

Symbiosis:

Renovating Traditional Cultural Landscape of Baiyangdian Lake-Wetland System, Hebei Province, China

MSc Architecture, Urbanism and Building Sciences | Track Landscape

Flowscape Studio | Circular Water Story 6 | P5

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Baiyangdian 1960s
Author: Zhangfan





Baiyangdian 1990s
Author: Xinhuashe



How can landscape design help the Baiyangdian area to reestablish a new relationship between people and water in a resilient and sustainable way?

1. How did people and water coexist harmoniously in the Baiyangdian area in the past?
What problems have they suffered in modern times?

2. In the process of transformation, which characteristics of the past can be retained, which need to be transformed, and what new characteristics can be added?

3. How to achieve these goal by means of landscape design, and what kind of spatial quality can these villages present in the future?



366 km²

Lake-wetland system



3.6m

average water level

Hebei Province, China

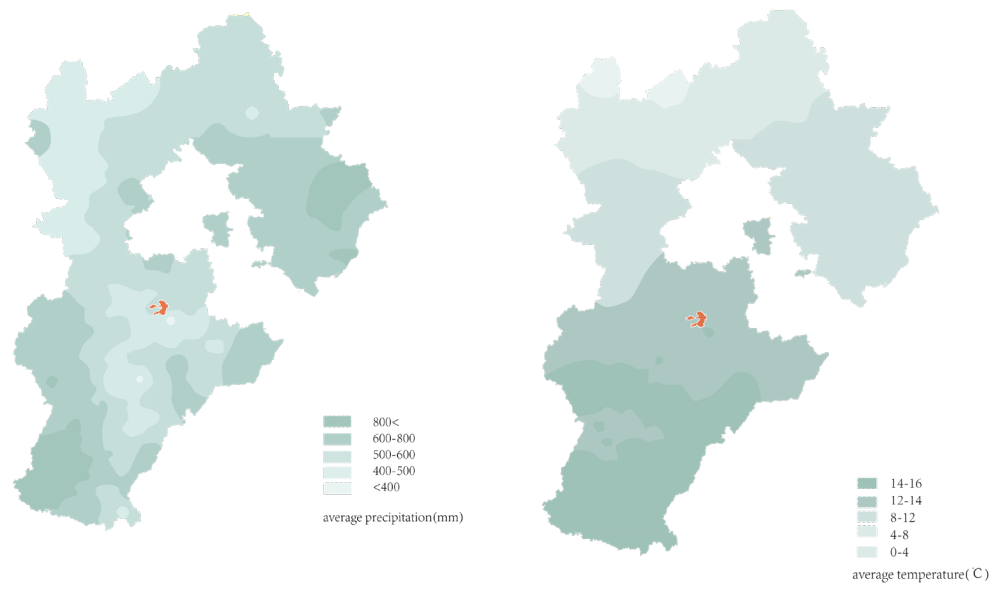
40

Island villages inside Baiyangdian

90, 000

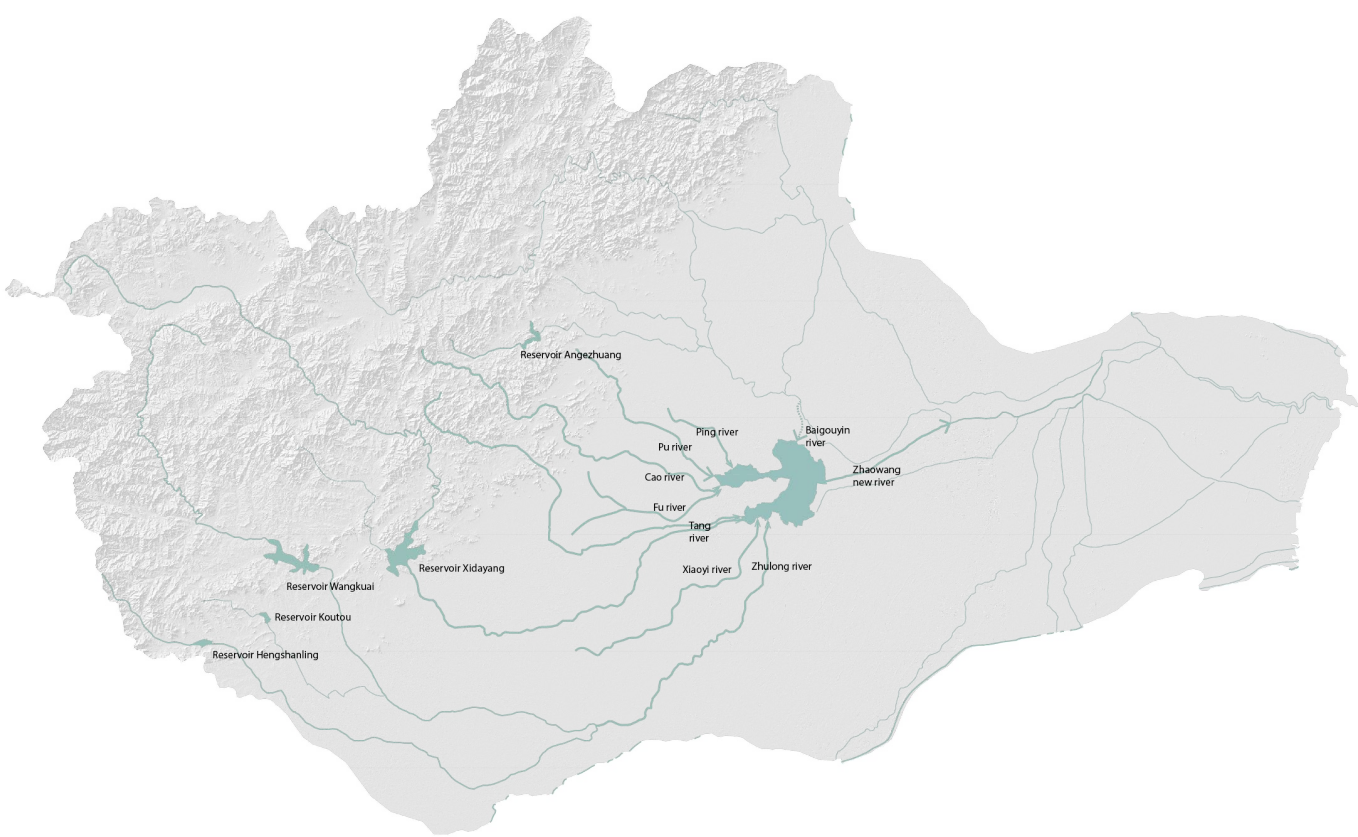
people living inside the lake
(2023)

A flood prone area in summer



Average precipitation
Hebei Meteorological Bureau

Average temperature
Hebei Meteorological Bureau



Catchment area
Drawn by presenter

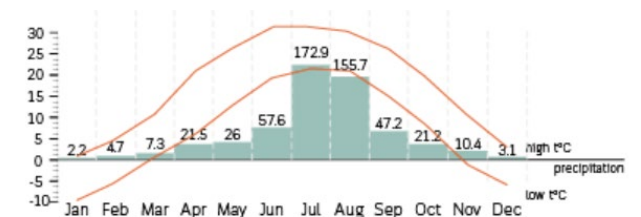
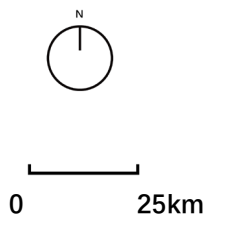


Figure 6 Annual precipitation and monthly average temperature

Obvious seasonal change in climate, rain and high temperature concentrate in summer
Eight rivers upstream and only 1 downstream

Sensitive to rain and flood, especially in summer



A system with seasonal water level change adaption

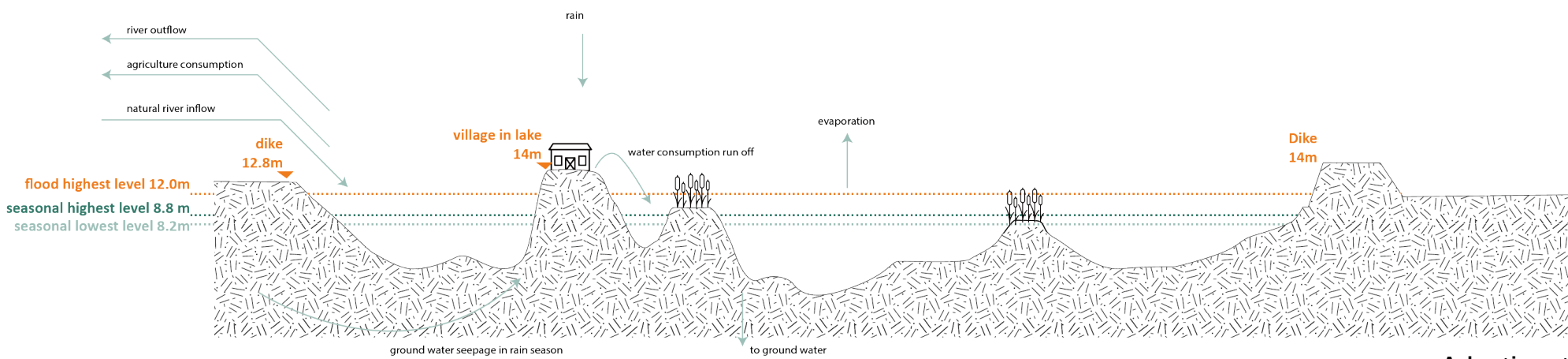
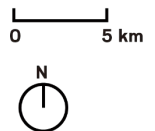


Spring (high level season)

Summer (Flood and low level season)

Autumn (high level season)

Winter (high level iced)



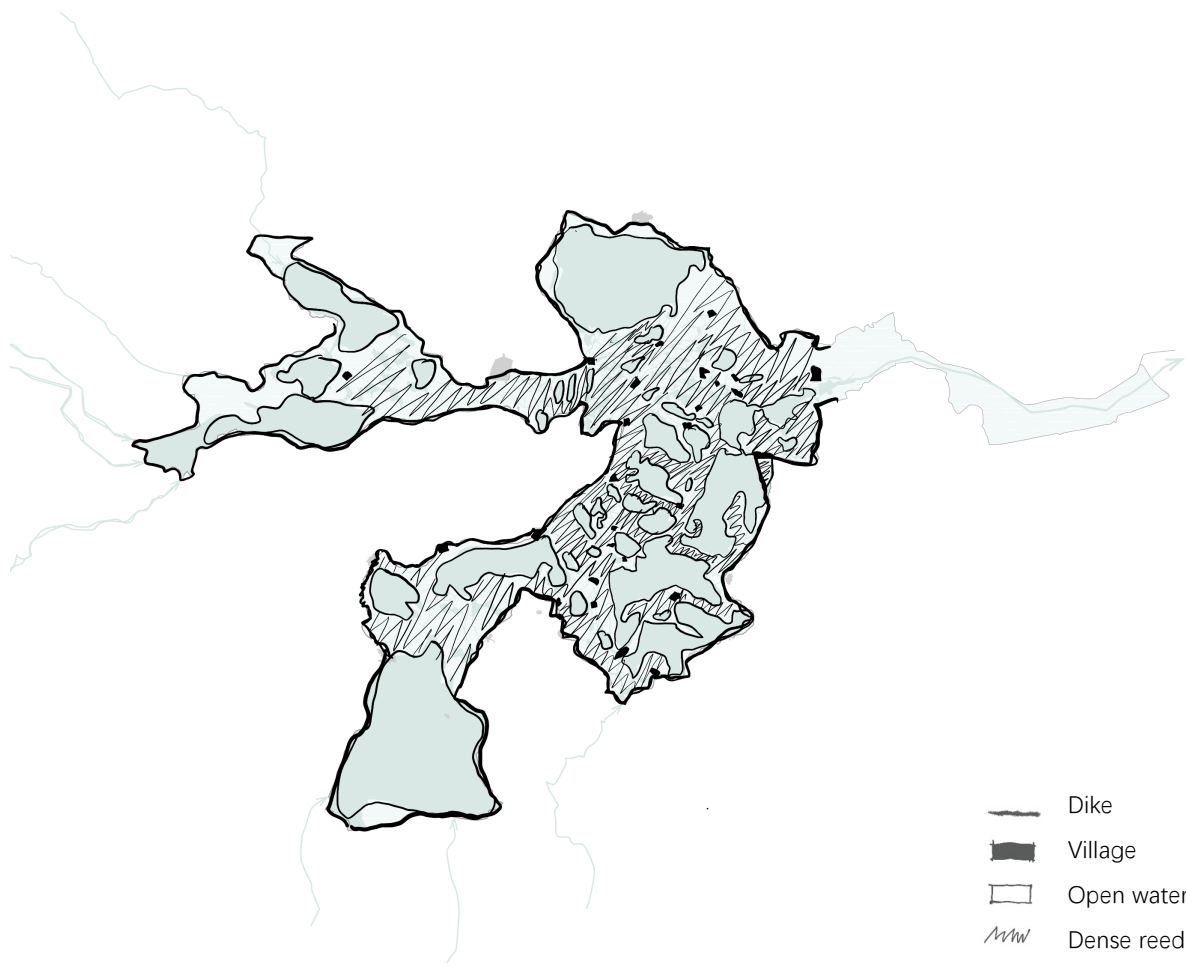
flood highest level 12.0 m
seasonal highest level 8.8 m
seasonal lowest level 8.2 m

Adaptive structure to water level change

Seasonal change of Baiyangdian,
Analysis of the Dynamic Changes of the Baiyangdian Lake Surface Based on a Complex
Water Extraction Method, Xiaoya Wang, 2018



4 Landscape typologies this adaptive system



Landscape composition in 1963

Drawn by presenter



Dike
resource: People.cn



Village
resource: Zhangfan



Open water
resource: People.cn



Dense reed
resource: People.cn



If you were local in island village...

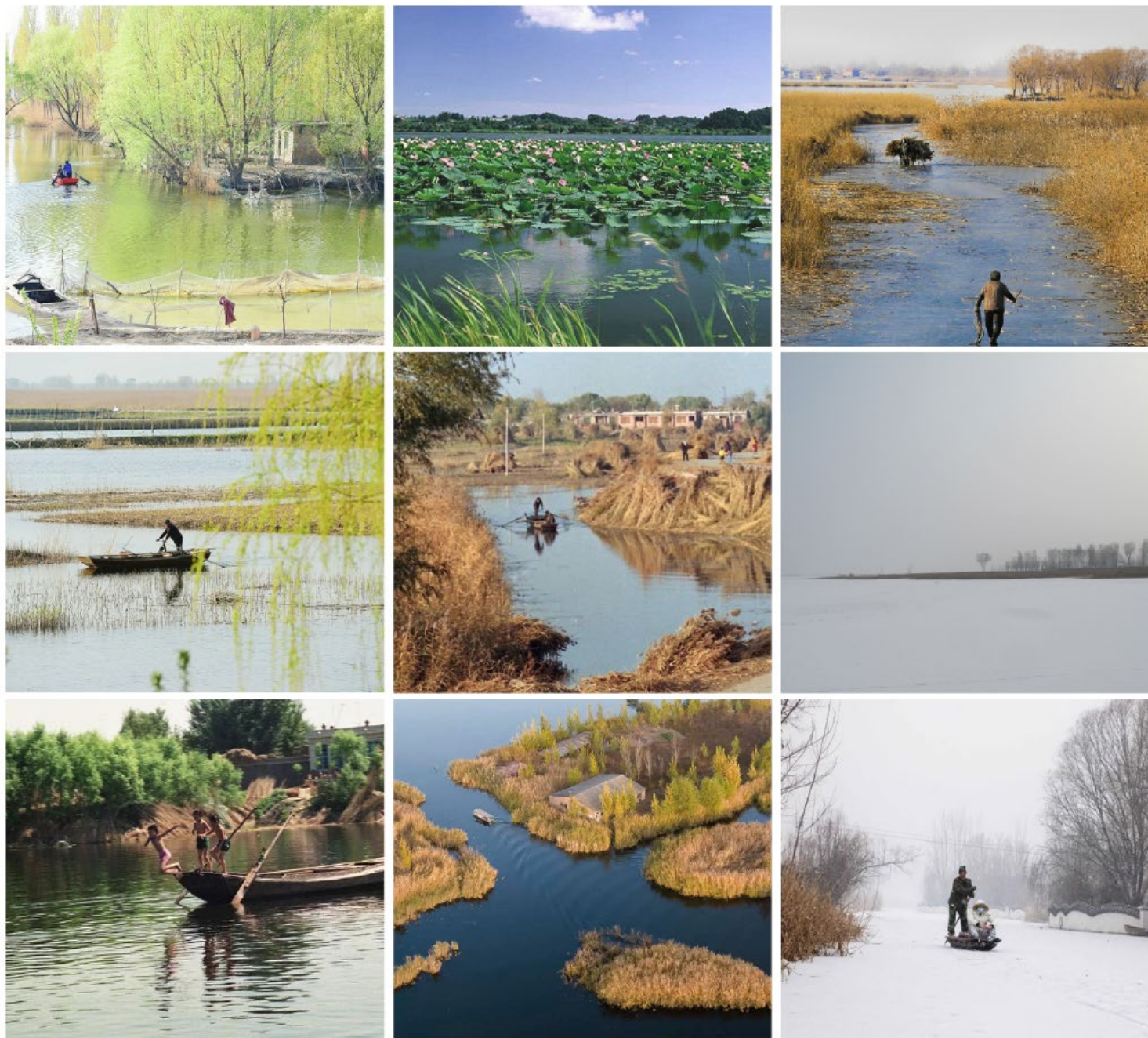
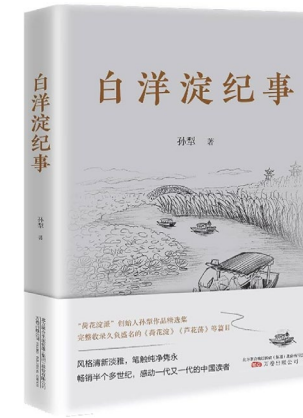


Figure 40: Seasonal change landscape in Baiyangdian
Resource: Zhang Fan



"She sat on reeds, like sitting on a clean white snow or cloud. She sometimes looked into the reed lake, which was also a silver-white world, with a thin mist shrouding the surface of the water, and the wind blowing over, carrying with the fresh fragrance of lotus leaves and flowers."

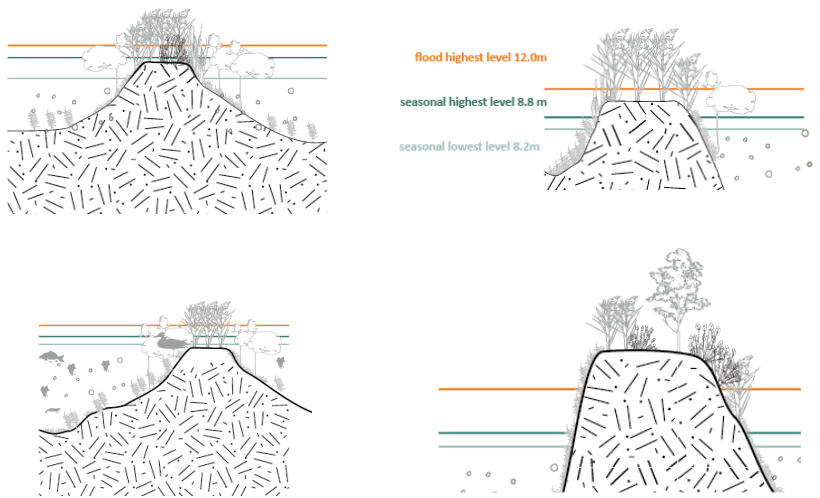
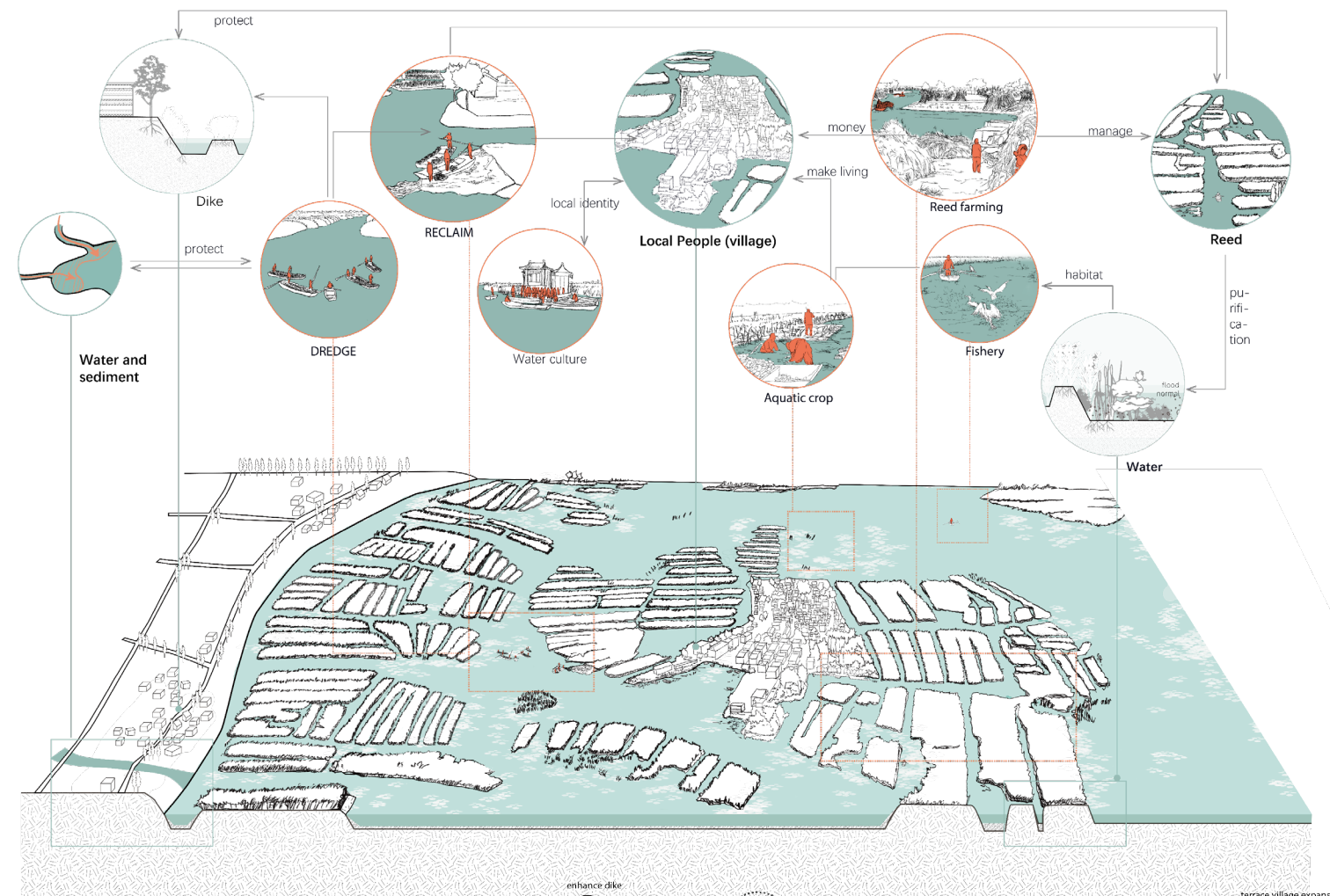
--SUN Li, The Stories in Baiyangdian

Local culture: based on local life style and environment

Losting local culture

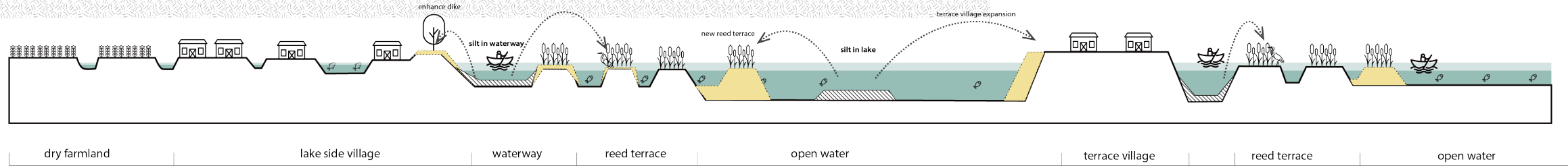
Resource: People's daily, amazon

Symbiosis of people and water: a cultural landscape maintained by locals



The system is a symbiosis of people and water

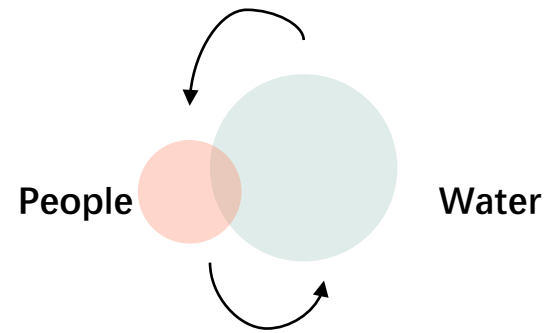
- Rivers bring water and sedimentation
- People transform the sedimentation into reed field or village, offer maintenance to the lake
- Reed fields are buffer for flood, purification for water, habitat for flora and fauna, and livelihood of local people (as well as fishery)
- People harvest the reed in case of rotting and pollute the water
- Local culture develop



