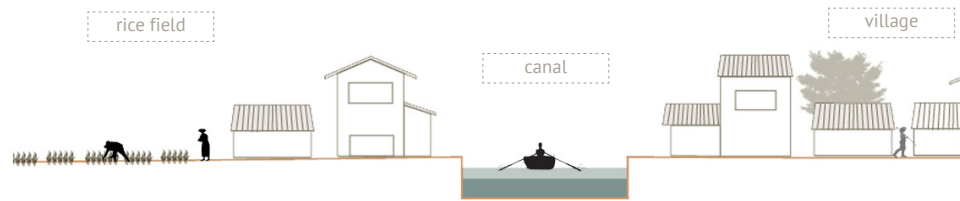


DESIGN EXPERIMENT

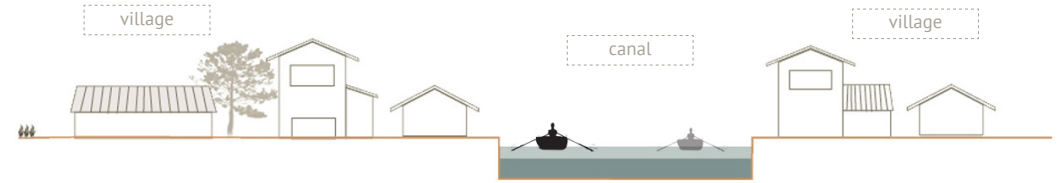


EXAMPLE 1/3 VILLAGE | APPLYING POLDER GRAMMAR IN DESINING WATERFRONT BUILT-UP AREA

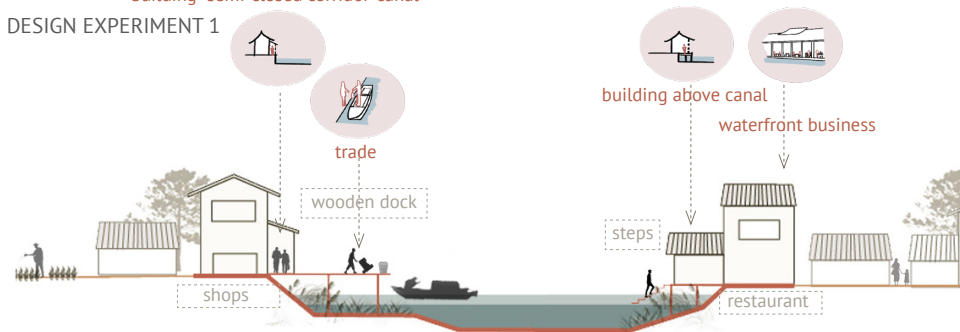
CURRENT SITUATION



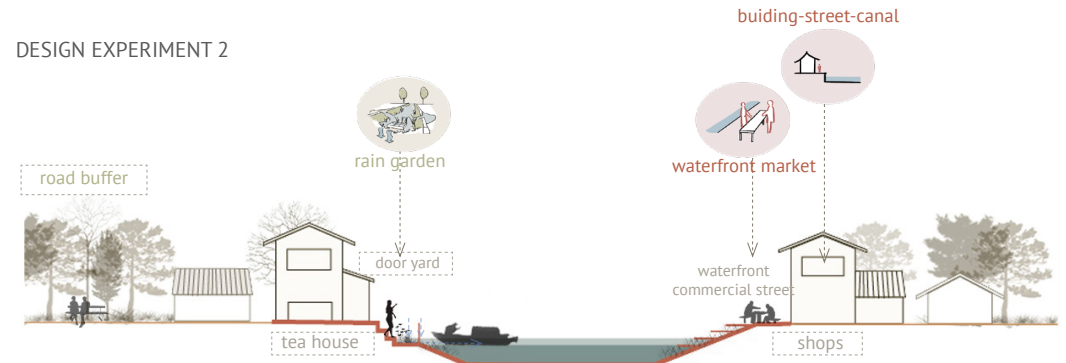
CURRENT SITUATION



