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green

Research on Eco-city Development Phenomenon in China

is the new

In Search of an Alternative Vision for Chinese Eco-city Development

black

P5 Presentation - Wenchi Yang
Mentors: Marta Relats, Taneha Bacchin, Marcin Dabrowski
Studio: Happy Cities





GLOBAL

China's Air Problem Is Worse Than You Think

A new study finds that air pollution kills 4,000 people per day in China

JAMES FALLOWS | AUG 14, 2015

Over the past 10 years of living in and then writing about China, I've struck these big three recurring themes:

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'The Polluted Landscape'
@ Lu Guang 2015





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Technology | Tue Mar 4, 2014 10:20pm EST

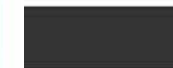
Related: ENVIRONMENT, CHINA

China to 'declare war' on pollution, premier says



Chinese Premier Li Keqiang gives an address during a news conference with French Prime Minister Jean-Marc Ayrault (not pictured) in the Great Hall of the People in Beijing December 6, 2013 file photo.

REUTERS/MARK RALSTON/POOL



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Urbanisation

China's 'eco-cities': empty of hospitals, shopping centres and people

As part of its plan to move tens of millions of people out of the countryside, China is building hundreds of brand-new cities. Tianjin Eco-city is a relatively successful example, but many of its 'green' buildings still echo like gymnasiums

Cities is supported by:
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And Ghost-Town Fears In China's New Mega Eco-City

on between Singapore and China has all the features of an environmentally sustainable future. But one thing

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China's eco-cities: Sustainable urban living in Tianjin

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just imagine...what will life be like in 2020?

August 22, 2007 -- Updated 1007 GMT (1807 HKT)

Chinese eco-city heralds revolution in urban living

STORY HIGHLIGHTS

Chinese island is first truly enviro
Dongtan is being planned with a
City will retain a traditional Chine

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PHOTOS

By Francesca de Châtel for CNN

LONDON, England (CNN) -- On an island off the coast of the Chinese city of Shanghai, architects, engineers and contractors are preparing to build a new city later this year. In itself, this is nothing special one would think.

With 20 percent of the world population living in China and national population figures set to hit 1.47 billion by 2020, there is always demand for new housing.

But the city that is to be built on Chongming Island at the mouth of the Yangtze River is like no other in the world: Dongtan eco-city is planned to be first truly environmentally and economically sustainable city.

Situated on a plot of land that is around two-thirds the size of Manhattan, Dongtan is surrounded by wetlands and lies beside a bird sanctuary where hundreds of rare migratory birds seek refuge.

Dongtan, the eco-city being built off the coast of Shanghai on the Yangtze River.

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It was these unusual natural conditions that sparked the ambitious idea of creating a new urban concept for an entirely sustainable city that would minimally impact the surrounding environment.

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Cities Get Smarter

China's Future City

China has put political muscle and technology i

By Yiting Sun on November 18, 2014

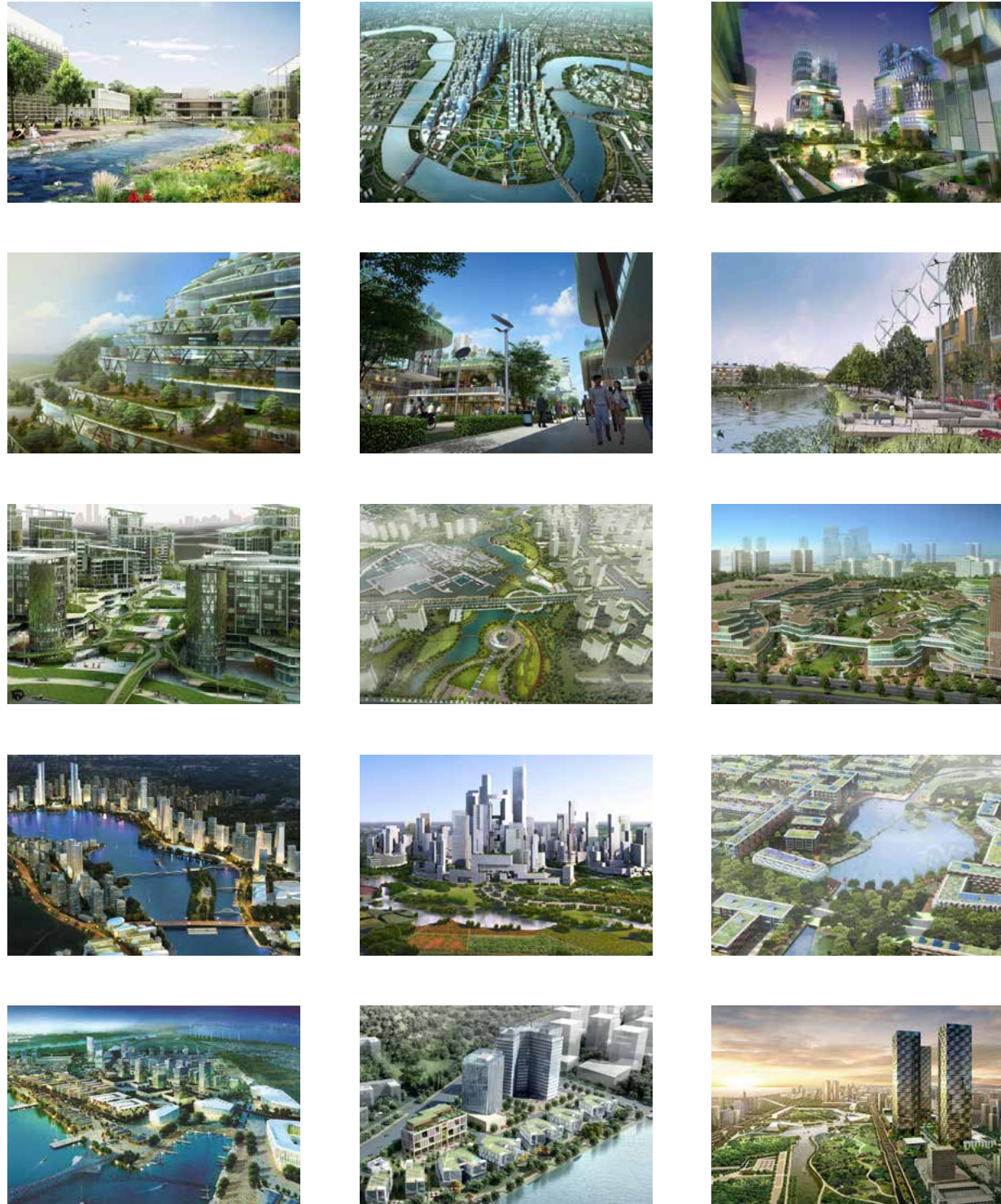
Strolling along sidewalks shaded by plan
might take Tianjin Eco-City for just another
many residential areas sprouting up all o
But on closer inspection, this place is dif
roadside trash cans are covered with sol
photovoltaic panels so they can light up
free electric buses connect different dist
drainage wells for storm water are all

_Eco-city Project in China



In 2010, a research shows there are 276 cities in China brand their development goals as 'Eco-city' or 'Low Carbon City'. Map above shows 19 clearly defined major eco-cities projects. (Research conducted by Chinese Society For Urban Studies)

_Eco-city Projects



Eco-city proposal renderings
@ Google



Eco-city projects in reality
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DE ZUIN

The Great Debate

China's eco-cities are often neither ecologically friendly, nor functional cities

By Wade Shepard | September 22, 2015

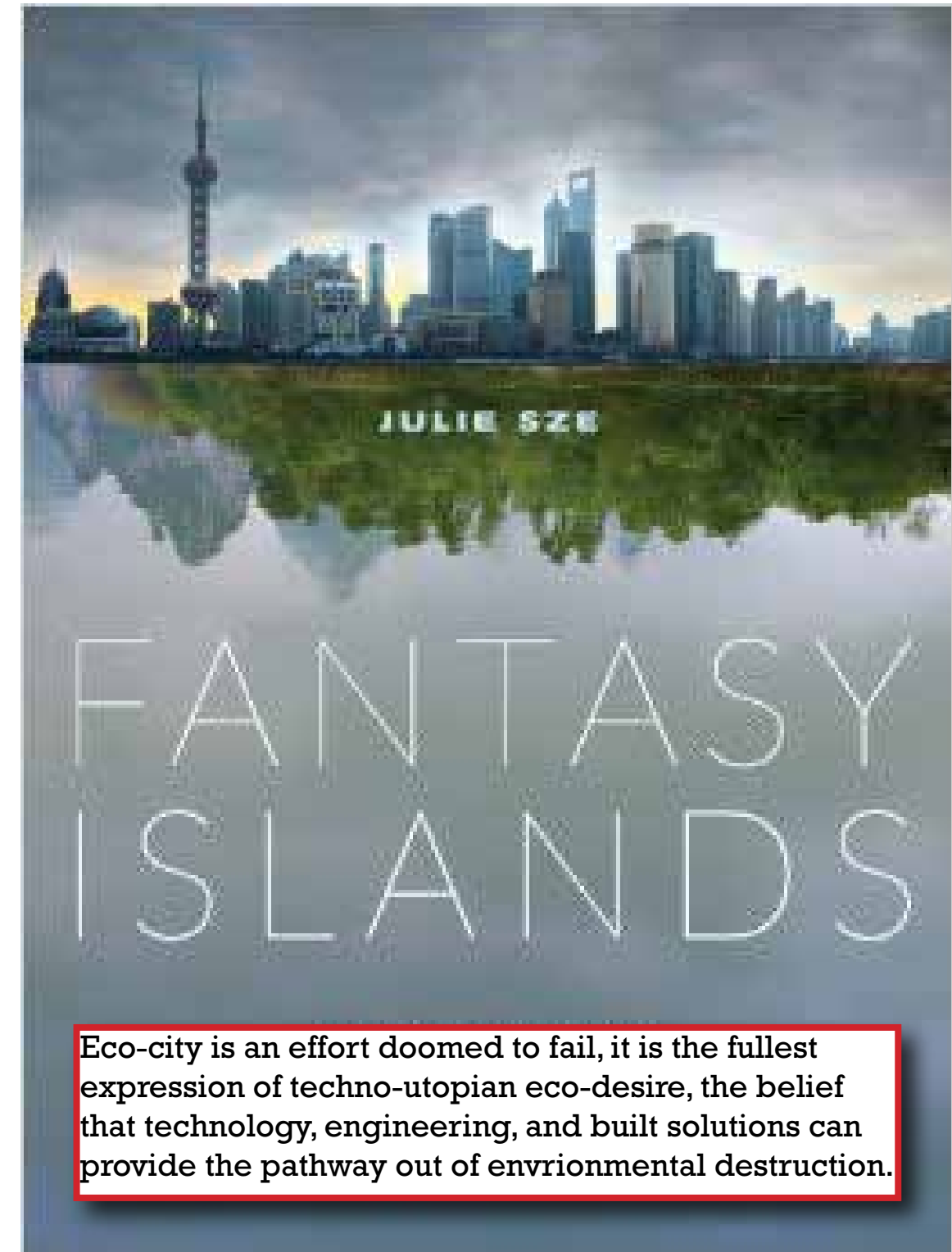


Tags: CHINA | DEVELOPMENT | ECO-CITY | GREENWASH



A model of the Dongtan Eco-City is displayed in the developing centre in Dongtan, on Chongming Island southeast to Shanghai in this January 21, 2008 file photo. REUTERS/ Nir Elias/Files

The words "eco" and "city" combined together seems like an unabashed oxymoron. The term "ecological" is the polar opposite of what we know our cities to be. Urban areas are environmental hazard zones: their concrete suffocates the soil, their power plants turn the skies insidious shades of gray, their sewer systems pump pollutants into waterways, their factories turn fertile land into unlivable fields, their traffic fills our lungs with

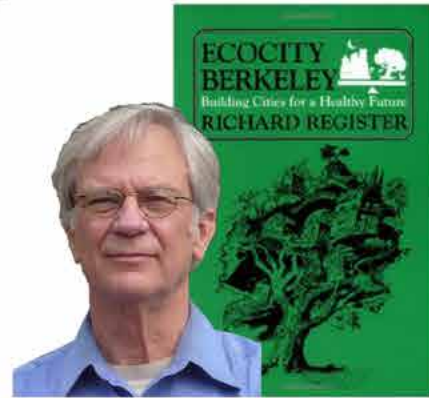


Eco-city is an effort doomed to fail, it is the fullest expression of techno-utopian eco-desire, the belief that technology, engineering, and built solutions can provide the pathway out of environmental destruction.

Are the eco-cities just the fantasy islands of China?

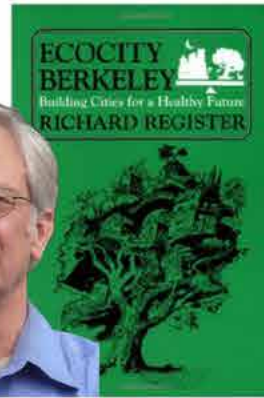
Fantasy Islands: Chinese Dreams and Ecological Fears in an Age of Climate Crisis
J Sze - 2014 - Univ of California Press

What is 'eco-city' as a
planning concept?
and
Why is it widely used by the
Chinese initiatives?



ECO-CITY: Richard Register

Defining the eco-city as one built according to the principles of living within the means of environment. (1973)



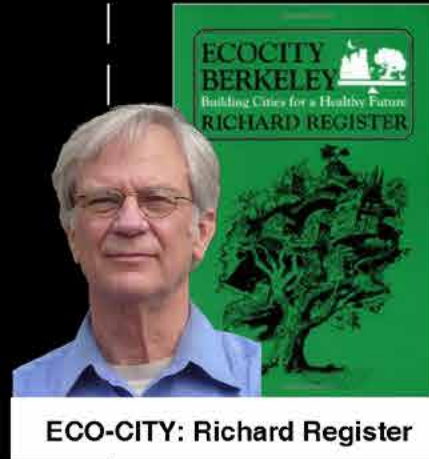
ECO-CITY: Richard Register

Defining the eco-city as one built according to the principles of living within the means of the environment. (1973)

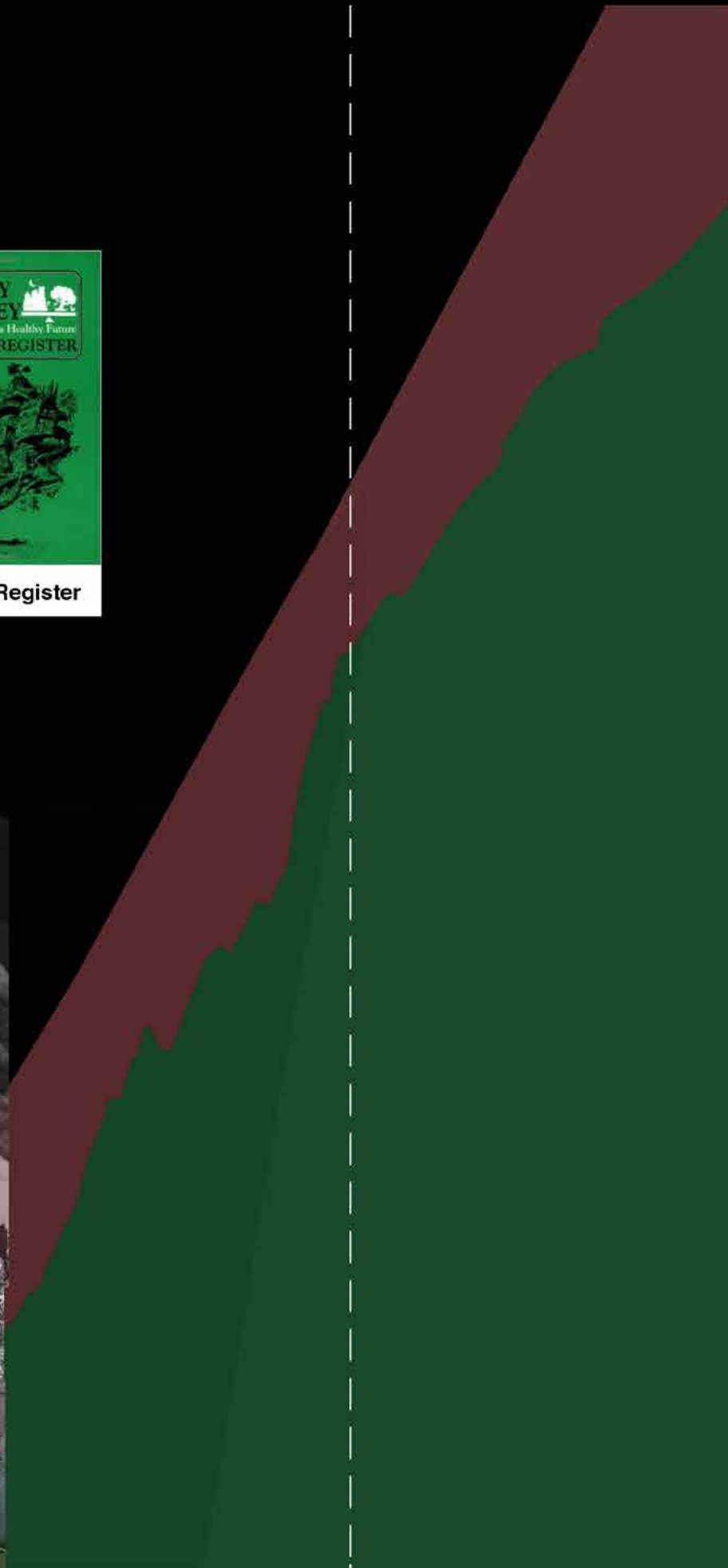
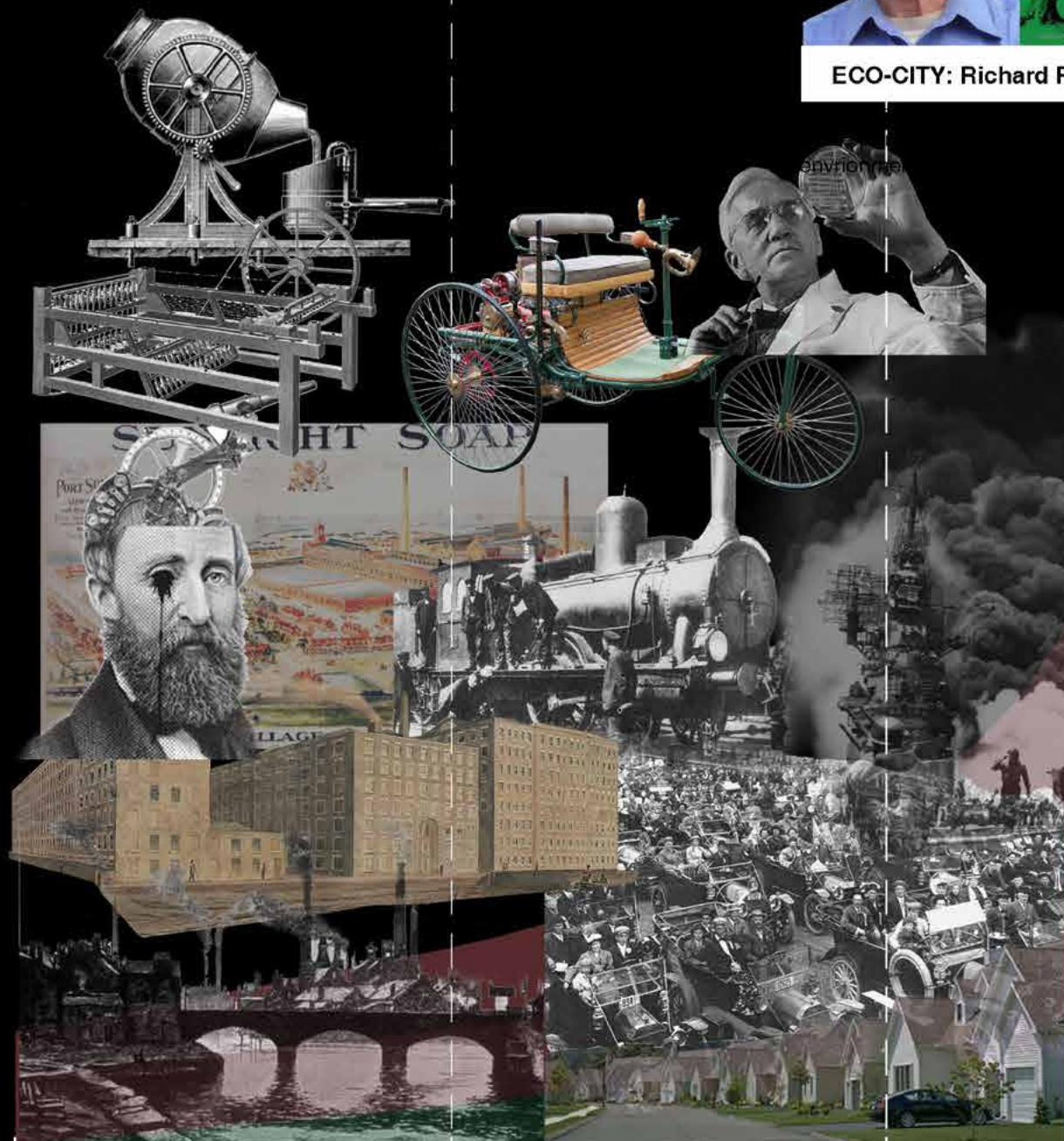


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2ND INDUSTRIAL REVOLUTION



ECO-CITY: Richard Register



1750

1850

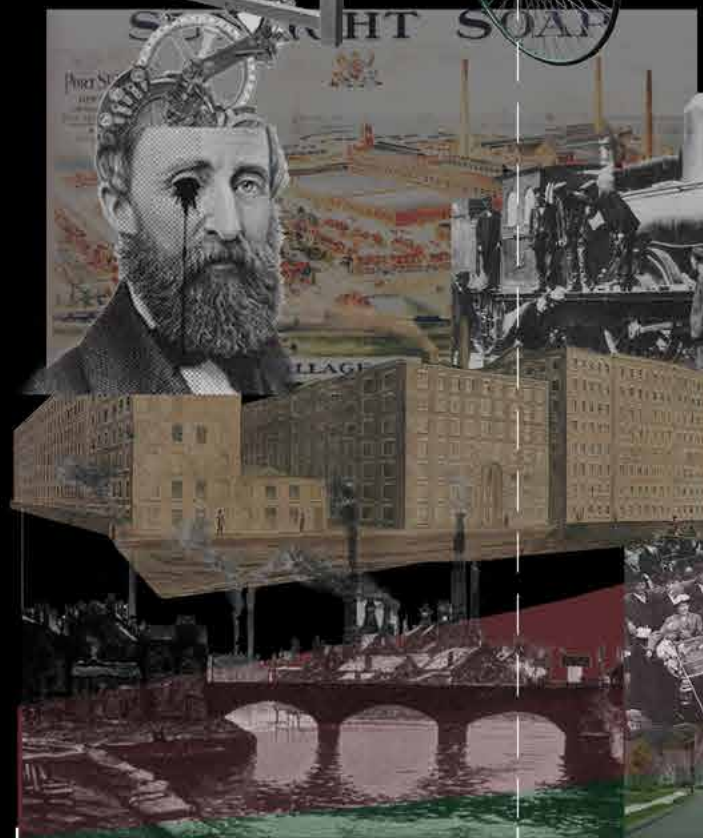
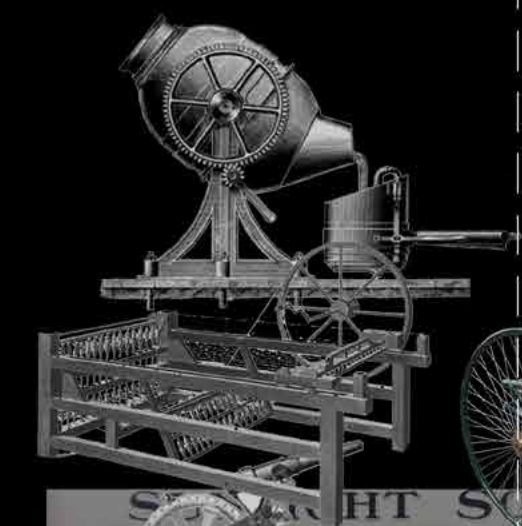
1950

2005

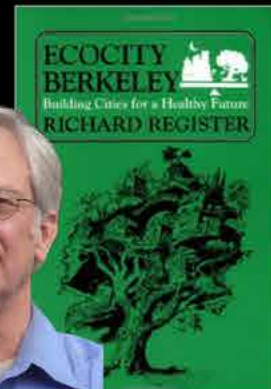
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ECO-CITY: Richard Register



net built according
in the means of



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SILENT
SPRING
Rachel

AIR
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KILLS

BREATHING
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WHAT'S THE SCORE?
DUST-60
Sulphur Diox-43

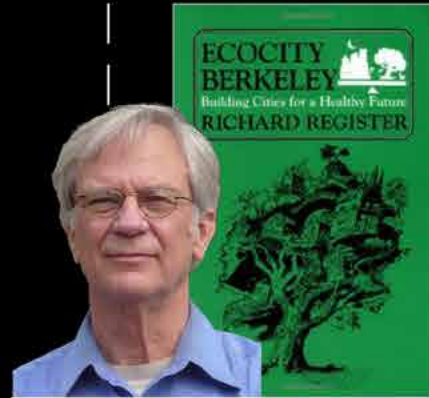
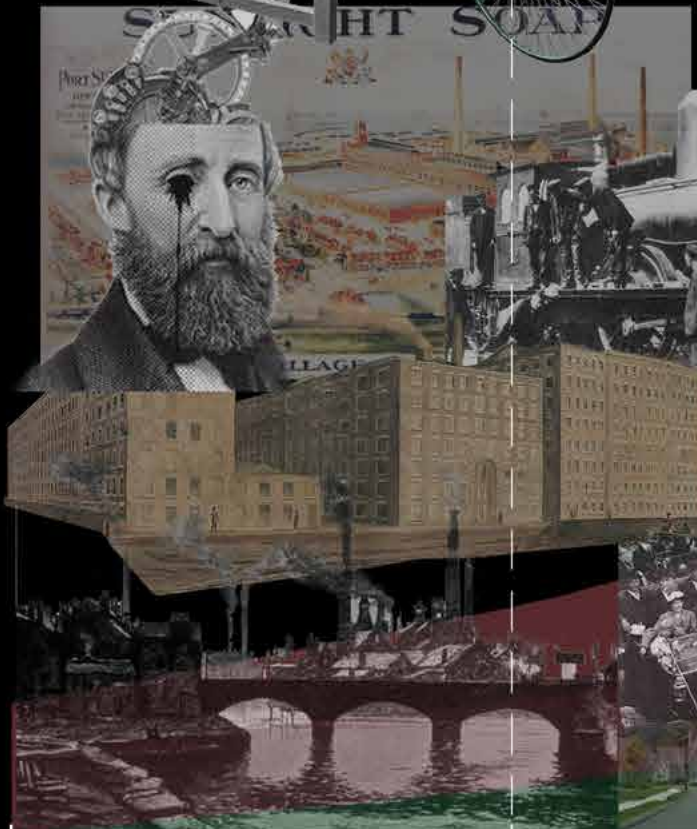
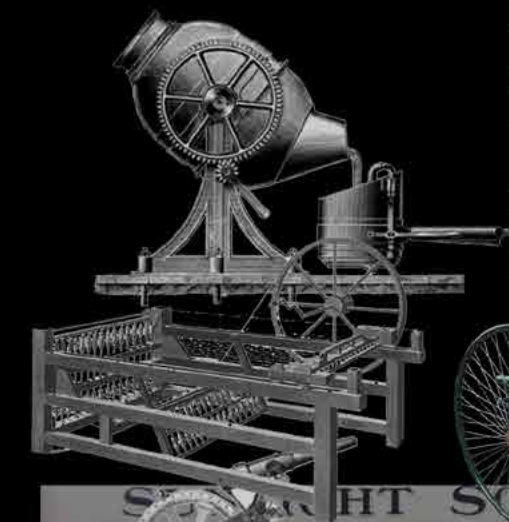
EARTH DAY

APRIL 22

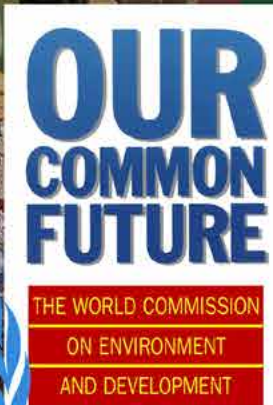
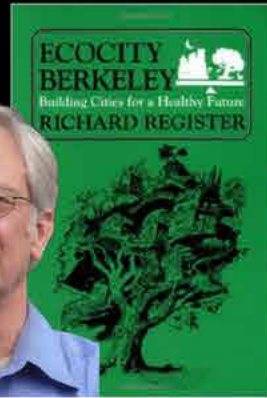
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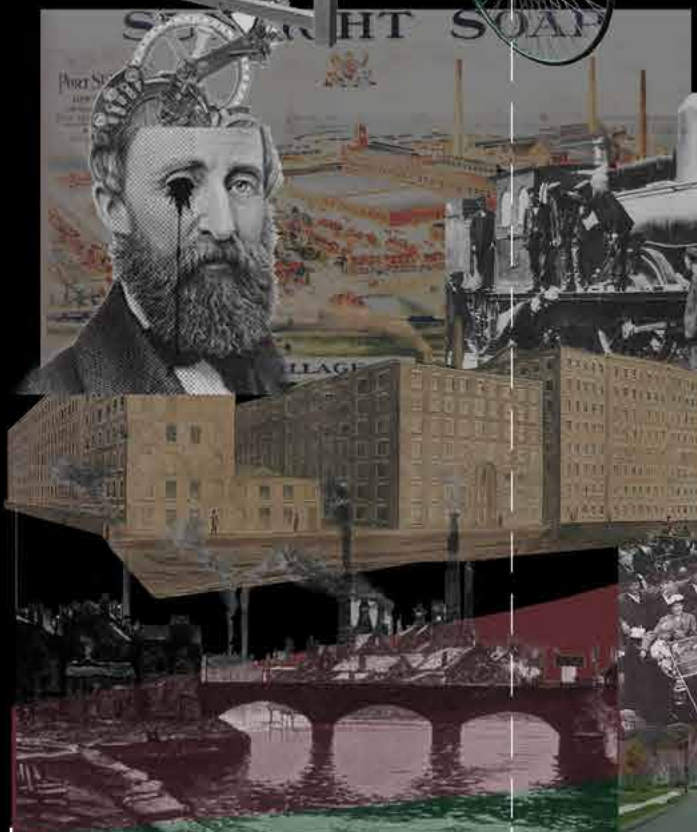
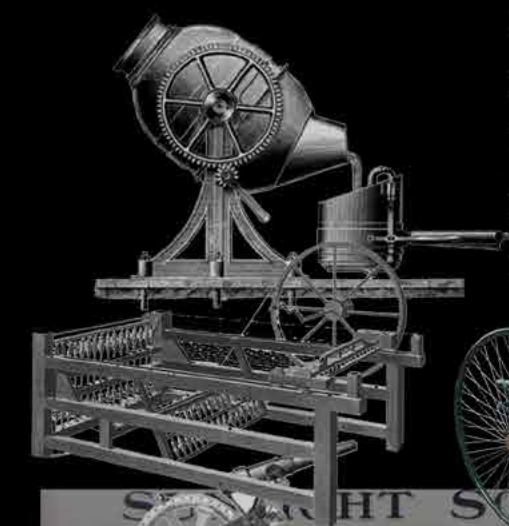
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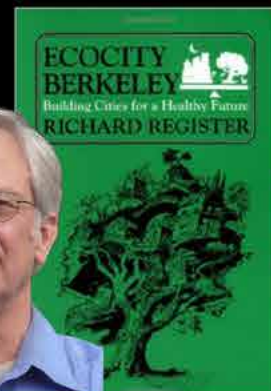


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AIR POLLUTION KILLS

WHAT'S THE SCORE?
DUST-60
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CLEAN AIR
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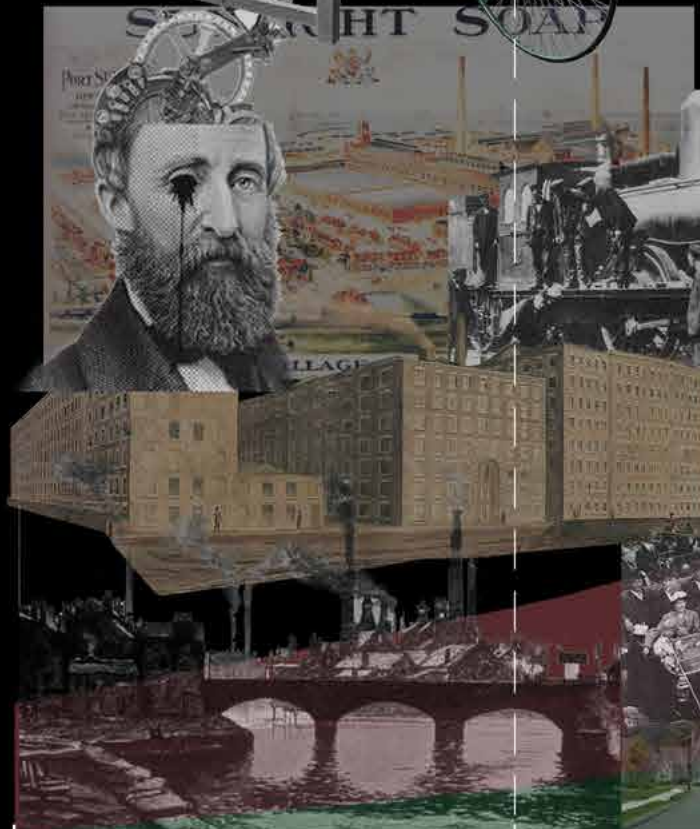
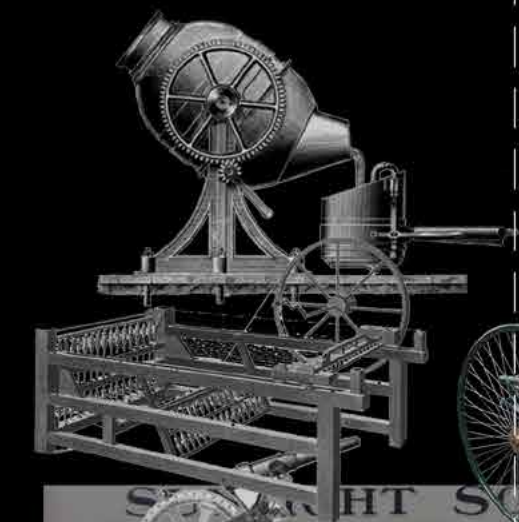
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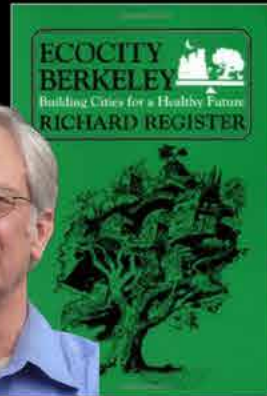
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Dongtan Eco-city Proposal (2005)



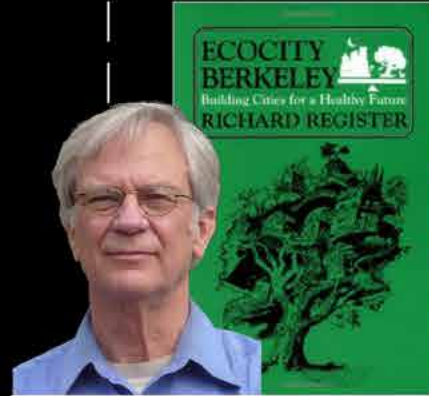
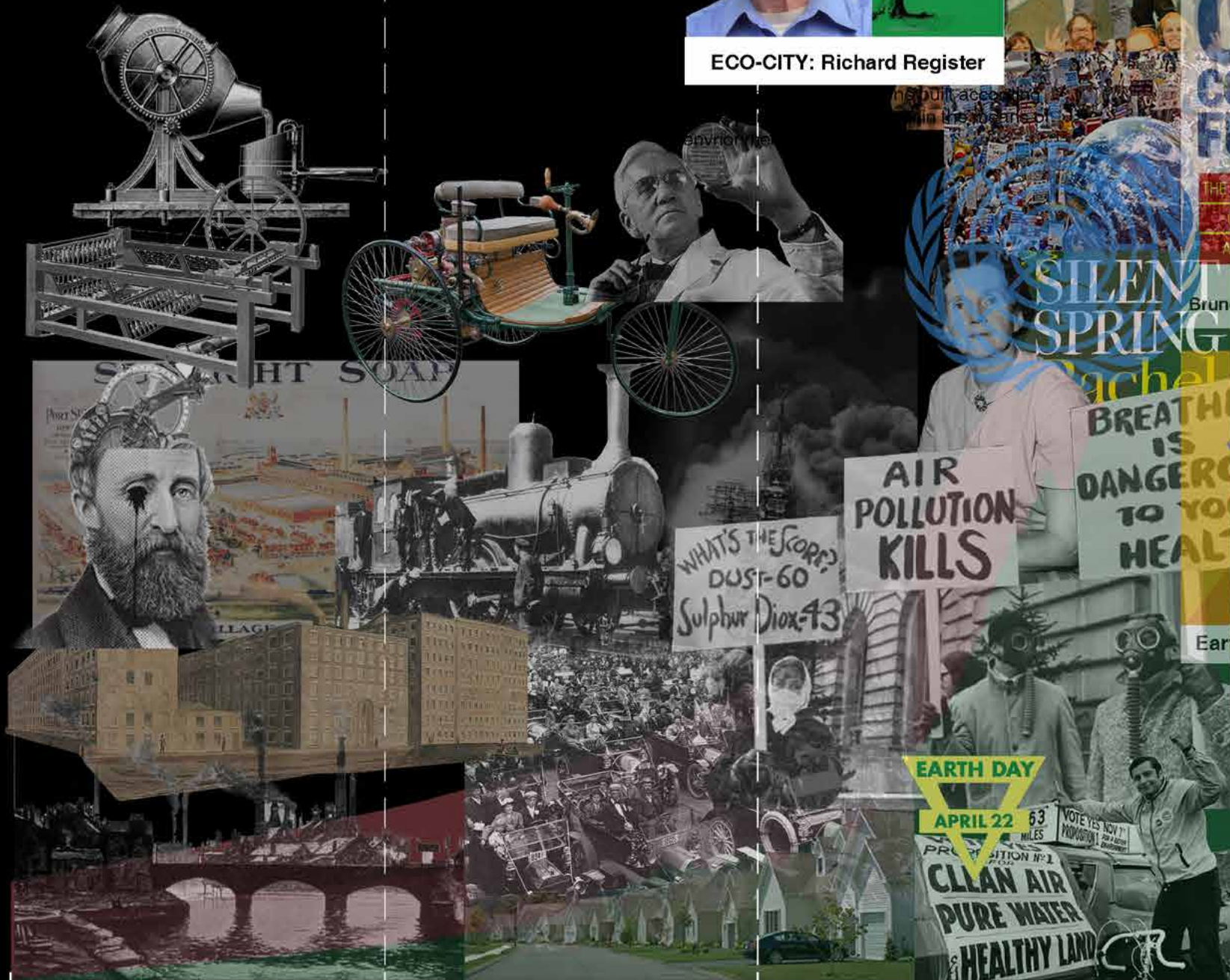
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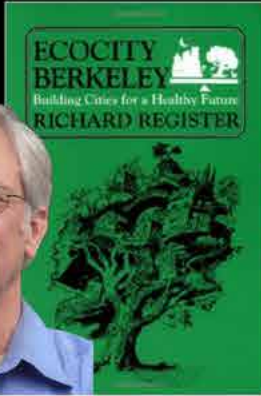
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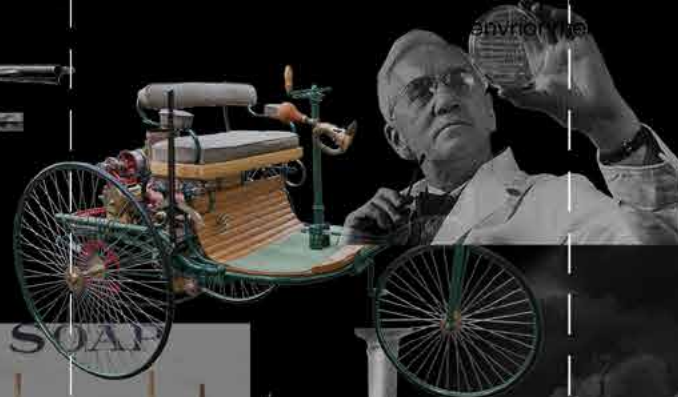
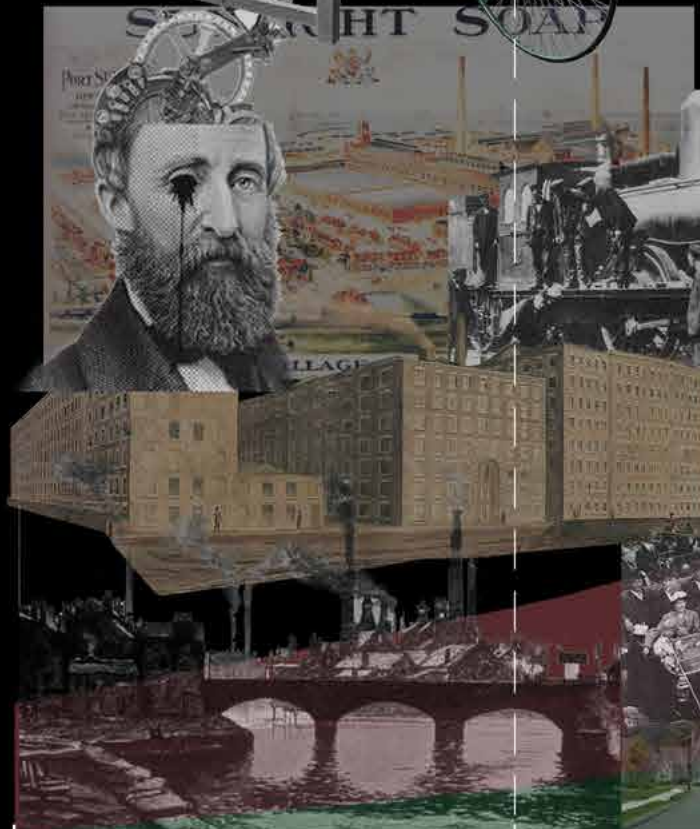
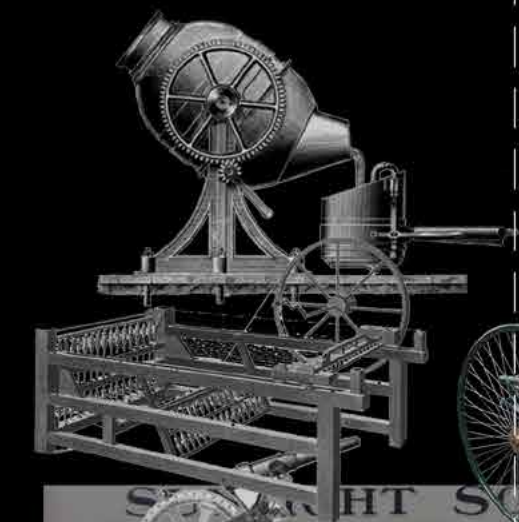
Dongtan Eco-city Proposal (2005)