Baiyangdian Lake-Wetland System



Cultural landscape
Cultivated and maintained by
locals



**Symbiosis of
People and Water**
Dynamic and sustainable



Heavy flood in 1963

Drying because of upstream reservoirs



- upstream river: still has water
- upstream river: no more water

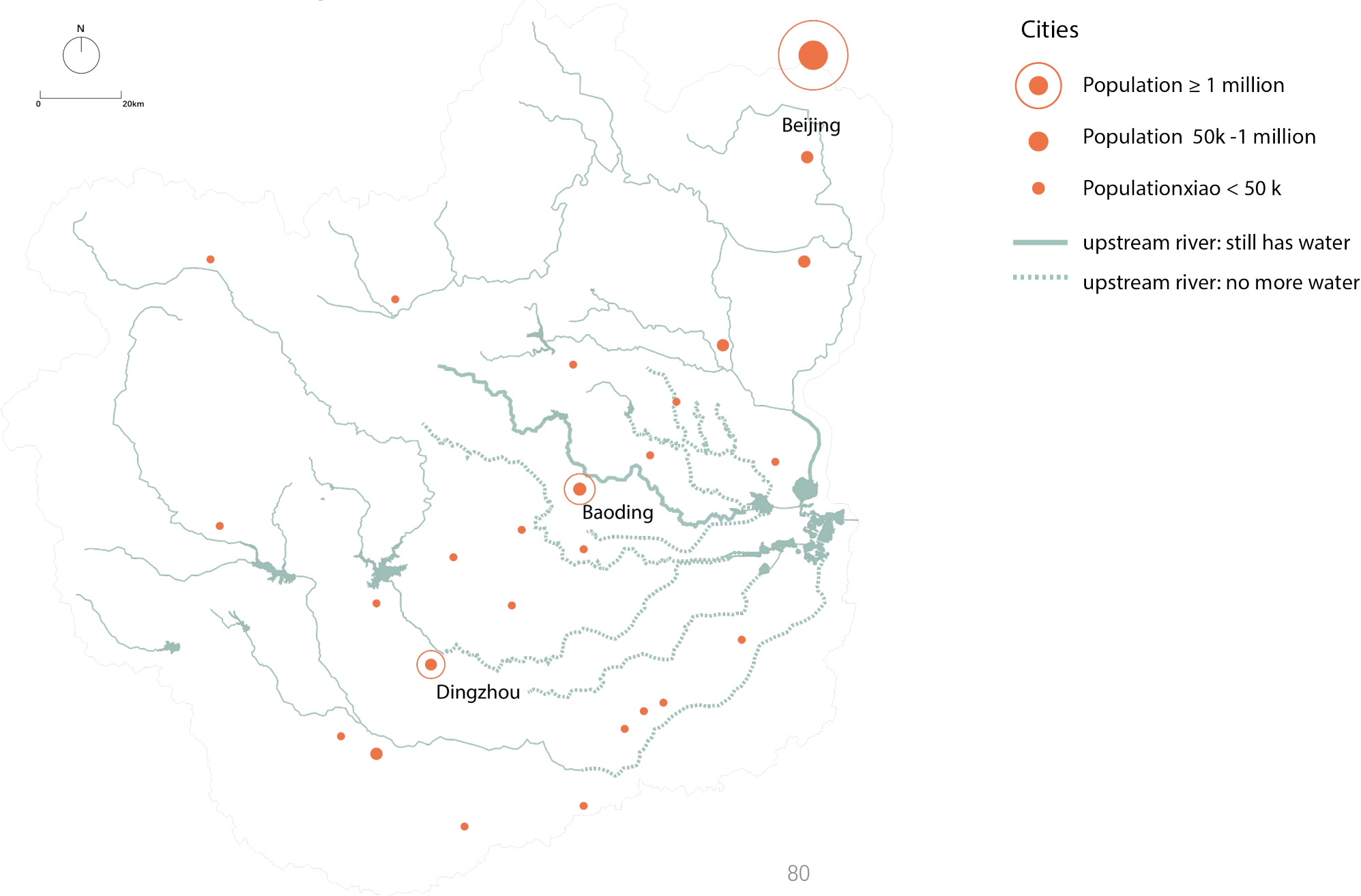
The climate change, upstream reservoir and cities caused 6 rivers dried in 8 upstream rivers of Baiyangdian



Urbanization since 1978

Increasing environmental burdens upstream

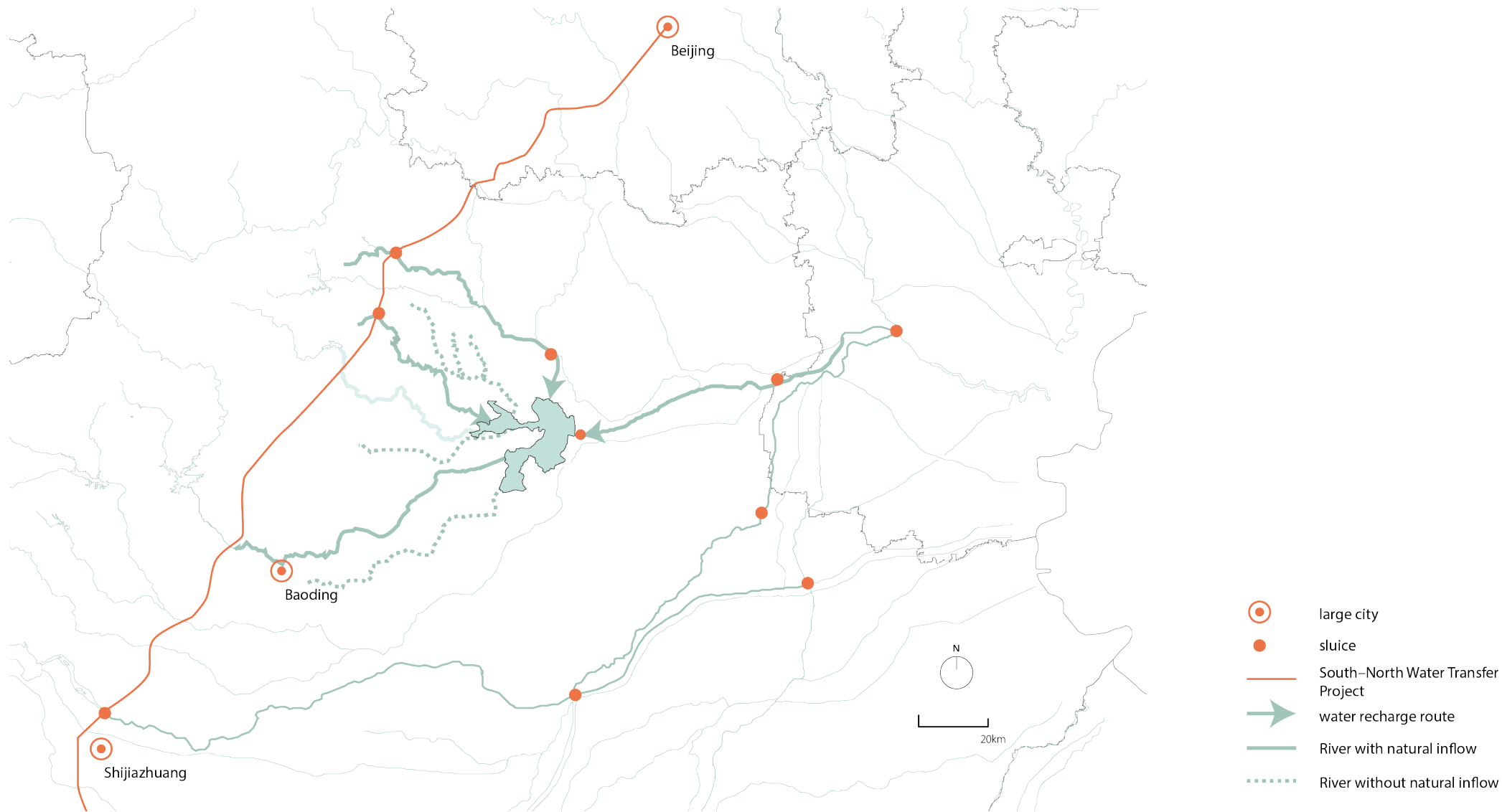
Upstream cities' development increased environmental burdens



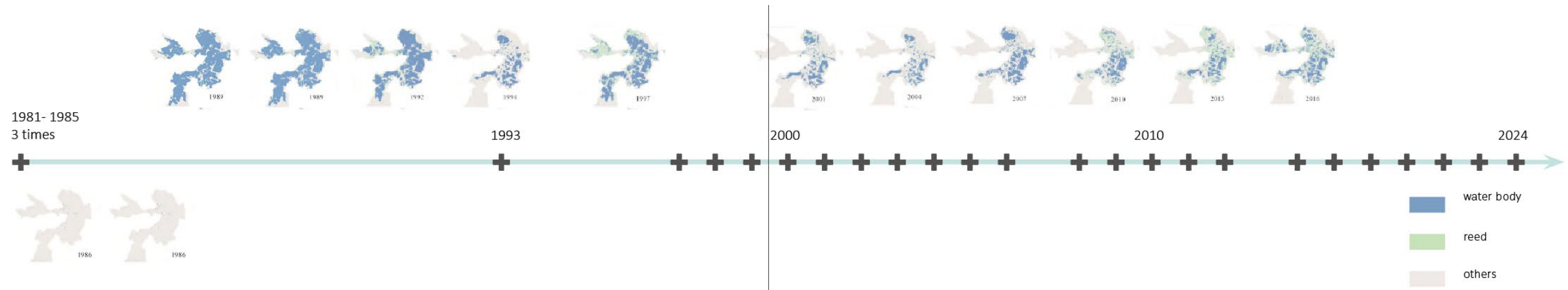


Severe water shortage in Hebei

Artificial water recharge since 1981

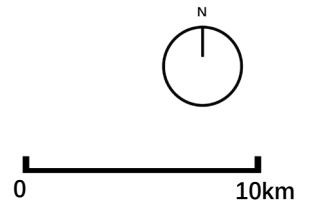
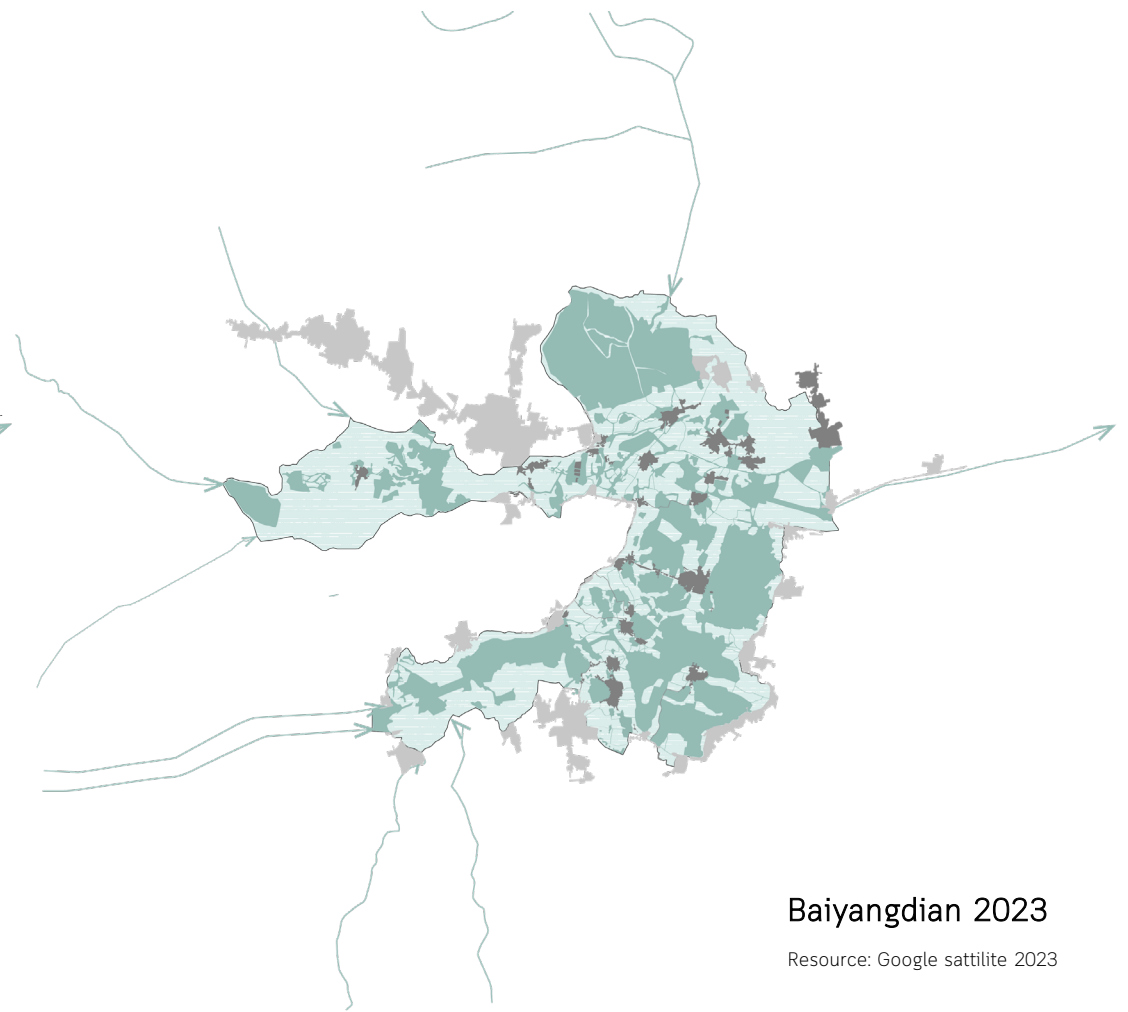
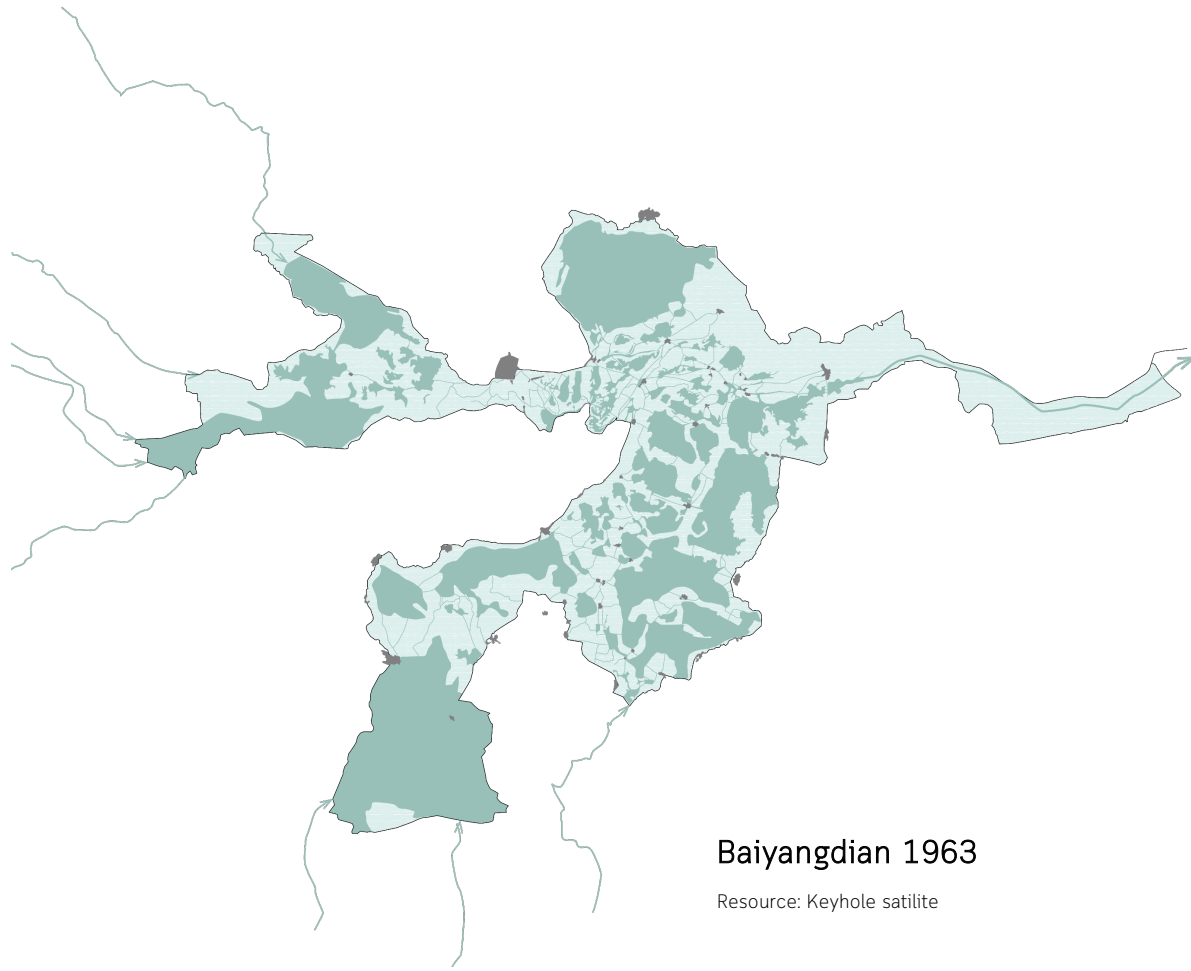


Artificial water recharge: necessary to preserve Baiyangdian



Artificial water recharge timeline

Resource: An Analysis of the Evolution of Baiyangdian Wetlands in Hebei Province with Artificial Recharge, Kailin Wang, 2018





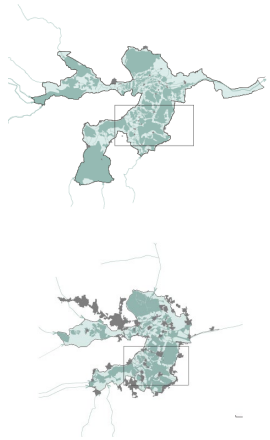
Industrialization since 1978

Local industry developed

Reed and dredge activities gradually abandoned by people because of low income

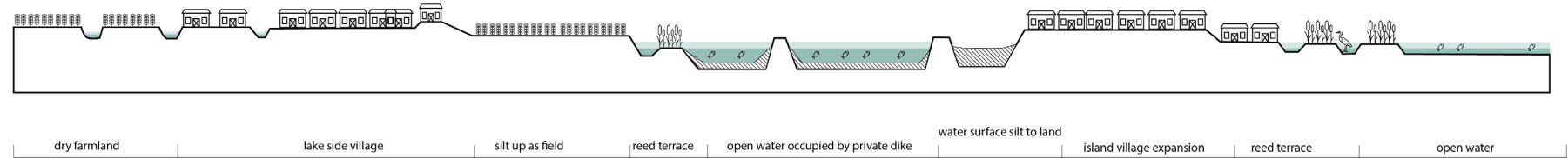
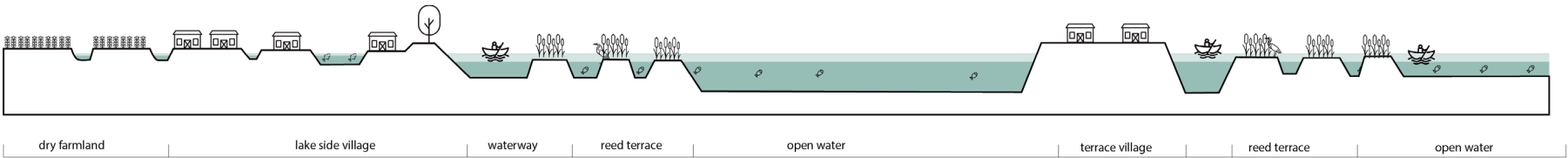
More pollution and water usage because of local industry

Expansion of villages inside Baiyangdian: occupying reed field and water



1961

2023



- 1. Reed field→village
- 2. Water surface occupied by private dikes
- 3. Water surface silted to land

Landscape shrink process

Take Quantou village as example : few blue, few green, big build area and dense house



1 Private factory



3 Disappeared water structure



2 Historical field under flood risk



4-1 Low quality green-blue structure



4-2 Deserted old house



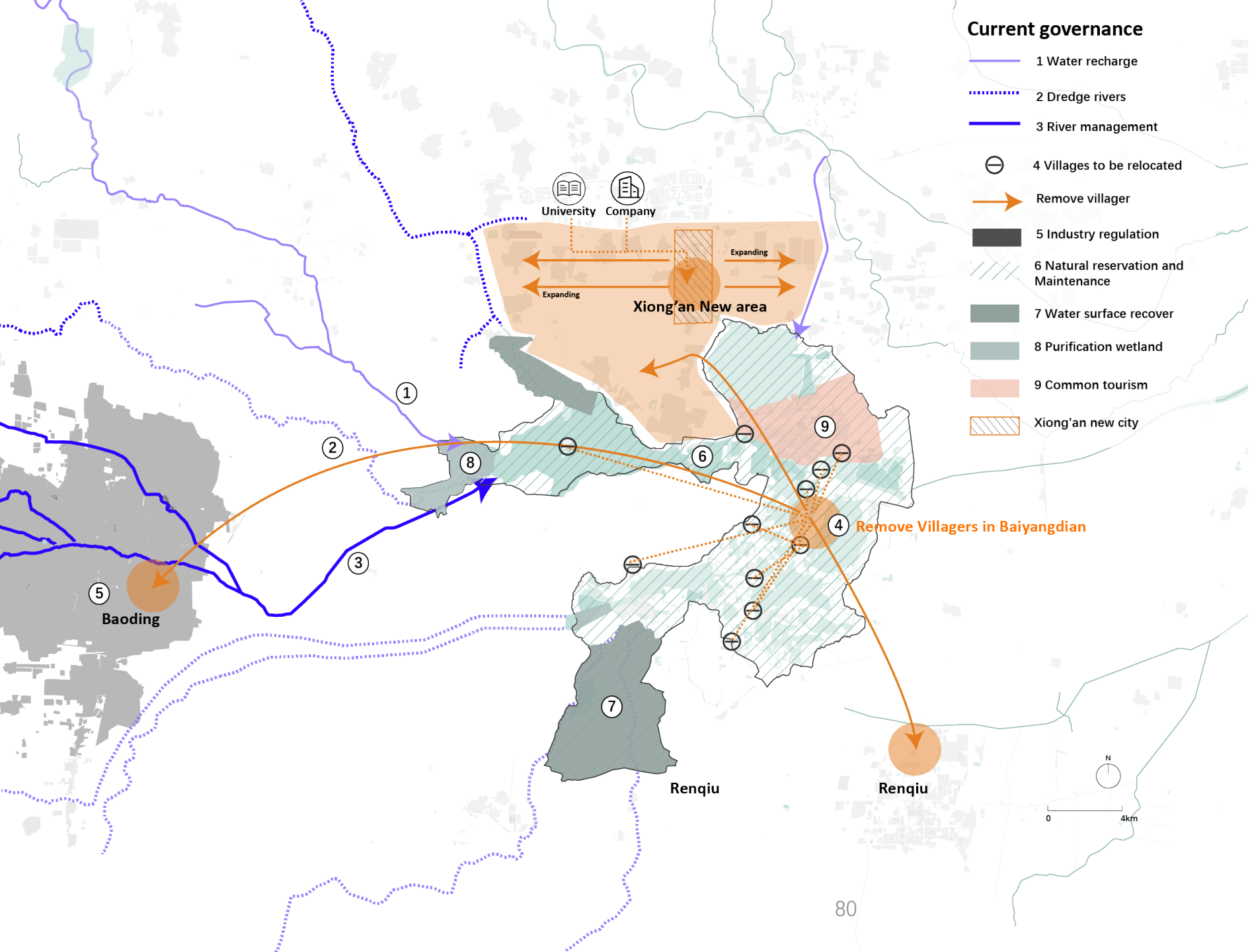


Water pollution



2017: Announcing plans for Xiong'an New Area
Brought more and more governance and treatment to Baiyangdian

Xiongan new area proposal 2035
 Resource: Xiong'an official

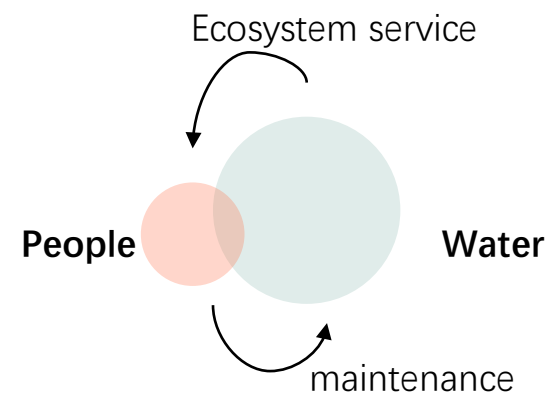


Current condition of Baiyangdian:
A nature preservation surrounded by cities in which people are gradually moved out

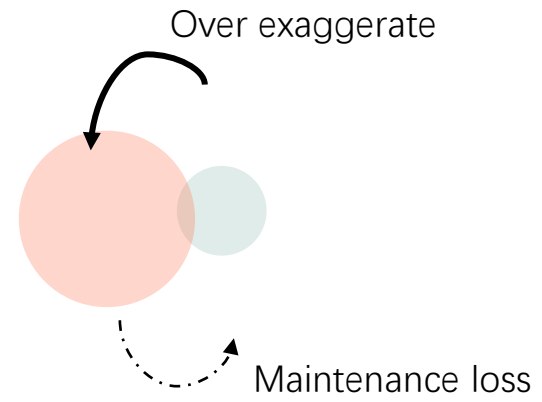
Maintenance change



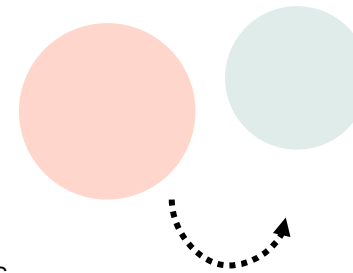
Locals get disconnected with Baiyangdian
Government taking over to keep the lake into good condition