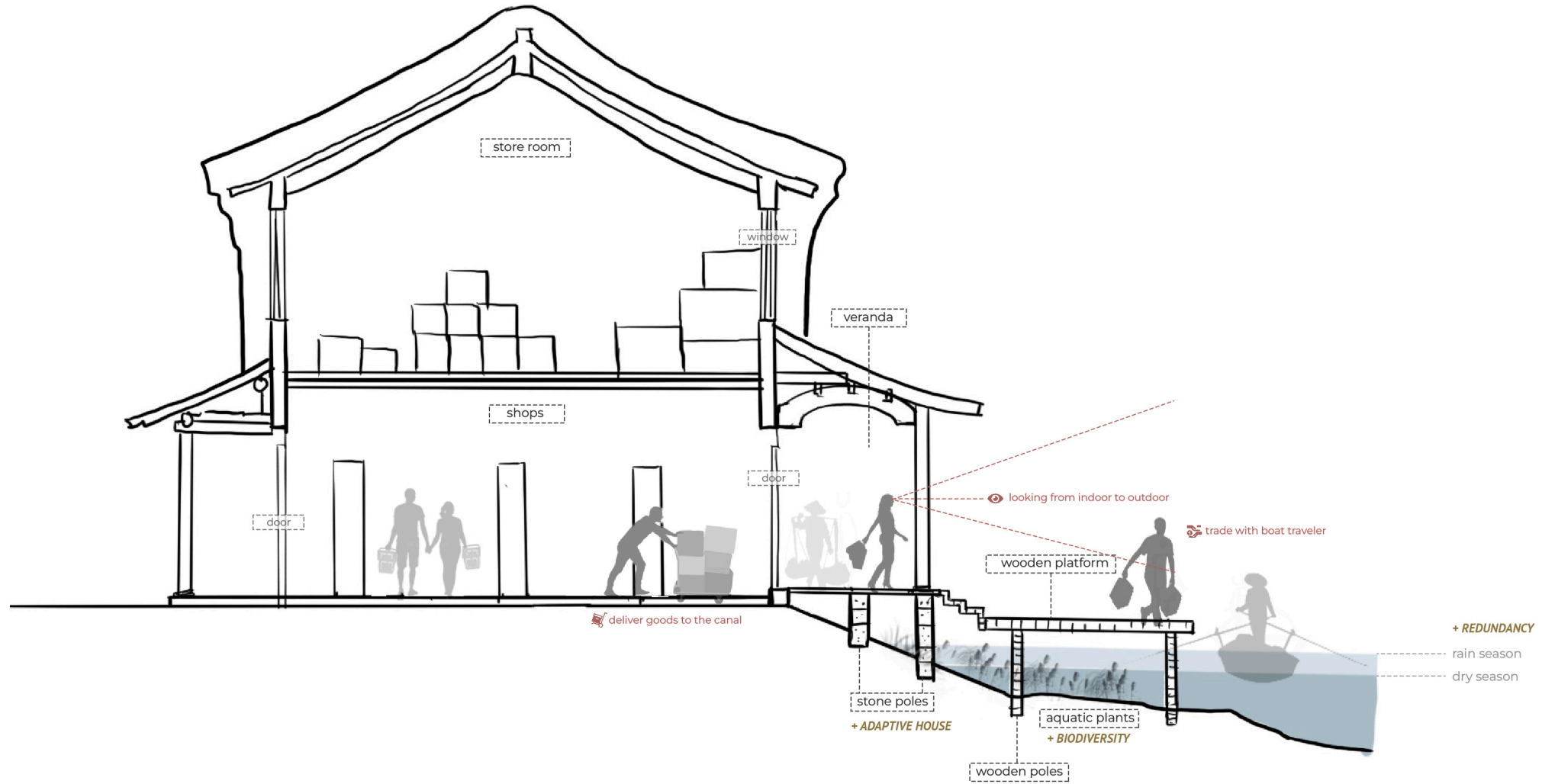
DESIGN EXPERIMENT 1
building - semi-closed corridor - canal



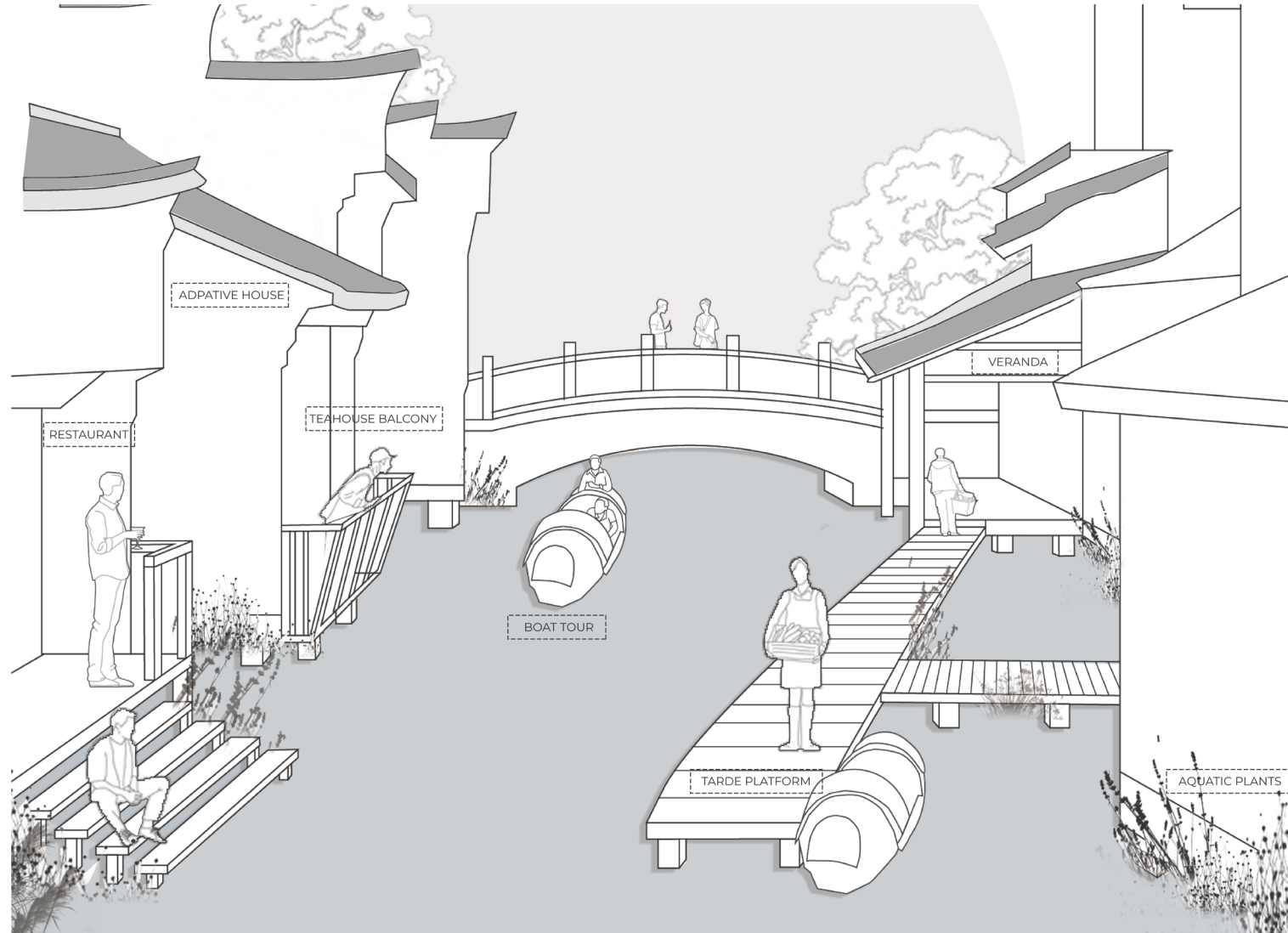
DESIGN EXPERIMENT 2



EXAMPLE 2/3 VILLAGE | TECHNICAL DETAILS OF WATERFRONT SPACE



EXAMPLE 2/3 VILLAGE | COMMERCIAL AND CULTURAL DISTRICT



EXAMPLE 3/3 | URBAN AREA DEVELOPMENT



(From Google earth)