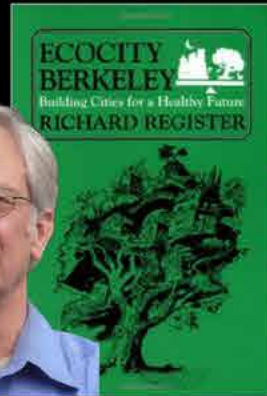
Dongtan Eco-city Reality (2012)

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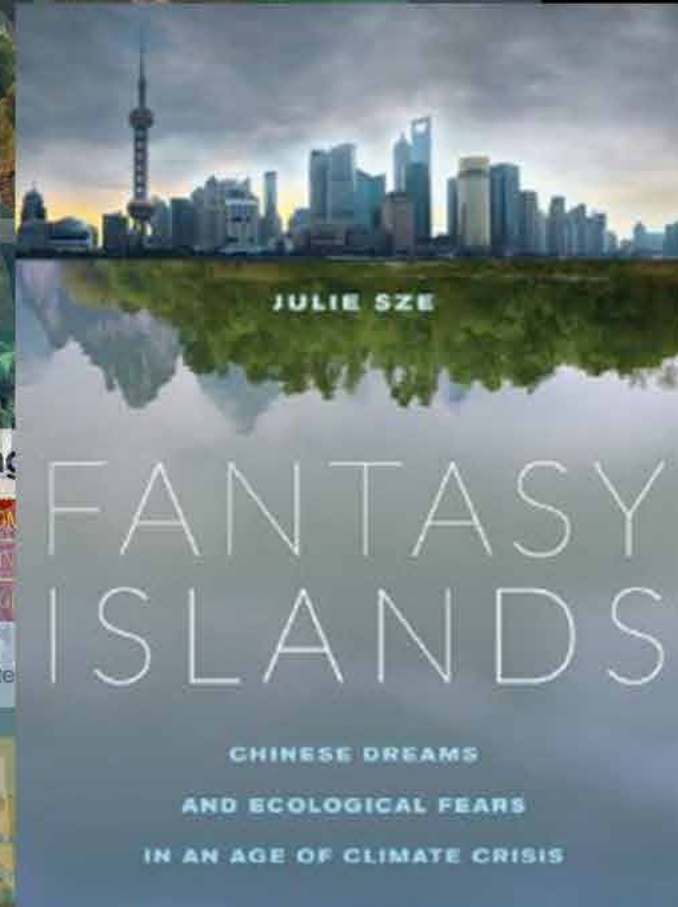
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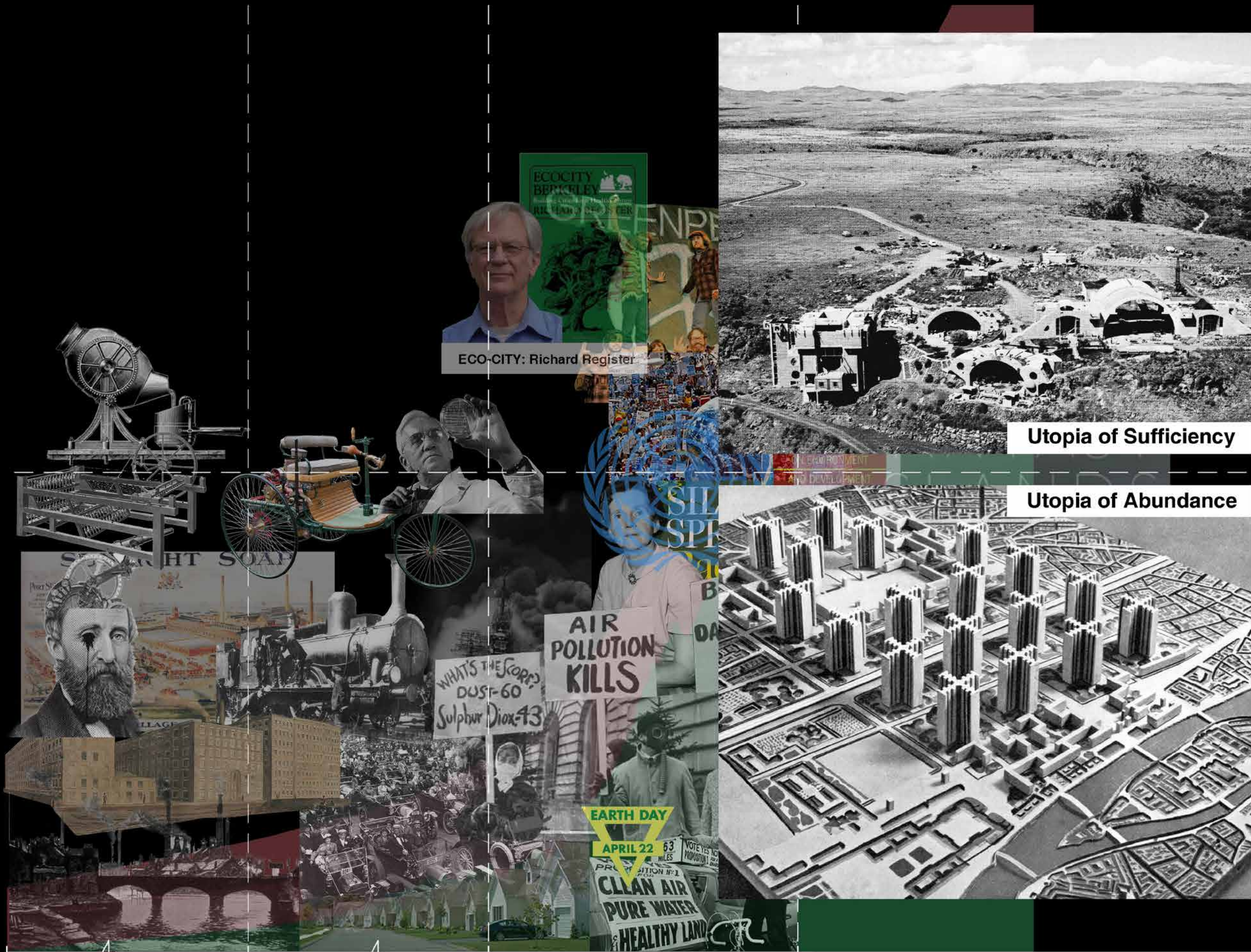
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PURE WATER
HEALTHY LAND



'Dongtan Eco-city is an effort doomed to fail, it is the fullest expression of techno-utopian eco-desire, the belief that technology, engineering, and built solutions can provide the pathway out of environmental destruction.' - Julie Sze

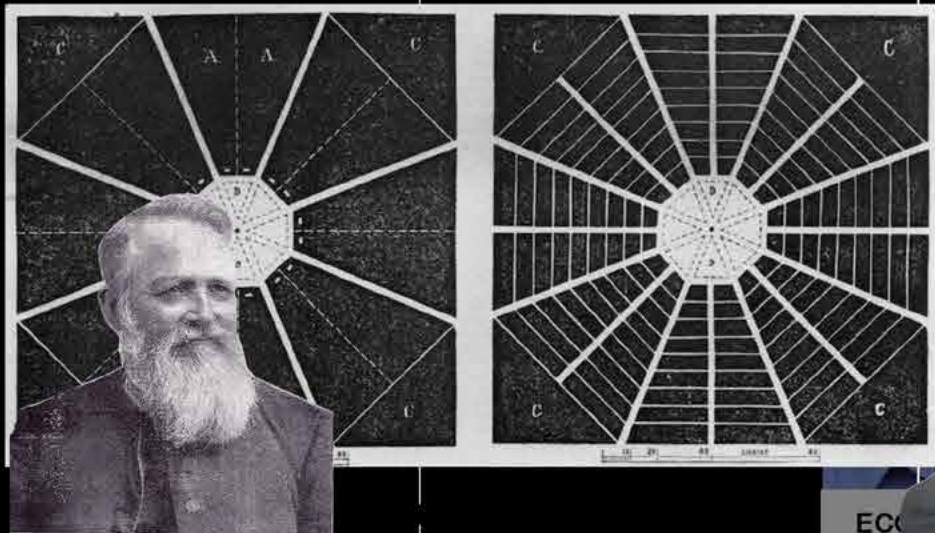
Dongtan Eco-city Reality (2012)



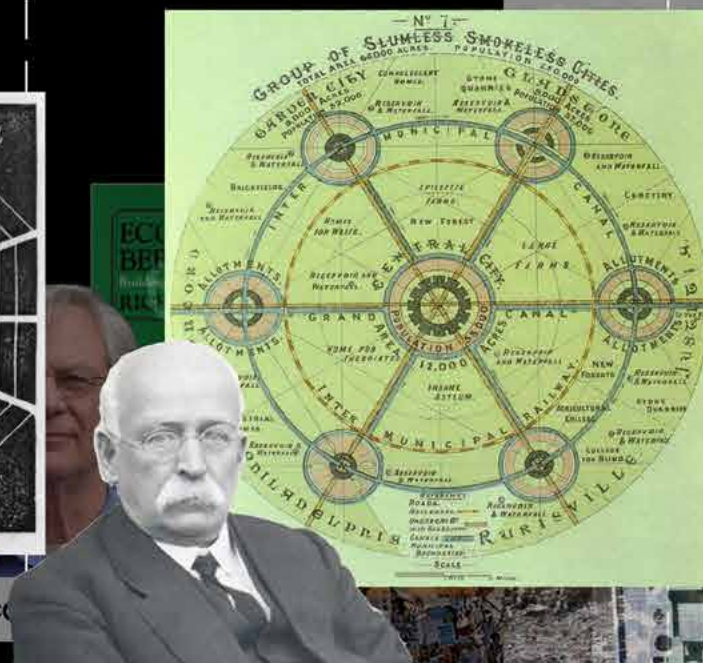
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Utopia of Sufficiency

Utopia of Abundance



Octagon City - Henry Clubb
1856



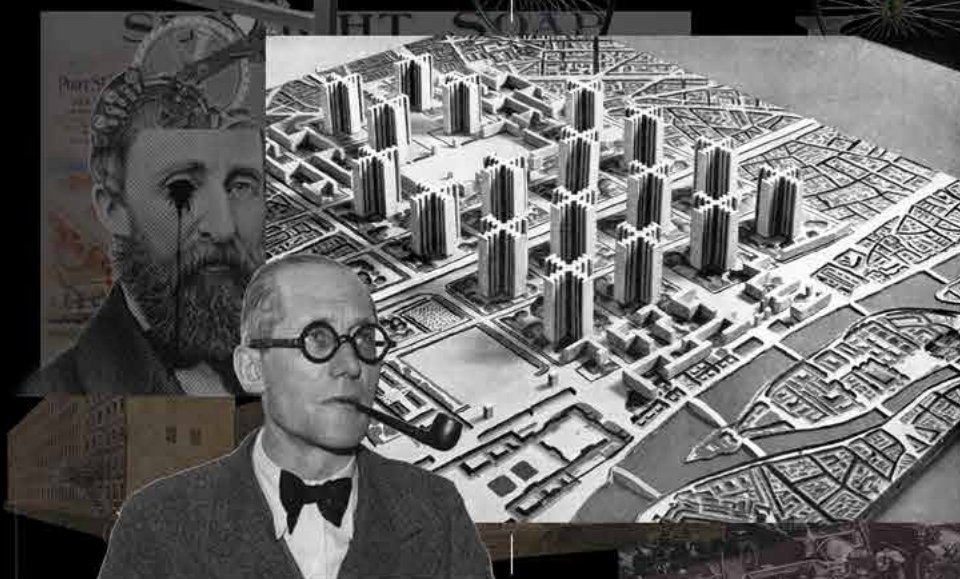
Garden City - Ebenezer Howard
1902



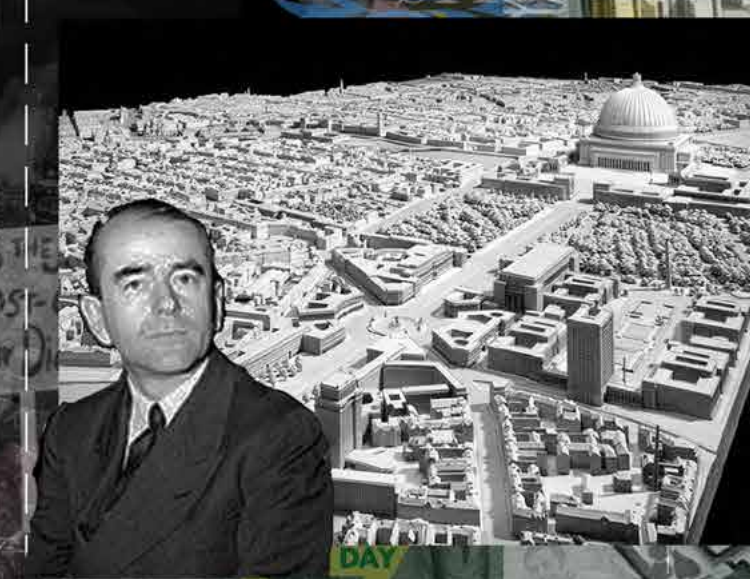
Broadacre City - Frank Lloyd Wright
1932

Utopia of Sufficiency

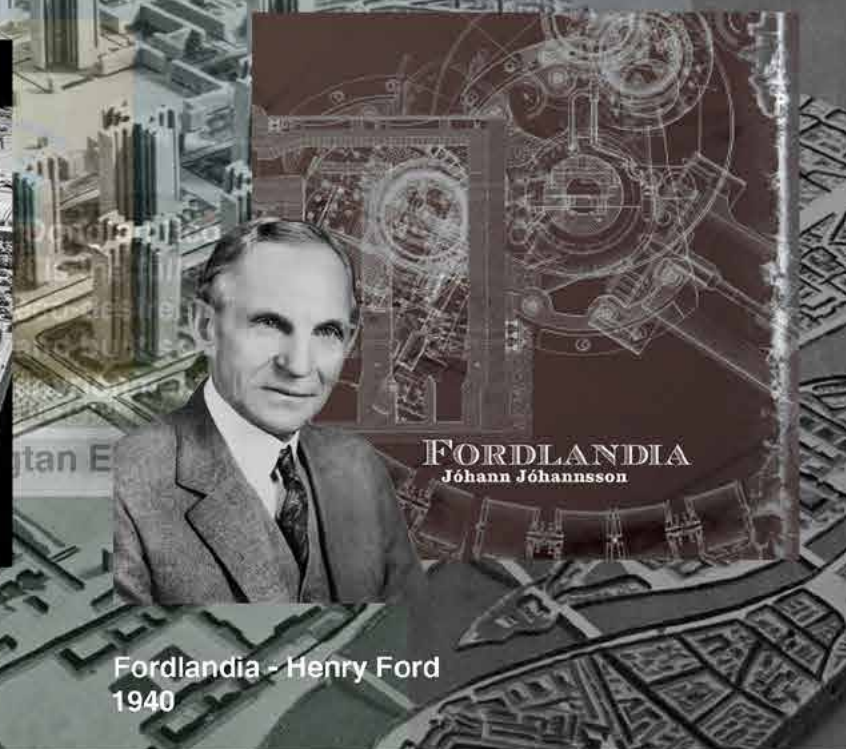
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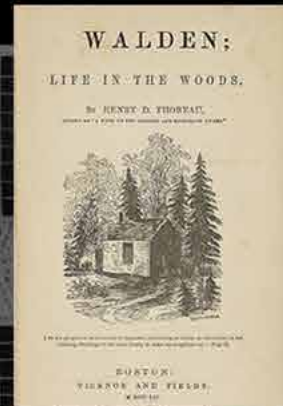
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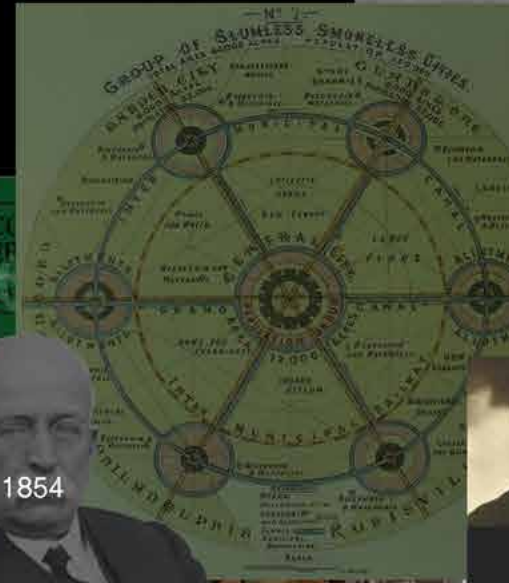
Fordlandia - Henry Ford
1940



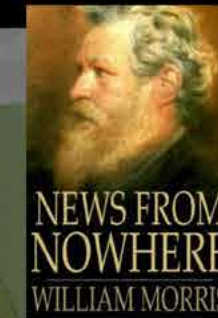
Tao Yuanming: The Peach Blossom Spring 412



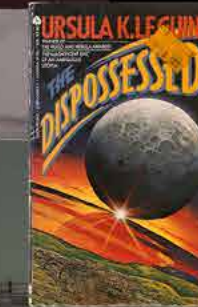
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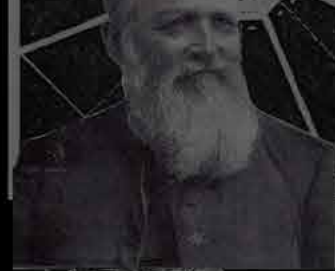
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Ursula Leguin
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UTOPIA
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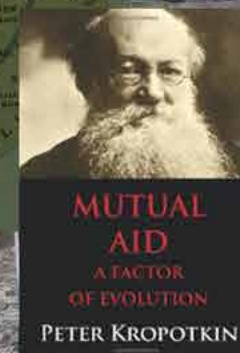
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1856



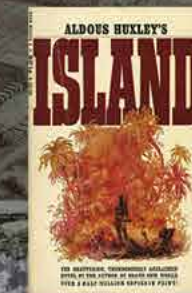
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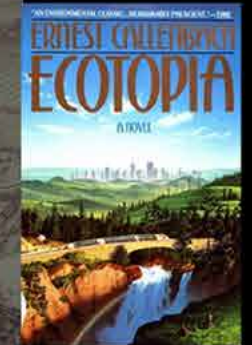
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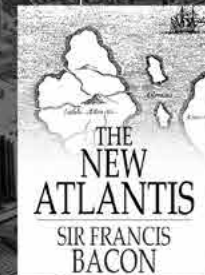
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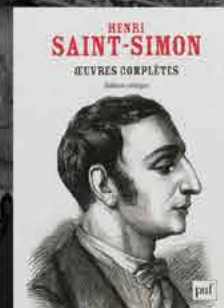
Ernest Callenbach
Ecotopia 1975

Utopia of Sufficiency

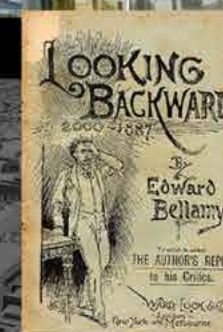
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Sir Francis Bacon: The New Atlantis 1623



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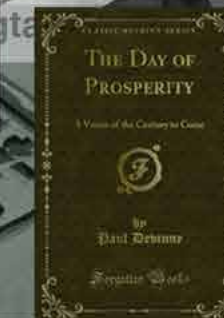


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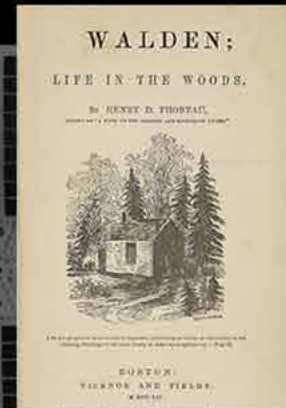
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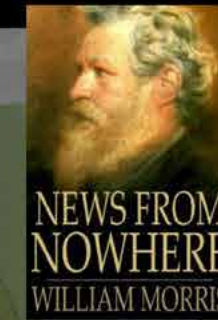
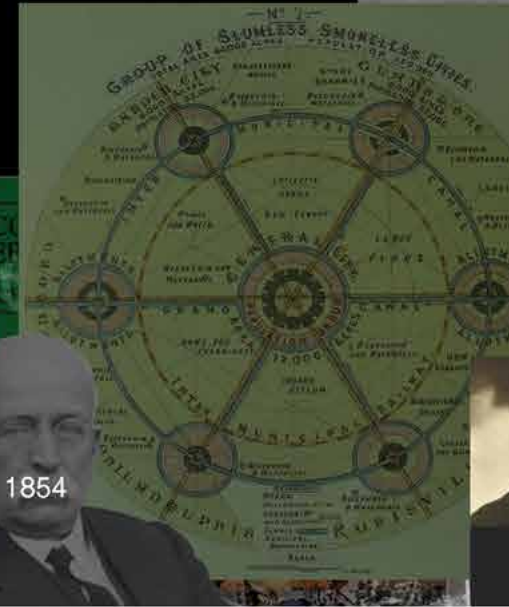
Paul Devine: The Day of Prosperity 1902



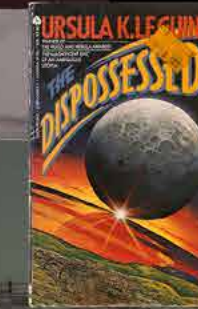
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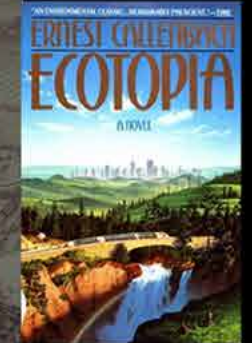
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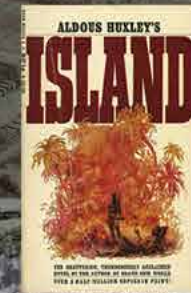
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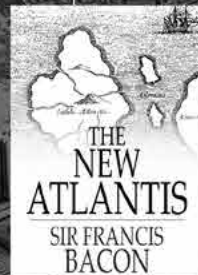


Aldous Huxley: Island 1962

Utopia of Sufficiency can be understood as ecological utopias, where happiness is achieved by limiting needs and the implementation of a relatively austere lifestyle. The quality of life in ecological utopia is to be determined by simplicity, self-restraint, and moderation.

Utopia of Sufficiency

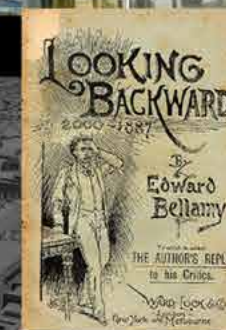
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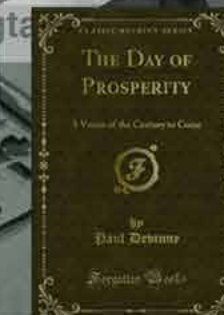
Edward Bellamy: Looking Backward 1854



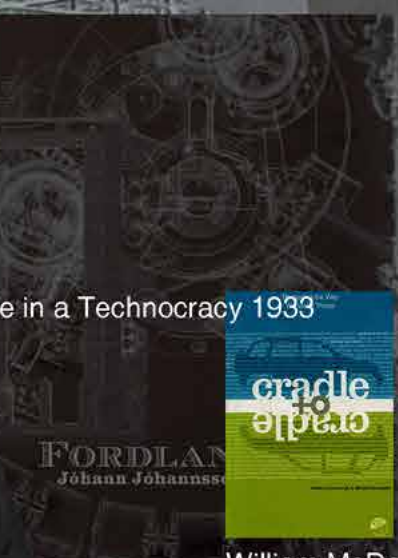
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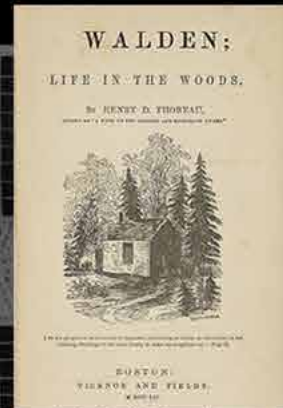
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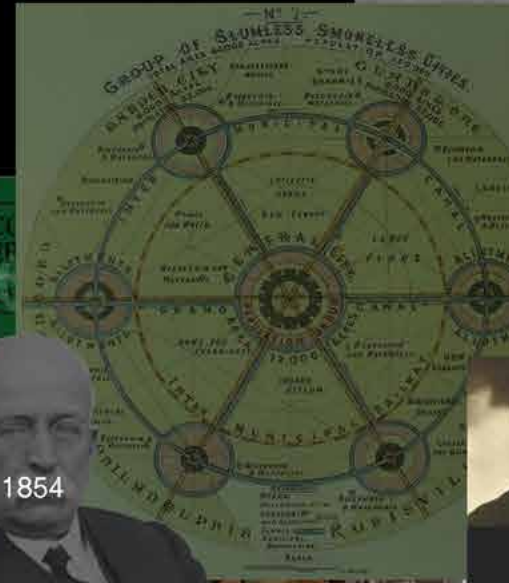
Ville Radieuse - Le Corbusier
1924



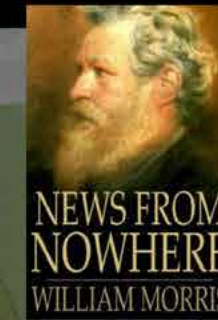
Tao Yuanming: The Peach Blossom Spring 412



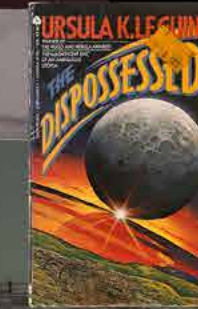
Henry Thoreau: Walden 1854



Garden City - Ebenezer Howard 1902



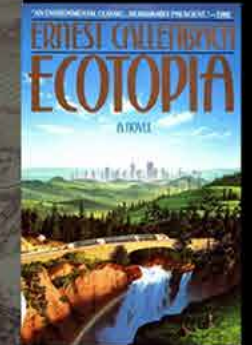
William Morris
News From Nowhere 1891



Ursula Leguin
The Dispossessed 1974



Murray Bookchin
The Ecology of Freedom 1982



Ernest Callenbach
Ecotopia 1975



Aldous Huxley: Island 1962



UTOPIA
Thomas More

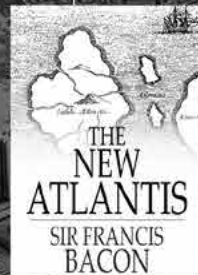
Thomas More: Utopia 1516

Octagon City - Henry Clubb 1856

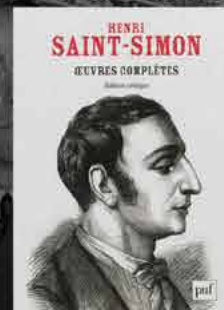
Utopia of Sufficiency

Utopia of Abundance can be understood as technological utopias, where happiness is achieved by satisfying unlimited desires and by an affluent lifestyle. The quality of life in technological utopia is to be determined by a luxury lifestyle and people attempt to dominate the natural environment. Nature is viewed as an instrument to satisfy the incessantly increasing desire of humankind.

Utopia of Abundance



Sir Francis Bacon: The New Atlantis 1623

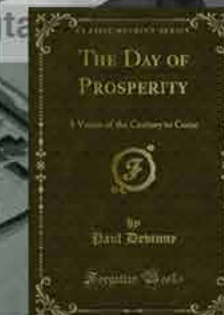


Henri de Saint-Simon: Le Politique 1819



Edward Bellamy: Looking Backward 1854

Harold Loeb: Life in a Technocracy 1933



Paul Devine: The Day of Prosperity 1902

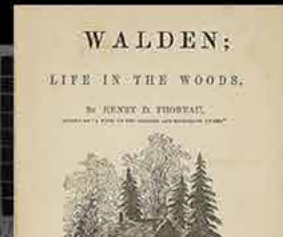


William McDonough
Cradle to Cradle 2002

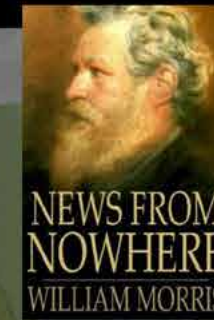
Ville Radieuse - Le Corbusier 1924



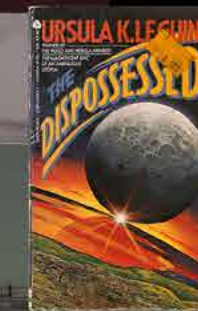
Tao Yuanming: The Peach Blossom Spring 412



This or That?



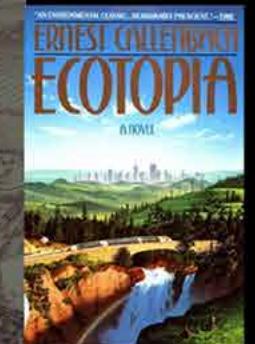
William Morris
News From Nowhere 1891



Ursula Leguin
The Dispossessed 1974



Murray Bookchin
The Ecology of Freedom 1982



Ernest Callenbach
Ecotopia 1975



EVA Lanxmeer Eco-Quatier, The Netherlands



Tianjin Eco-city, China

Edward Bellamy: Looking Backward 1854

Abundance?



Paul Devine: The Day of Prosperity 1902



William McDonough
Cradle to Cradle 2002

Sufficiency?



Henri de Saint-Simon: Le Politique 1819

Octagon City - Henry
1856

Ville Radieuse - Le Corbusier
1924

SIR FRANCIS
BACON

Sir Francis Bacon: The New Atlantis 1623

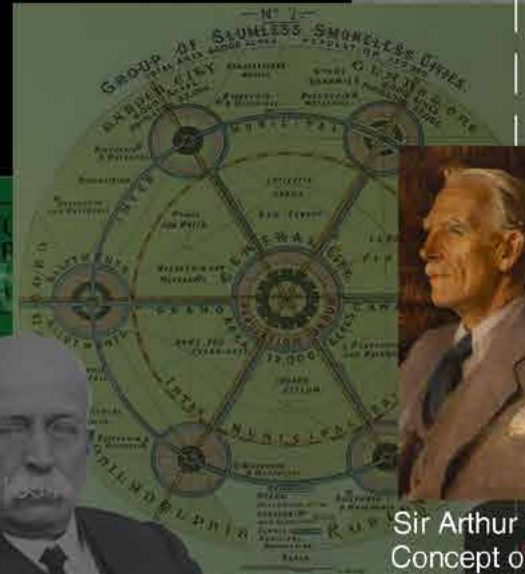
Germania - Albert
1937



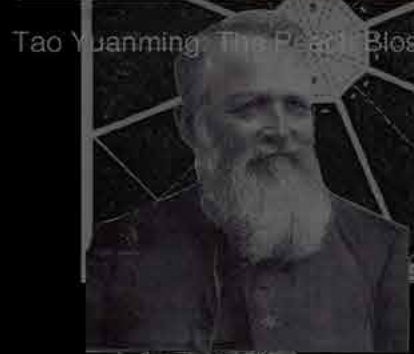
Tao Yuanming: The Peach Blossom Spring 412



Henry Thoreau: Walden 1854



Sir Arthur Tansley (1935)
Concept of 'ecosystem'



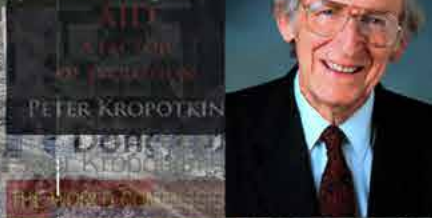
UTOPIA
Thomas More

Octagon City - Henry Clubb
1856

Thomas More: Utopia 1516



Garden City - Ebenezer Howard
1902



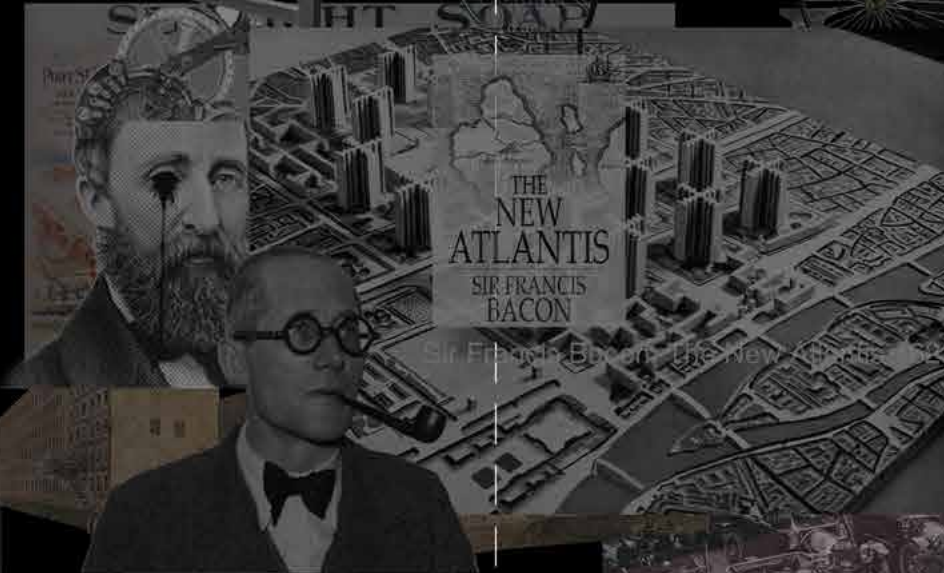
Eugene T. Odum (1953)
<Fundamentals of Ecology>



C.S. Holling (1973)
Shifting steady-state mosaics



Points + Lines



THE NEW ATLANTIS
SIR FRANCIS BACON



Henri de Saint-Simon: Le Système de la Nouvelle Organisation de la Société 1804



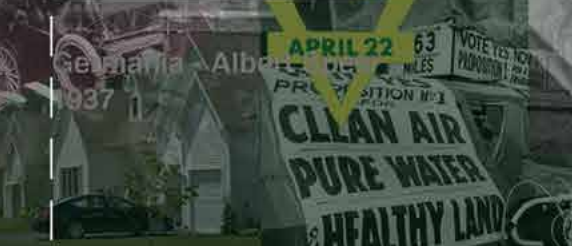
Edward Bellamy: Looking Backward 1884



Richard Forman (1995)
Land Mosaic



Ville Radieuse - Le Corbusier
1924



Germany - Albert Speer
1937



Ian McHarg (1969)
Environmental impact assessment



Paul Devine: The Day of Prosperity 1902



William McDonough & Michael Braungart: Cradle to Cradle 2002

Ecosystem Services as a Tool to Construct an Alternative Future

Ecosystem Services Assessment as a planning framework

Ecosystem services is a concept endorsed by the Convention on Biological Diversity (CBD) and the Millennium Ecosystem Assessment (ME) conceptual framework (ME 2005; UNEP 2015). CBD defines it as "a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way". (UNEP 2015)



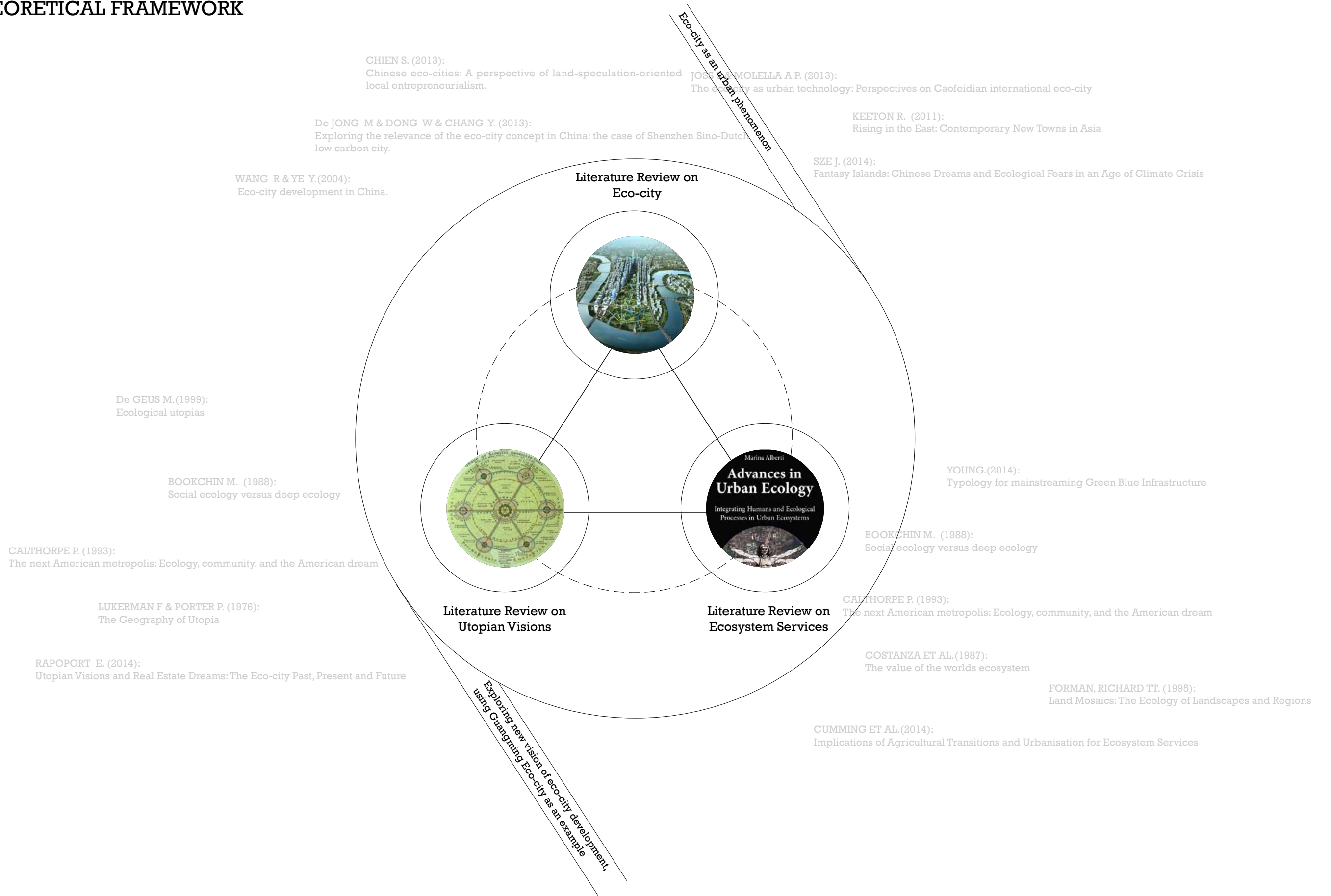
PROVISION SERVICES

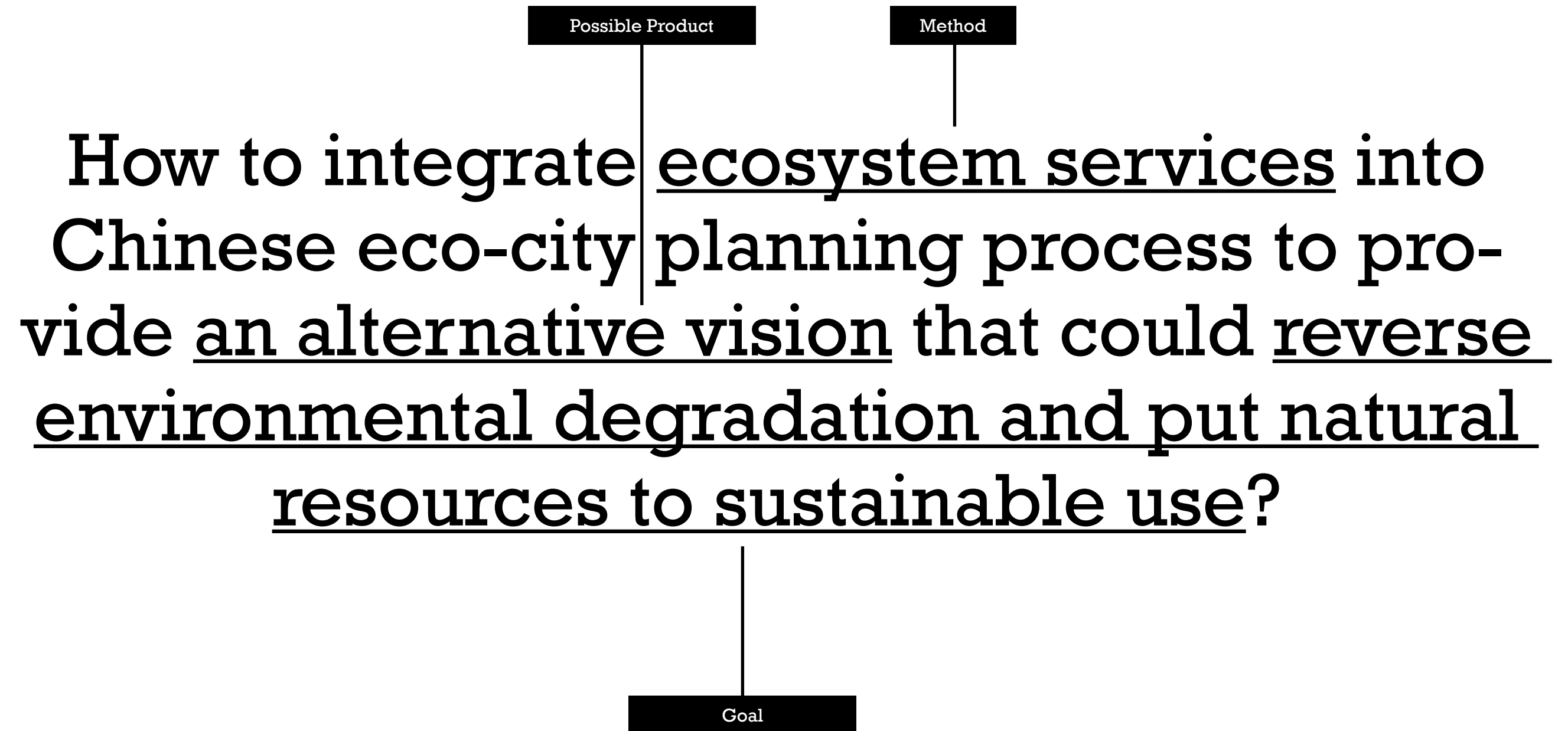
REGULATING SERVICES

CULTURAL SERVICES

SUPPORT SERVICES

_THEORETICAL FRAMEWORK





Earthquakes, hurricanes, cyclones and tsunamis: the world's 10 riskiest cities

NO.3 PEARL RIVER DELTA

This near-unbroken urban conglomeration, including Hong Kong, Shenzhen, Dongguan, Macau and Ghangzhou, is home to more than 42 million people. One of China's economic jewels (estimated GDP: \$690bn) is spread across a flood plain threatened by all manner of natural disasters: it is the number one metropolitan area for storm surge, with 5.3 million people affected, the third-highest for cyclonic wind damage (17.2 million), and the fifth riskiest city for river floods.