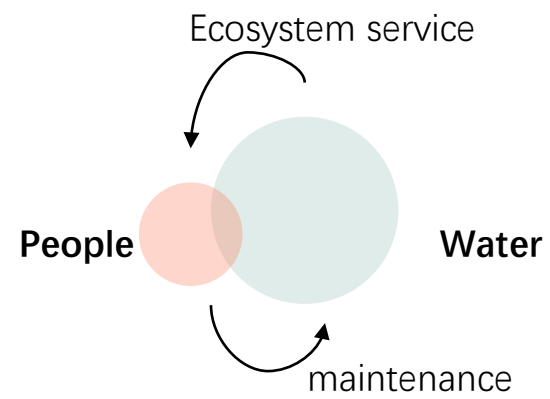
Connected symbiosis in past



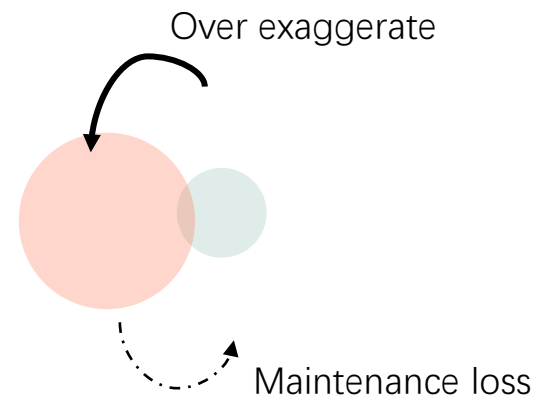
Imbalance after 1963



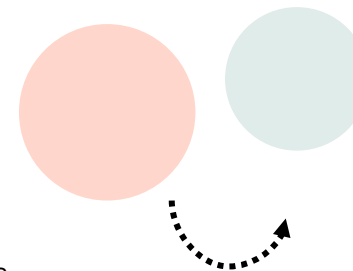
Disconnection under governance



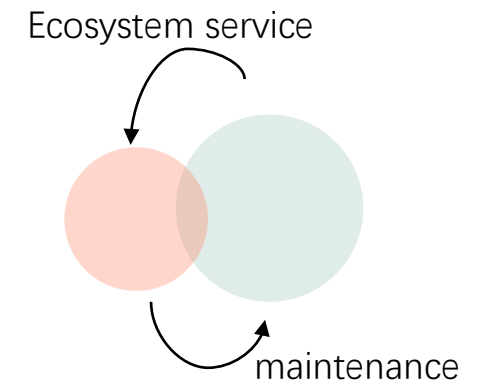
Connected symbiosis in past



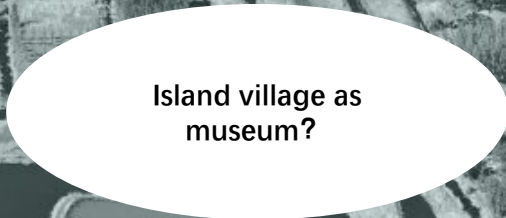
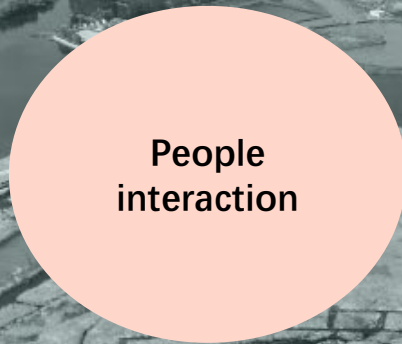
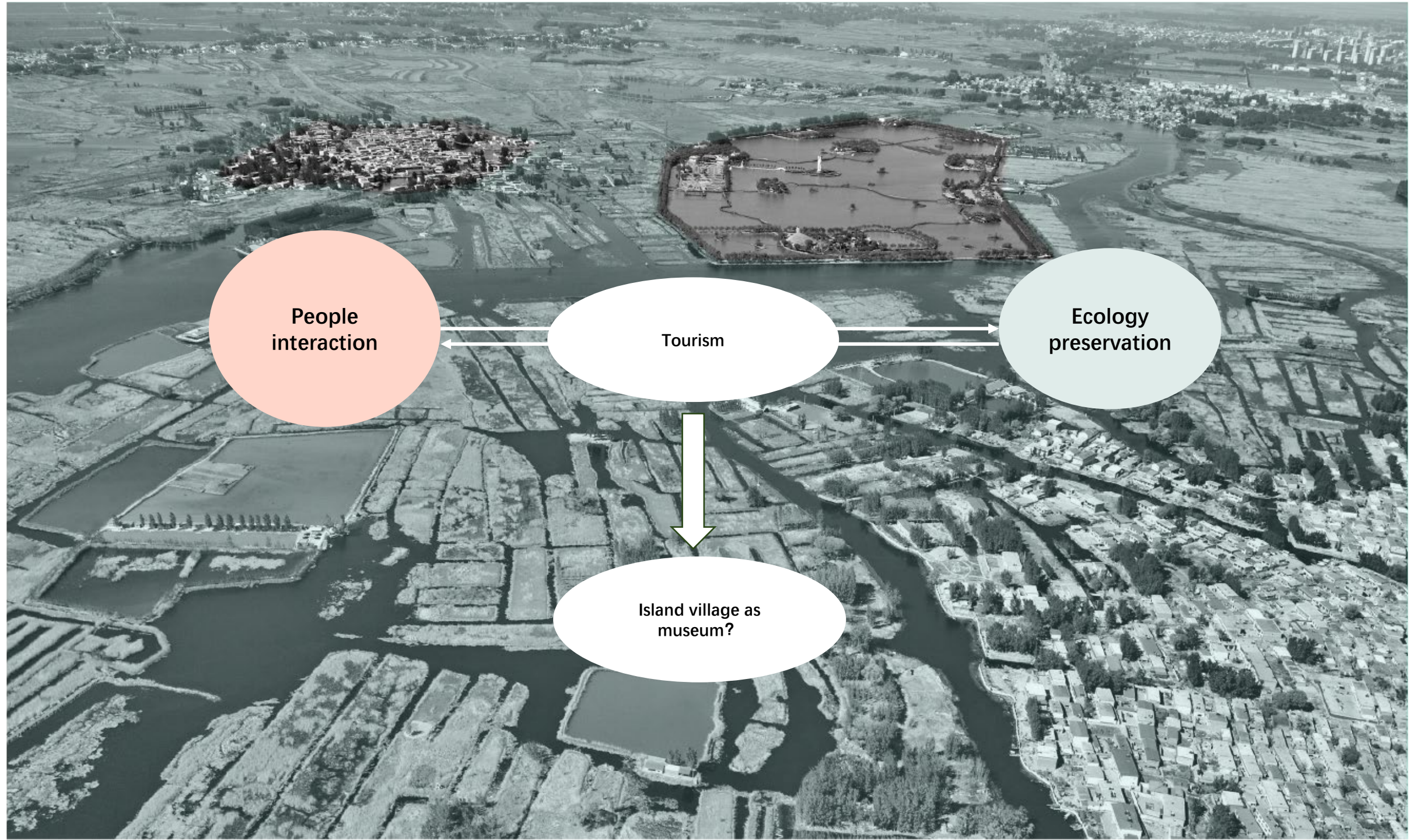
Imbalance after 1963

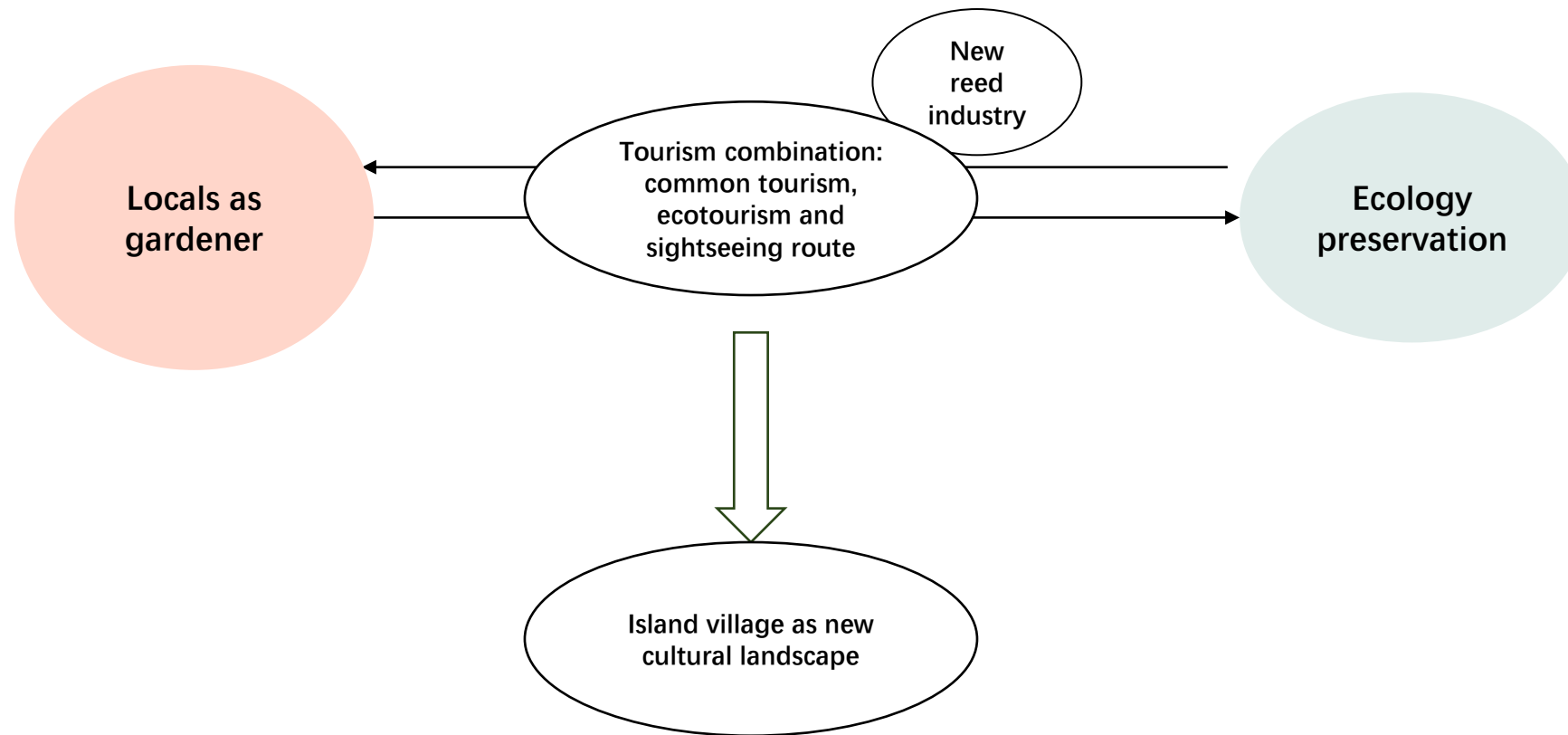


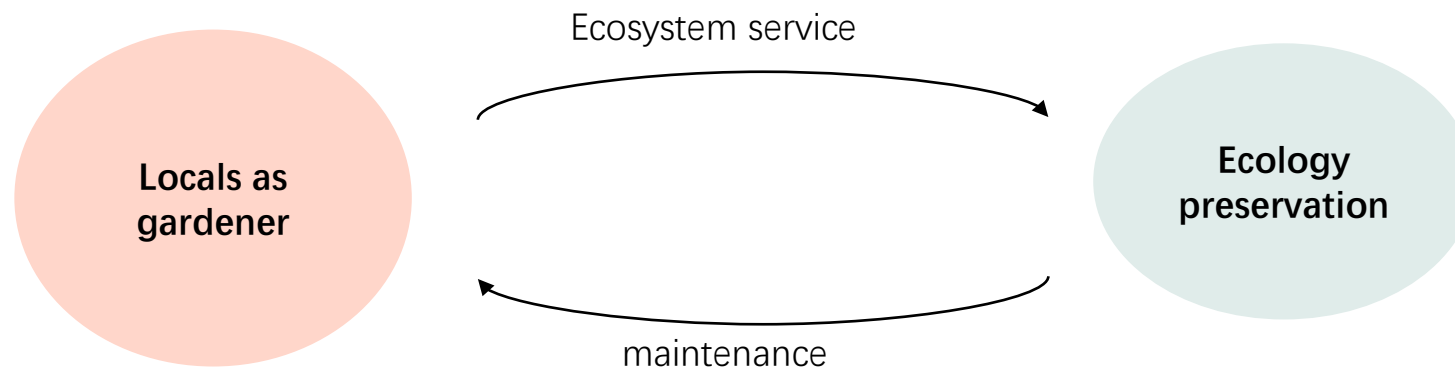
Disconnection under governance



Restore the symbiosis







Demands and responsibilities





Methods and tools

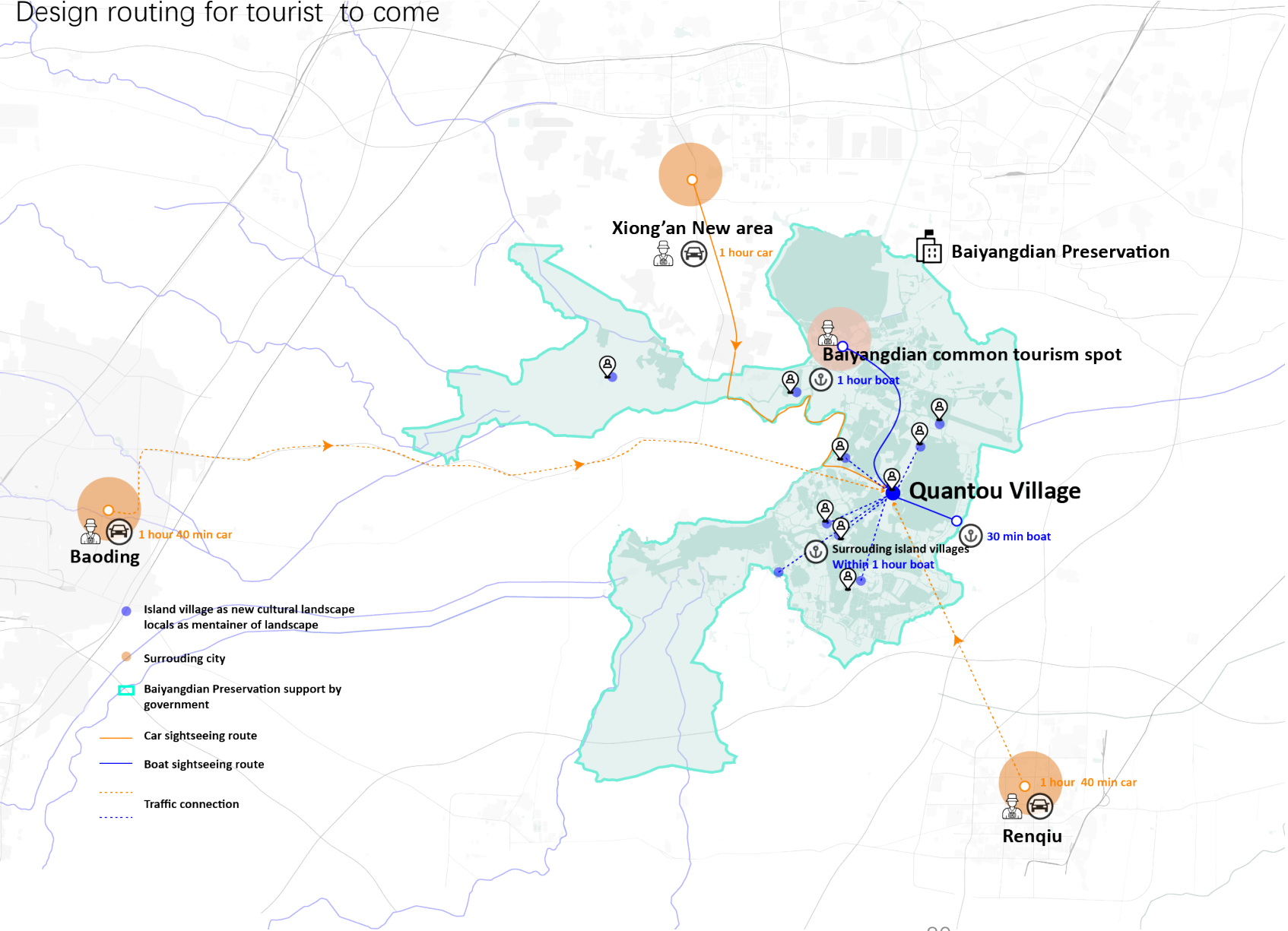


1.Industrial land: Industry land transformation	2.Historical reed field: water level change adaptive design	3.Historical water structure: Restore Water structure as backbone	4.Existing green-blue structure and houses: Improve spatial quality and add function	5.Human interaction : Maintenance, activities which are nature and local culture related
Vegetation purify	2-1 Floodable green land	3-1 Water way	4-1 Increase native species richness	4-7Villager harvest existing reed
Remove polluted top soil	2-2 Pile up with removed material	3-2 Water front park and plaza	4-2 reed field garden	4-8 entertain pond
	2-3 Retention land	3-3 Water front street	4-3Productive pond	
			4-4Old housing renewal	
			4-5Vacant house remove	
			4-6Community green land	

Baiyangdian scale vision: a new symbiosis of people and nature preservation connected by tourism

Transform the island village for local to live in and take over the maintenance

Design routing for tourist to come



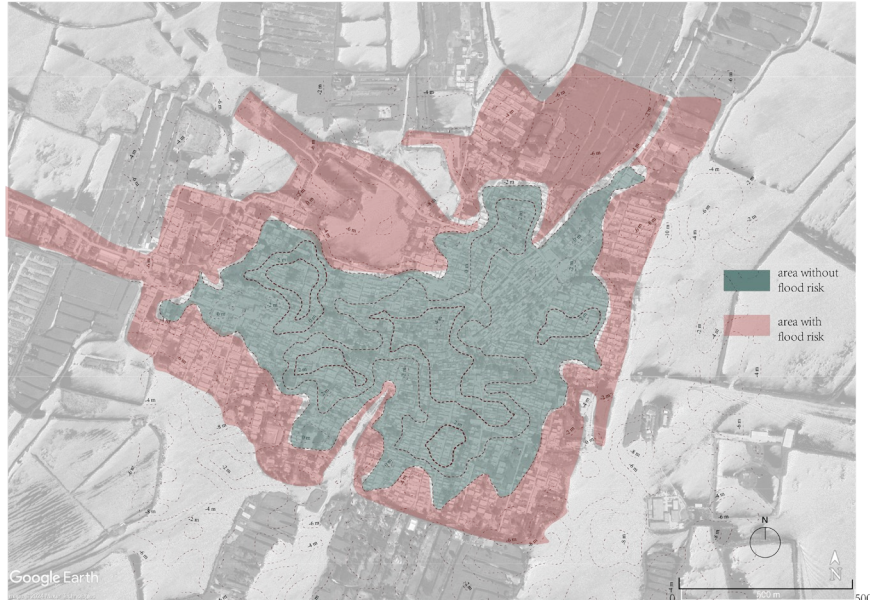
Tourism combination: common tourism, ecotourism and sightseeing route

Island village as place in which locals as gardener

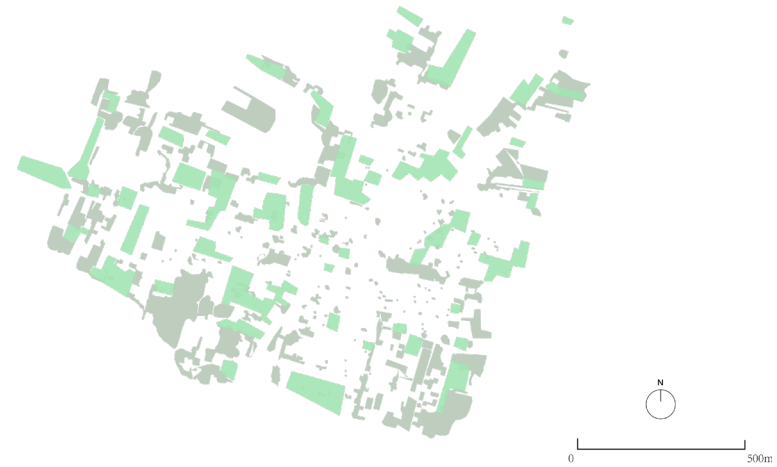
Large scale ecology preservation

Develop new reed industry

Strategy design in island village: take Quantou Village as example



transform sites with high flood risk, make use of water level change for adaptive design.



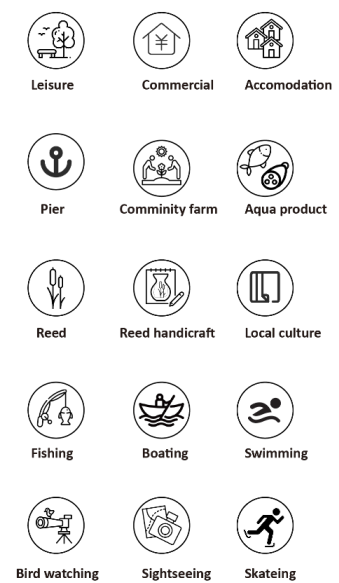
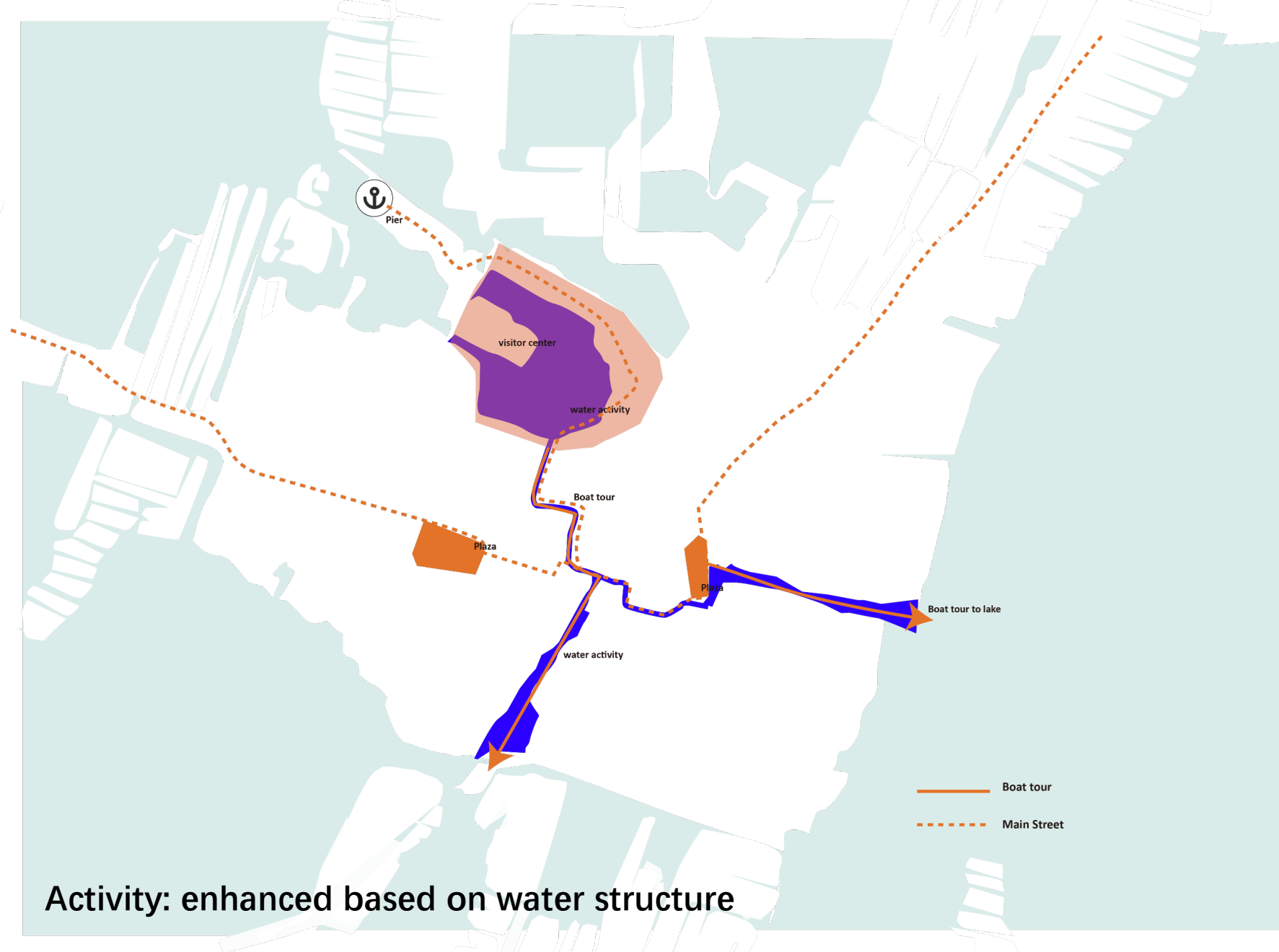
transform industrial sites, introduce ecotourism, reed industries and handicrafts, and consider purification of pollution, reduce the village's population.



