

Bring Linpan back to life

Revival of the Linpan community, Sichuan, China, in a modern context through adaptation and appreciation of its circularity.

ZHIYUN ZHANG

Presentation 04 | 5th Oct 2023

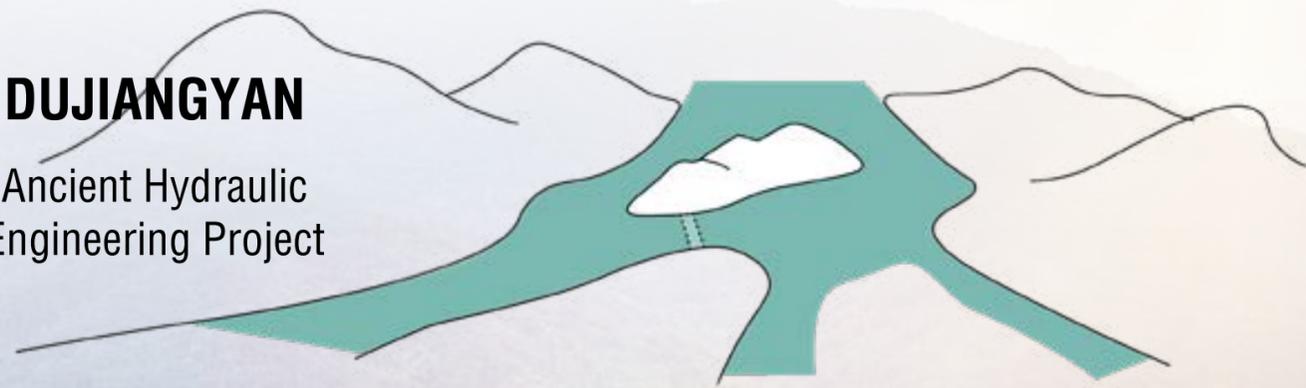
Mentors - Inge Bobbink and Yawei Chen

External Examiner - Pierijn van der Putt

Delft University of Technology

DUJIANGYAN

Ancient Hydraulic
Engineering Project



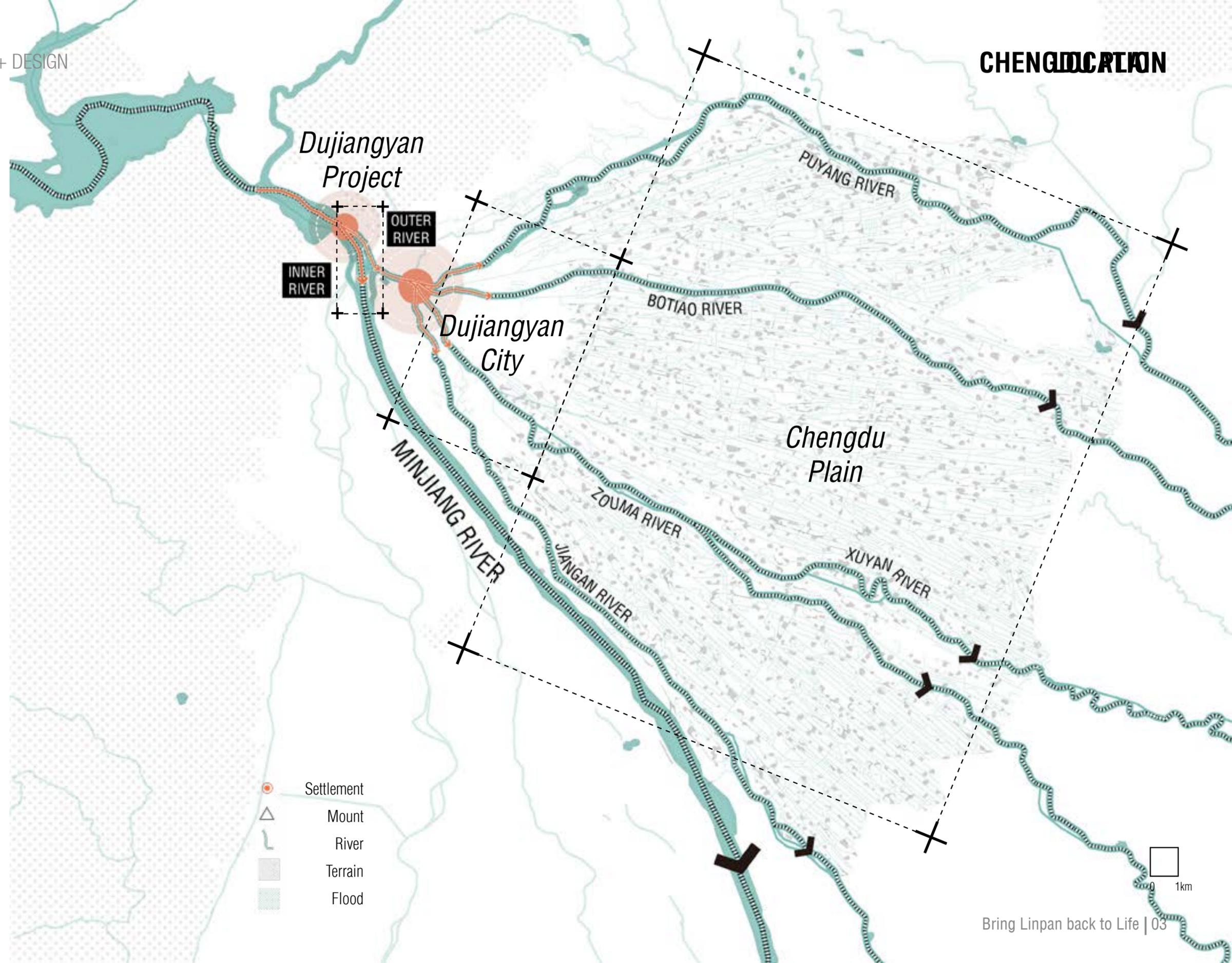
DUJIANGYAN
“都江堰”

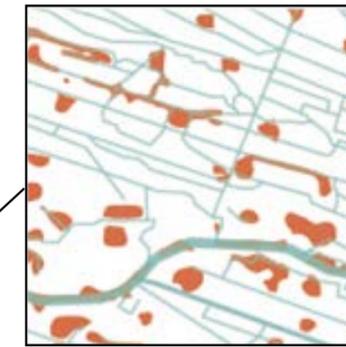
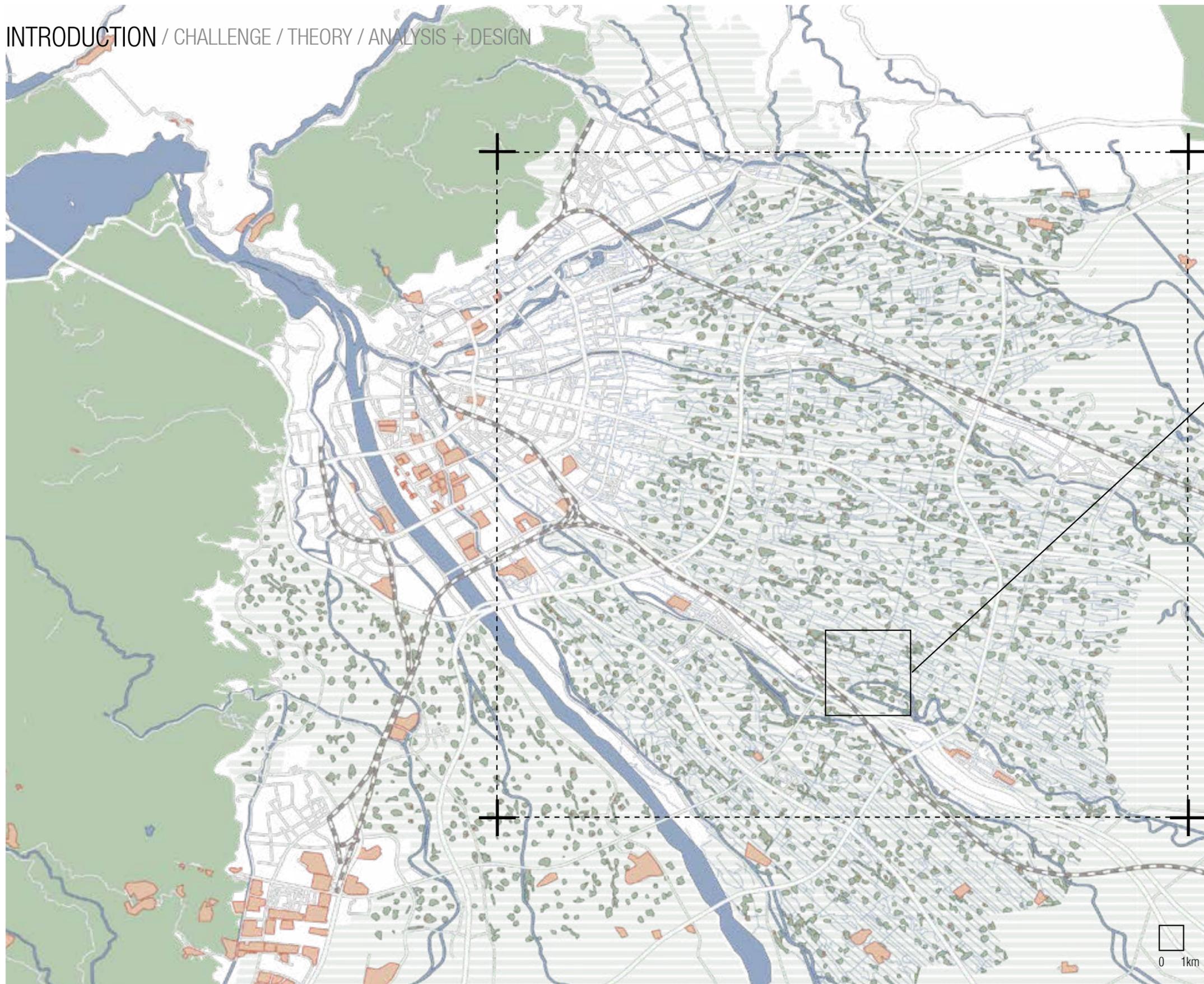
A long history
built 2275 years ago

Heritage
entered World Heritage List

Sustainable
ecological friendly







Abstract



Photo



Irrigation water net

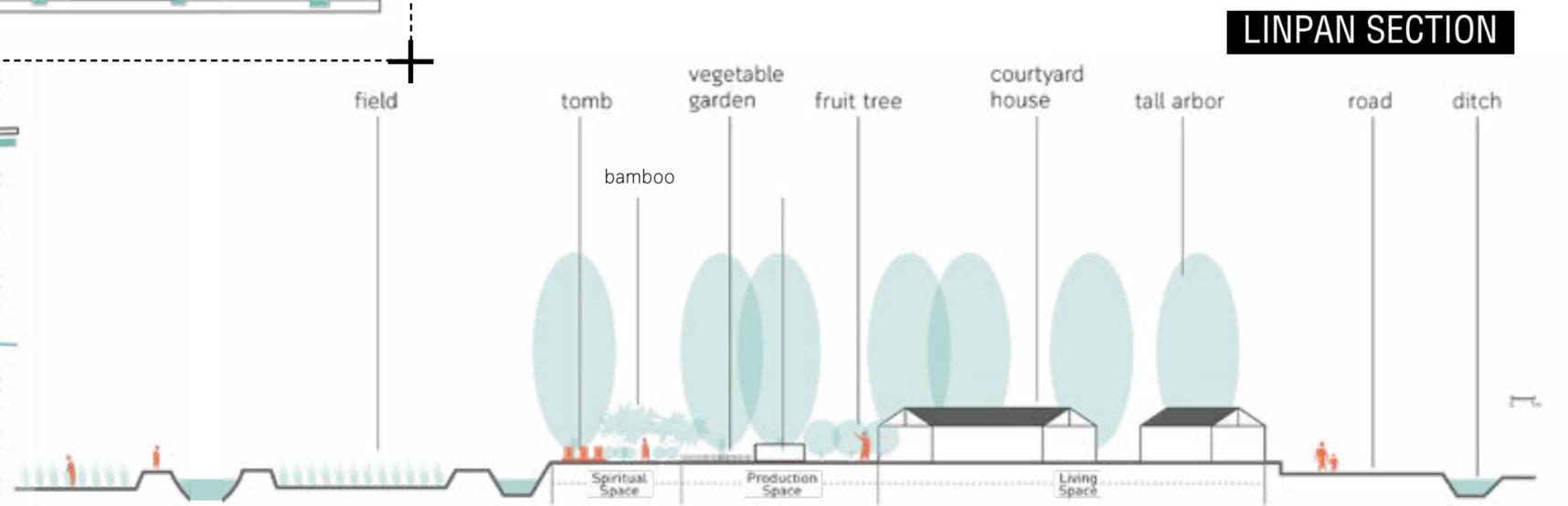
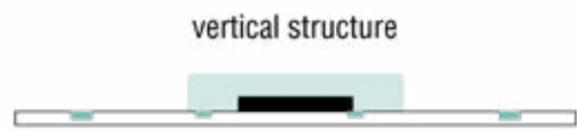
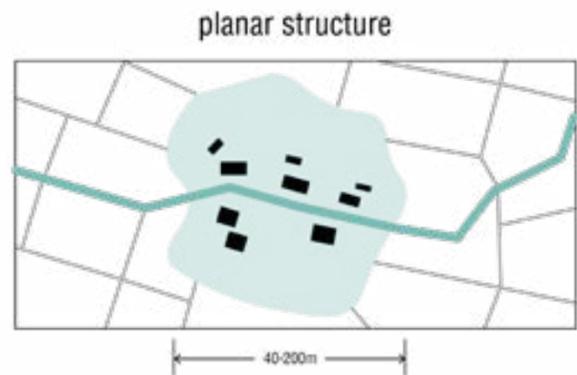
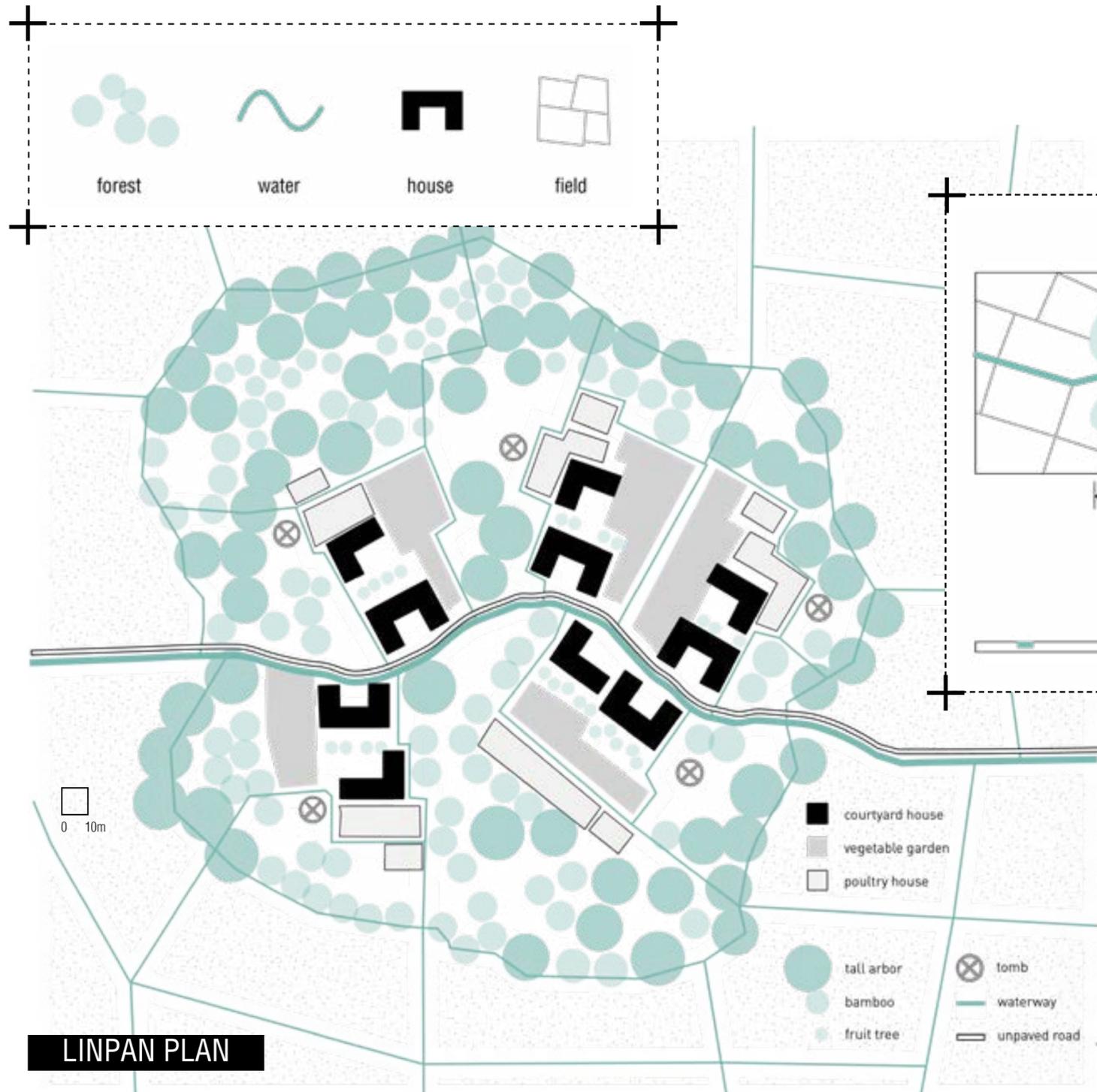


Linpan settlement

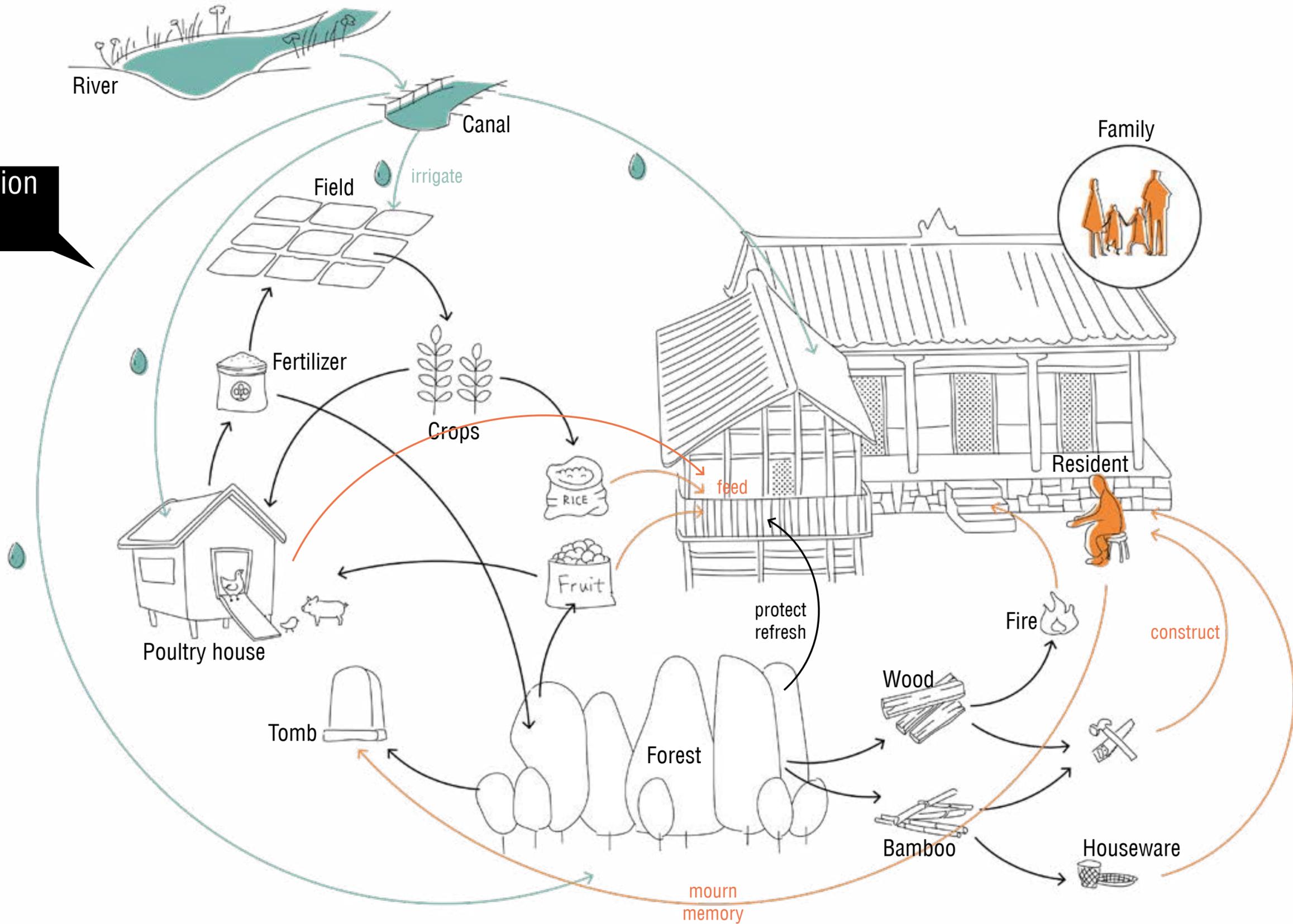


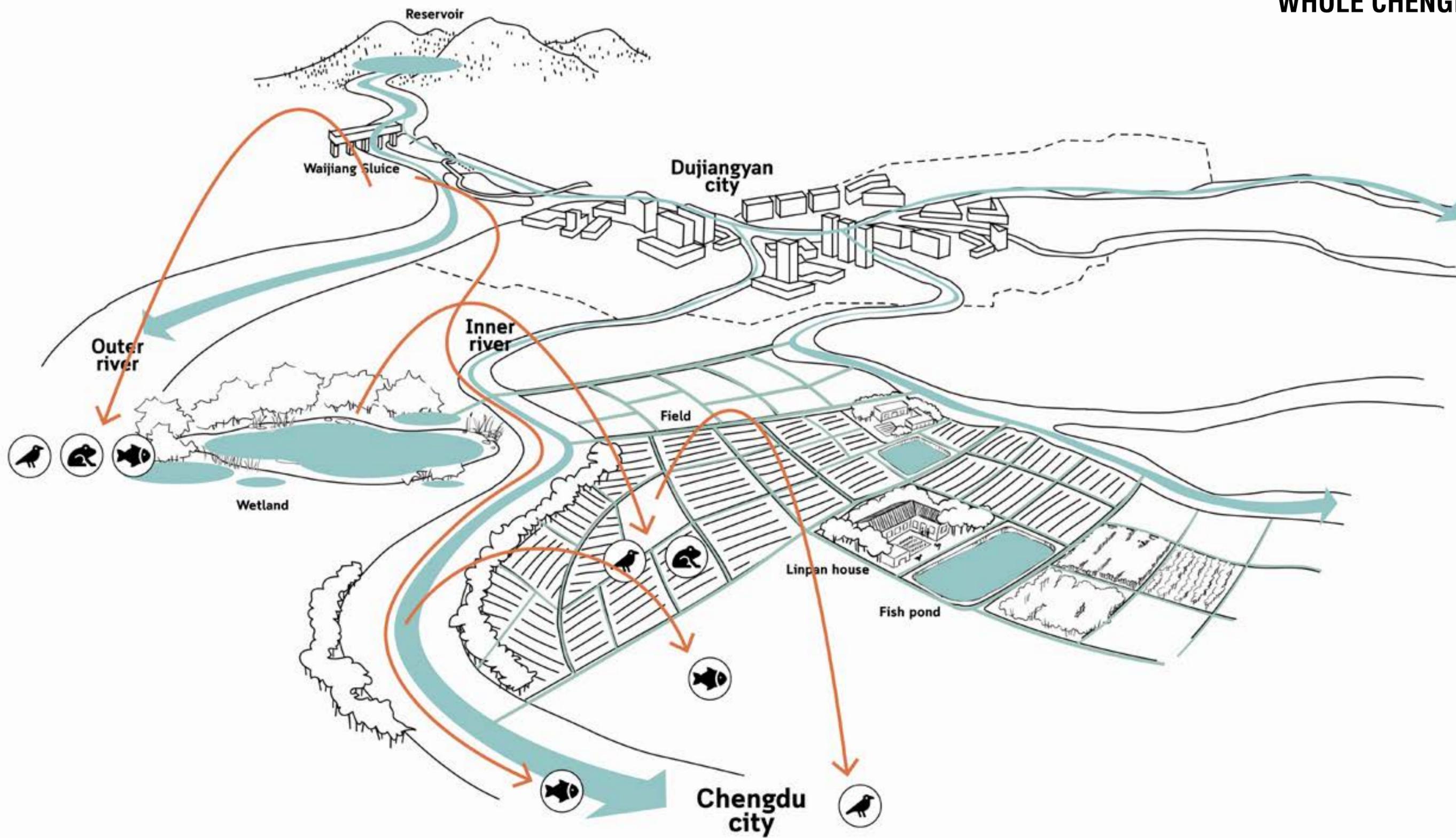
- Linpan settlement
- rural area
- residential block
- river
- canal
- road





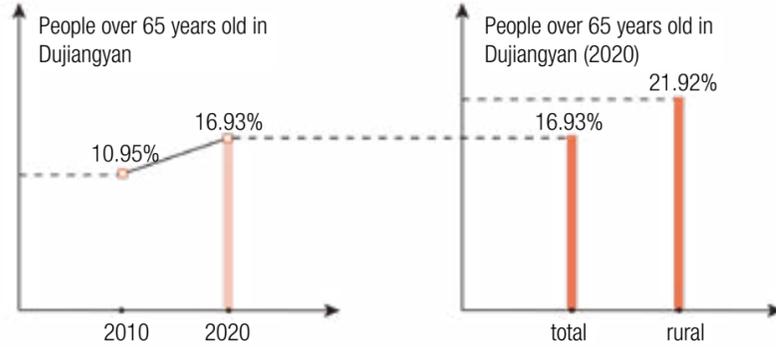
Biggest Attraction
[Circularity]





SOCIAL PROBLEMS

The small-scale peasant economy has been unable to support the development of the region. A large number of young people have left the countryside and flowed into the city. As a result, only the elderly and children are left in the Linpan area, and there is a lack of labor of the right age, which further hinders industrial development.

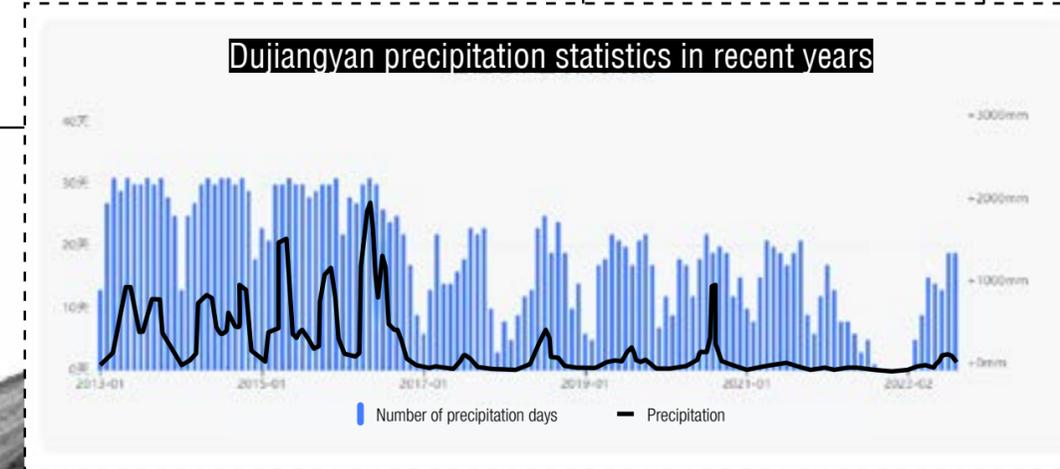


- Population outmigration
- Unstable agricultural economy
- Population aging
- Local industry facing transition difficulties

ECOLOGICAL PROBLEMS

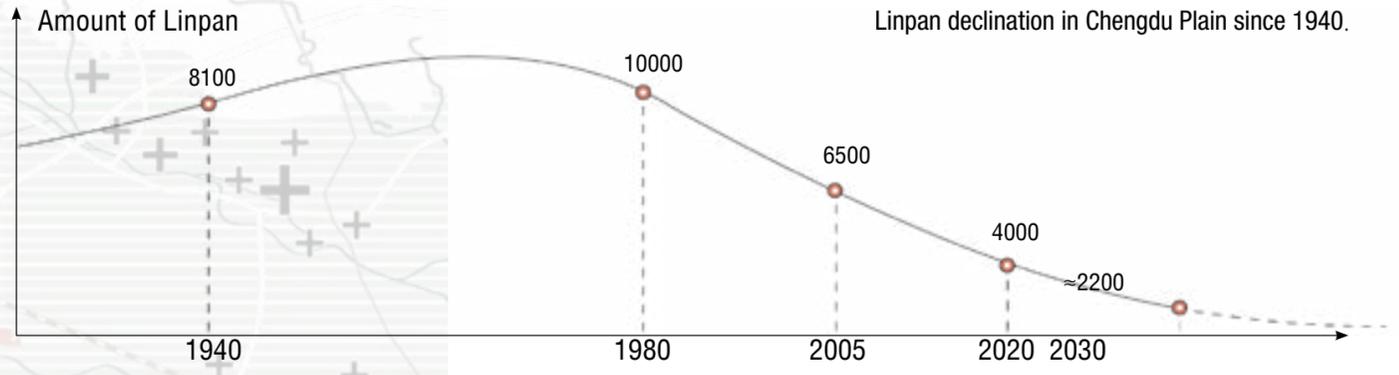
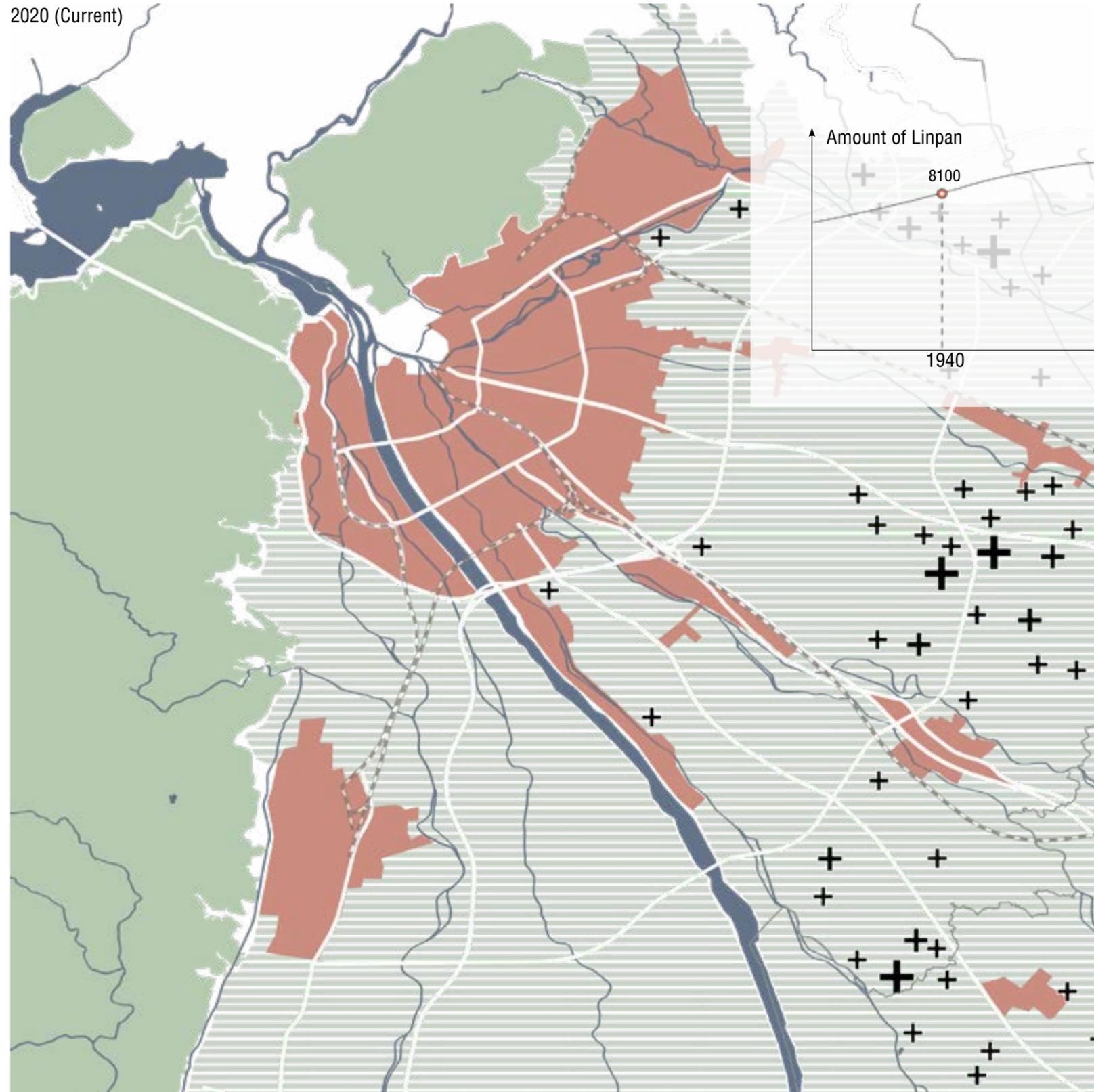
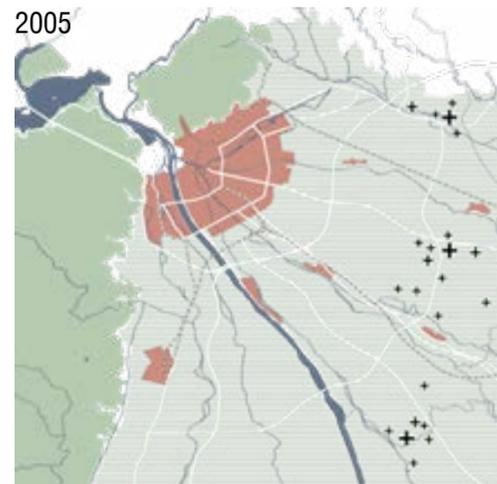
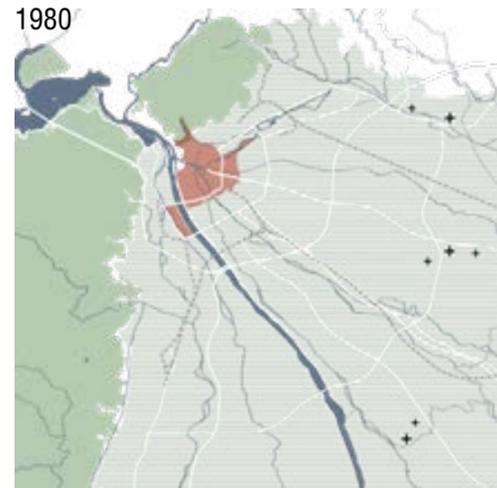
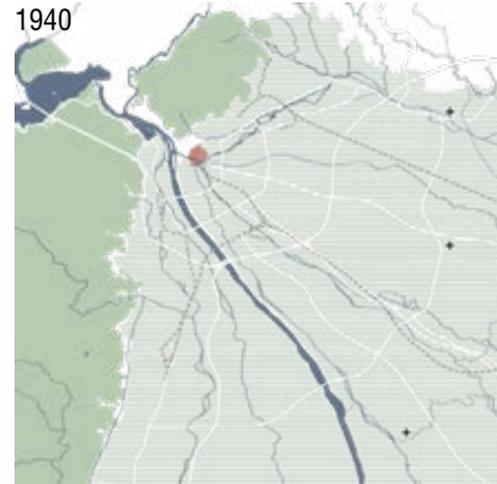
The Linpan area is facing the deterioration of the ecological environment and the imbalance of the ecological system, among which the seasonal water shortage and floods have the most serious impact on the local ecology.

- Fragmented ecological
- Water shortage
- Ecosystem imbalance



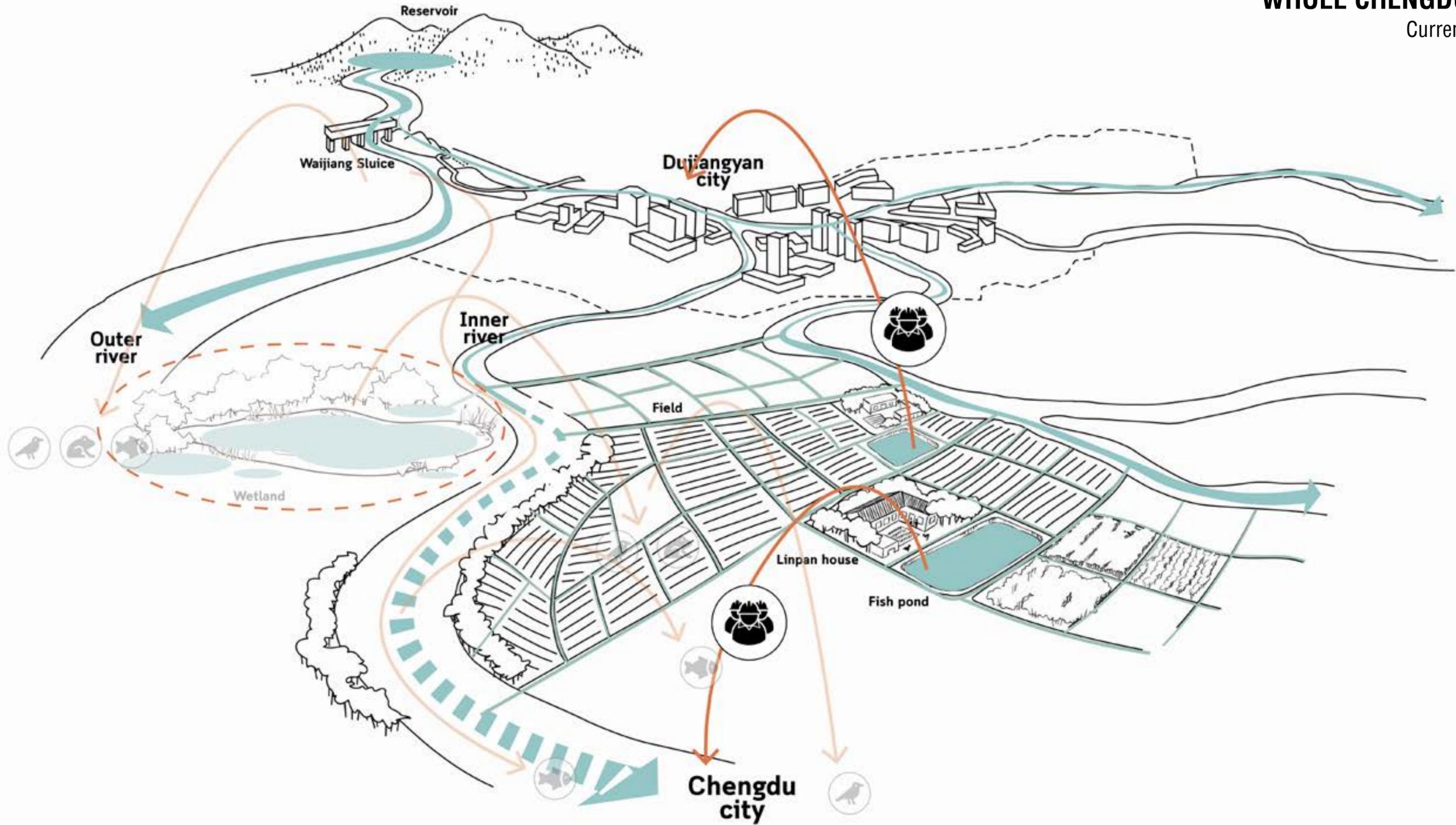
PROBLEMS OF CHENGDU PALIN

Spatial representation



- former urban range
- latter urban range
- urban expansion direction
- hollowed Linpan
- railway
- road
- mountain range
- Linpan area
- urban area
- river





Chaotic landscape

Some forest landscape have been abandoned for a long time, left unattended, growing out of order. Some newly planted exotic plants destroy the original environment.



Can not fit

Some newly built rural houses imitate western-style buildings, which are difficult to blend into the surrounding environment



Drought

The waste of water in rural areas is beyond imagination. In recent years drought happens much more than the past, especially in summer.



Waste incineration

There is no systematic waste disposal in rural areas, so many people choose to burn waste in the open.



Broken Buildings

Some are because they have been unoccupied for a long time and have not been repaired, and some are because the poor families cannot afford the repair costs.

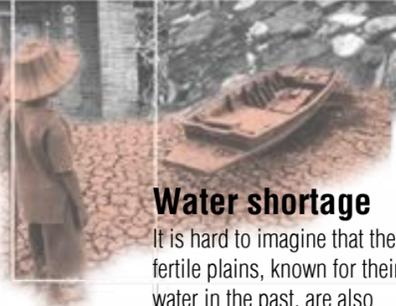
Unoccupied buildings

This phenomenon became more serious after the large-scale housing construction after the Wenchuan Earthquake and the migration of a large number of rural people to cities.



Water shortage

It is hard to imagine that the fertile plains, known for their water in the past, are also facing water shortages.



Water pollution

The random discharge of domestic water has affected the ecological environment and people's livelihood.

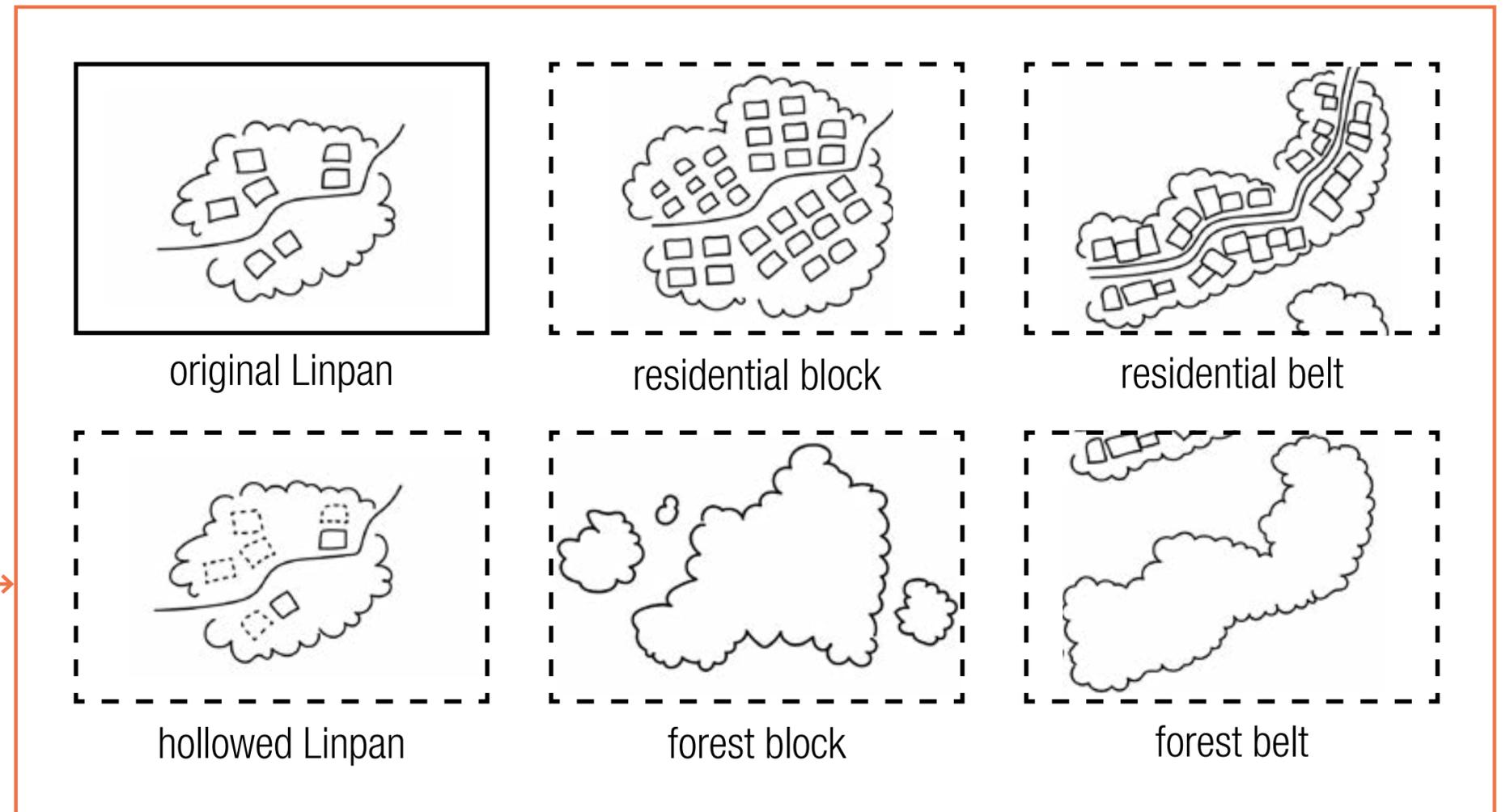
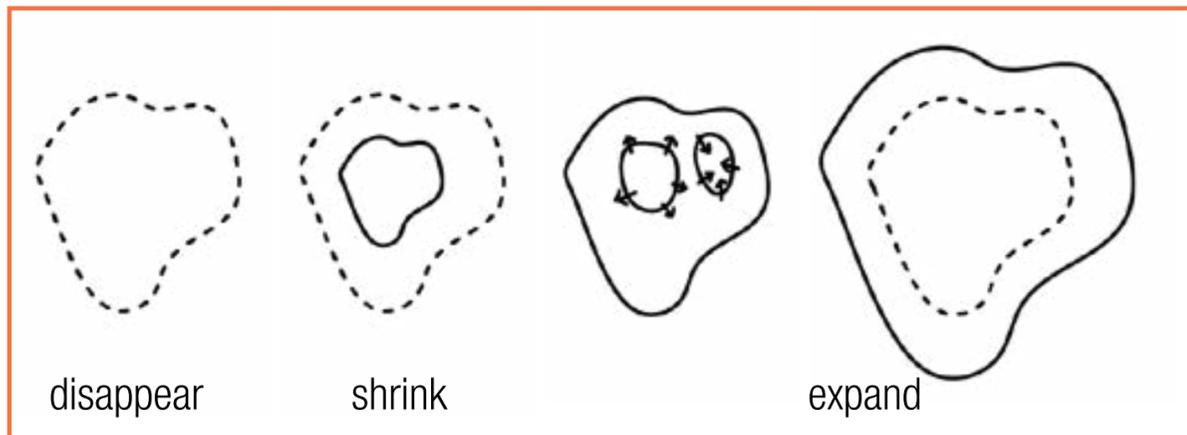


Disposal of garbage

People have not yet developed the habit of dumping garbage at fixed points, so it's common to see untreated garbage piles outdoors.