*source: <http://www.theguardian.com/cities/gallery/2014/mar/25/earthquakes-hurricanes-cyclones-and-tsunamis-10-riskiest-cities-world>

Dongguan
东莞市

Guangshan
山市

Shenzhen
深圳市

Shenzhen
深圳市

Macau
澳門

Macau
澳門

Hong Kong
香港

Hong Kong
香港

The image is a composite. The top half features a red-tinted aerial map of Shenzhen, showing the city's layout and surrounding water bodies. A person in a dark jacket stands in the foreground, looking up at the map. The bottom half shows a black and white photograph of a cityscape with several tall apartment buildings and industrial smokestacks emitting thick smoke. The person in the foreground is also visible in this lower section, looking up at the city.

Factory of the World

SHENZHEN

The spectacular story of Shenzhen is well-known: lying adjacent to Hong Kong in the Pearl River Delta, the former fishing village became a New Town in 1980 when the central Chinese government gave it the status of Special Economic Zone. Shenzhen soon became a metropolis and a prototype for both economic and urban reform within China. Shenzhen is a city that has been raising eyebrows for years, because of its fast development and exceptional position. However, Shenzhen is also facing huge socio-economic as well as environmental challenges, similar to all major Chinese metropolis.

*source: <http://www.newtowninstitute.org/spip.php?article1048>

Eco-City 1.0
DONGTAN

Eco-City Future ?

Eco-City 2.0
TIANJIN

Eco-City 3.0 ?
GUANGMING

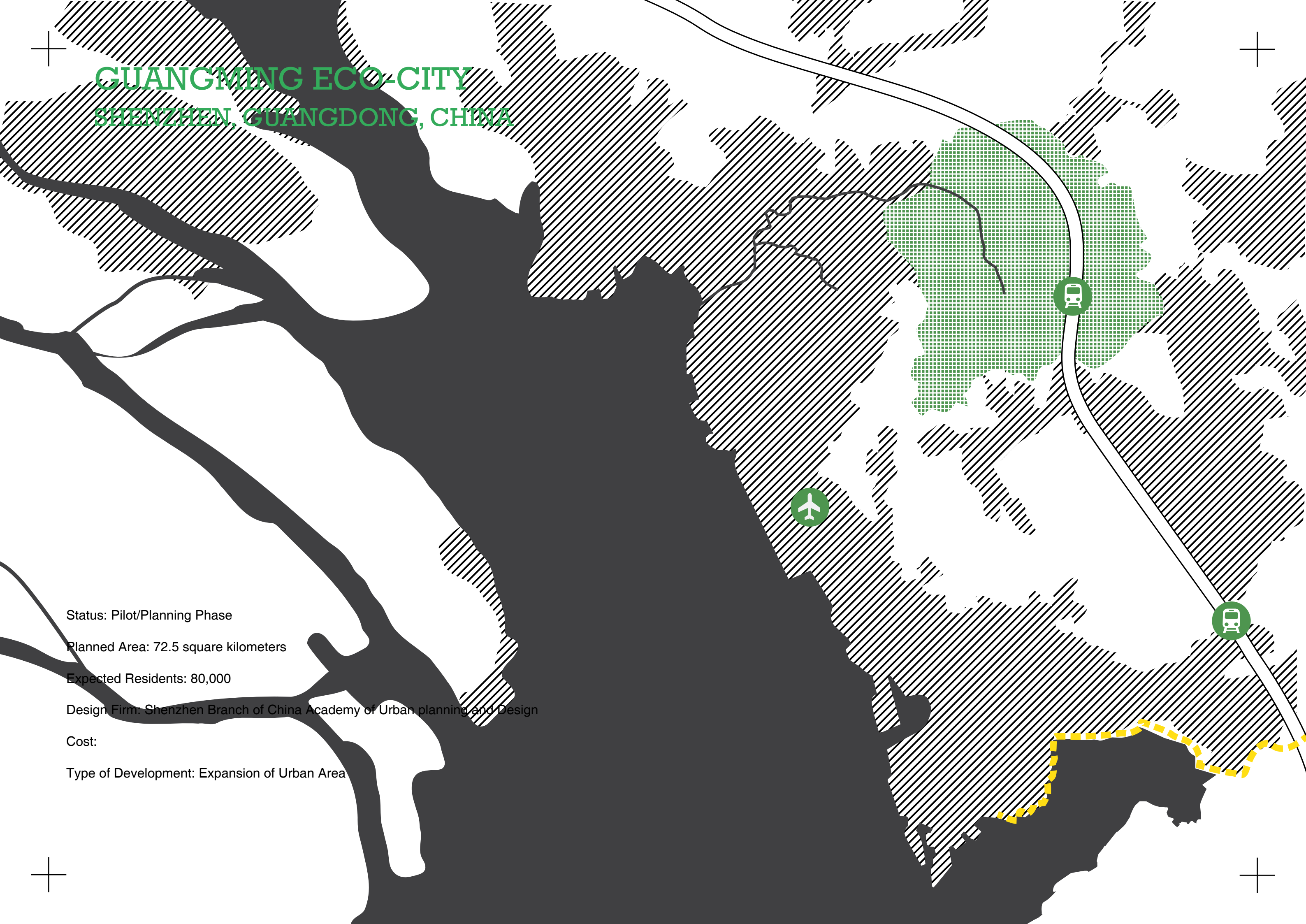
GUANGMING ECO-CITY

"GREEN ECONOMY"
"SPONGE CITY"
"URBAN REGENERATION"
"FROM FACTORY OF THE WORLD TO WORLD CITY"

*source: Guangming Phoenix Planning documents

GUANGMING ECO-CITY

SHENZHEN, GUANGDONG, CHINA



Status: Pilot/Planning Phase

Planned Area: 72.5 square kilometers

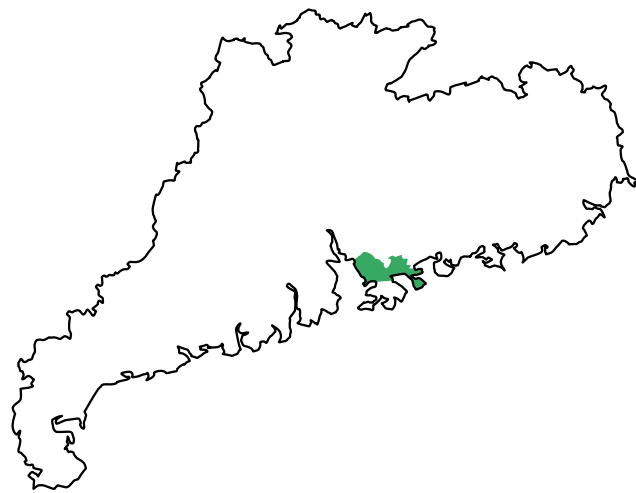
Expected Residents: 80,000

Design Firm: Shenzhen Branch of China Academy of Urban planning and Design

Cost:

Type of Development: Expansion of Urban Area

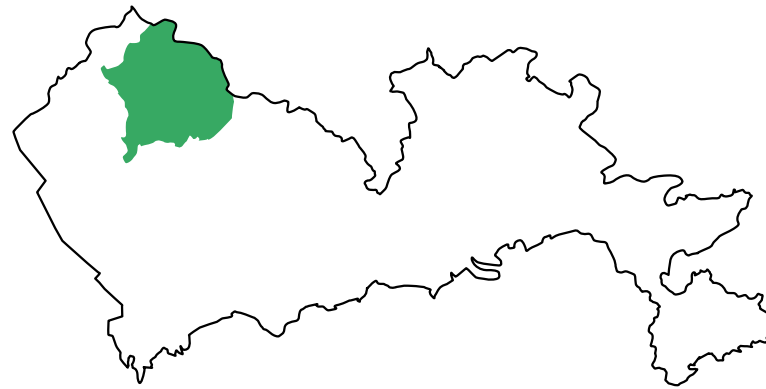
_LOCATION & SCALE



Macro_Pearl River Delta

Administrative: Guangdong province

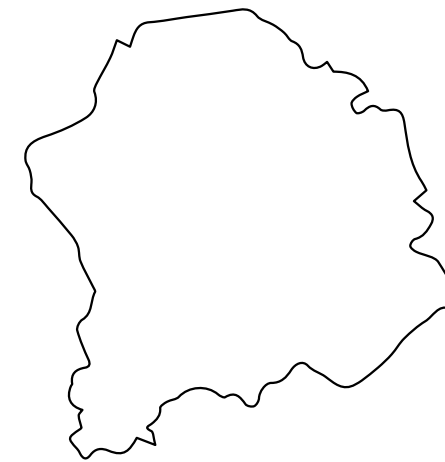
Area: 39,380 km²
Population: 63.7m~120m



Meso_Shenzhen

Administrative: Sub-provincial city

Area: 2,050 km²
Population: 10.6m



Micro_Guangming New Town

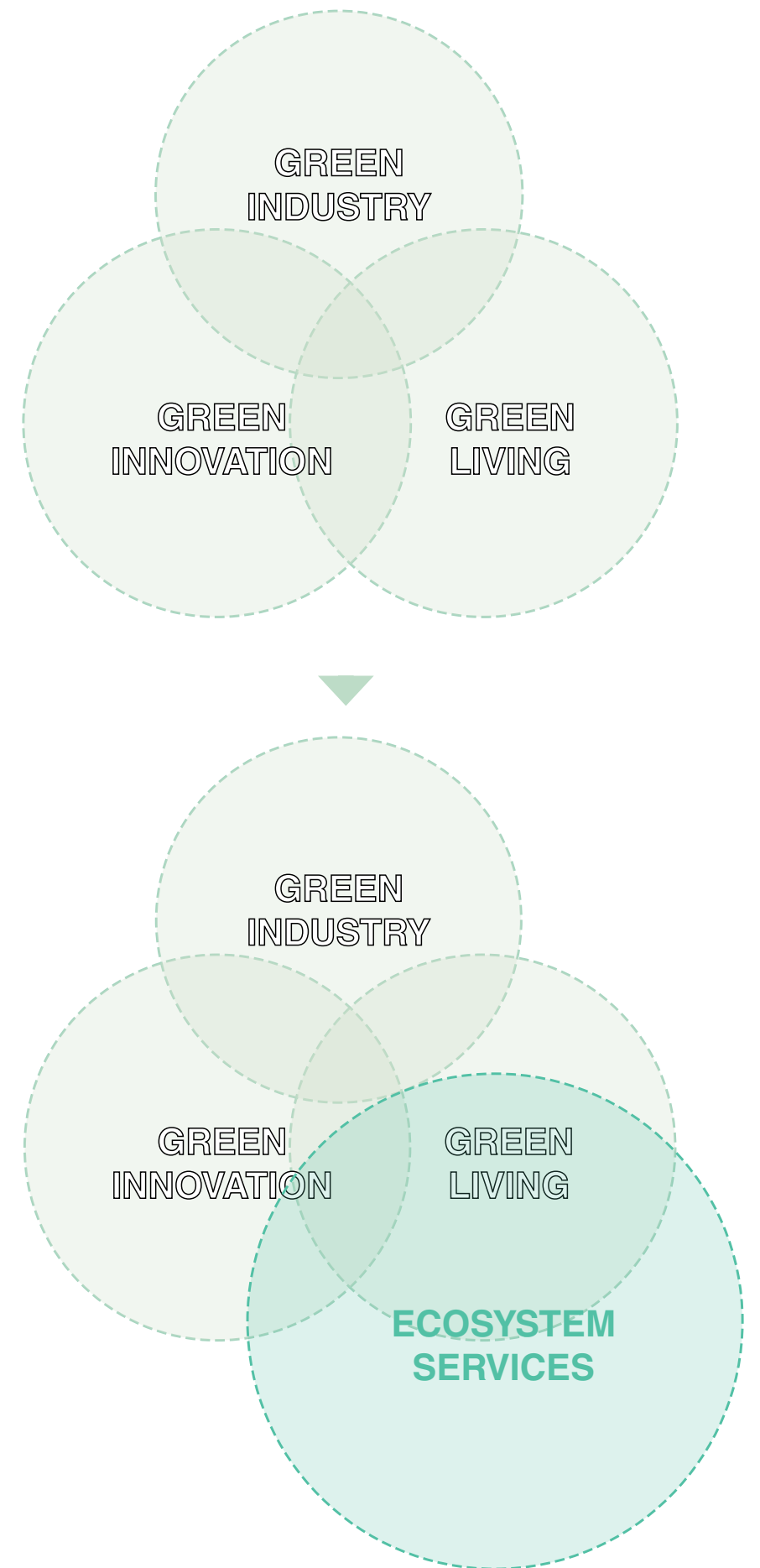
Administrative: Joint Guangming and
Gongming sub-district

Area: 72.3 km²
(for urban development)
Population: 800,000

How can ecosystem services
assist construction of the vision?



* Vision illustration of Guangming Eco-city by
Shenzhen institute of urban planning and design

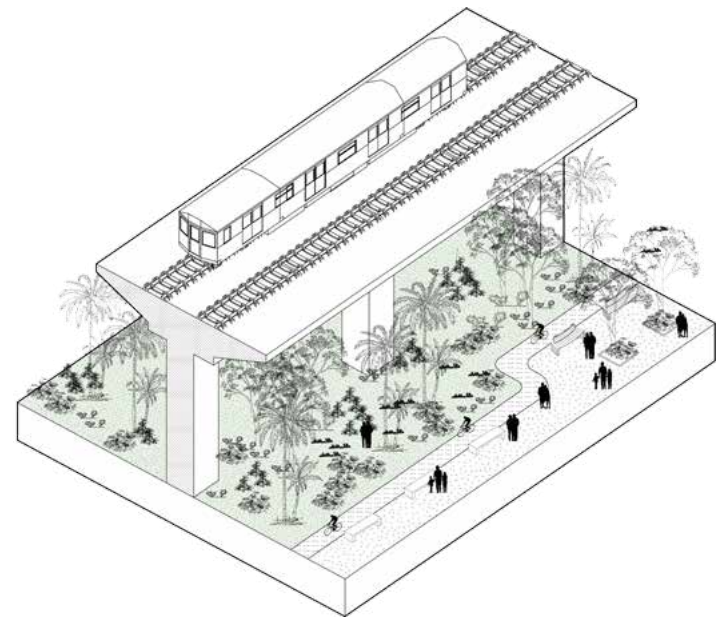
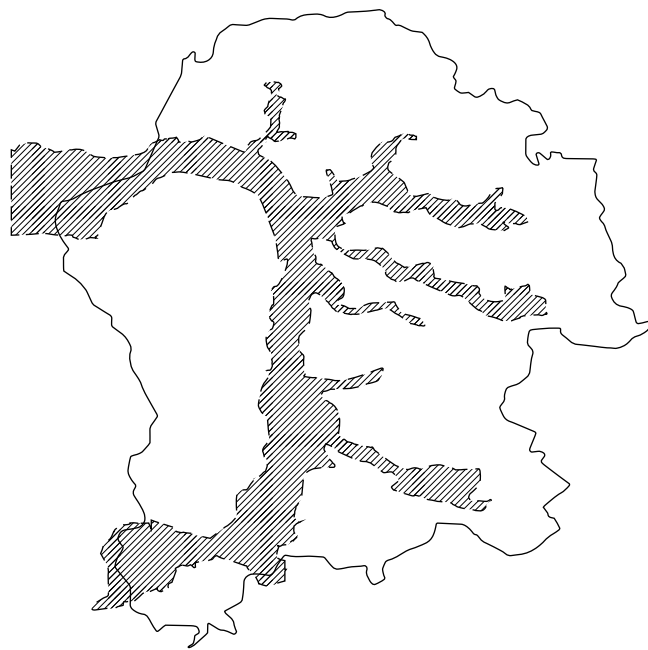
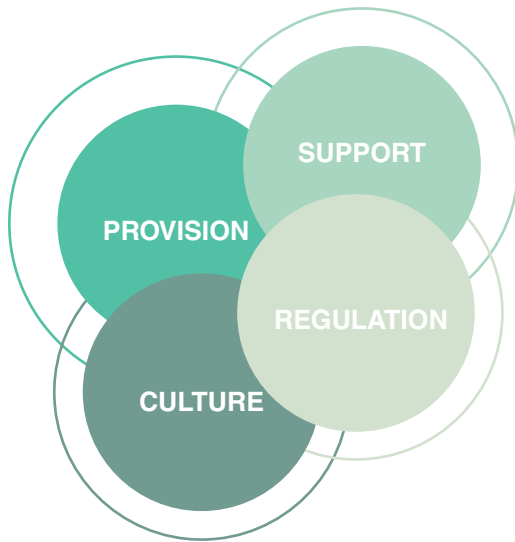




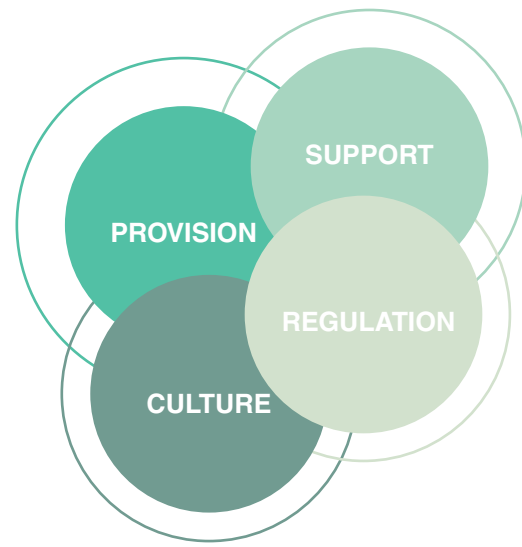
Diagnosis

Synthesis

Principles



_Diagnosis



Ecosystem Services

provision

- food
- fresh water
- fuel
- fiber

regulation

- purification
- climate
- pollination
- water

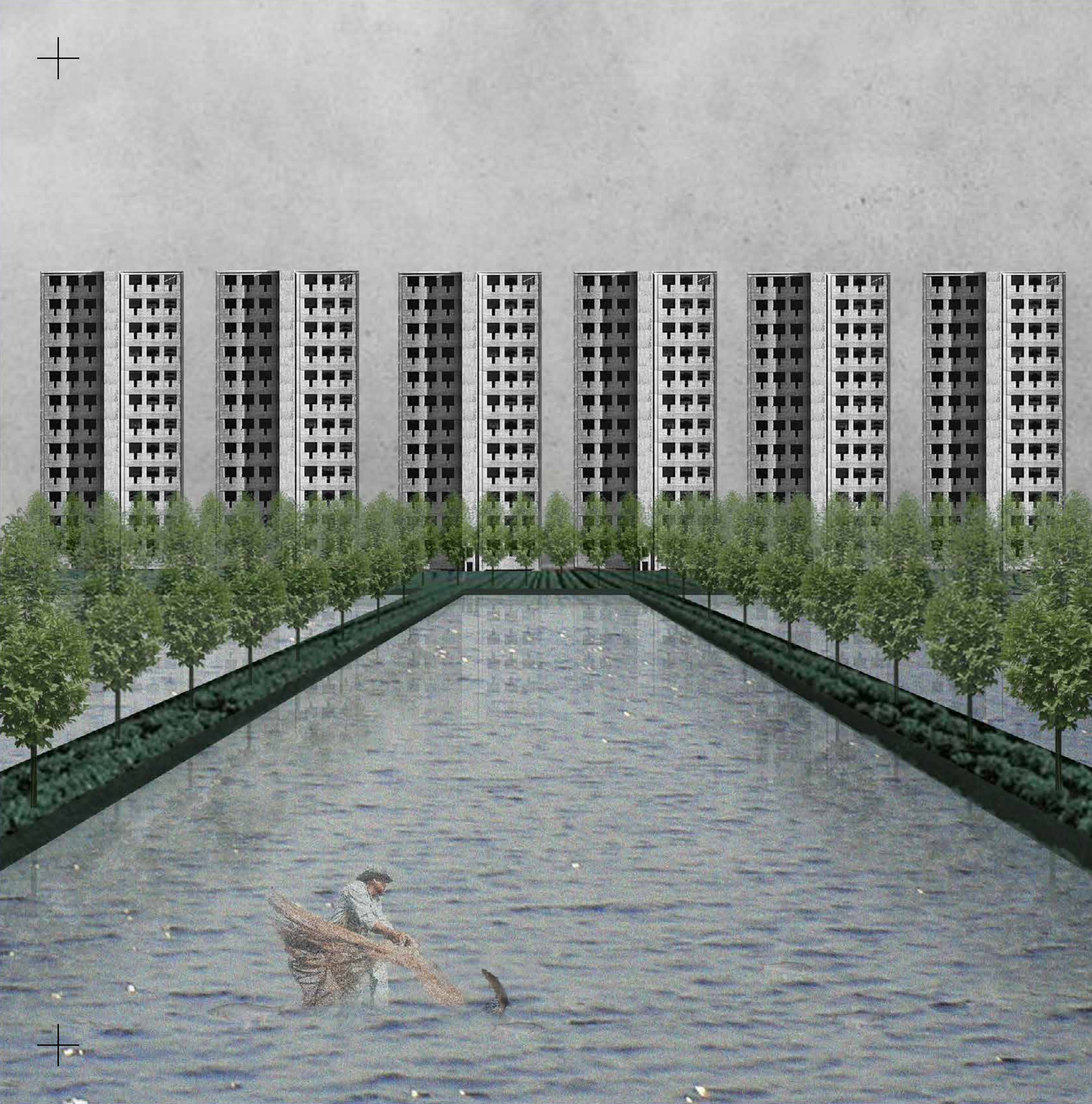
support

- nutrient cycling
- habitat
- soil formation

culture

- recreation & education
- spiritual & religious
- aesthetics
- cultural heritage





A

PROVISION

WHAT IF WE COULD RE-INTRODUCE PRODUCTIVE
LANDSCAPE INTO URBAN ENVIRONMENT?

provision services

food -

fiber -

freshwater -

floodplein -

The Mulberry Dike-Fish Pond Complex

A

PROVISION

WHAT IF WE COULD RE-INTRODUCE PRODUCTIVE
LANDSCAPE INTO URBAN ENVIRONMENT?

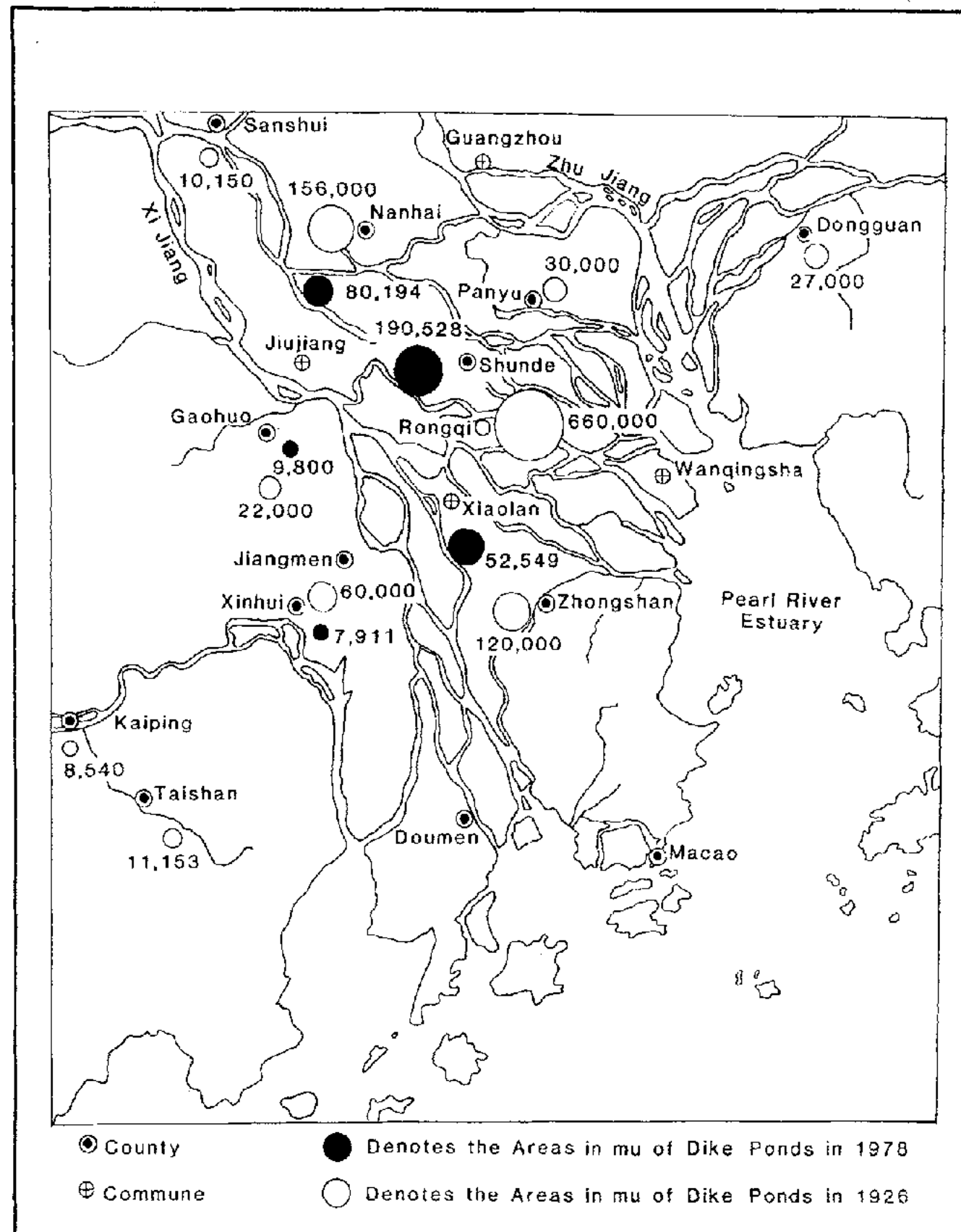
provision services

food -

fiber -

freshwater -

floodplain -





A

PROVISION

WHAT IF WE COULD RE-INTRODUCE PRODUCTIVE
LANDSCAPE INTO URBAN ENVIRONMENT?

provision services

food -

fiber -

freshwater -

floodplain -

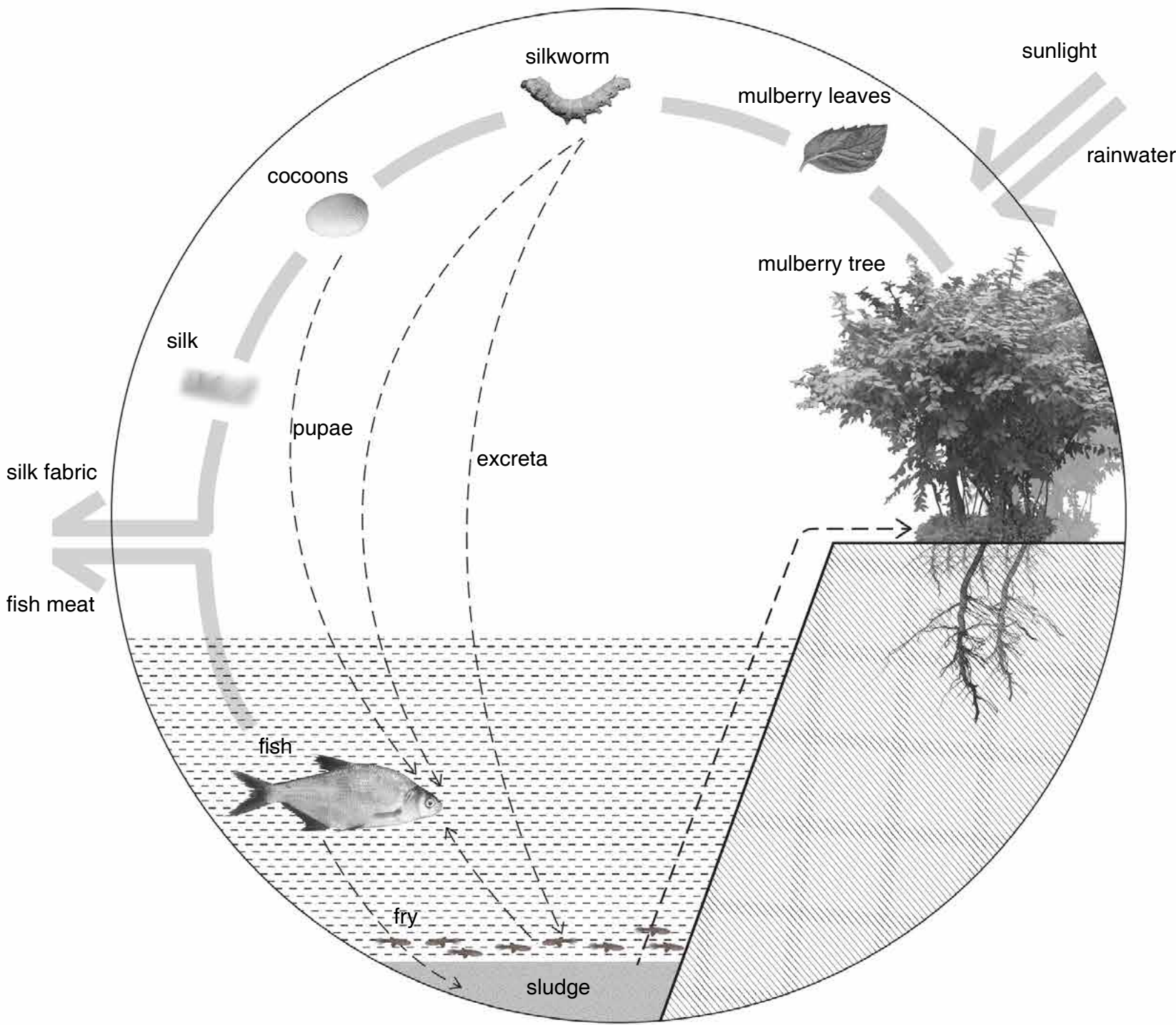




A

PROVISION

WHAT IF WE COULD RE-INTRODUCE PRODUCTIVE
LANDSCAPE INTO URBAN ENVIRONMENT?



provision services

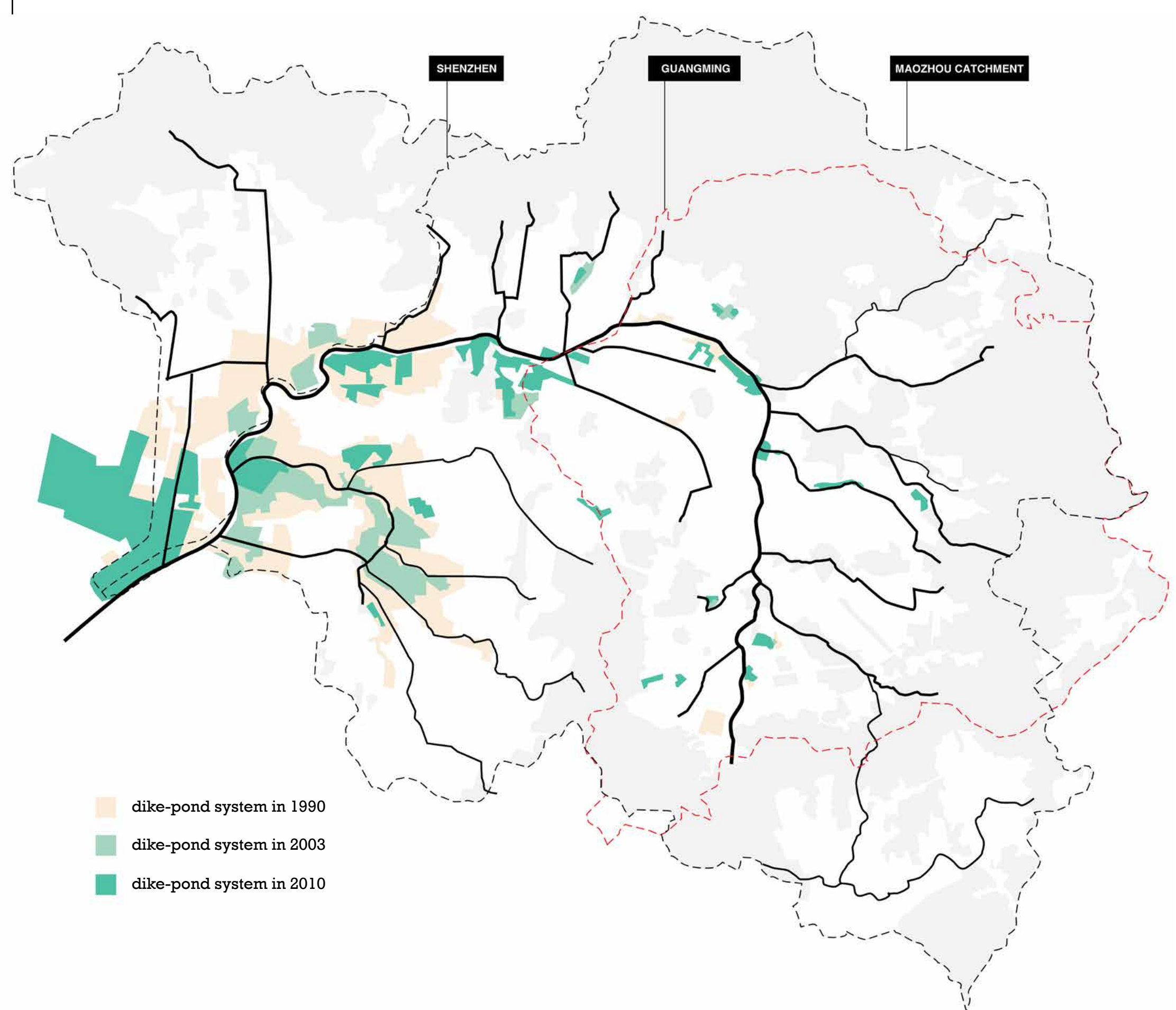
food -

fiber -

freshwater -

floodplain -





- diike-pond system in 1990
- diike-pond system in 2003
- diike-pond system in 2010

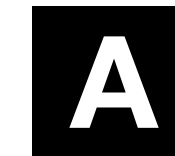
A

PROVISION

WHAT IF WE COULD RE-INTRODUCE PRODUCTIVE LANDSCAPE INTO URBAN ENVIRONMENT?