- | | | |
|-----------------------------|---------------------------------|------------------------|
| ① Redesigned city main road | ④ Bioswale | ⑦ Ecological community |
| ② Reopened waterchannel | ⑤ Public space in the community | ⑧ Recreation center |
| ③ New bridge | ⑥ Mid-rise community | ⑨ Waterfront platform |

EXAMPLE 3/3 CITY | LOCAL IMPLEMENTATION

GREEN STRUCTURE

TRANSPORTATION

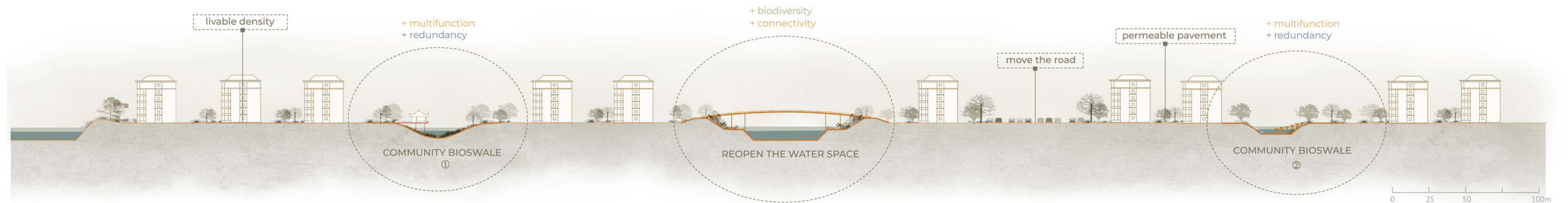
PUBLIC SPACE