For a single Linpan:



Research question

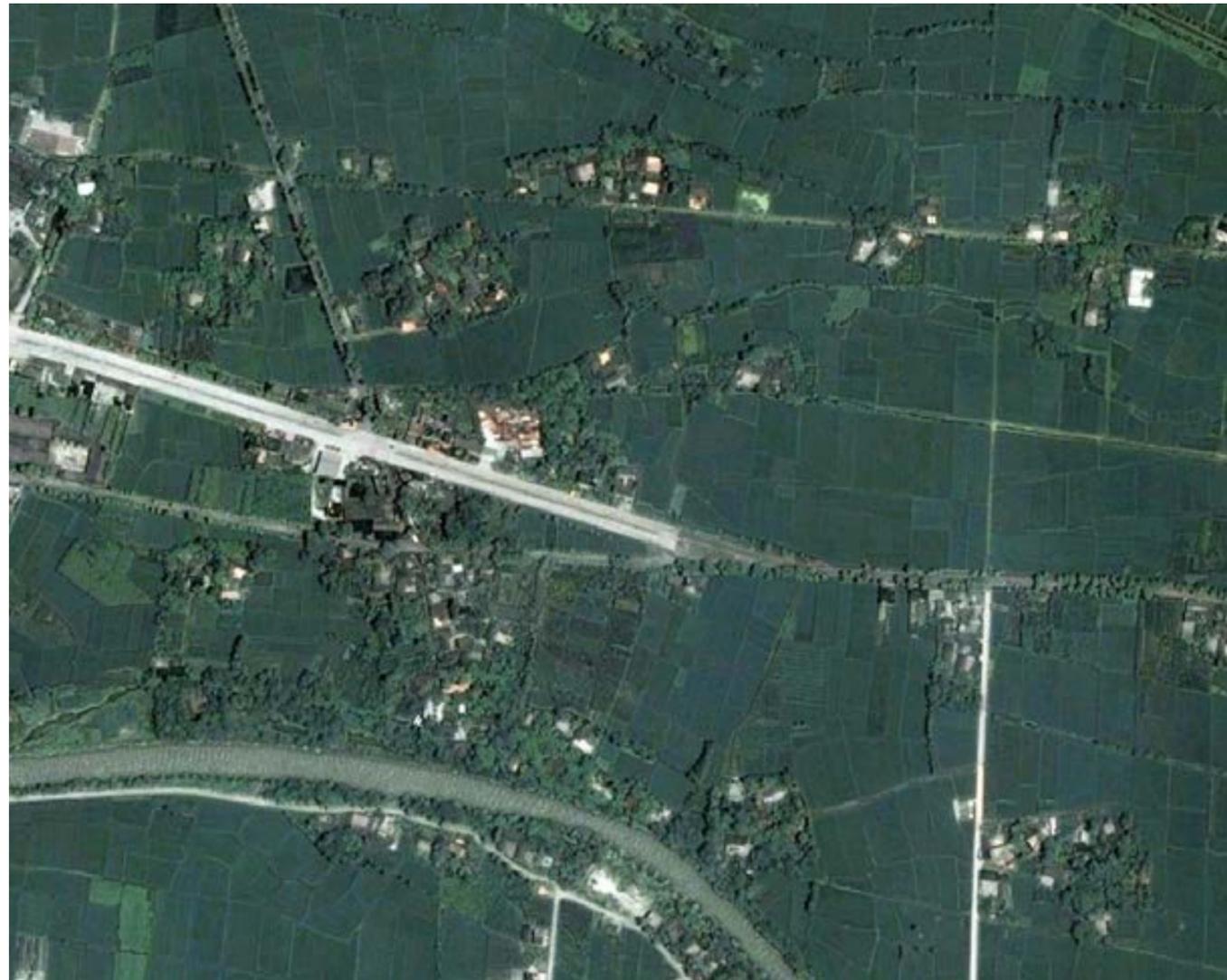
“

How can the deteriorated Linpan rural landscape be revitalized through landscape architectonic design?

”

Sub questions

- How does the Linpan landscape work, and what is its quality?
- What are the (negative) impacts of the rapid urbanization that has occurred (and will continue to occur) on the Linpan rural landscape?
- What landscape architecture means can enable Linpan's landscape to cope with future urbanization?
- Is preserving parts of the landscape and transforming others by keeping the circular quality of the Linpan viable?
- How these landscape means will influence and shape the future of Linpan rural landscape?



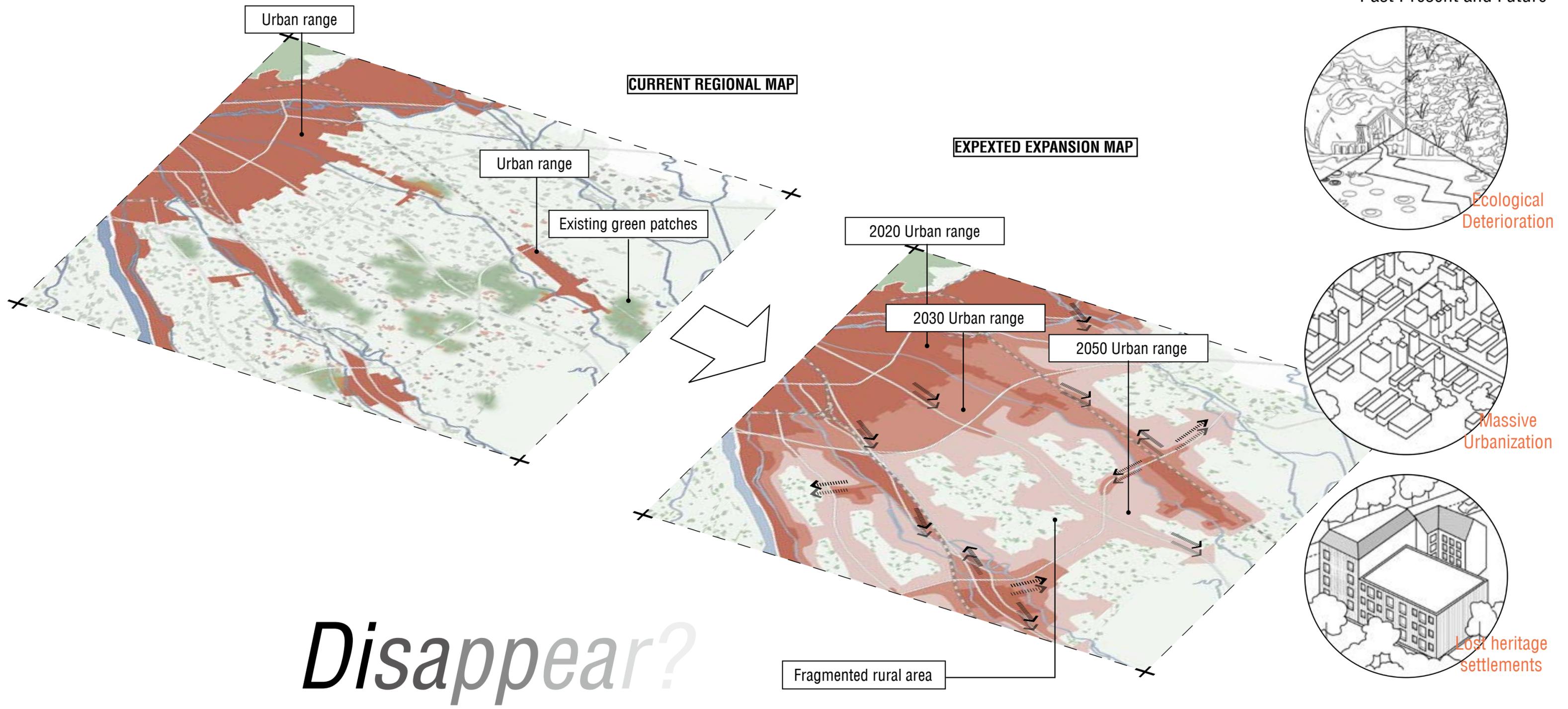
2007



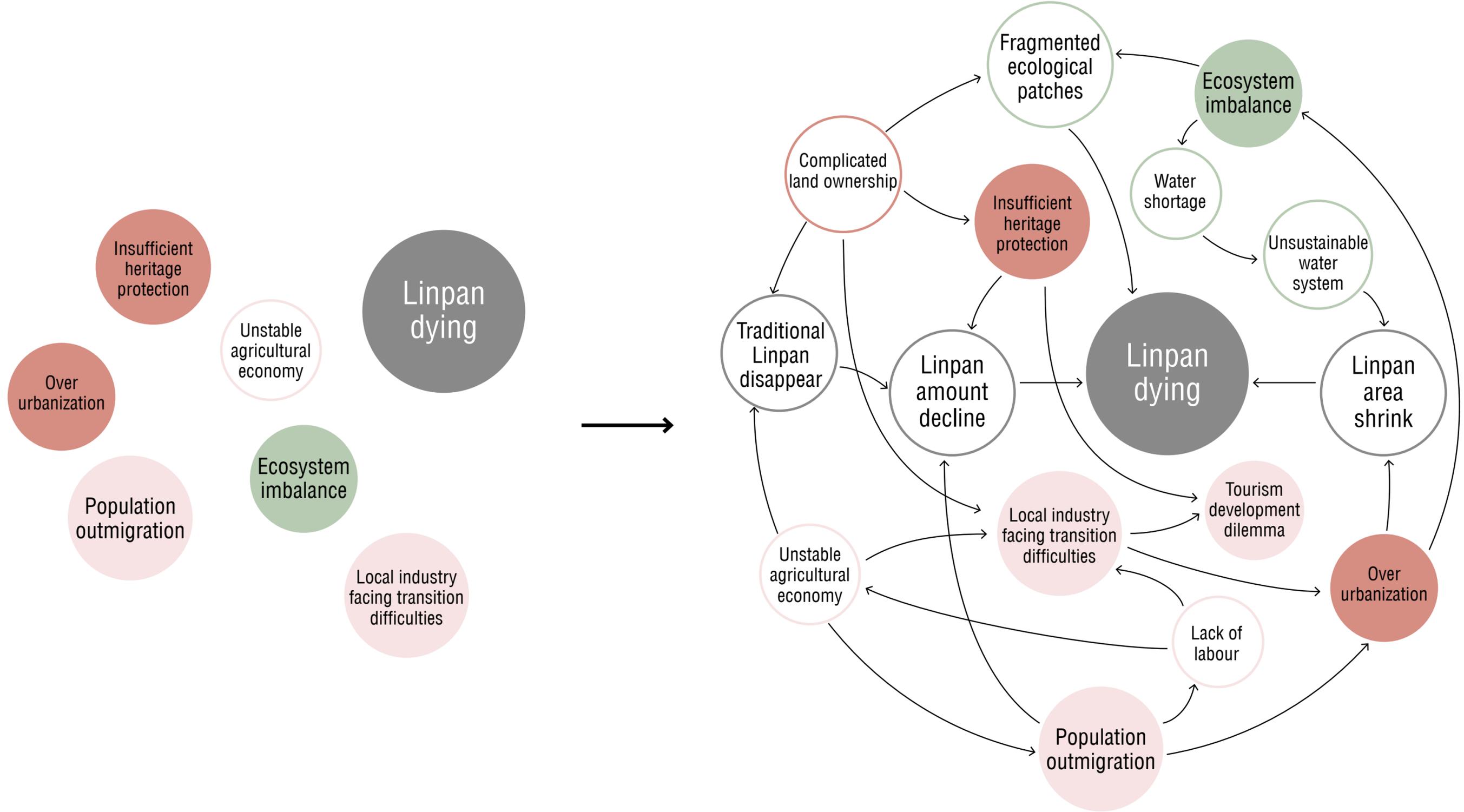
2022

URBAN EXPANSION

Past Present and Future

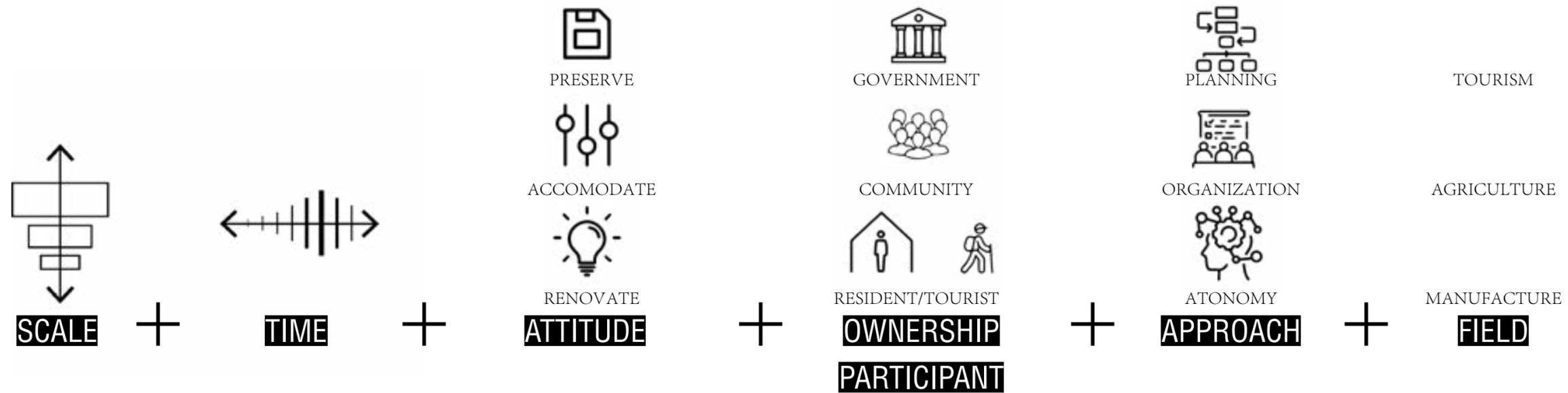


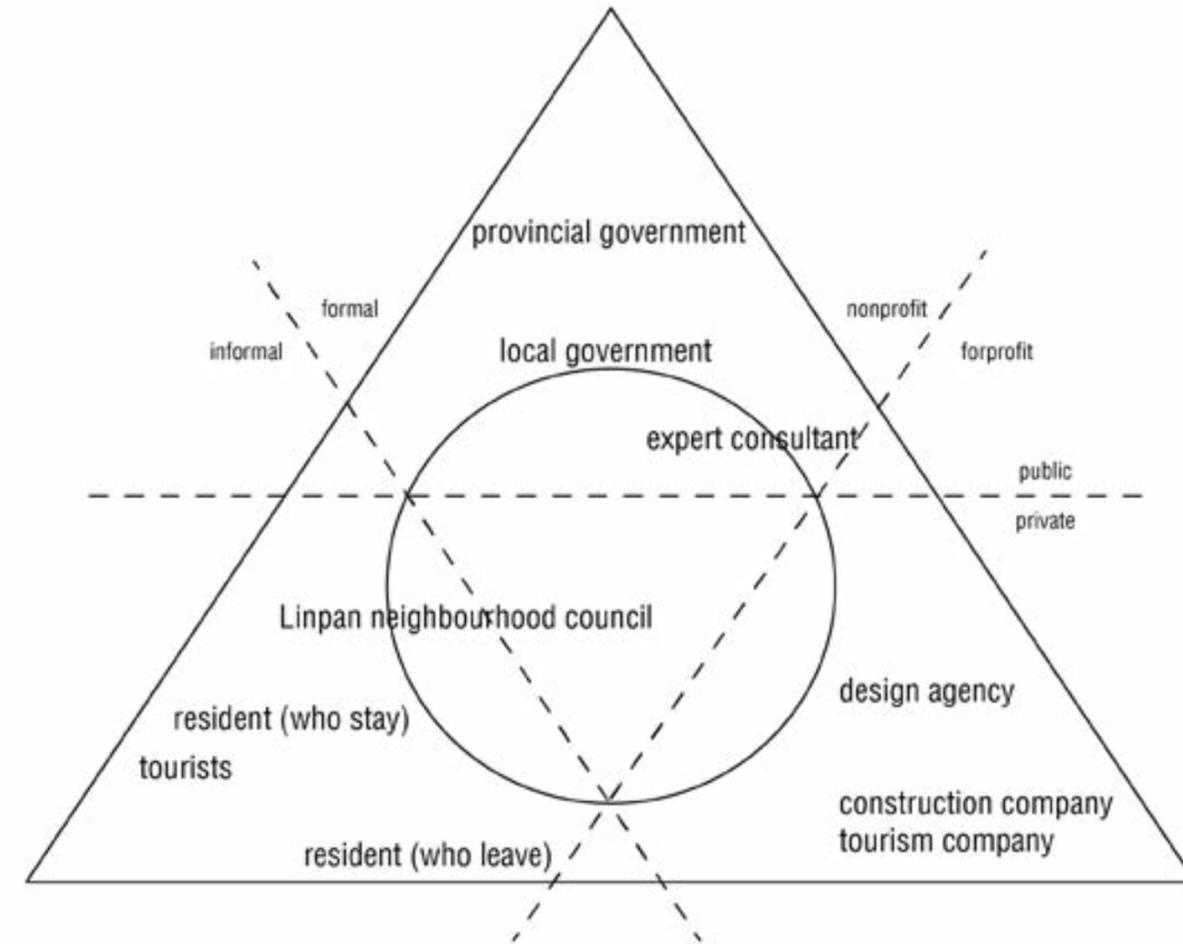
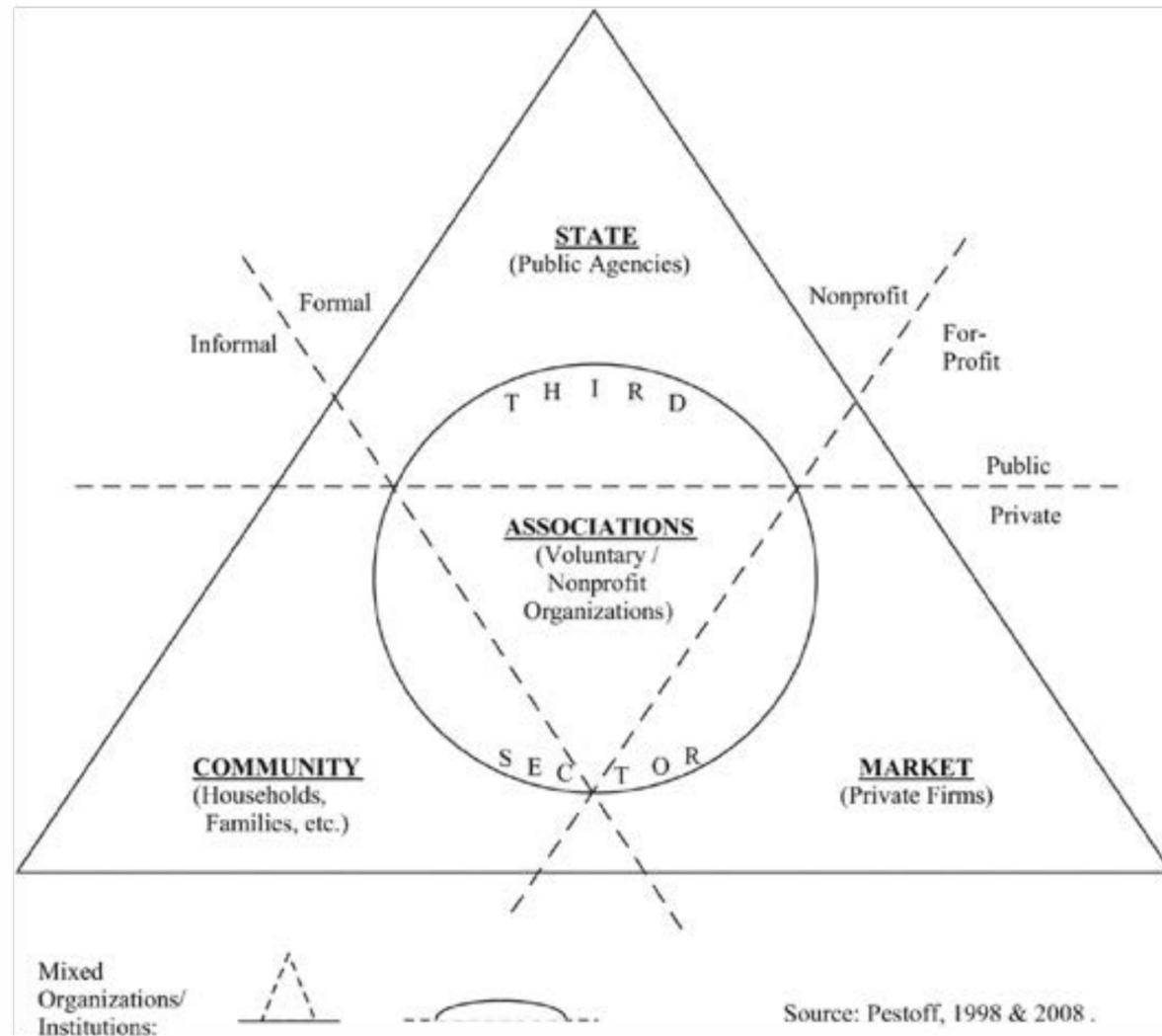
Disappear?

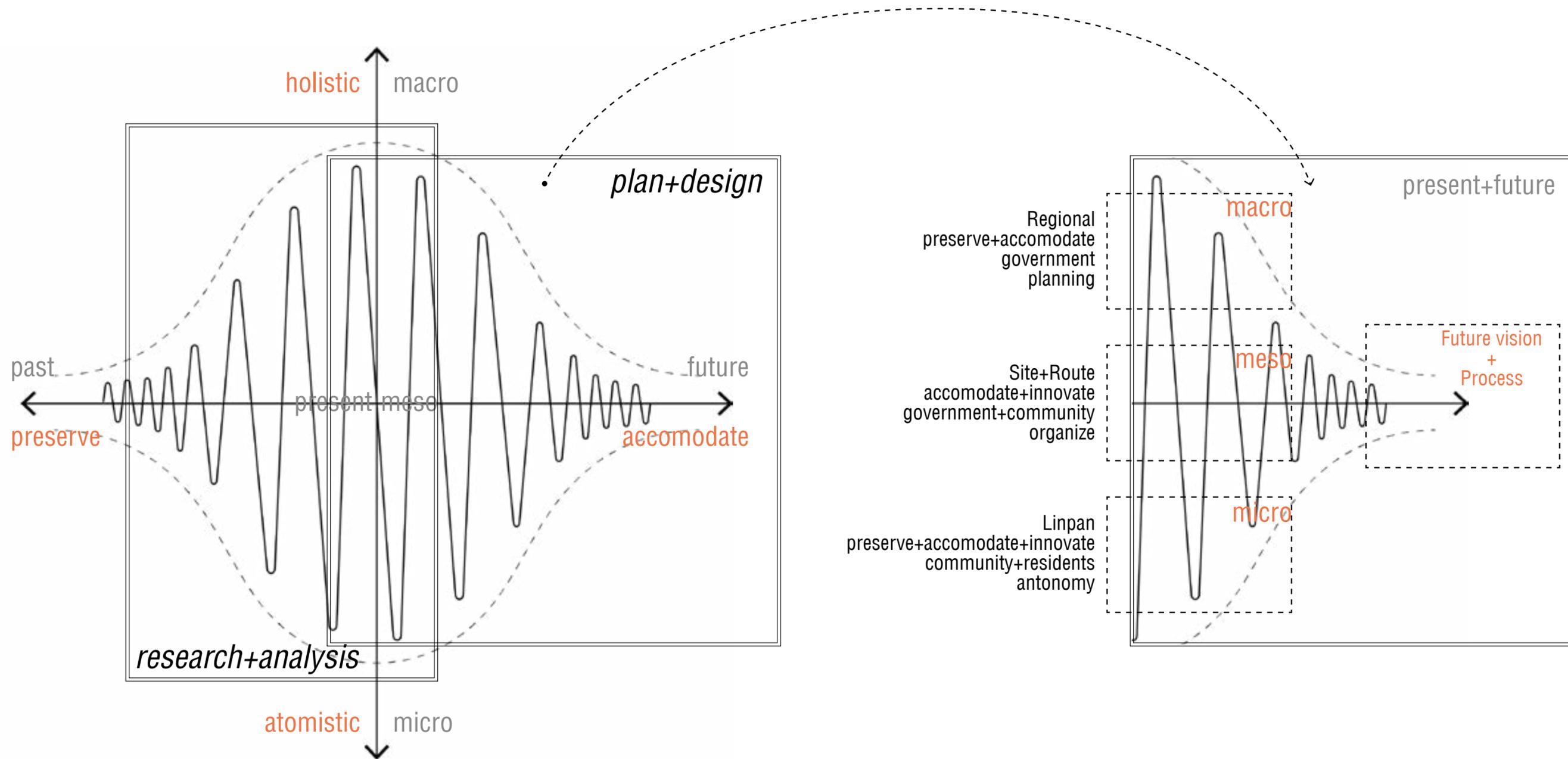


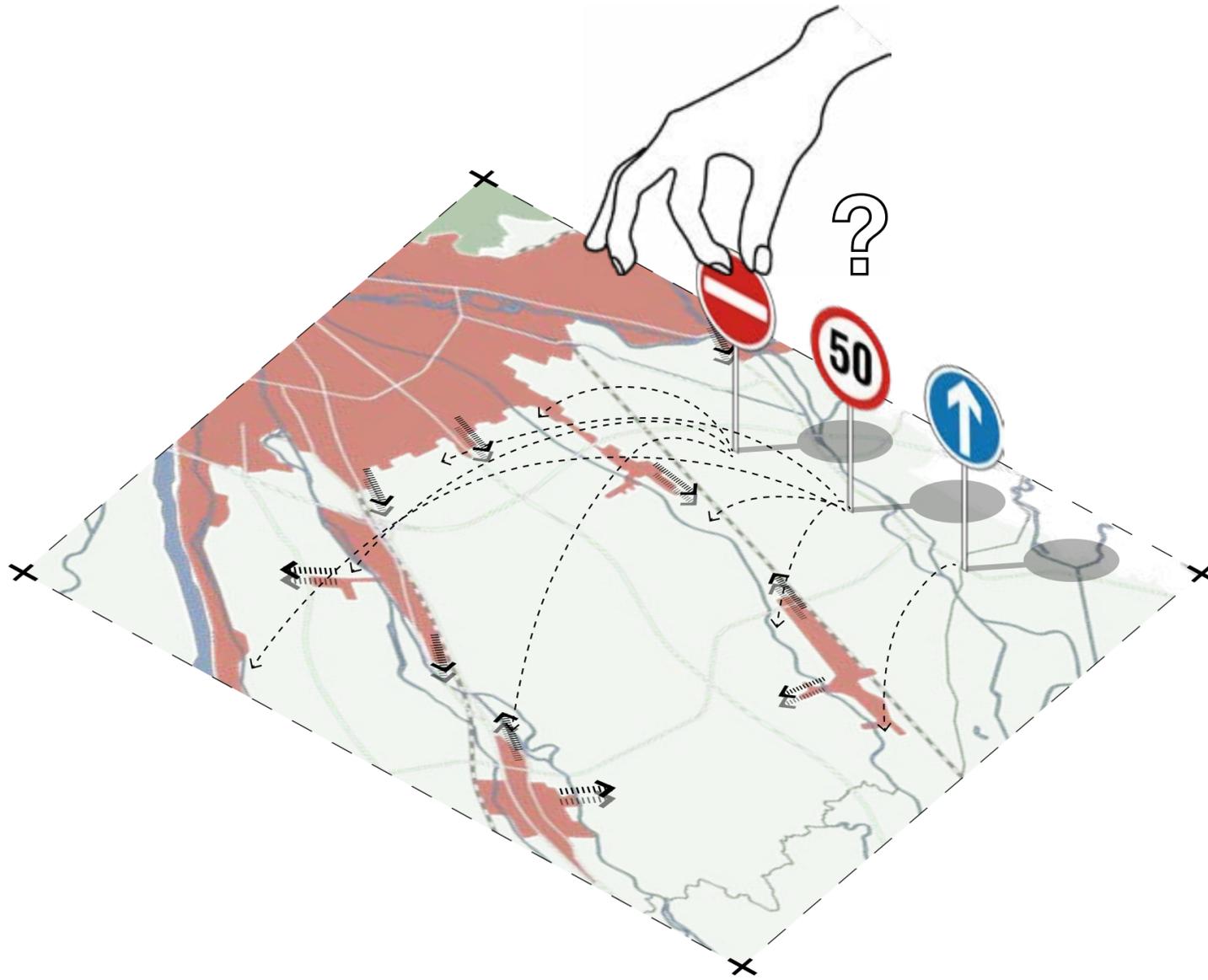
**Holistic
Landscape
Concept**

In studying the landscape as a whole, we see it as a whole, a system that is greater than the sum of its parts. Before we can understand the parts, we need to understand the whole.

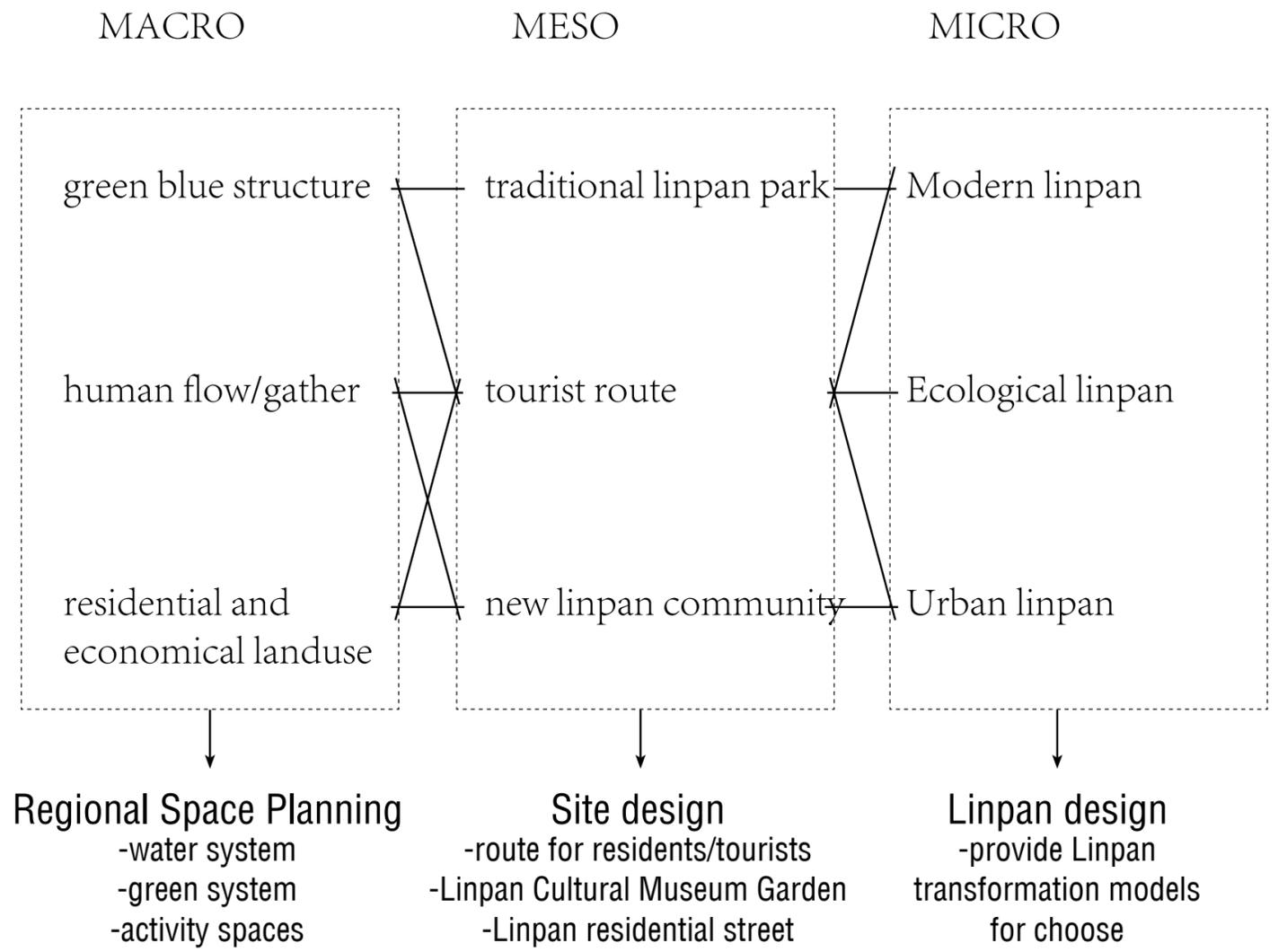






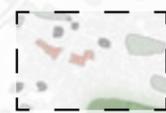


PRESERVE
 ACCOMODATE
 INNOVATE





Micro Linpan

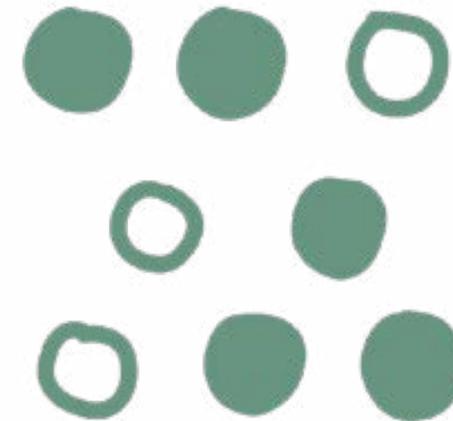


-provide Linpan transformation models for choose



- farmland
- courtyard house
- vegetable garden
- poultry house
- tomb
- waterway
- unpaved road

"PARTLY CHANGE"



SOME LINPANS CHANGE,
OTHERS REMAIN THE SAME.



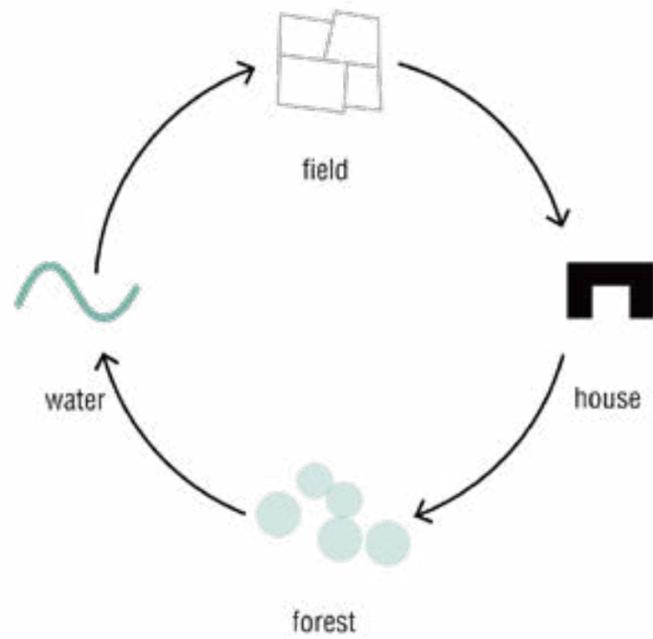
A PART OF LINPAN CHANGES,
THE REST REMAINS THE SAME.

*The assessment of the **current quality of Linpan** and **the residents' individual will** determine which Linpan will be changed and what parts will be changed.*

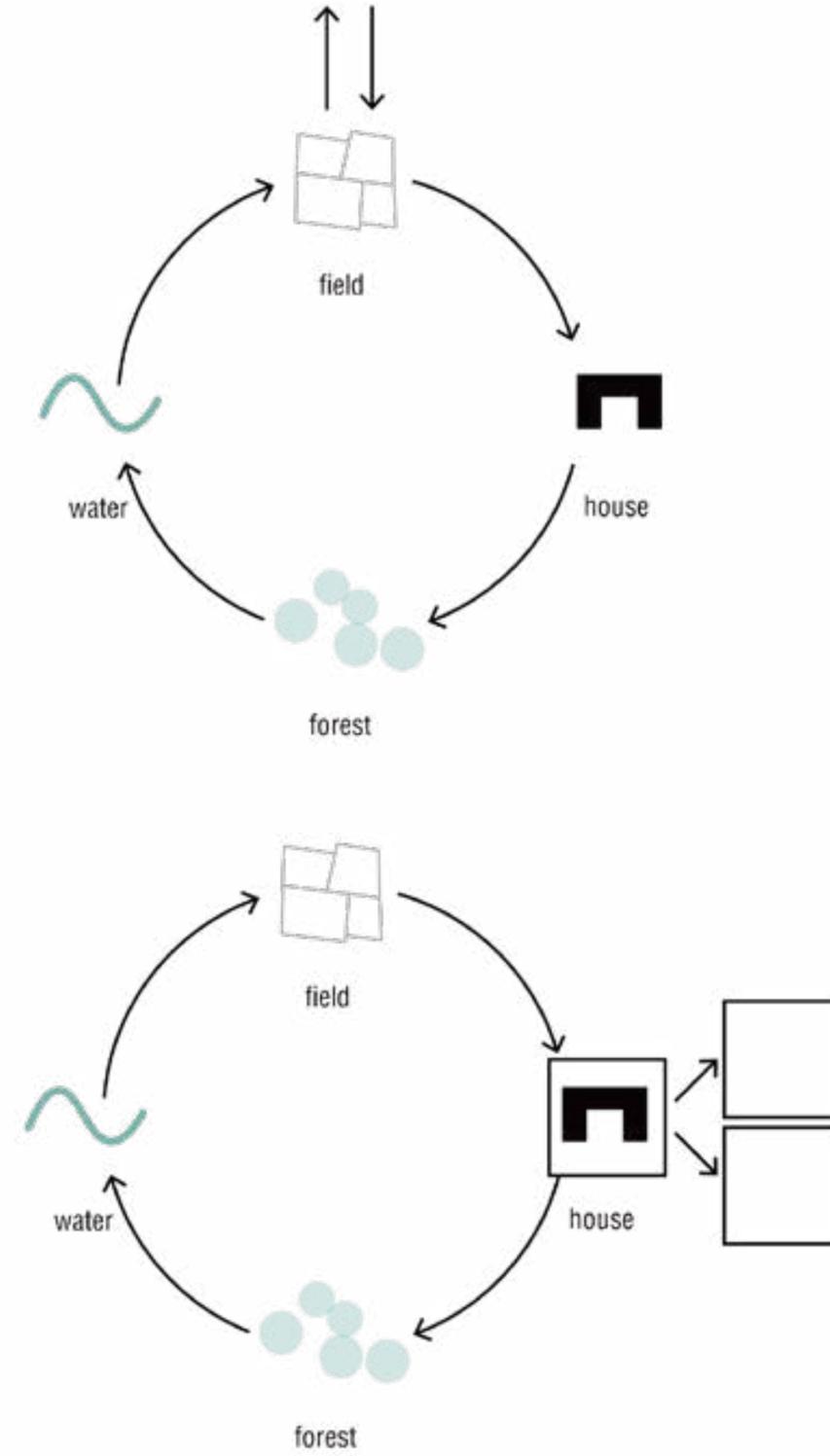
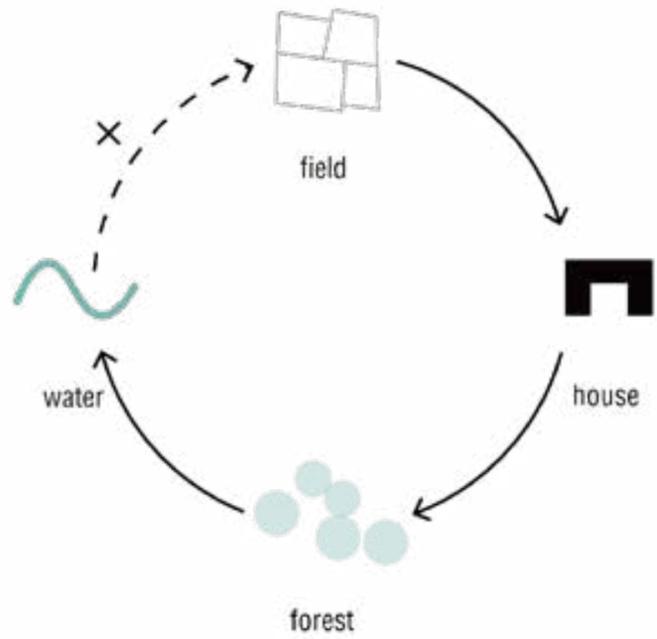
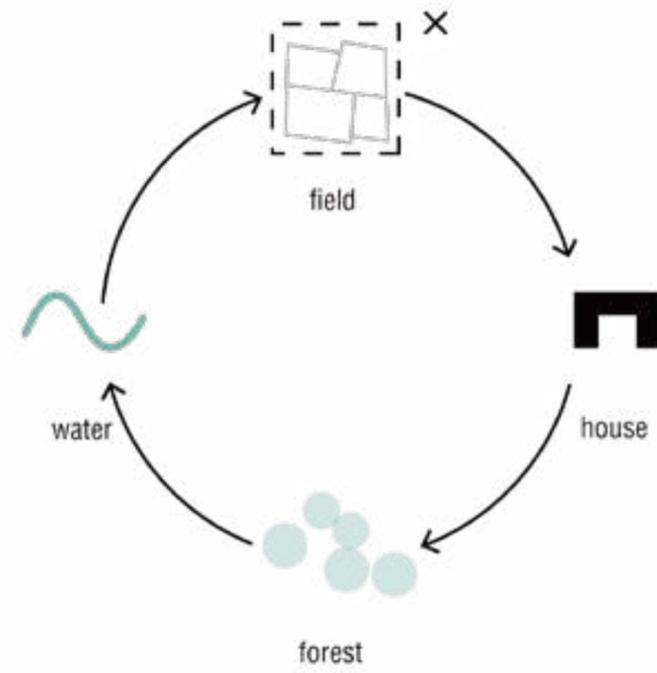
Extract the essential characteristics of Linpan