- provision services
 - food -
 - fiber -
 - freshwater -
 - floodplein -





PROVISION

WHAT IF WE COULD RE-INTRODUCE PRODUCTIVE
LANDSCAPE INTO URBAN ENVIRONMENT?

provision services

food -

fiber -

freshwater -

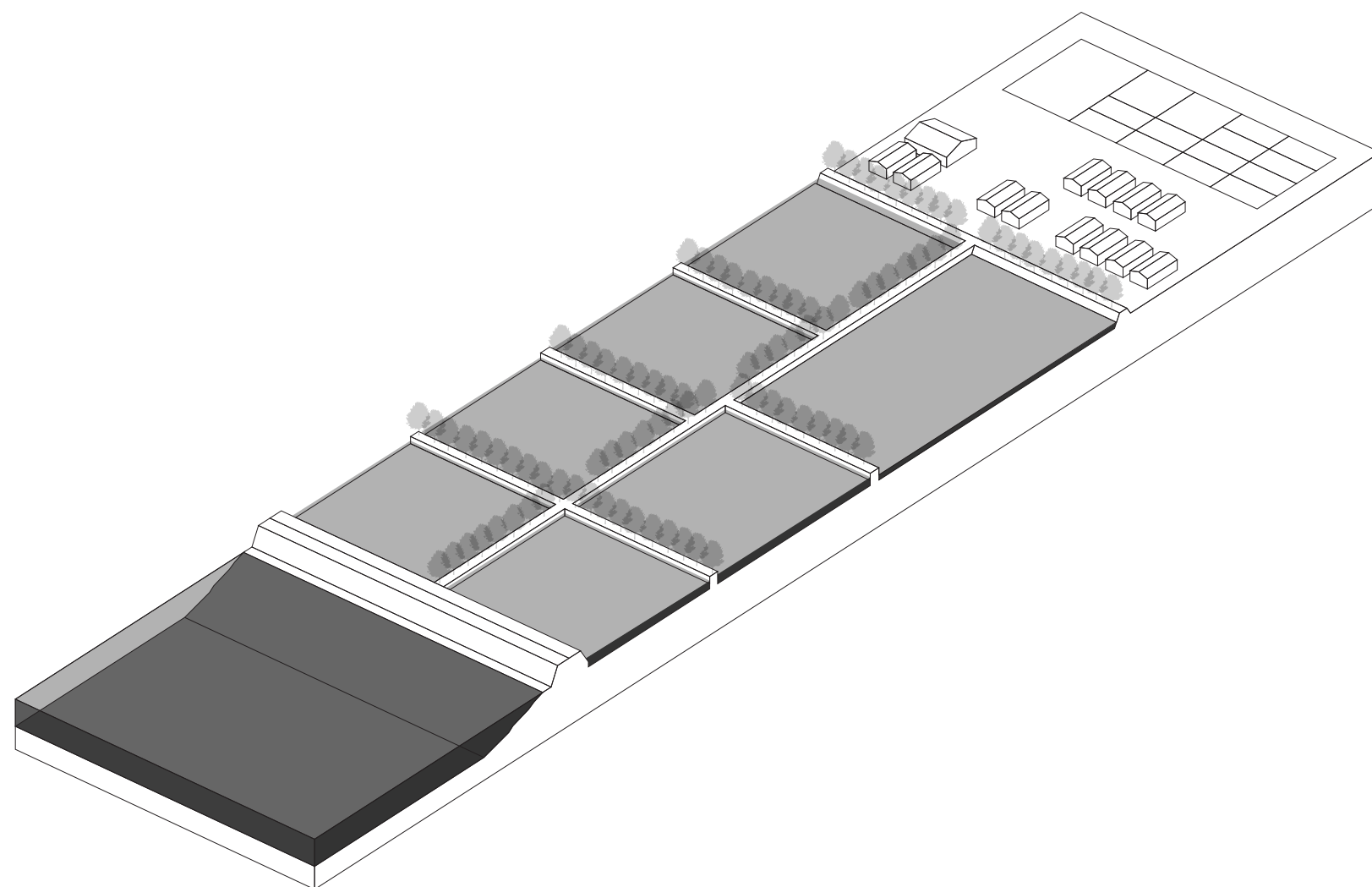
floodplain -



Day to day rainfall

Exceedance rainfall

Extreme rainfall





B

REGULATION

WHAT IF WE COULD RECLAIM URBAN OPEN SPACE
TO REGULATE STORMWATER AND PROVIDE A
MULTIFUNCTIONAL URBAN NATURE?

regulating services

stormwater management -

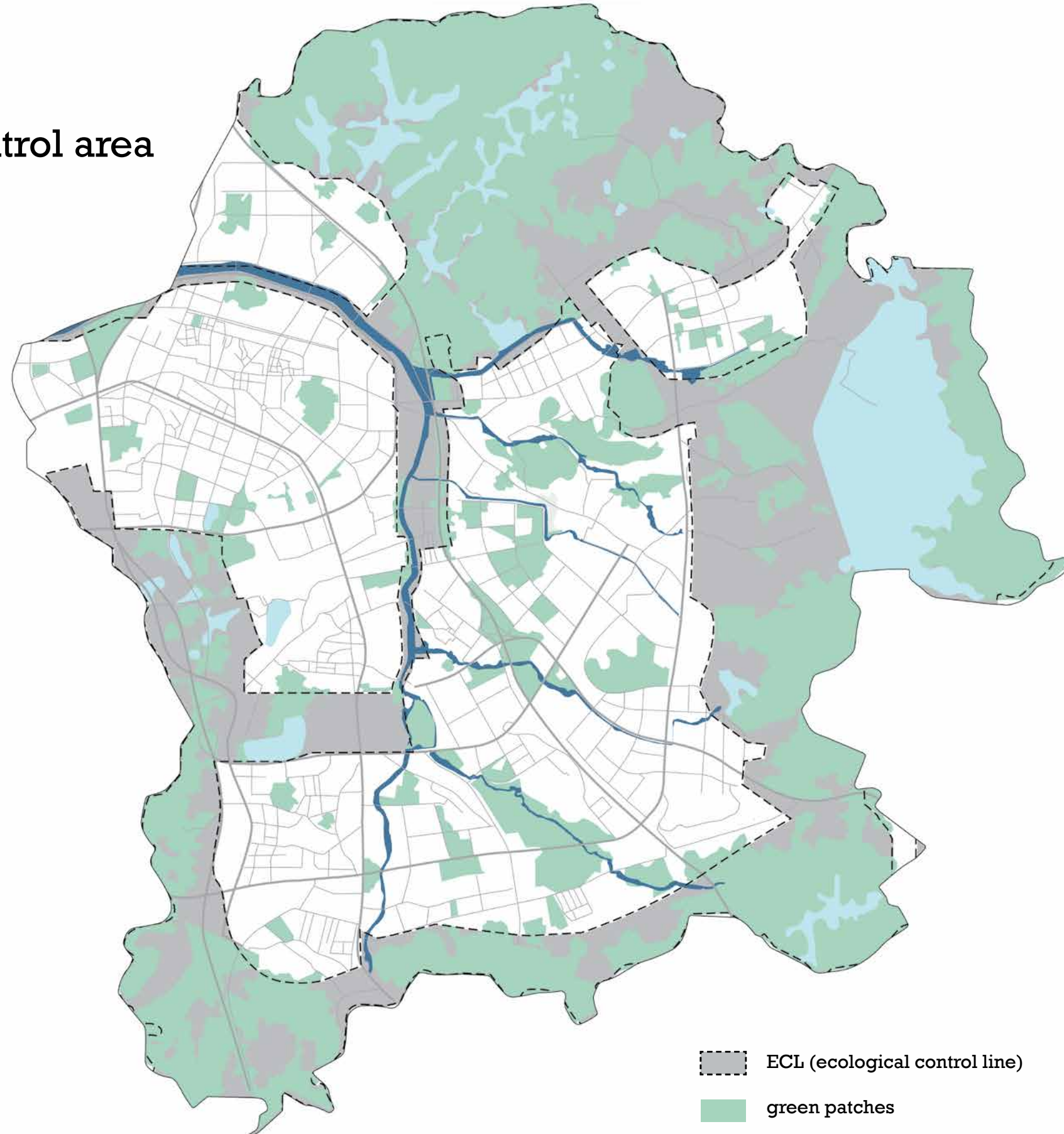
ground water recharge -

air quality -

flood risk -

temperature -

83.8 km² of ecological control area

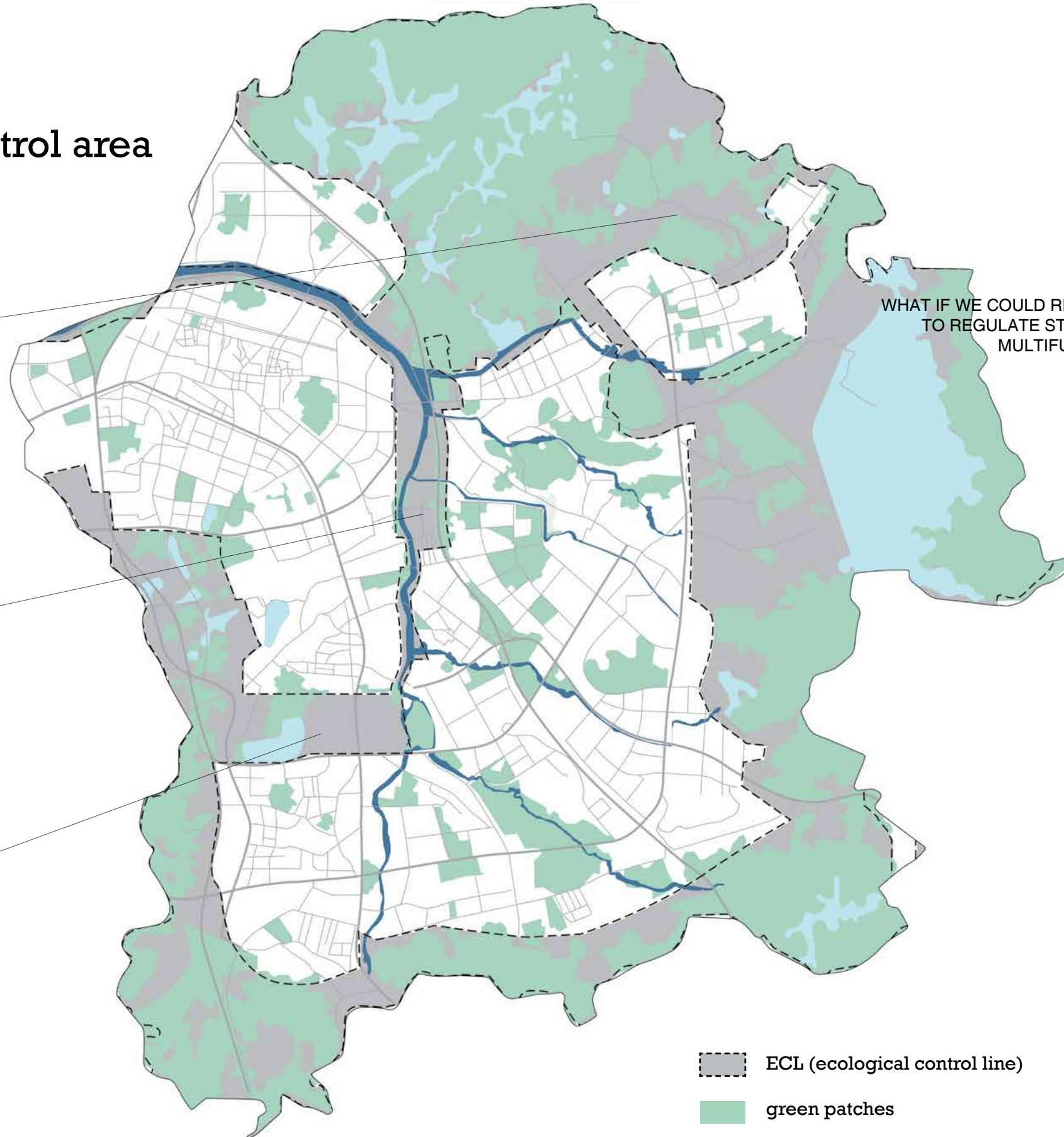


B

REGULATION

regulating services
stormwater management -
ground water recharge -
air quality -
flood risk -
tempreature -

83.8 km² of ecological control area



--- ECL (ecological control line)
■ green patches

B

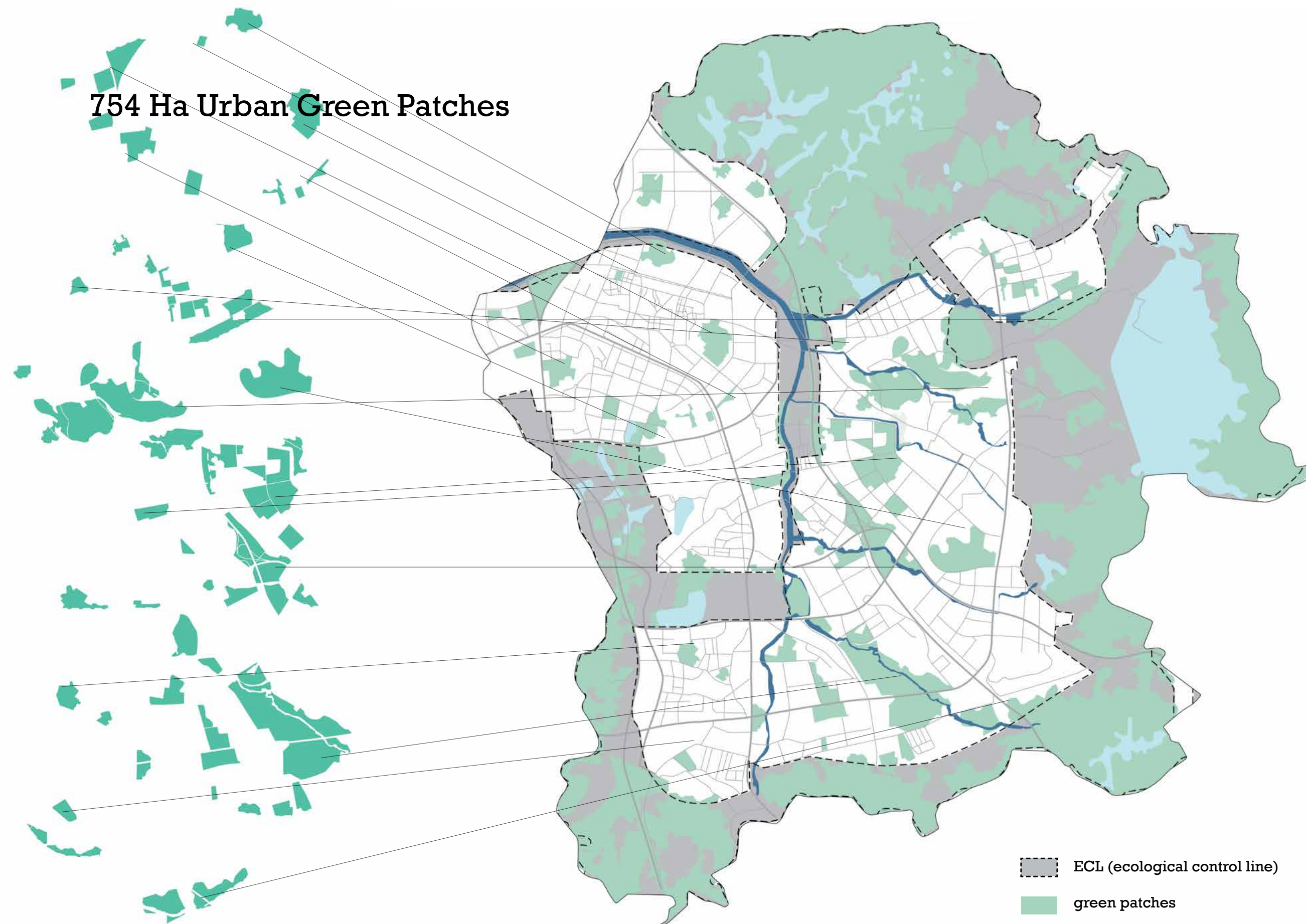
REGULATION

WHAT IF WE COULD RECLAIM URBAN OPEN SPACE
TO REGULATE STORMWATER AND PROVIDE A
MULTIFUNCTIONAL URBAN NATURE?

regulating services
stormwater management -
ground water recharge -
air quality -
flood risk -
temperature -



754 Ha Urban Green Patches



B

REGULATION

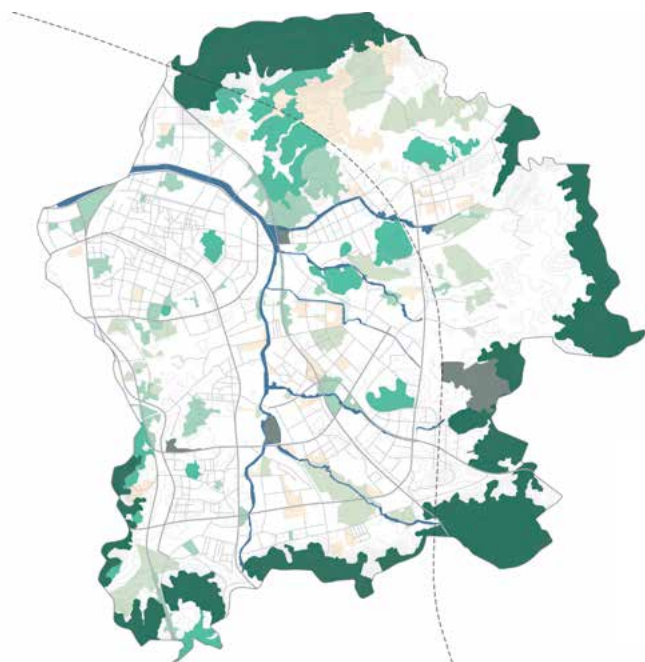
- regulating services
- stormwater management -
- ground water recharge -
- air quality -
- flood risk -
- tempreature -

 ECL (ecological control line)

 green patches



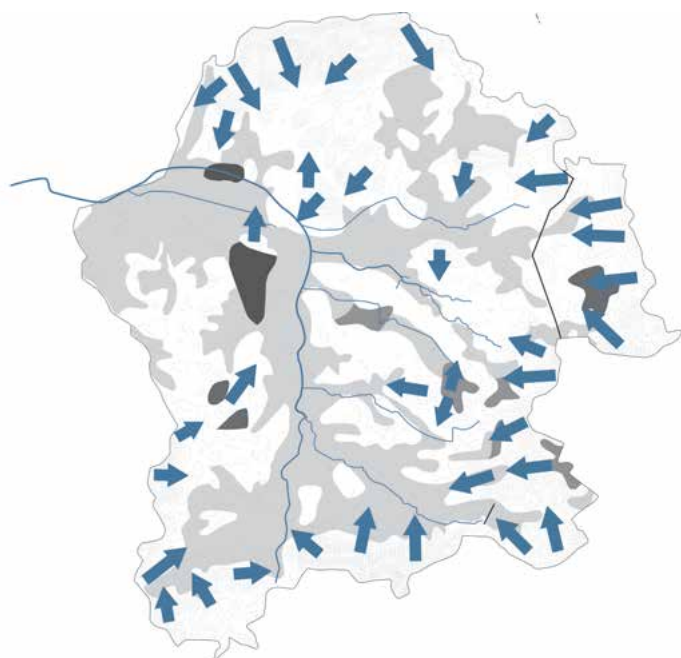
Landcover classification



Natural & Artificial hydrology



Waterflow & Soil types



B

REGULATION

regulating services

stormwater management -

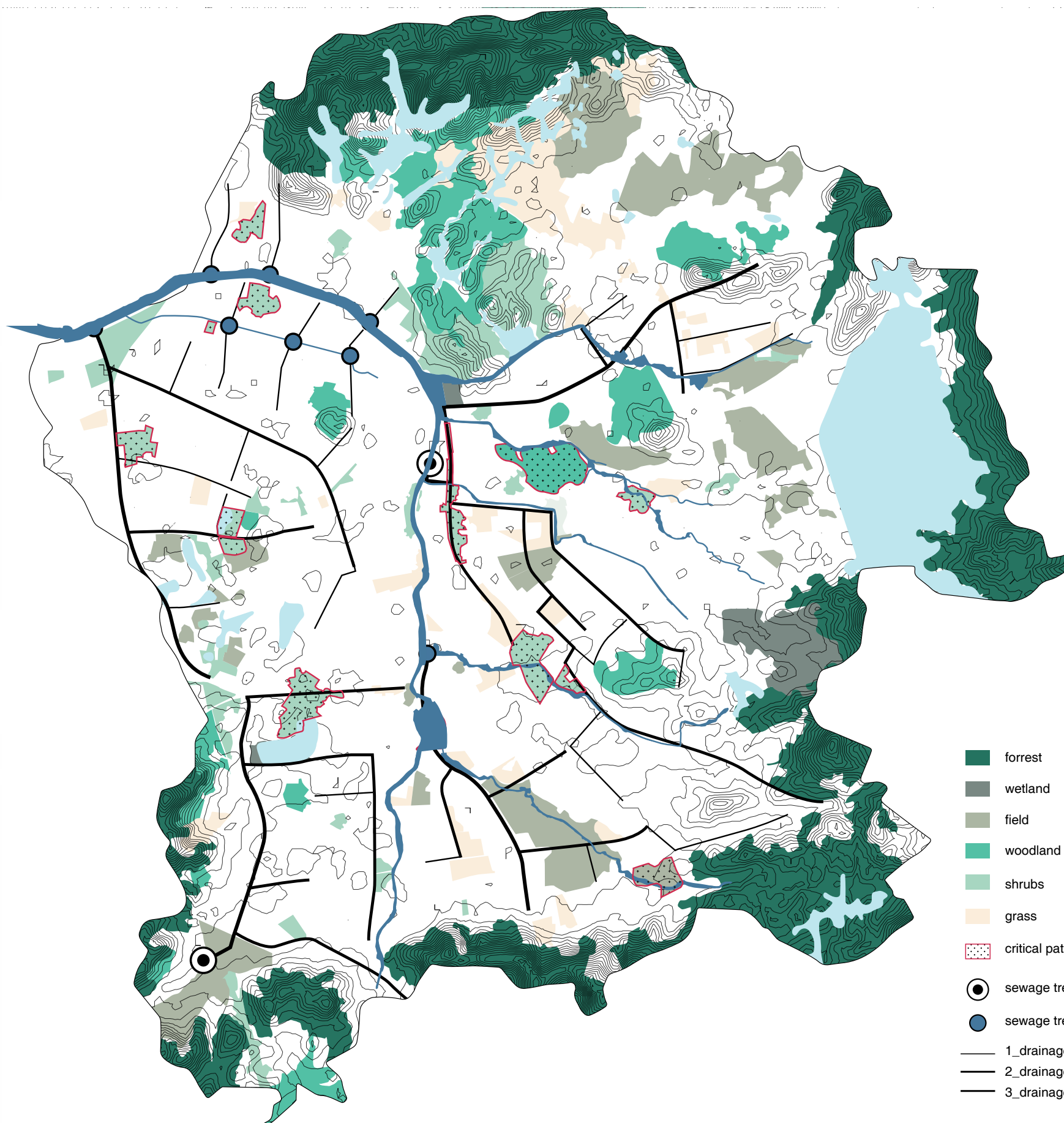
ground water recharge -

air quality -

flood risk -

tempreature -

- forrest
- wetland
- field
- woodland
- shrubs
- grass
- critical patches
- sewage treatment plant
- sewage treatment plant
- 1_drainage infrastructure
- 2_drainage infrastructure
- 3_drainage infrastructure



REGULATION

regulating services

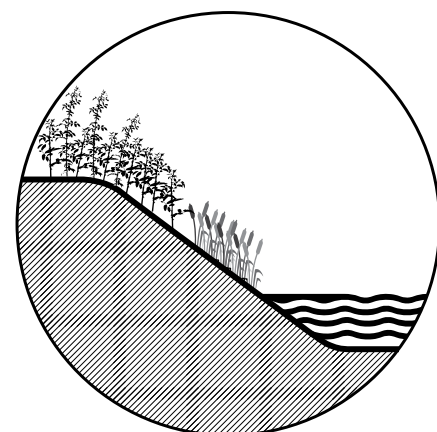
stormwater management -

ground water recharge -

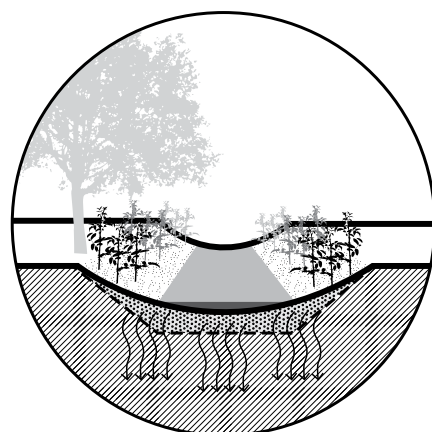
air quality -

flood risk -

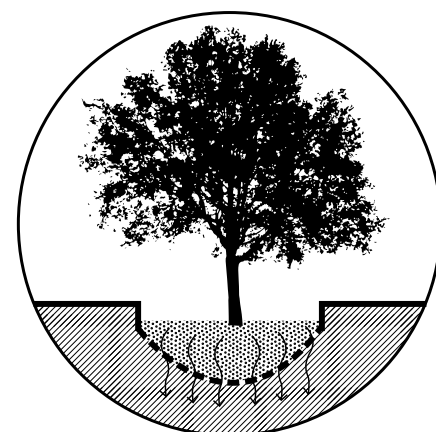
temperature -



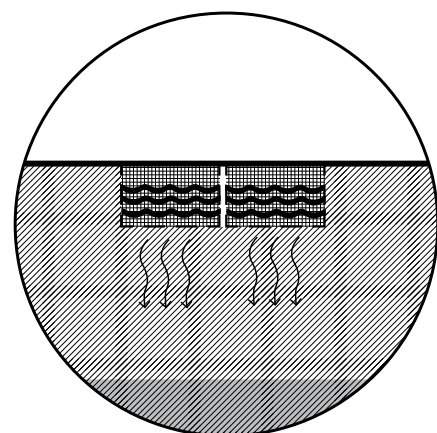
green shores (open water)



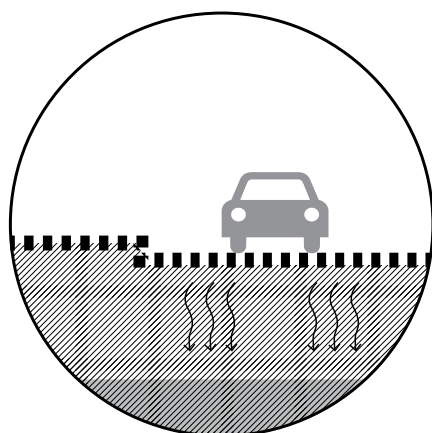
bioswale



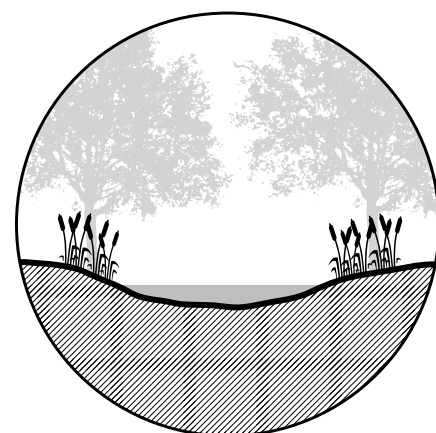
tree pit bio-retention



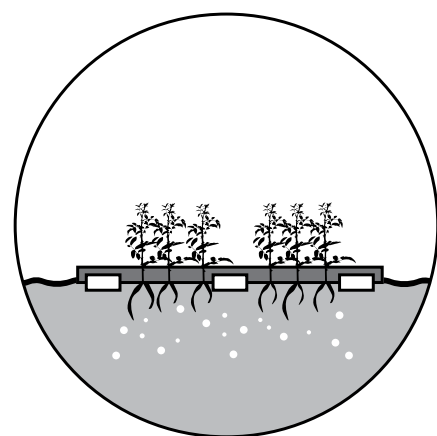
infiltration boxes



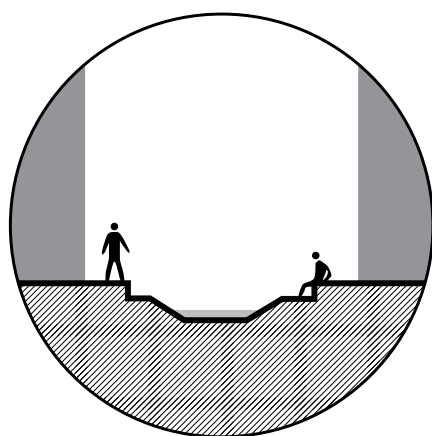
porous pavement



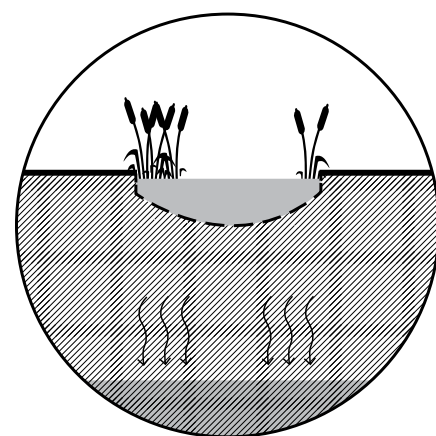
constructed wetland



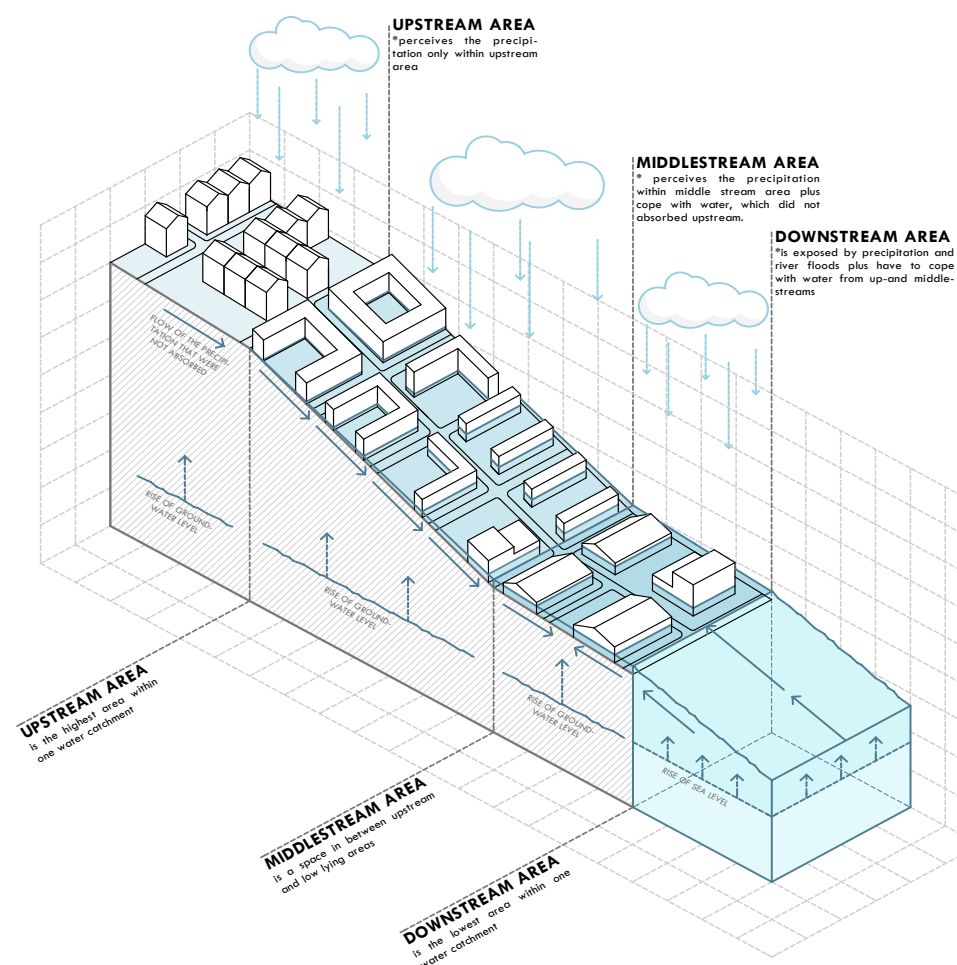
floating puri-plants



water square



bioretention pond



* Drawing by Ekaterina Andrusenko based on scheme of Taneha Bacchin



C

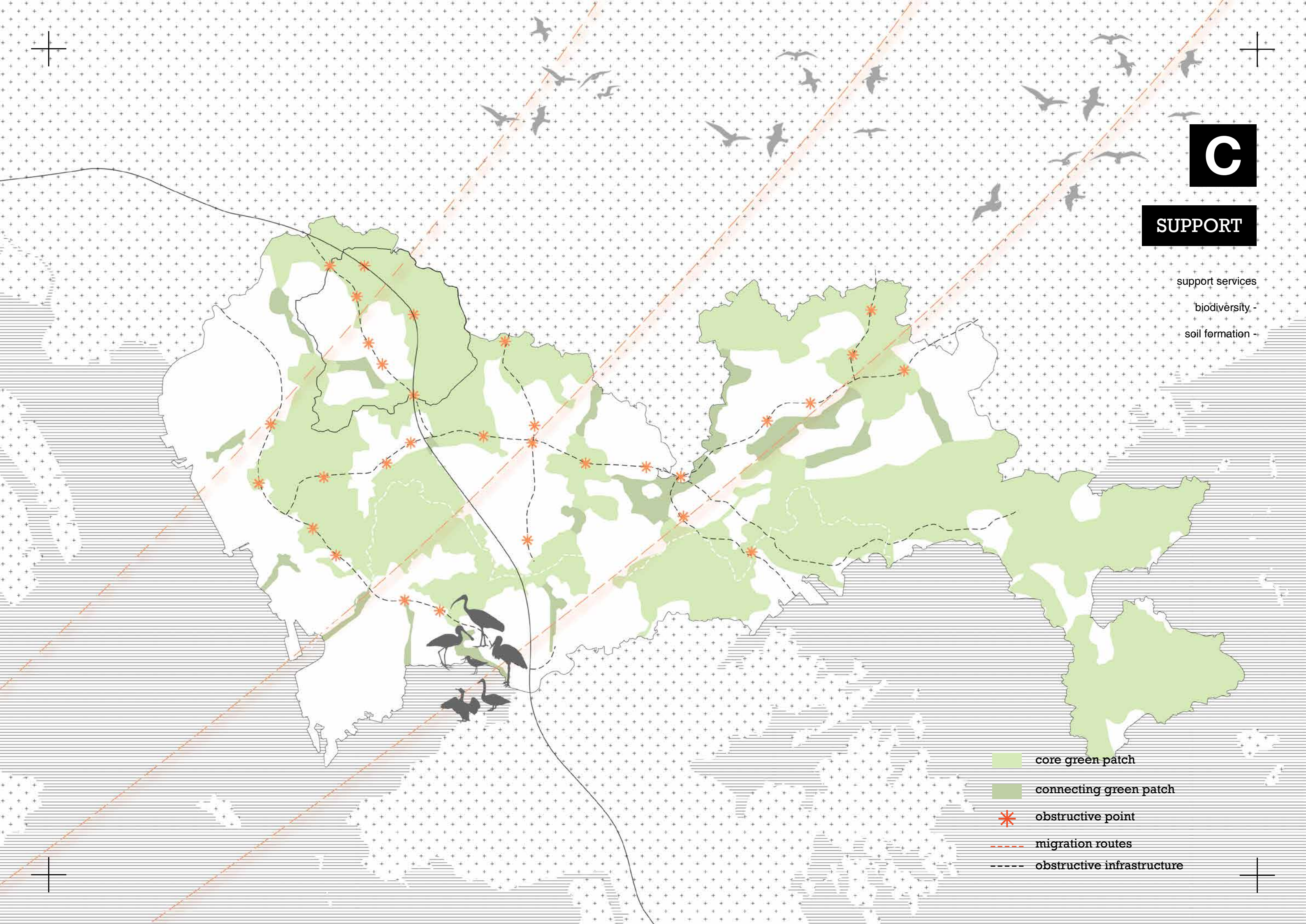
SUPPORT

WHAT IF WE COULD RESTORE ECOLOGICAL CORRIDOR
TO PROVIDE HABITAT FOR FLORA AND FAUNA?

support services

biodiversity -

soil formation -



C

SUPPORT

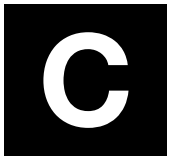
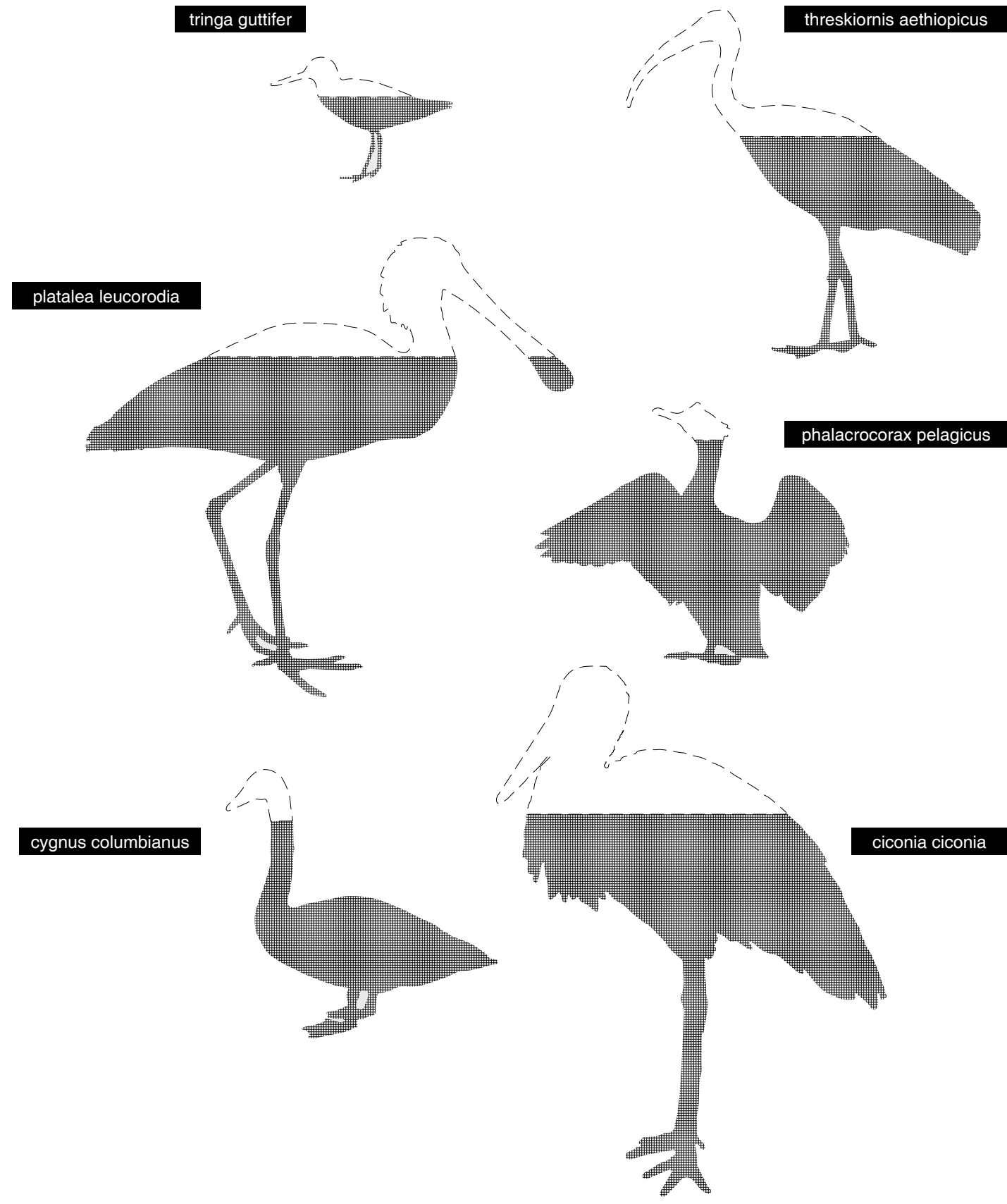
support services

biodiversity -

soil formation -

- core green patch
- connecting green patch
- obstructive point
- migration routes
- obstructive infrastructure

Decreasing bird species in Shenzhen



SUPPORT

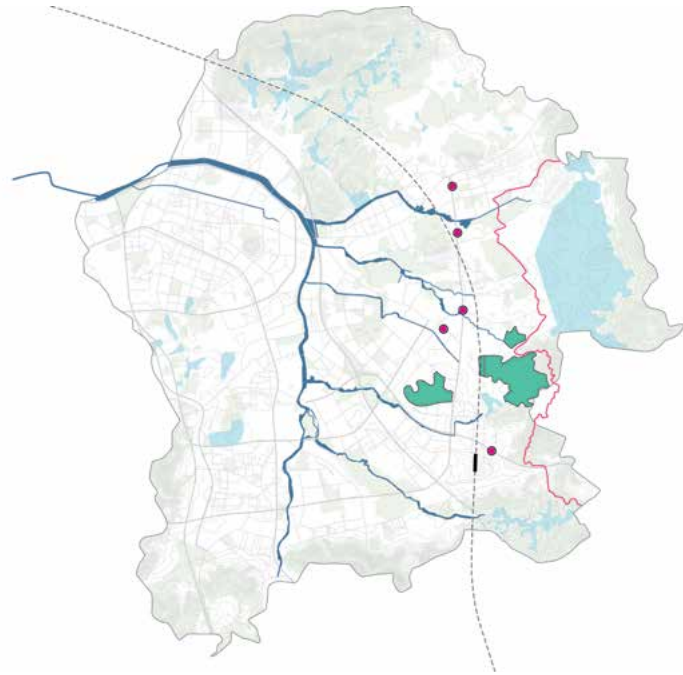
support services

biodiversity -

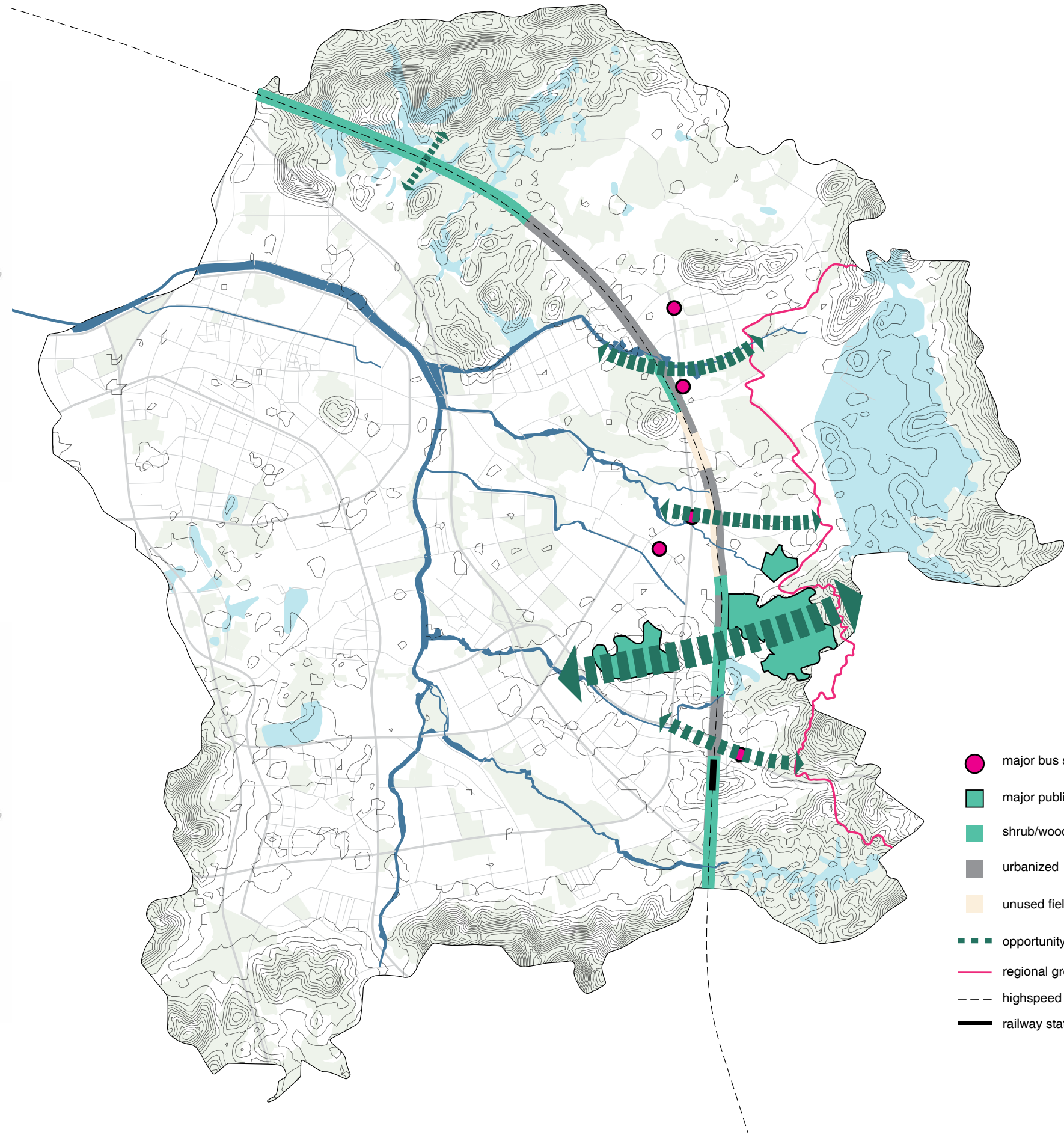
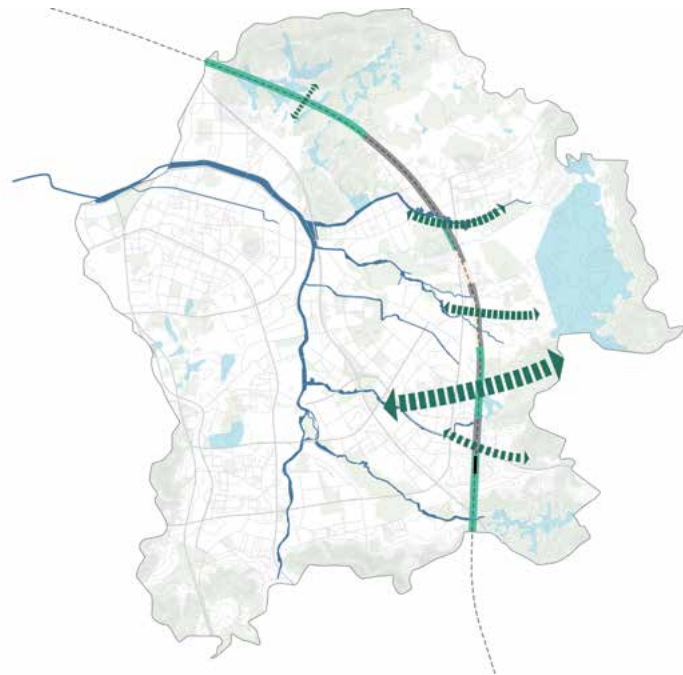
soil formation -