Water structure



Connection in Baiyangdian scale



Island village vision: more blue, more green, less build area and less house



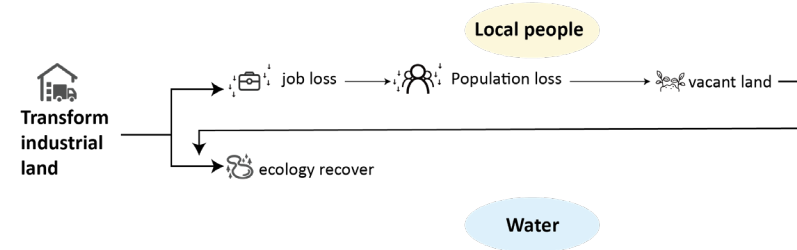
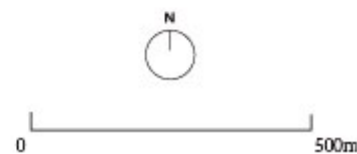
Phase I 2024-2026 Current transform

Industrial land remove and purify

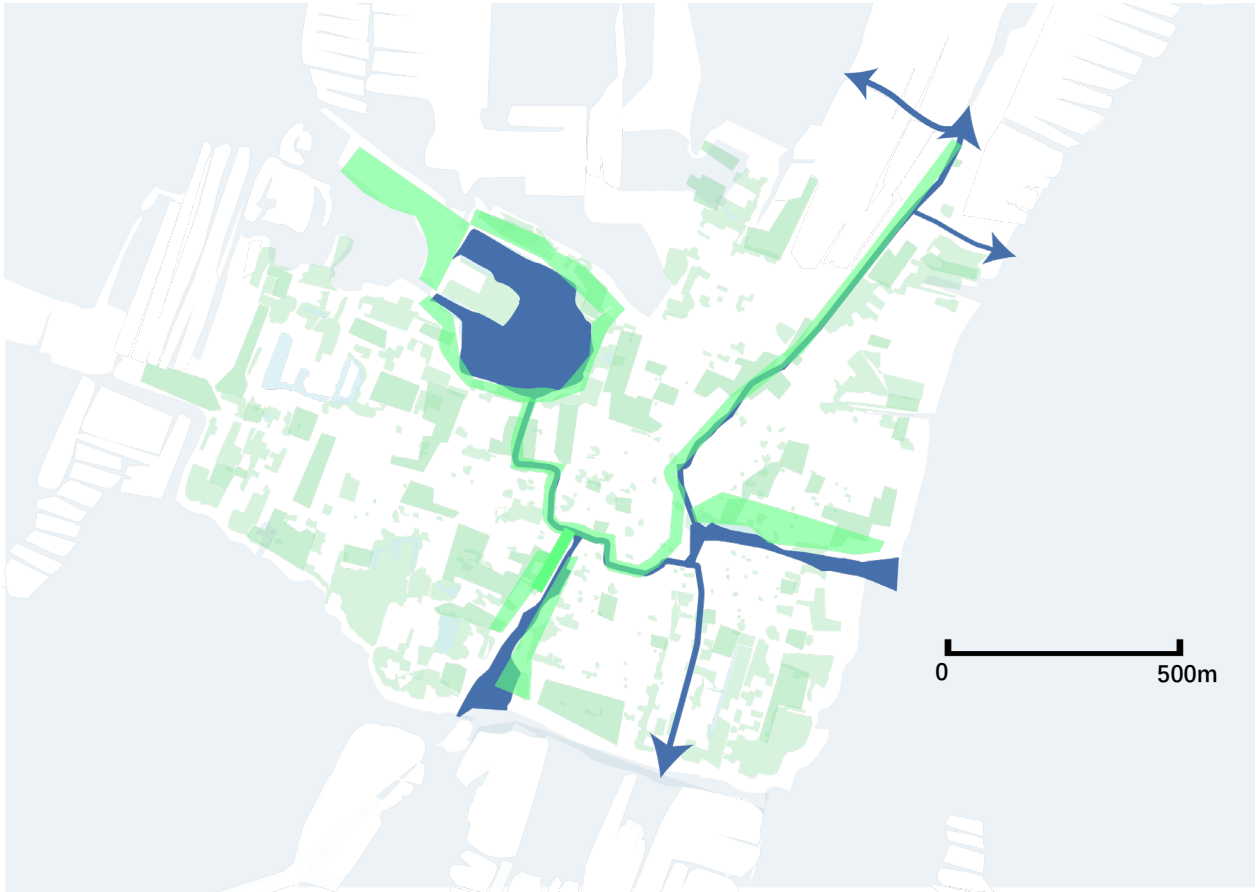
Job and population loss, and residential house decrease



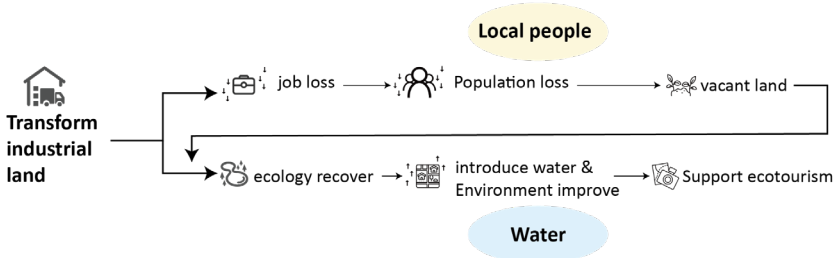
- polulation -60%
- build land -25%
- maintenance cost +10%
- income -80%
- green land +20%



Phase II 2026-2028
Environment restore: water structure and green area



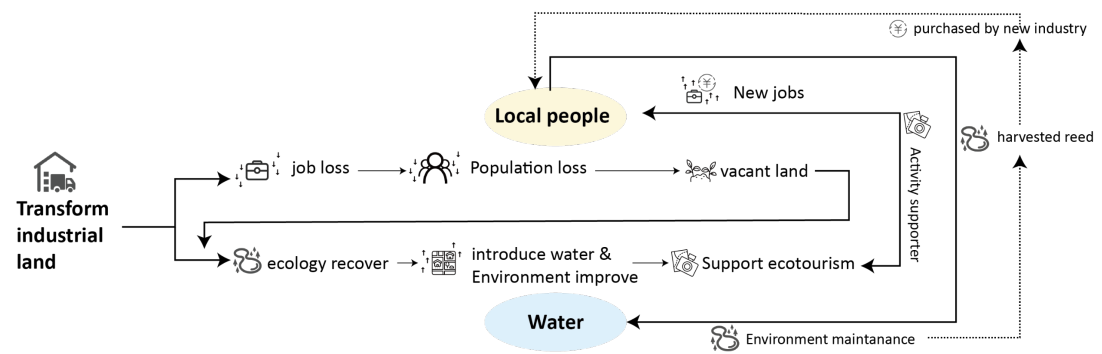
- polulation -50%
- build land -30%
- maintenance cost +20%
- income + 20%
- green land +25%
- water +10%

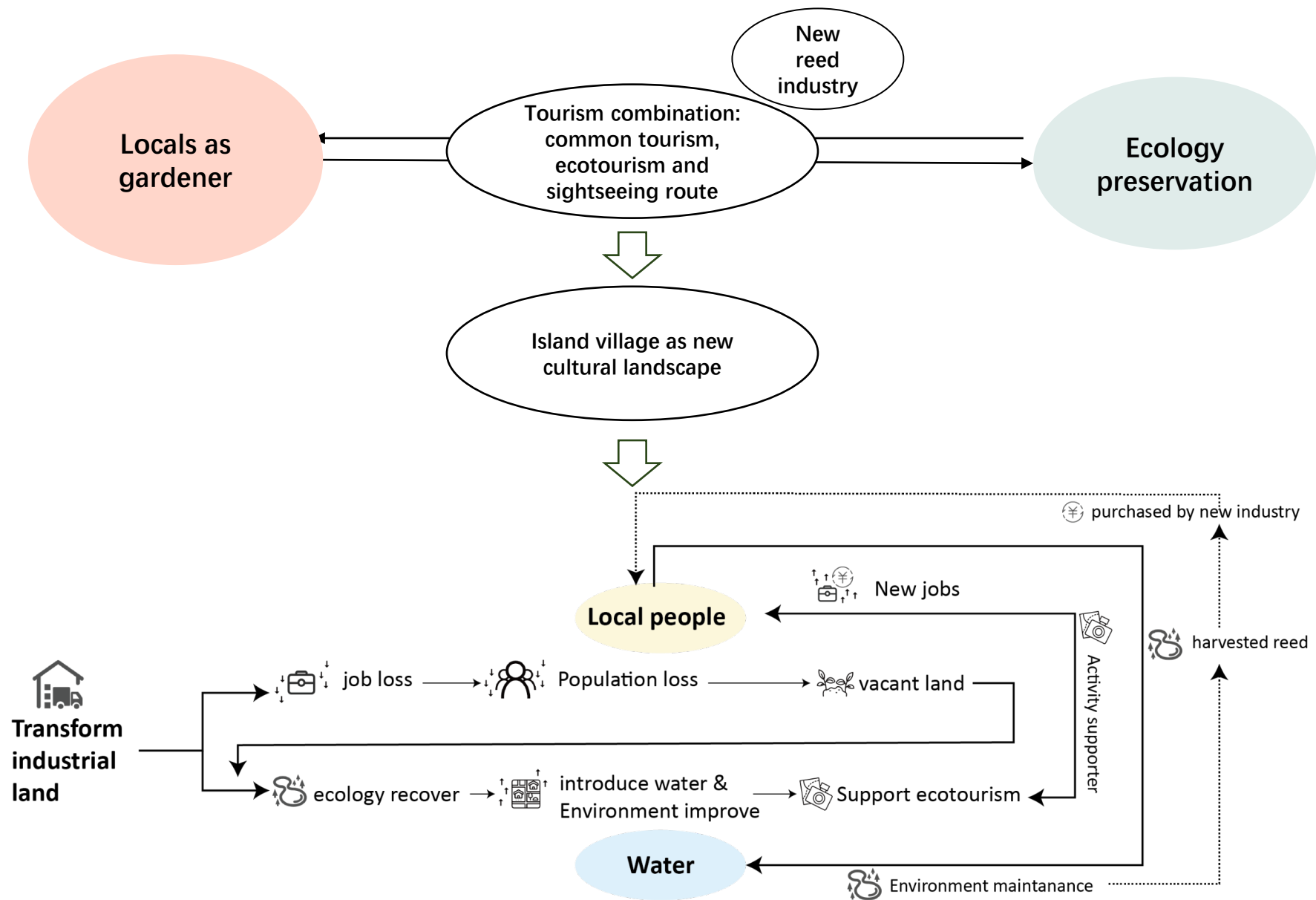


Phase III 2028-2034
Diversity enhance



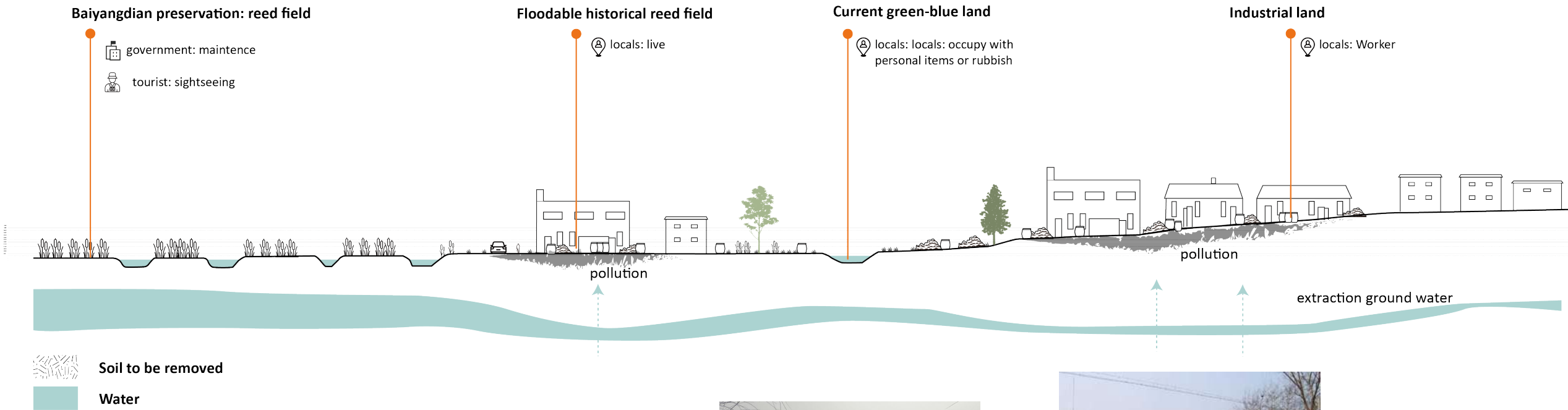
- population -50%
- build land -40%
- maintenance cost -30%
- income + 40%
- green land +30%
- water +15%





Current transform

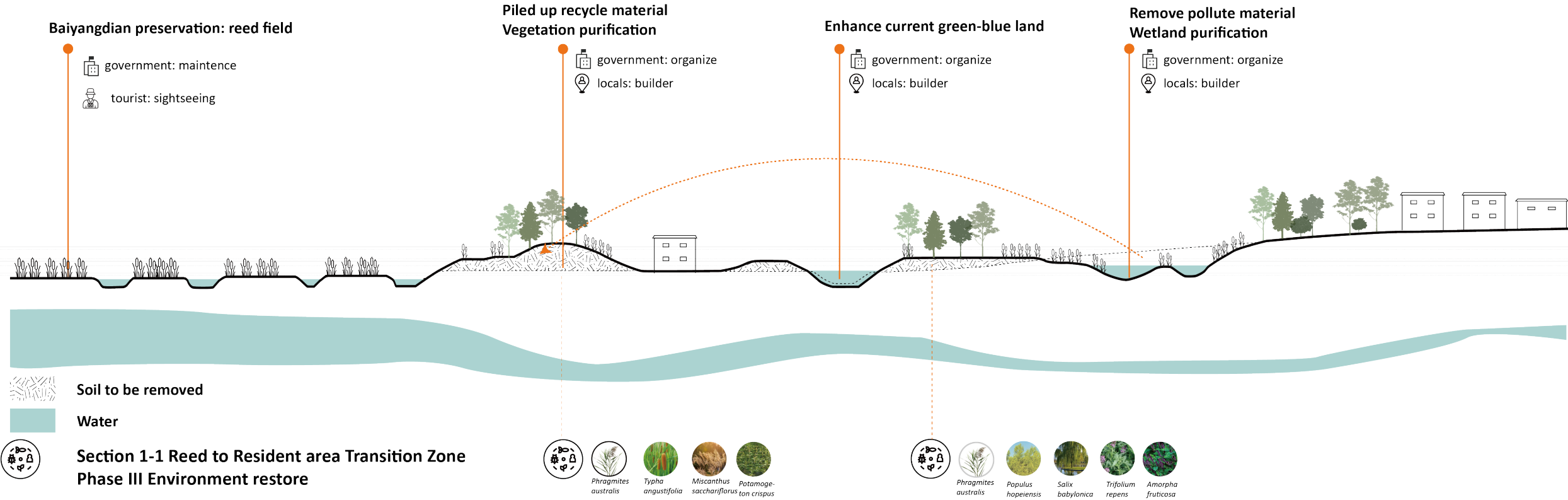
Chaos in space: Occupy reed field with informally development



Section 1-1 Reed to Resident area Transition Zone
Phase I Current transition

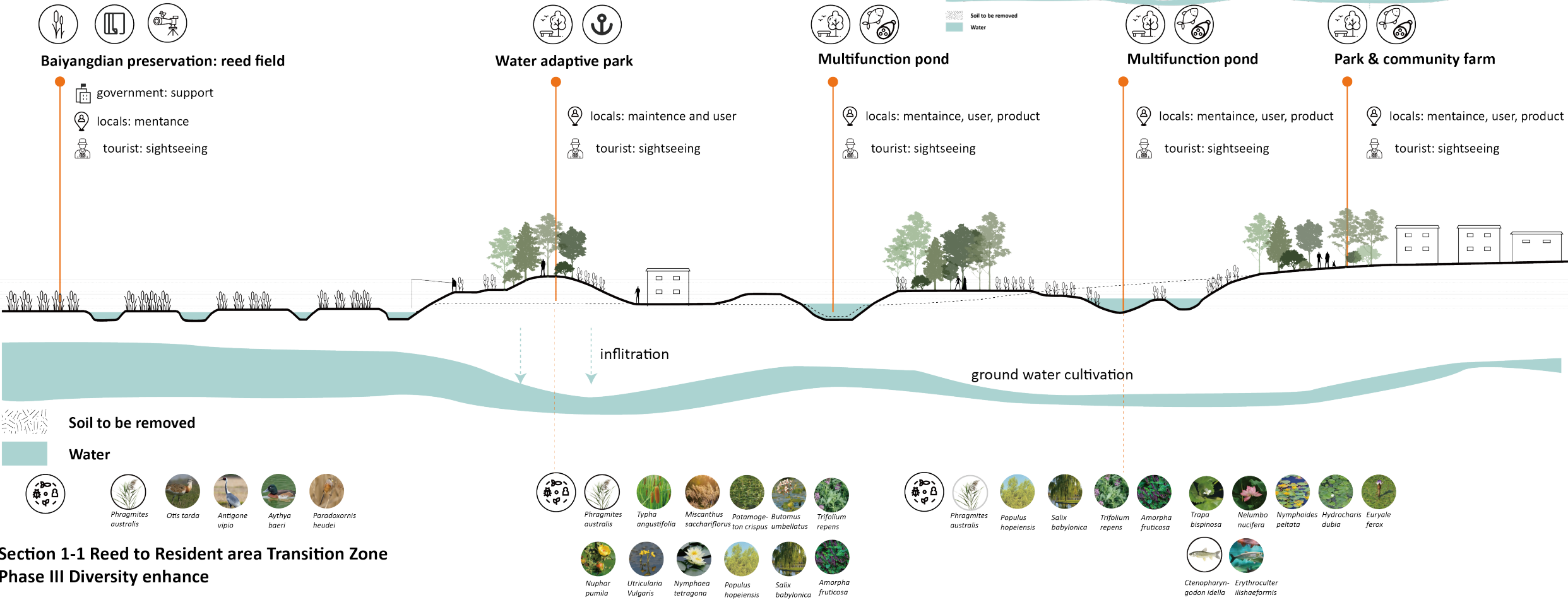


Transition: Created green buffer in between



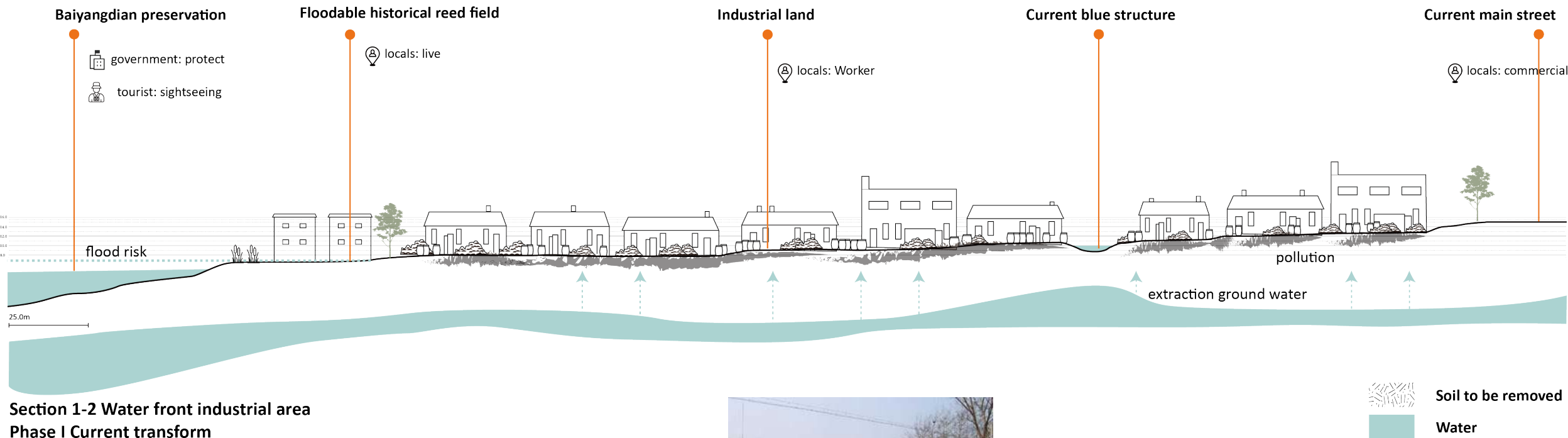
Phase III 2028-2034: Diversity enhance

A symbiosis of Reed field, park, production and residential



Current transform

Chaos in space: Occupied with informally development and with flood risk

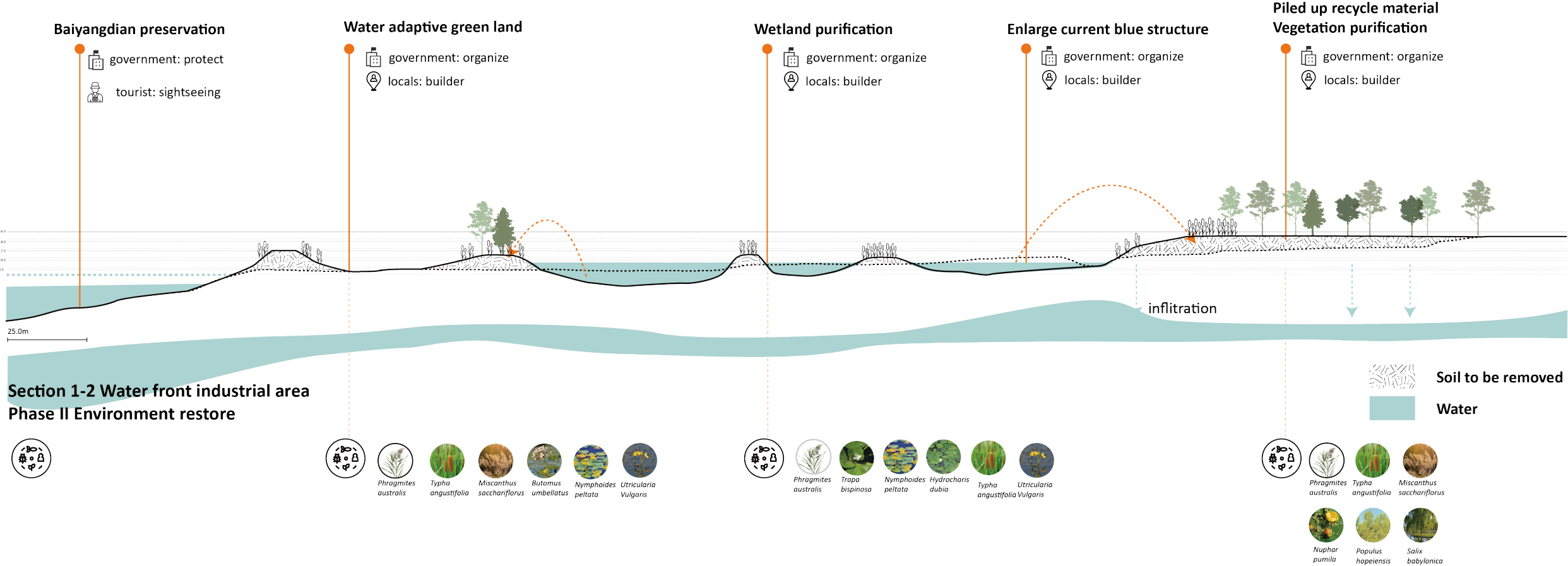
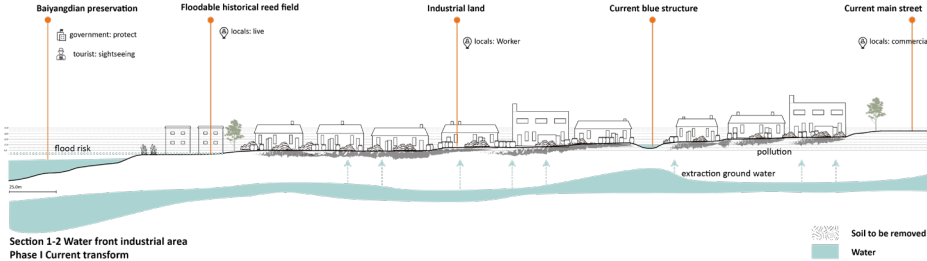