Most essential feature

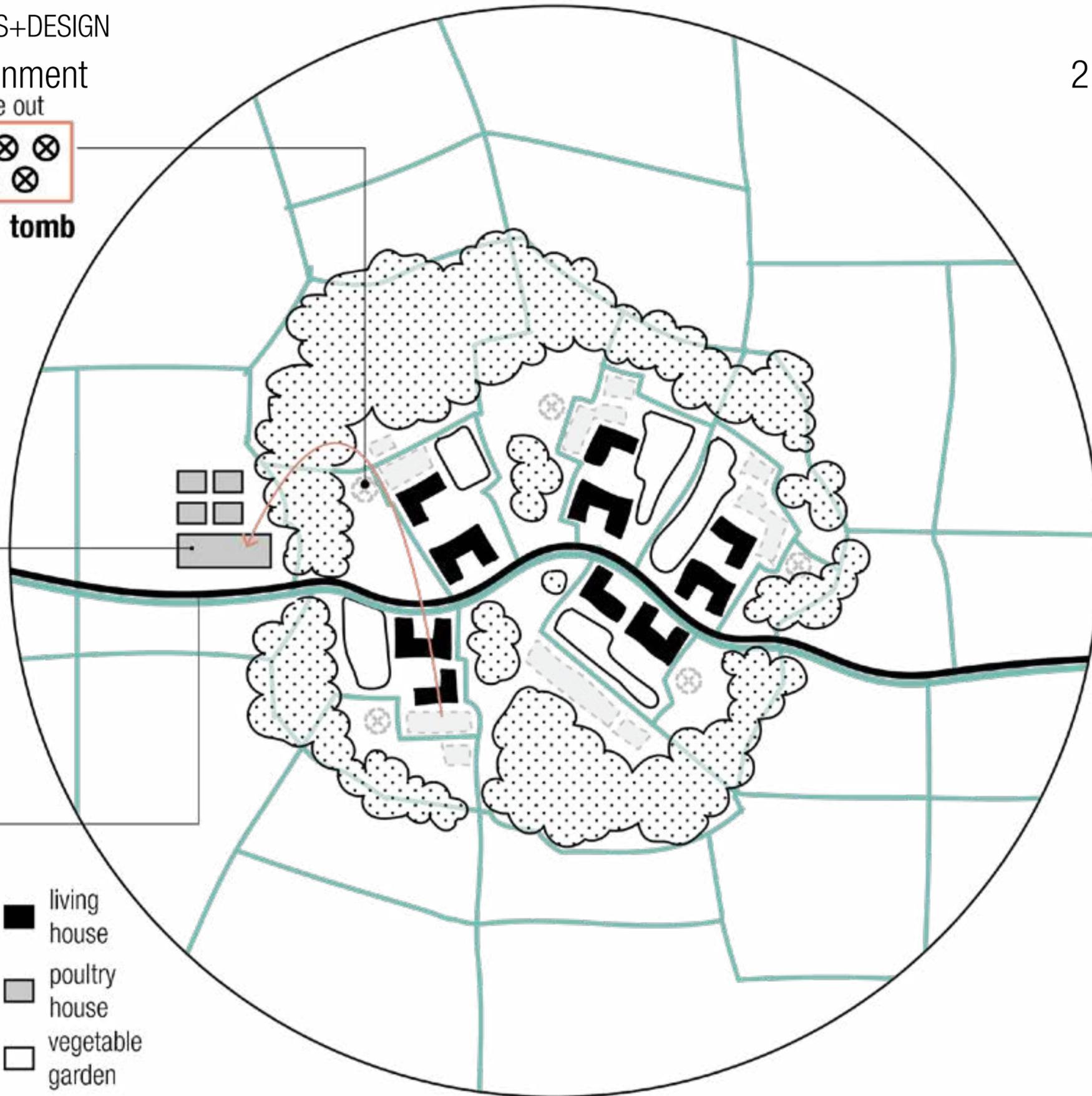
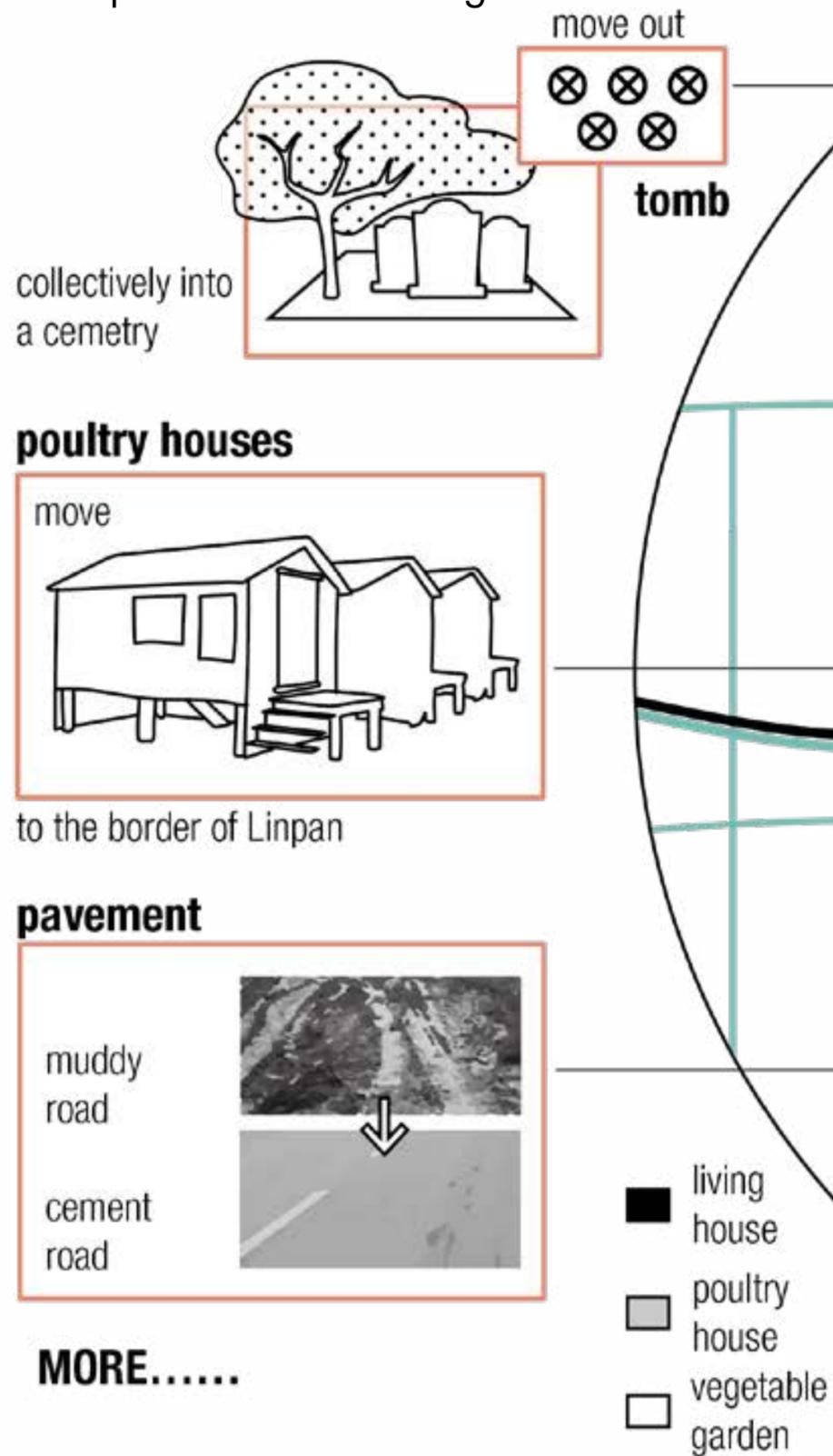
| | Forest-aqua landscape | Linpan structure | Family based | Agriculture | Lifestyle&landuse |
|------------------------------------|-----------------------|------------------|---------------|---------------|-------------------|
| Linpan transformation types | | | | | |
| 0. Traditional Linpan | Keep | Keep | Keep | Keep | Keep |
| 1. Modern Linpan | Keep | Keep | Keep | Keep | Change |
| 2. Ecological Linpan | Keep | Keep | Keep | Change | Change |
| 3. Urban Linpan | Keep | Keep | Change | Change | Change |



**ORIGIN
CIRCULATION**

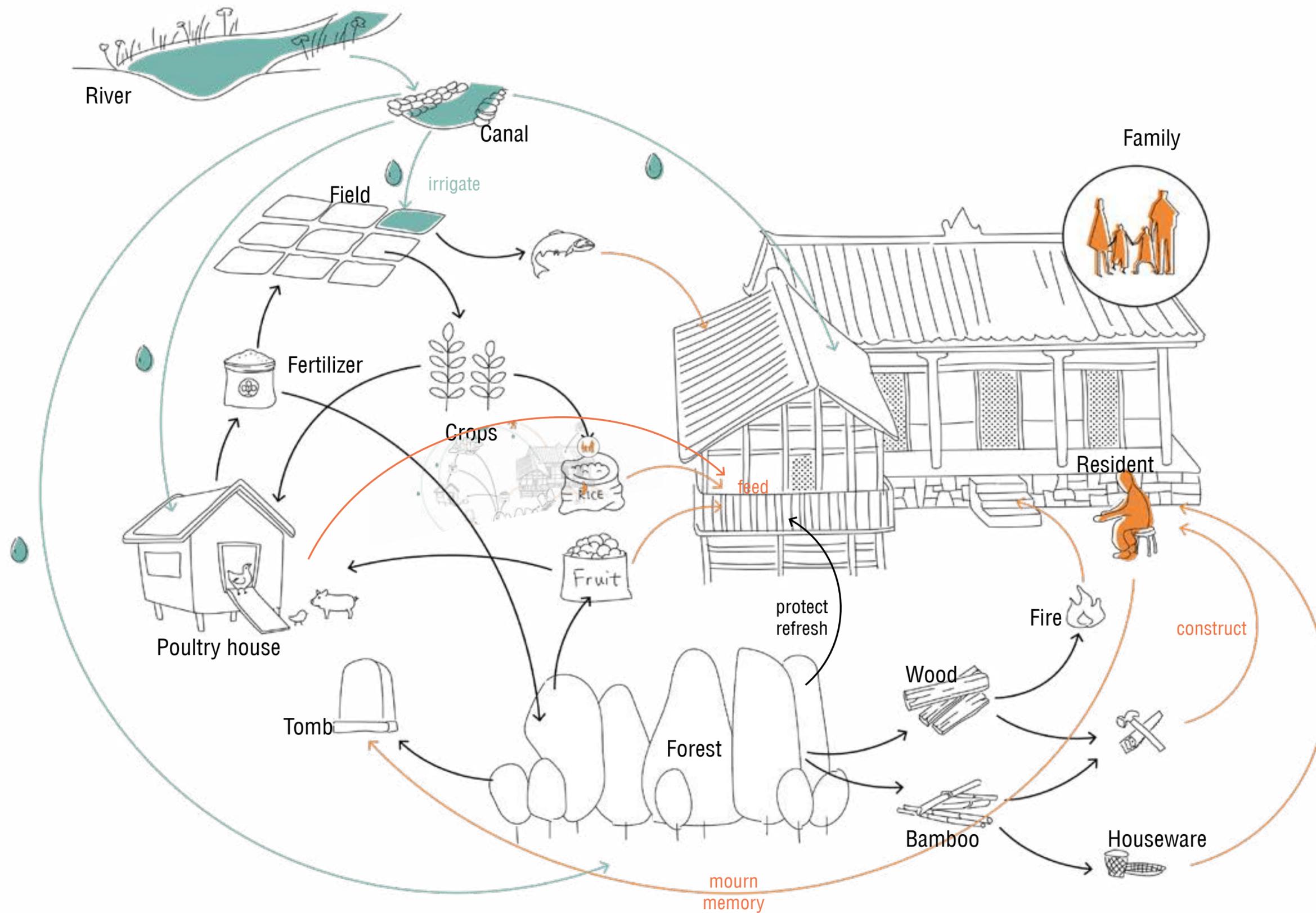


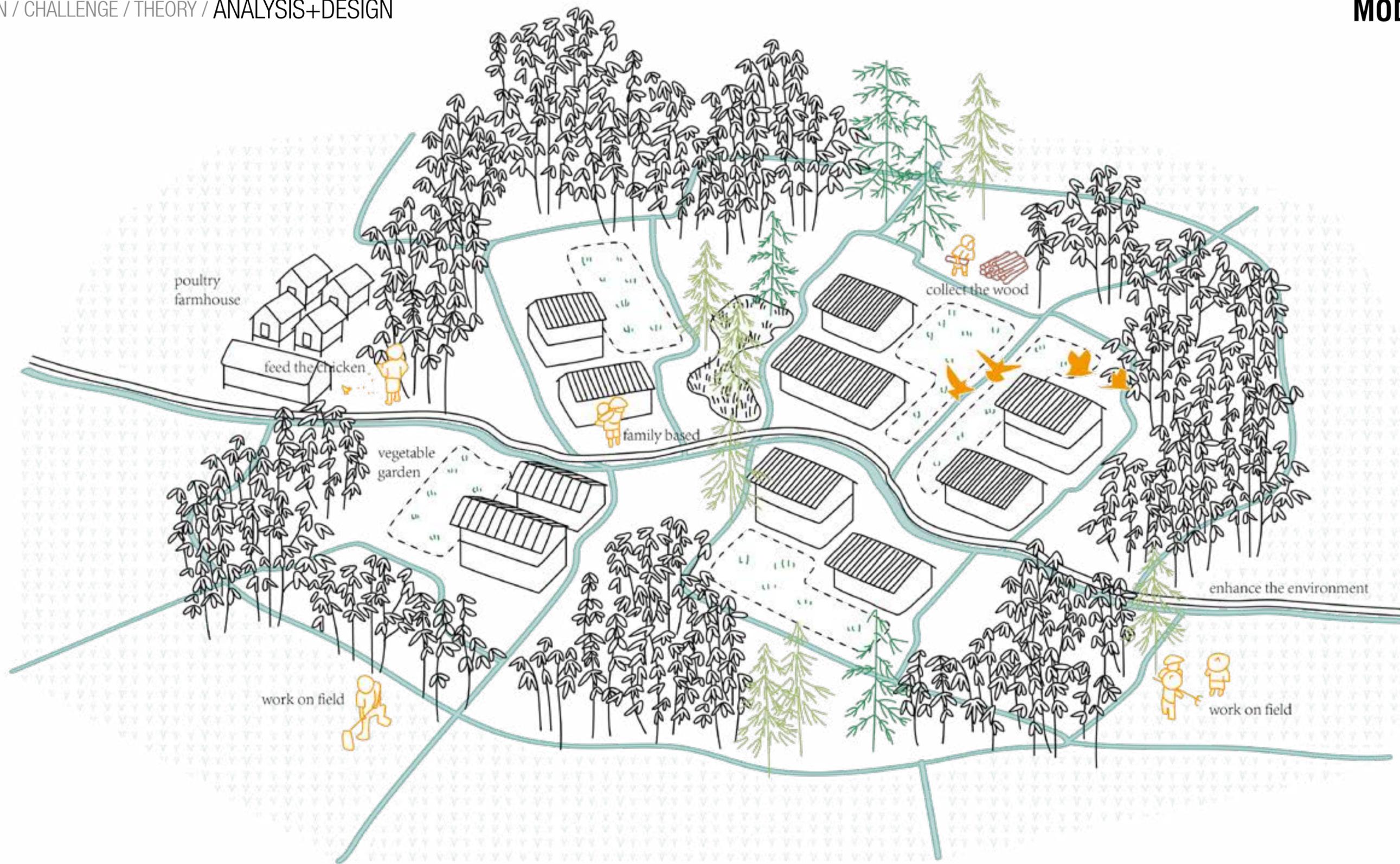
1. improvement of living environment



2. changes in living income

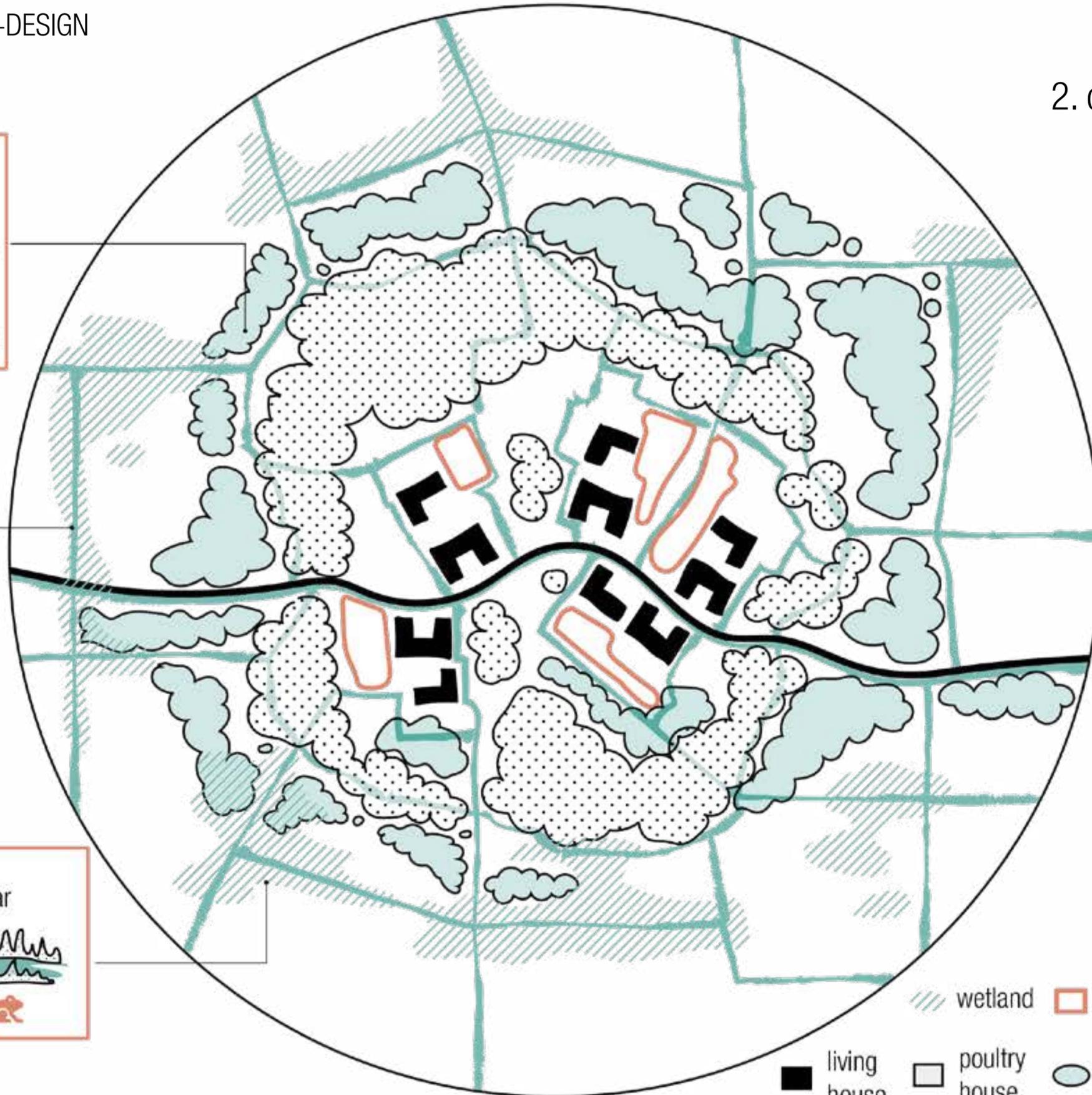
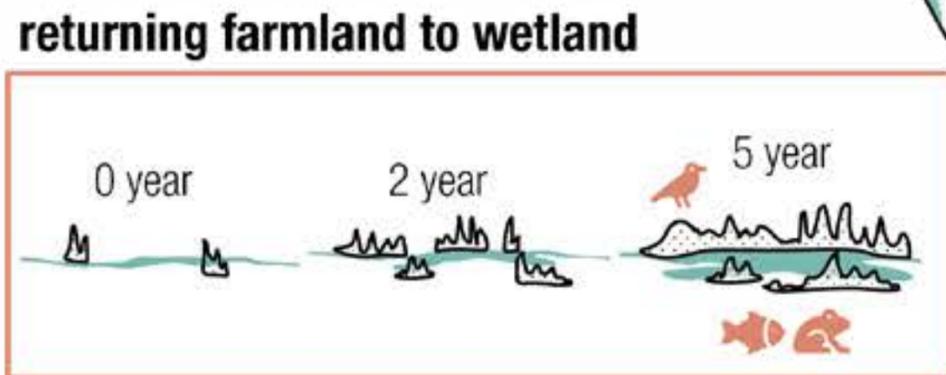
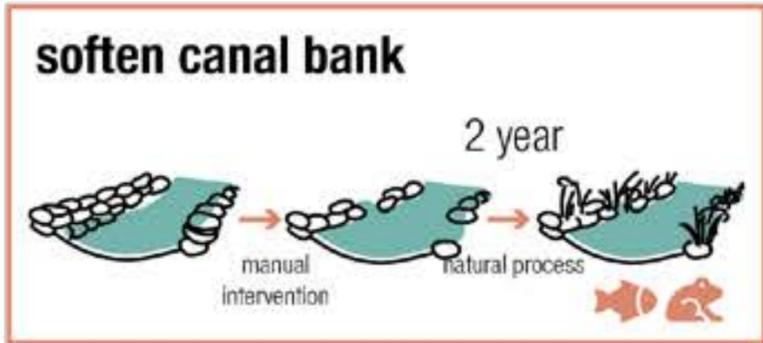
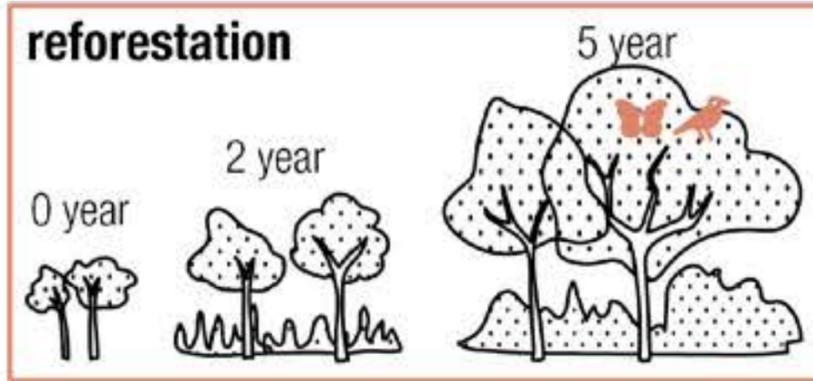






1. rewilding

2. changes in living income

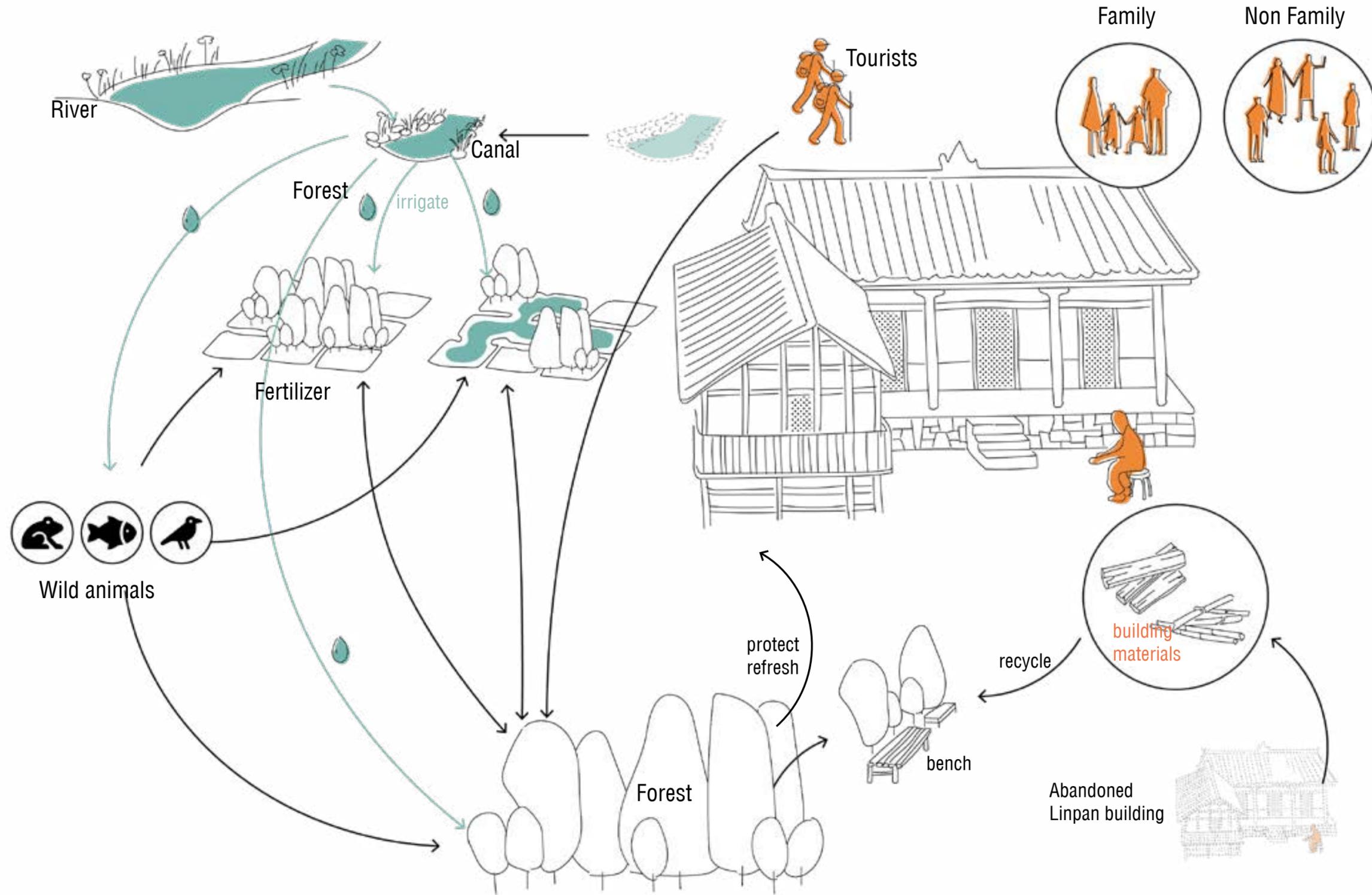


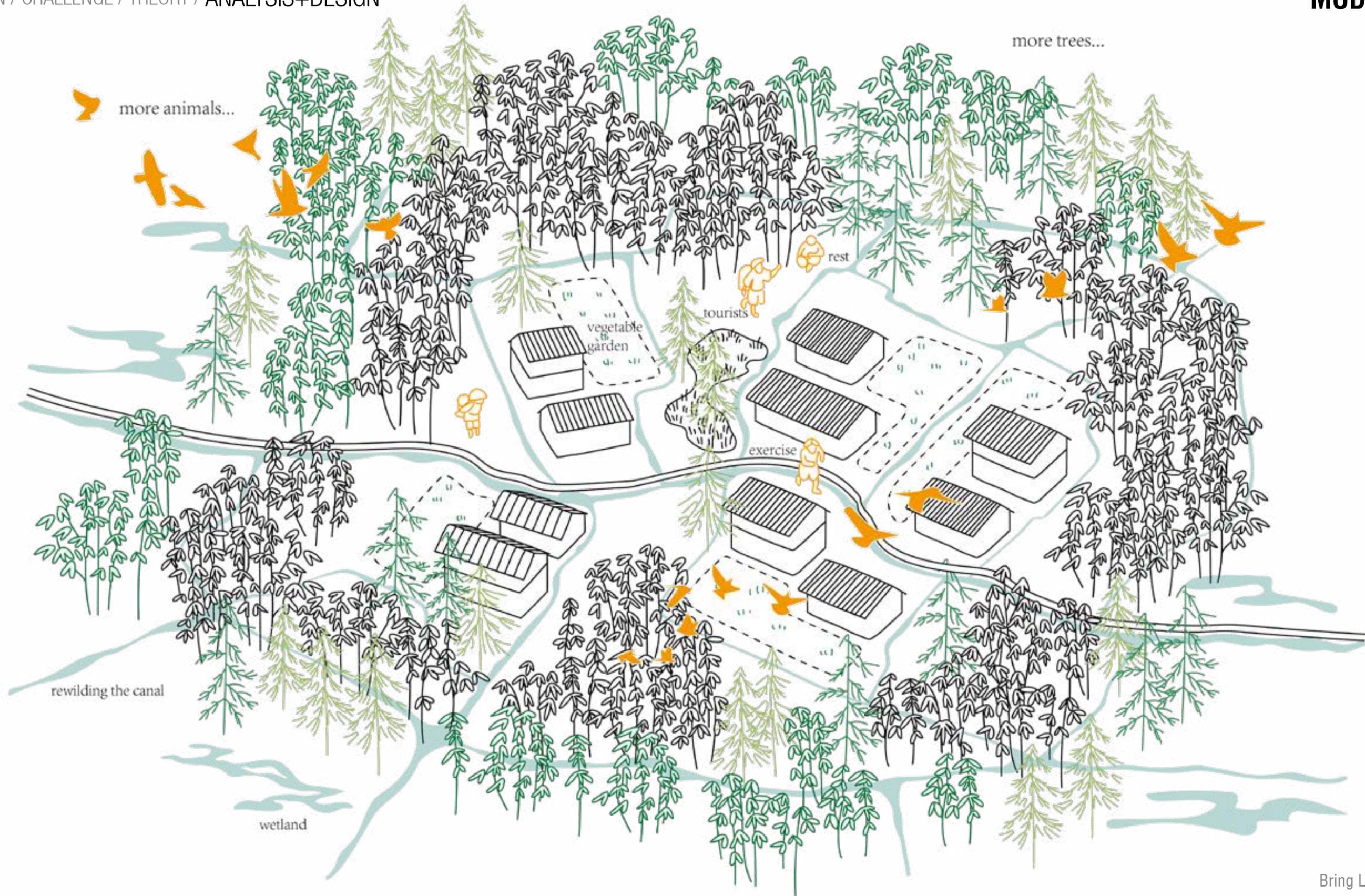
poultry house
 living house
 new forest
 wetland
 garden

Live on Linpan



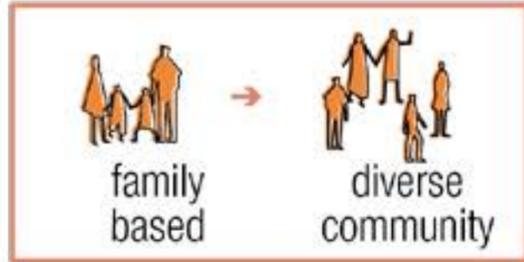
Live on Society?





1. Main function: residence

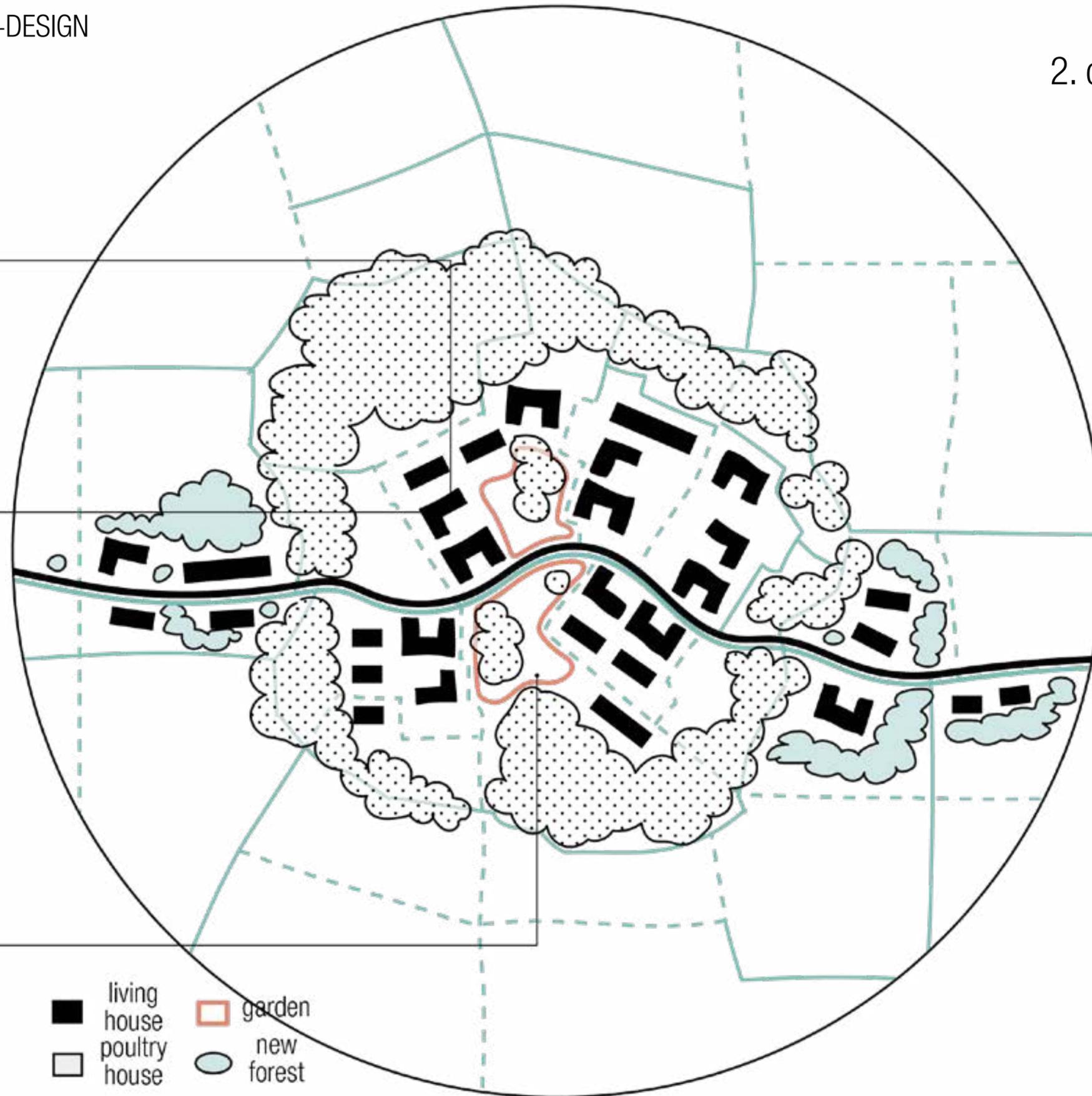
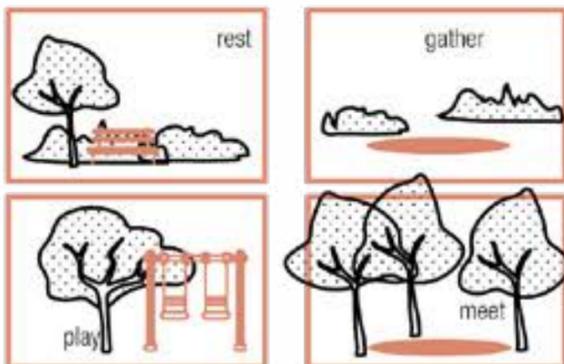
residents



buildings



activities



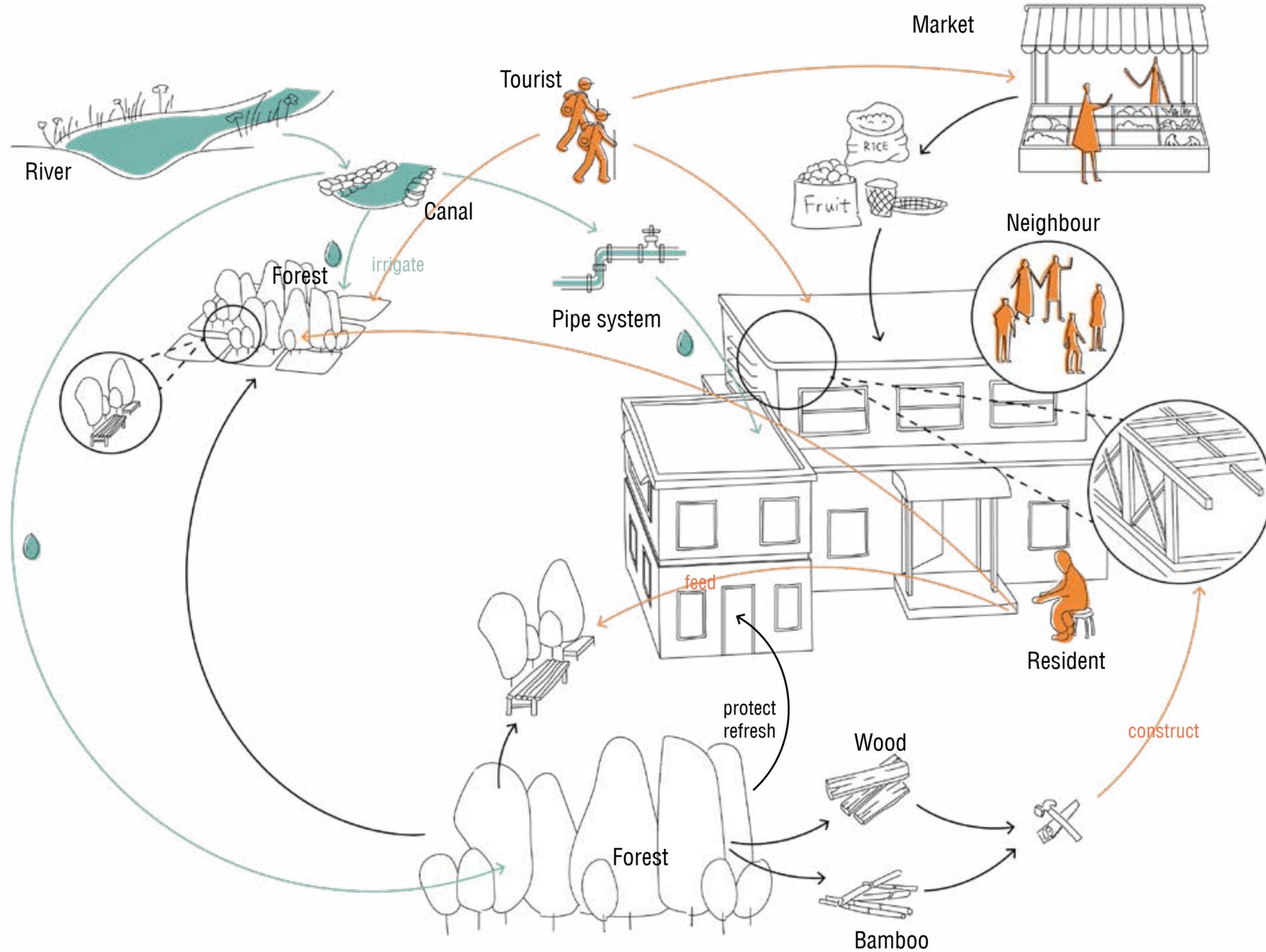
URBAN LINPAN

2. changes in living income

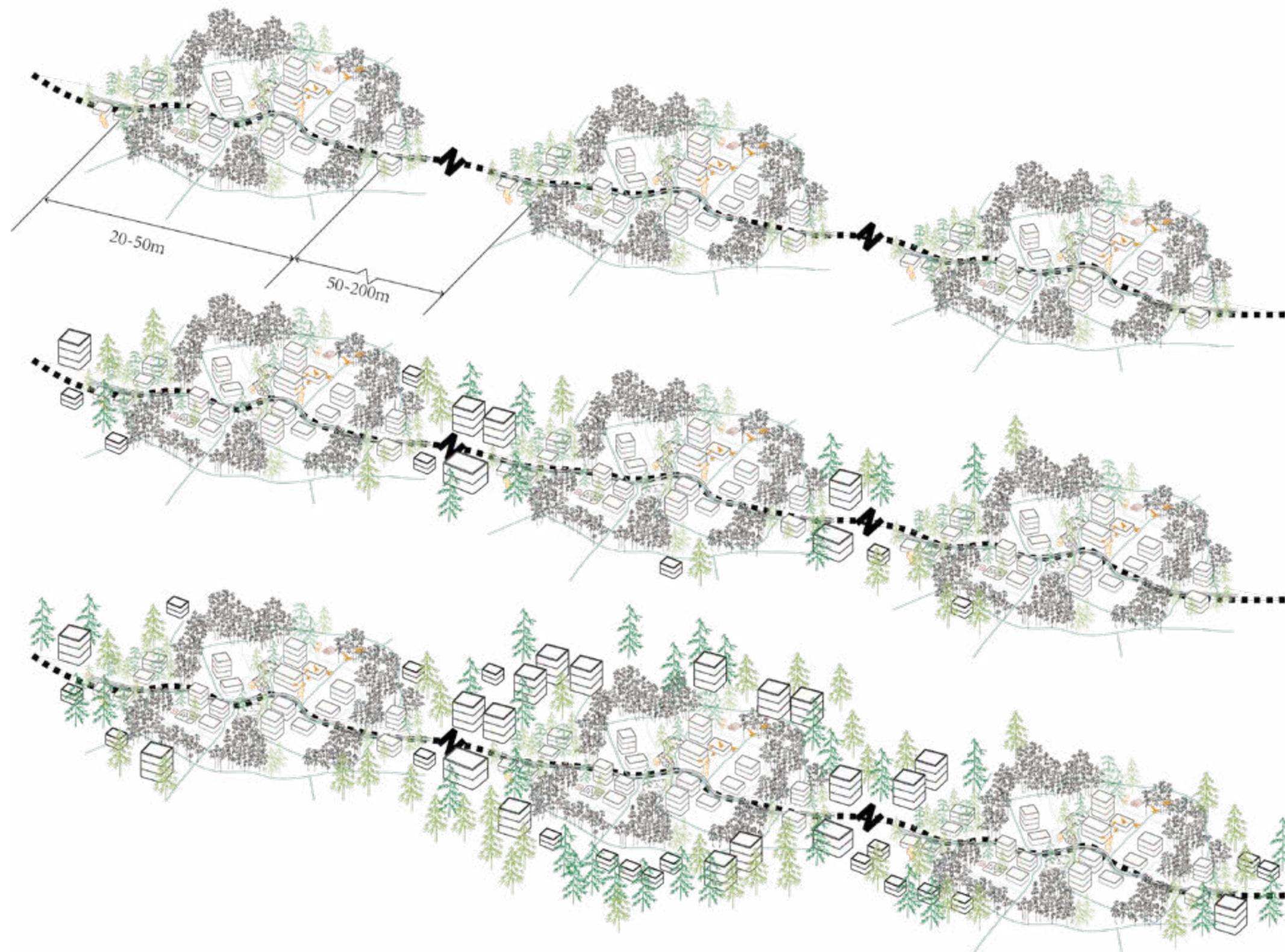
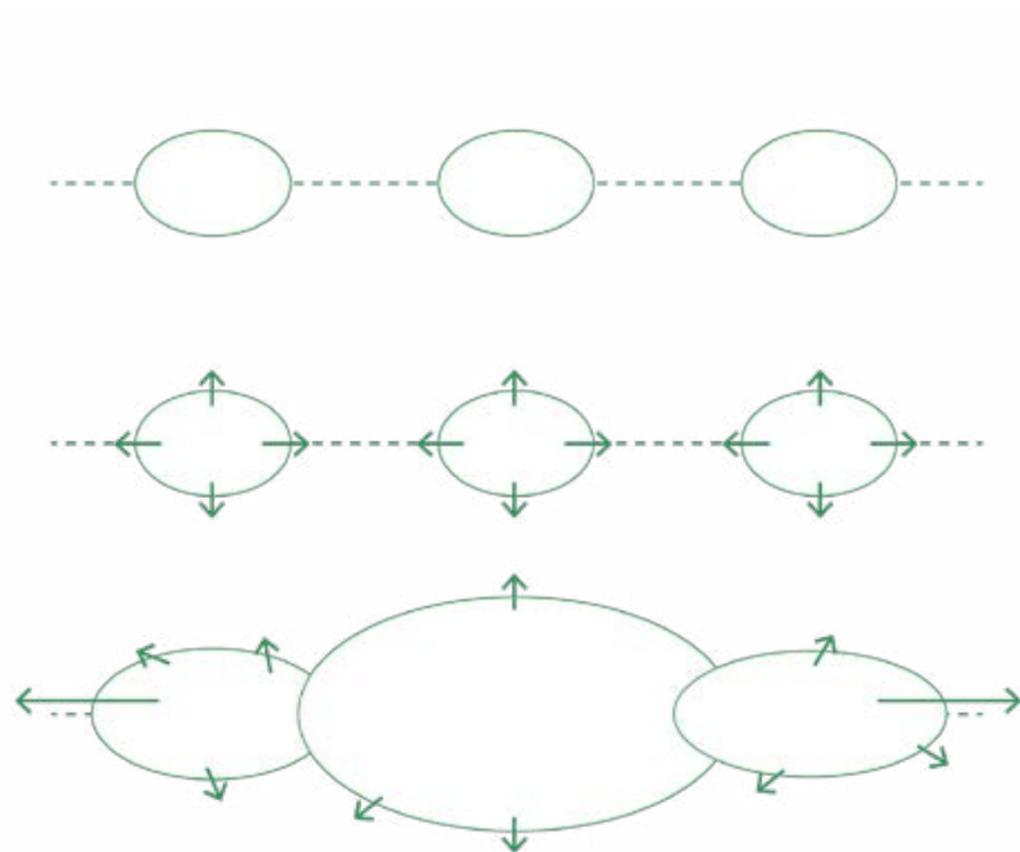
Live on Linpan