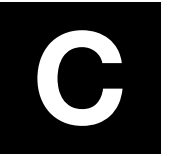
Regional green path and public facilities



Creating connecting corridors



- major bus stops
- major public open space
- shrub/woodland/forrest
- urbanized
- unused field
- opportunity for ecological connection
- regional green pathway
- highspeed railway
- railway station



SUPPORT

support services

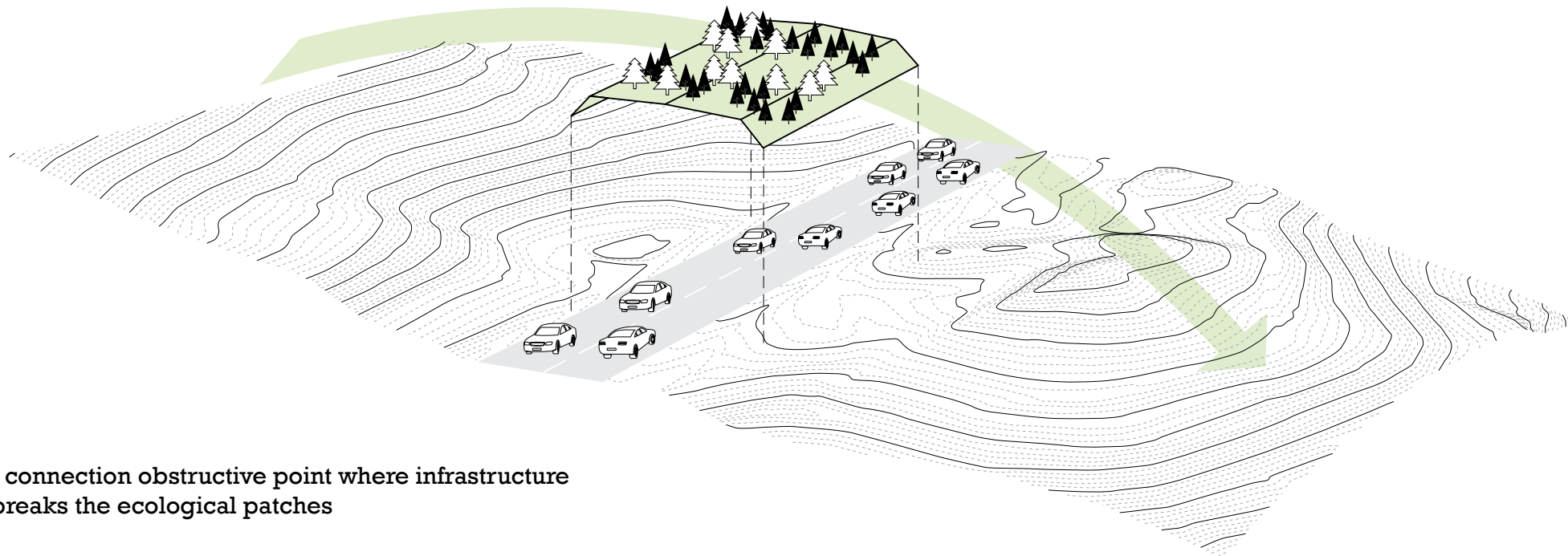
biodiversity -

soil formation -



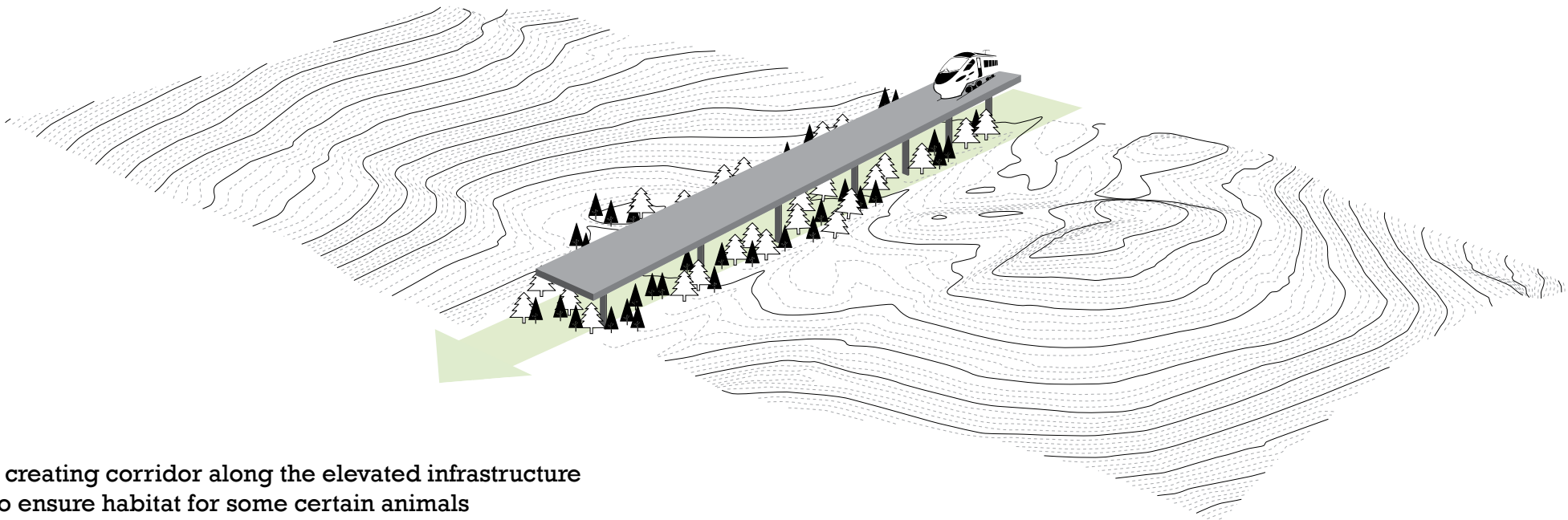


Ecological connection

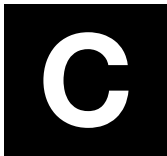


- connection obstructive point where infrastructure breaks the ecological patches

Ecological corridor



- creating corridor along the elevated infrastructure to ensure habitat for some certain animals



SUPPORT

- support services
- biodiversity -
- soil formation -





D

CULTURE

WHAT IF WE COULD PROVIDE PUBLIC
SPACE TO RE-IDENTIFY THE URBAN-RURAL
CULTURAL OF GUANGMING?

cultural services

recreation -

cultural heritage -

religion -



D

CULTURE

cultural services

recreation -

cultural heritage -

religion -

urban village



D

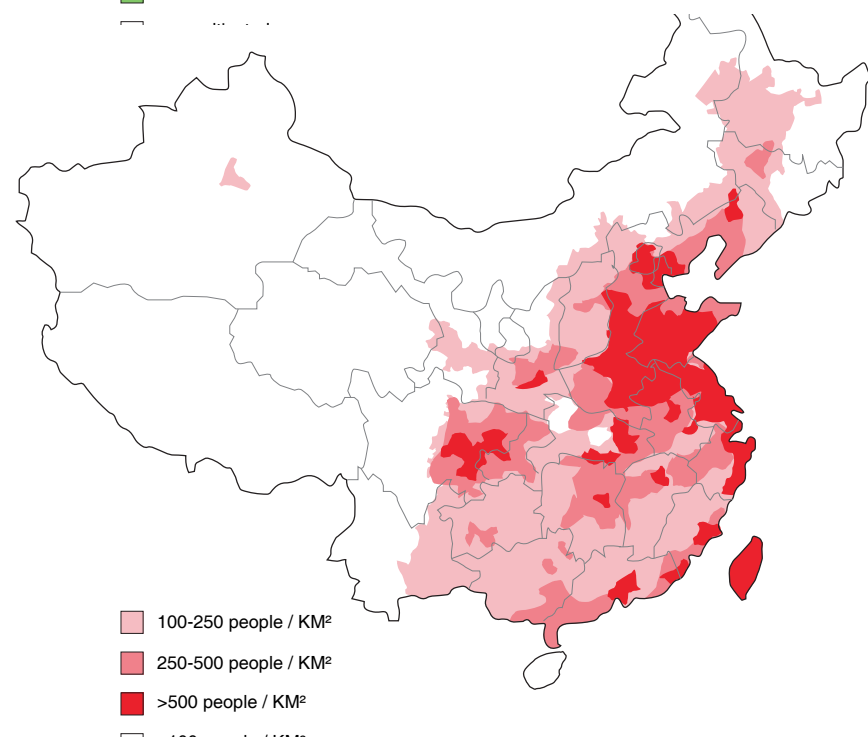
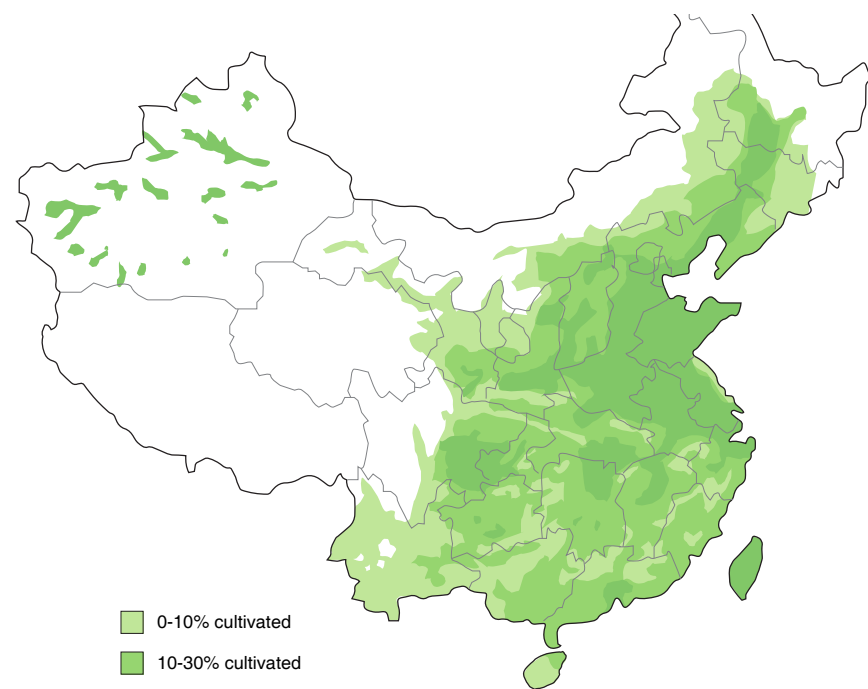
CULTURE

cultural services

recreation -

cultural heritage -

religion -

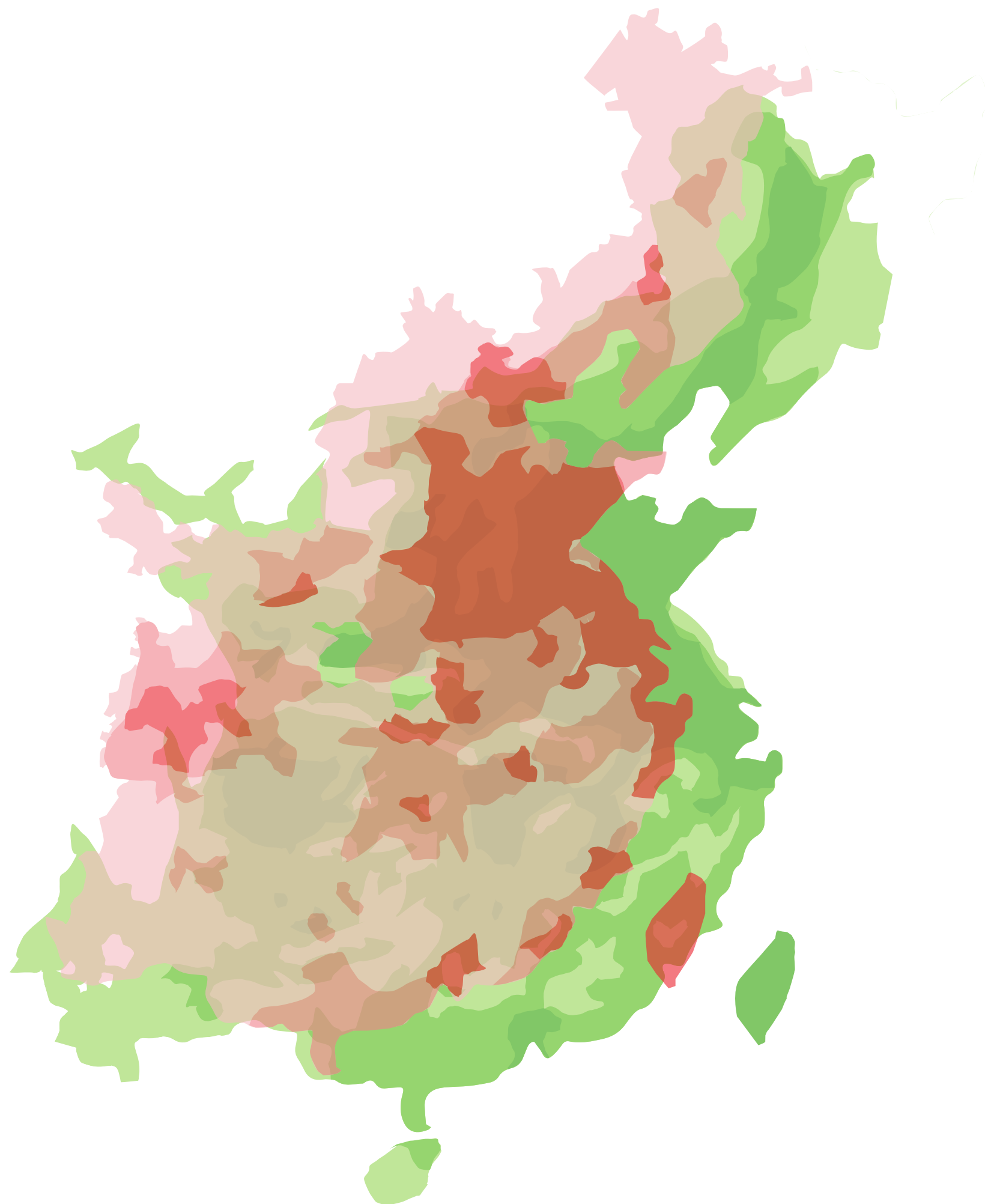


information source: <The Chinese Dream> Neville Mars, drawing by author



CULTURE

- cultural services
- recreation -
- cultural heritage -
- religion -





GUIMIAO NEW VILLAGE
9,800 residents

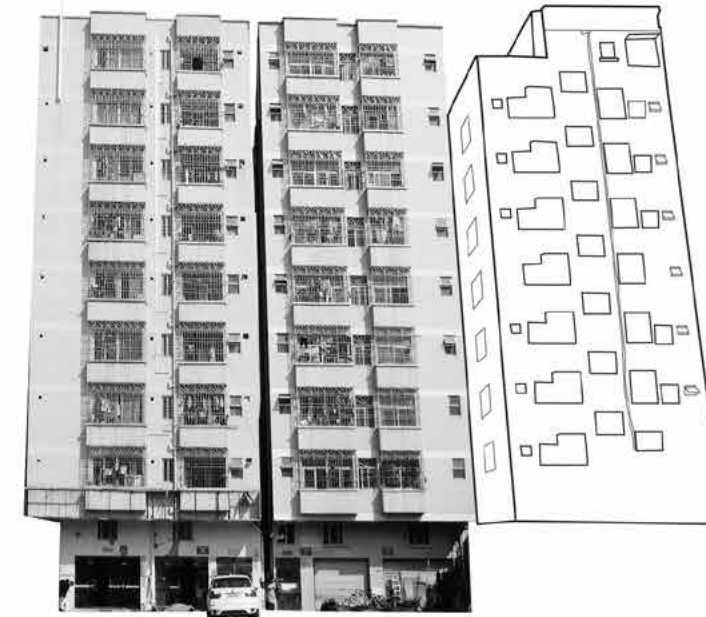
HUANGGANG NEW VILLAGE
12,800 residents



TANGWEI VILLAGE
130,000 residents



XIA VILLAGE
45,000 residents



XIASHA VILLAGE
80,000 residents



BAISHIZHOU VILLAGE
120,000 residents

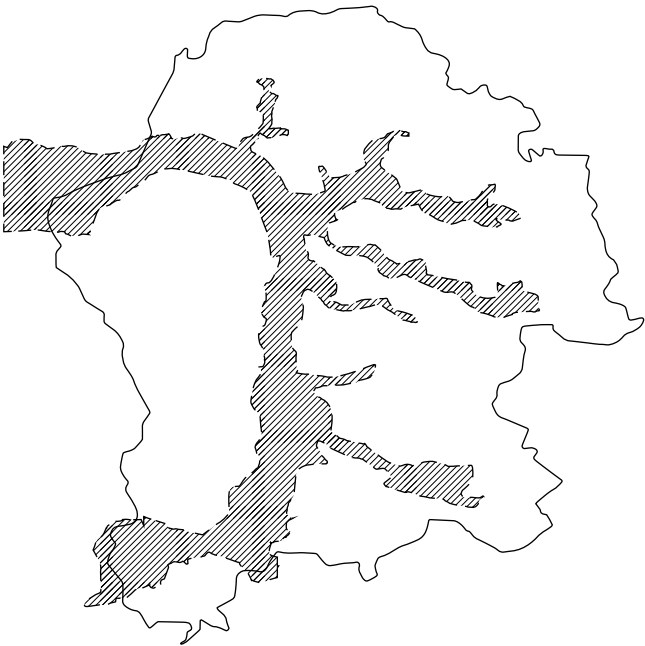
D

CULTURE

- cultural services
- recreation -
- cultural heritage -
- religion -

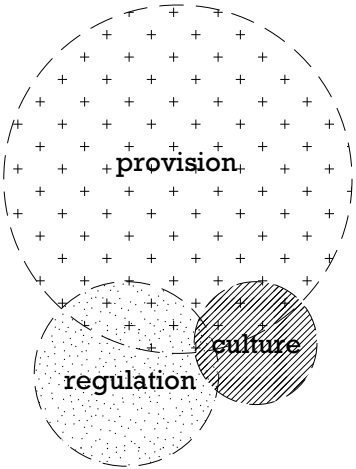


_Synthesis

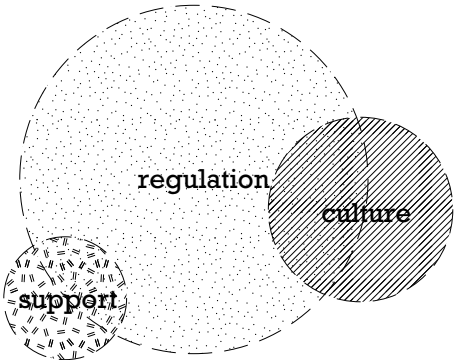


Vision
Component

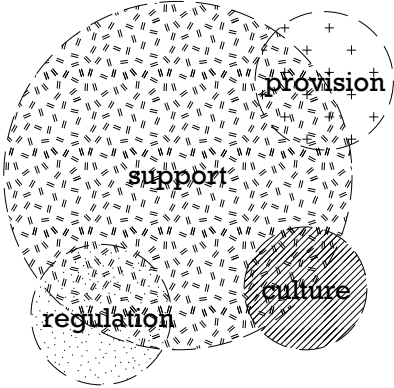
productive
floodplain



performative
urban network



eco-tourism
corridor



PRODUCTIVE FLOODPLAIN

Re-introducing aquafarming into urban fabric for flood prevention

- 1 highway dike-pond
- 2 riverfront dike-pond
- 3 water treatment plant
- 4 orchard
- 5 vegetable farms
- 6 highway dike-pond / park
- 7 dike-pond recreation park
- 8 vegetable farm / dike-pond
- 9 urban farm / recreation center

PERFORMATIVE URBAN NETWORK

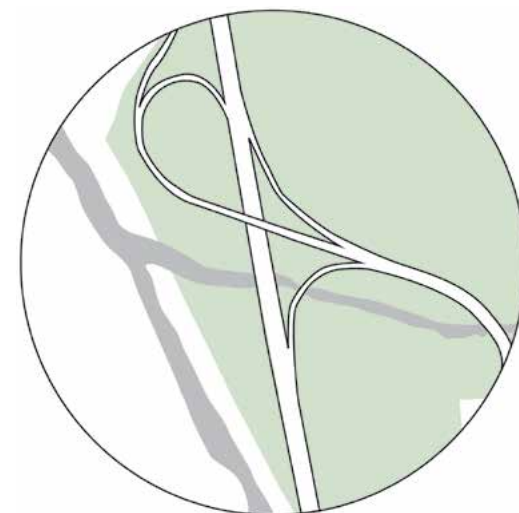
ECO-TOURISM CORRIDOR



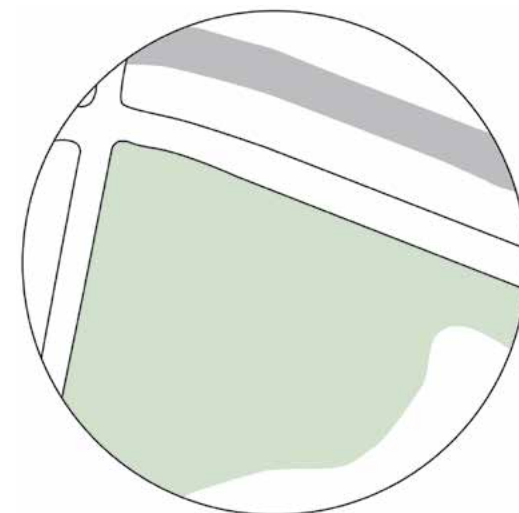
- potential vacant plots
- low quality buildings plots
- blue line (river)
- ecological patch

Plot typologies

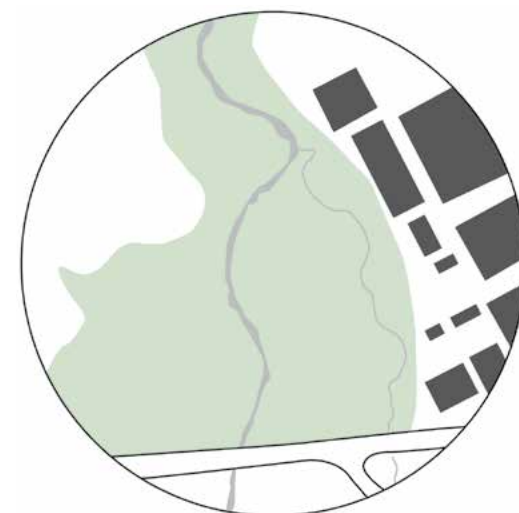
A. Low accessibility area

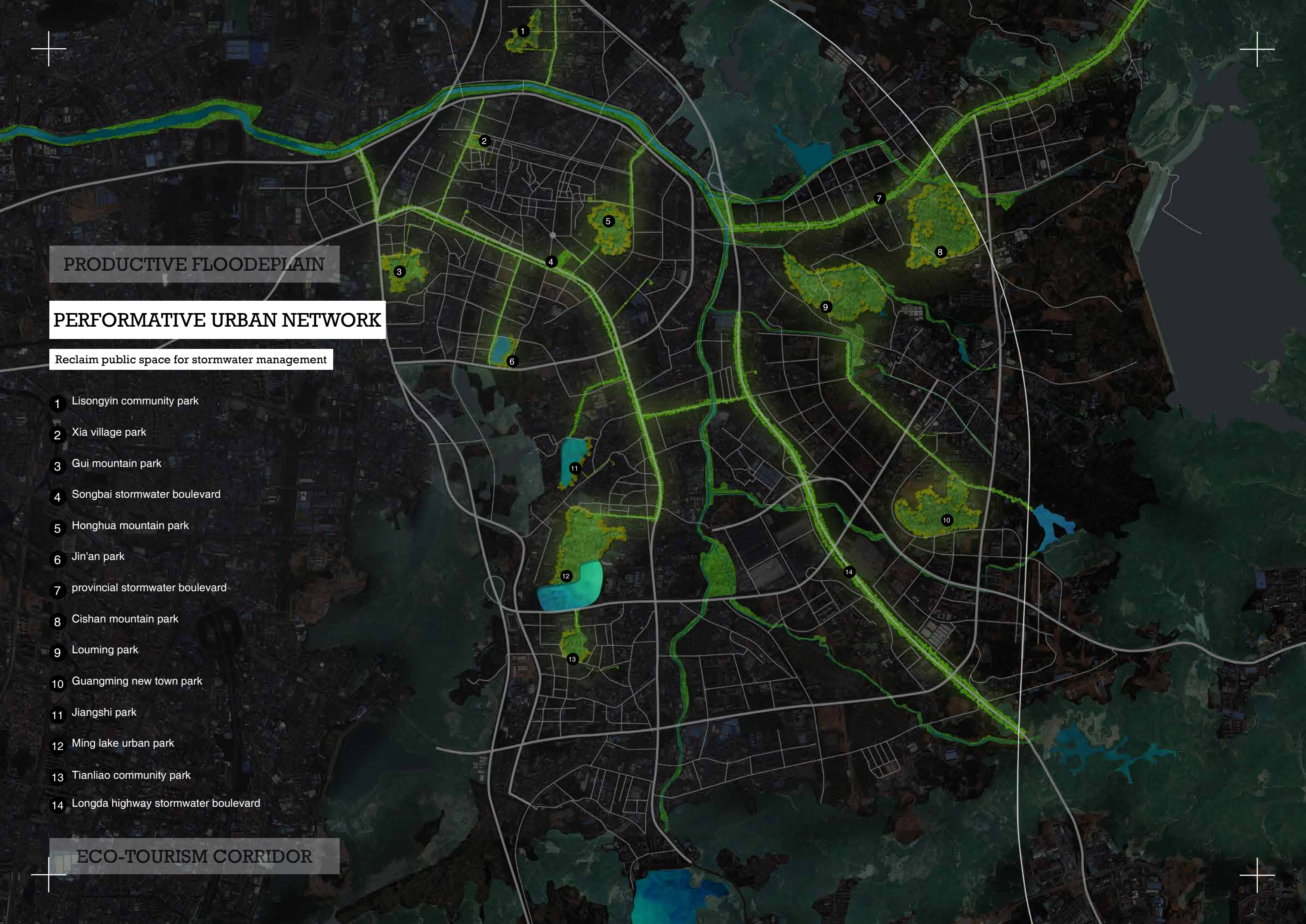


B. Separated plot



C. Riparian area





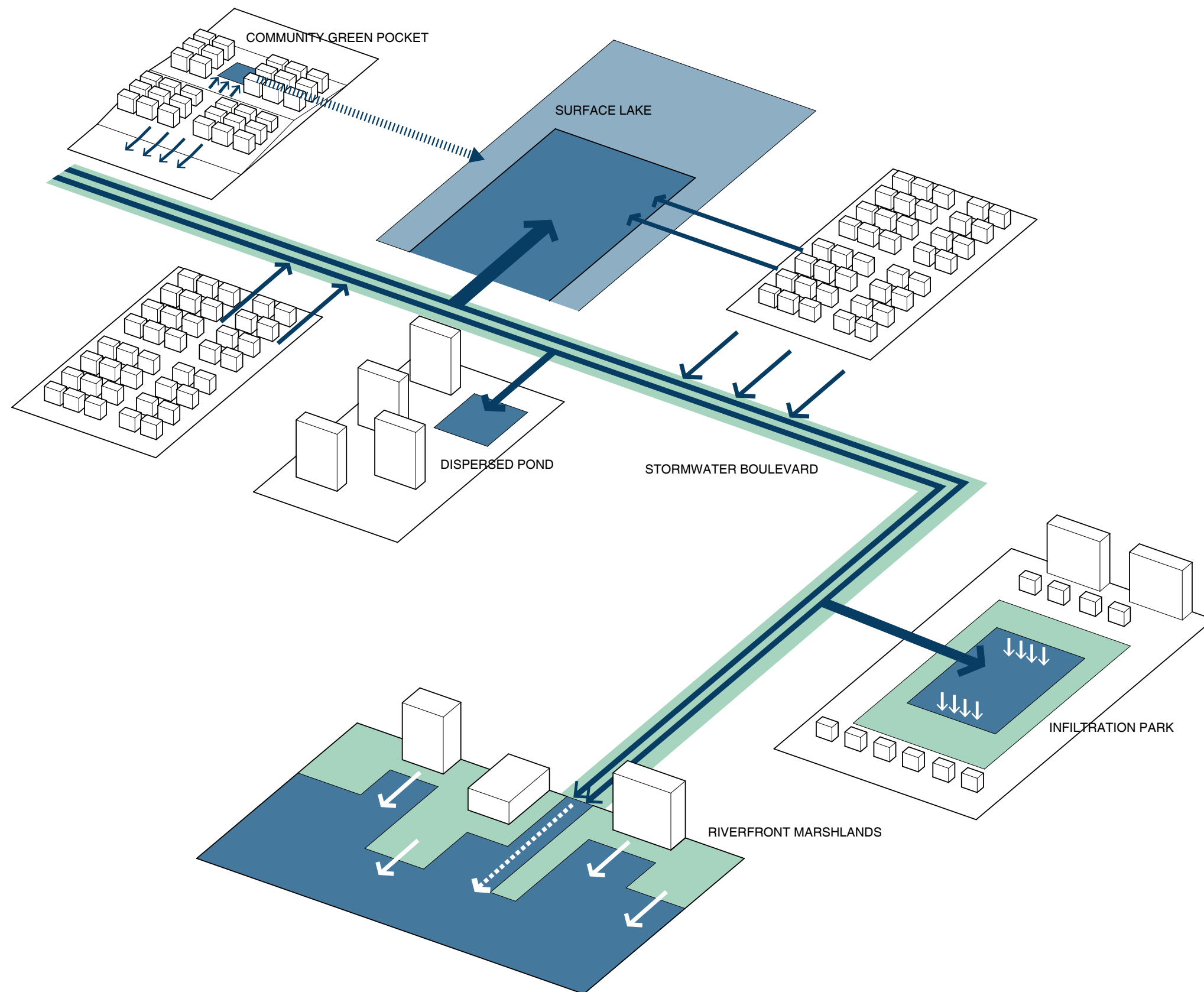
PRODUCTIVE FLOODPLAIN

PERFORMATIVE URBAN NETWORK

Reclaim public space for stormwater management

- 1 Lisongyin community park
- 2 Xia village park
- 3 Gui mountain park
- 4 Songbai stormwater boulevard
- 5 Honghua mountain park
- 6 Jin'an park
- 7 provincial stormwater boulevard
- 8 Cishan mountain park
- 9 Louming park
- 10 Guangming new town park
- 11 Jiangshi park
- 12 Ming lake urban park
- 13 Tianliao community park
- 14 Longda highway stormwater boulevard

ECO-TOURISM CORRIDOR



PRODUCTIVE FLOODPLAIN

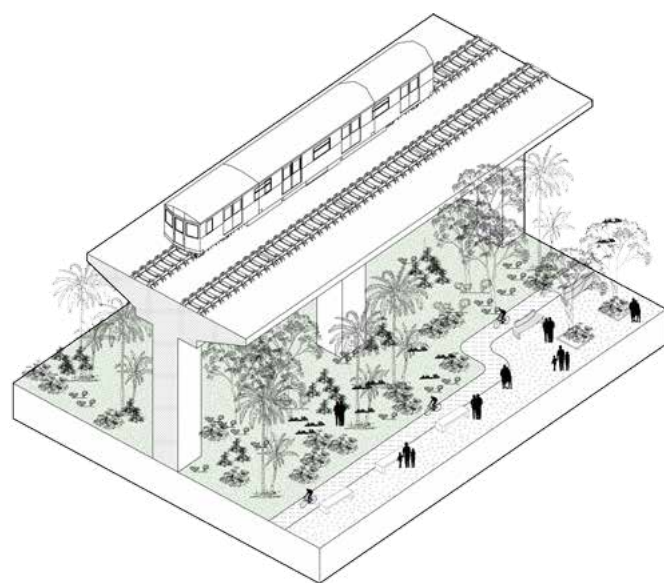
PERFORMATIVE URBAN NETWORK

ECO-TOURISM CORRIDOR

Improve ecological connectivity to restore habitat and promote eco-tourism

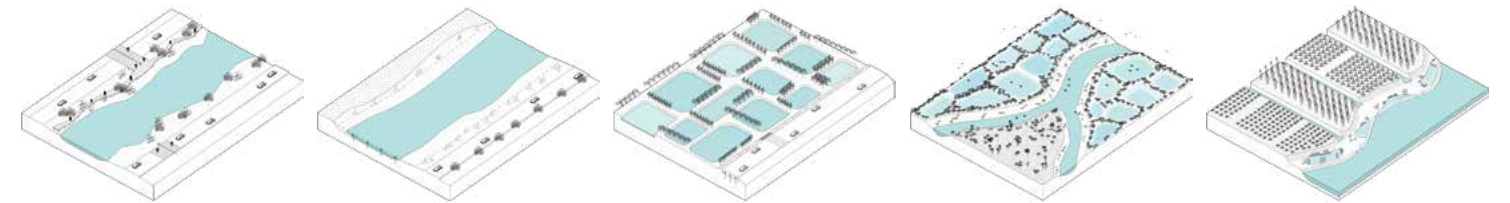
- 1 Guangming golf club
- 2 Guangming new town park
- 3 railway station complex
- 4 railway eco-corridor
- 5 Guangming agricultural park
- 6 milk production base
- 7 Cishan mountain park
- 8 regional green pathway