adapt new strategies for city development to the local culture

CURRENT SITUATION

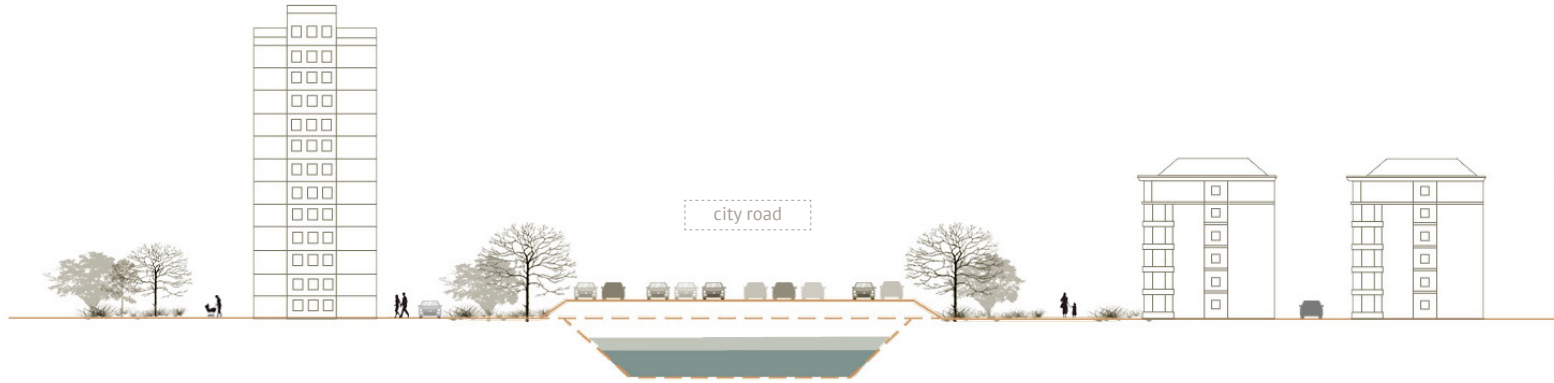


DESIGN PROPOSAL

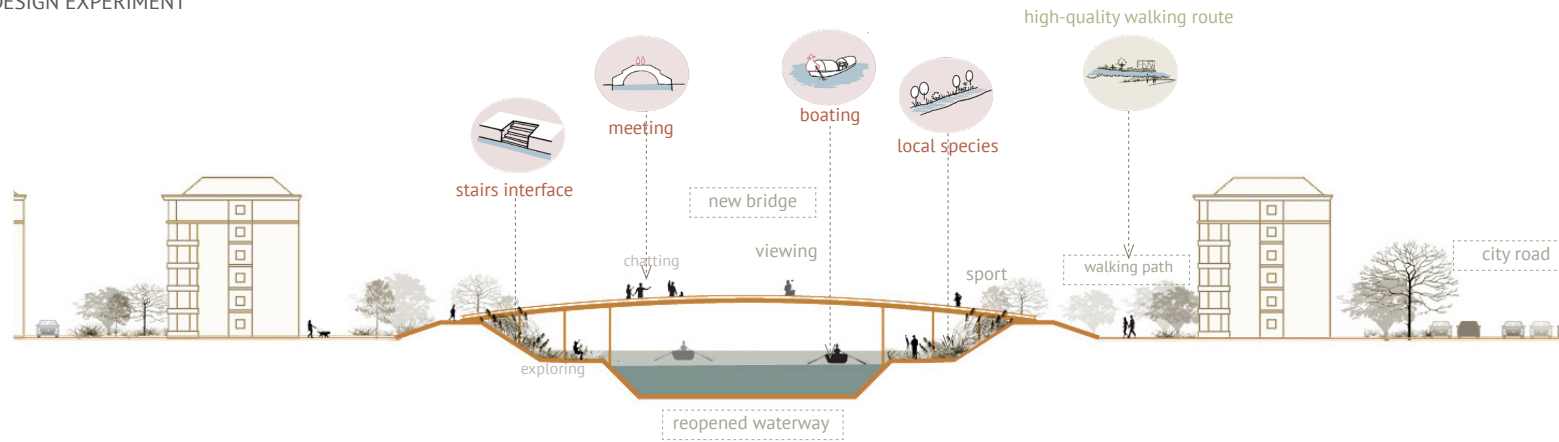


EXAMPLE 3/3 CITY | APPLYING POLDER GRAMMAR TO REDESIGN THE ROAD

CURRENT SITUATION



DESIGN EXPERIMENT

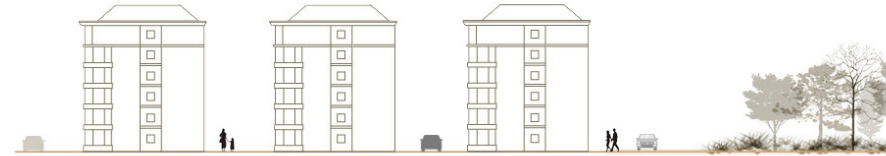


EXAMPLE 3/3 CITY | APPLYING THE POLDER GRAMMAR IN DESIGNING RESILIENT RAINWATER MANAGEMENT

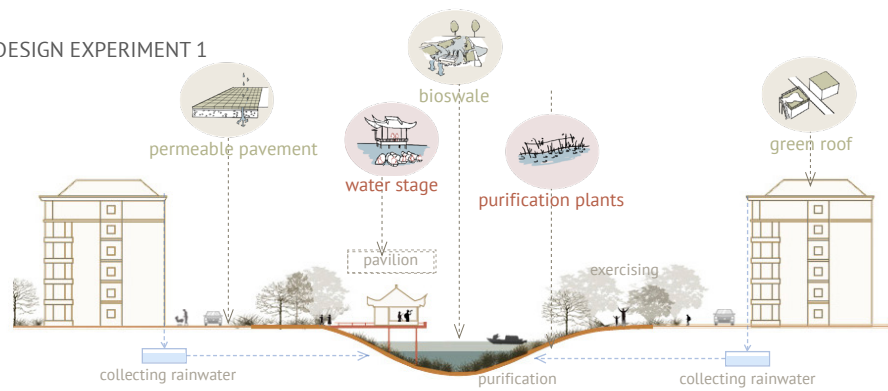