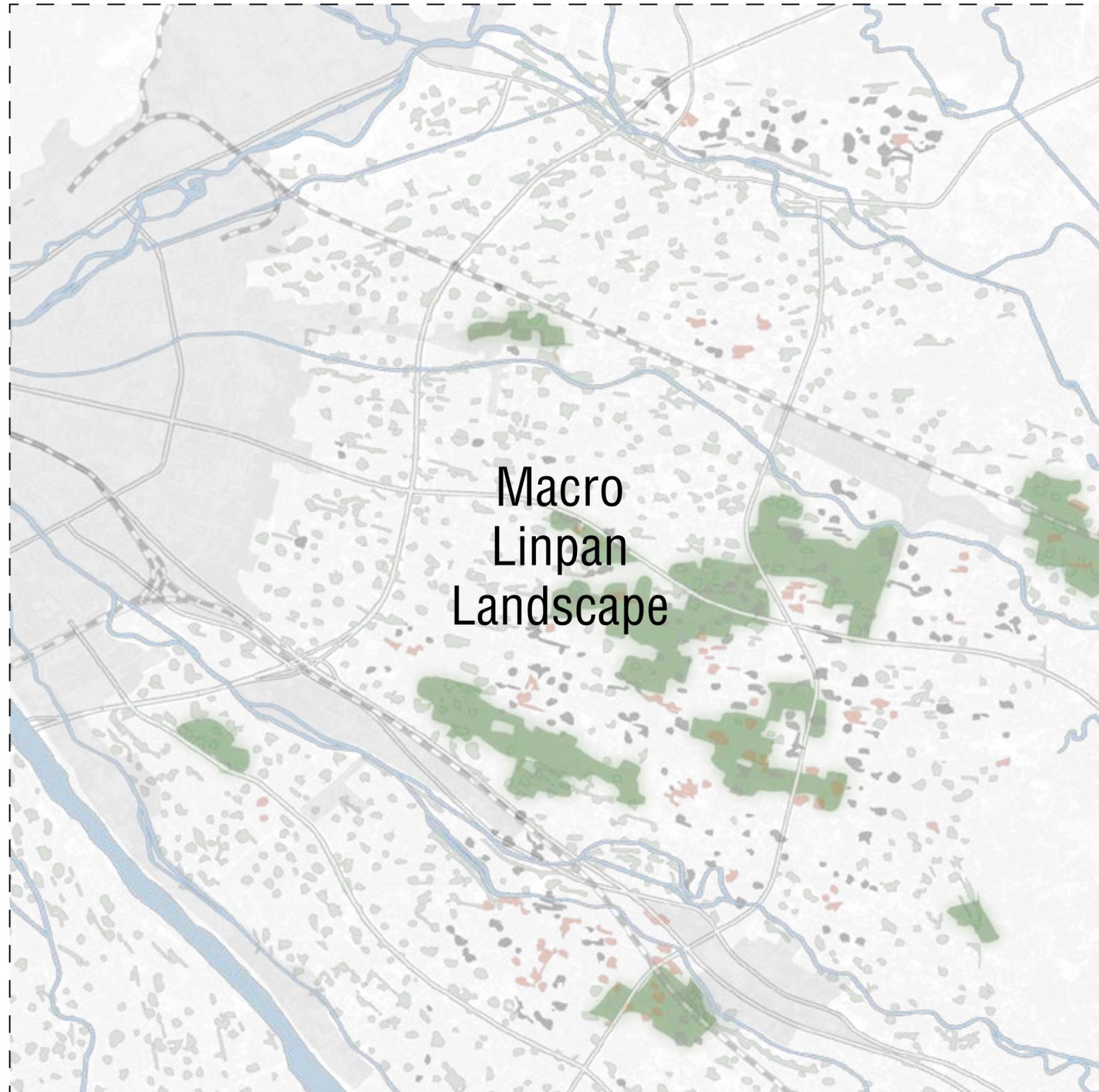


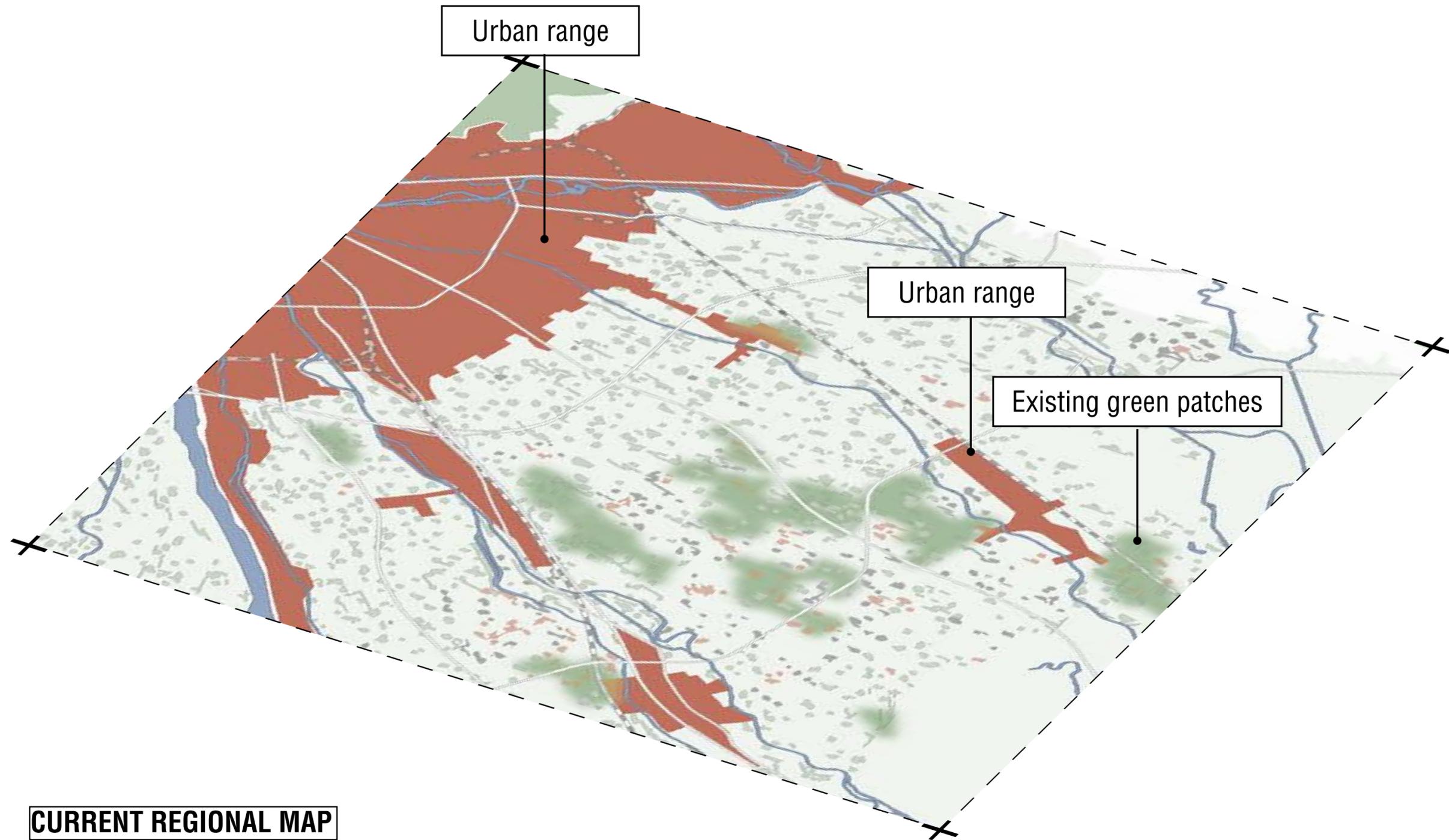
Live on Society?



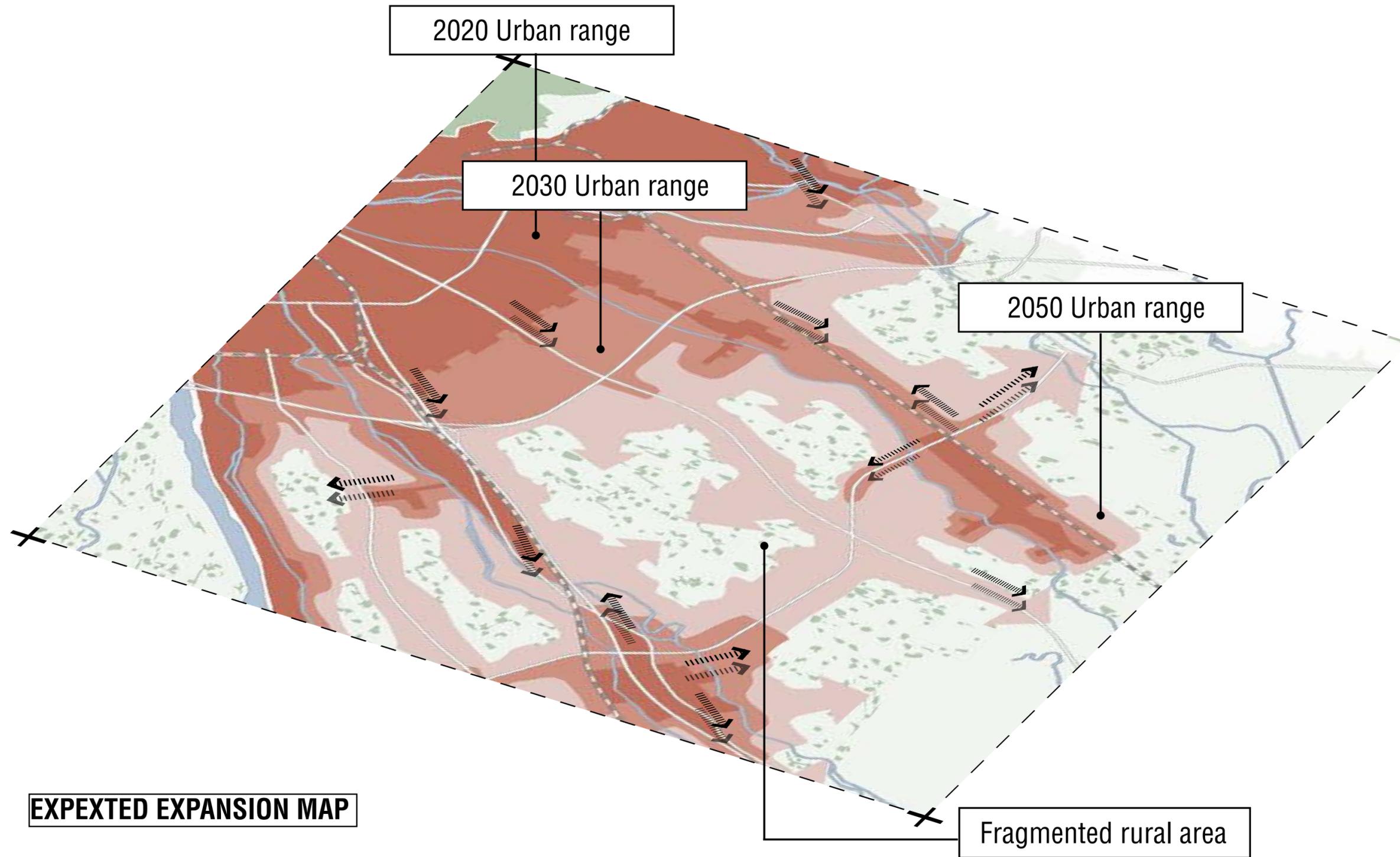








CURRENT REGIONAL MAP



GREEN-BLUE STRUCTURE MAP

Expanded canal

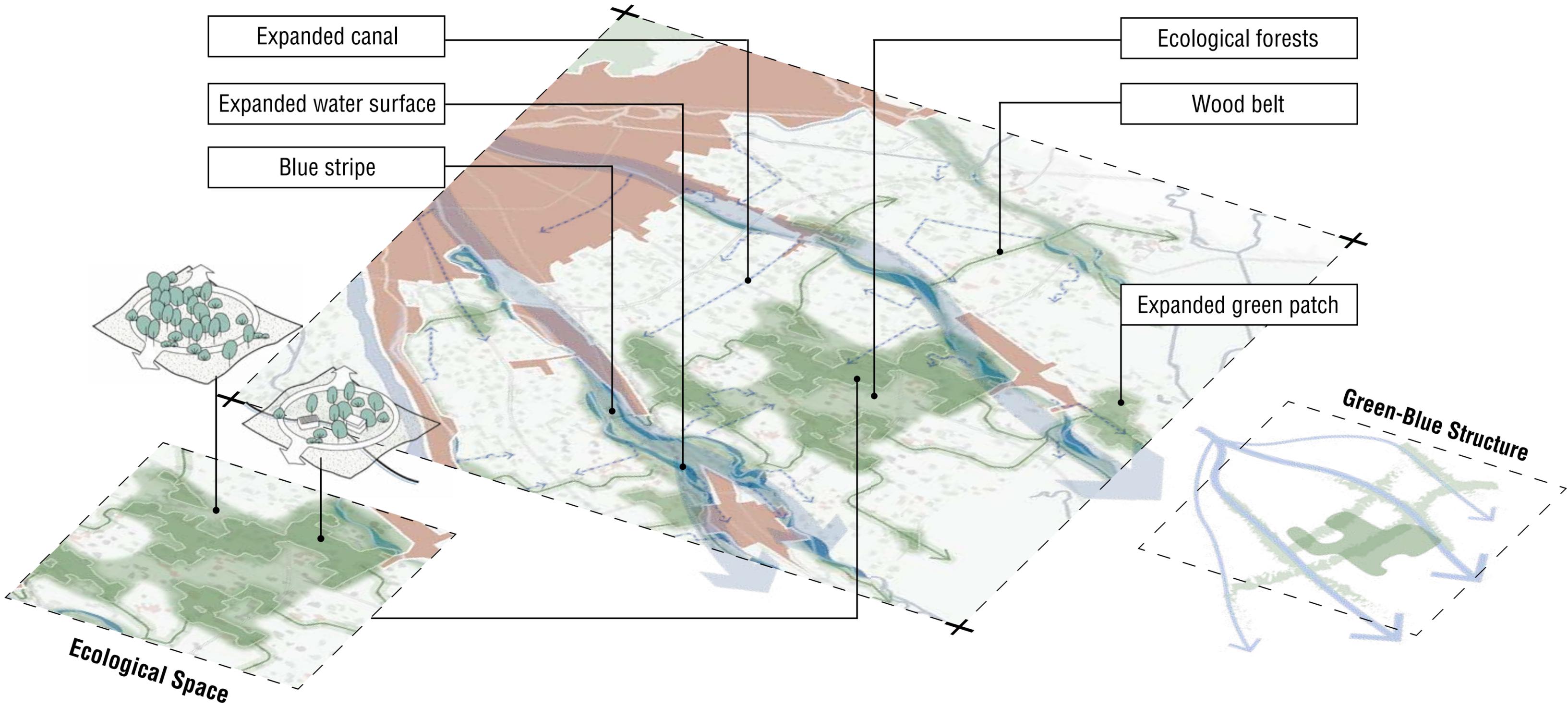
Expanded water surface

Blue stripe

Ecological forests

Wood belt

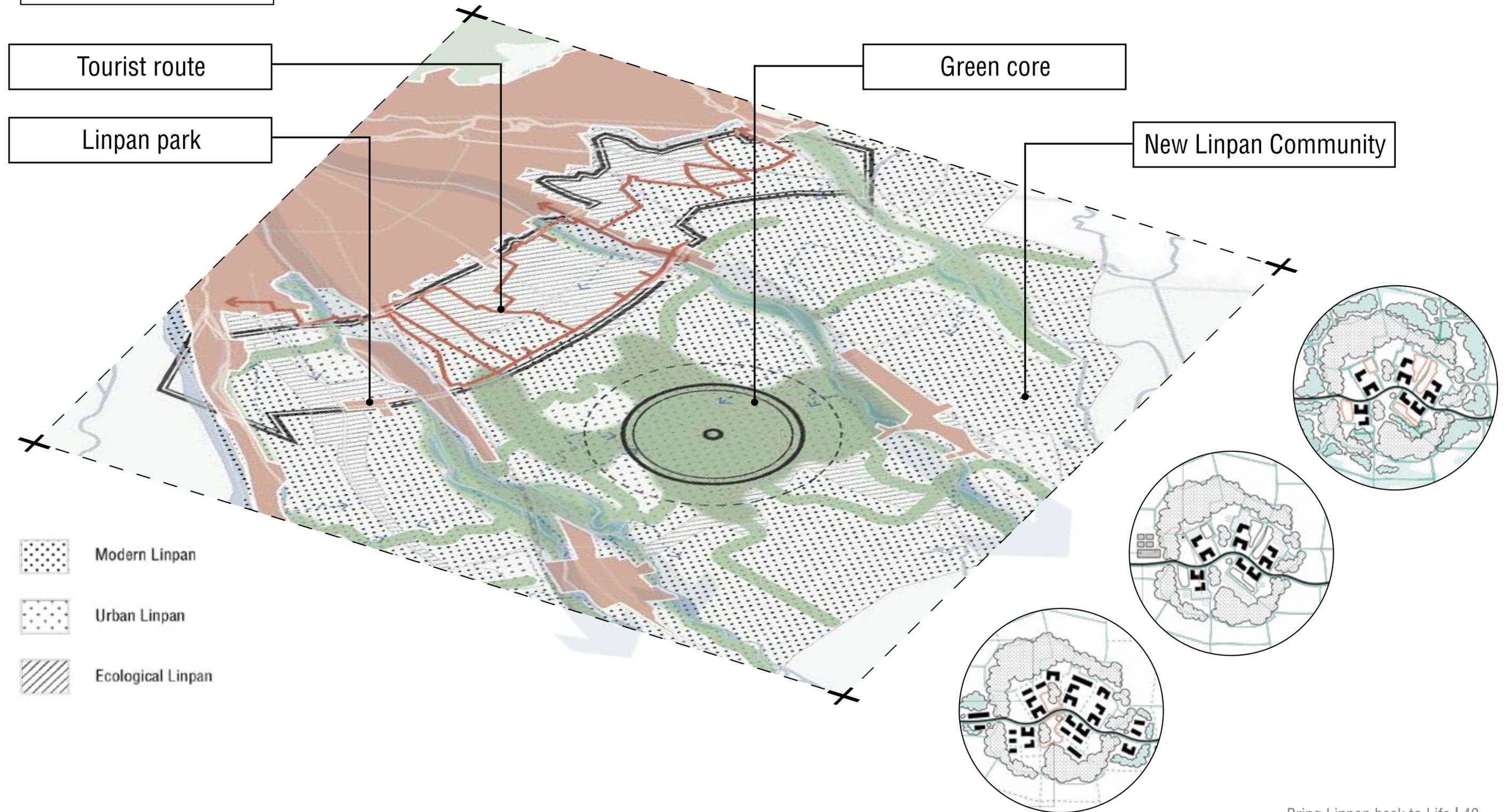
Expanded green patch



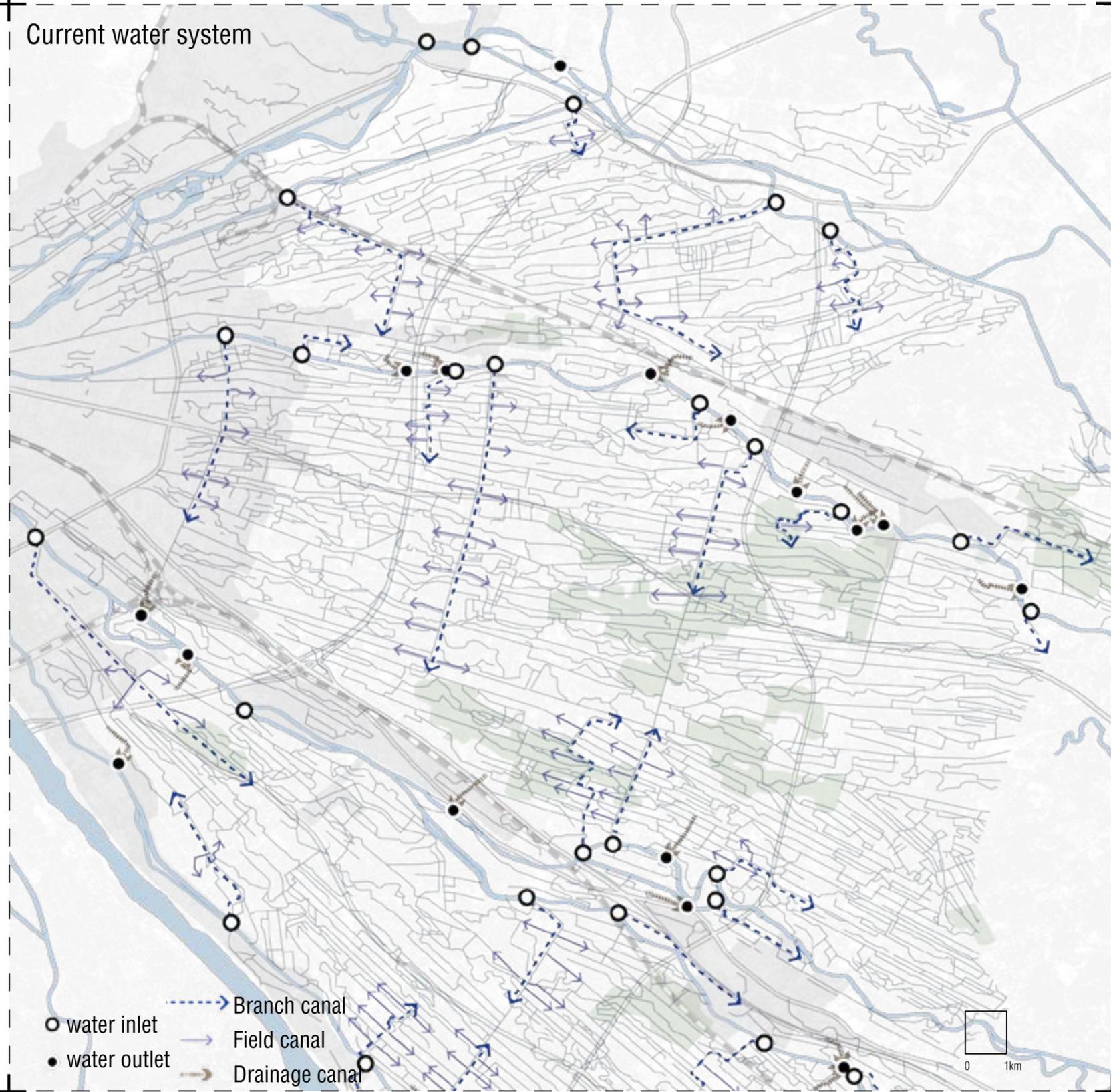
Ecological Space

Green-Blue Structure

REGIONAL ZONING MAP



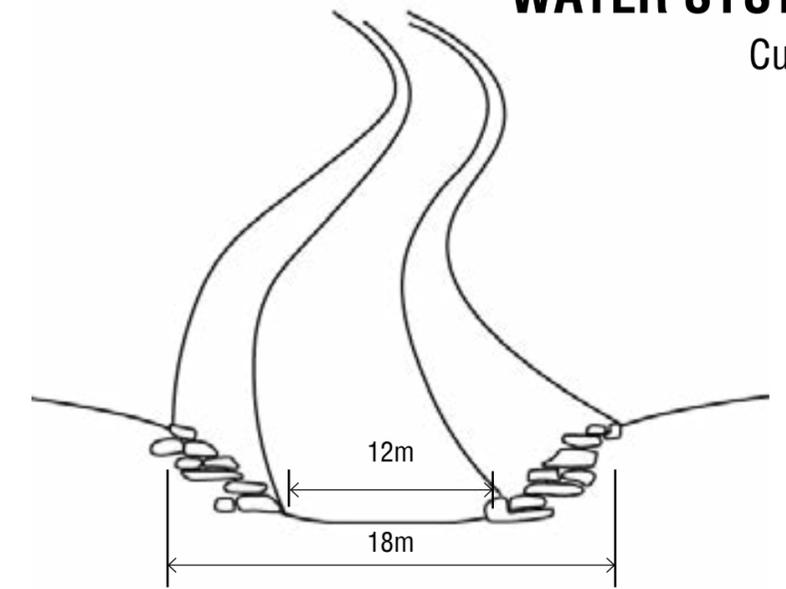
Current water system



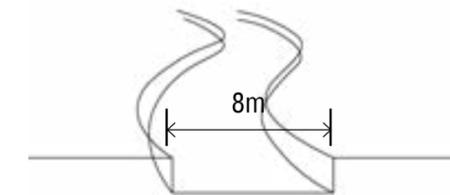
WATER SYSTEM

Current

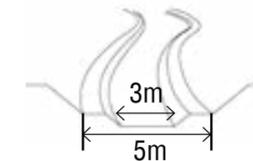
River



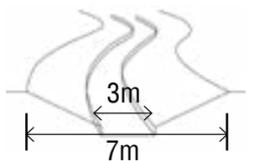
Branch canal



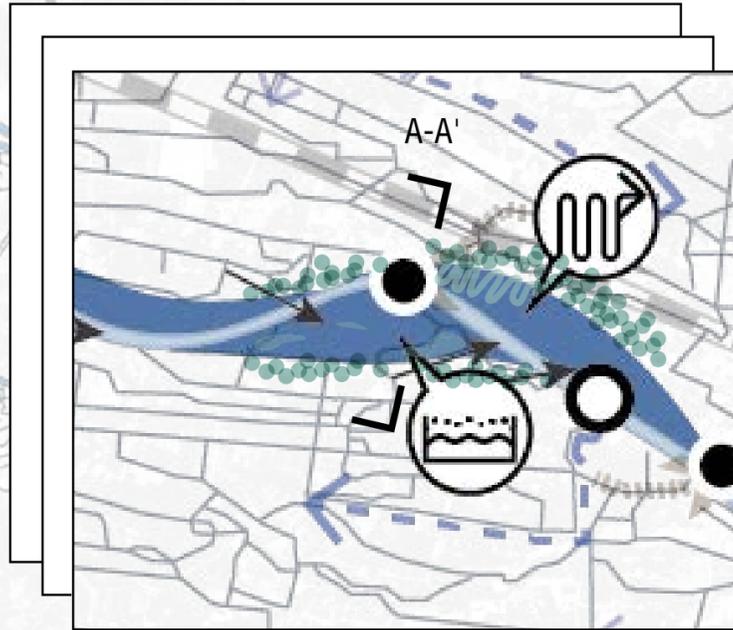
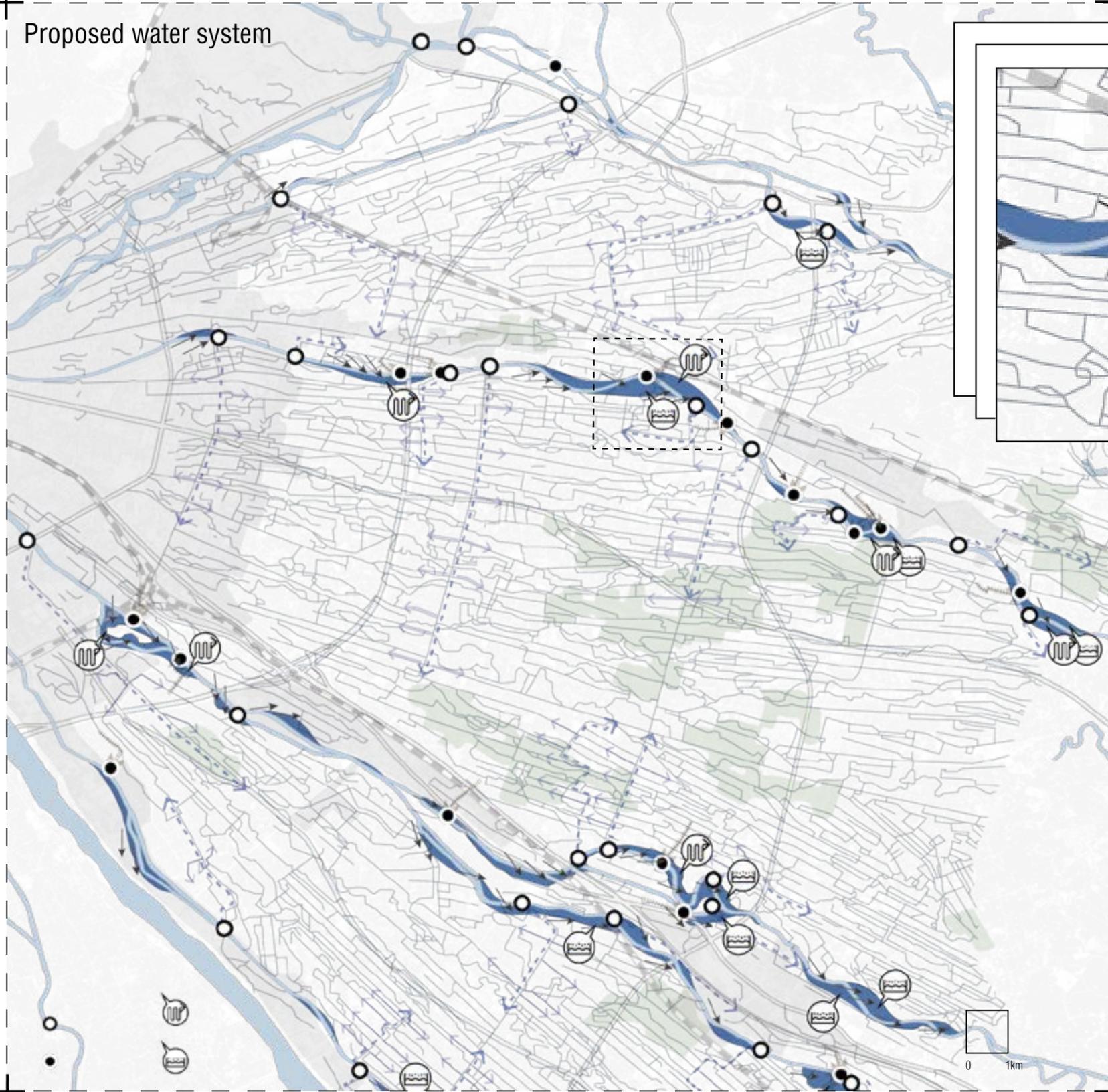
Field canal



Drainage canal



Proposed water system

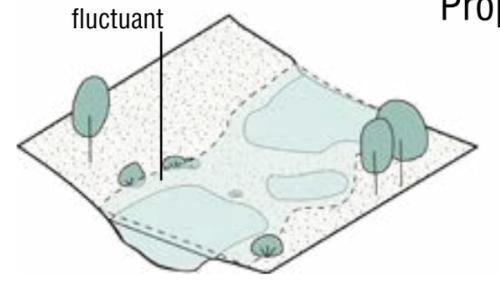


WATER SYSTEM

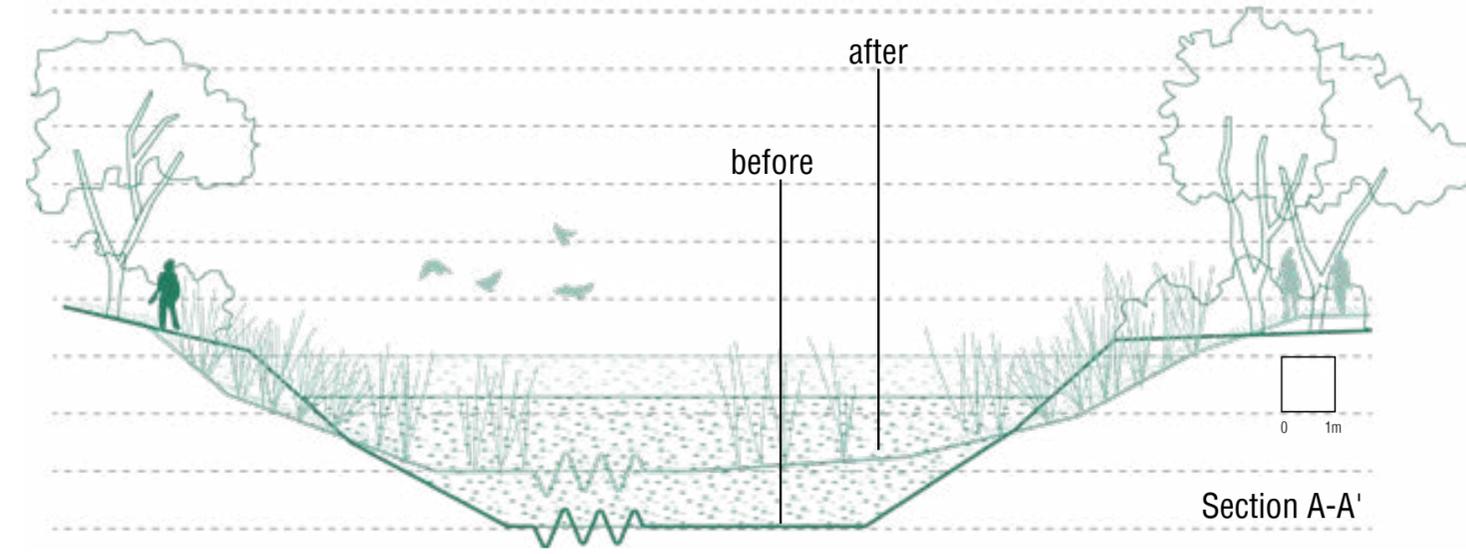
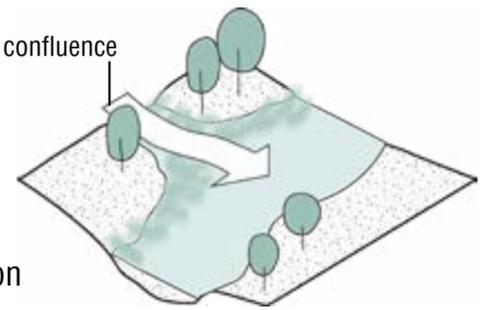
Proposed



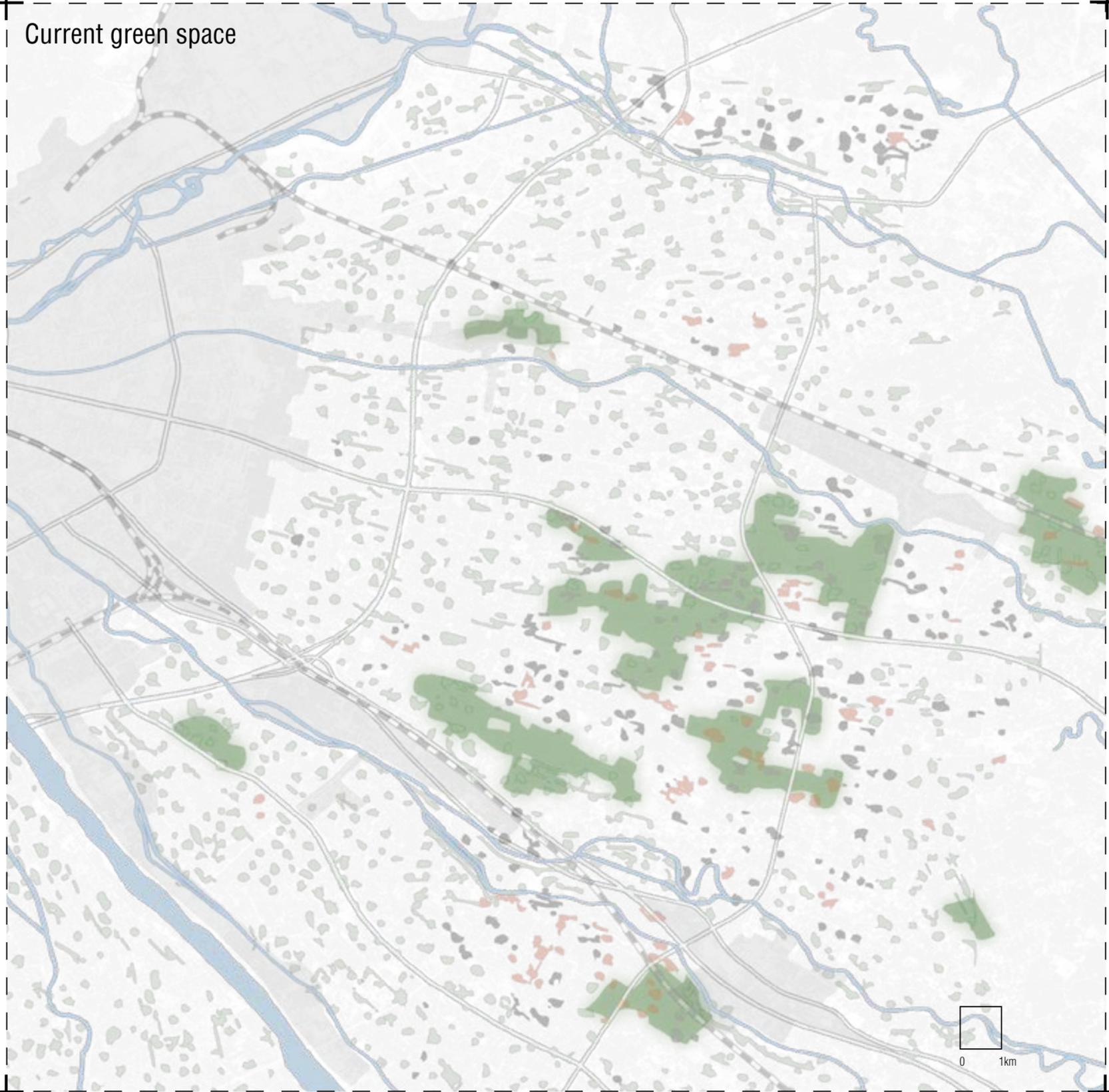
Water resilience



Water purification



Current green space



GREEN SYSTEM

Current



Bambusa emeiensis



maple poplar



southern magnolia



Common Elaeocarpus



soap berry



Muskrat



Yamashina's mole shrew



Smew



Egret



Black-headed Gull



Eurasian Harvest Mouse



Green treefrog



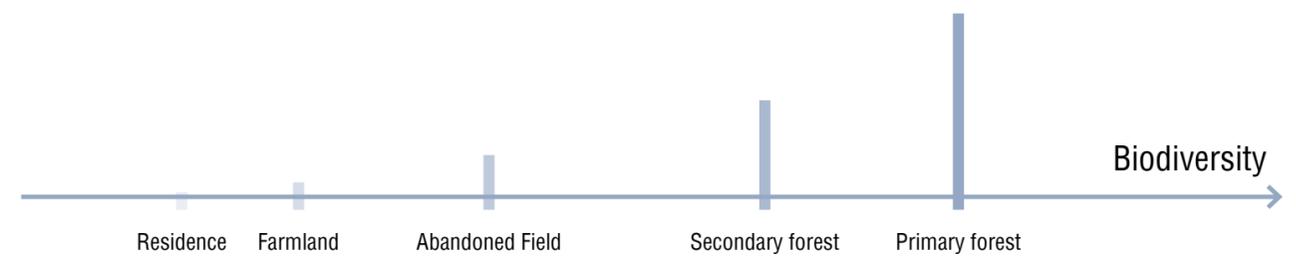
Eurasian Coot



Water Redstart



White-browed Laughingthrush



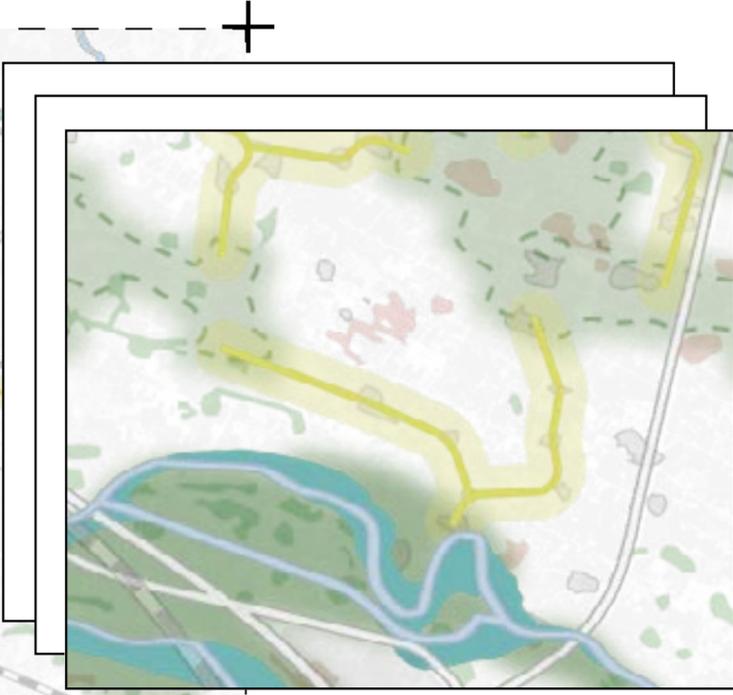
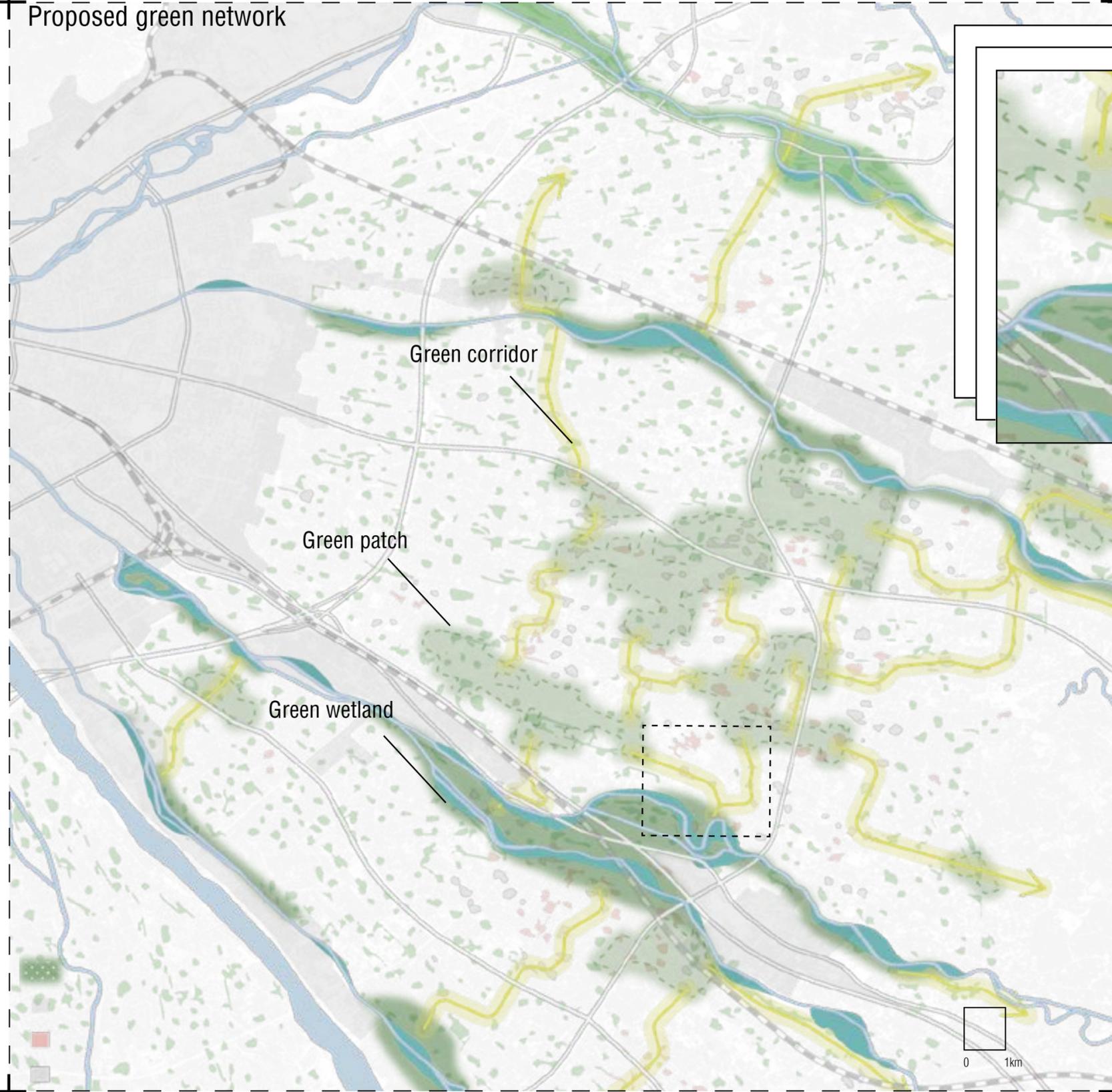
Secondary forest