_Principles

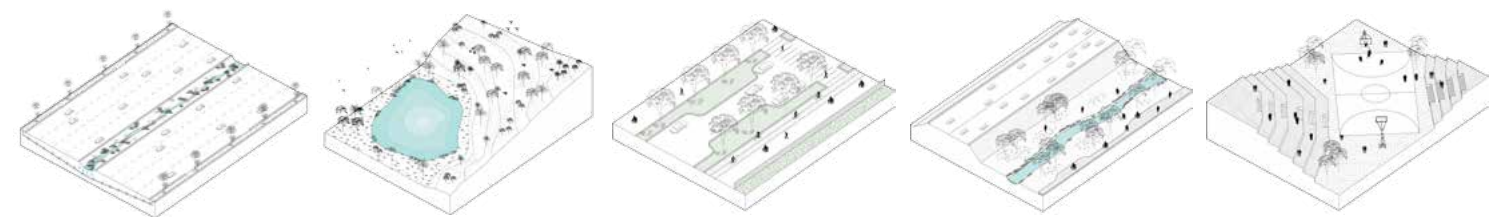


Design Principles

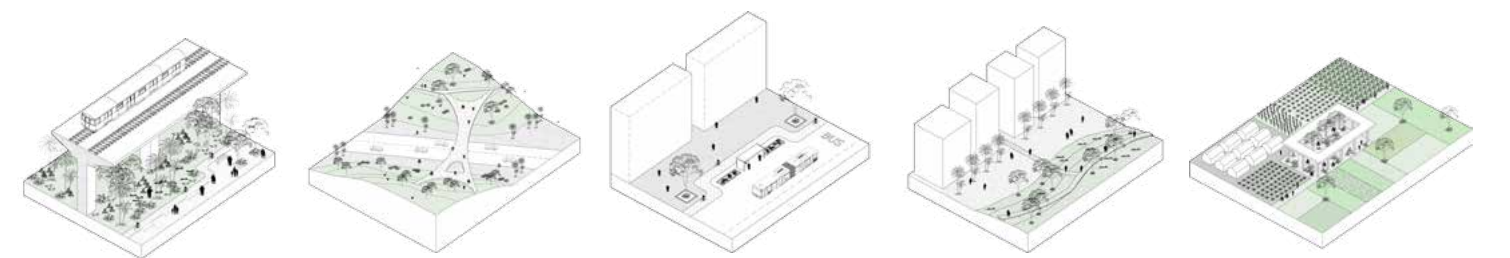
productive floodplain



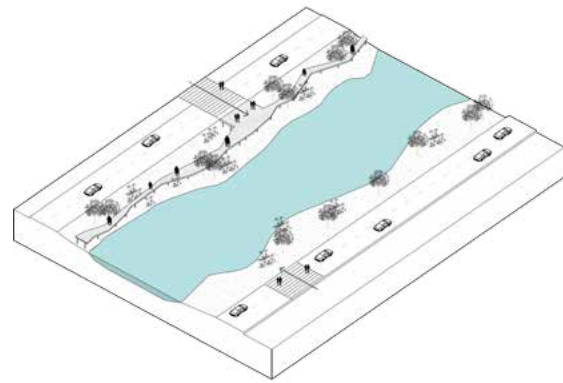
performative urban network



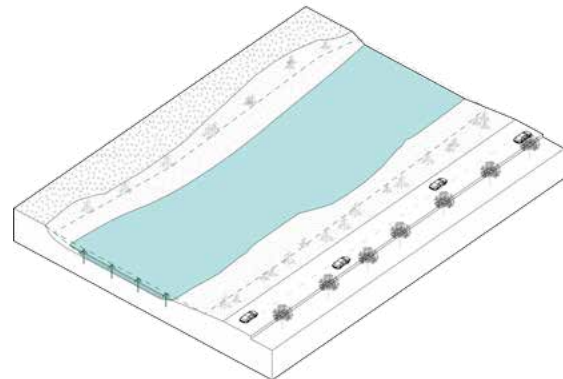
eco-tourism corridor



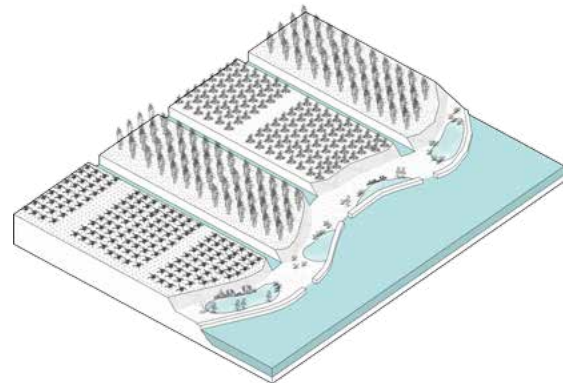
Create access to urban water front



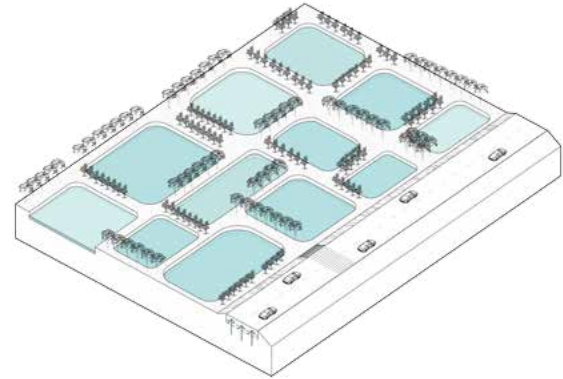
Enlarge waterbed



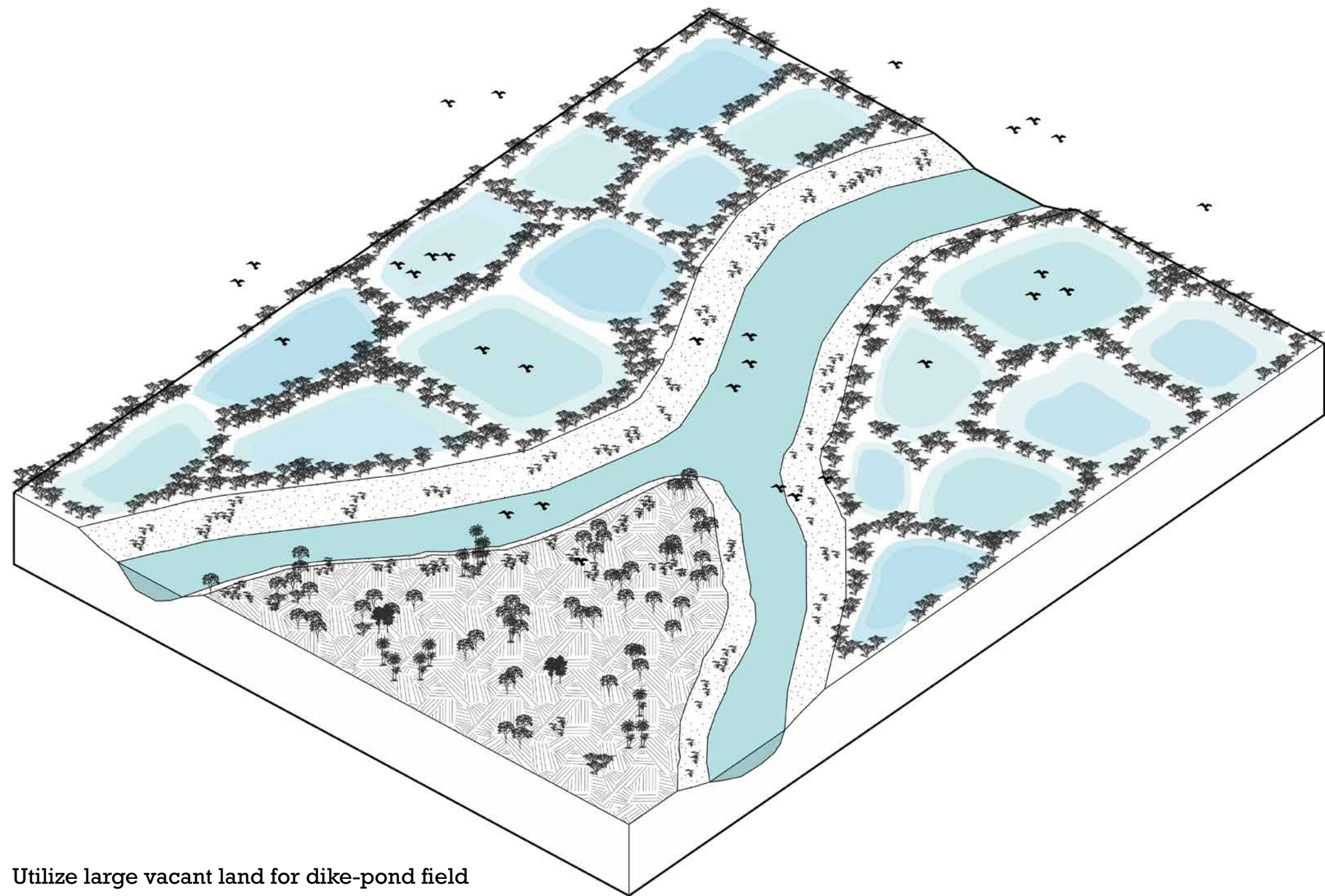
Treatment of agricultural waste water



Dike-pond system in urban context

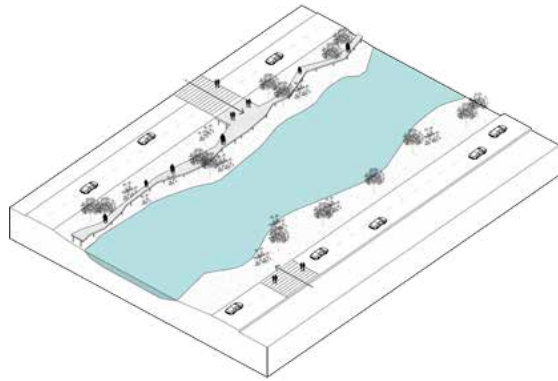


PRODUCTIVE FLOODPLAIN

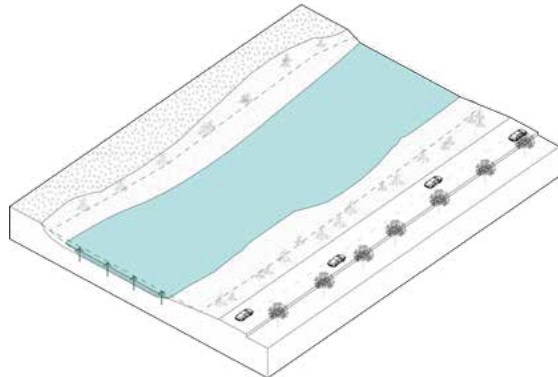


Utilize large vacant land for dike-pond field

Create access to urban water front



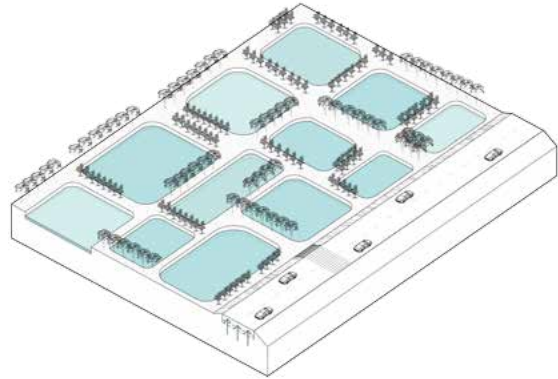
Enlarge waterbed



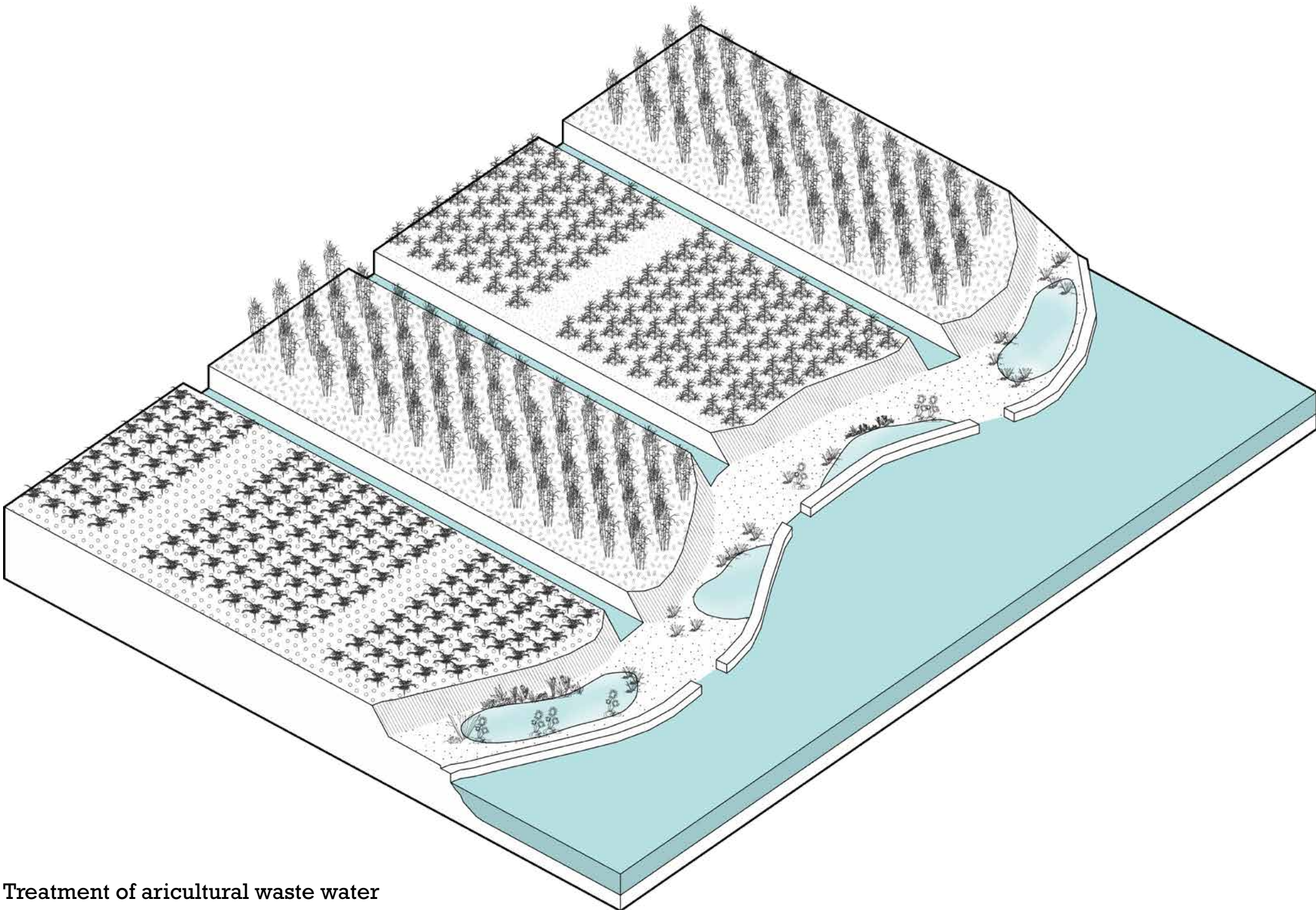
Utilize large vacant land for dike-pond field



Dike-pond system in urban context

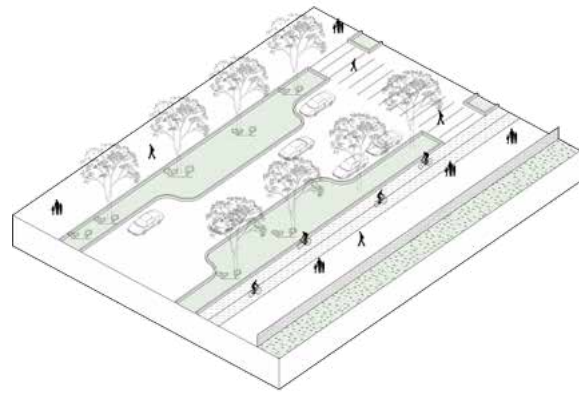


PRODUCTIVE FLOODPLAIN

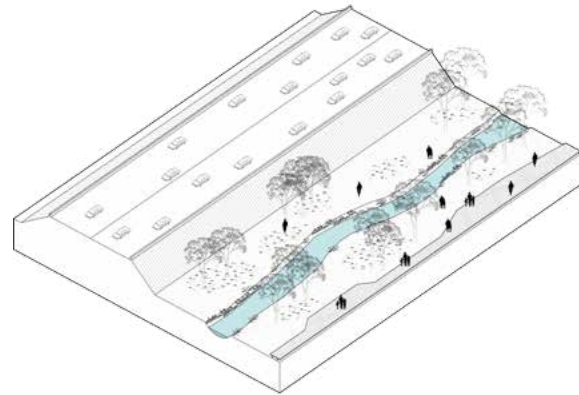


Treatment of agricultural waste water

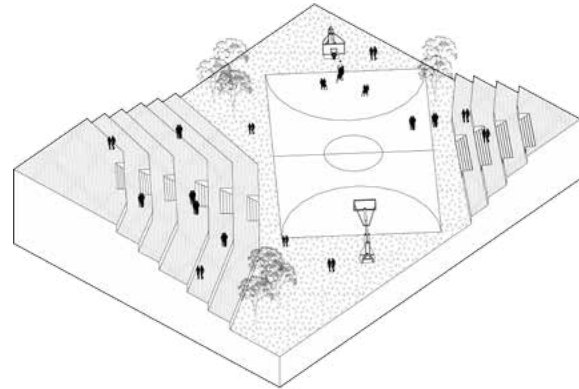
New street profile in certain area



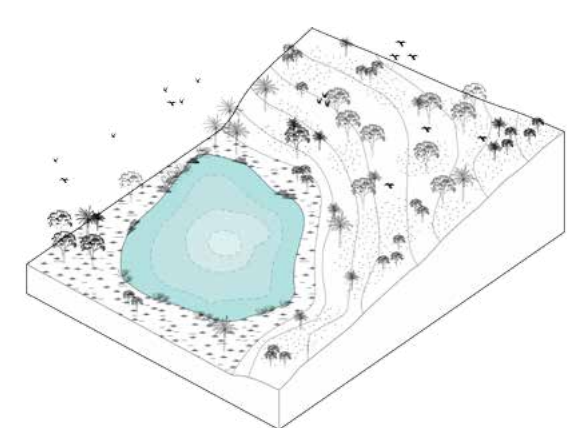
Storm water boulevard along highway



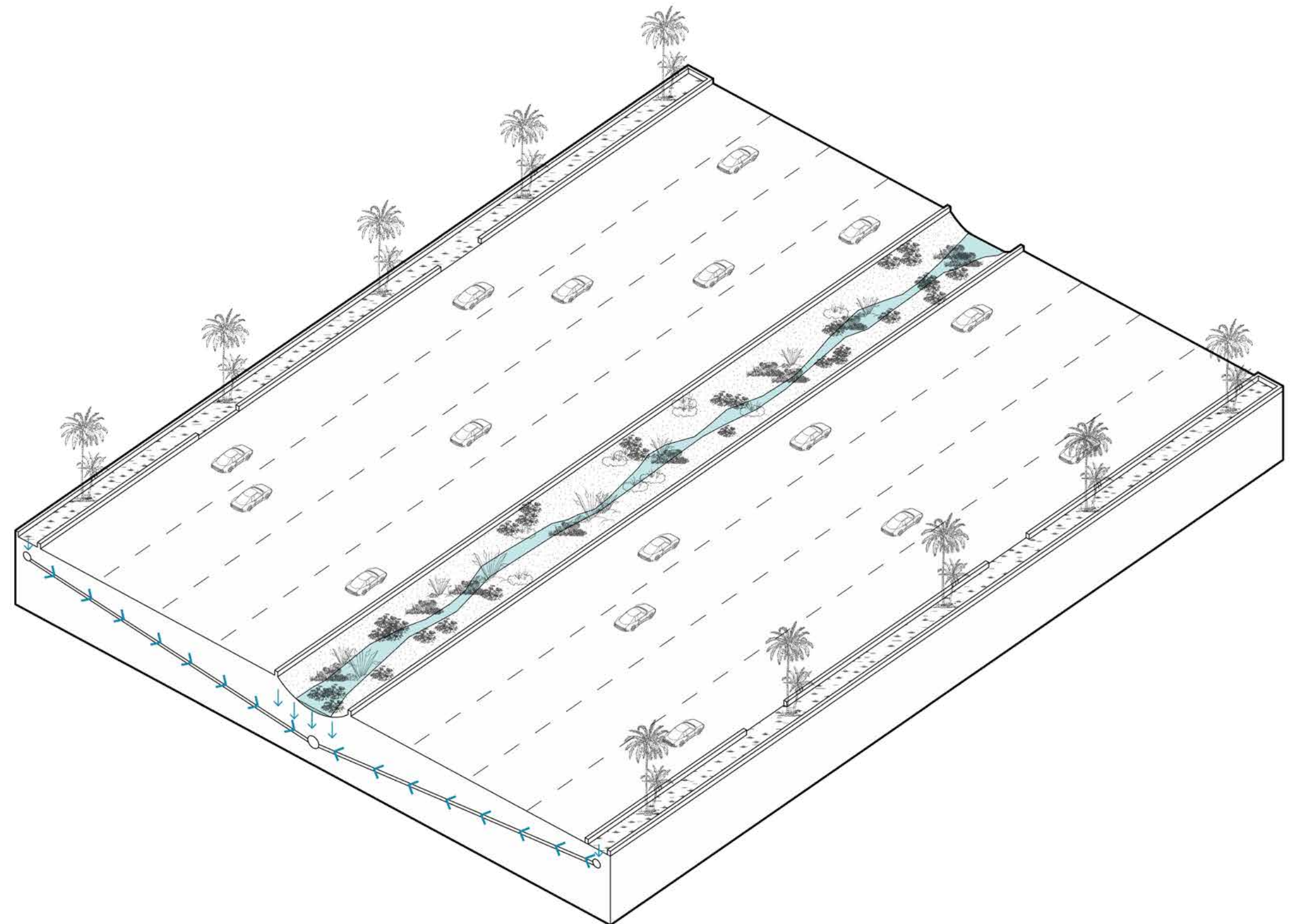
Water square in urban context



Retention pond in critical area

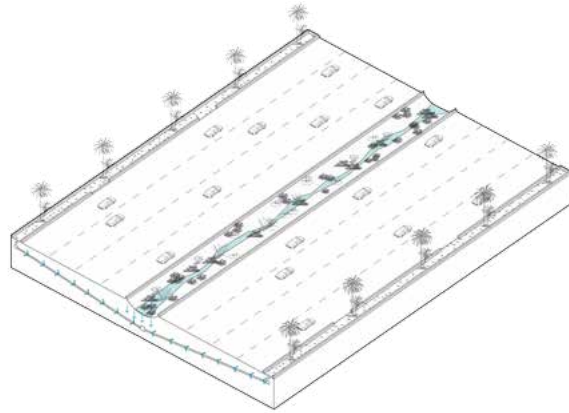


PERFORMATIVE URBAN NETWORK

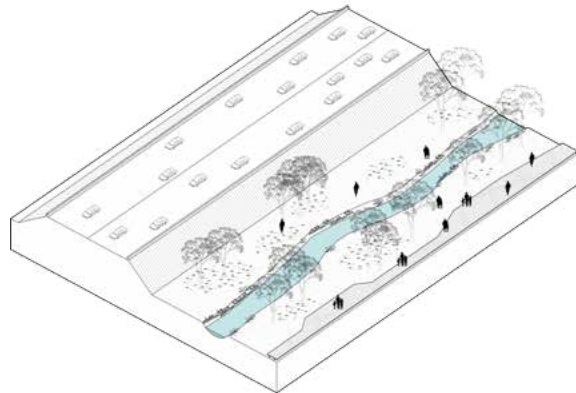


Create bioswale in critical infrastructure

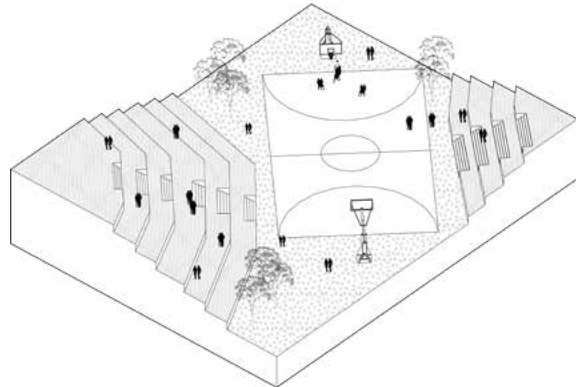
Create bioswale in critical infrastructure



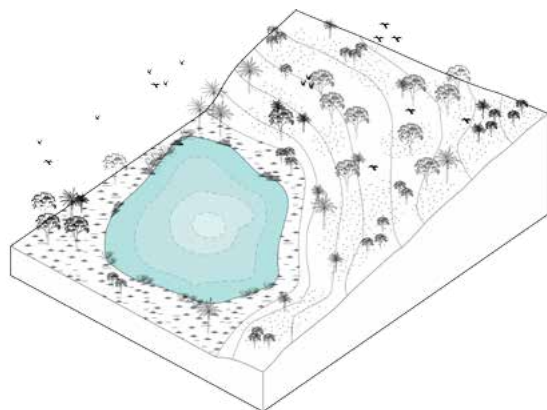
Storm water boulevard along highway



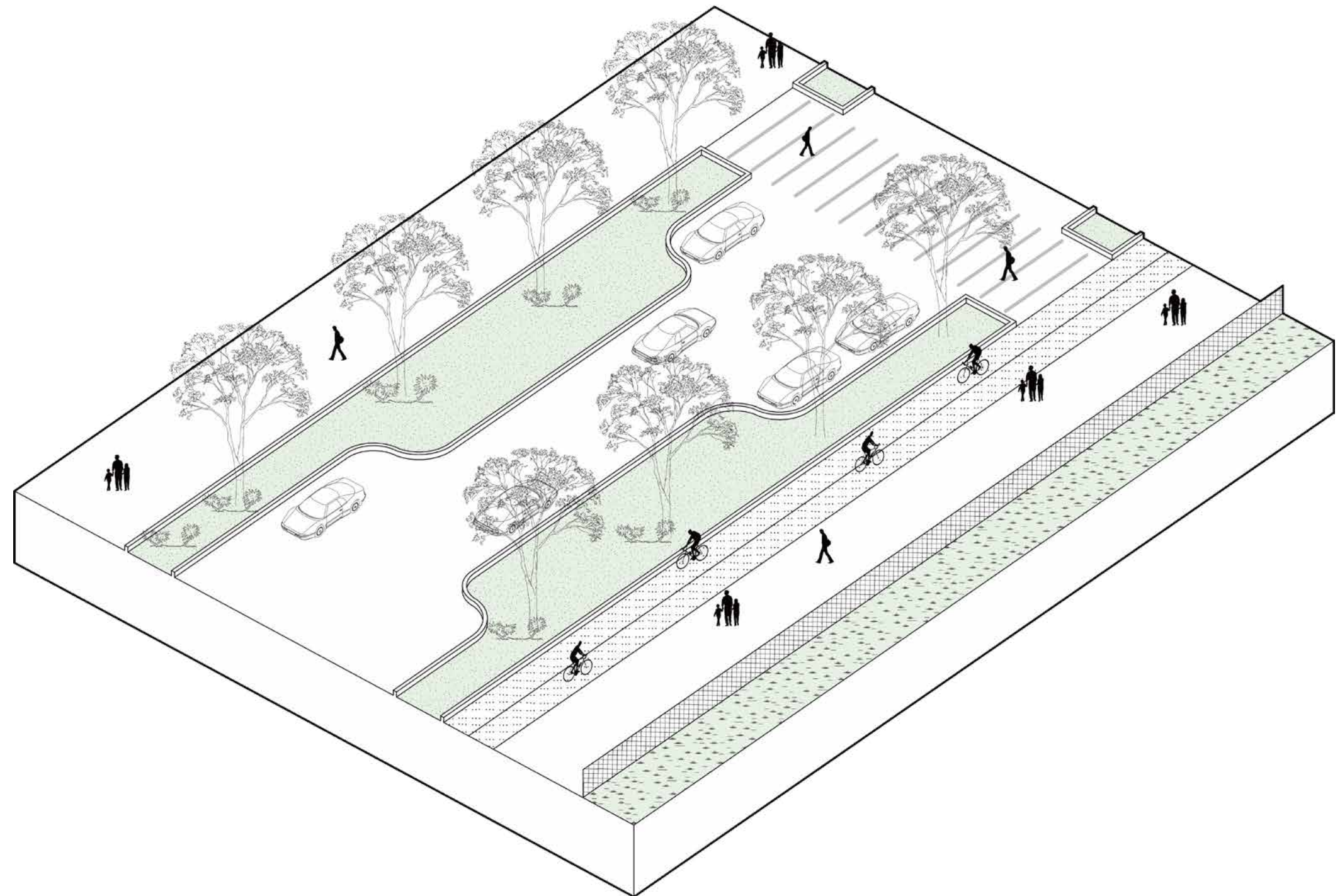
Water square in urban context



Retention pond in critical area

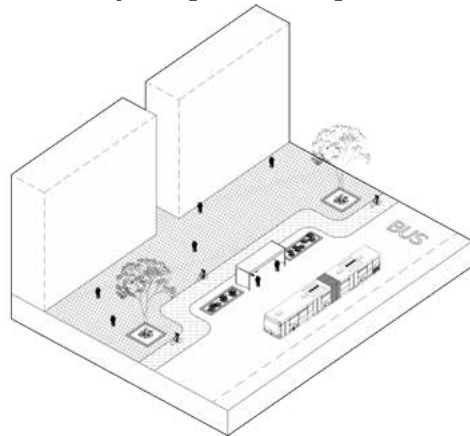


PERFORMATIVE URBAN NETWORK

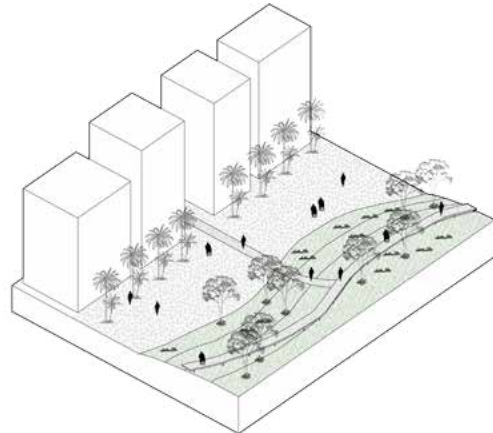


New street profile in certain area

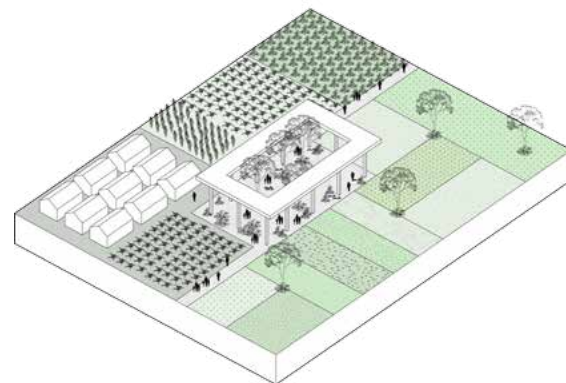
Slow mobility and public transportation



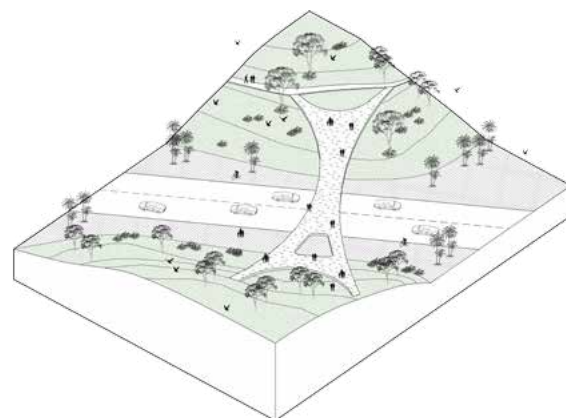
Connection to regional green pathway



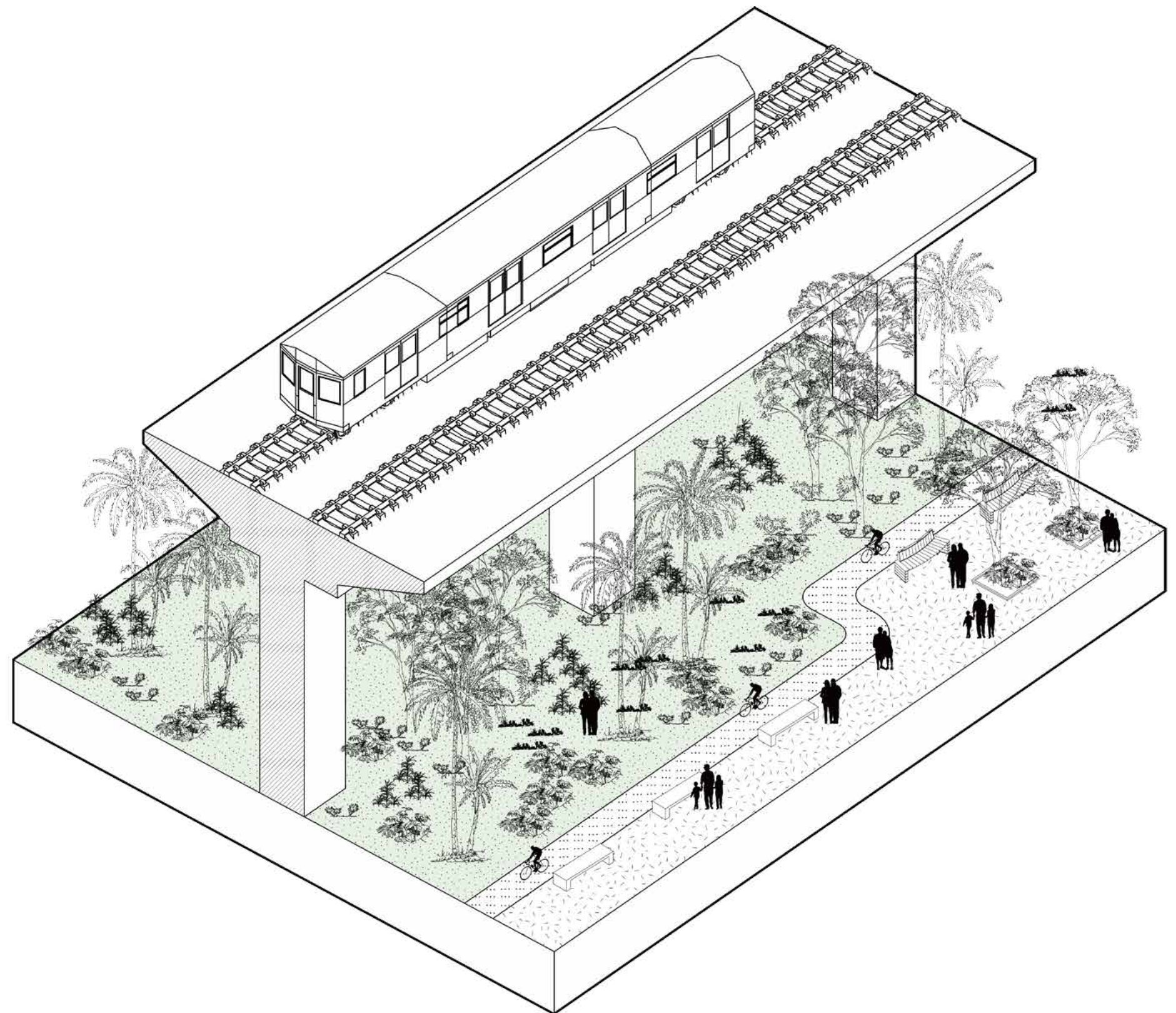
Explore the value of agricultural tourism



Eco-bridge connecting important patches

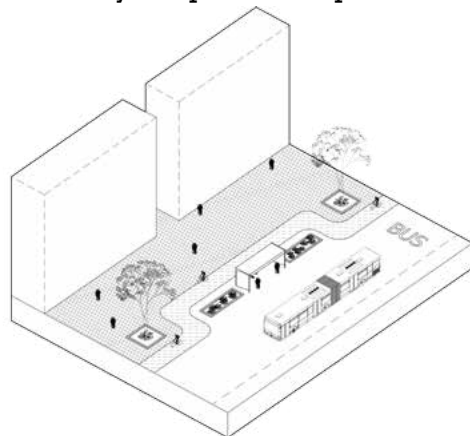


ECO-TOURISM CORRIDOR

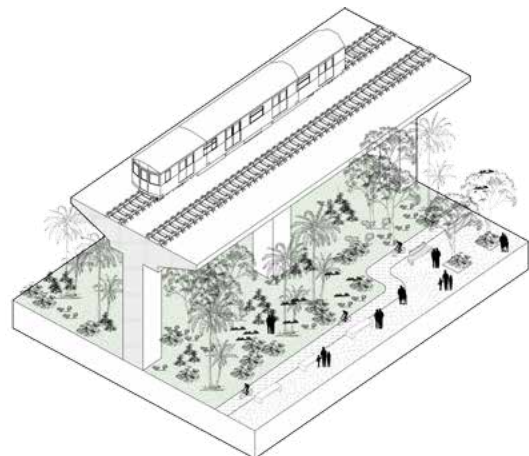


Revitalize vacant space under elevated railway

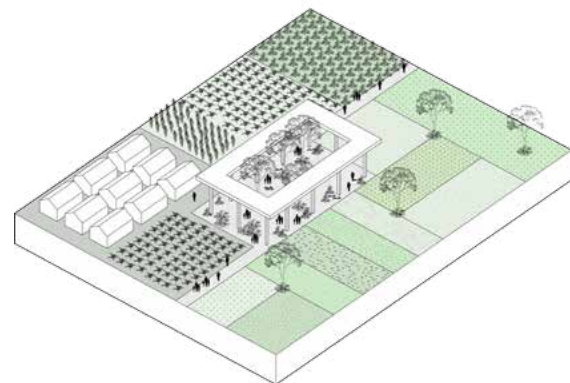
Slow mobility and public transportation



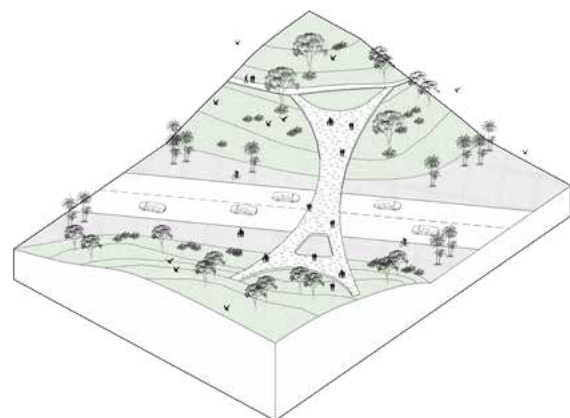
Revitalize vacant space under elevated railway



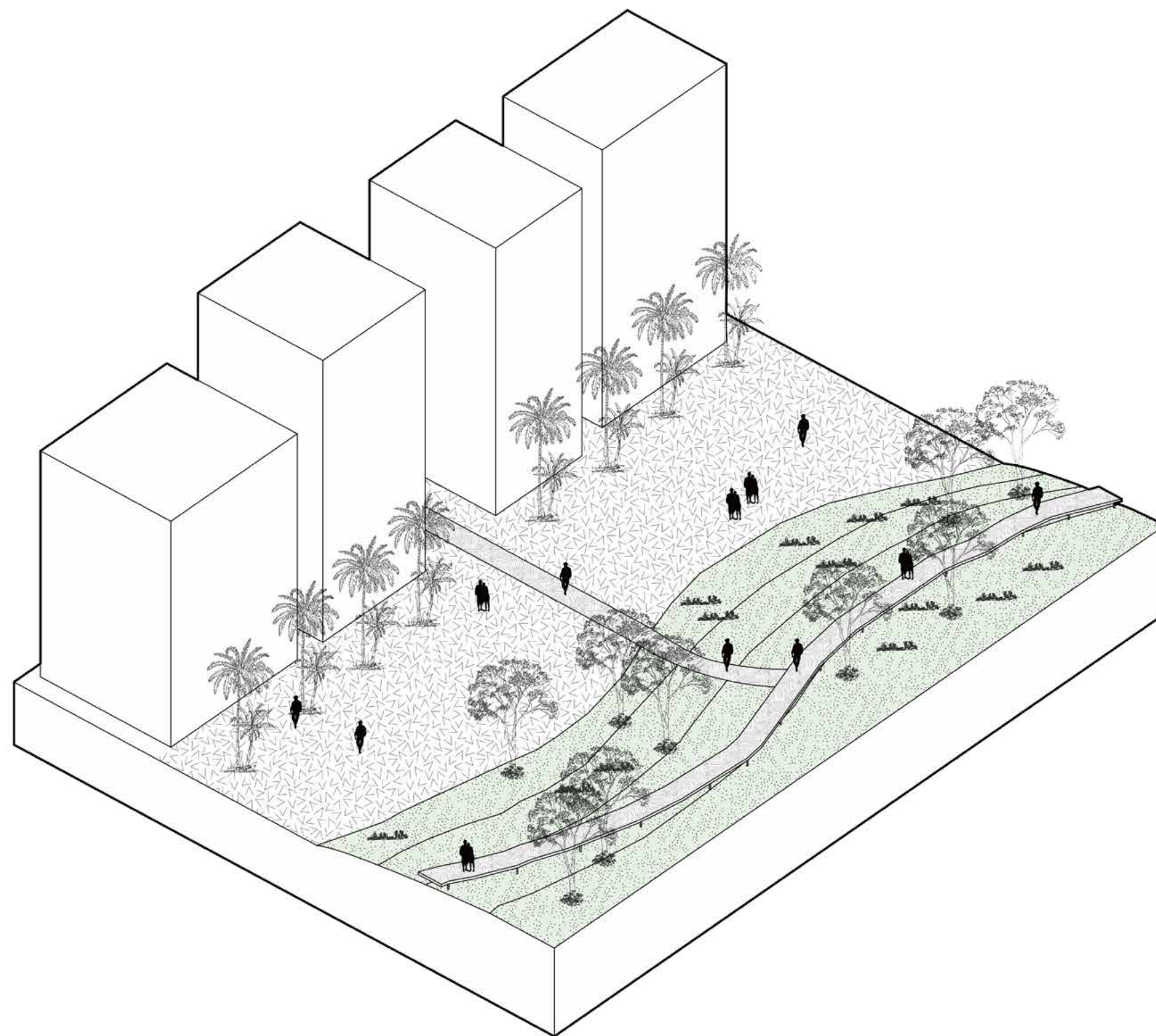
Explore the value of agricultural tourism



Eco-bridge connecting important patches



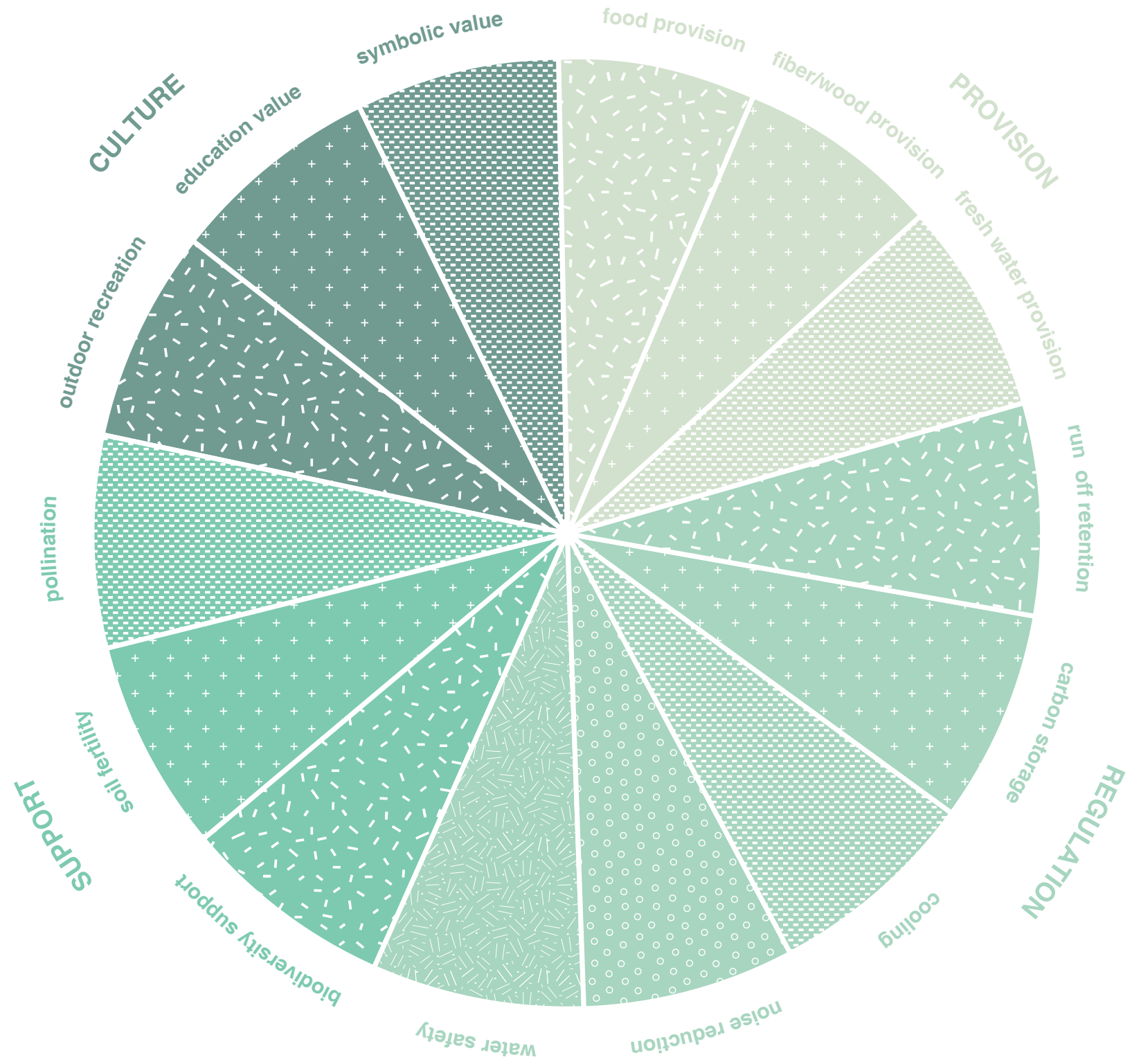
ECO-TOURISM CORRIDOR



Connection to regional green pathway

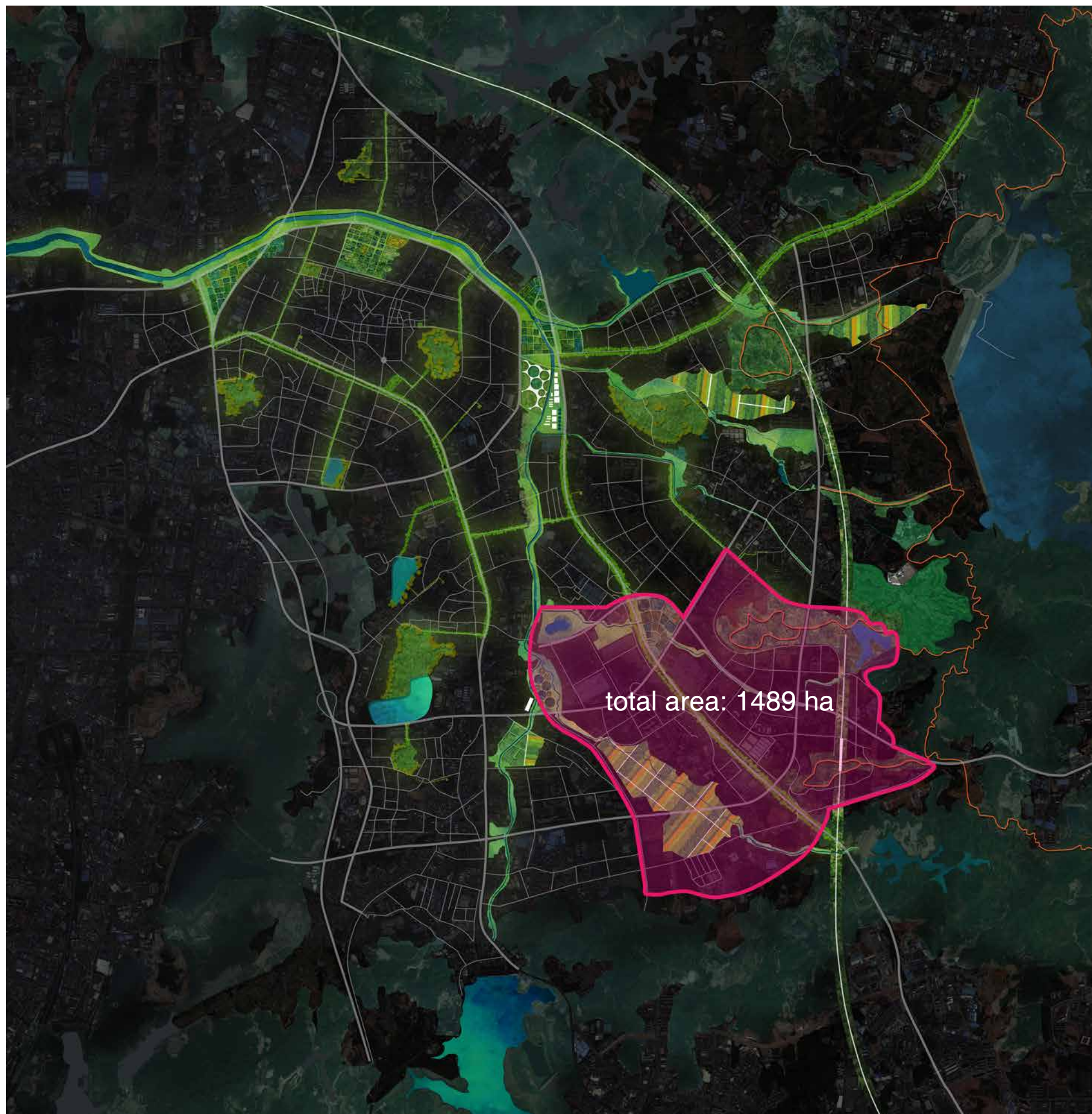


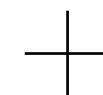
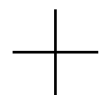
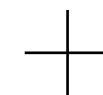
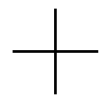
_Ecosystem Services Bundle



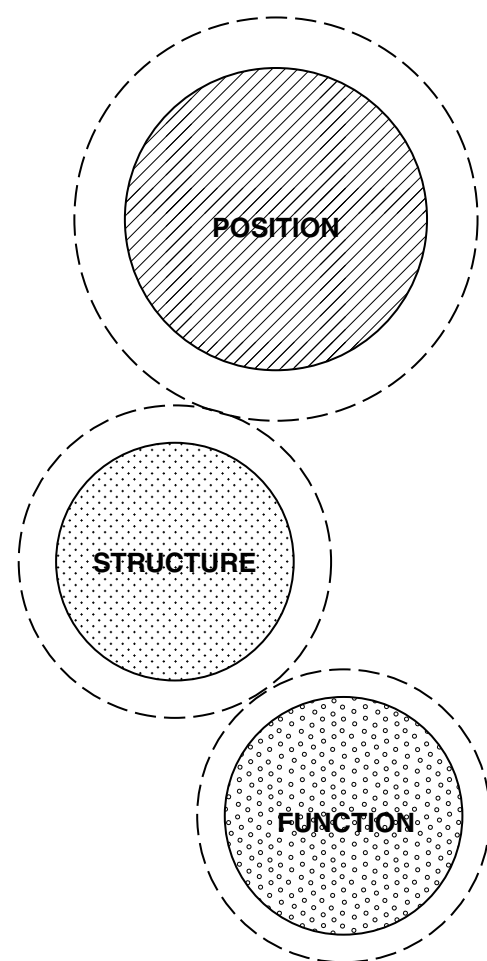
How can this vision guide the
spatial interventions and the
implementation?