CURRENT SITUATION



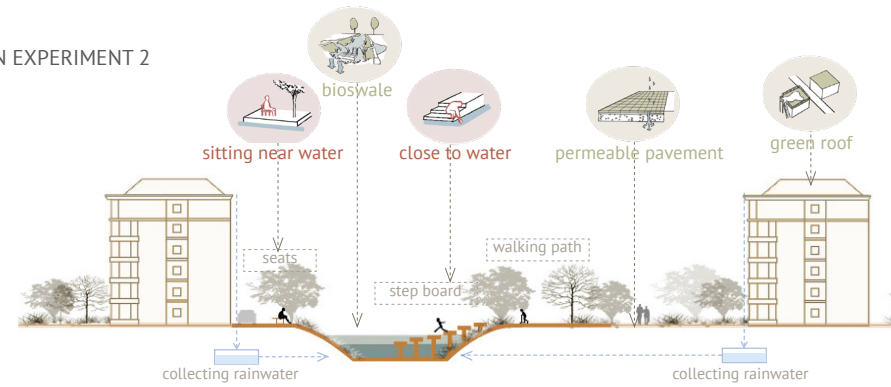
CURRENT SITUATION



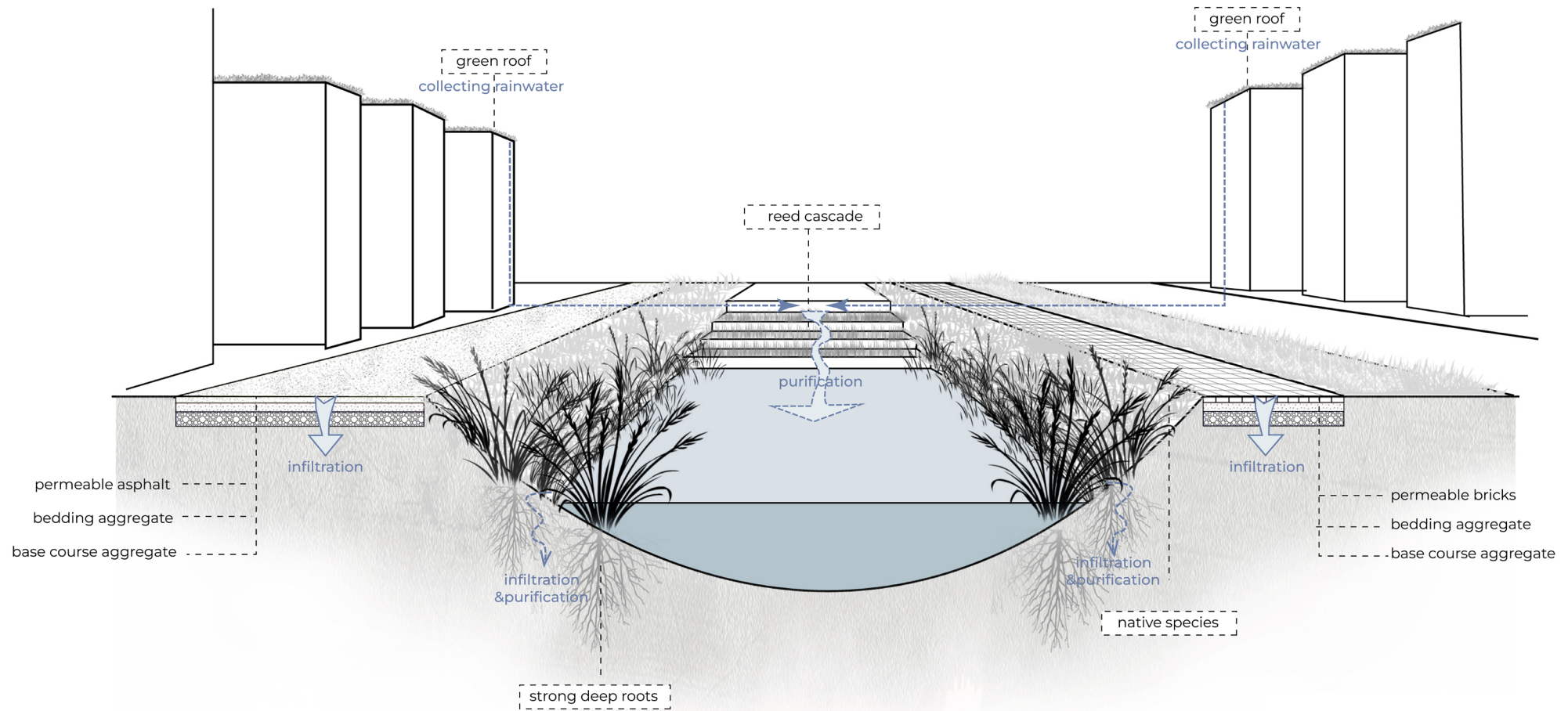
DESIGN EXPERIMENT 1



DESIGN EXPERIMENT 2



EXAMPLE 3/3 CITY | RAINWATER MANAGEMENT DETAILS



EXAMPLE 3/3 CITY | NEW LIVABLE COMMUNITY



06 DICUSSION & CONCLUSION

APPLYING POLDER GRAMMAR IN SHAOXING STRIP

PILOT PROJECT



0~5 years

BACKBONE



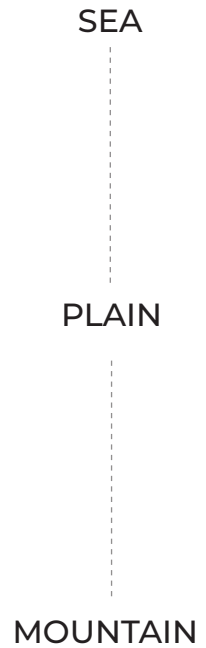
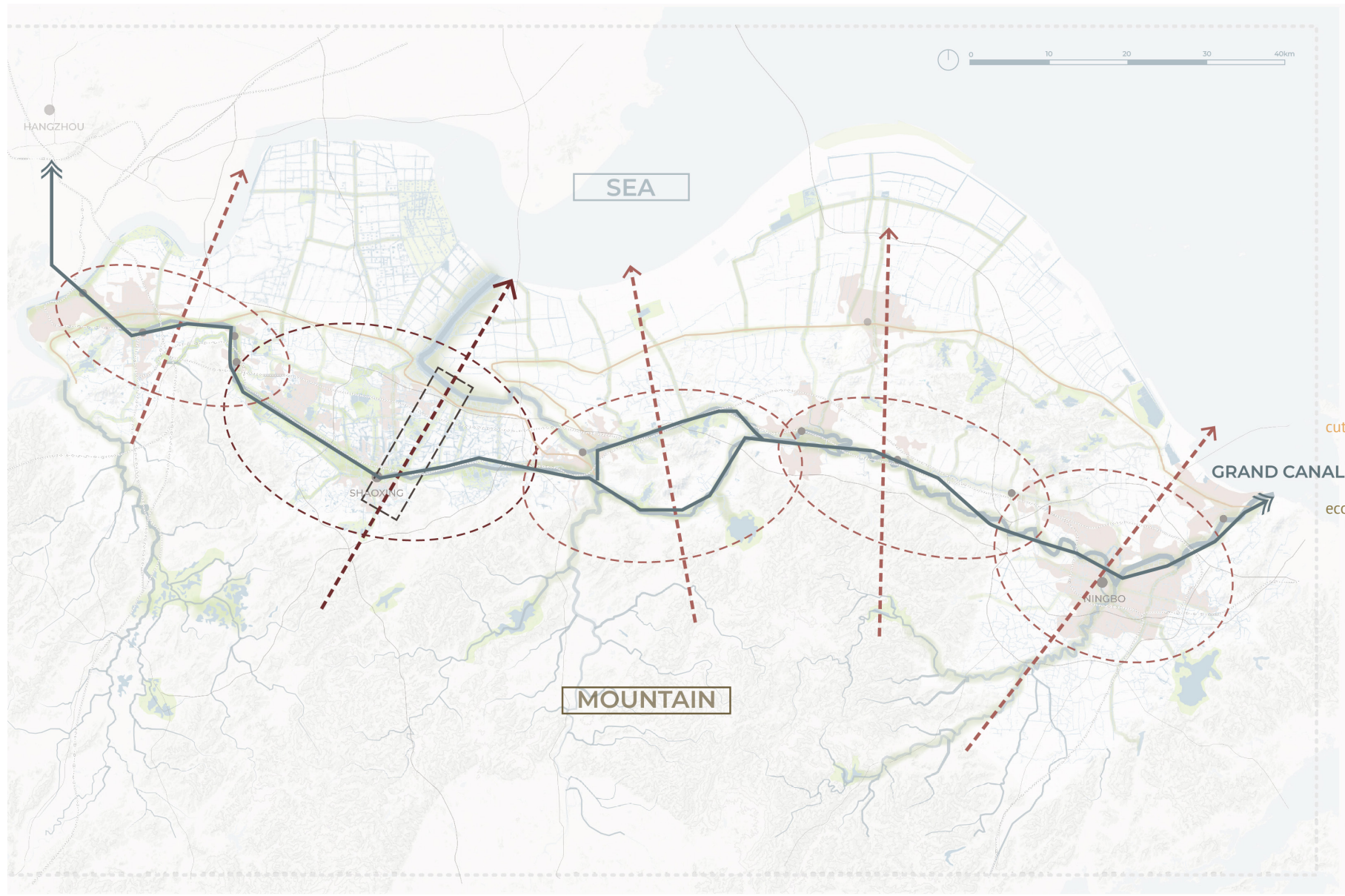
5~20 years