Linpan

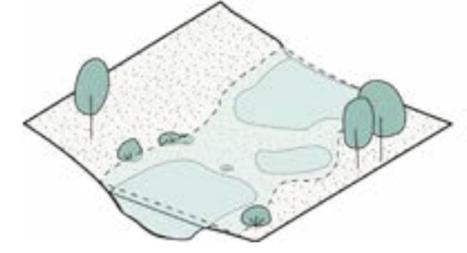
Abandoned Linpan

Newly-built residence

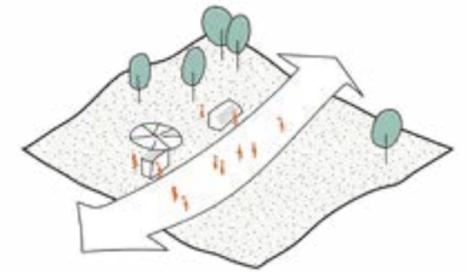
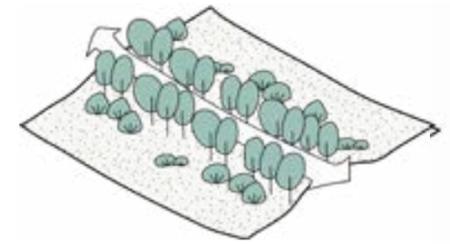
Proposed green network



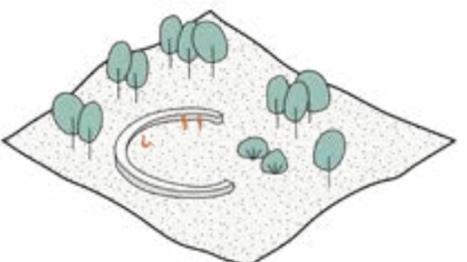
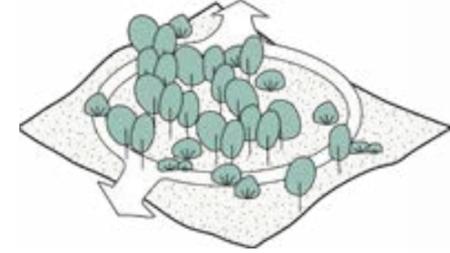
Green-blue wetland



Green corridor

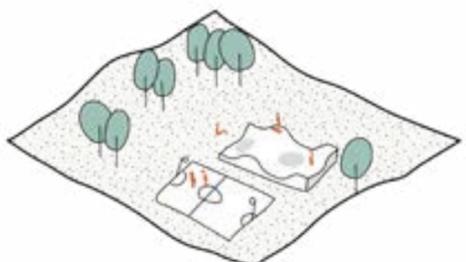


Green patch



Green forest

Gathering space for resident/tourist



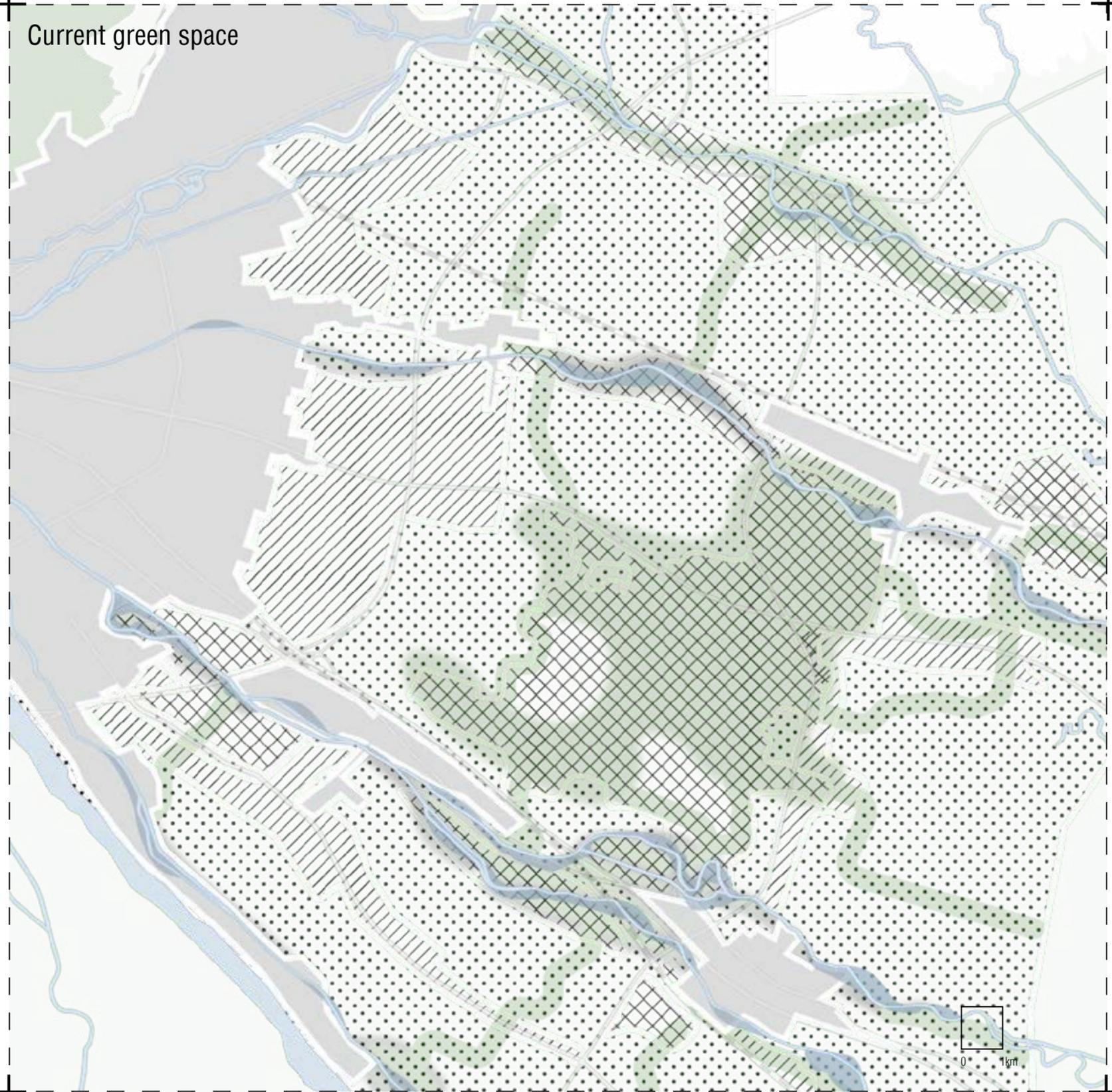
Activity space for resident

Green CORE

Green BORDER



Current green space



MODERN LINPAN



ECOLOGICAL LINPAN



URBAN LINPAN

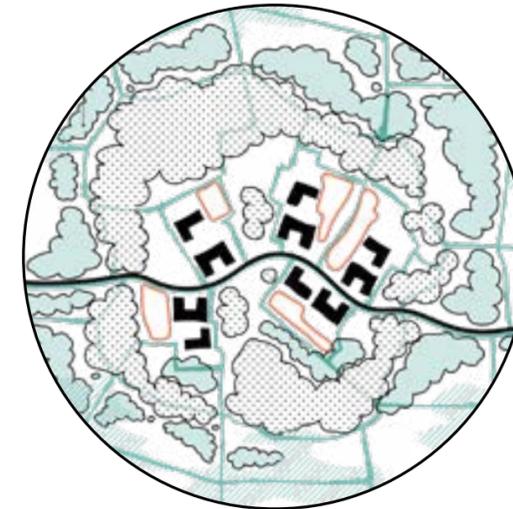


LINPAN SYSTEM

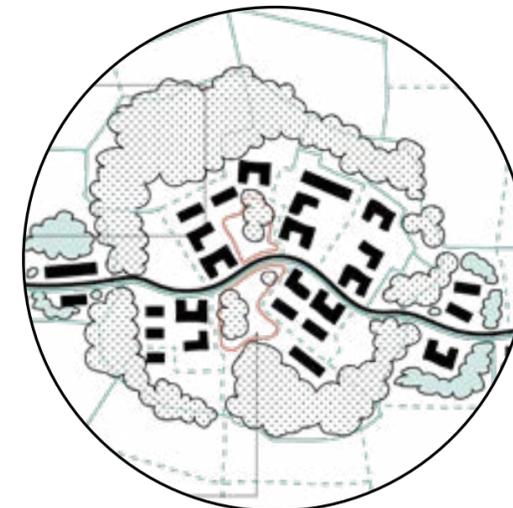
Proposed



Mainly transformed form well-preserved Linpans.

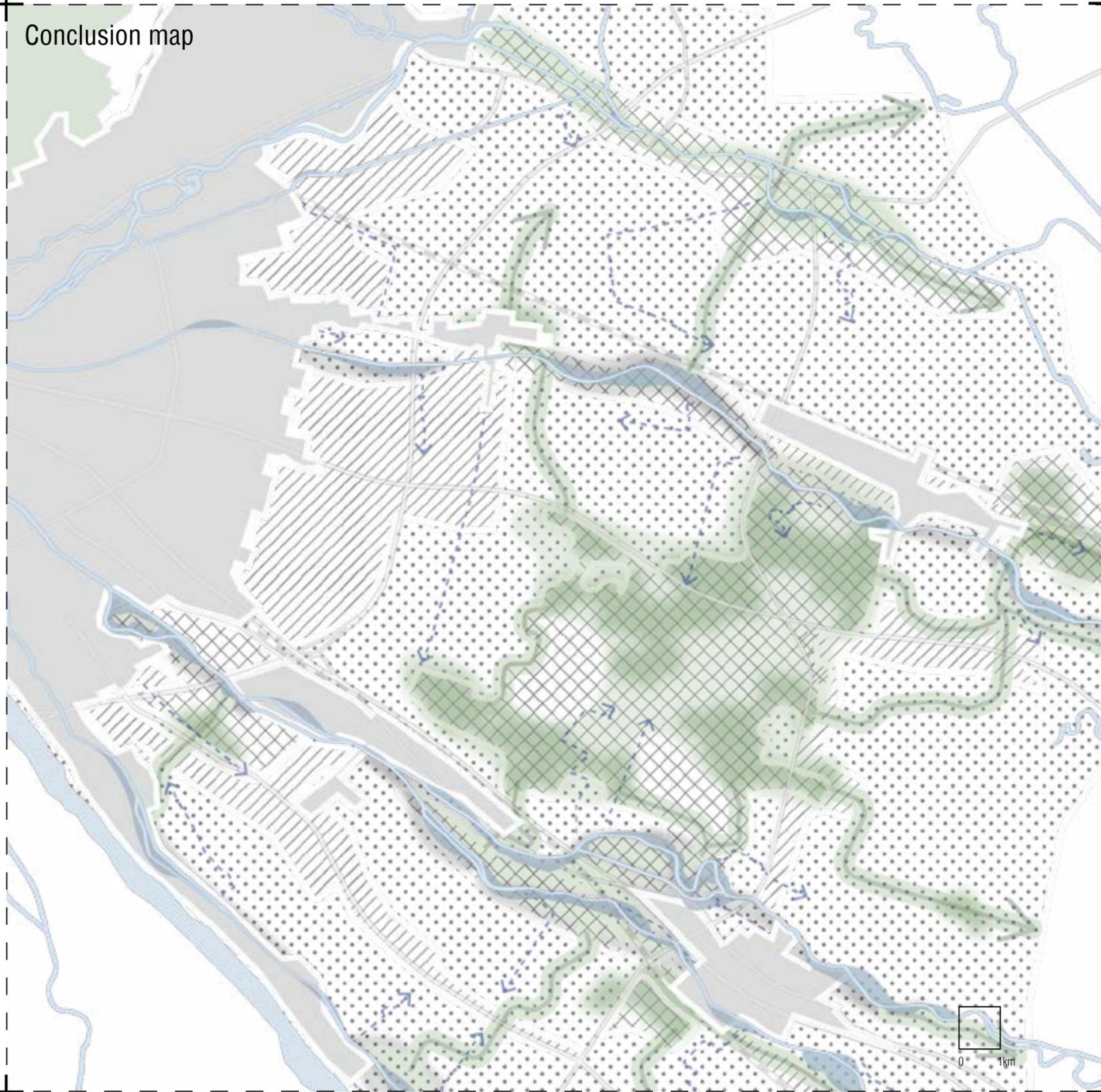


Within/At the border of Green patches and along the river.



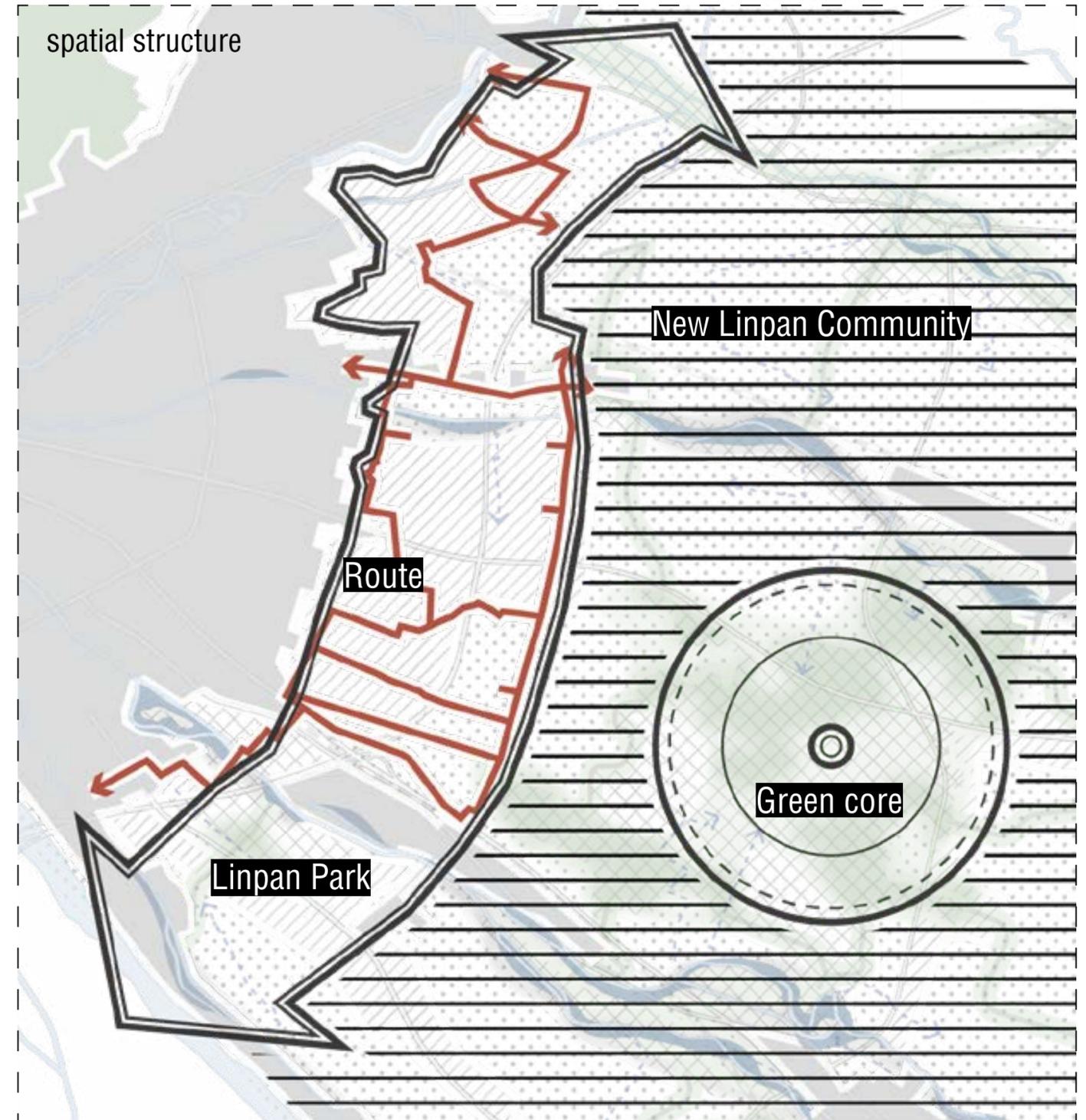
Near the city border/Along the main infrastructure.

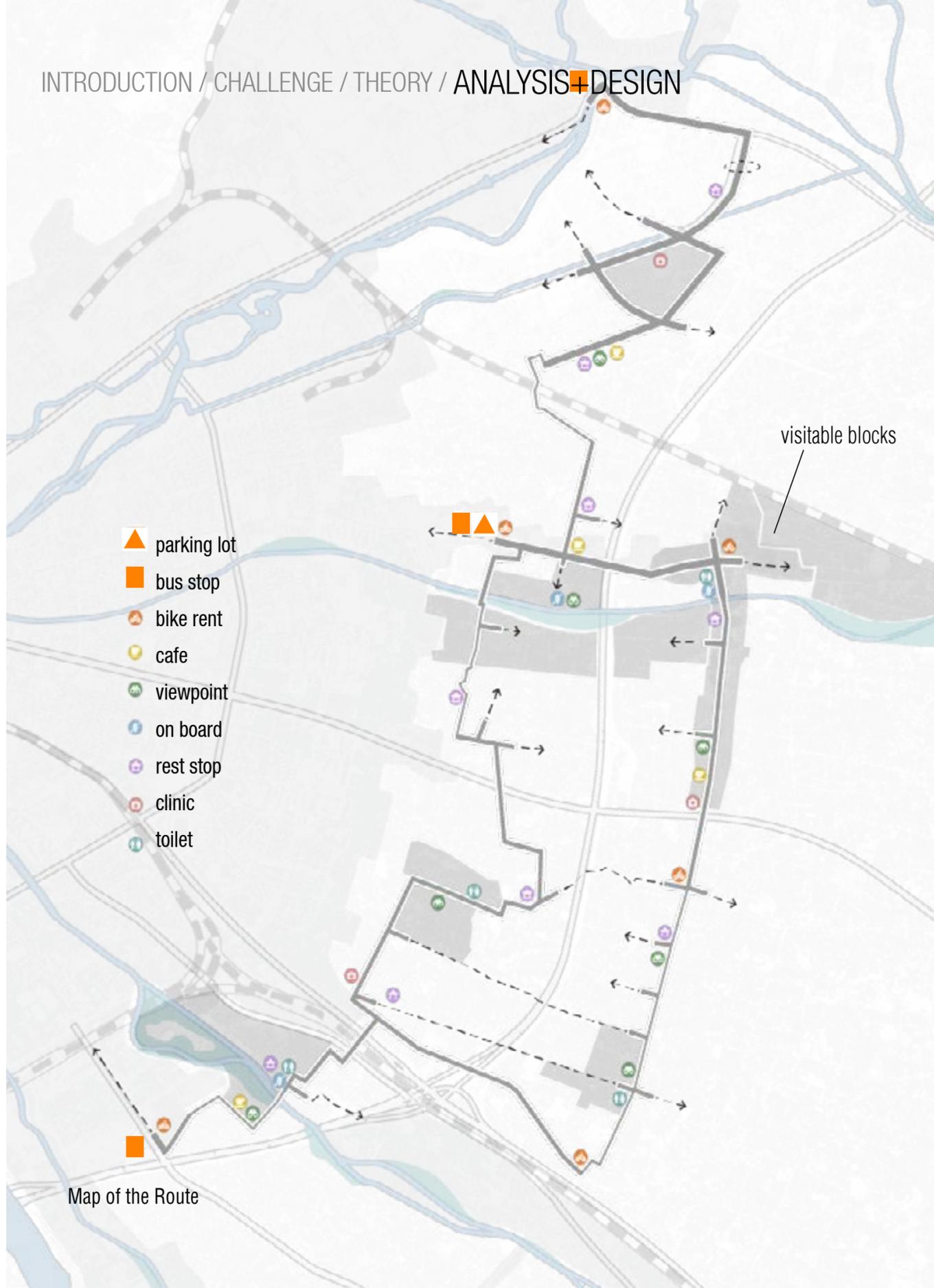
Conclusion map



LINPAN SYSTEM

spatial structure

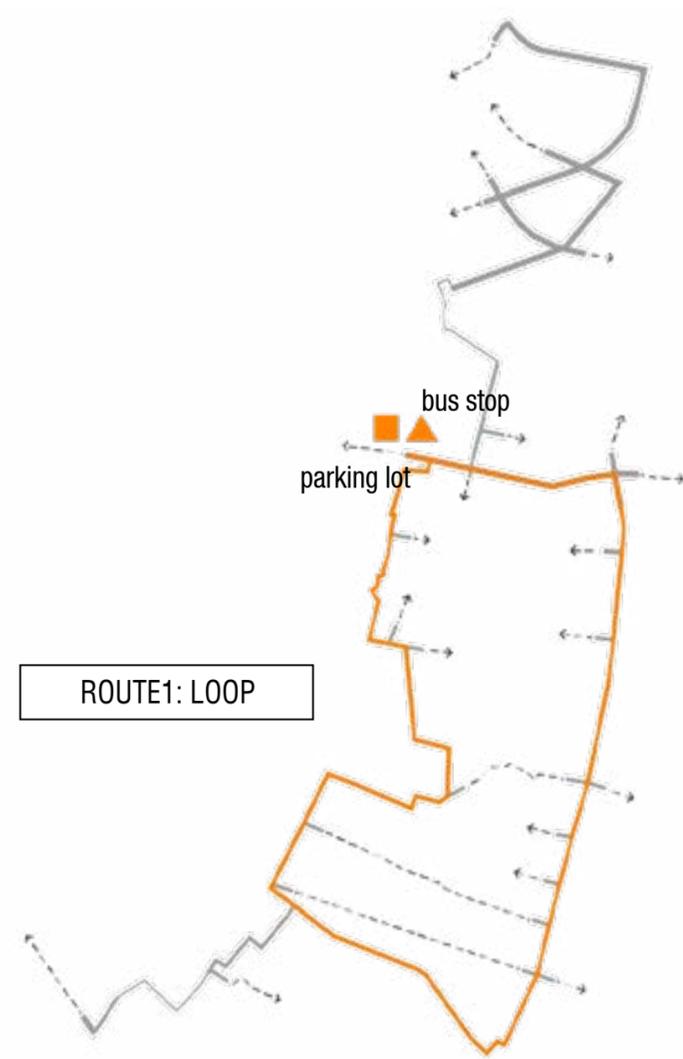




Map of the Route

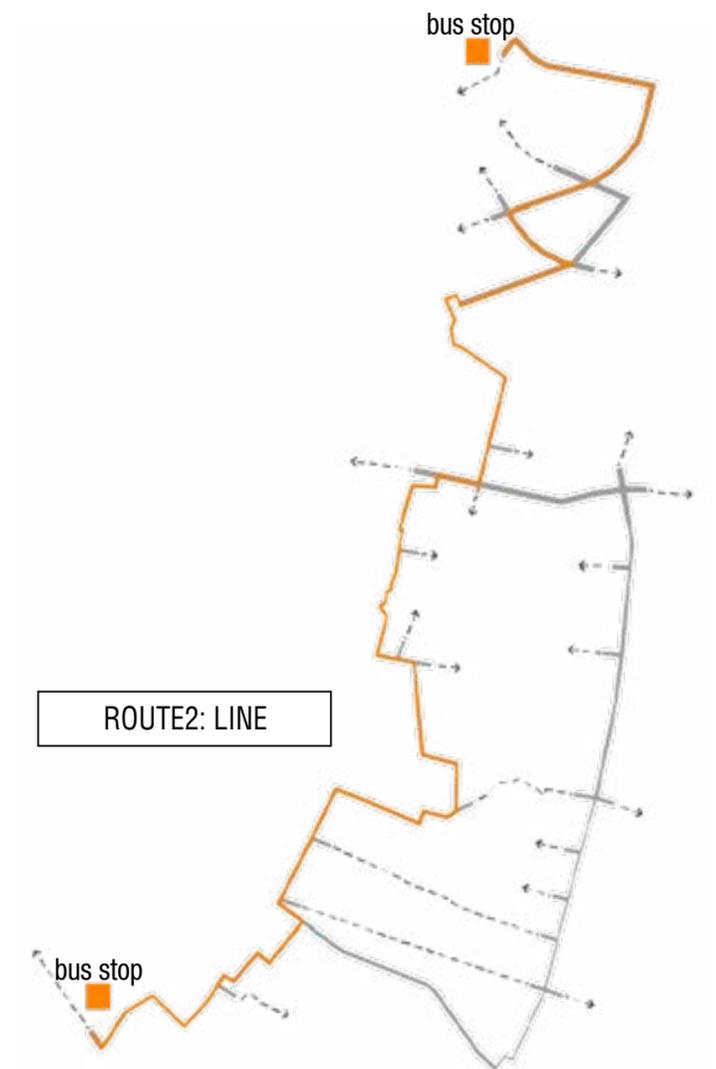
ROUTE PLAN

ROUTE1: LOOP

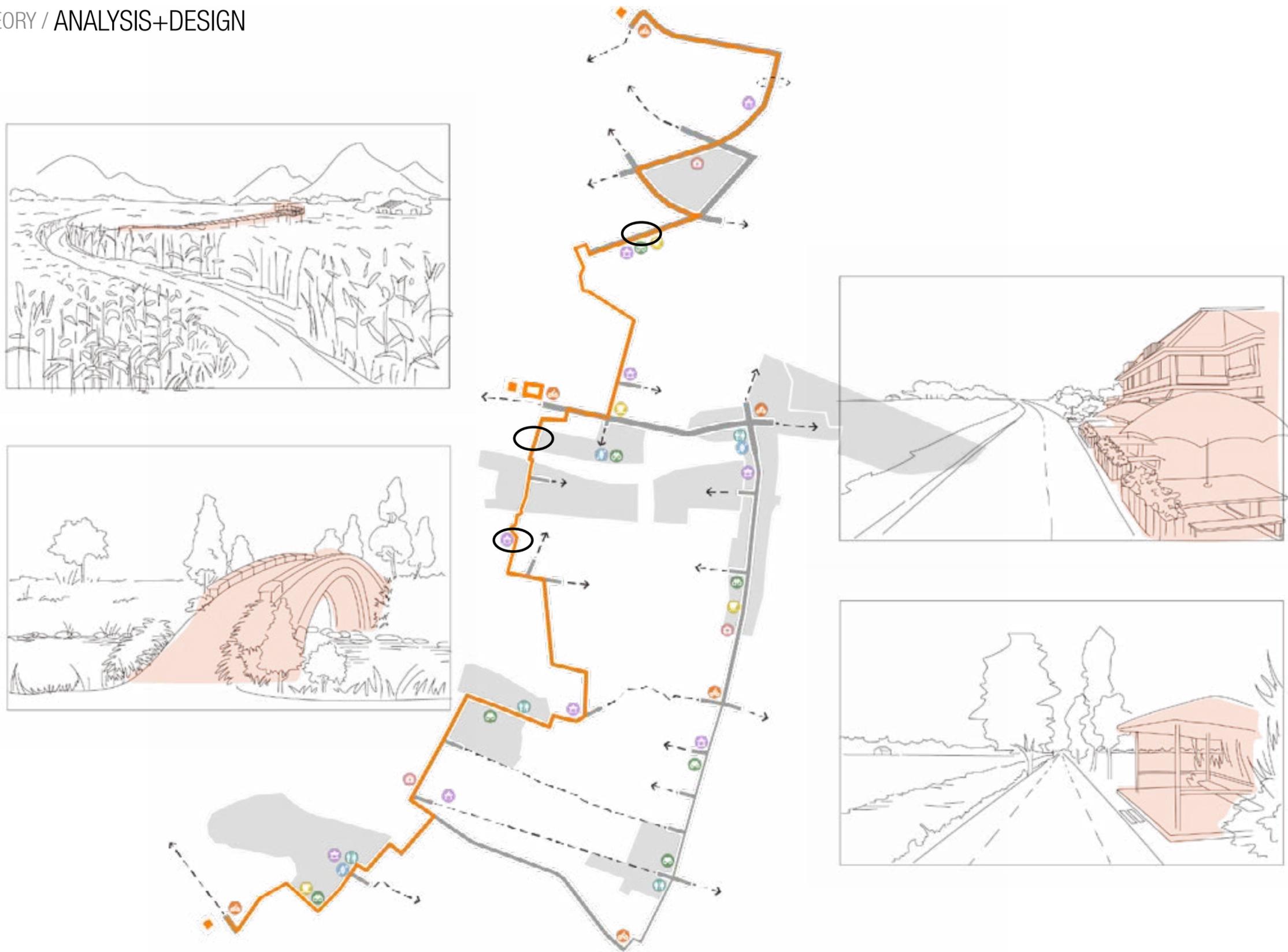


The total length of this road is about 15 kilometers. It takes about 4 hours to walk and 1 hour to cycle. The visit and stay add 2-4 hours to this. Coming either by bus or car is fine. During the tour, you can also choose to take a boat trip to enjoy the Linpan landscape from different angles.

ROUTE2: LINE

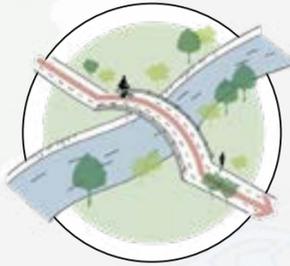


The total length of this route is about 14 kilometers. It takes about 3.5 hours to walk and 1 hour to cycle. The visit and stay add 2-4 hours to this. It is recommended to come by bus.

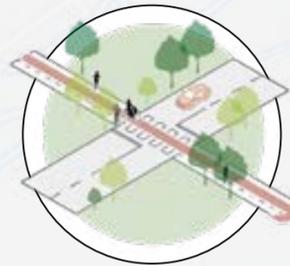


INTRODUCTION / CHALLENGE / THEORY / ANALYSIS+DESIGN

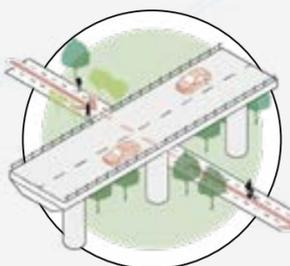
- cross the river



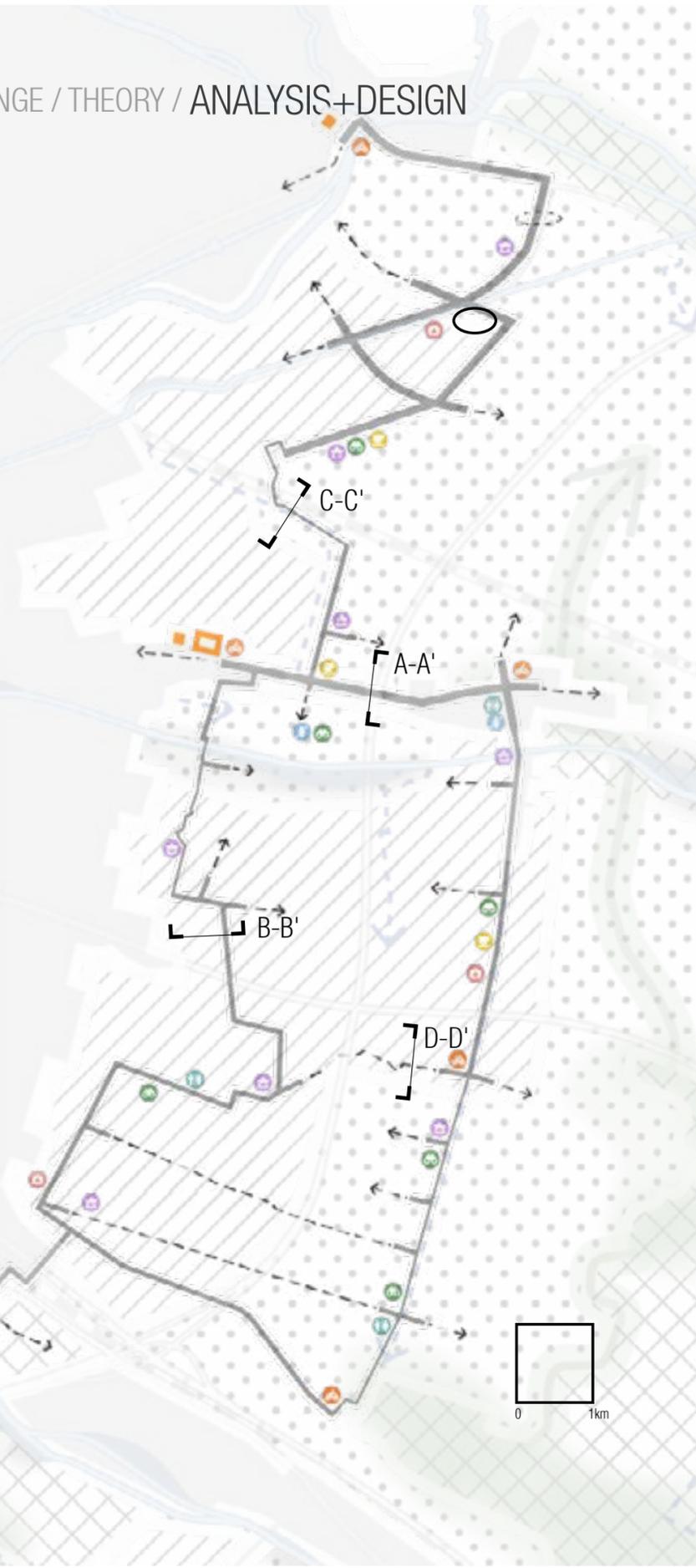
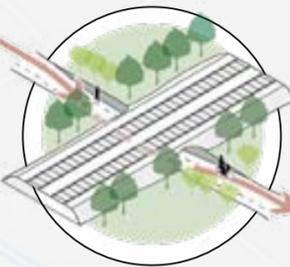
- cross the road



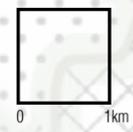
- cross the highway



- cross the railway

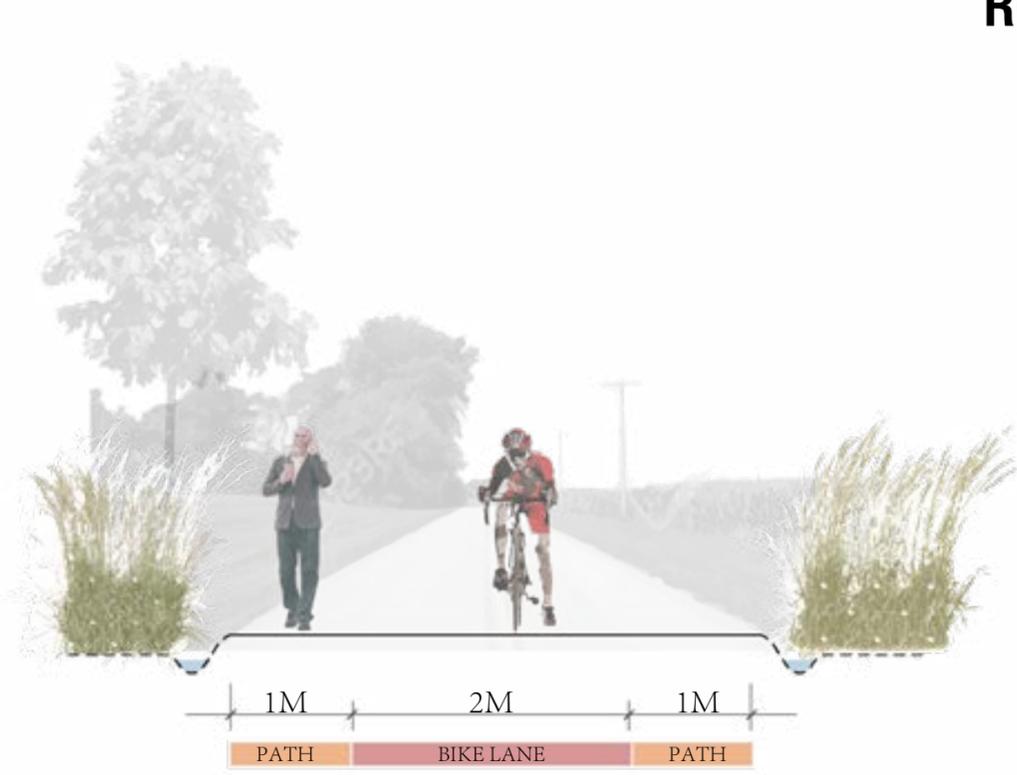


Road Classification

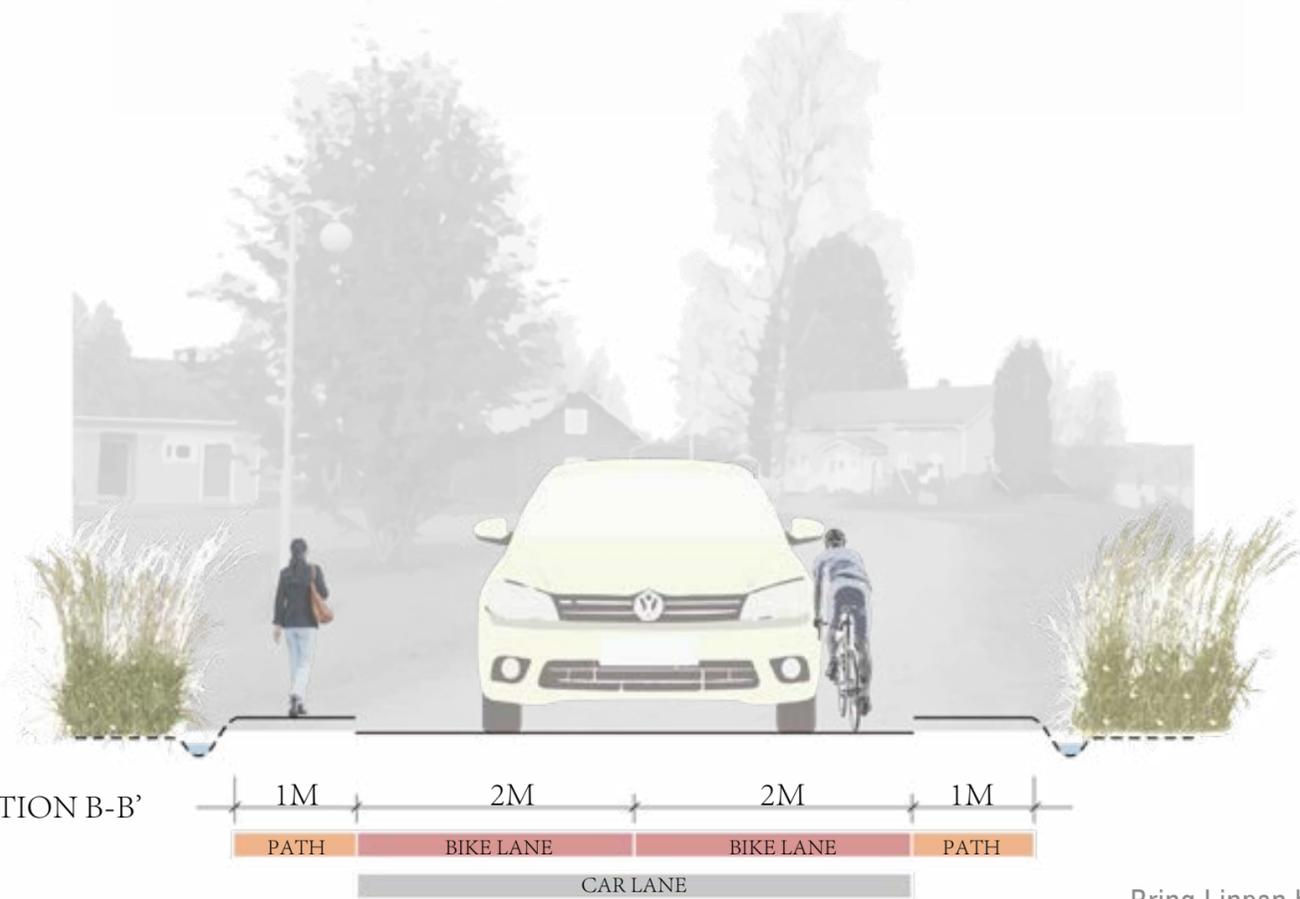


ROUTE SECTION

SECTION A-A'



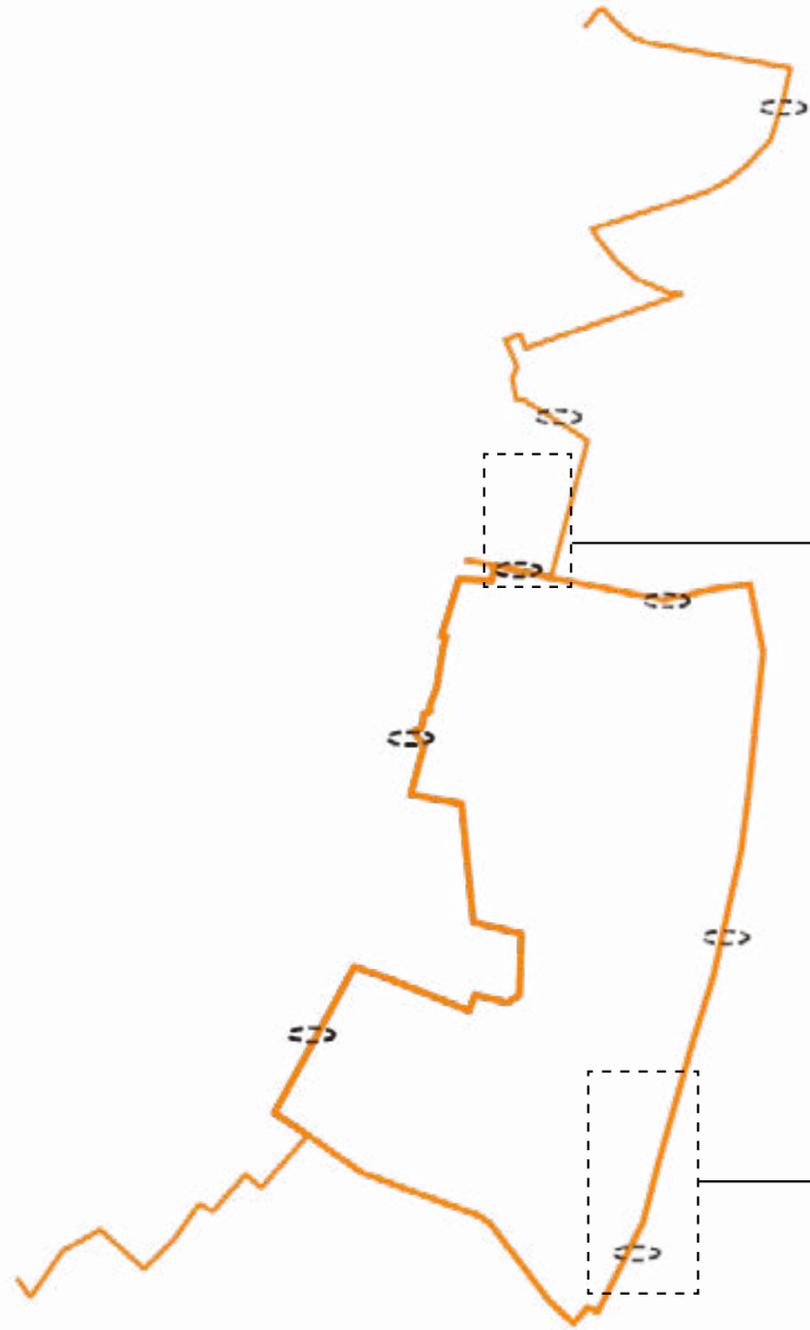
SECTION B-B'





SECTION C-C'