_Pilot Area

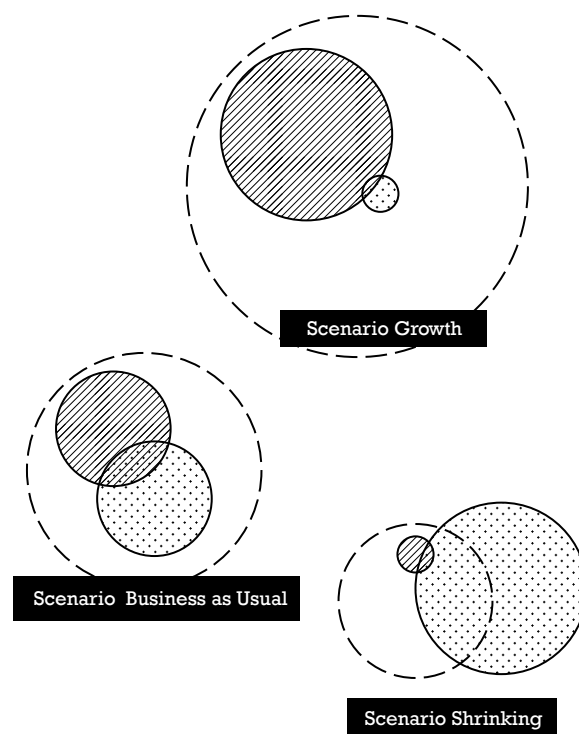




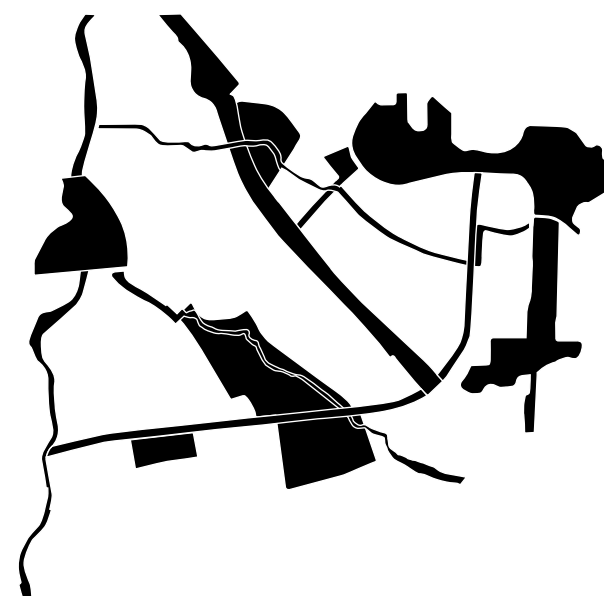
Spatial Narrative



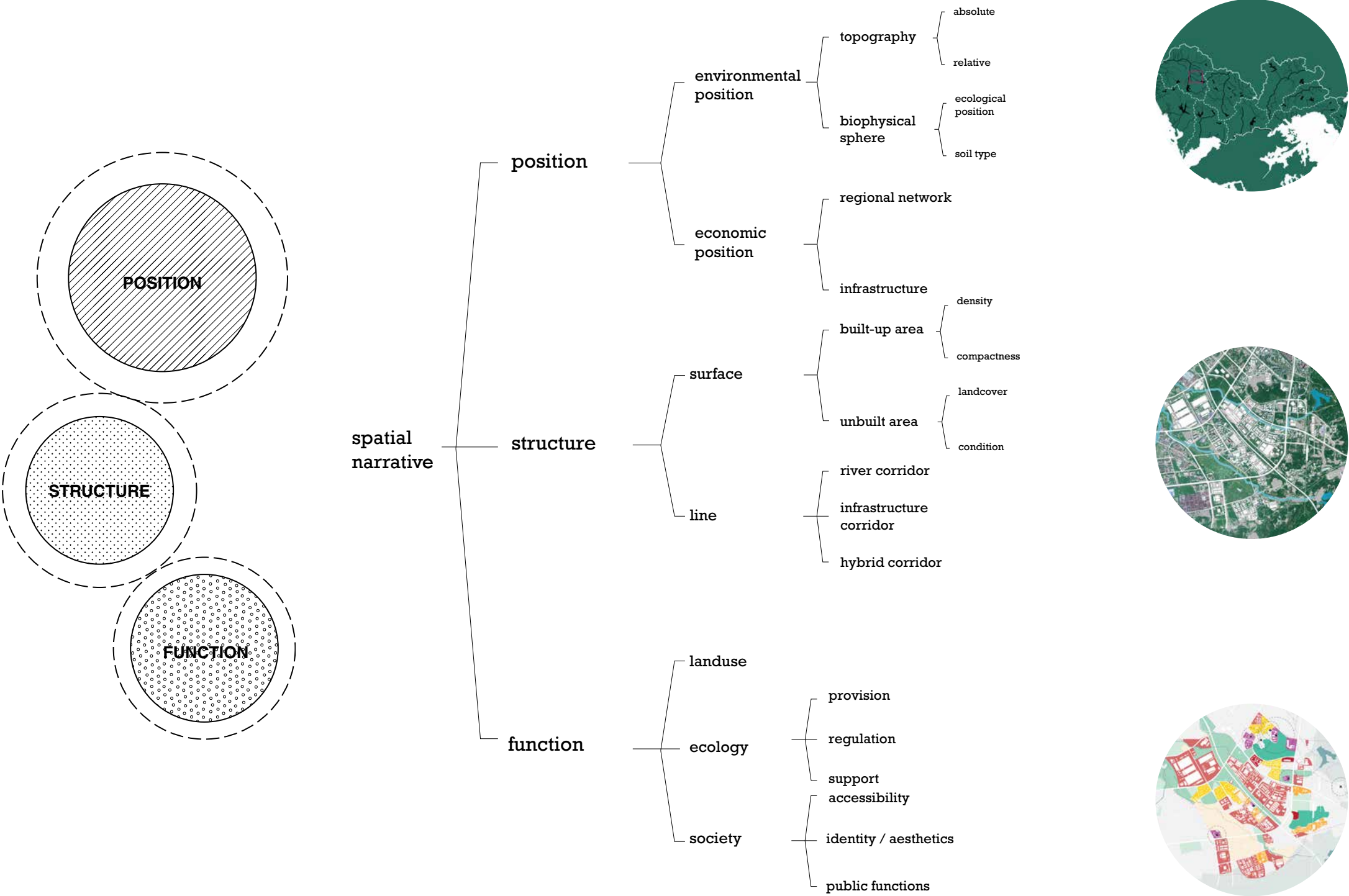
Scenarios



Strategies



_Spatial Narrative





_POSITION

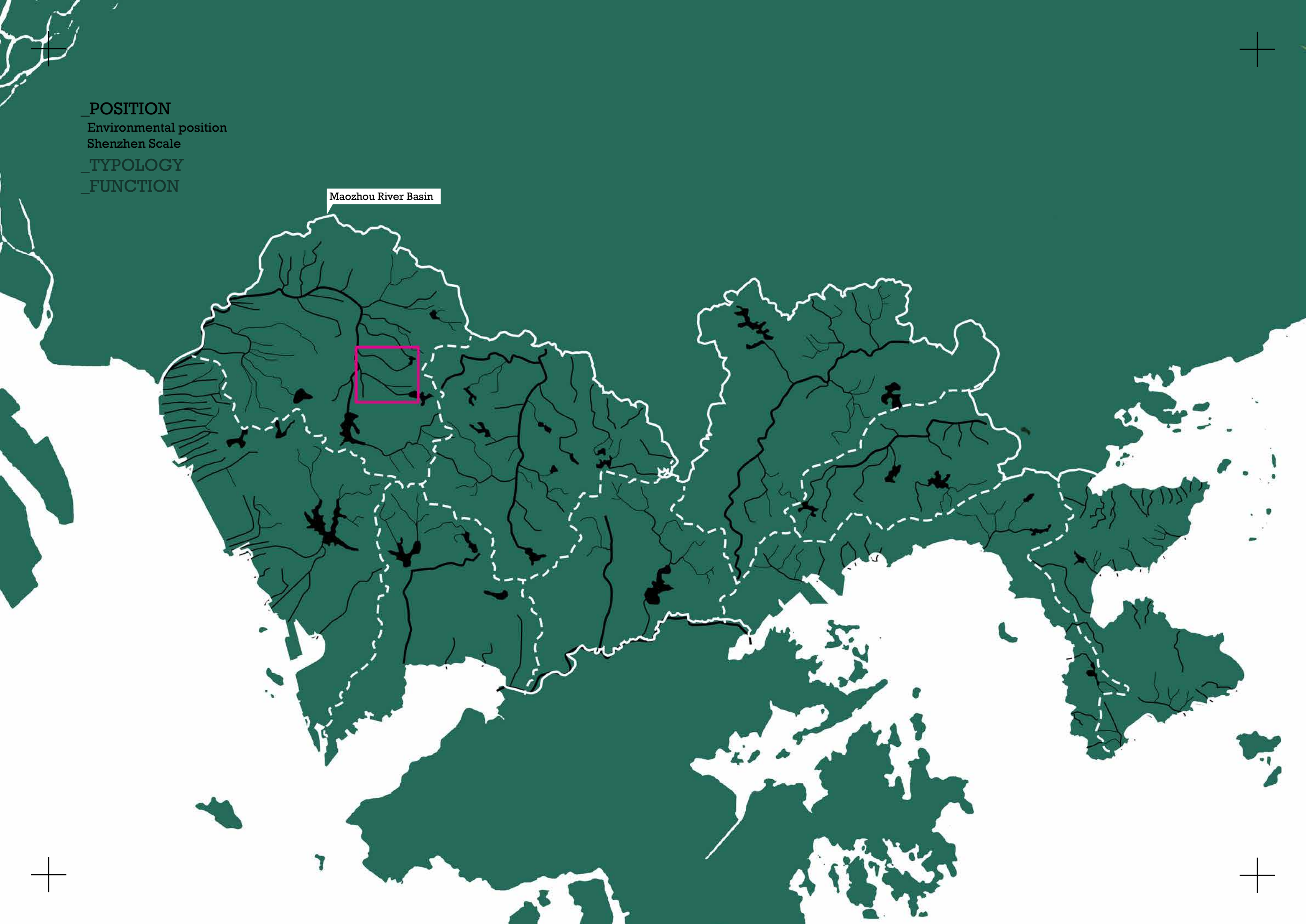
Environmental position

PRD Scale

_TYPOLOGY

_FUNCTION

Shenzhen



_POSITION

Environmental position

Shenzhen Scale

_TYPOLOGY

_FUNCTION

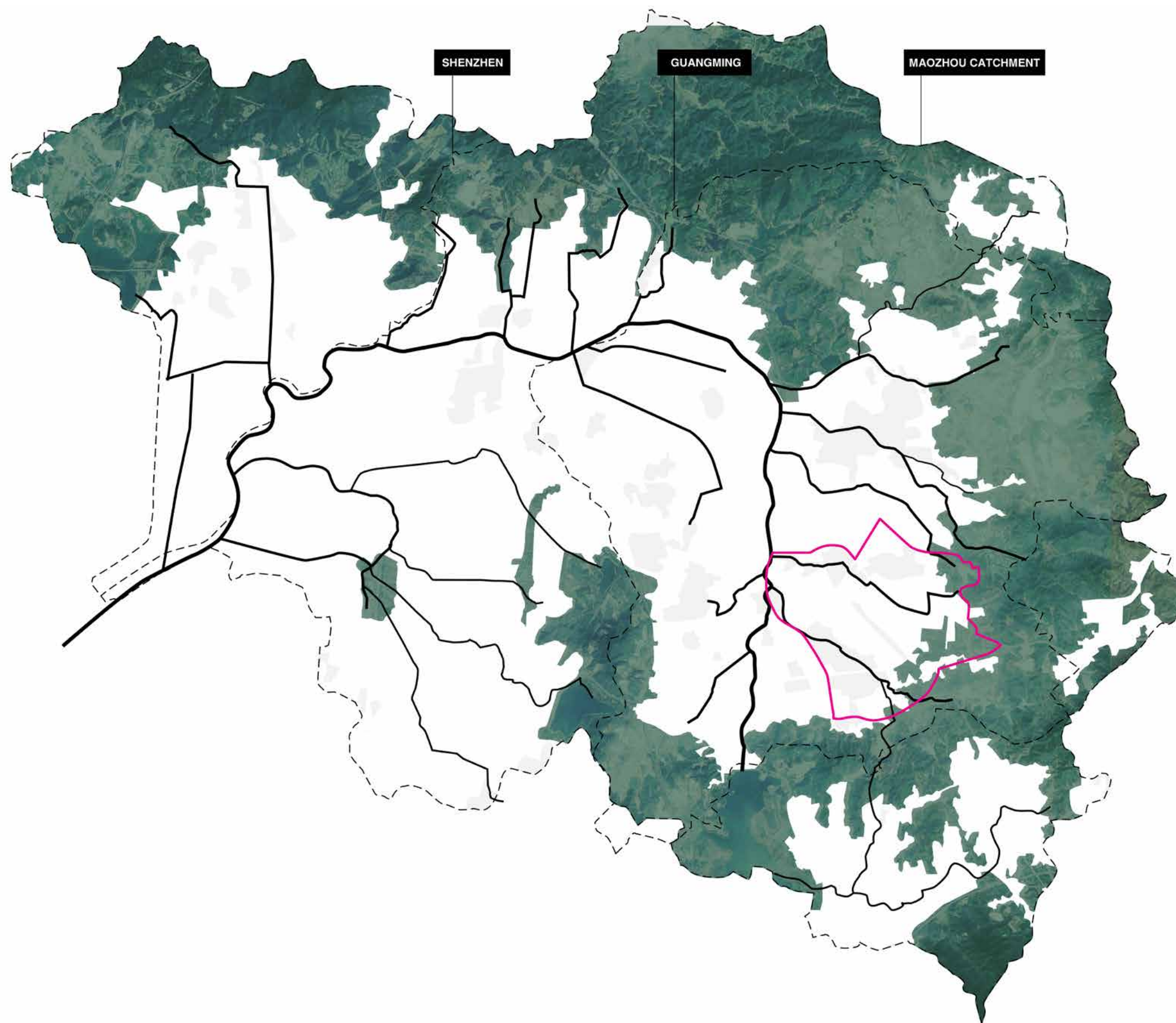
_POSITION

Environmental position
Maozhou River Basin Scale

_TYPOLOGY

_FUNCTION

— natural hydrology_1
— natural hydrology_2
— natural hydrology_3



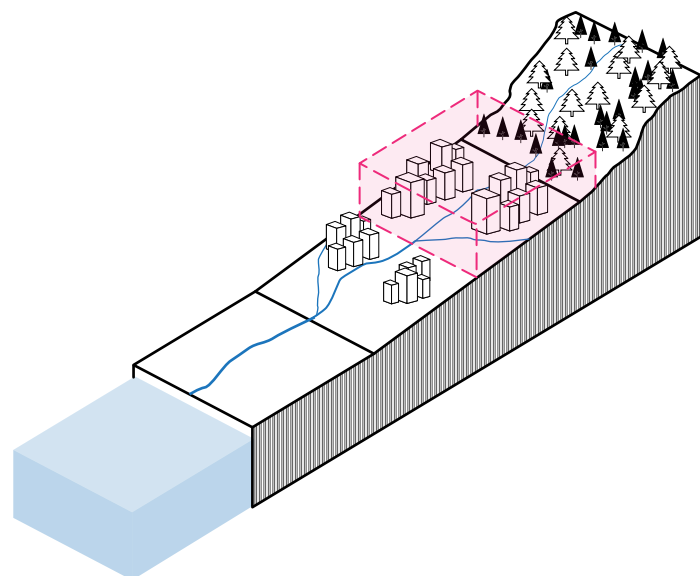


_POSITION

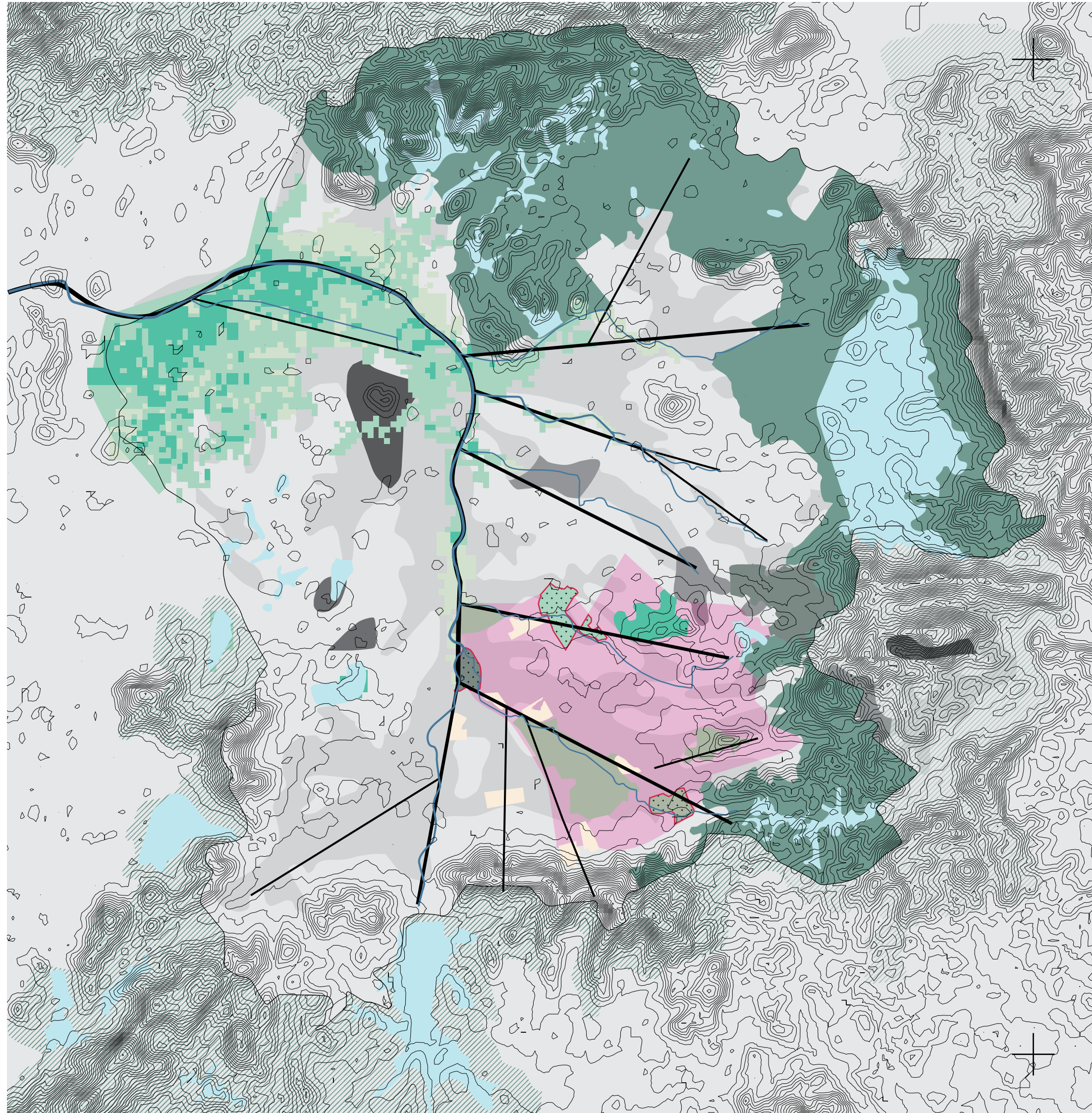
Environmental position
Guangming Eco-city Scale

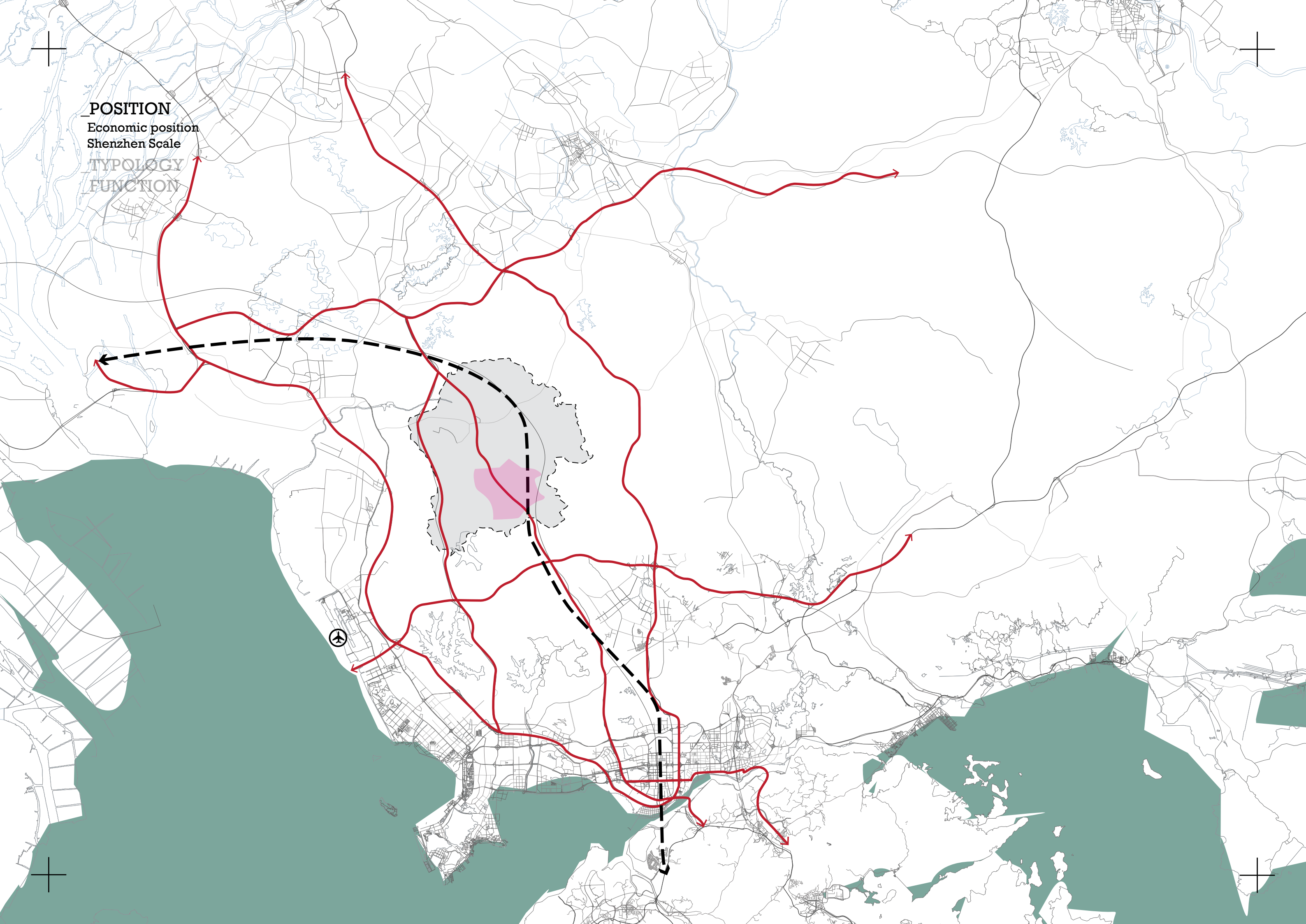
_TYPOLOGY

_FUNCTION



- drainage conveyance_1
- drainage conveyance_2
- drainage conveyance_3
- high flood susceptibility
- medium flood susceptibility
- low flood susceptibility
- important patch
- densed forest
- woods
- field
- grass
- exposed soil





POSITION

Economic position
Shenzhen Scale

TYPOLGY

FUNCTION



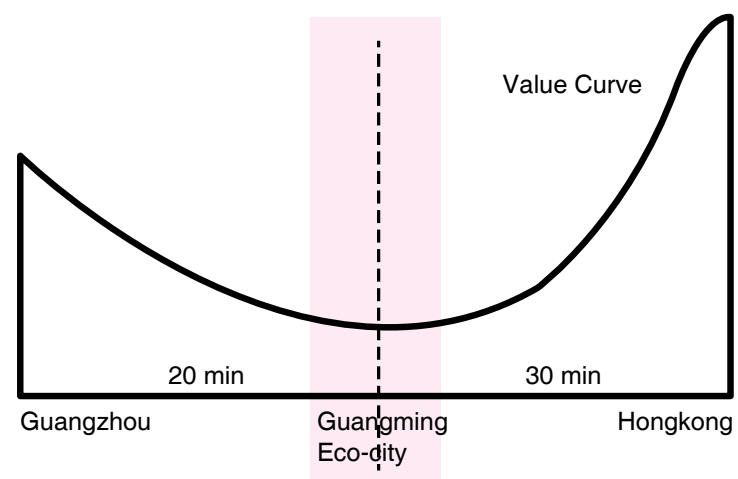
_POSITION

Economic position

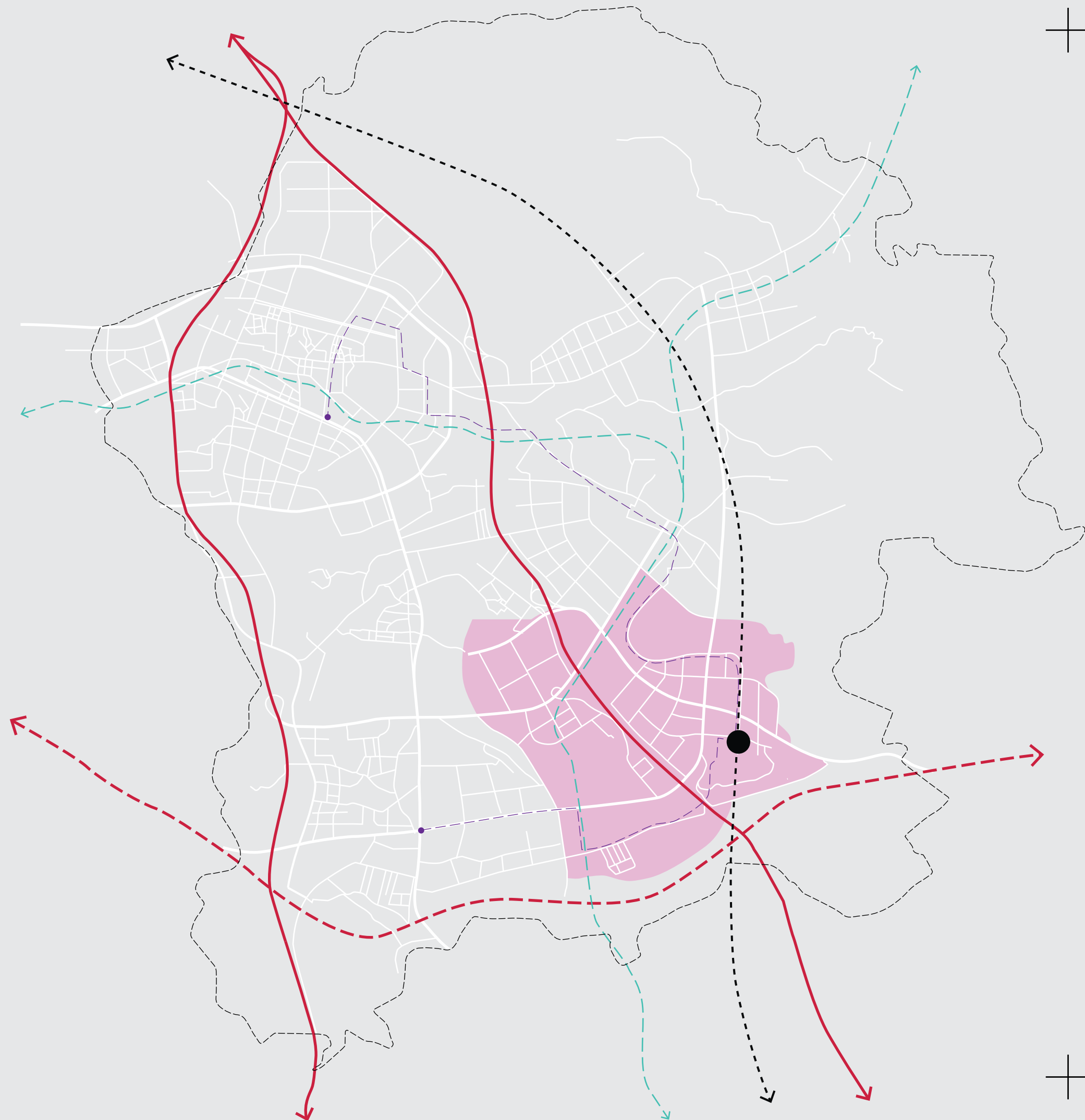
Guangming Eco-city Scale

_TYPOLOGY

_FUNCTION



- highway
- highway (planned)
- GZ-SZ HK high-spped railway
- metro line 6 (planned)
- tram line (long-term planned)





POSITION

TYPOLOGY

Overview Urban and Natural System
Pilot Area Scale

FUNCTION

+

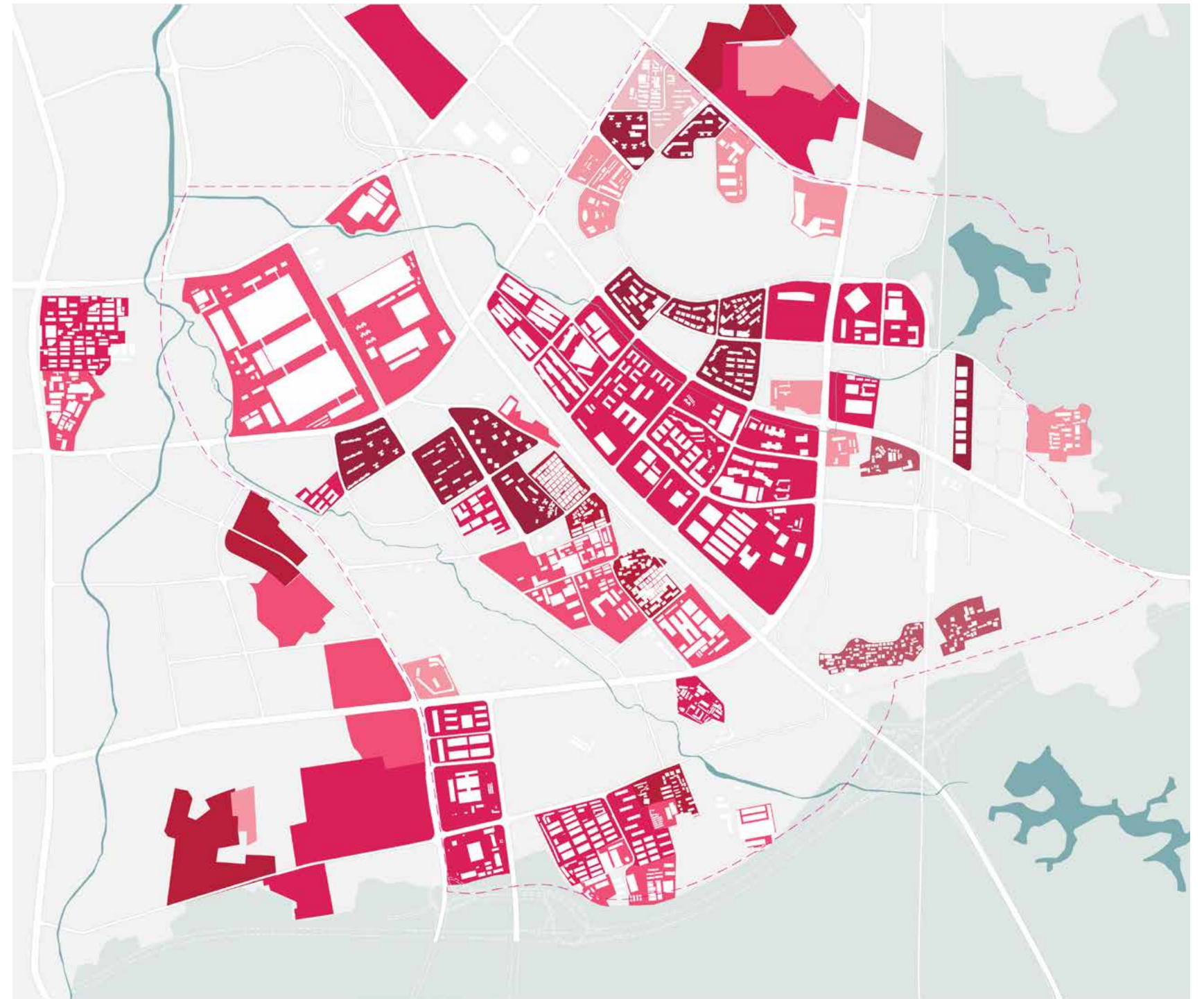
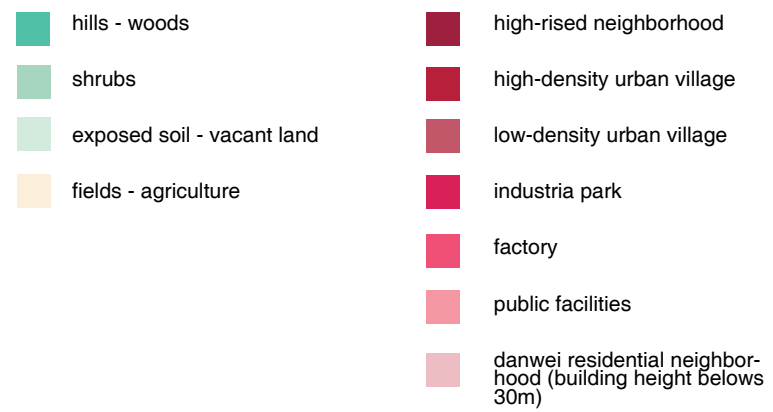
POSITION

TYPOLGY

Overview Urban and Natural System

Pilot Area Scale

FUNCTION





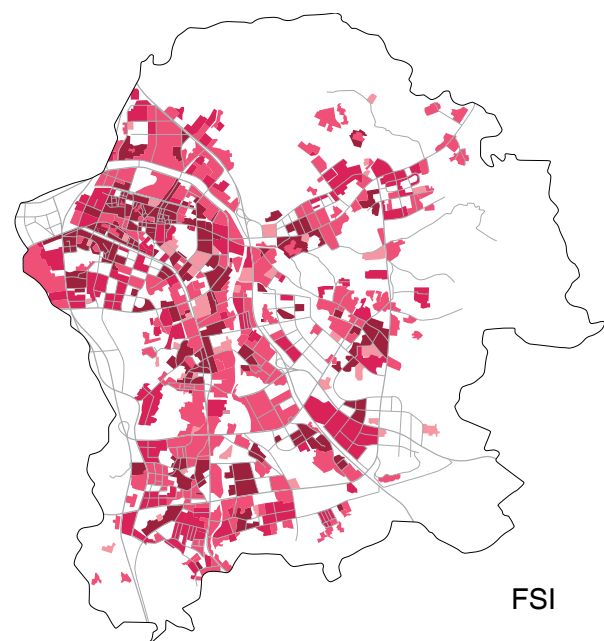
_POSITION

_TYPOLOGY

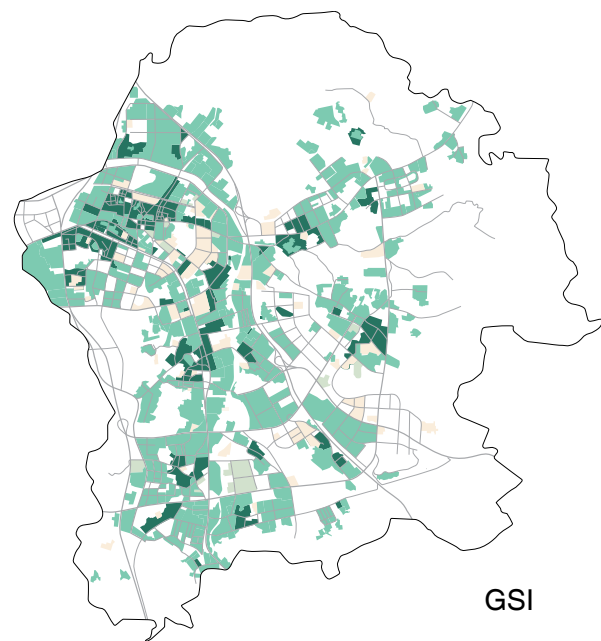
Surface

Built-up Area

_FUNCTION

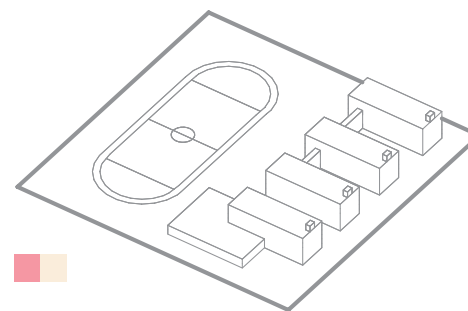


FSI



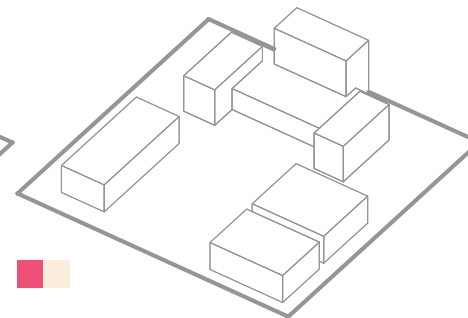
GSI

Education Facility



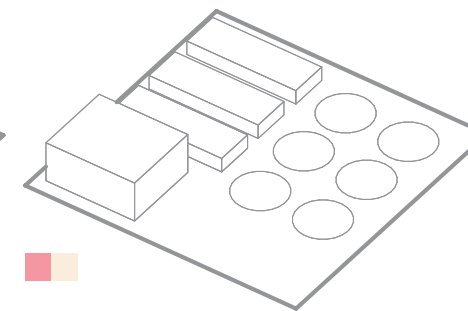
FSI: <2.0
GSI: <30%
Opportunity: providing public sports facilities