LANDSCAPE FRAMEWORK



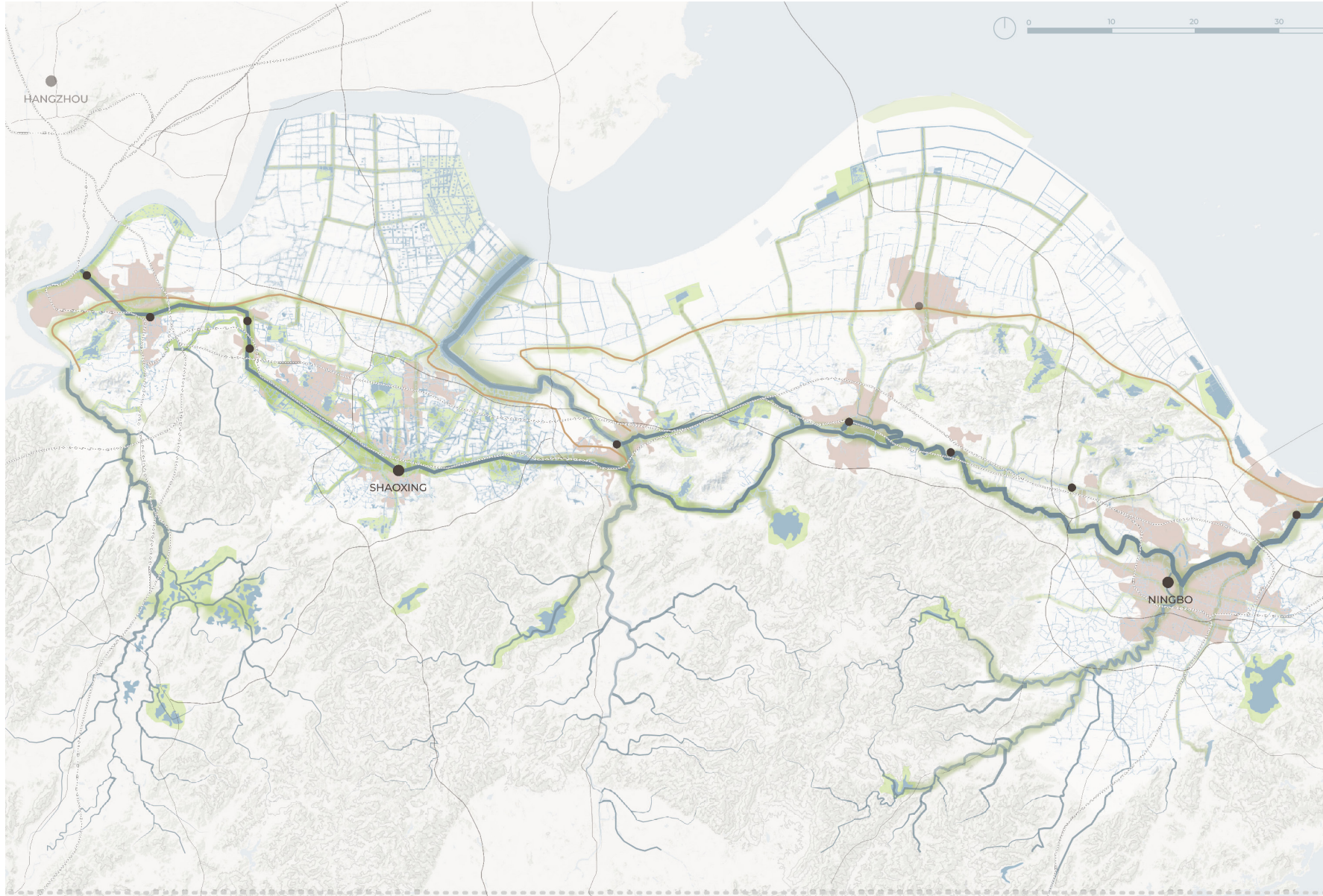
20~50 years

TOWARDS A LANDSCAPE FRAMEWORK FOR THE NINGSHAO PLAIN



cultural corridor
ecological corridor

TOWARDS A LANDSCAPE FRAMEWORK FOR THE NINGSHAO PLAIN



+ ECOLOGICAL VALUE



INCREASE
BIODIVERSITY



IMPROVE
MICROCLIMATE



ADAPTIVE TO SEA
LEVEL RISE

+ SOCIAL/ECONOMIC VALUE



RECREATION
NETWORK

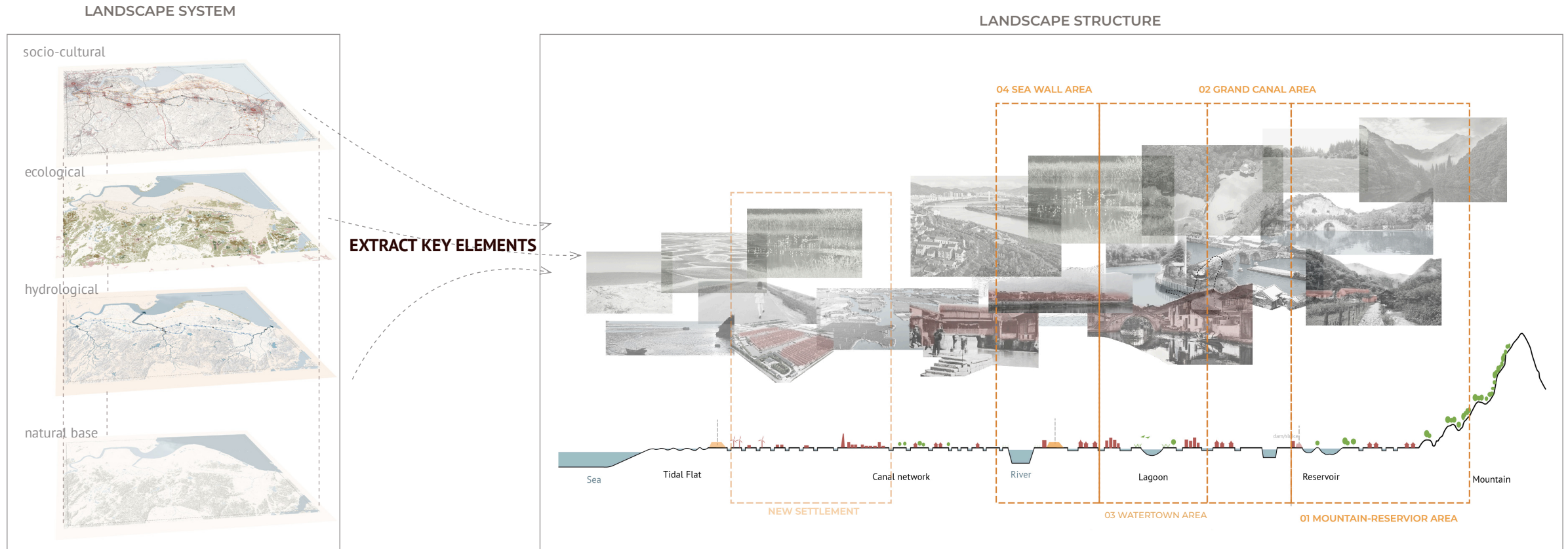


LIVABLE HOUSING

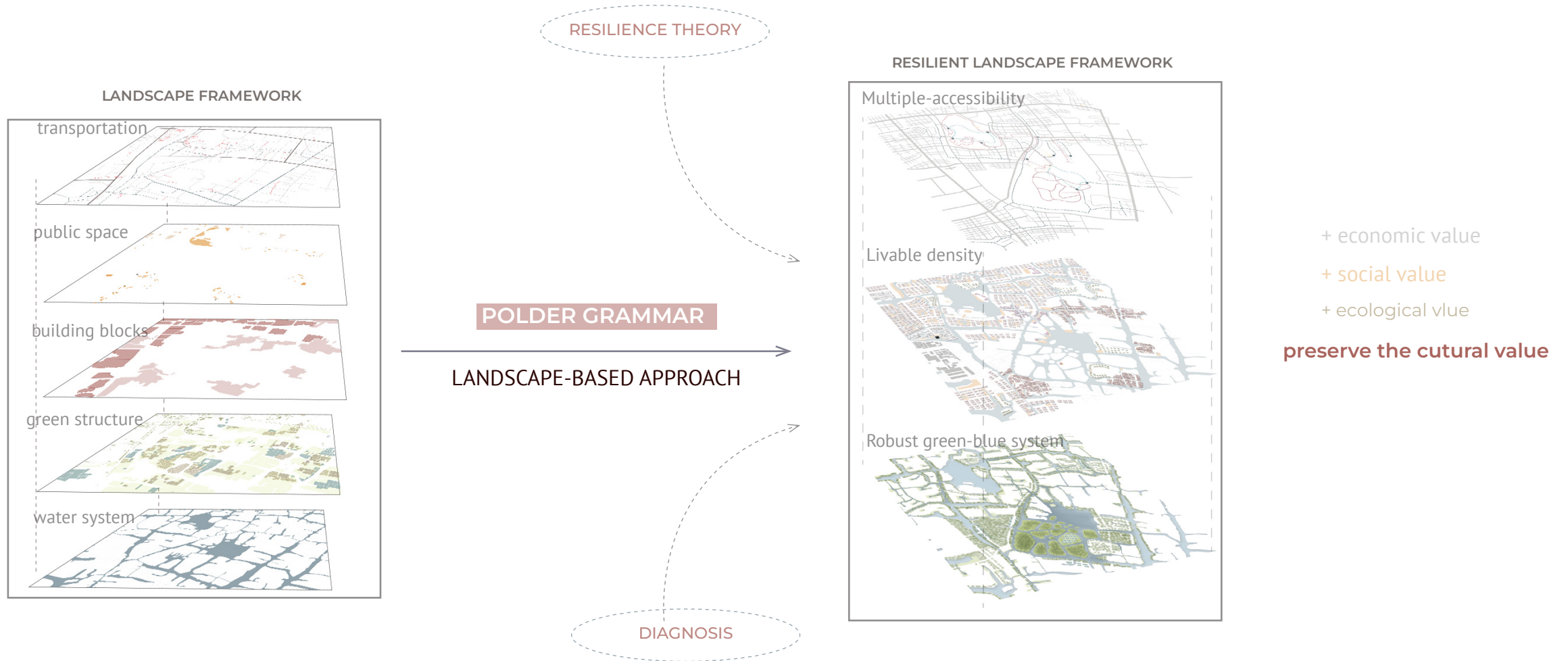


BOOST TOURISM

LESSONS LEARNED | LANDSCAPE STRUCTURE



LESSONS LEARNED | RESILIENT LANDSCAPE FRAMEWORK

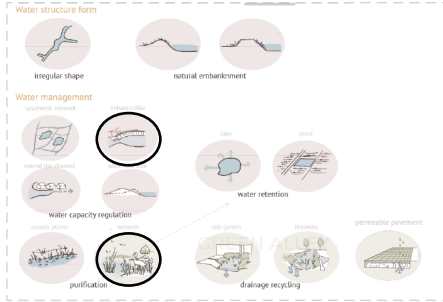


LESSONS LEARNED | POLDER GRAMMAR

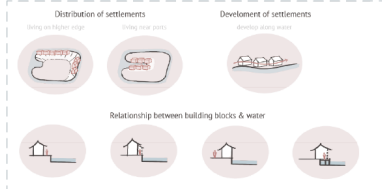
TOOL BOX