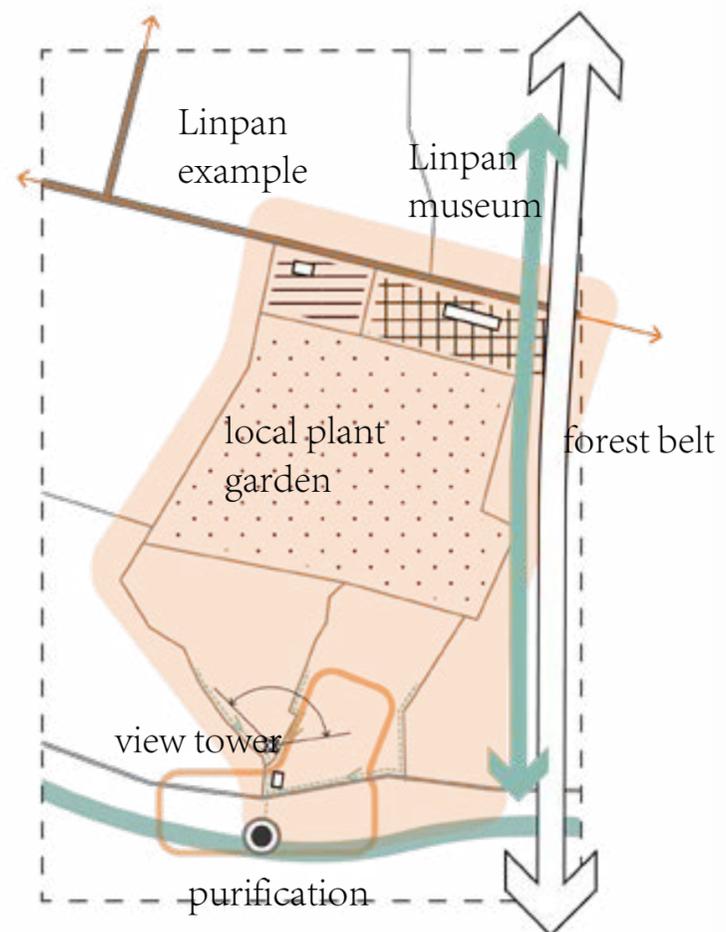
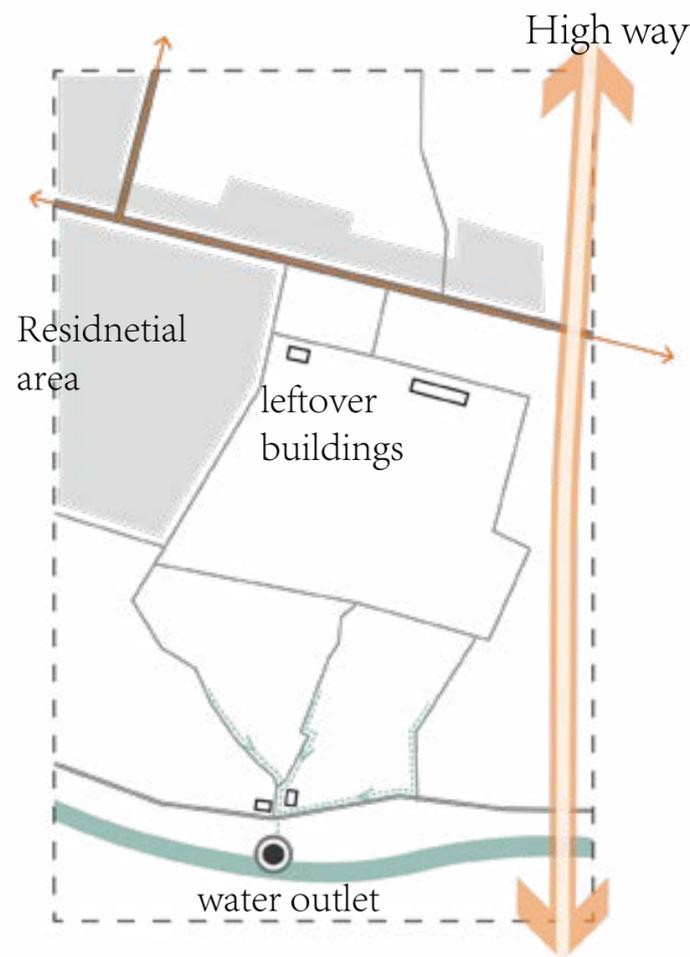


LINPAN MUSEUM GARDEN



LINPAN COMMUNITY STREET





SITE 1: LINPAN MUSUEM GARDEN







gathering
space

bench

new path

rewilding
canal

Wetlands

More wild animals



Motivation

- Dujiangyan Water Project and its downstream rural settlements - Linpan
- Present challenges

Definition of the research context

Site definition:

- Heritage landscape
- Rural landscape
- water system

Times background:

- Urbanization
- Rural revitalization in China

Research Question

Research

Analysis

Case study selection:

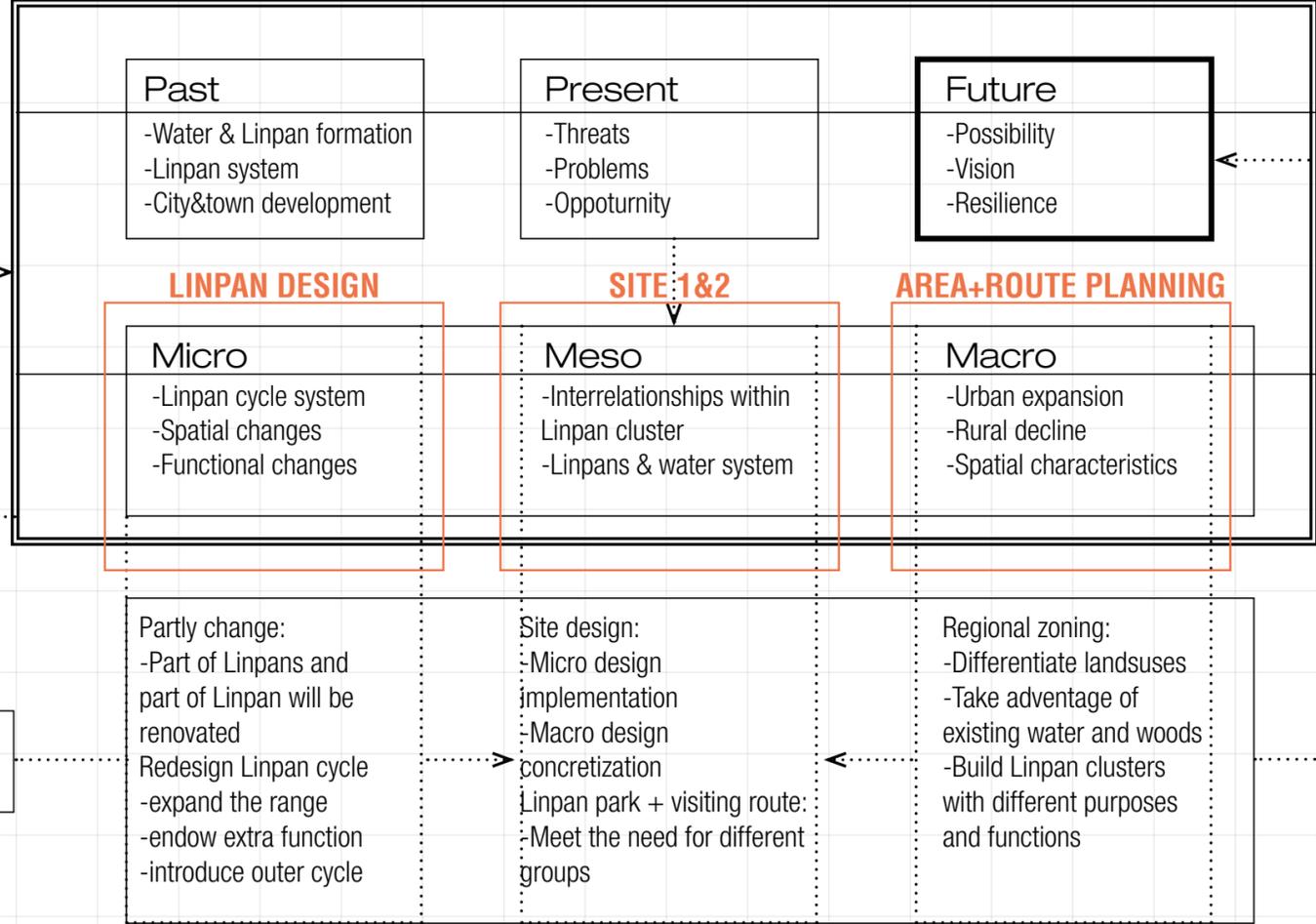
- Linpan area
- Rural revitalization
- Water-related infrastructure

Theory exploration:

- Holistic landscape
- Heritage adaptive reuse

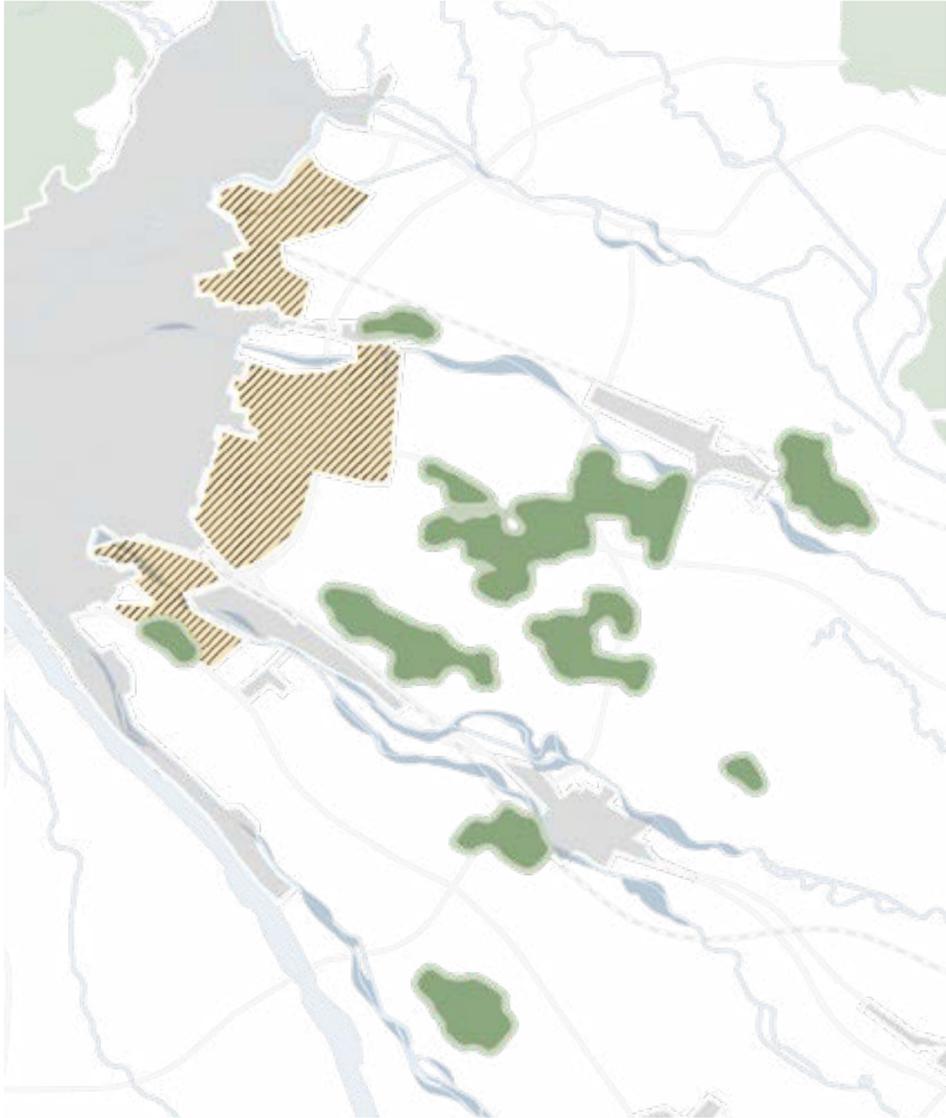
Design

END PRODUCTS

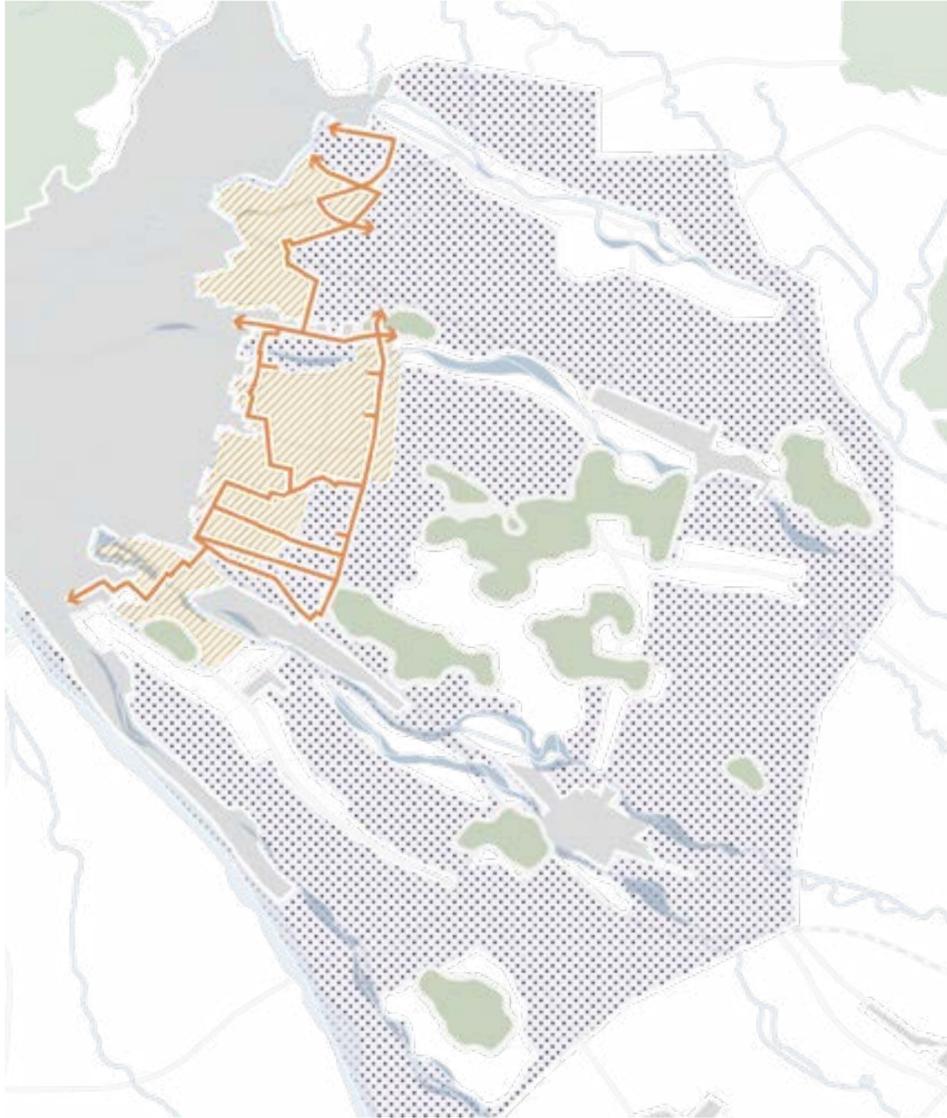


SCALE in time

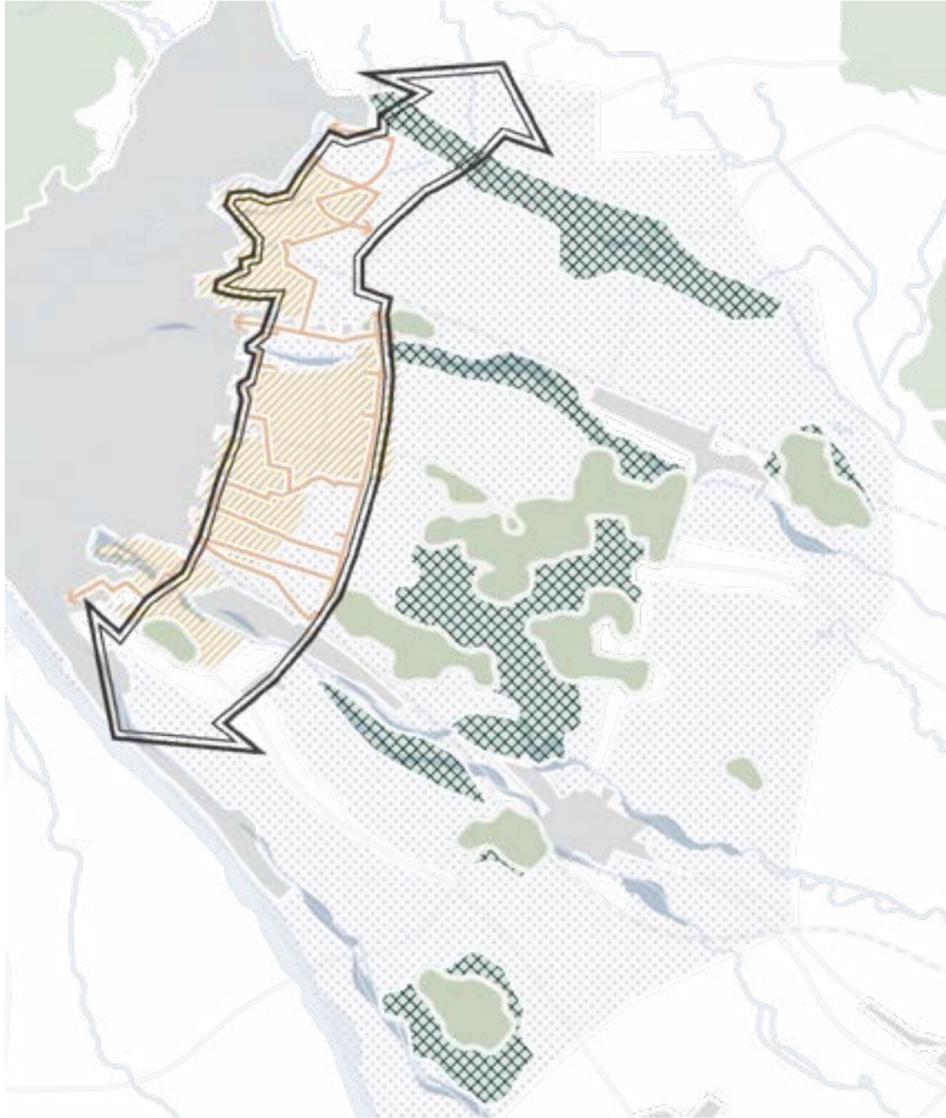
SCALE in space



5-YEAR PLAN:
GREEN CORE+URBAN LINPAN



10-YEAR PLAN:
ROUTE+MODERN LINPAN



20-YEAR PLAN:
RESERVE PARK+ECOLOGICAL LINPAN

Thank you for your attention!

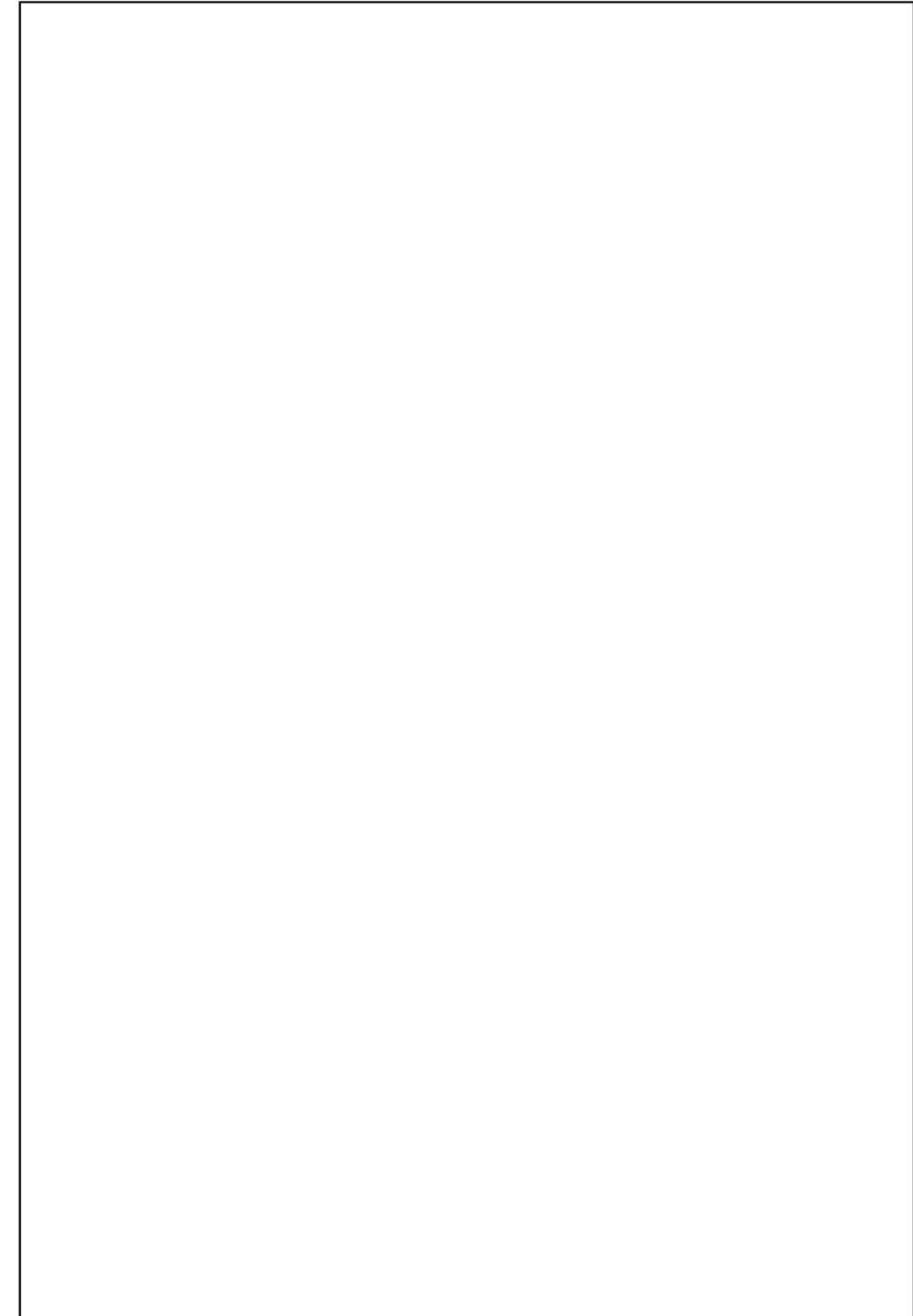
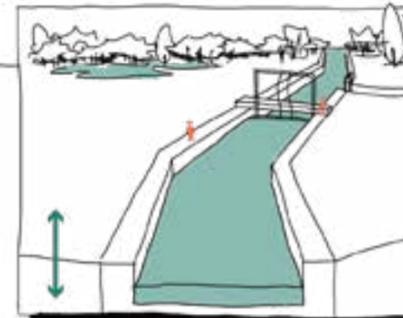
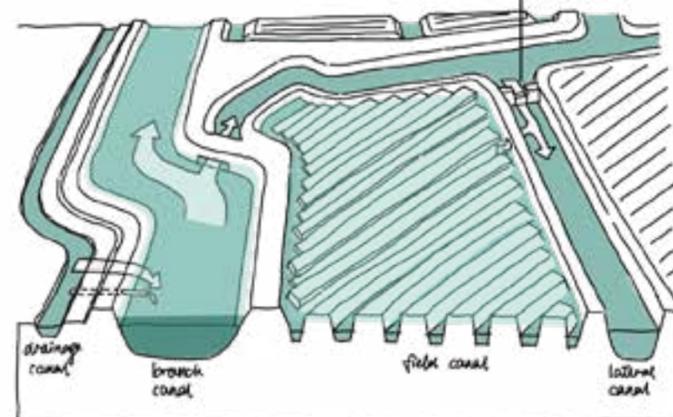
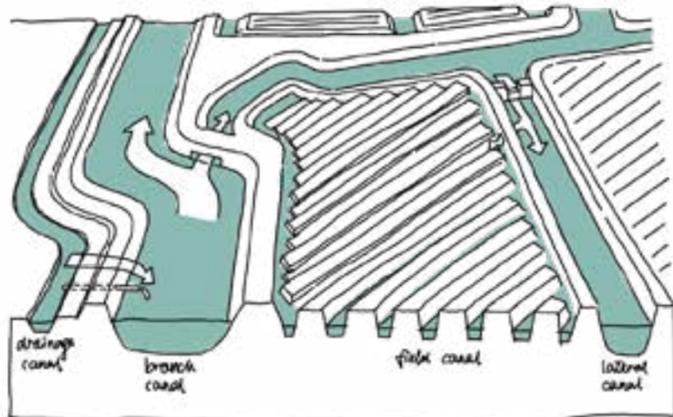
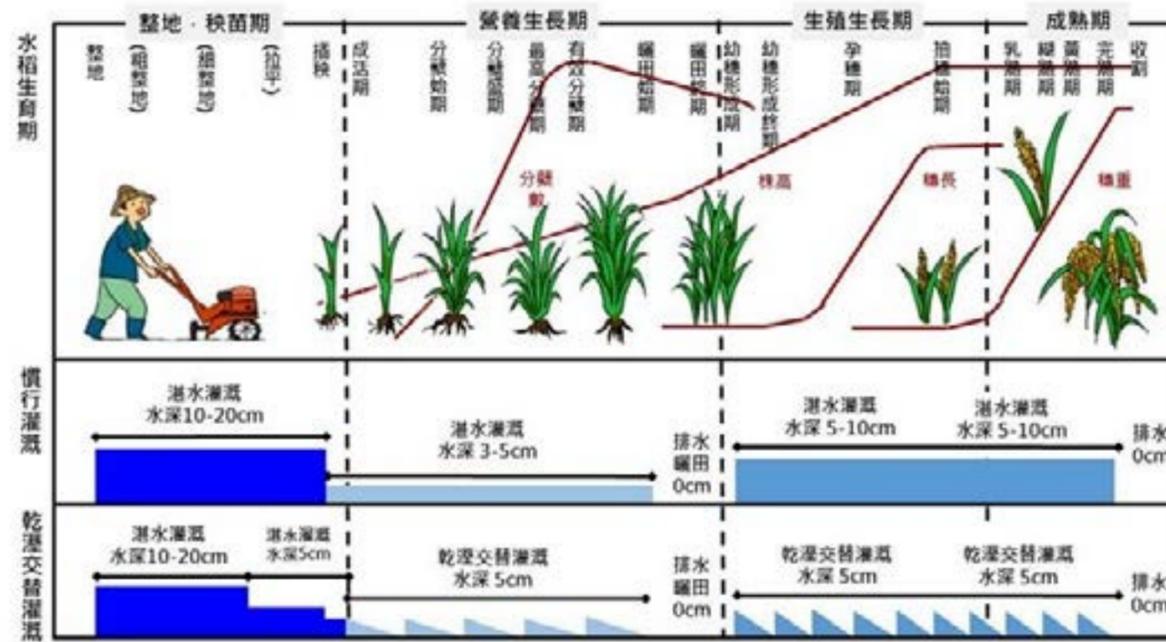
Linpan type composition

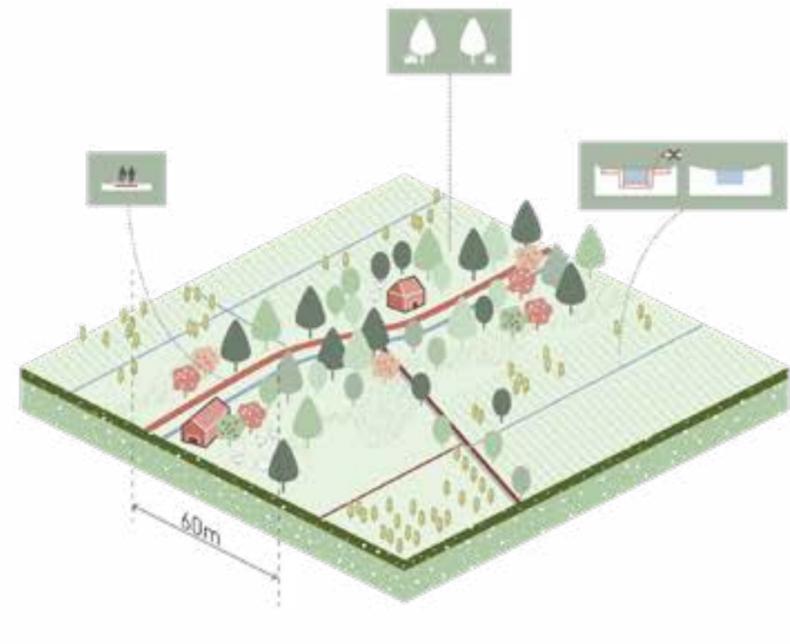
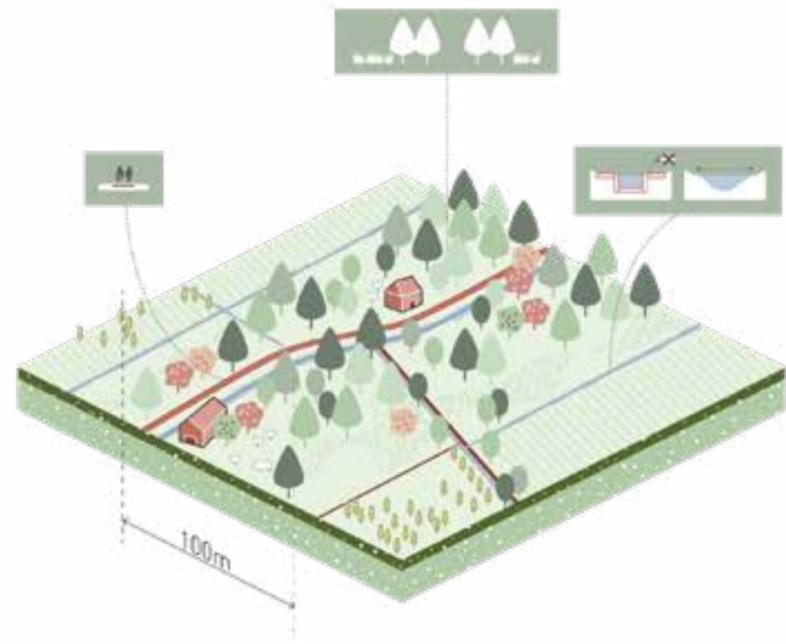
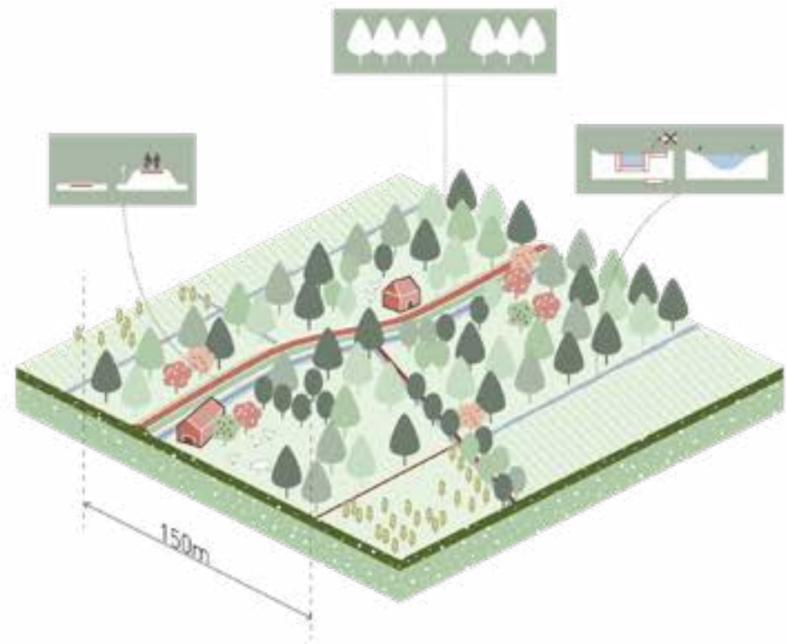
Periodic rural open air market

Alternate wet and dry irrigation method

- With alternate wet-dry irrigation method, farmers can reduce irrigation water without reducing yields. Alternate wet-dry irrigation means allowing the standing water in the rice fields to dry up for a few days before irrigating again.

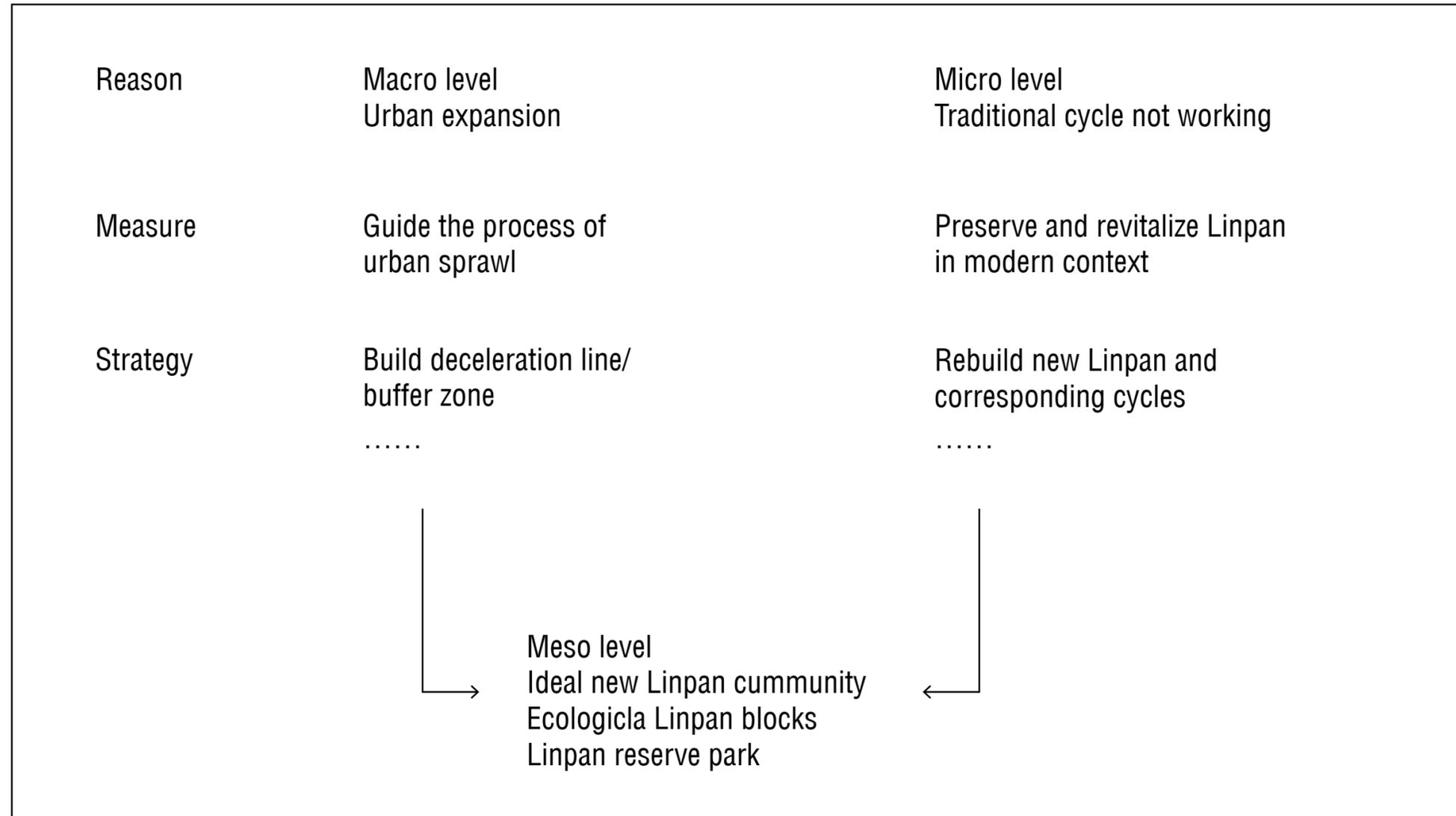
-After the seedlings survive and before harvesting, each irrigation should be filled to a depth of 5 centimeters and then stopped. Let the irrigation water naturally evaporate, evaporate or leak and gradually decrease. When there is no water on the soil surface but the soil moisture is still saturated and moist, then fill it with water to a height of 5 cm, and repeat this operation.





Prolem

Linpan decline

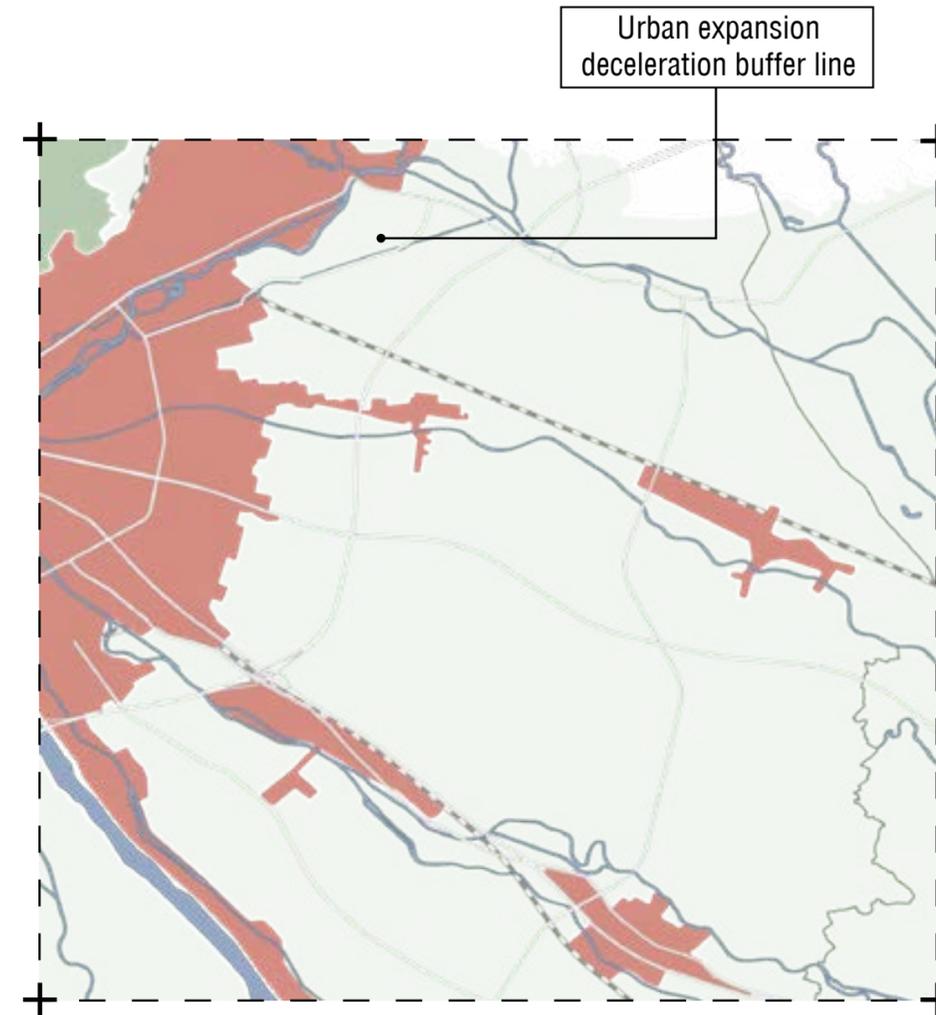
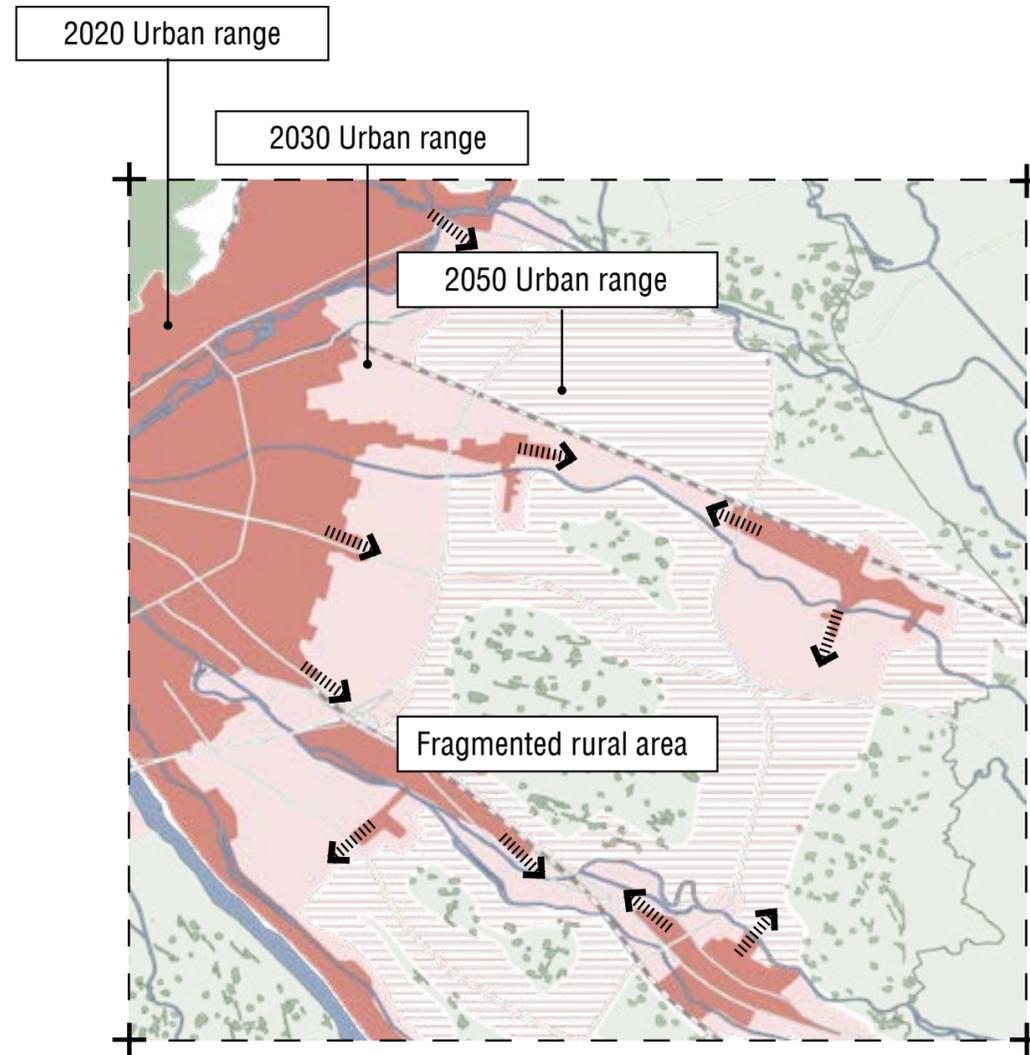