Section 1-2 Water front industrial area
Phase I Current transform



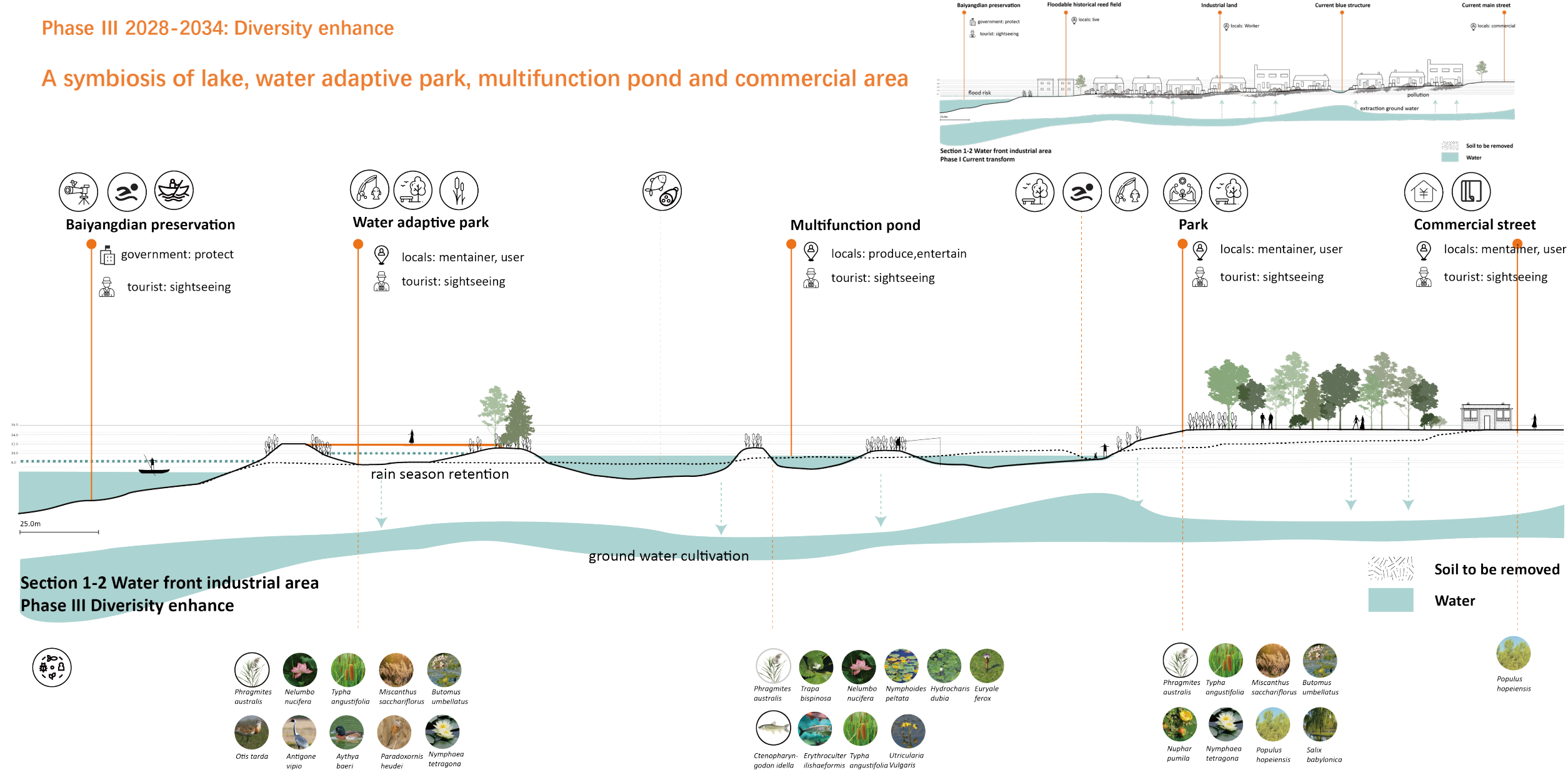
Phase I- II 2024-2028: Environment restore

Reorganize the polluted soil as green-blue buffer

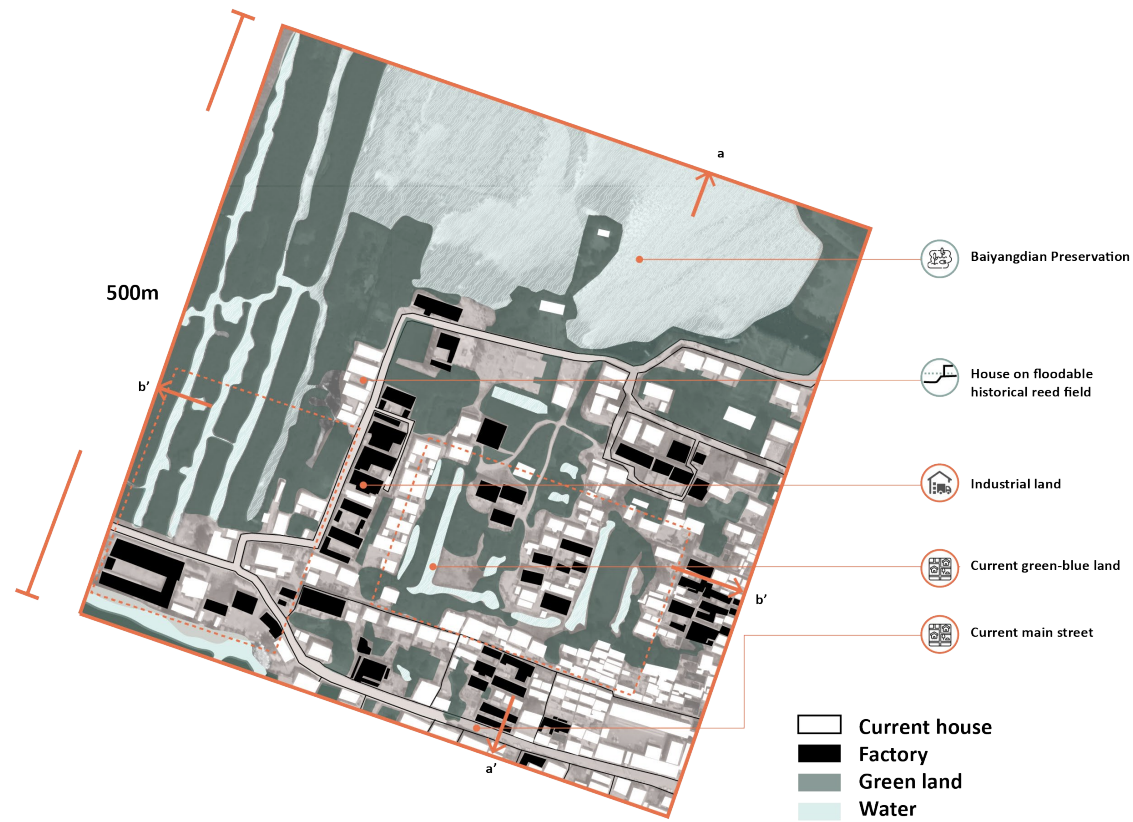


Phase III 2028-2034: Diversity enhance

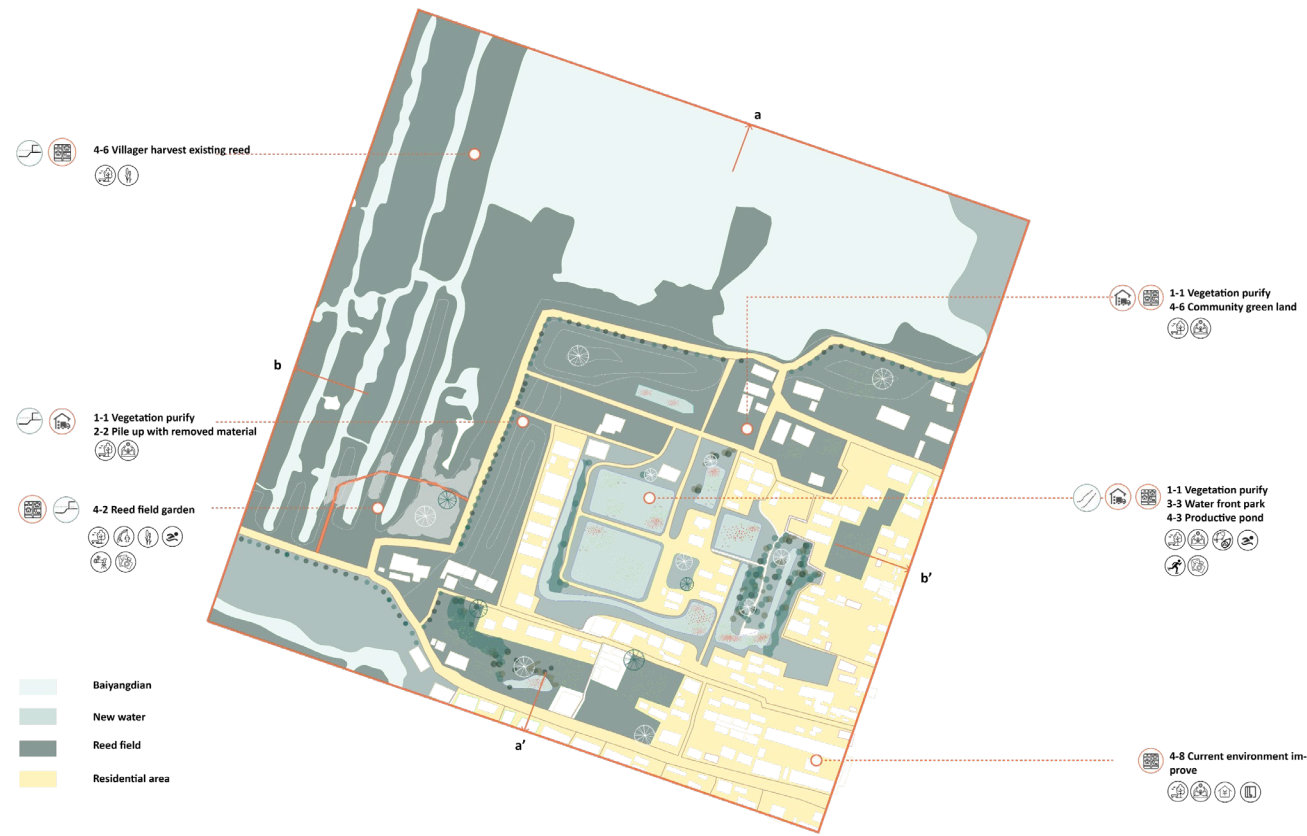
A symbiosis of lake, water adaptive park, multifunction pond and commercial area



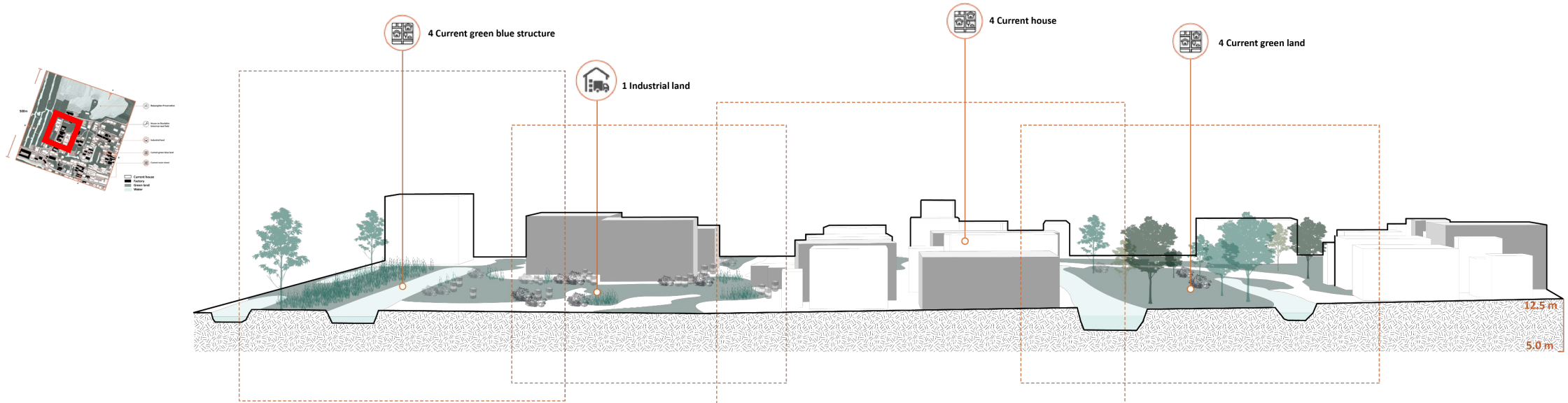
Site 1: a Transition Zone from reed field to residential area



Chao area with risk of pollution and flood

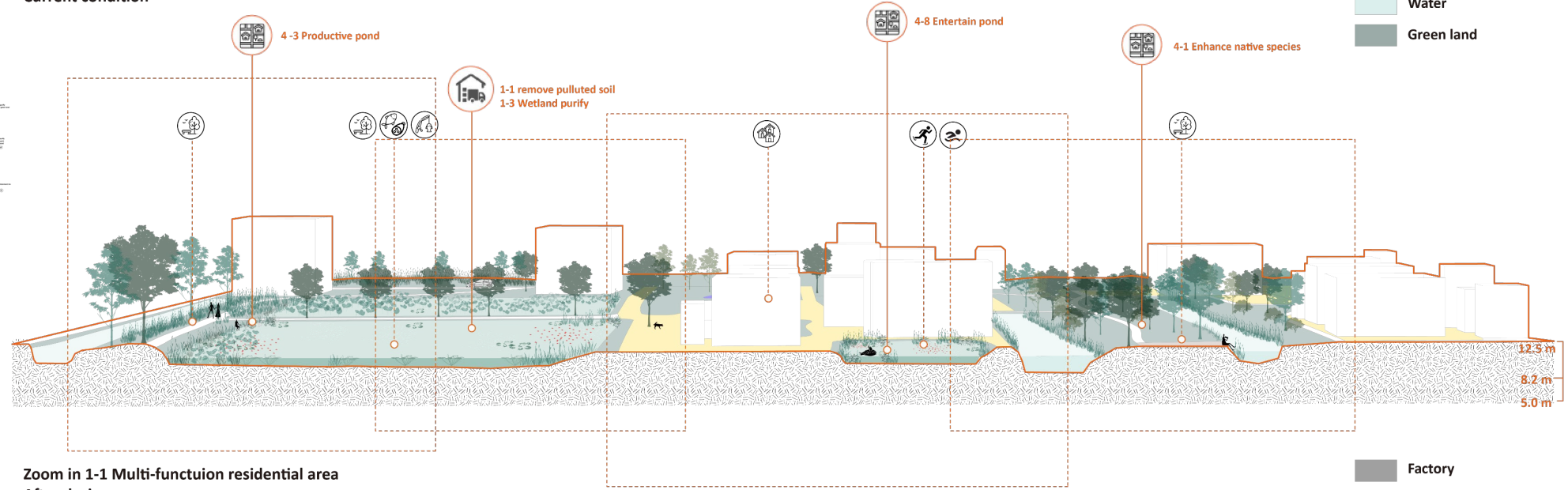


Transition Zone from accessible reed field to livable residential area



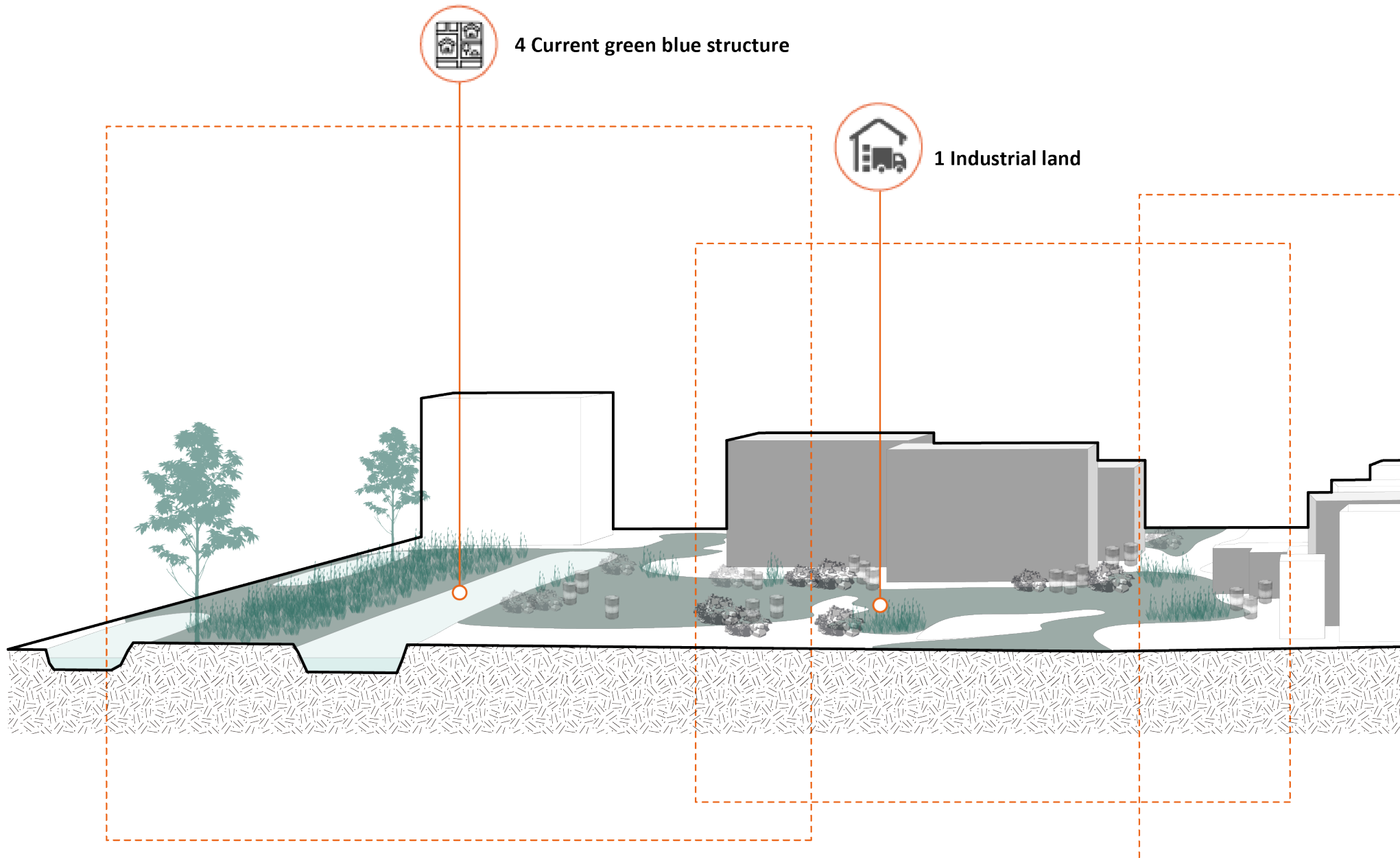
Zoom in 1-1 Industrial land transform
Current condition