DESIGN PRINCIPLES

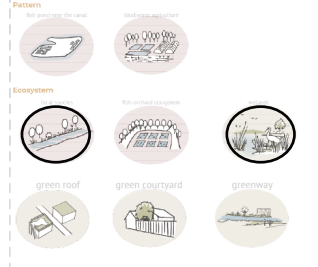
WATER SYSTEM



BUILDING BLOCKS



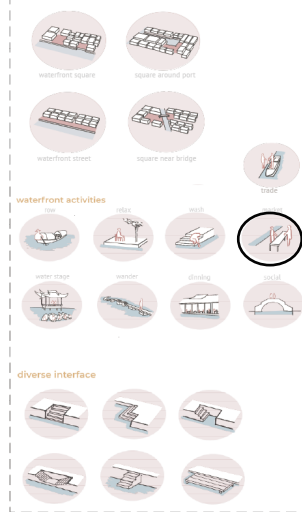
GREEN STRUCTURE



TRANSPORTATION

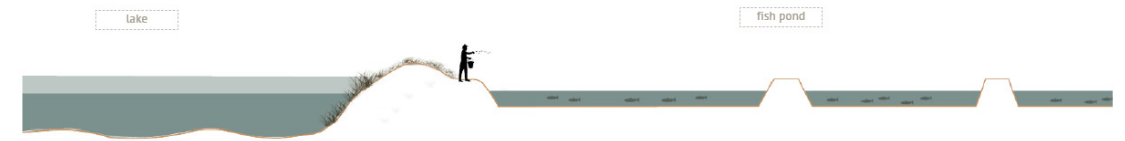


PUBLIC SPACE



LOCAL-SPECIFIC ALTERNATIVE

CURRENT SITUATION



DESIGN EXPERIMENT



CONCLUSION

LADSCAPE SYSTEM

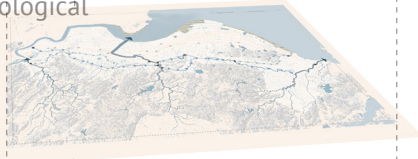
socio-cultural



ecological



hydrological

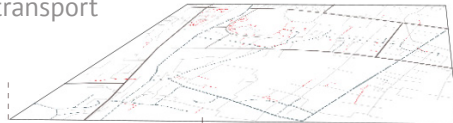


natural base

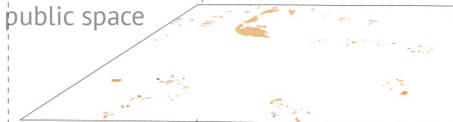


POLDER GRAMMAR

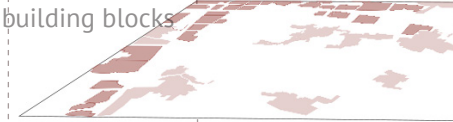
transport



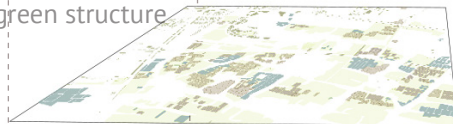
public space



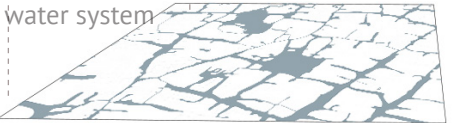
building blocks