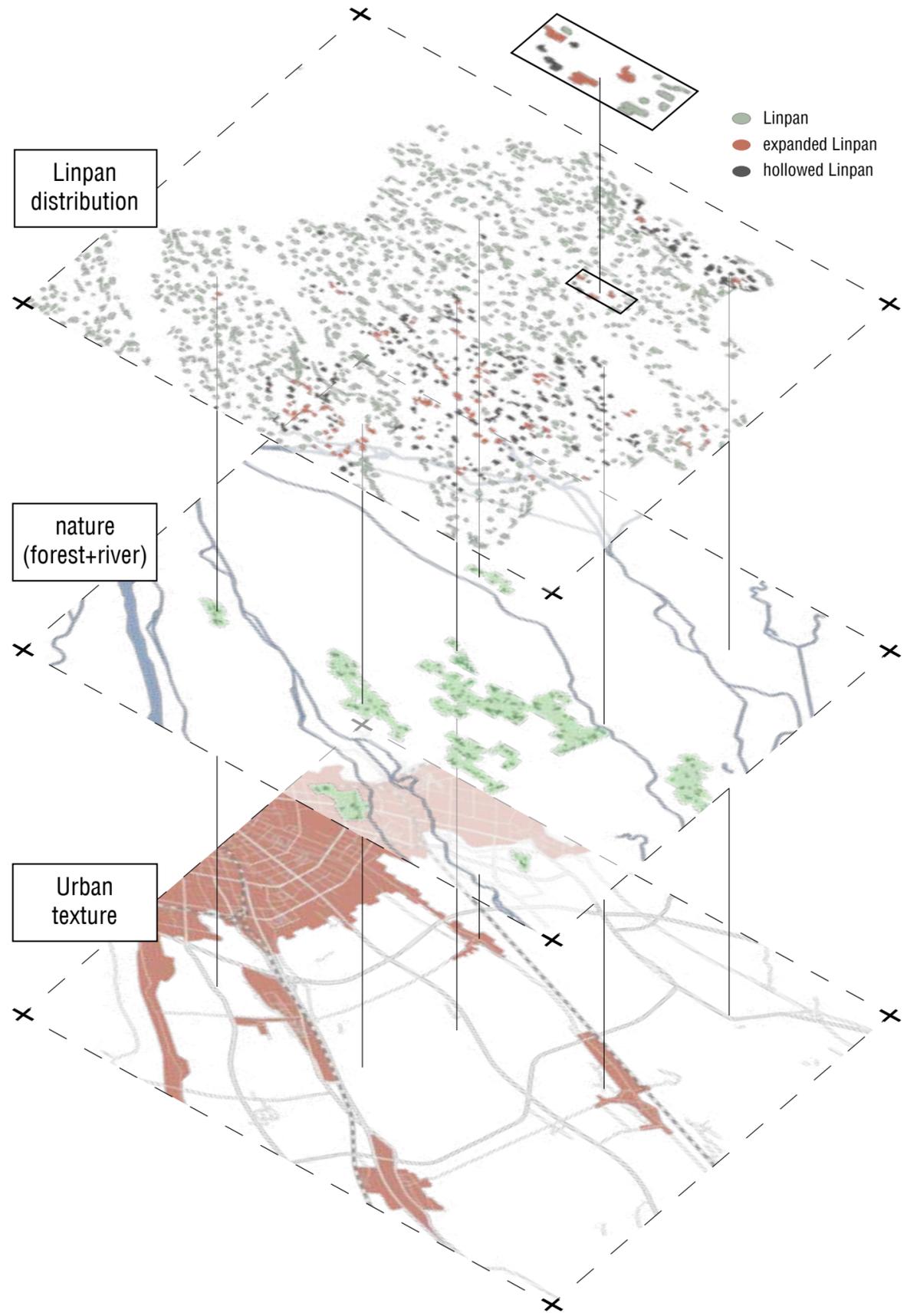
BUFFER ZONES

climate adaptation

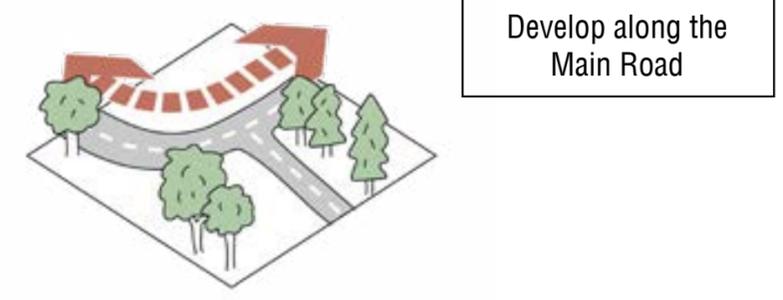
ecological patches

Linpan preserve





Develop along the City Border

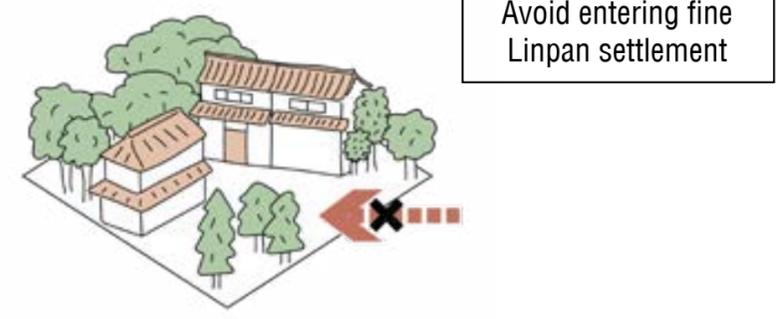


Develop along the Main Road

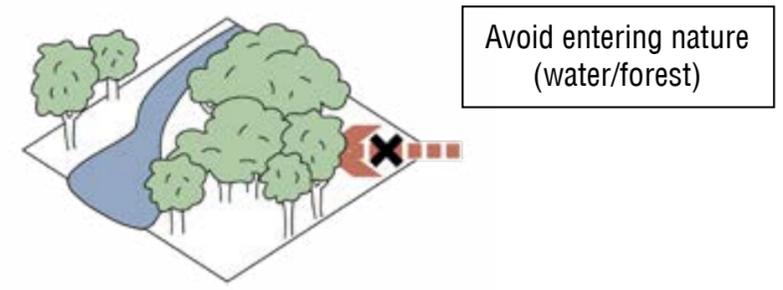
GO



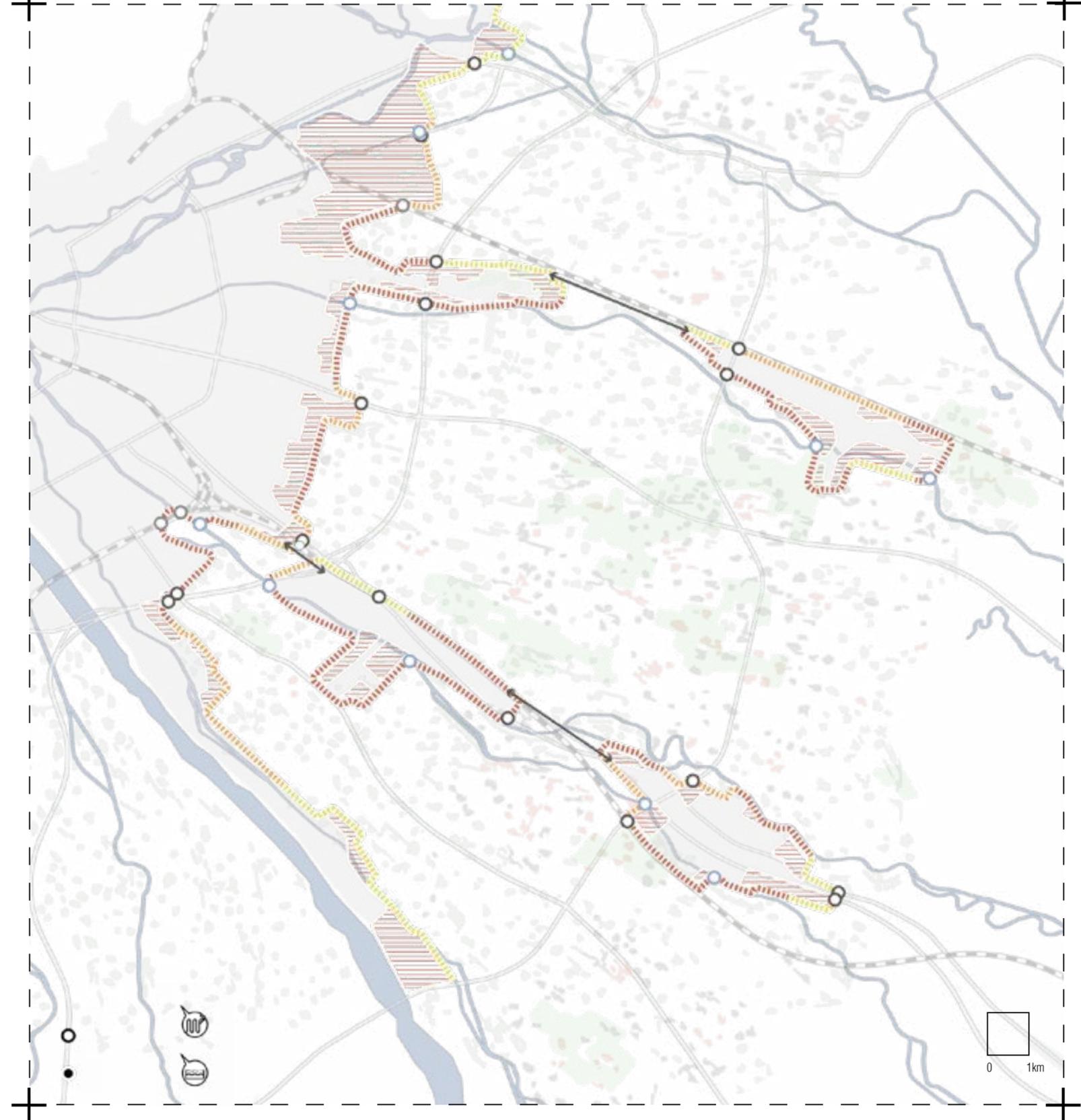
STOP



Avoid entering fine Linpan settlement



Avoid entering nature (water/forest)



Potential urbanized area

Current urban boundary

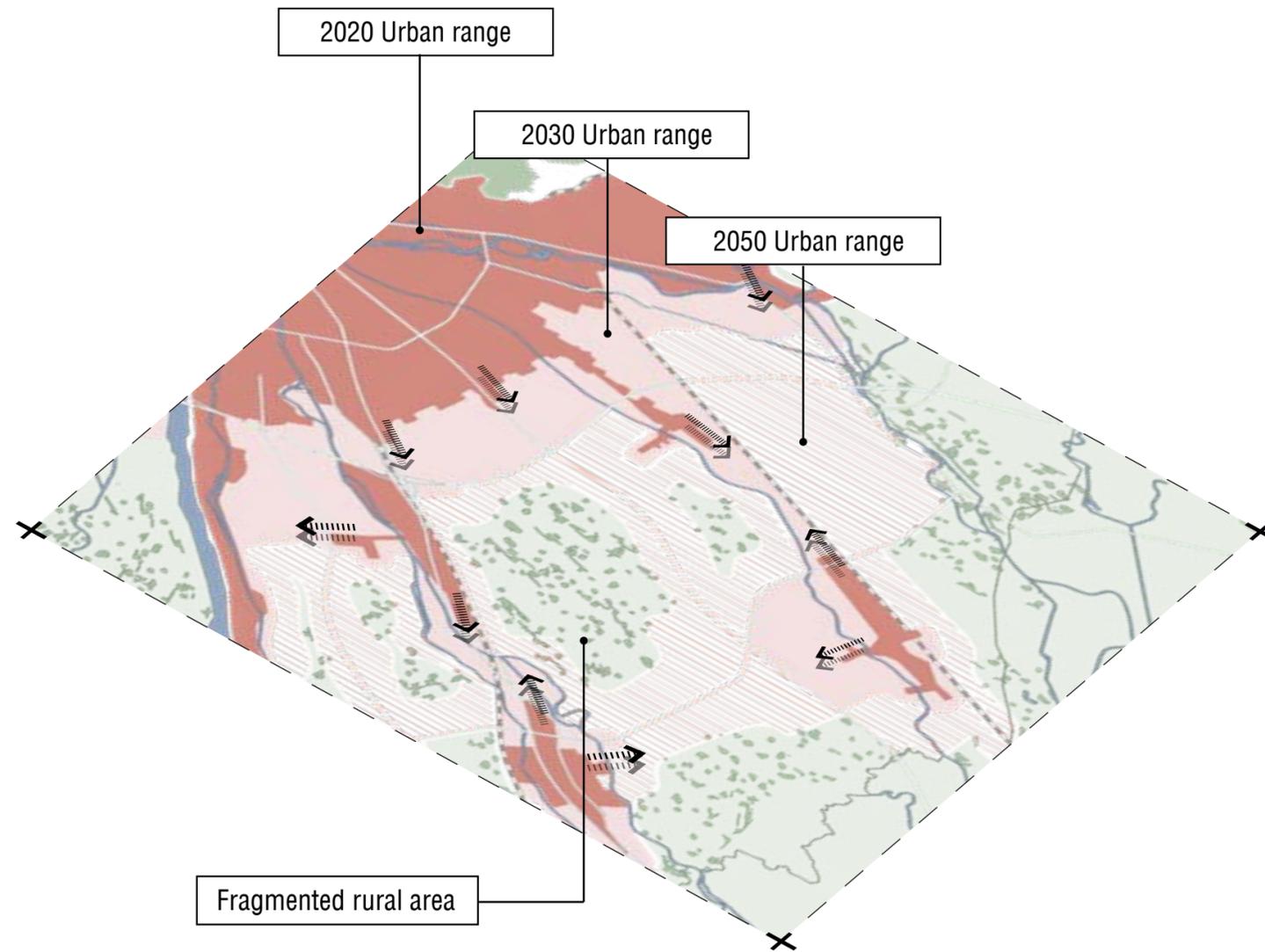
Priority urbanized area

extreme climate
green+blue

ecosystem
imbalance

Linpan disappear

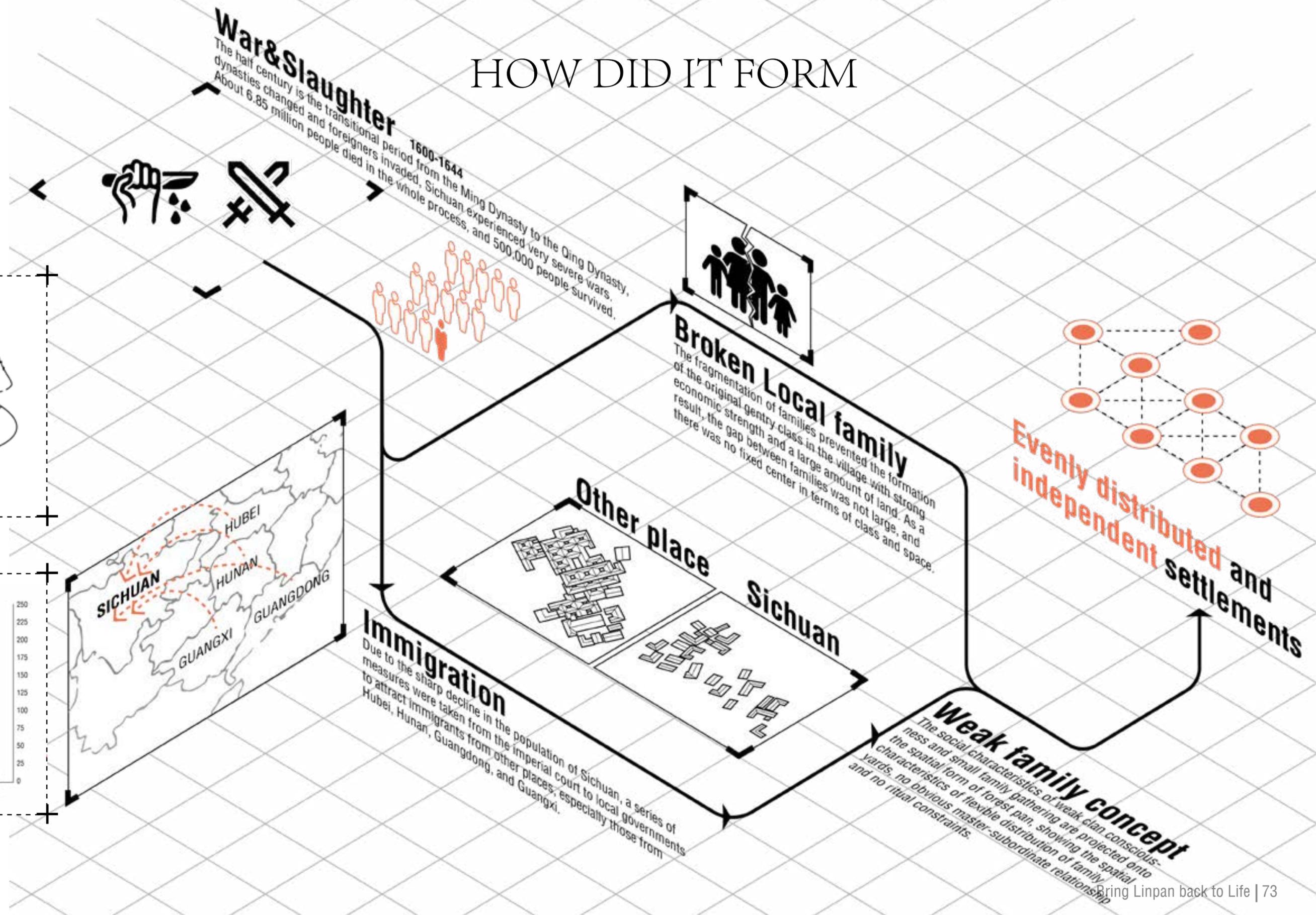
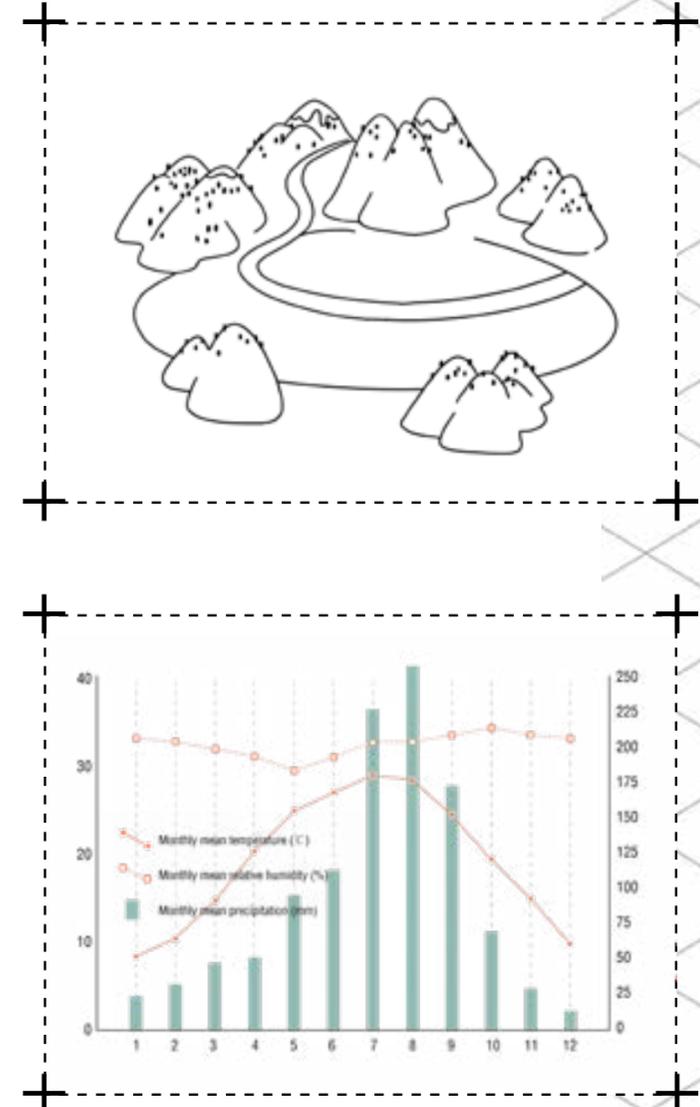
extreme climate
green+blue

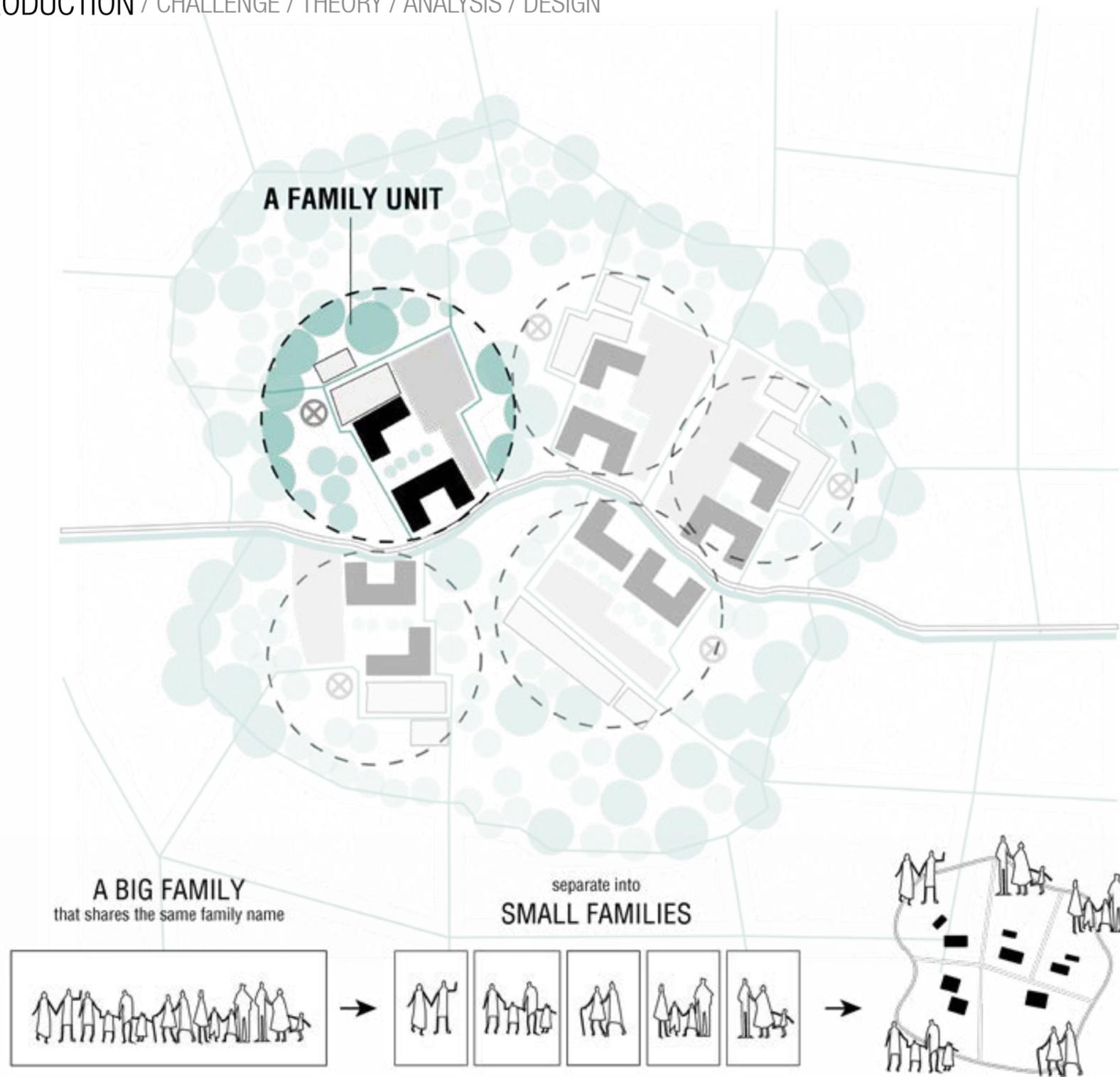


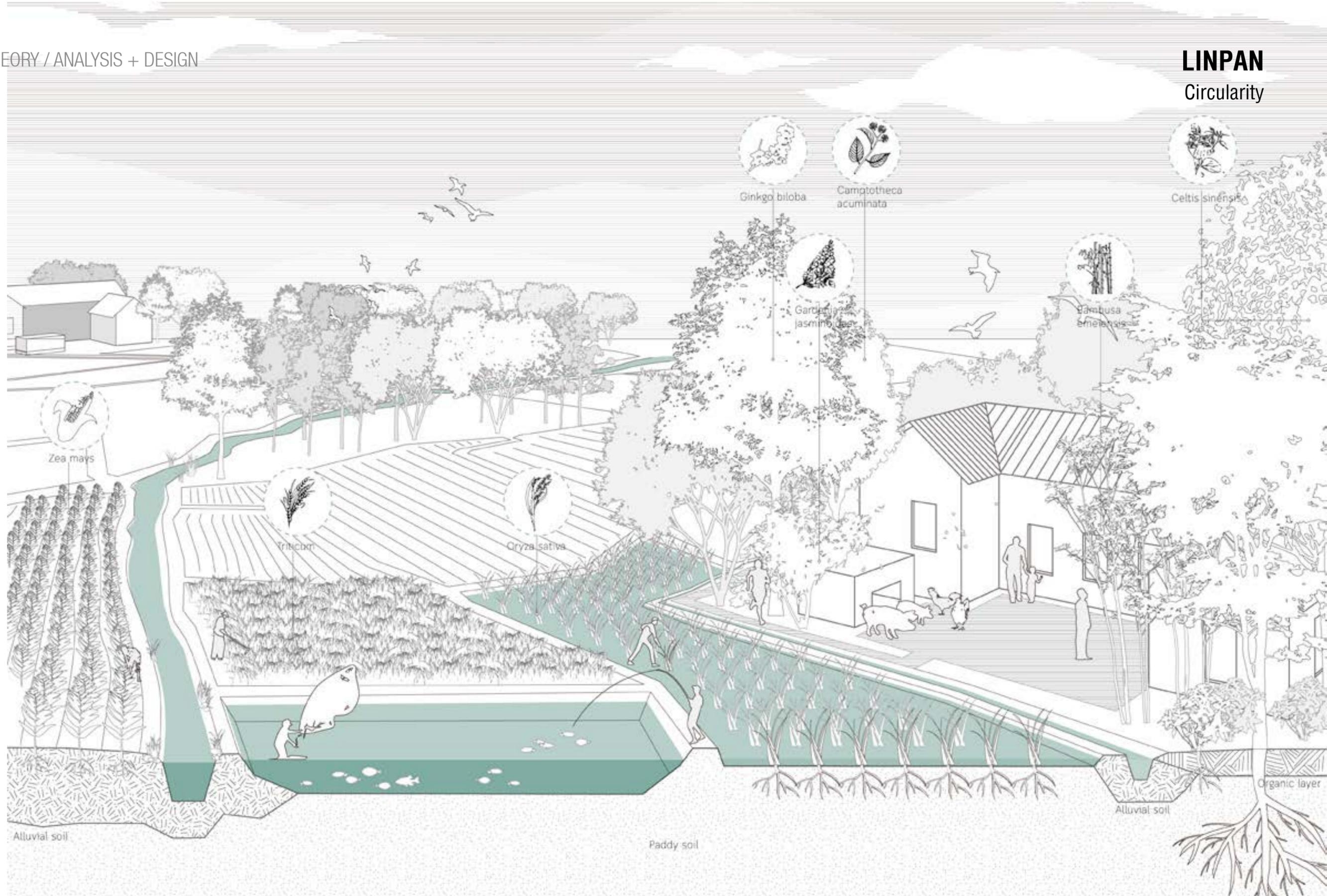
ecosystem imbalance

Linpan disappear

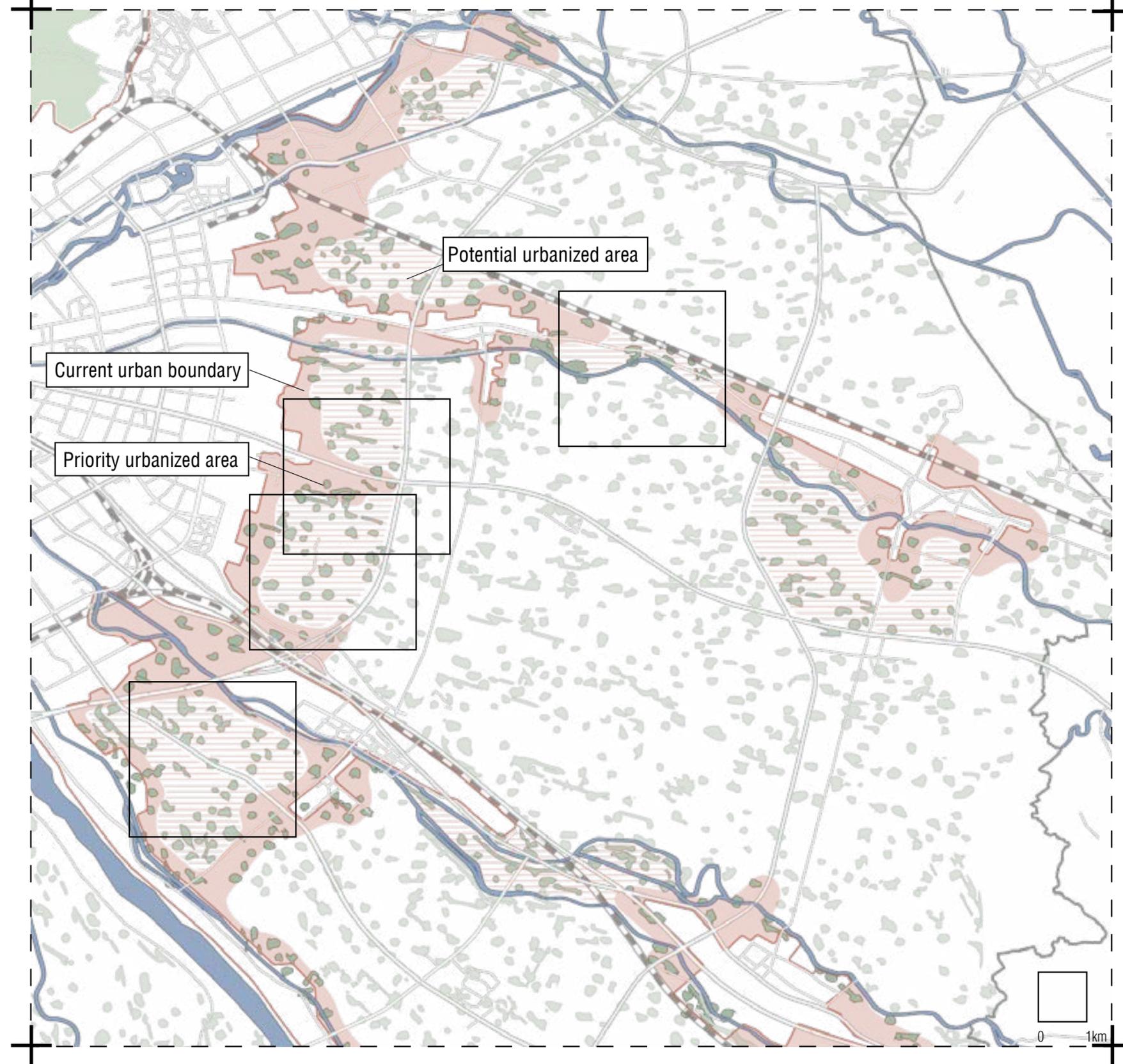
HOW DID IT FORM







| | | | | | |
|-----------------------|-------------|-----------|------------------------|-----------|-----------------|
| Crops field (On land) | Field canal | Fish pond | Crops field (On water) | Net canal | Forest + Houses |
|-----------------------|-------------|-----------|------------------------|-----------|-----------------|

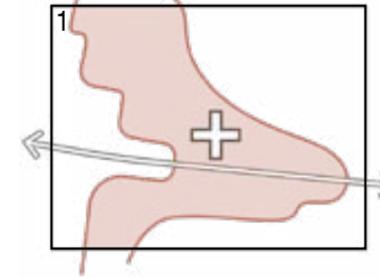


ENDANGERED LINPAN AREA

Priority urbanized area

Rural areas that will has high possibility to be urbanized in the following years of urban development

present 2030(predicted)

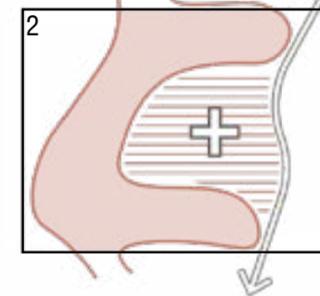


- Close to existing urban construction boundaries
- Along the direction of main transportation infrastructure

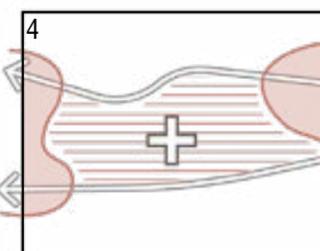
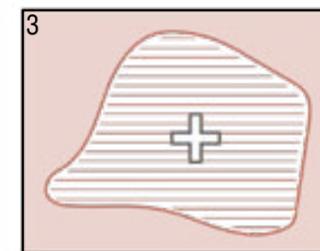
Potential urbanized area

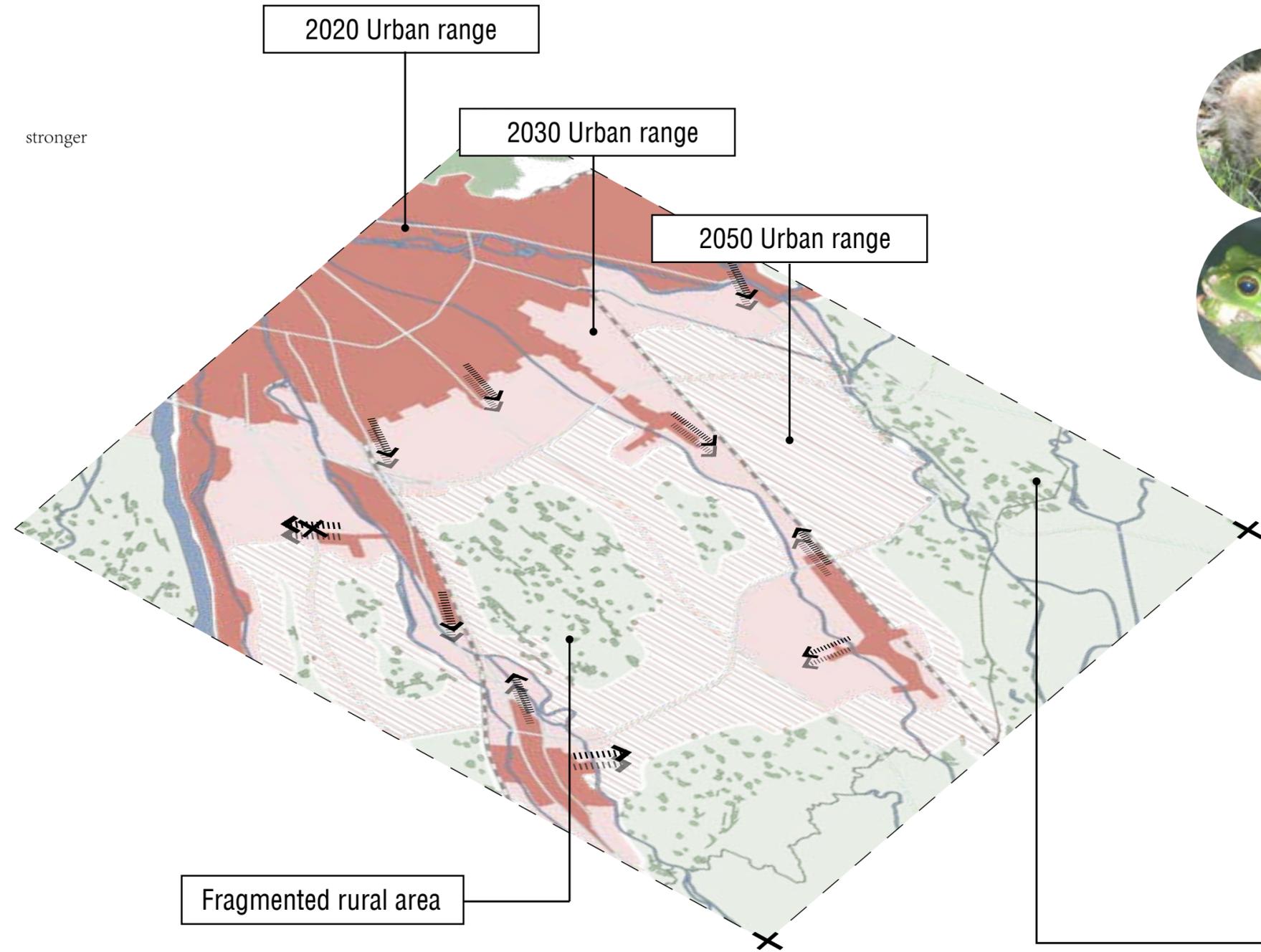
Rural areas that has the potential to be urbanized in the following years of urban development

present 2030(predicted)



- Surrounded by priority urbanized area and main transportation infrastructure
- Completely surrounded by priority urbanized area
- Fragmented and lack of connectivity due to urban construction area and main transportation infrastructure