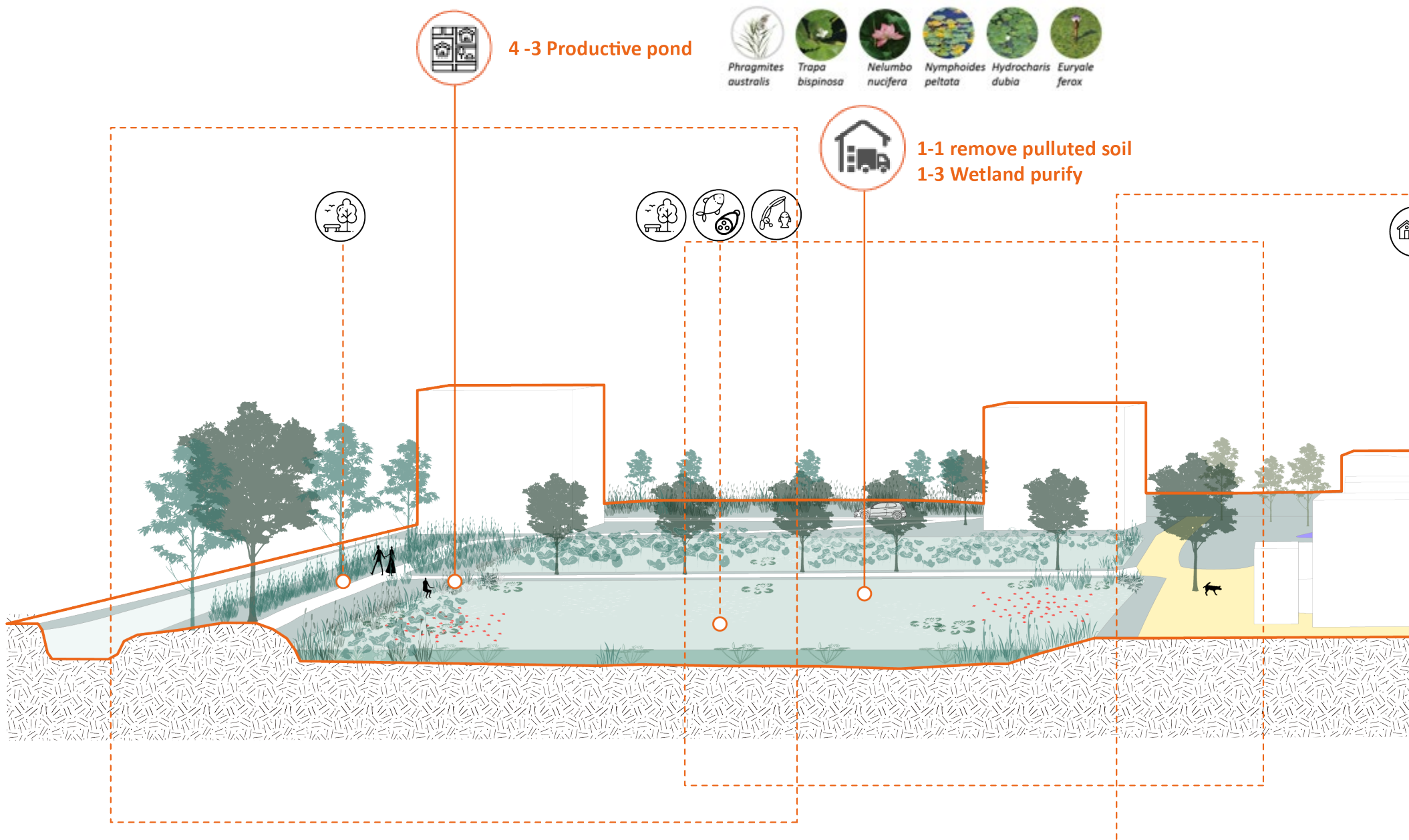
- Factory
- Water
- Green land

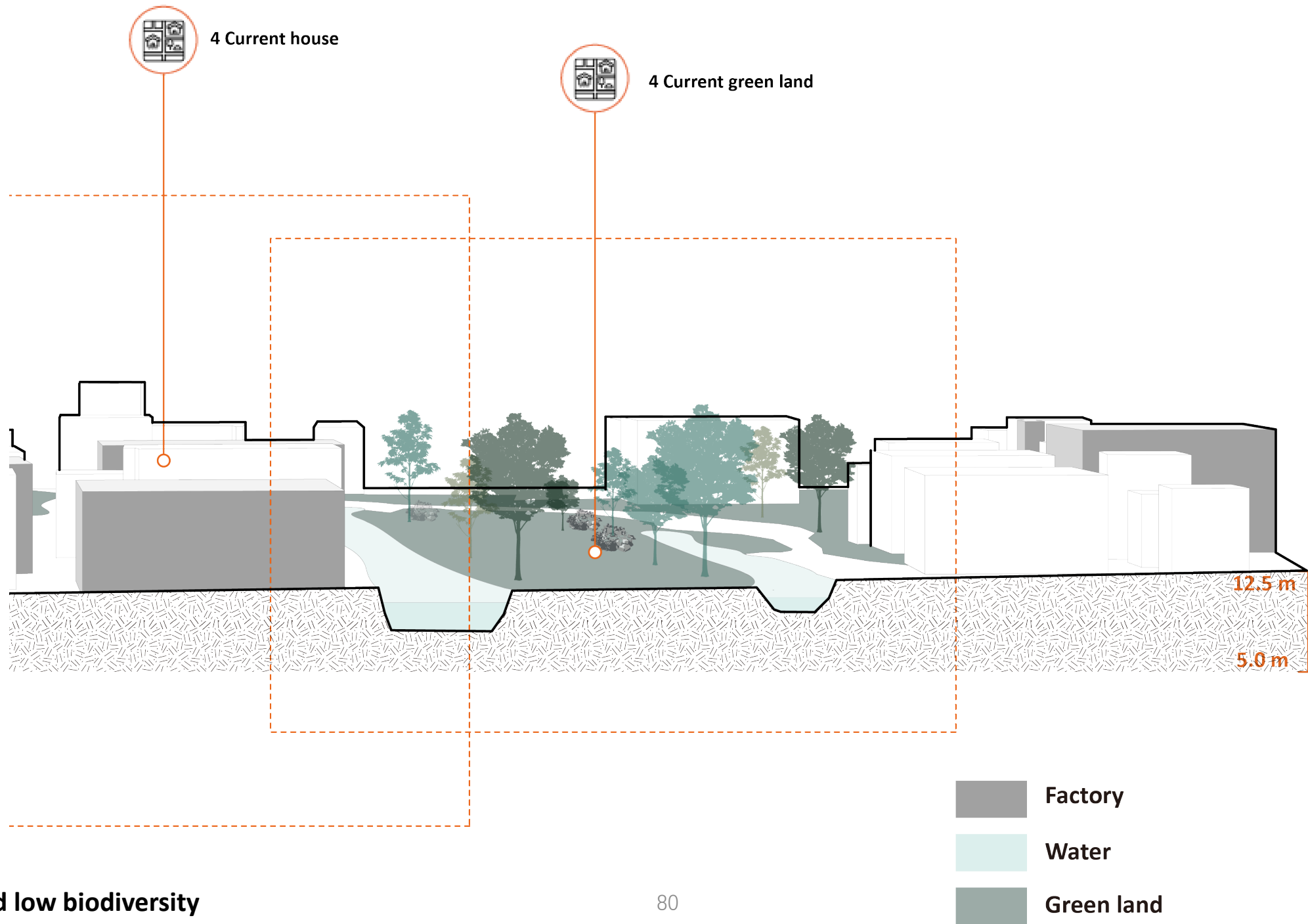


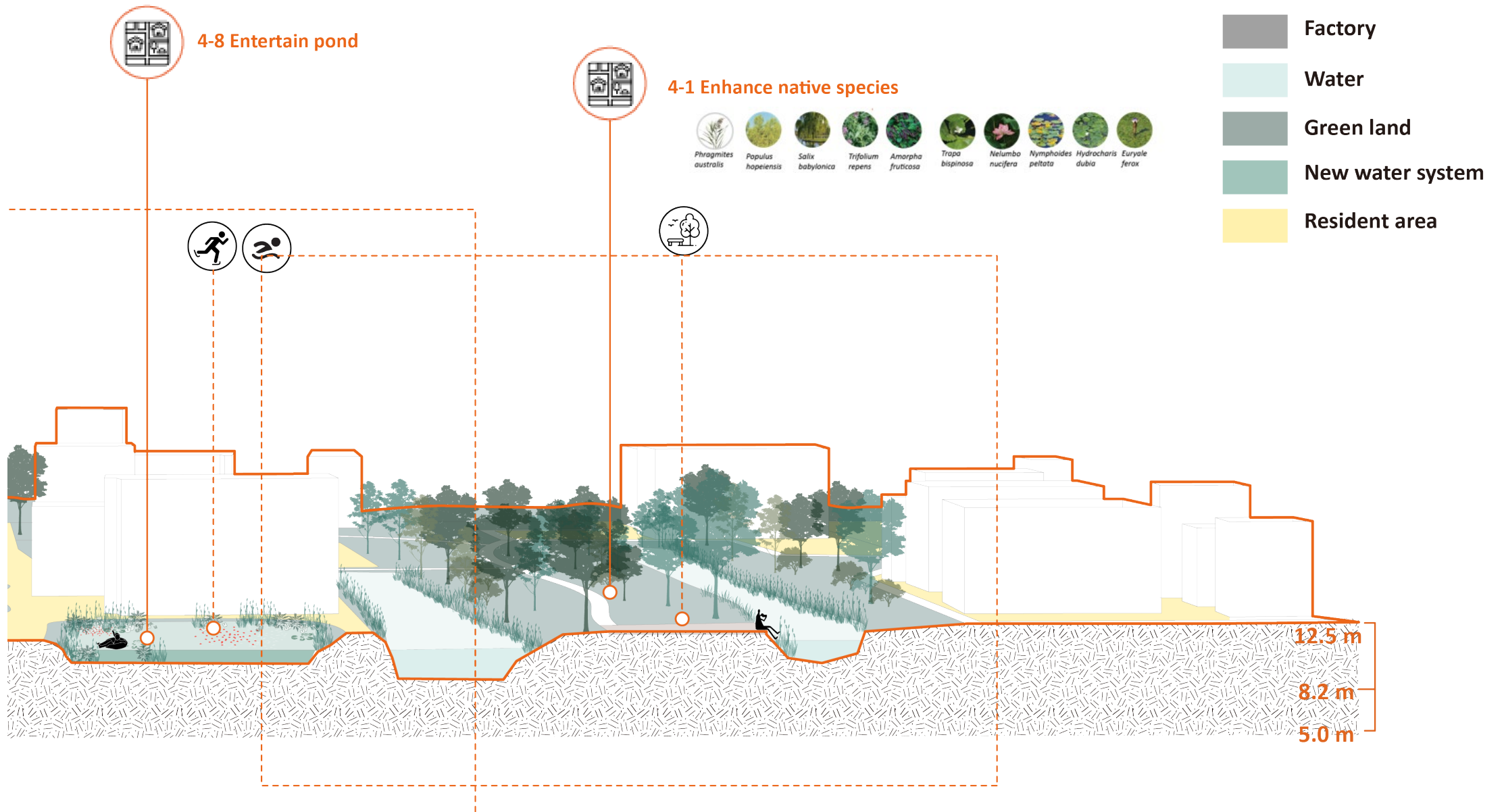
Zoom in 1-1 Multi-function residential area
After design

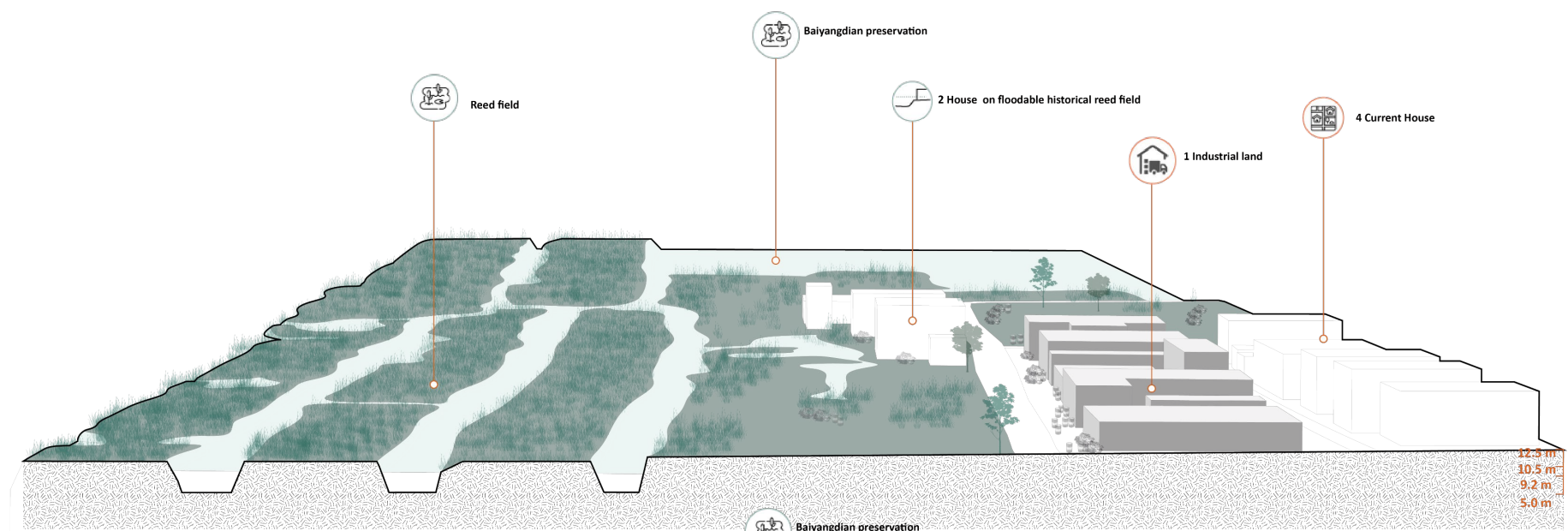
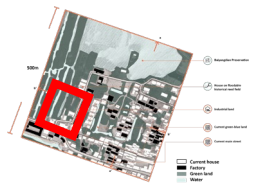
- Factory
- Water
- Green land
- New water system
- Resident area



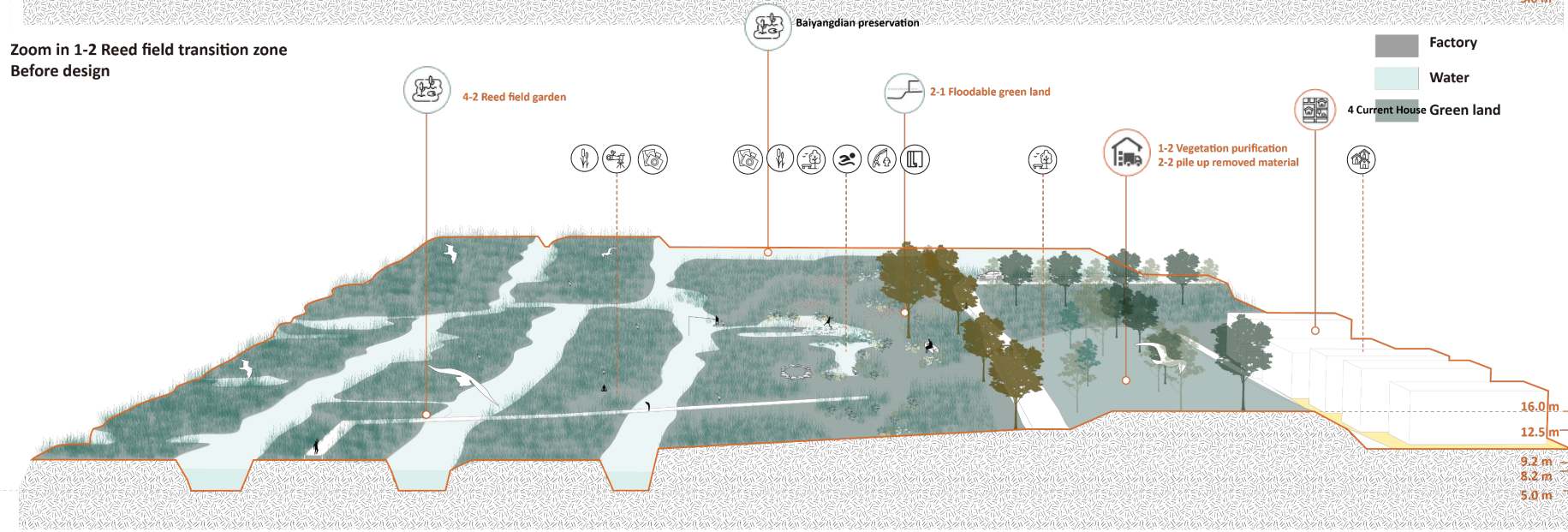








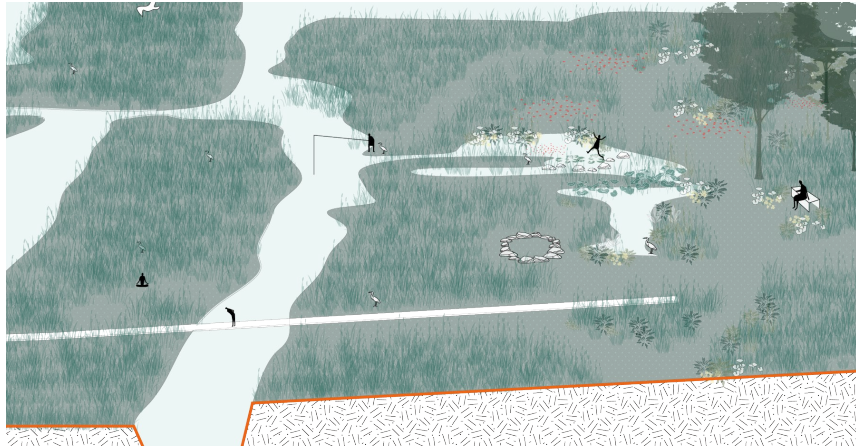
Zoom in 1-2 Reed field transition zone
Before design



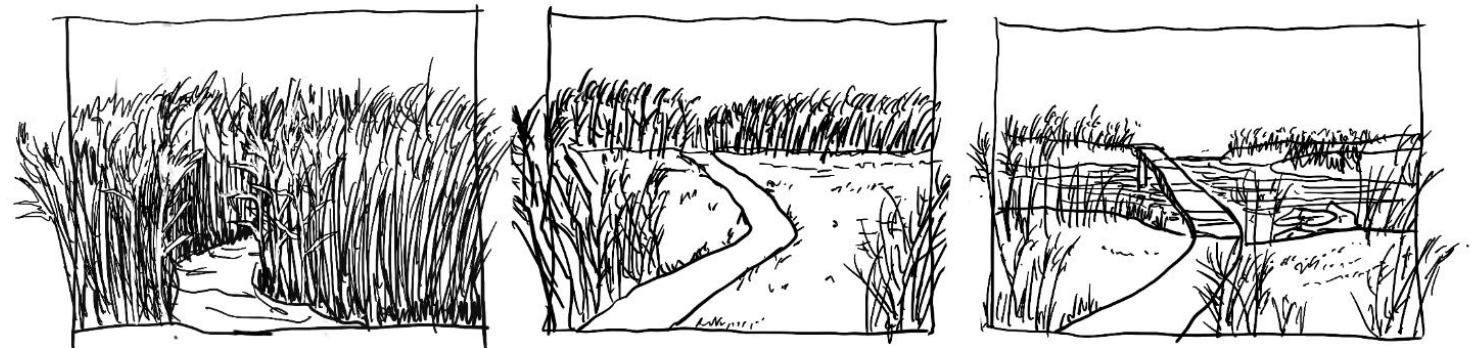
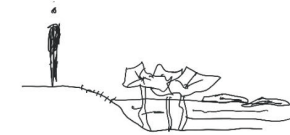
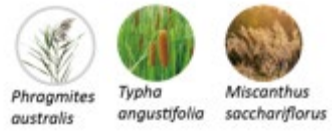
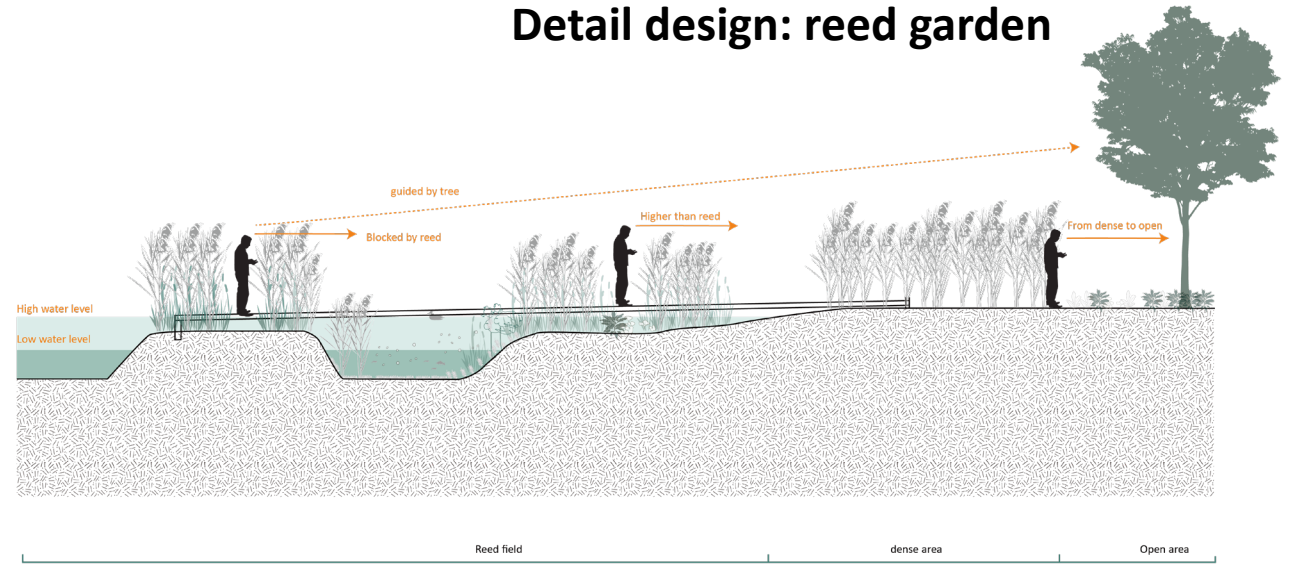
Zoom in 1-2 Reed field transition zone
After design

Zoom in 2: restored reed field with more accessibility and water safety

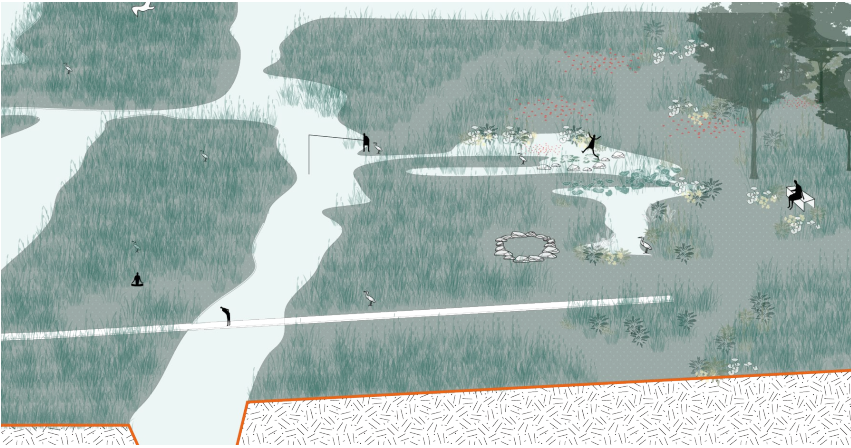
- Factory
- Water
- Green land
- New water system
- Resident area



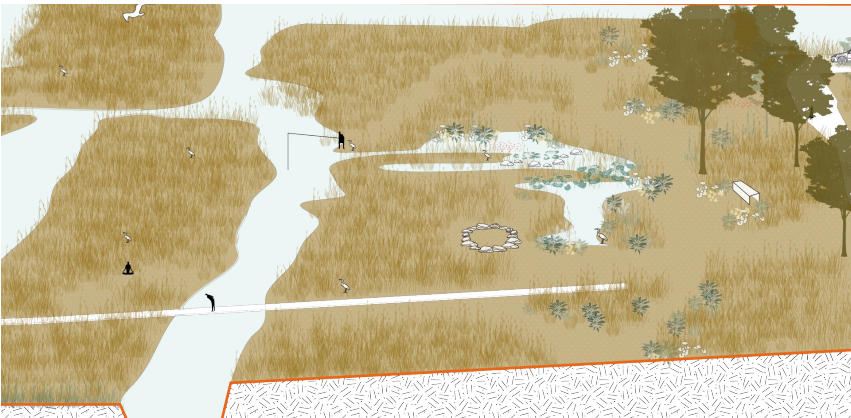
Detail design: reed garden



Atmosphere in different season



Summer: dense and quite



Autumn: plants turn to yellow

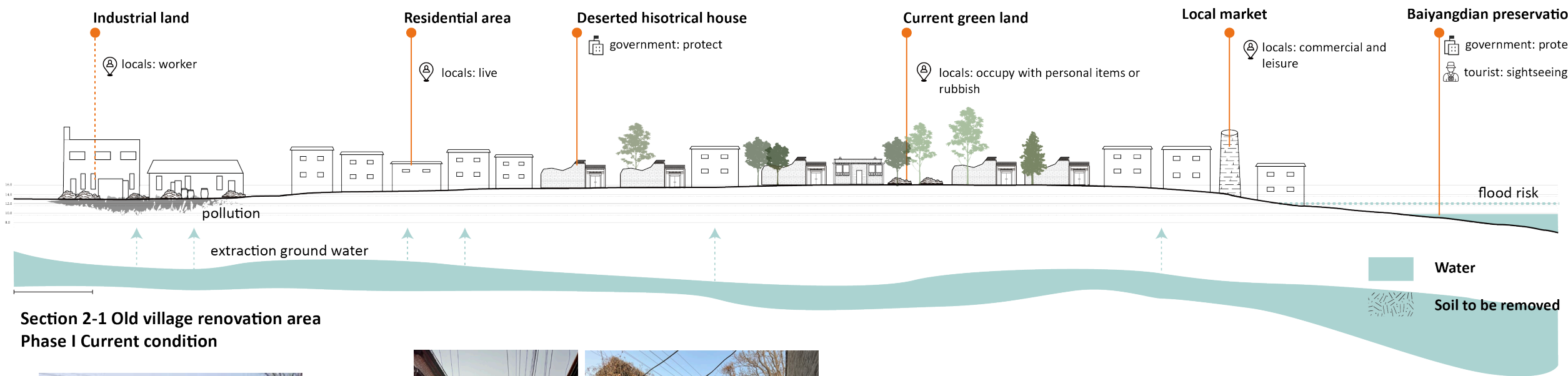


Autumn after harvest: open space for gathering



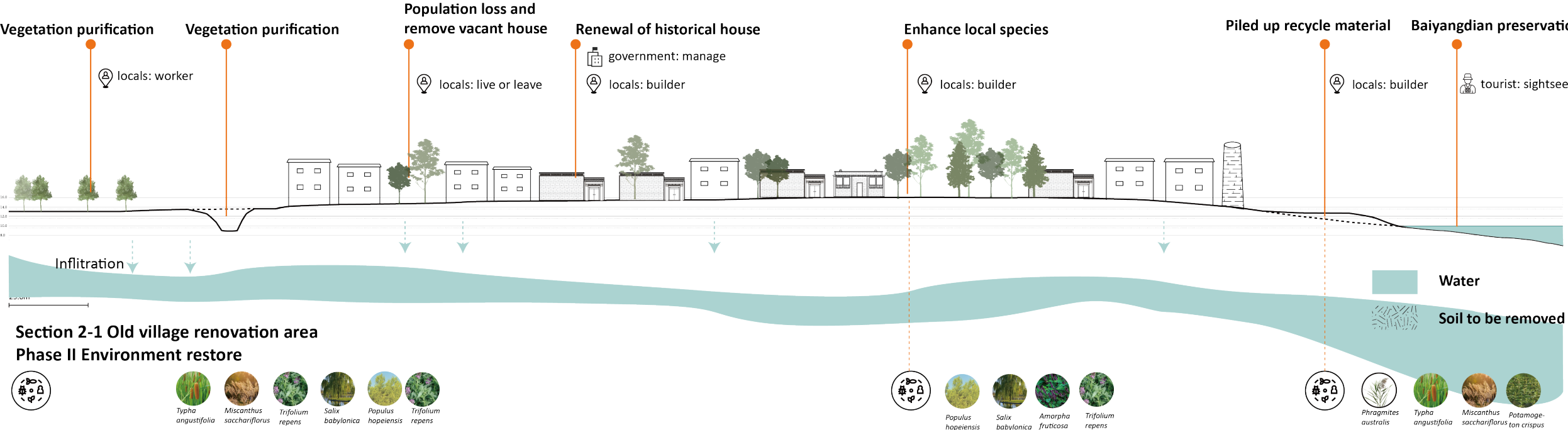
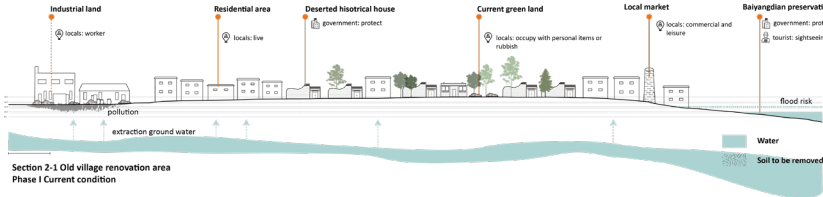
Current transform

Dense environment: industrial land, resident area and deserted house



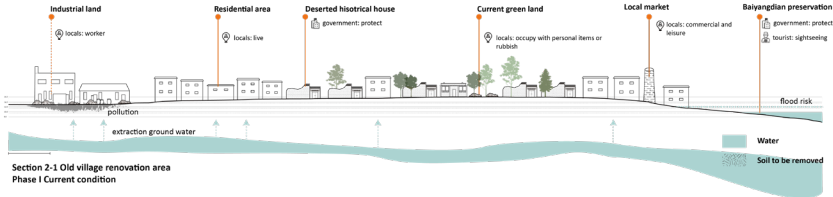
Phase I- II 2024-2028 : Environment restore

Reorganize: Remove factory and some old houses for re-introduce water



Phase III 2028-2034: Diversity enhance

A symbiosis of water way, traditional house, public green space and water front area