green structure



water system



RESILIENT LANDSCAPE FRAMEWORK

Multiple-accessibility



Livable density



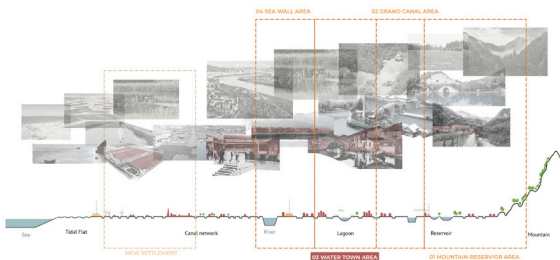
Robust green-blue system



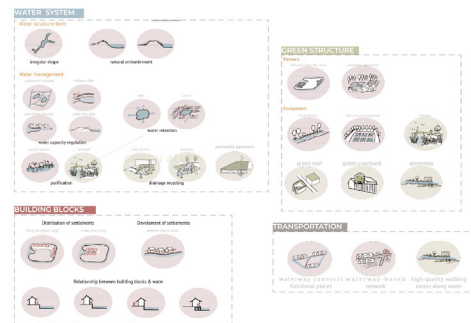
- **Landscape structure as the basis**
 - landscape as system
 - layers mapping
- **Resilient Landscape framework**
 - reference of a landscape-based approach
 - limitation of polder grammar
- **Polder Grammar as principle**
 - culturally/historically sensitive tool box
 - make the alternative more site-specific



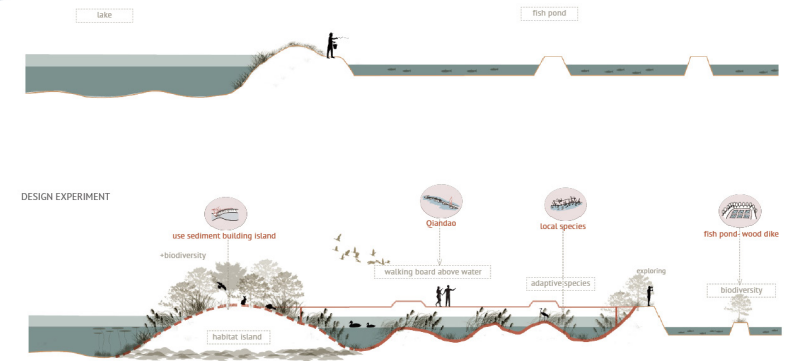
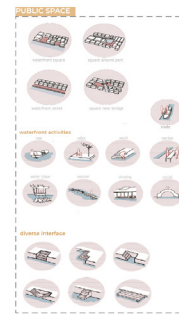
LADSCAPE STRUCTURE



DESIGN PRINCIPLES



DESIGN PRINCIPLES



LOCAL DESIGN EXPERIMENT