flora and fauna



tradition

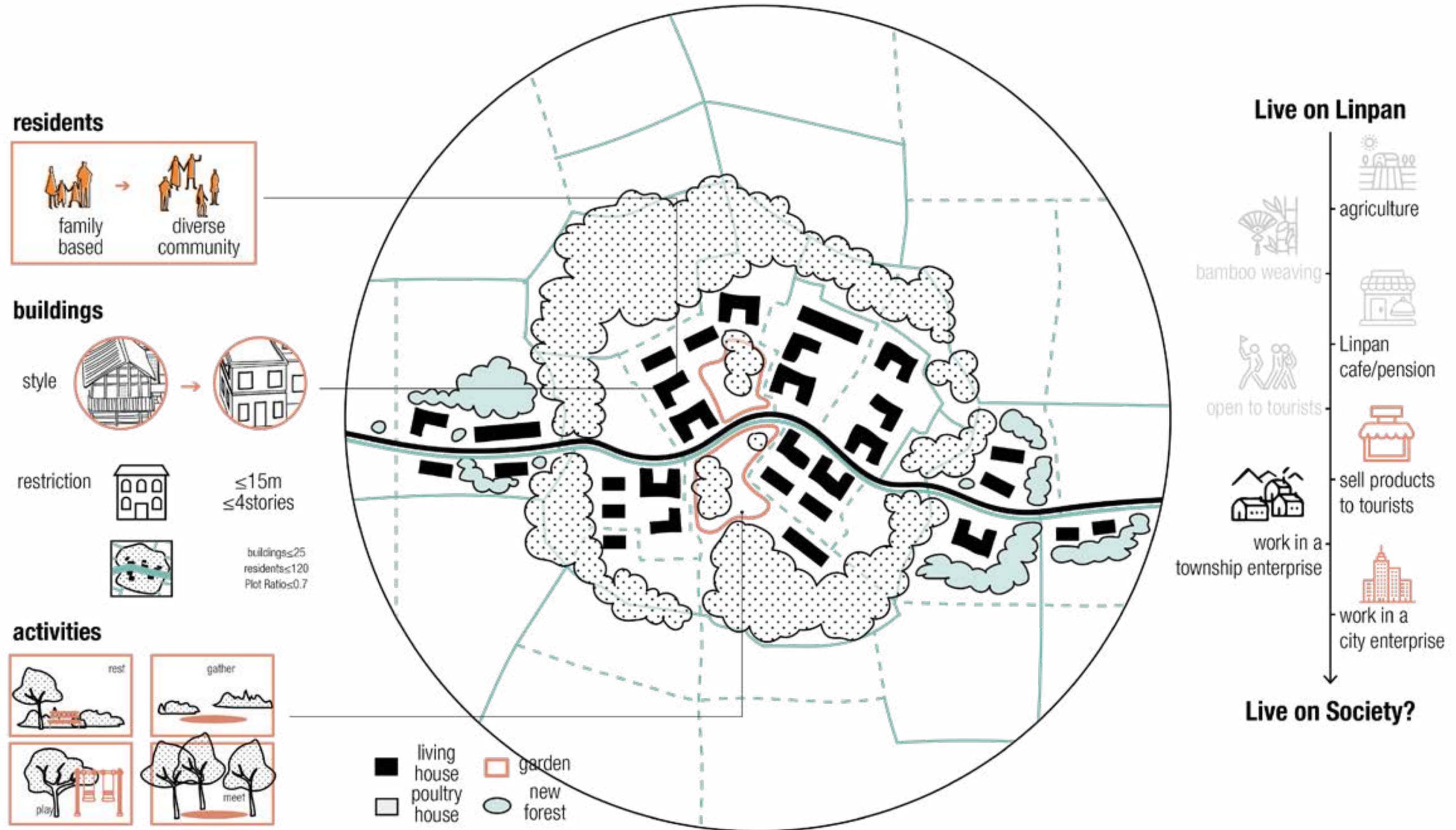


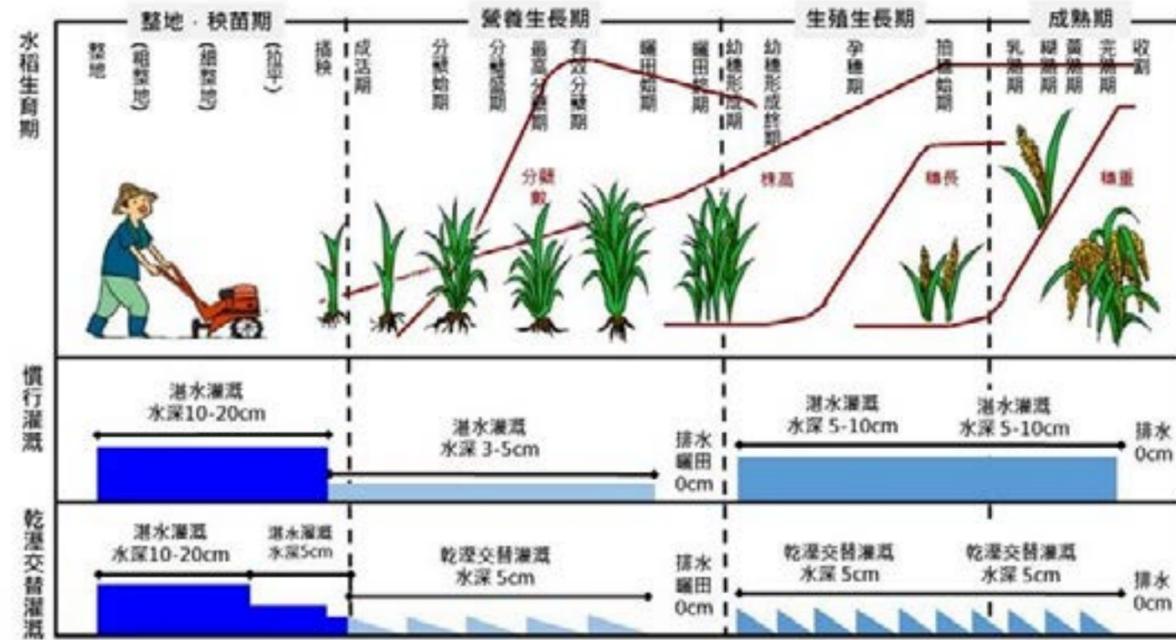
life style



Disappear







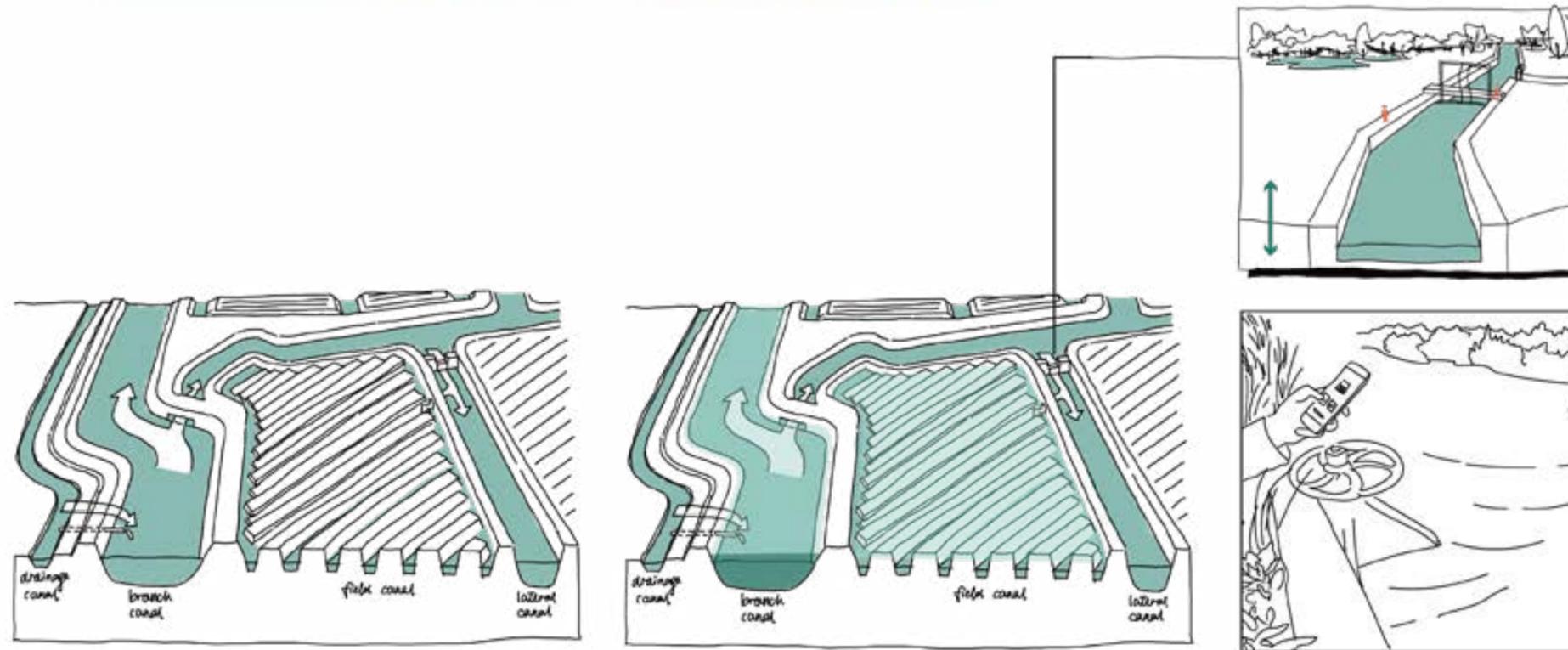
Alternate wet and dry irrigation method

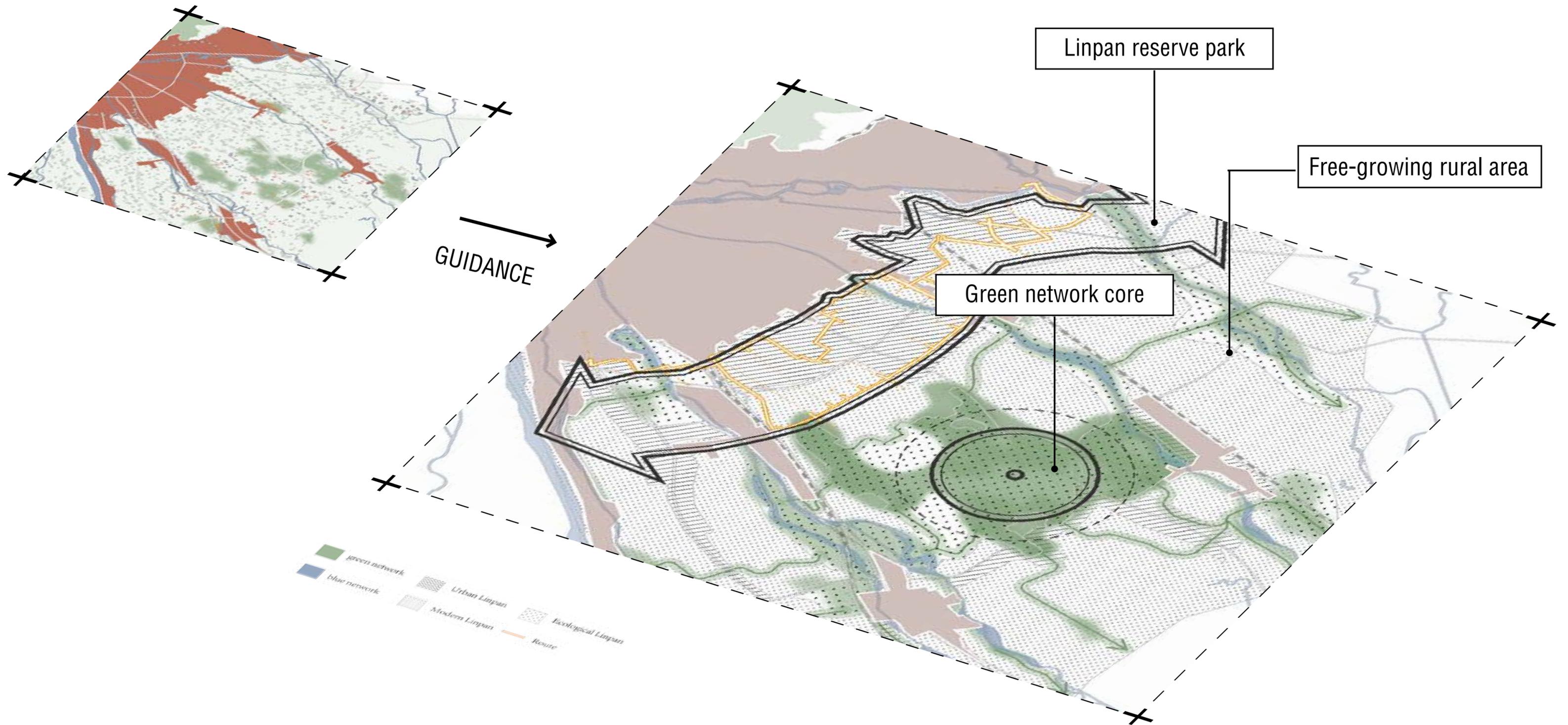
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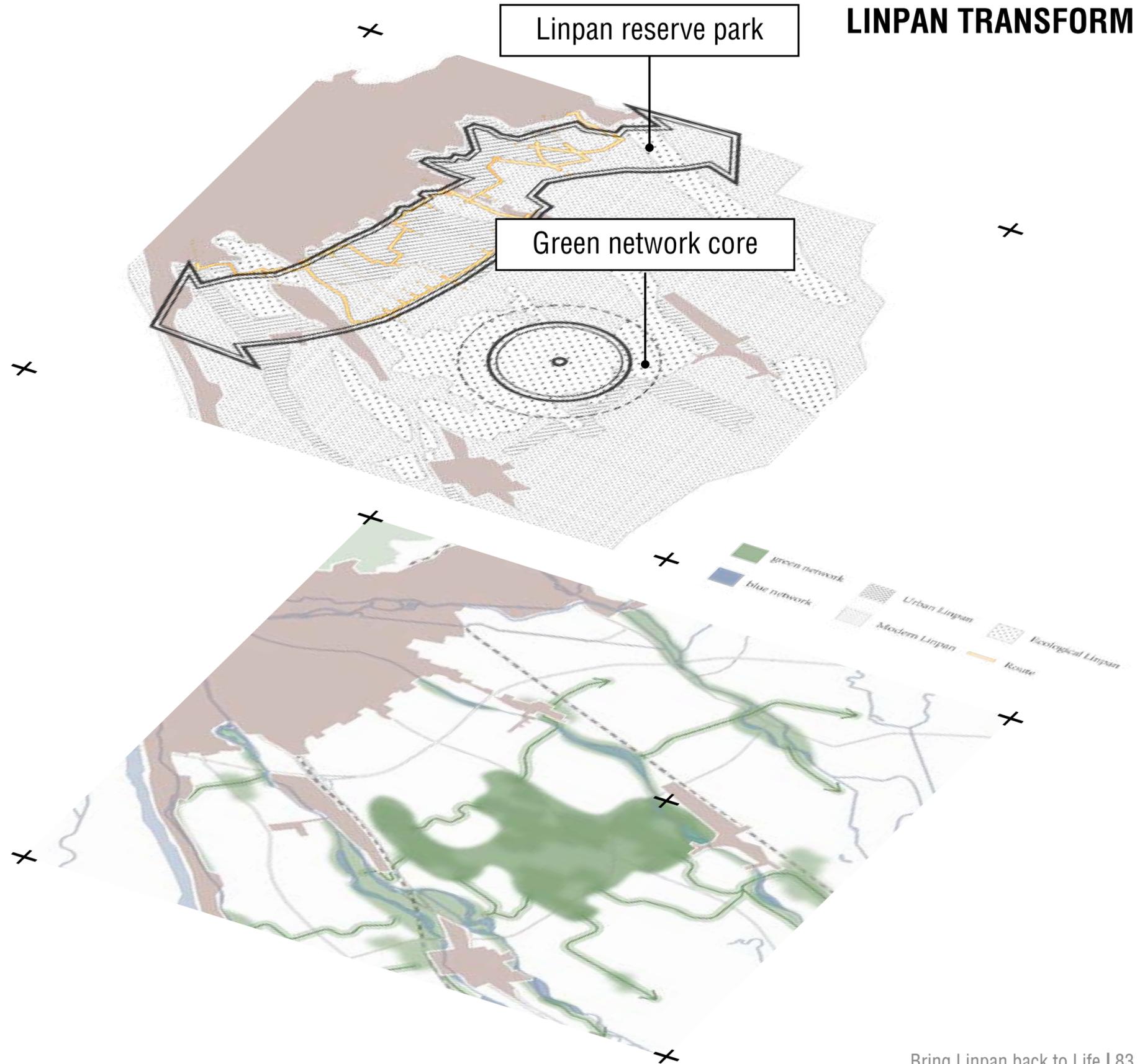
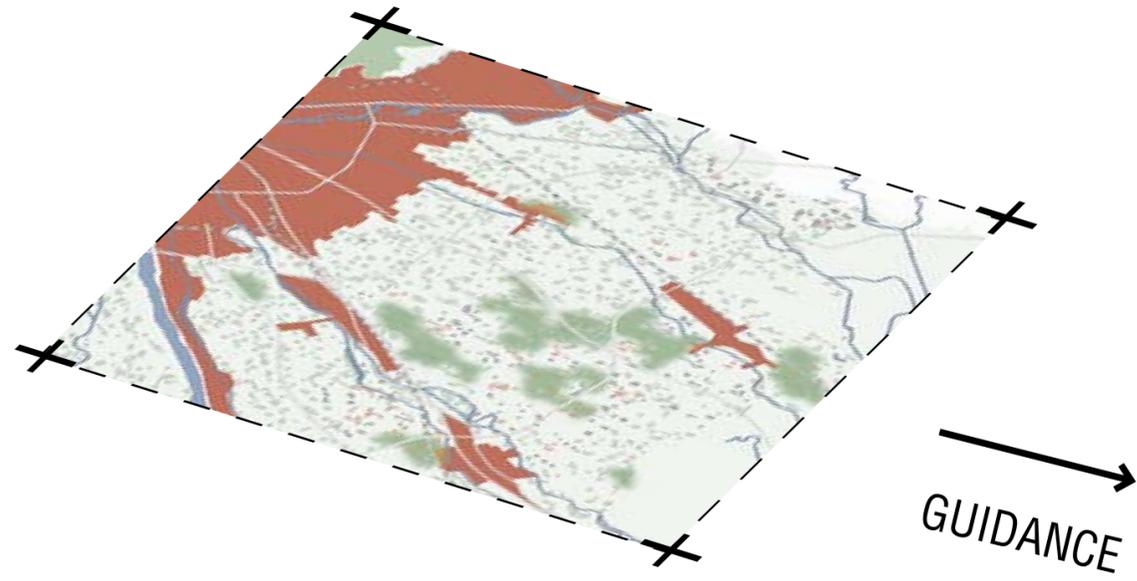
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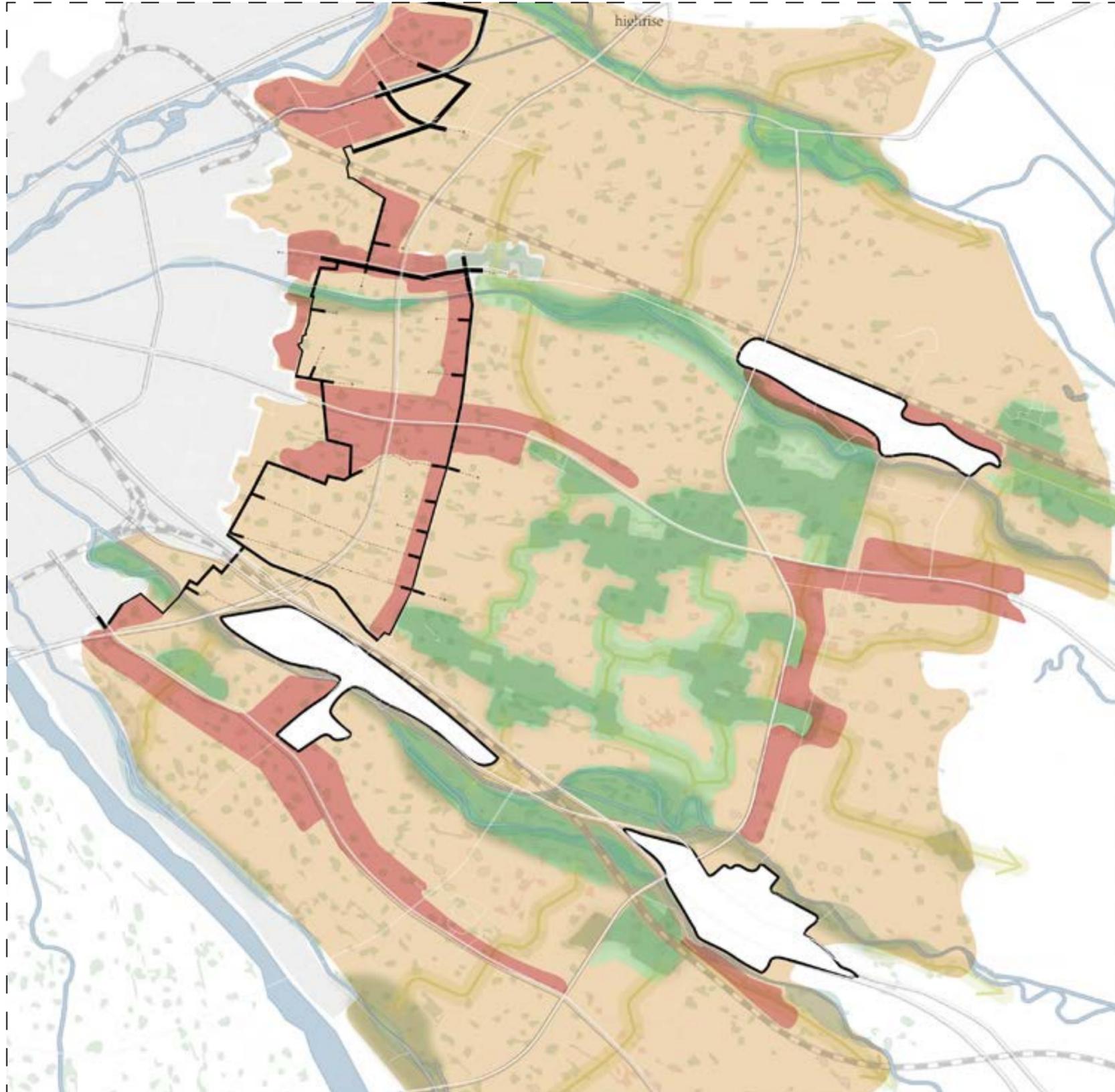
Field/Garden rewilding

- Stop using fertilizers or pesticides
- Rewild your lawn
- Choose the right plants
 1. Which seeds are right for your rewilding project?
 2. Native or non-native plants?
 3. Plant insect-friendly plants
- Create layers
- Build woodpiles
- Create a compost
- Set up wildlife corridors
- Install feeders and nest boxes
- Build a pond
- Reduce, reuse, recycle

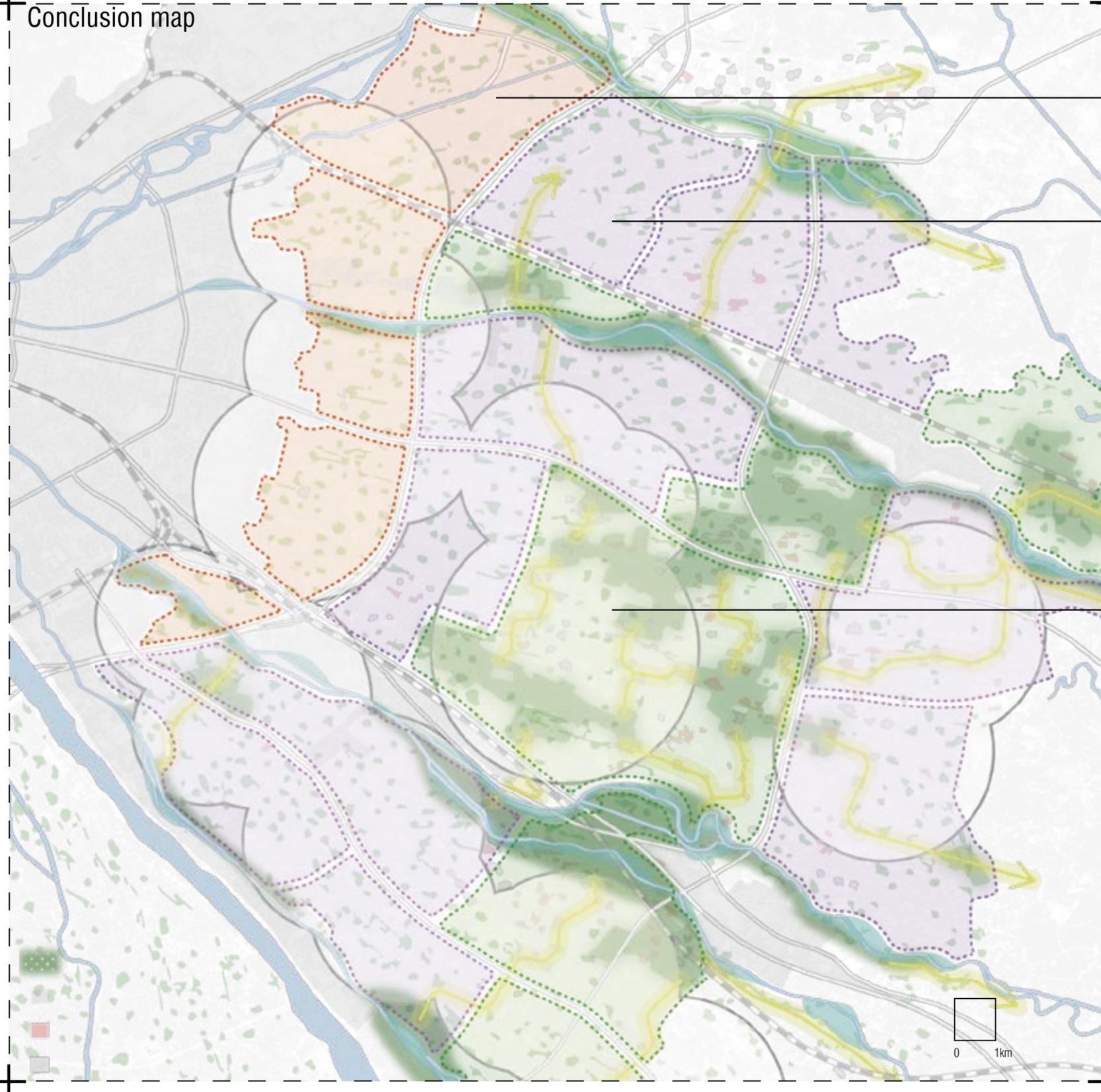








Conclusion map

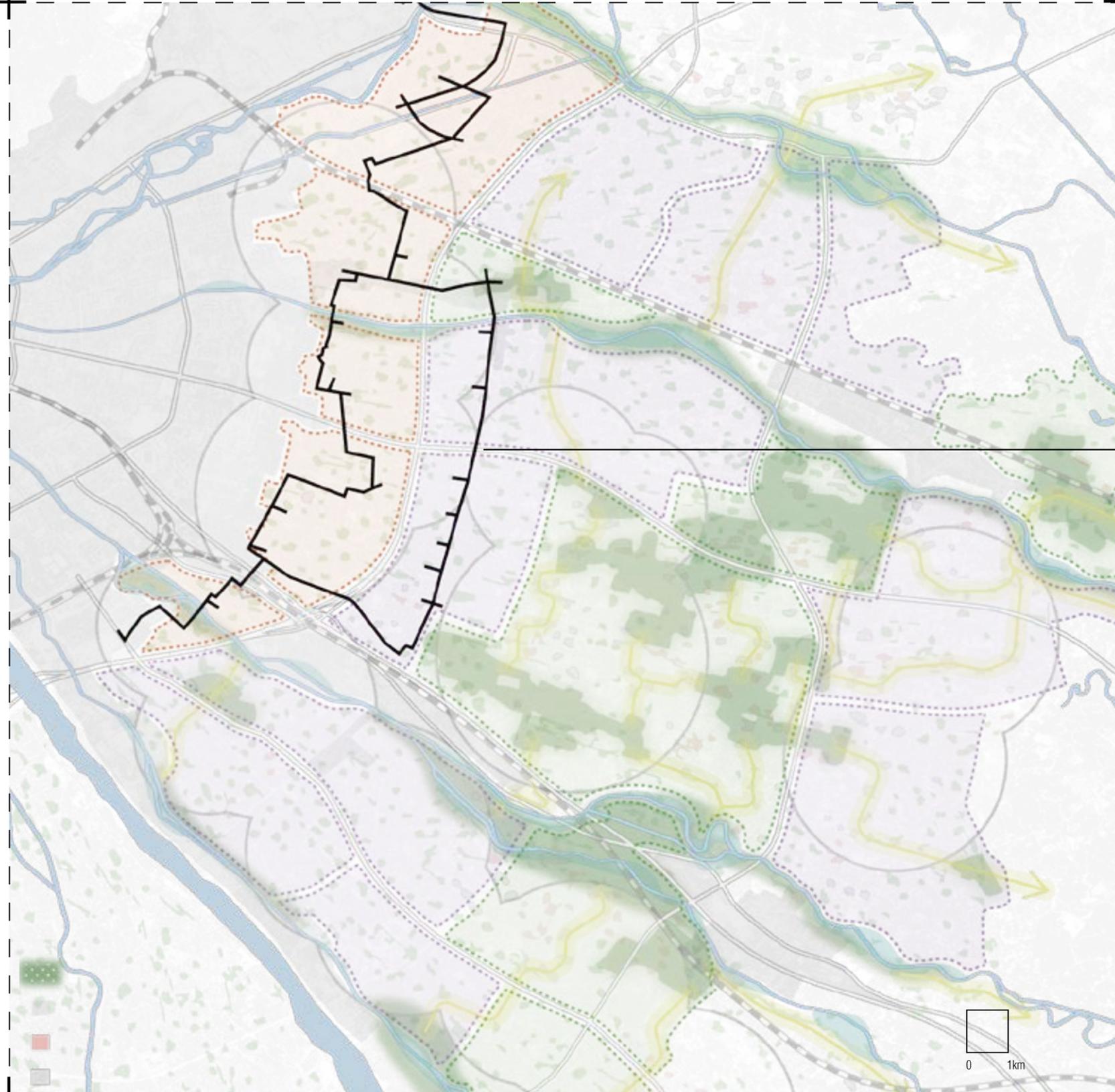


Linpan reserve park

New Linpan living area

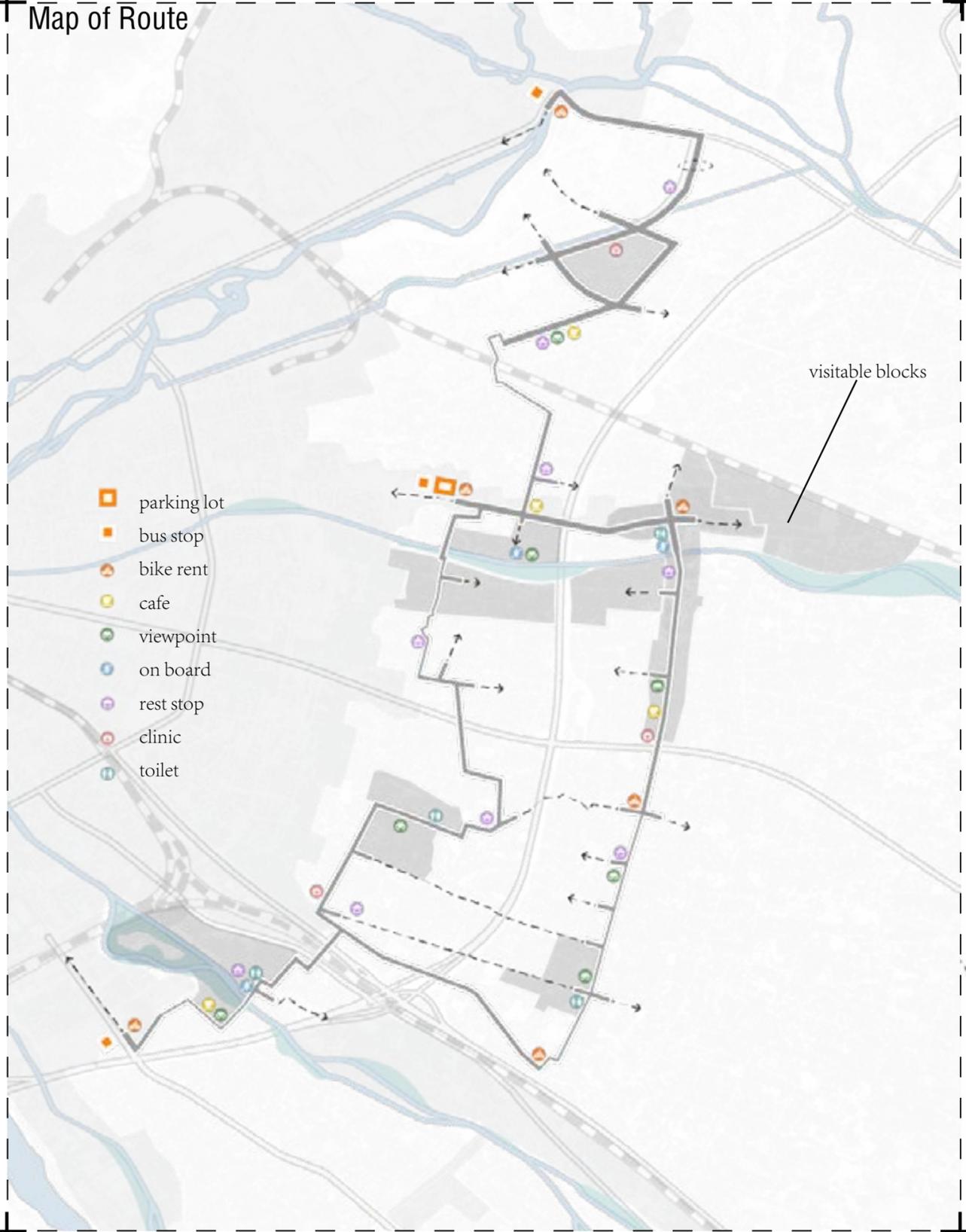
Ecological green-blue area

How to organize all these spaces?



Linpan deep-visiting Route

Map of Route



ROUTE 1



ONE WAY TOUR

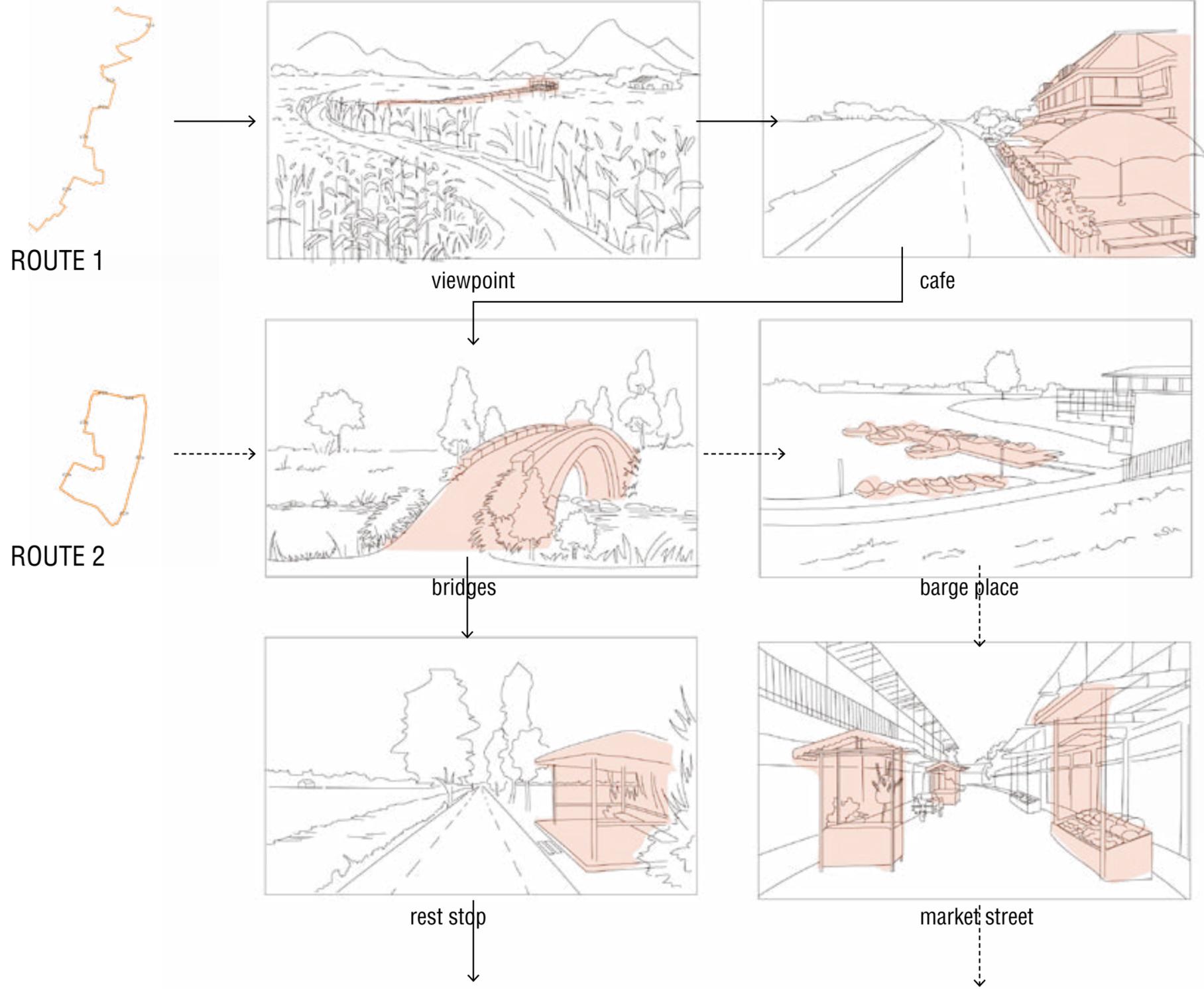
ROUTE 2



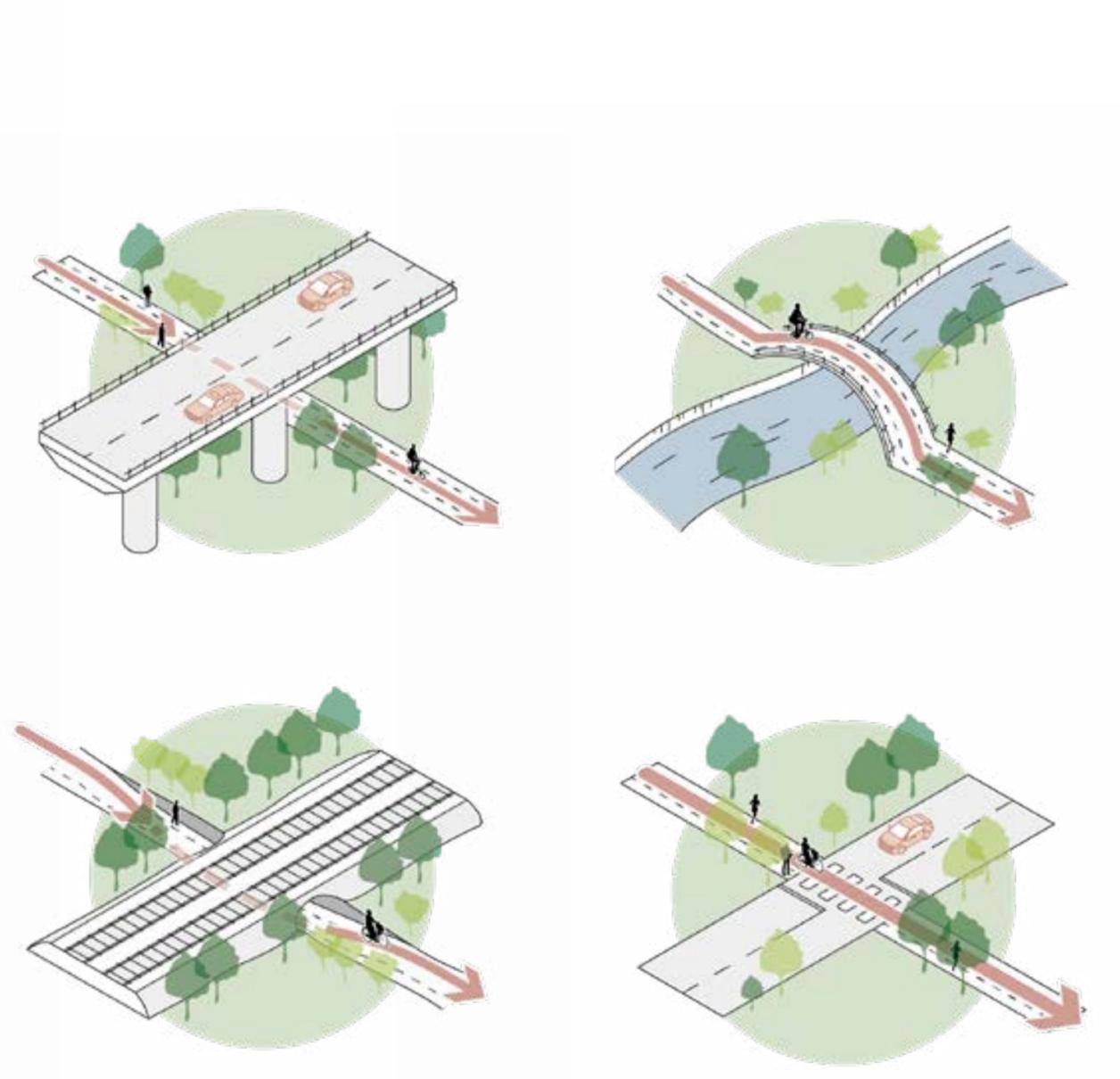
LOOP

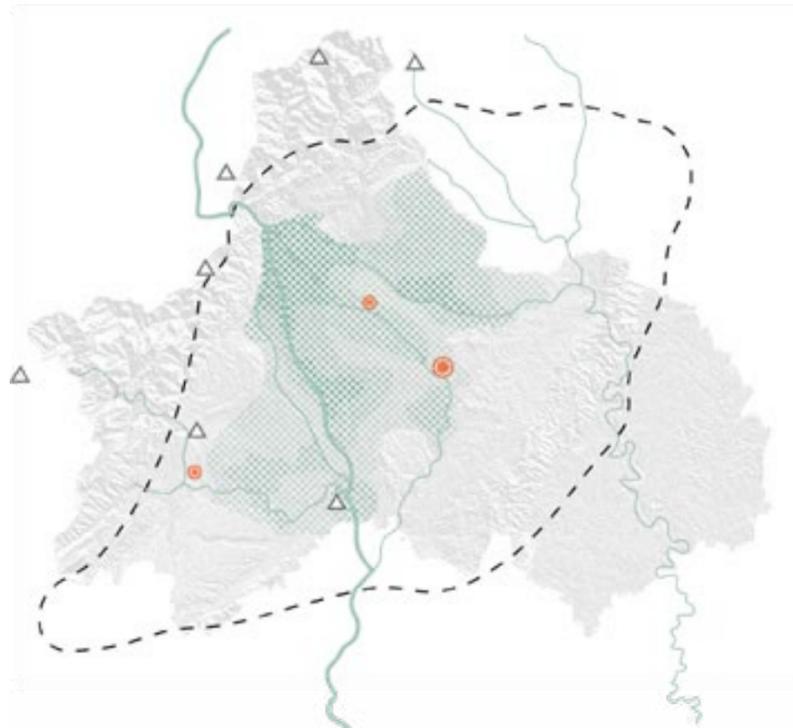
ROUTE PLAN

Perspectives: bike and pedestrian

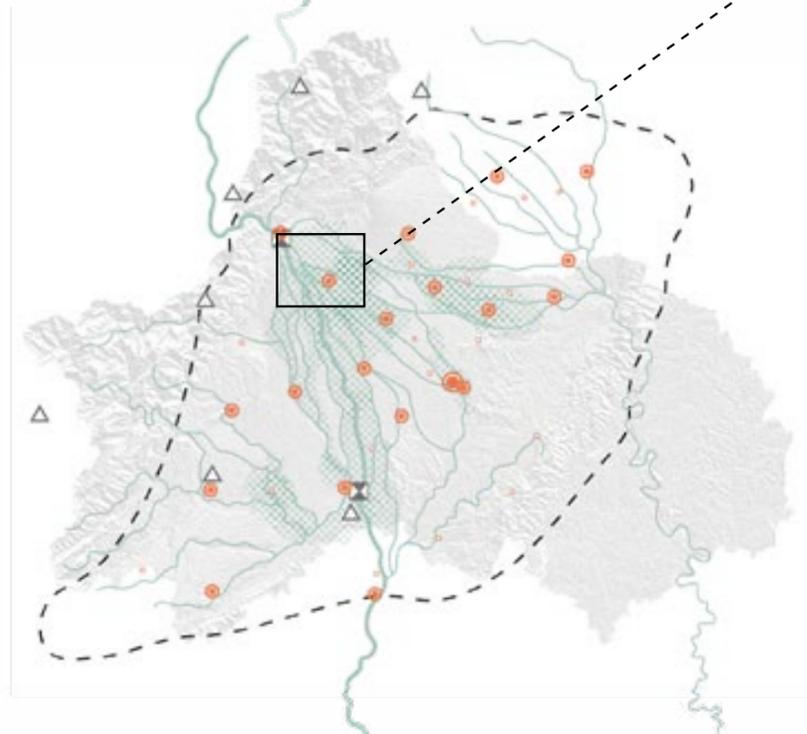


Crossings

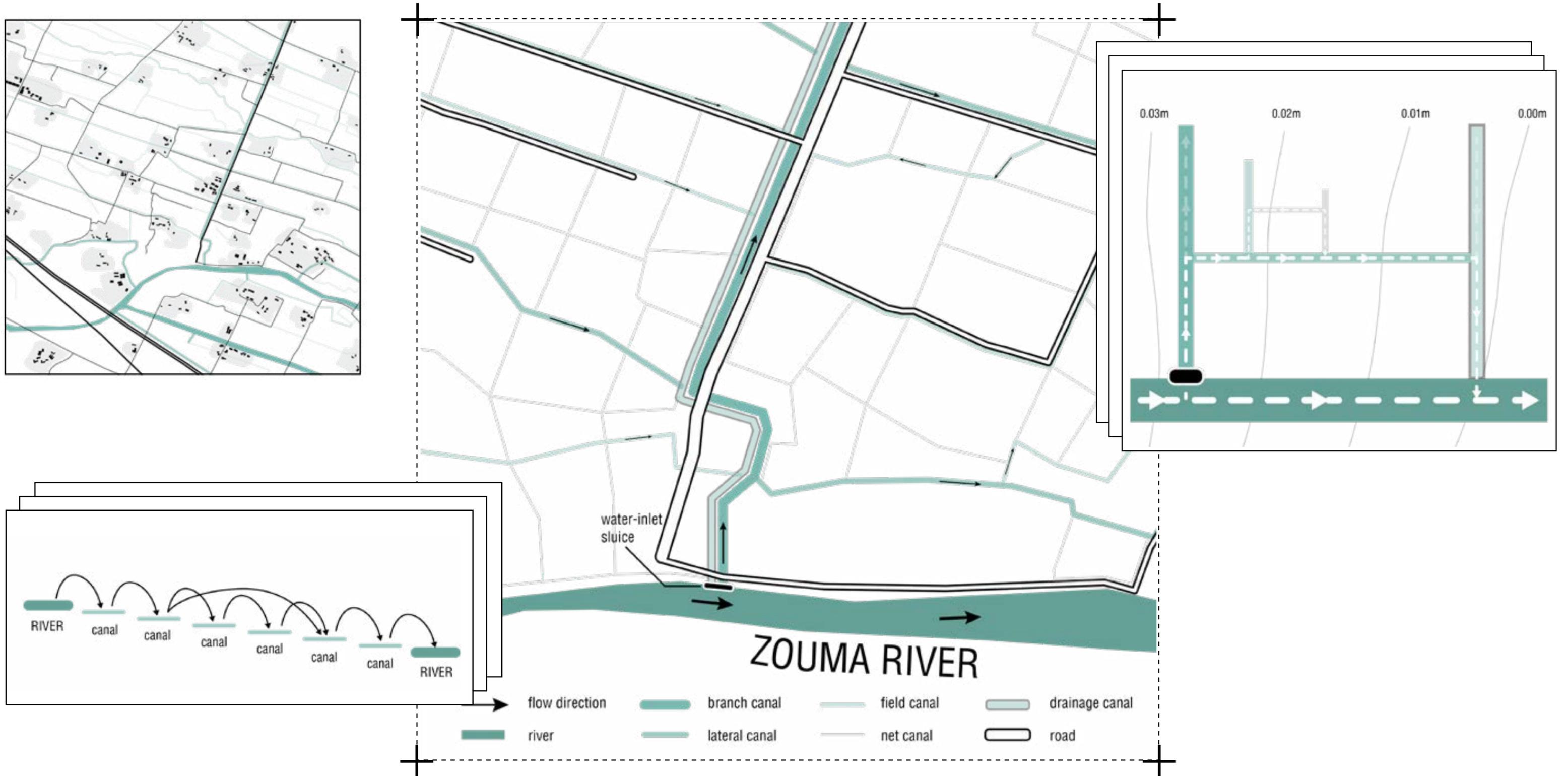




Origin period: 5000BC-256BC



Mature priod: 1271-1911



Government planning and resident spontaneous behavior

File

Chengdu City Park Urban Green Space System Plan (2019-2035)

Wetland Ecosystem Protection Plan
The core irrigation area of the Dujiangyan Water Conservancy Project starts from the Dujiangyan irrigation mouth, goes east to the central city of Chengdu ... covering an area of about 3,128 square kilometers.



Chengdu City Park Urban Green Space System Plan (2019-2035)

Greenway System Planning
The regional greenways of Chengdu City link "mountains, water, fields and forests" and build a city-wide main greenway system with "one axis, two mountains, three rings and seven belts", linking various city groups within the city, reflecting the natural wildness of Shu Mountain and Rong Water, with a total length of 1,920 km.

Implementation Opinions of Chengdu Construction Committee on Promoting the Protection of the City's West Sichuan Linpan

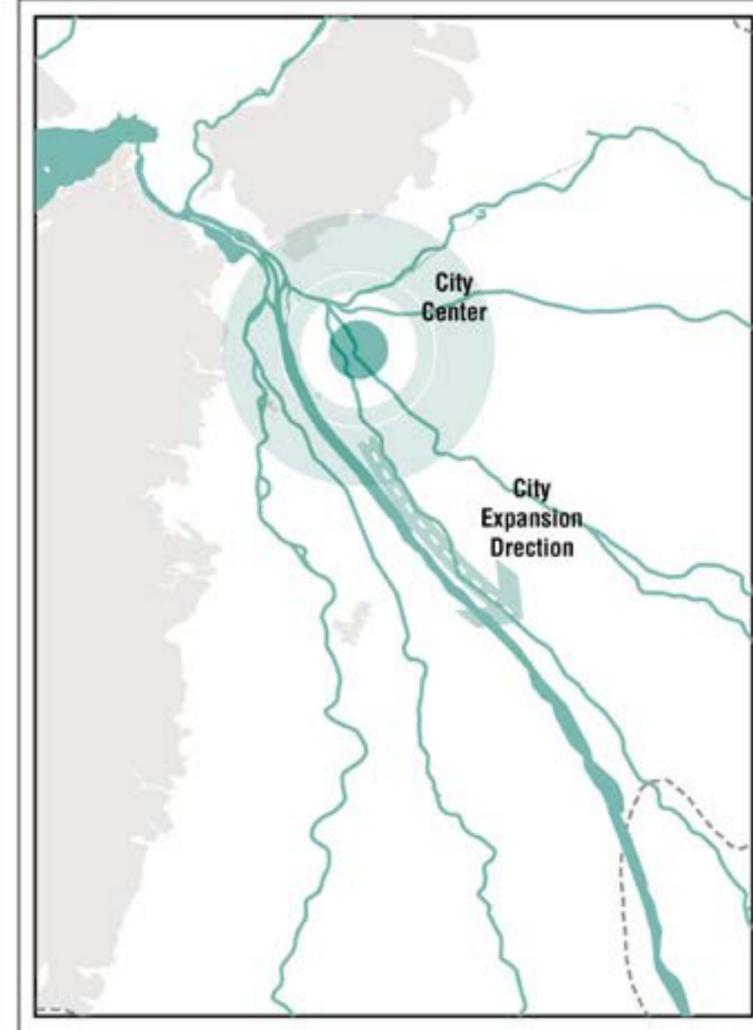
2,100 residential Linpans
2,885 non-residential ecological Linpans

The city's Linpan ecological barrier system remains intact and the ecological environment is improved.

The overall landscape appearance of the western Sichuan farmhouses in the form of forest pans has been protected and inherited, and the rural industrial structure has been optimized and diversified.

The overall level of new rural construction has been improved.

Planning



- 1. Pension
- 2. Farmhouse restaurant
- 3. Cafe

- 4. Market
- 5. Fishery
- 6. Plantation forest