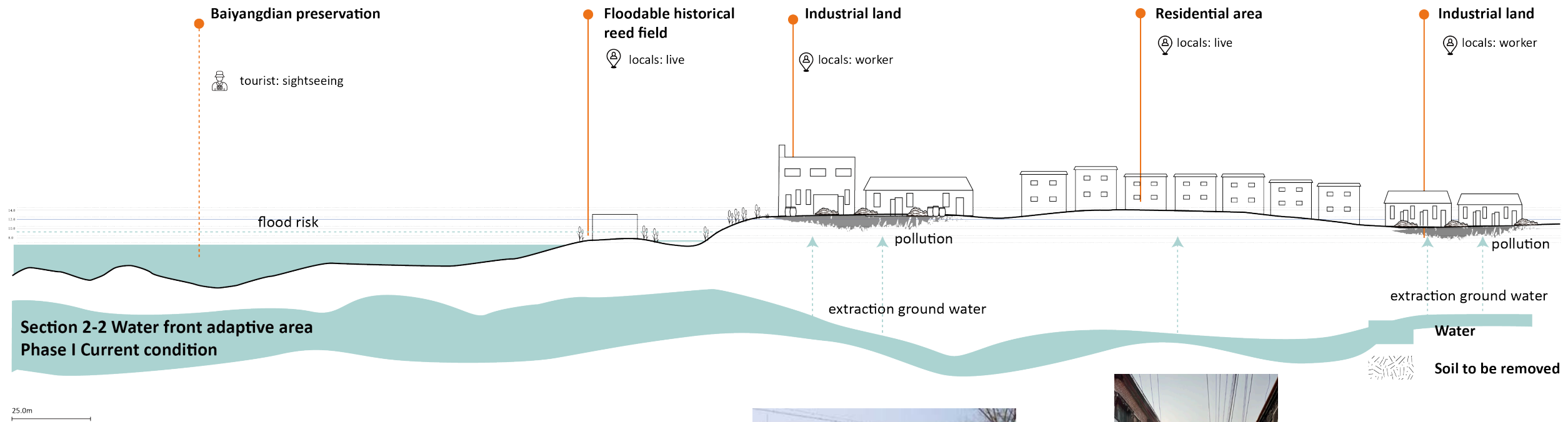


Section 2-1 Old village renovation area
Phase II Diversity enhance

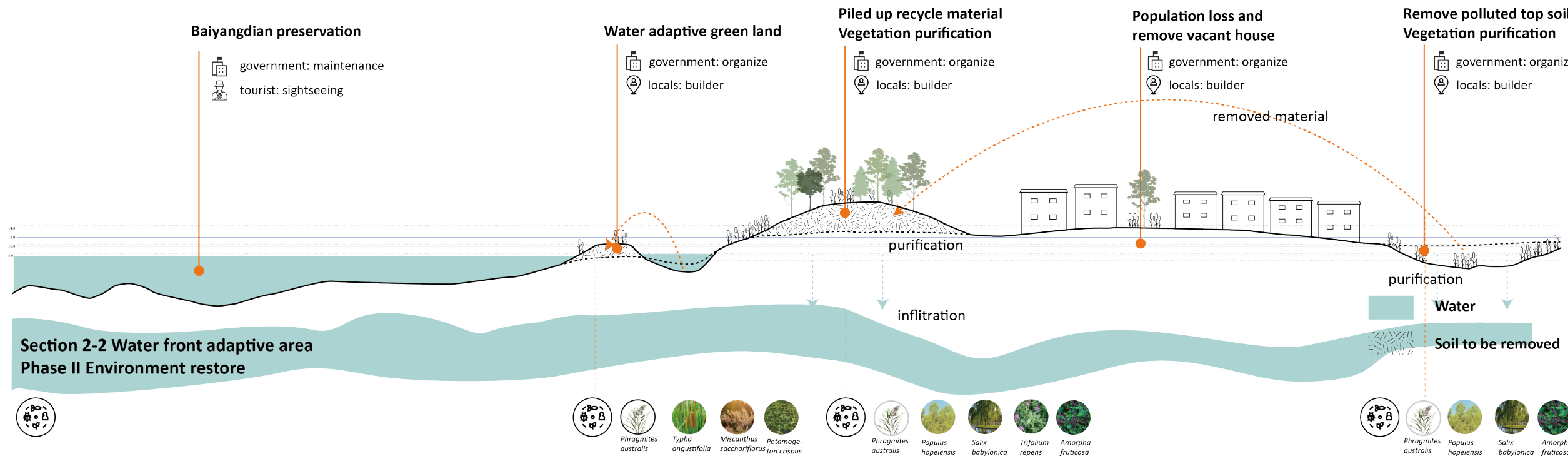


Current transform

Polluted water front: house and industry land

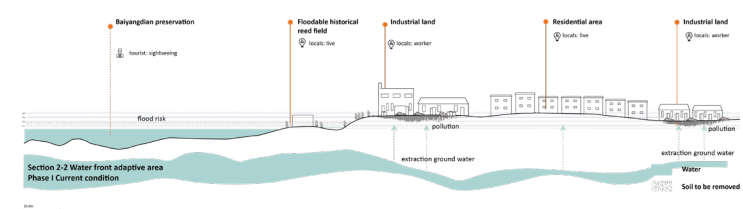
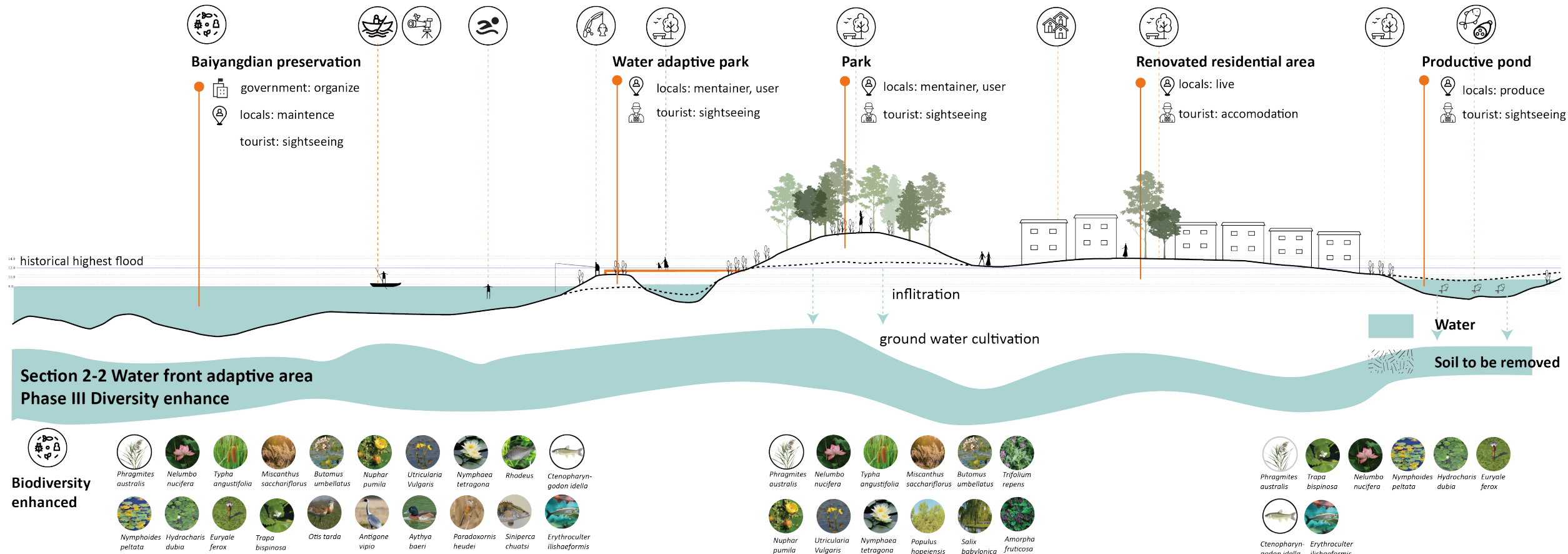


Reorganize: gather the soil for purification and green buffer



Phase III 2028-2034: Diversity enhance

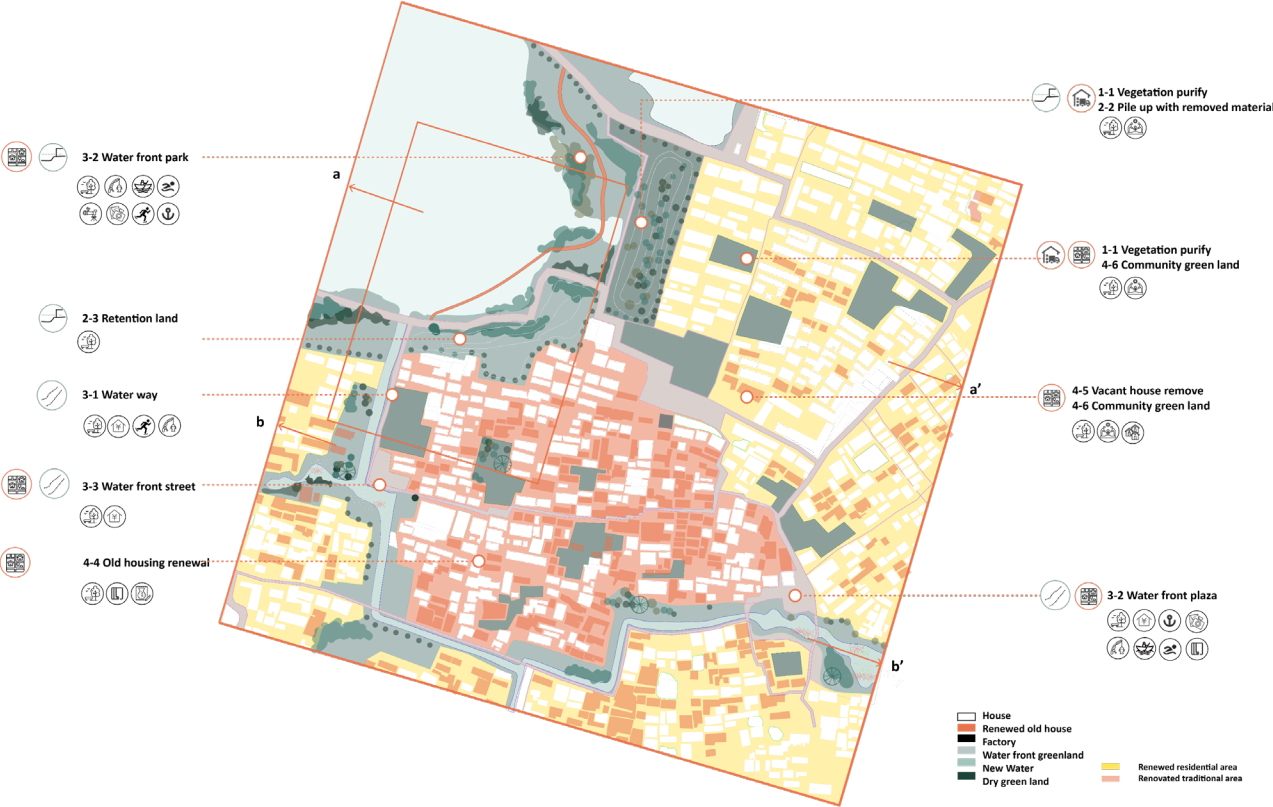
A symbiosis of lake, water adaptive park, and residential area



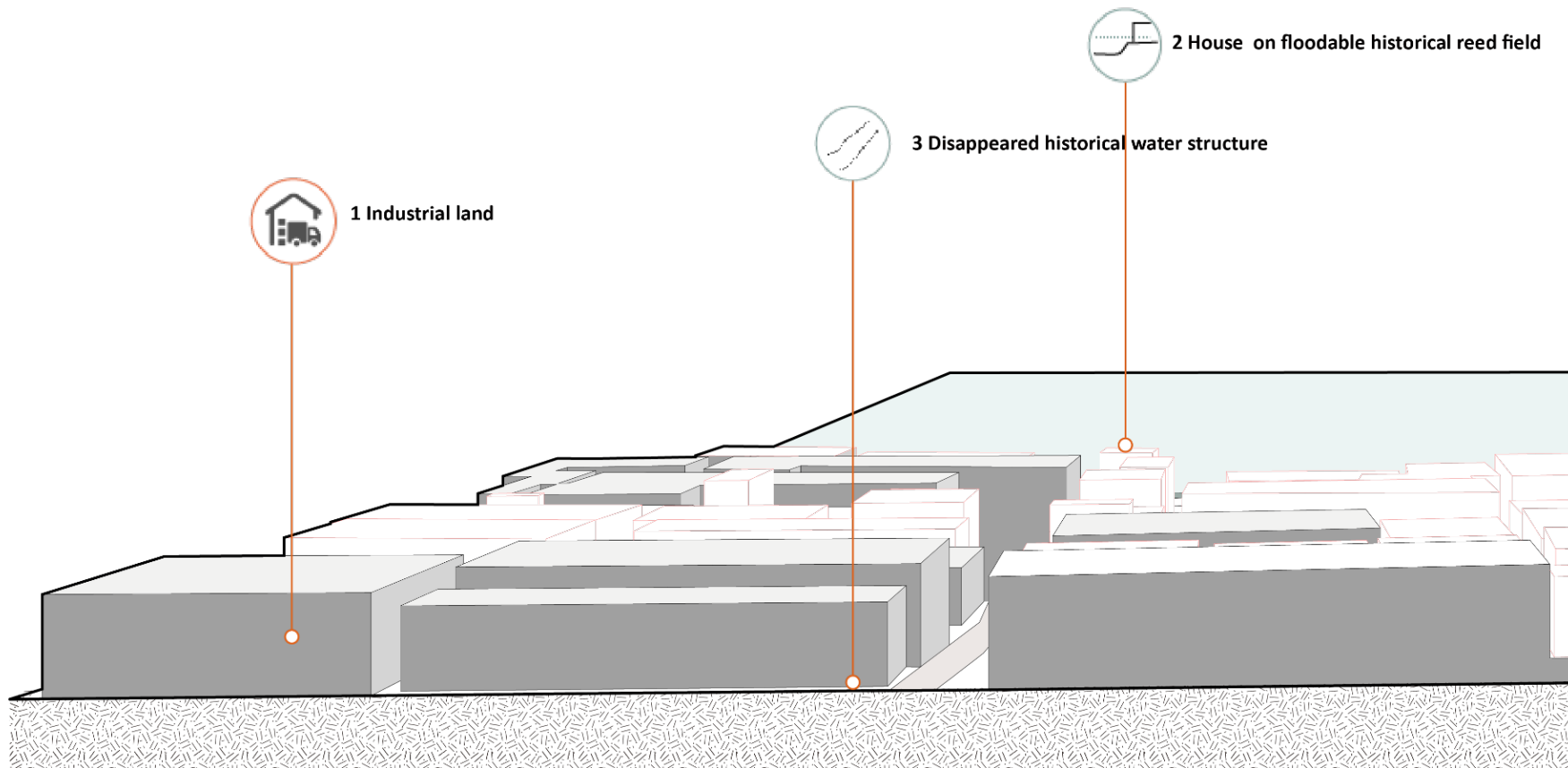
Site 2 Renovated old island village

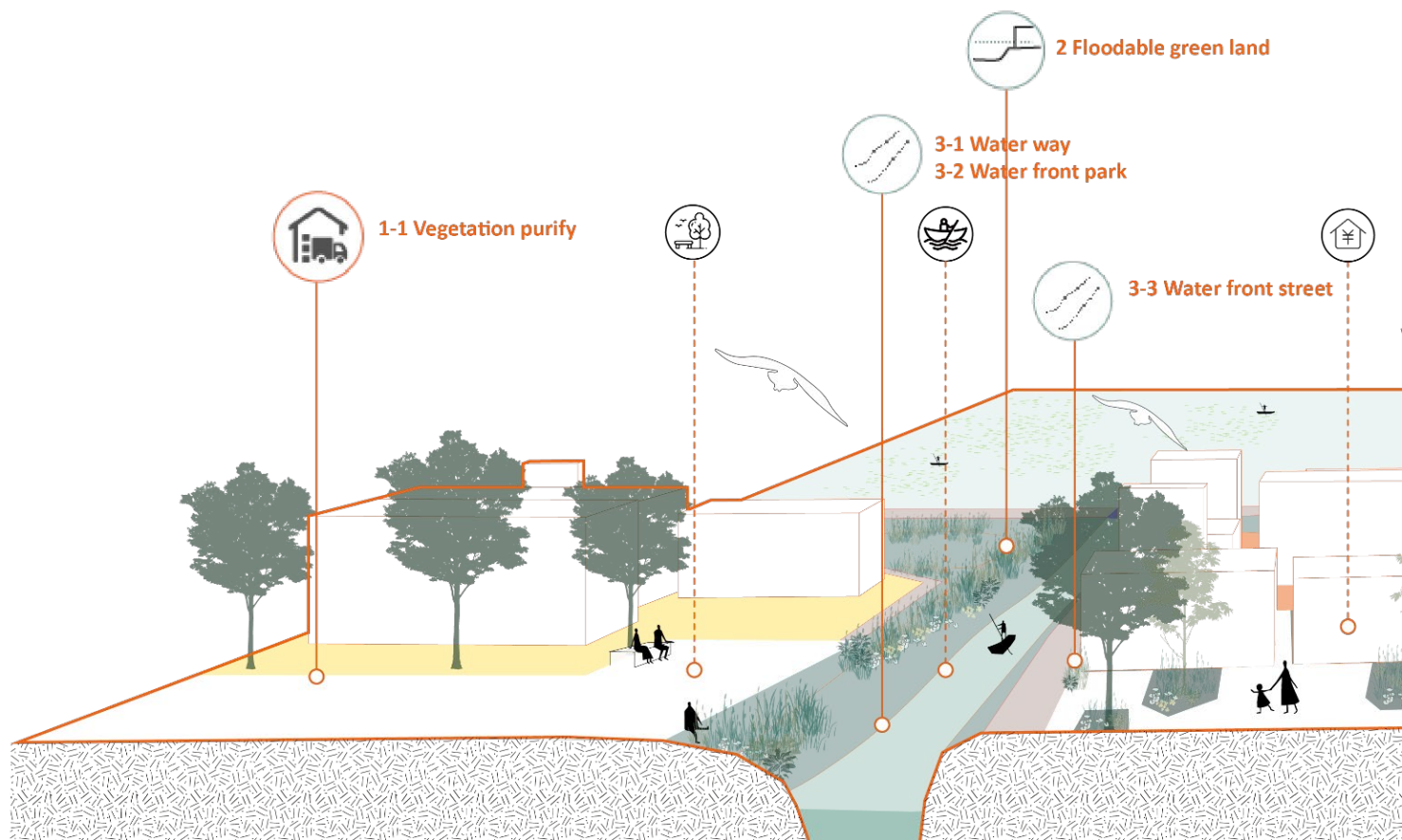


Dense area with ruins of house



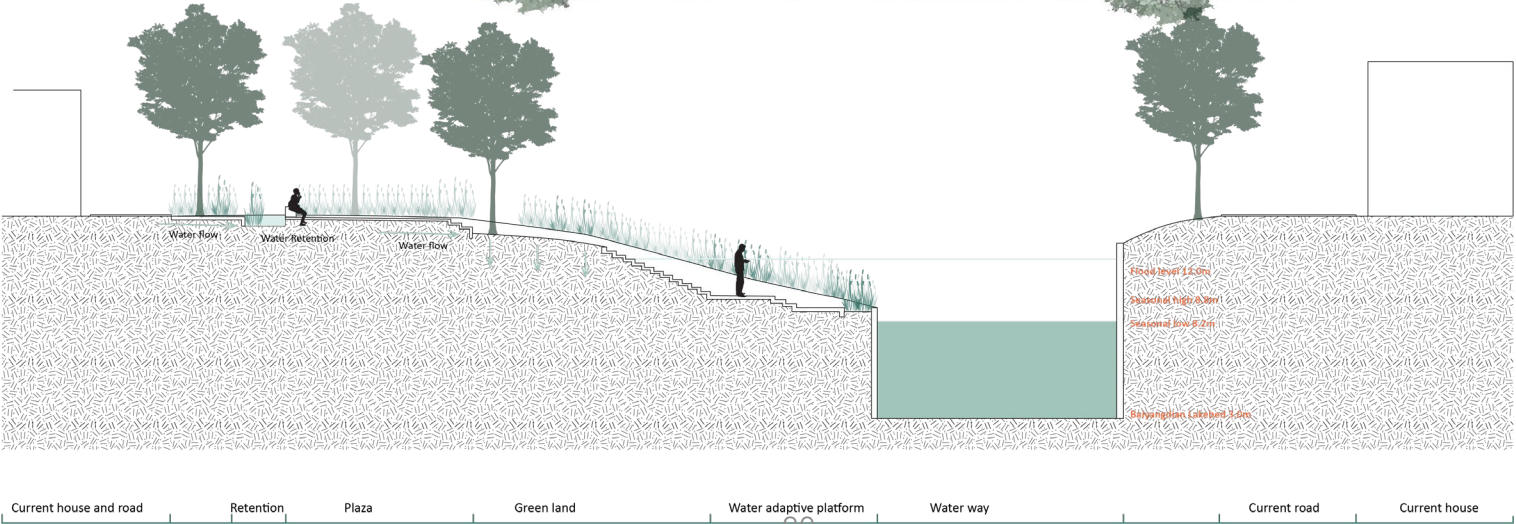
Traditional island village integrated with water





After design: water landscape and new space are connected by water way

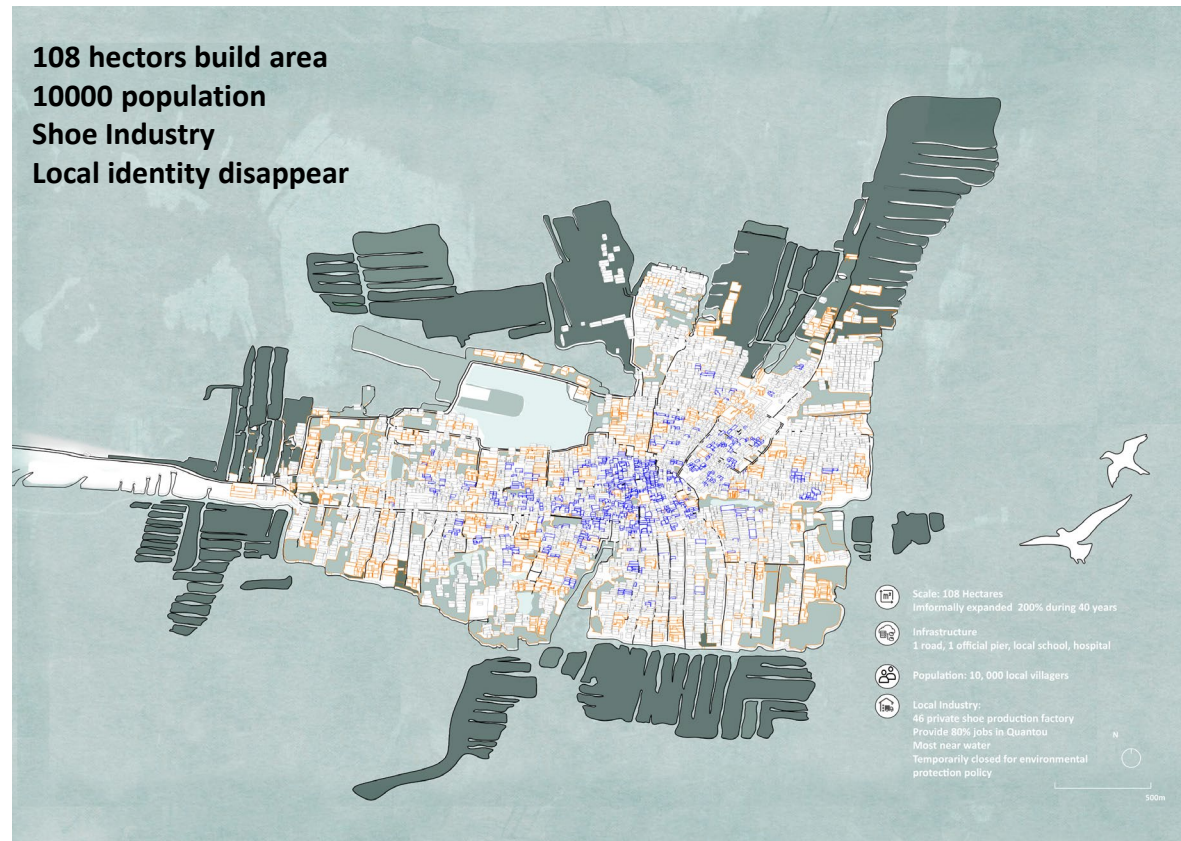
Detail design:
water front space-water way



Water level change adaptive structure

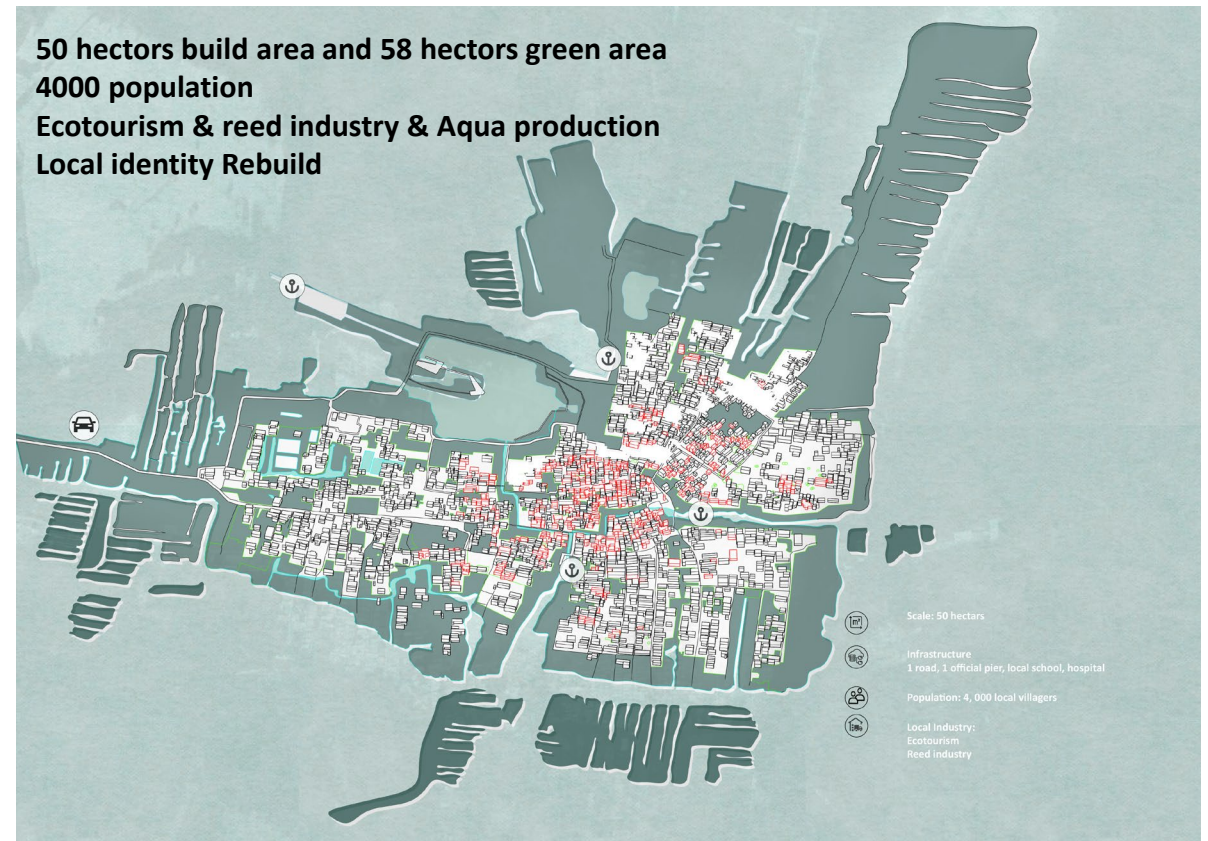


Current condition



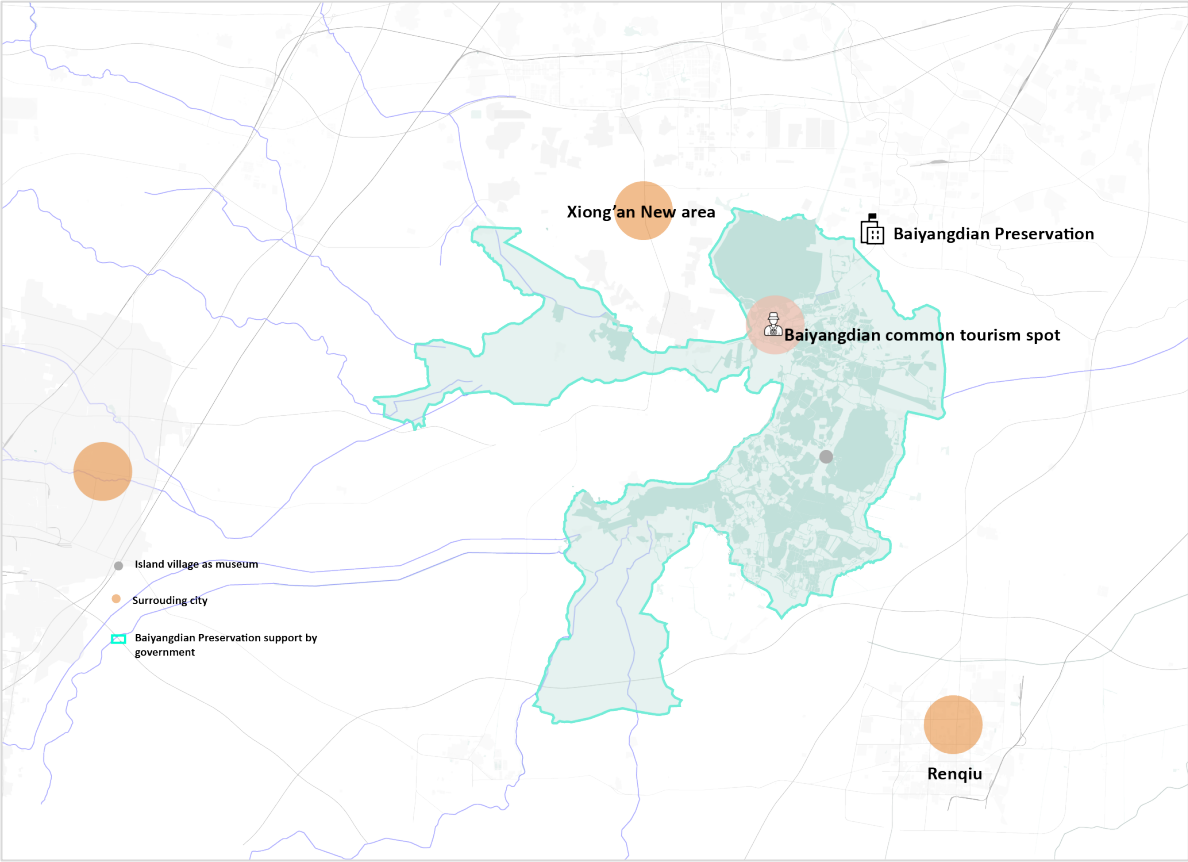
- 1 Industry land with factories need to be removed
- 2 Historical reed field with house under flood risk
- 3 Historical water structure disappeared
- 4 Current green-blue structure and housing with low spatial quality
- 5 Baiyangdian Preservation: lose connection with locals

New symbiosis



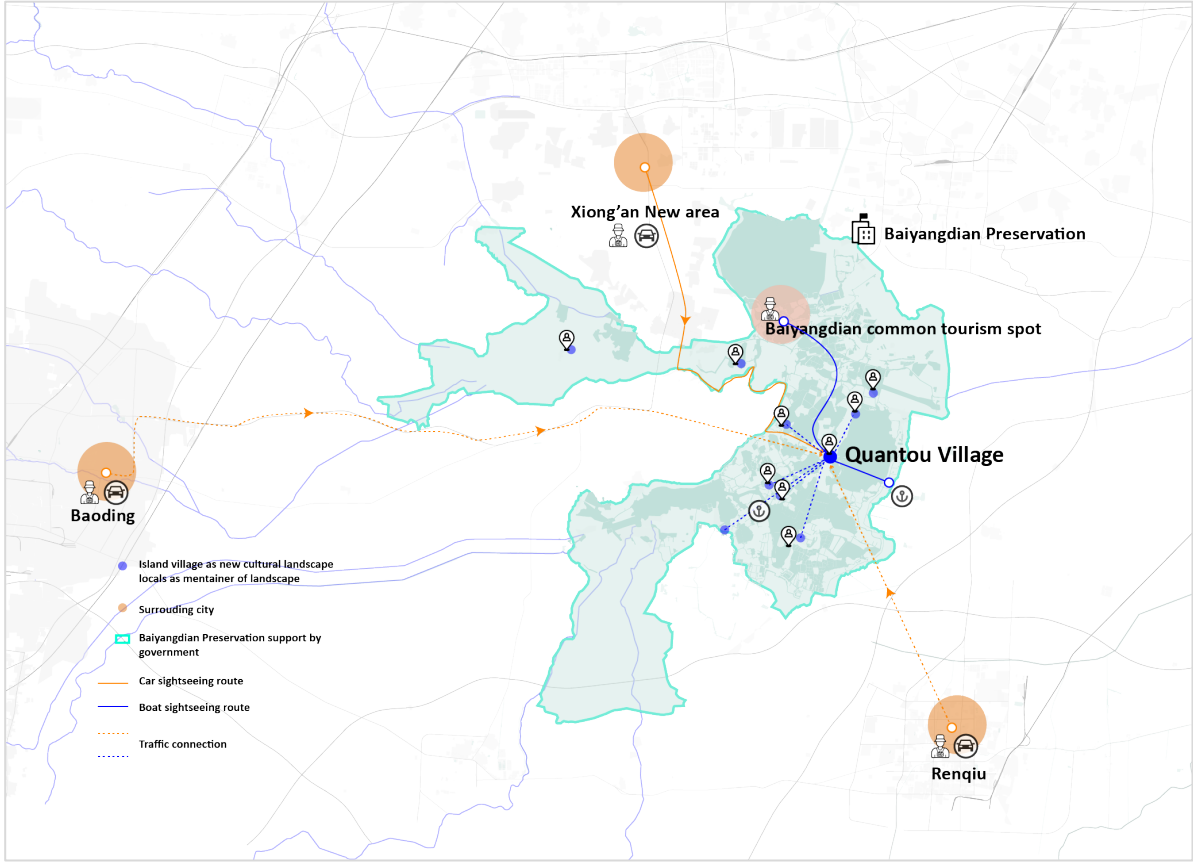
- 1 Green land with recreation and production function
- 2 Historical reed field restore and accessible water adaptive area
- 3 Historical water structure restore
- 4 Current green-blue structure and housing renovate
- 5 Baiyangdian Preservation: maintained by locals

Current condition



- Locals leave Baiyangdian or stay as 'museum'
- Common tourism as 'Disney land'
- Government take over maintenance
- Baiyangdian environment restore

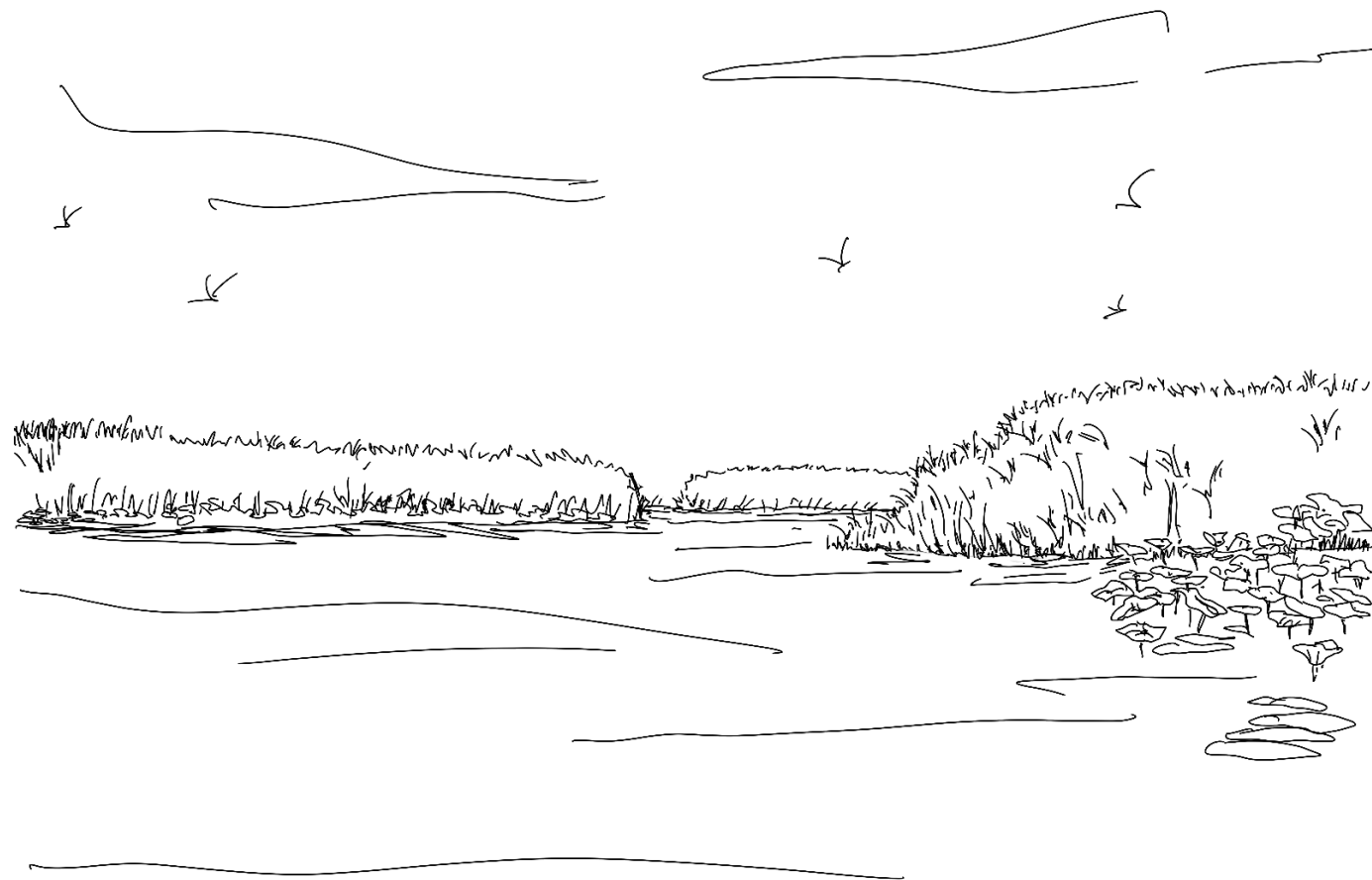
New symbiosis

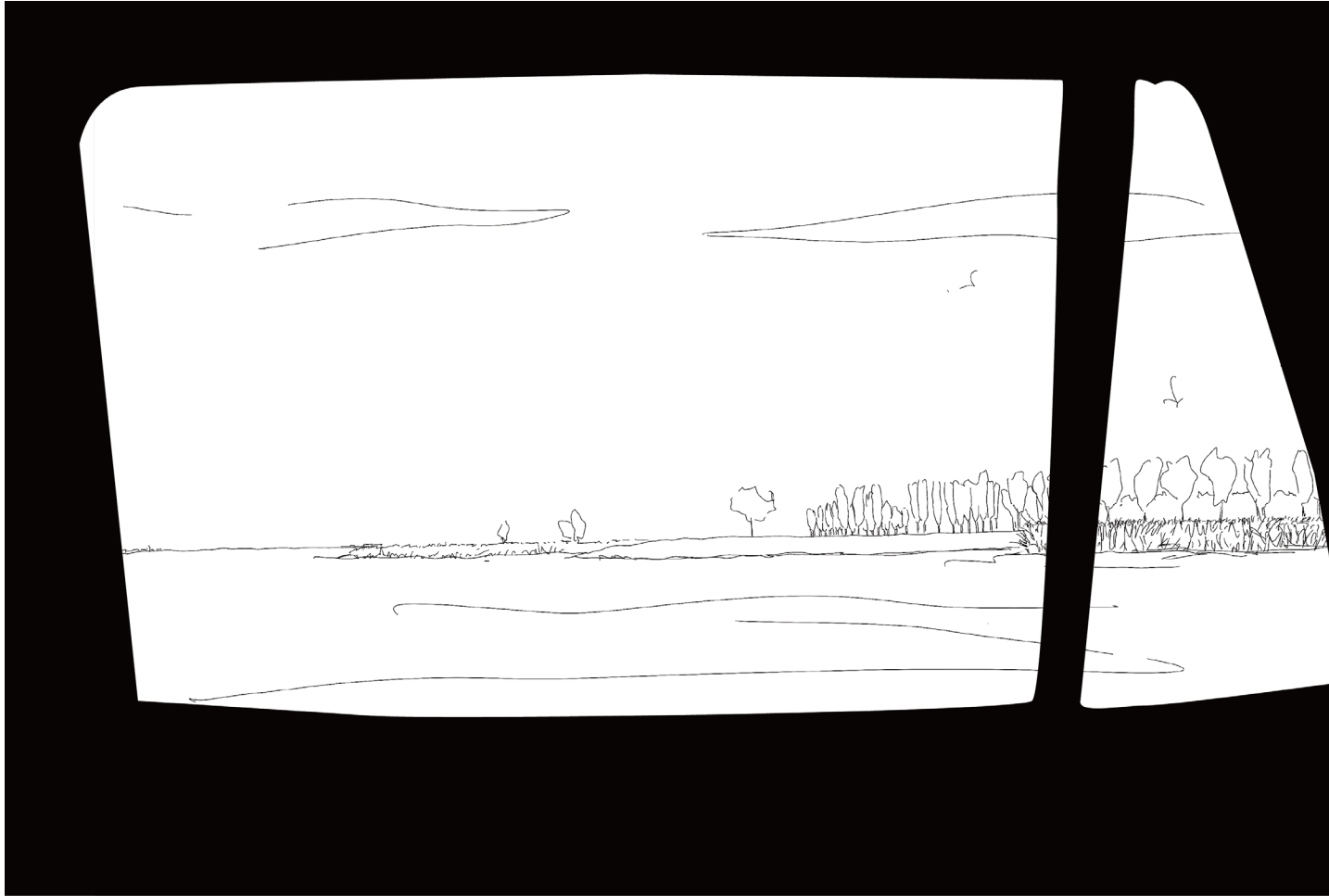


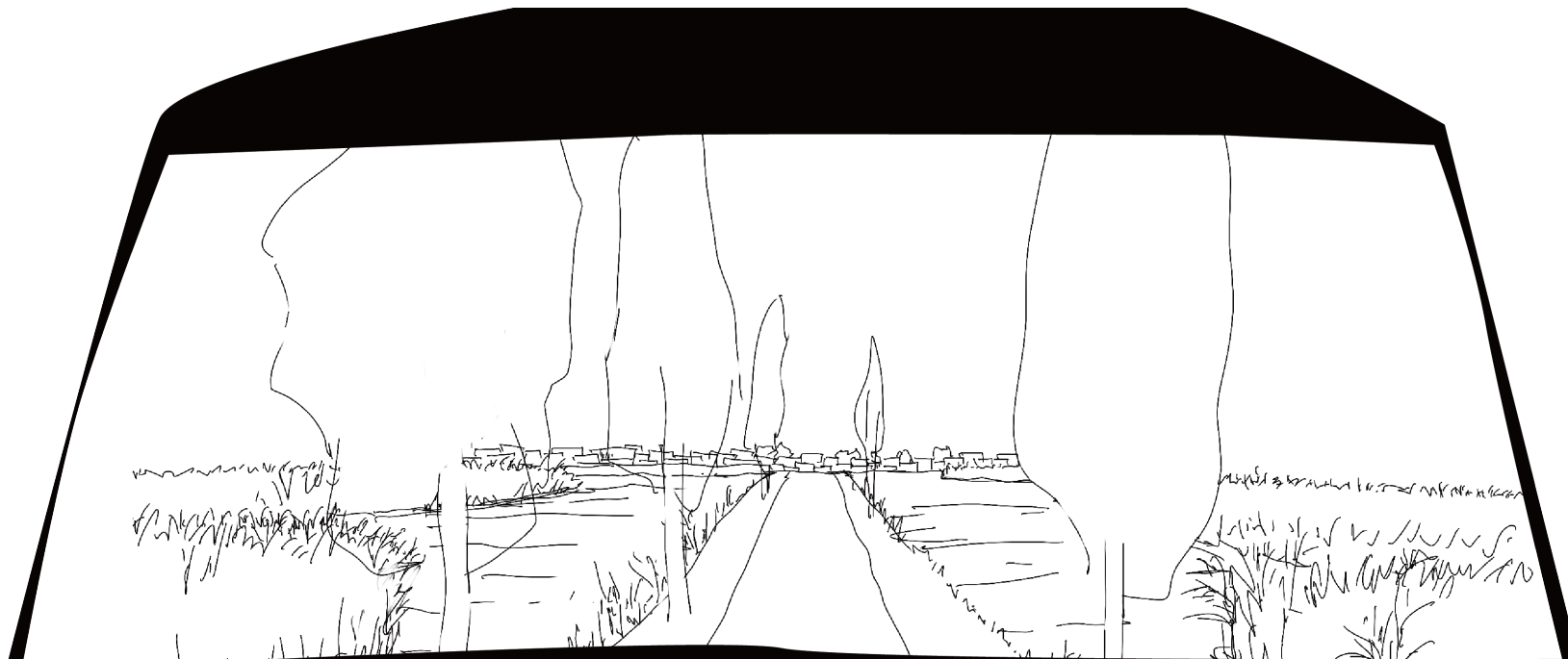
- Locals stay with local life style
- Eco tourism with local identity
- Locals take over maintenance
- Baiyangdian environment restore

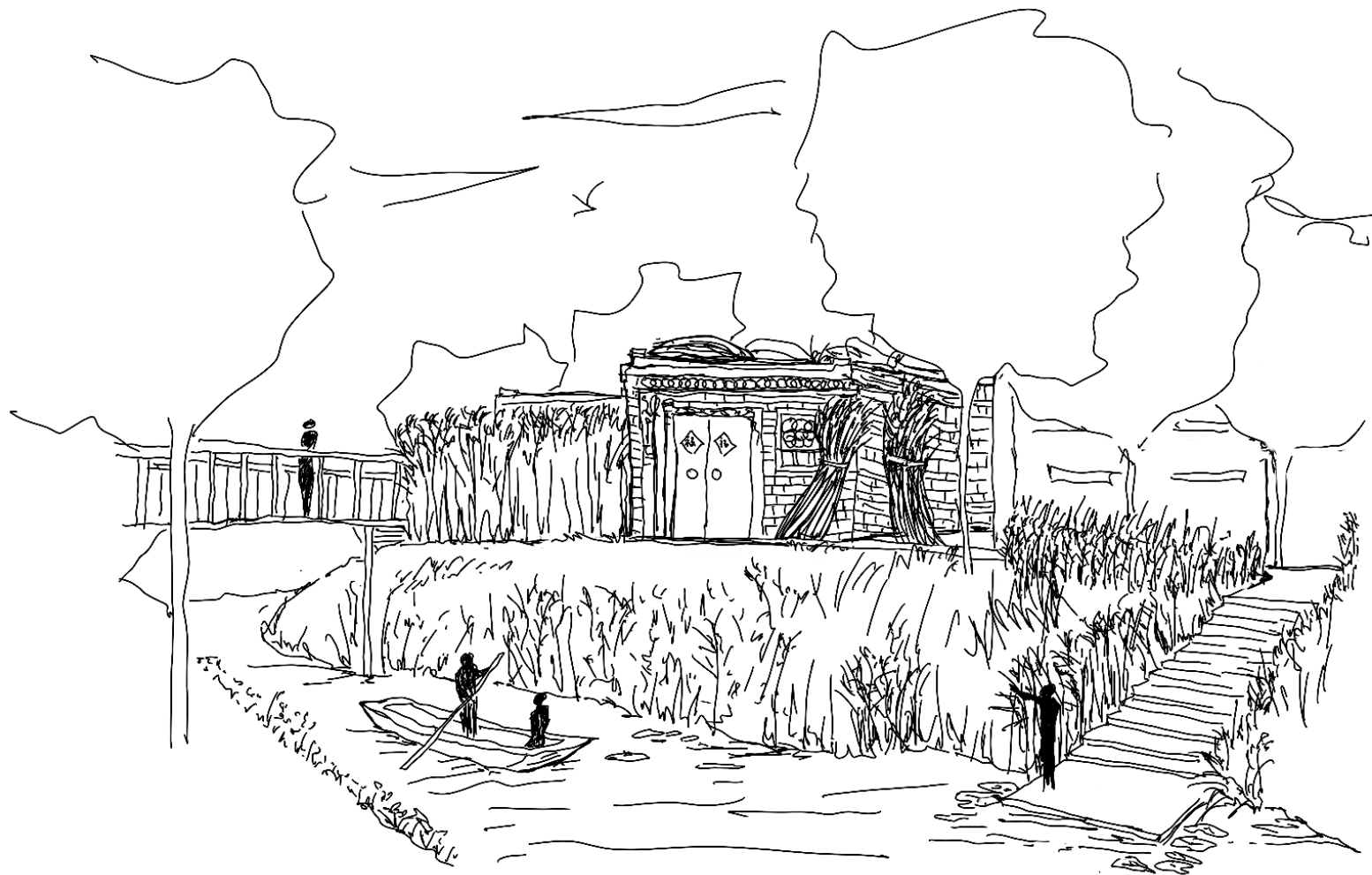
A tour to an Island village

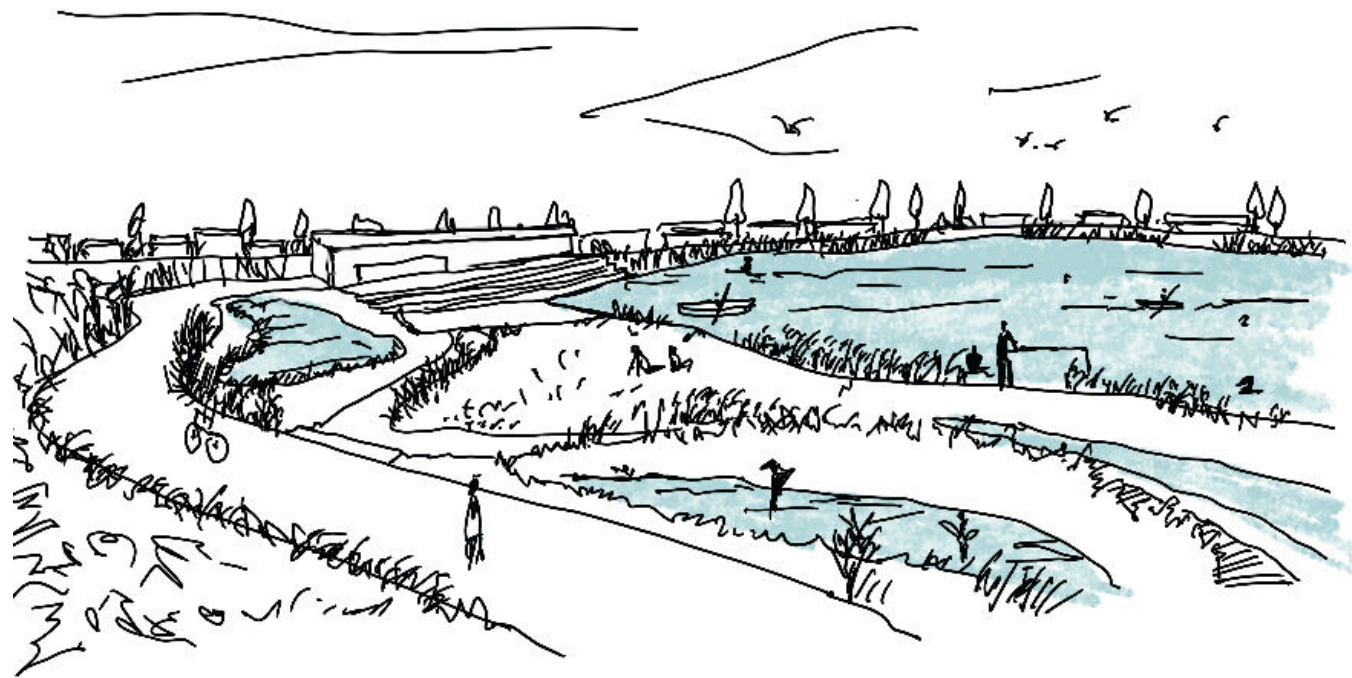
















Thank you for listening!

感谢倾听！