Administrative Facility



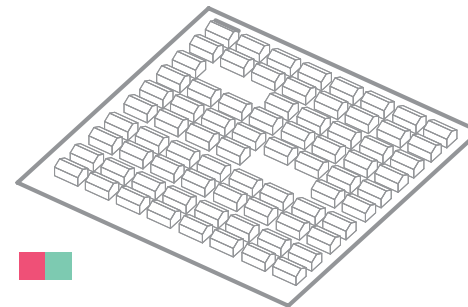
FSI: 2.0-3.0
GSI: <30%
Opportunity: retrofitting open space or public space for the public

Public Facility



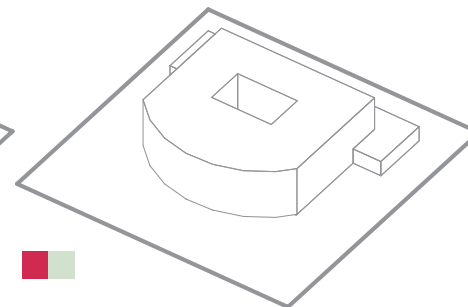
FSI: <2.0
GSI: <30%
Opportunity: retrofitting space for more infiltration/retention area

Urban Village (low density)



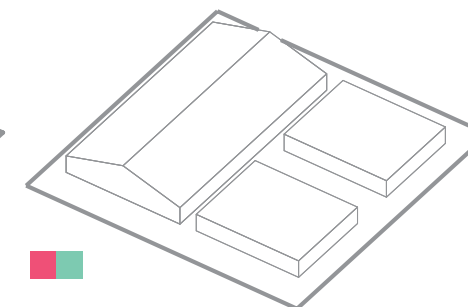
FSI: 3.0-4.0
GSI: 50%-70%
Opportunity: providing public space with ecological functions, increase quality of the environment

Commercial Center



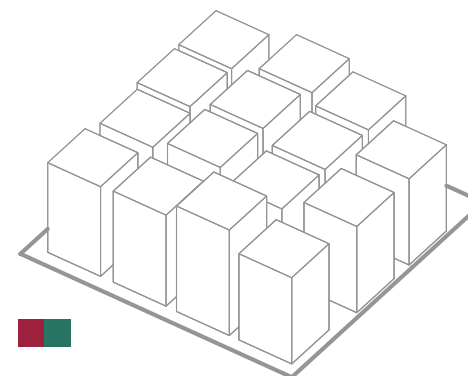
FSI: >4.0
GSI: 30%-50%
Opportunity: retrofitting open space for public use and ecological functions

Factory



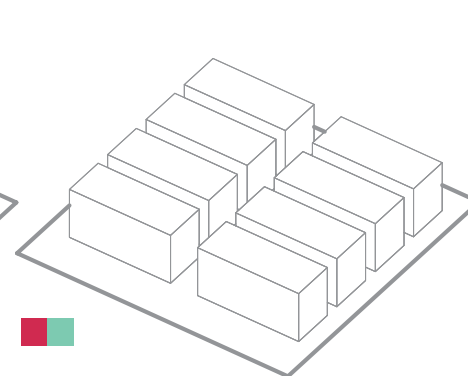
FSI: 2.0-3.0
GSI: 50%-70%
Opportunity: retrofitting open space for ecological functions; upgrading buildings for ecological functions

Urban Village (high density)



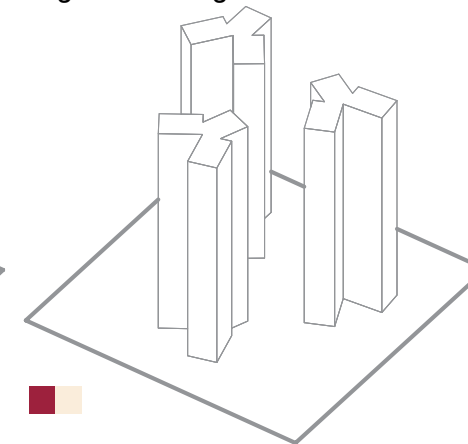
FSI: >4.0
GSI: >70%
Opportunity: providing drainage facilities and essential infrastructure

Industrial Park



FSI: 3.0-4.0
GSI: 50%-70%
Opportunity: upgrading buildings for ecological functions; retrofitting open space

High-rised Neighborhood



FSI: >4.0
GSI: <30%
Opportunity: retrofitting open space for retention/public functions/food provision





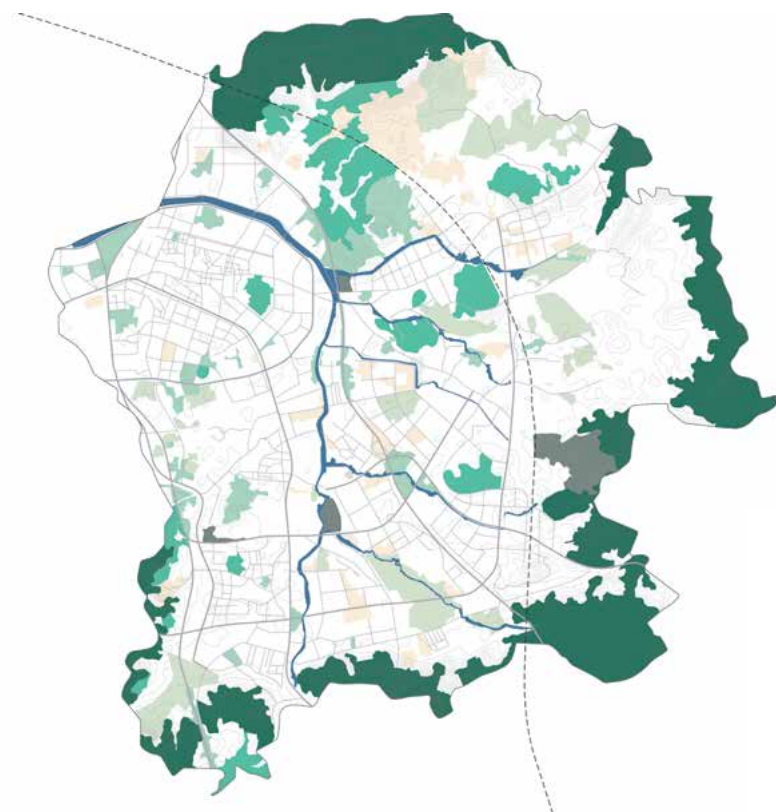
_POSITION

_TYPOLOGY

Surface

Unbuilt Area

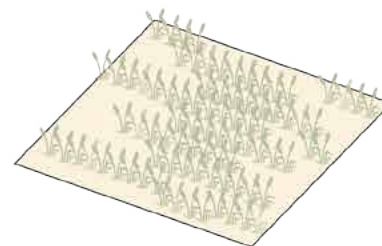
_FUNCTION



- forrest
- wetland
- field
- woodland
- shrubs
- grass



Field (corpland)



paddy field



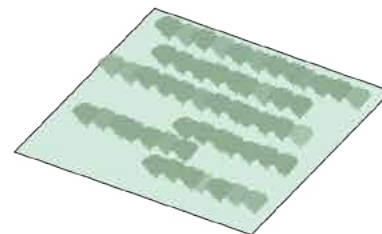
glebe field



vegetable field



Orchard



mulberry orchard



fruit orchard



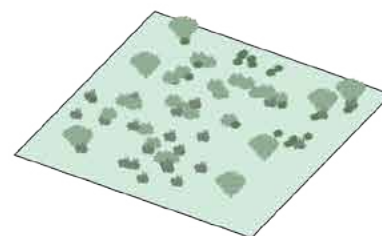
rea orchard



rubber tree orchard



Shrubs



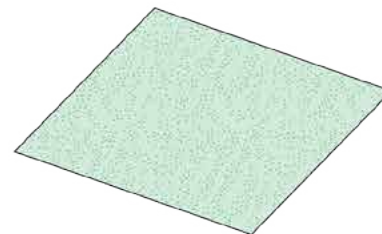
open-scrubs



closed-scrubs



Grassland



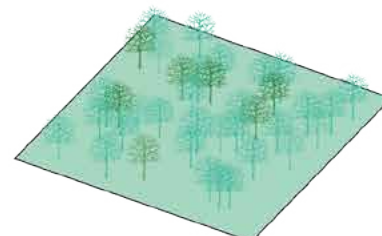
man-made lawn



natural grass



Woodland



bamboo



bush forest



woodland in protection area





_POSITION

_TYPOLOGY

Line
Overview

_FUNCTION

- hybrid type A_ Longda highway corridor
- hybrid type B_ high-speed railway corridor
- river corridor
- infrastructure type A_main road
- infrastructure type B_secondary road
- infrastructure type C_neighborhood road
- infrastructure type D_urban village road



+

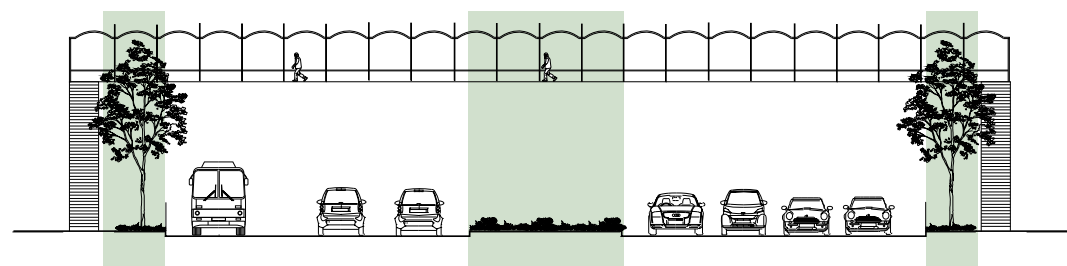
_POSITION

_TYPOLOGY

Line

Infrastructure

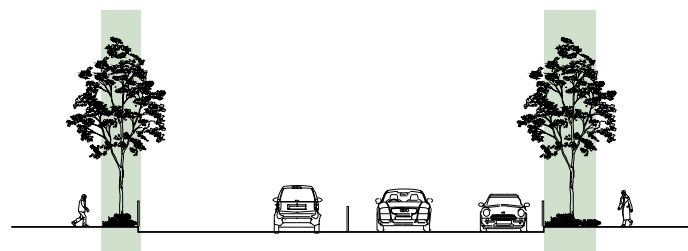
_FUNCTION



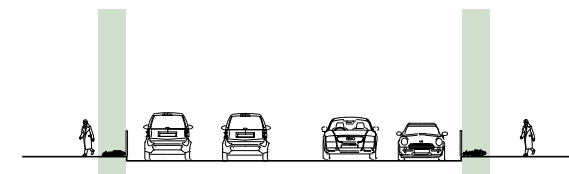
Infrastructure_type A



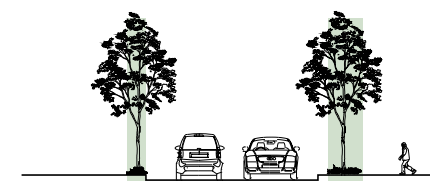
Infrastructure_type B1



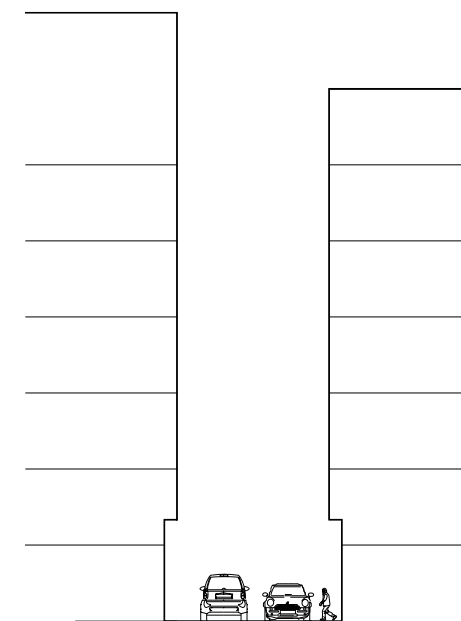
Infrastructure_type B2



Infrastructure_type C1



Infrastructure_type C2



Infrastructure_type D

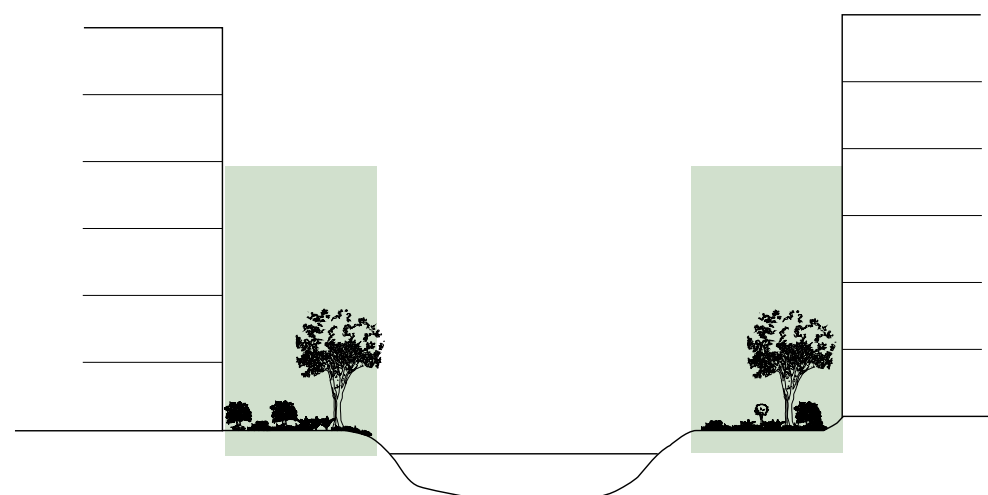
+



_POSITION
_TYPOLOGY
Line
River Corridor
_FUNCTION



Corridor_type A_Maozhou River



Corridor_type B_Maozhou River / Ejing River



Corridor_type C_Dongkeng River





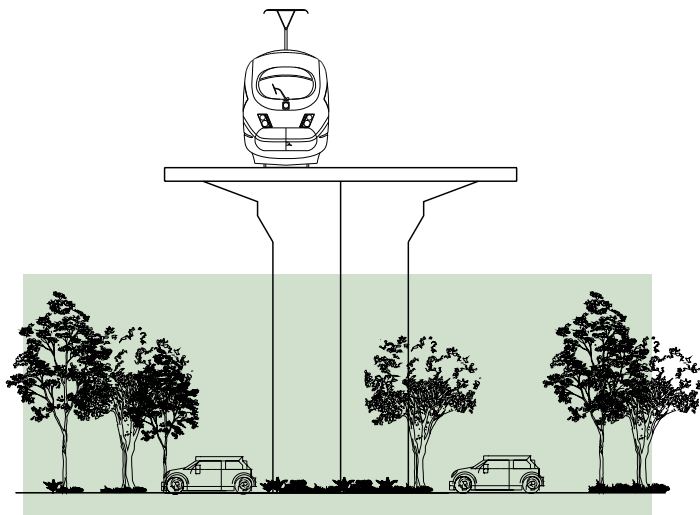
_POSITION

_TYPOLOGY

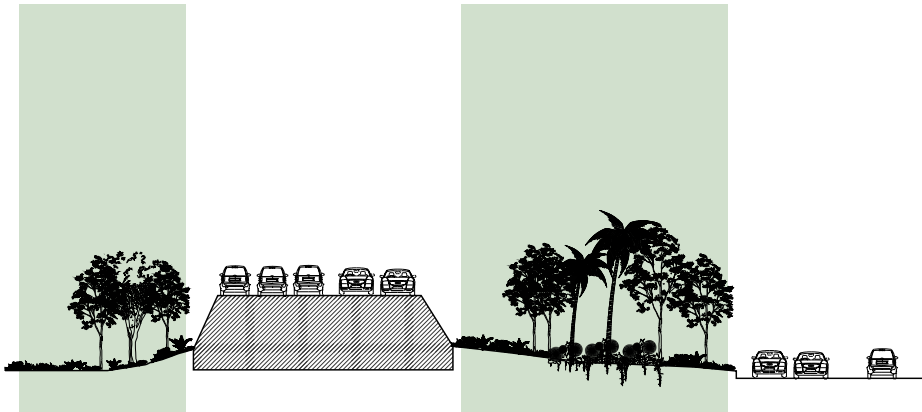
Line

Hybrid

_FUNCTION



Hybrid_type A_High-speed Railway

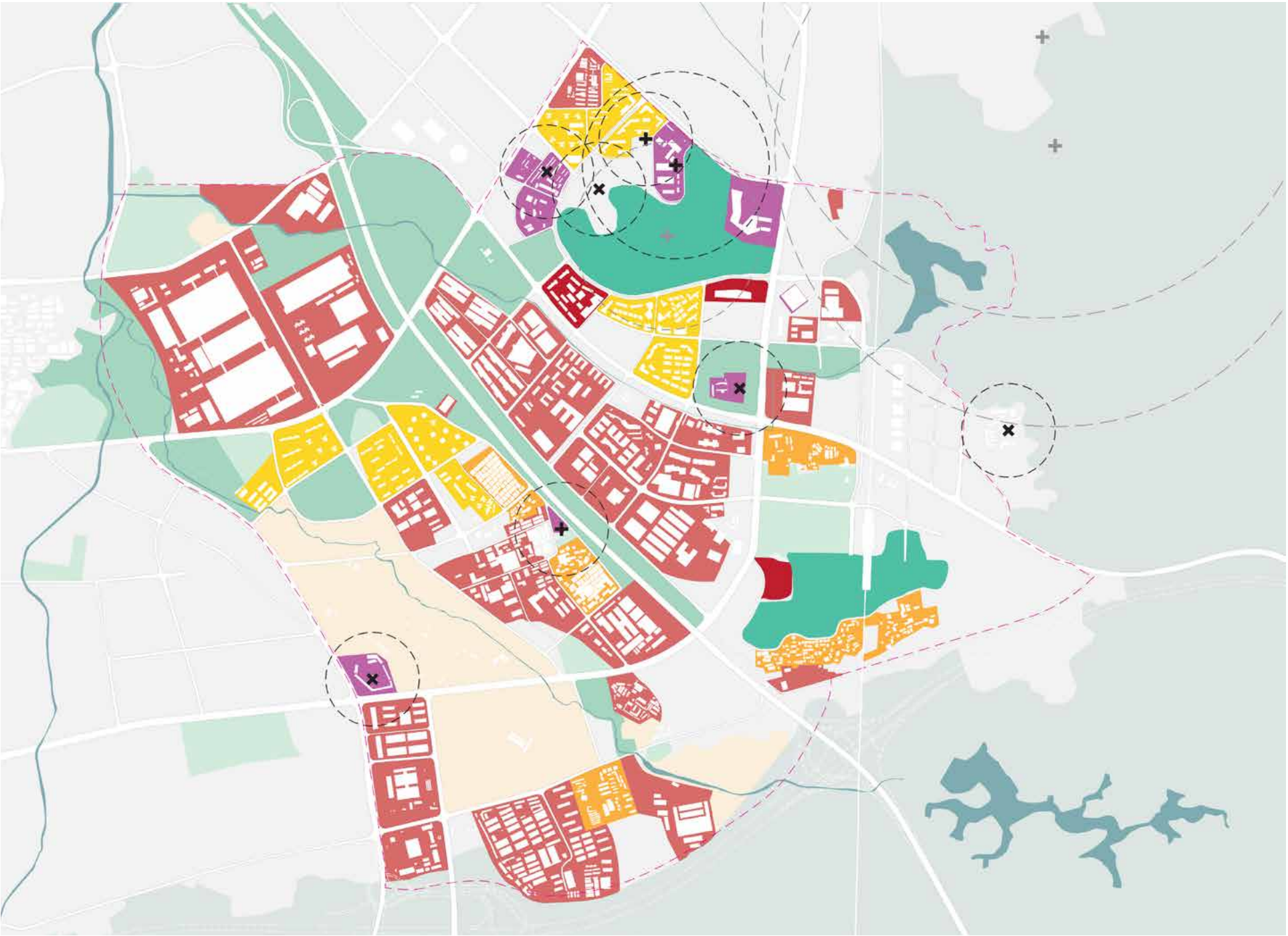
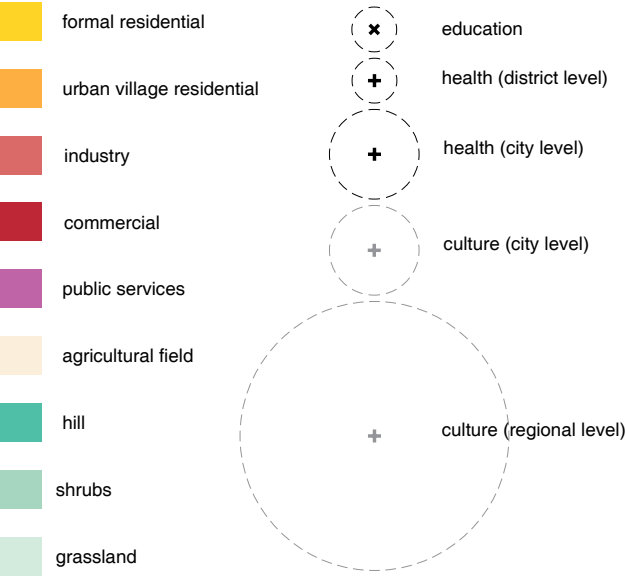


Hybrid_type B_Longda Highway





_POSITION
_TYPOLOGY
_FUNCTION
Urban Facilities
Land Use








_POSITION

_TYPOLOGY

_FUNCTION

Public Space Functions +
Society

-  high accessibility to urban facilities and green areas
-  medium accessibility to urban facilities and green areas
-  low accessibility to urban facilities and green areas



Spatial Opportunity Projects

1

2

3

4

11

7

6

13

9

5

10

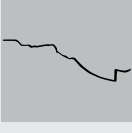
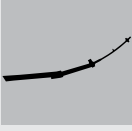
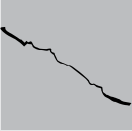
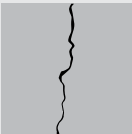
8

12

1. Maozhou River/Riverfront Urban Design
2. Huangxing Park Design
3. Ejing River/Riverfront Restoration
4. Guangming Green Gate Park Design
5. Guangqiao Road Retrofitting
6. Urban Farmland Re-development
7. Tangjia Urban Village Street Re-design
8. Guangming New Town Park + Biyan Reservoir Park Design
9. Dongkeng River Water Quality Improvement
10. Guangming Railway Station District Urban Design
11. Longda Highway Stormwater Boulevard Urban Design
12. Changzhen Village Retention Pond
13. Guangming Cultural Center + Park Road Retrofitting Design



_Projects Overview



No.	Name	Project Level	Area	Landscape Agency	Ecosystem Services Bundle (Goal)	Major Stakeholders	Urgency
01	Maozhou River/Riverfront Urban Design	City Level	length 31 km catchment area 388 km2	Corridor	Water safety + Water purification + Symbolic value + Outdoor recreation + Food provision + Biodiversity support	GMNTDC + BWRSZ + Land owners along the riverfront	++++
02	Huangxing Park Design	District Level	56 ha	Patch	Water safety + Water purification + Runoff retention + Symbolic value + Outdoor recreation + Food provision + Fiber/wood provision + Education value + Carbon storage	GMNTDC + BWRSZ + AAFFSZ +TCSZ + CSOT + UV Jiazitang	++
03	Ejing River/Riverfront Restoration	District Level	length 9 km catchment area 22.28 km2	Corridor	Runoff retention + Water purification + Outdoor recreation + Cooling + Noise reduction	GMNTDC + BWRSZ + TCSZ +Land owners along the riverfront	++++
04	Guangming Green Gate Park Design	District Level	16 ha	Patch	Symbolic value + Runoff retention + Outdoor recreation + Noise reduction + Carbon storage	GMNTDC + TCSZ + UPLRCSZ + Kangjia Group	+++
05	Guangqiao Road Retrofitting	City Level	17 ha	Corridor	Runoff retention + Water purification	GMNTDC + BWRSZ + TCSZ	+++
06	Urban Farmland Re-development	City Level	200ha	Patch	Food provision + Outdoor recreation + Symbolic value + Education value	GMNTDC + UPLRCSZ + UV Tangjia + UV Hongao + Sun Yat-Sen University	++
07	Tangjia Urban Village Street Re-design	Neighborhood Level	6ha	Corridor	Runoff retention + Outdoor recreation + Education value	GMNTDC + UPLRCSZ + UV Tangjia	+
08	Guangming New Town Park + Biyan Reservoir Park Design	City Level	134ha	Patch	Runoff retention + Outdoor recreation + Education value + Symbolic Value + Noise reduction + Cooling + Carbon storage + Fresh water provision	GMNTDC + BWRSZ + AAFFSZ +TCSZ + CSOT + OCT Loft + GRC	++
09	Dongkeng River Water Quality Improvement	City Level	length 2.4 km catchment area 10 km2	Corridor	Outdoor recreation + Water Purification	GMNTDC + BWRSZ + Land owners along the riverfront	+++
10	Guangming Railway Station District Urban Design	City Level	54ha	Patch	Outdoor recreation + Symbolic Value + Noise reduction + Cooling + Carbon storage + Biodiverstiy support	GMNTDC + AAFFSZ +TCSZ + CSOT + OCT Loft + GRC + CMG	+++
11	Longda Highway Stormwater Boulevard Urban Design	City Level	108ha	Corridor	Runoff retention + Outdoor recreation + Education value + Symbolic Value + Noise reduction + Cooling + Carbon storage	GMNTDC + BWRSZ + TCSZ + Land owners along the highway	+++
12	Changzhen Village Retention Pond	Neighborhood Level	14ha	Patch	Runoff retention + Outdoor recreation	GMNTDC + BWRSZ + UV Changzhen	+
13	Guangming Cultural Center + Park Road Retrofitting Design	District Level	10ha	Corridor + Patch	Runoff retention + Water purification	GMNTDC + BWRSZ + UV Changzhen	+++



River Restoration
Project 1, 2, 3, 9

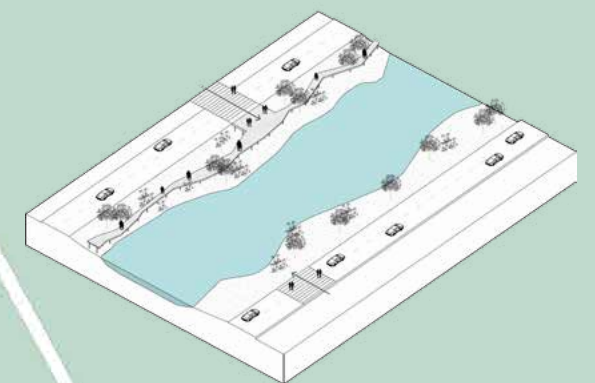
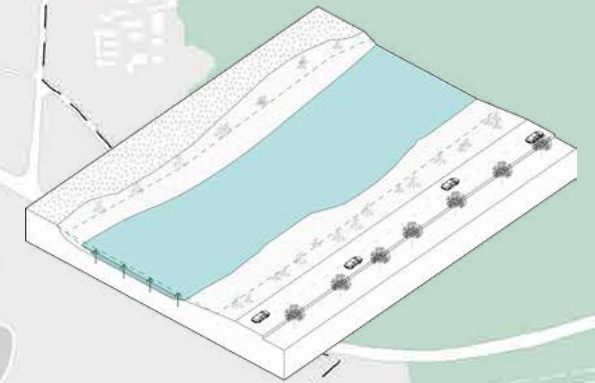
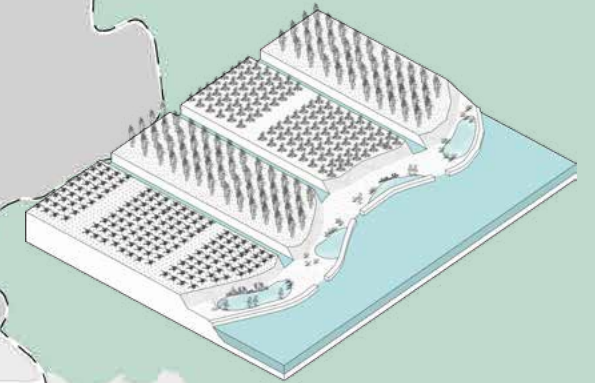
- 1.Maozhou River/Riverfront Urban Design
- 2.Huangxing Park Design
- 3.Ejing River/Riverfront Restoration
- 9.Dongkeng River Water Quality Improvement

1

2

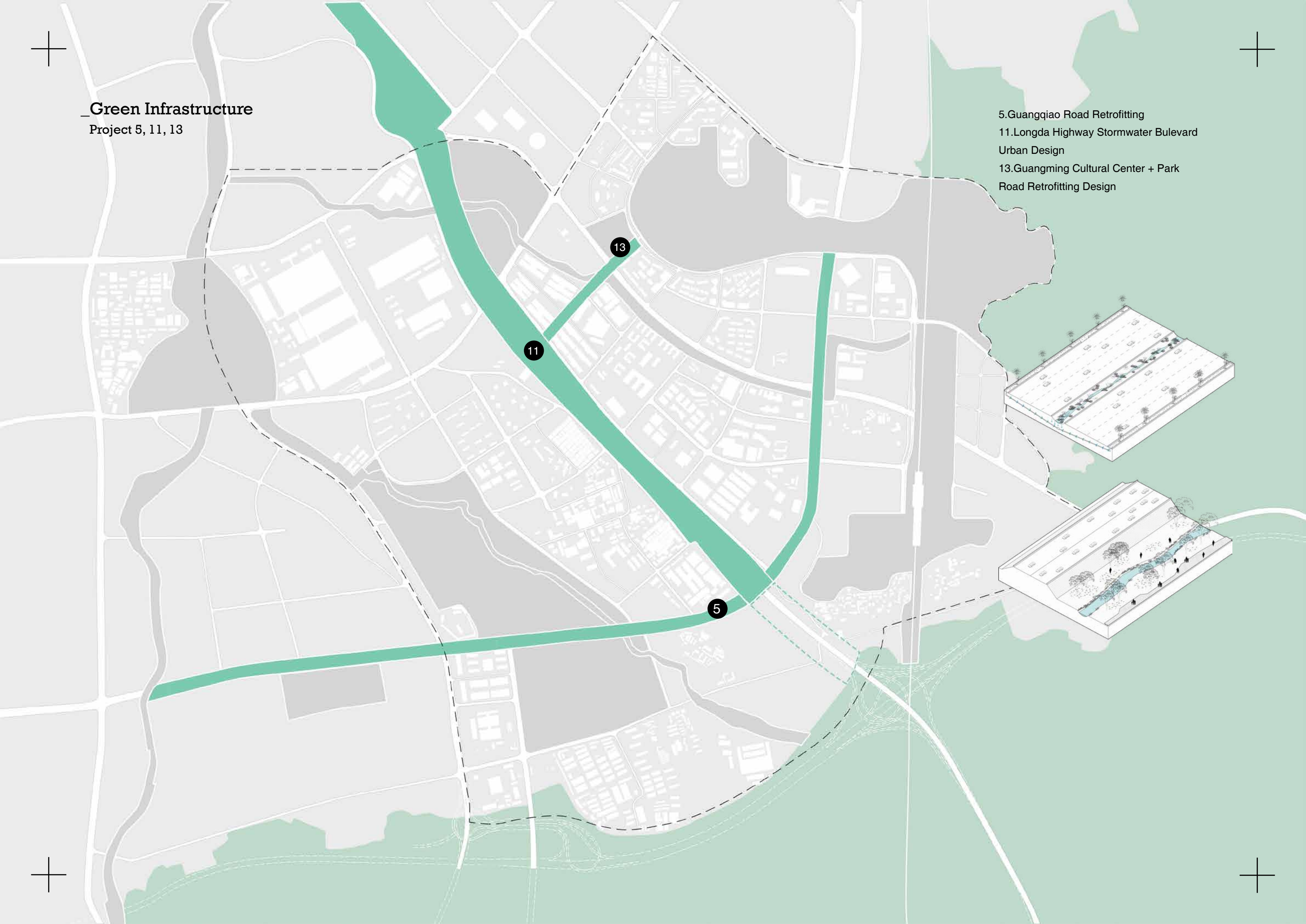
3

9



_Green Infrastructure
Project 5, 11, 13

5.Guangqiao Road Retrofitting
11.Longda Highway Stormwater Boulevard
Urban Design
13.Guangming Cultural Center + Park
Road Retrofitting Design



Agricultural Development

Project 2, 3, 6

2.Huangxing Park Design

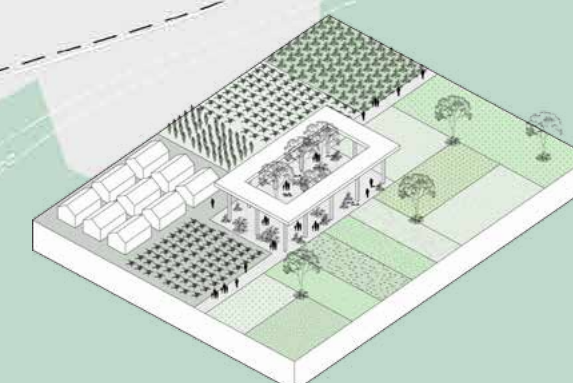
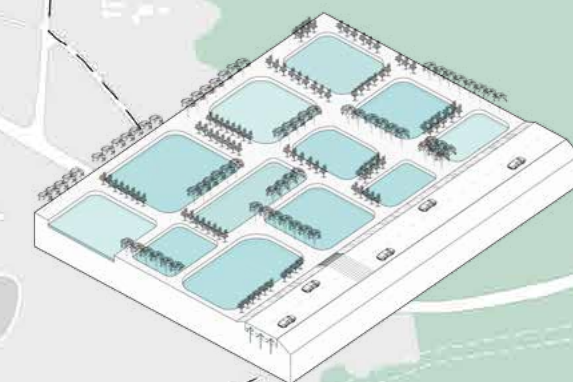
3.Ejing River/Riverfront Restoration

6.Urban Farmland Re-development

2

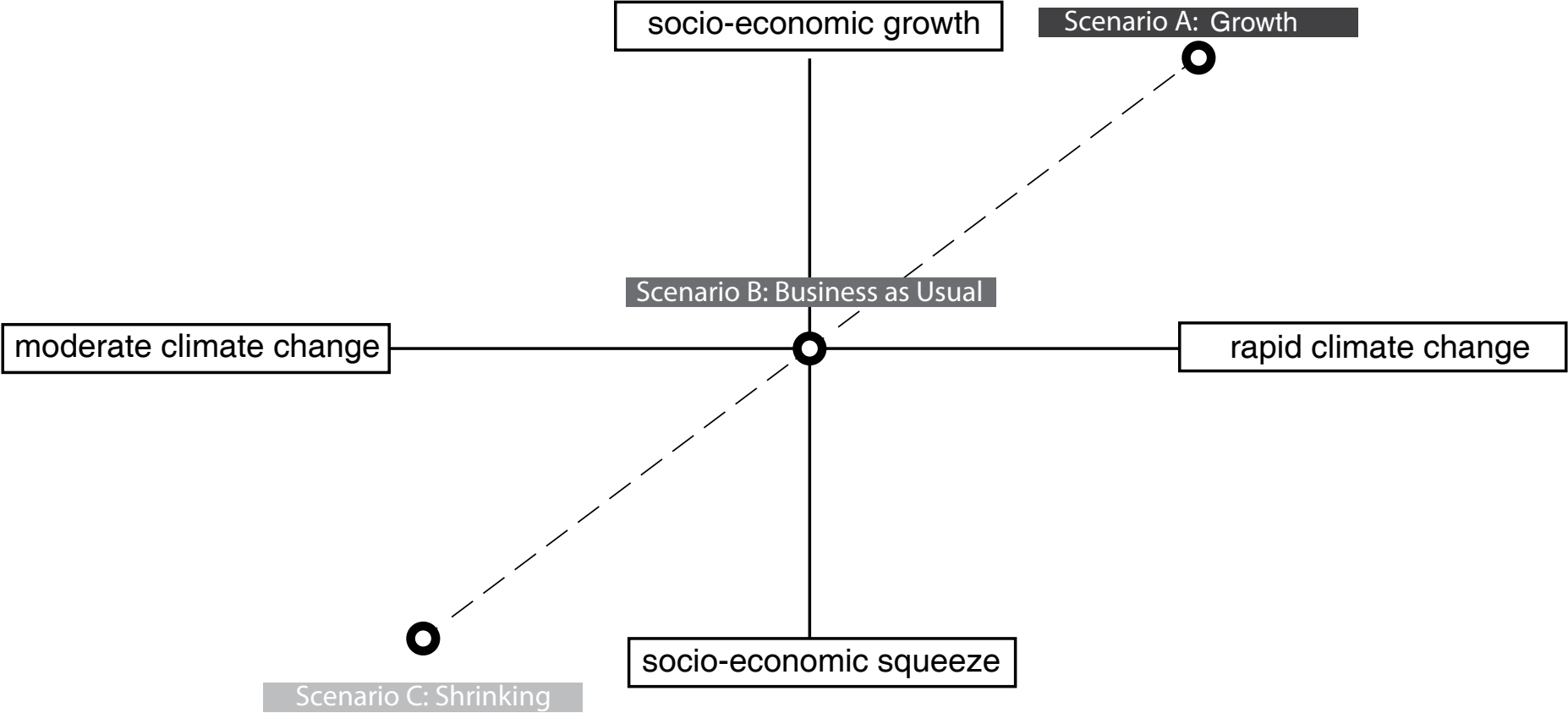
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6





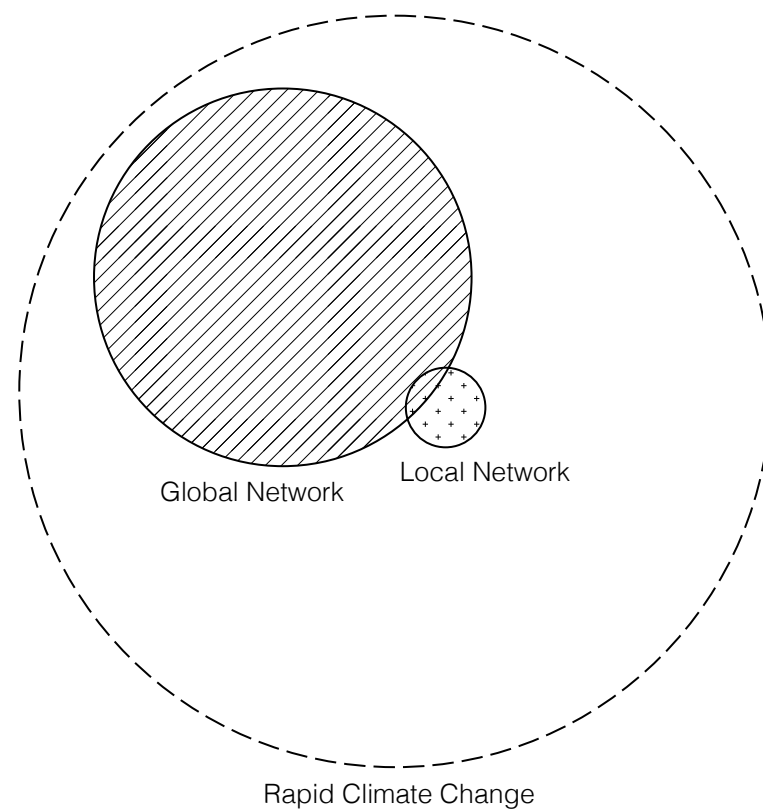
_Scenario



_Scenario Implications

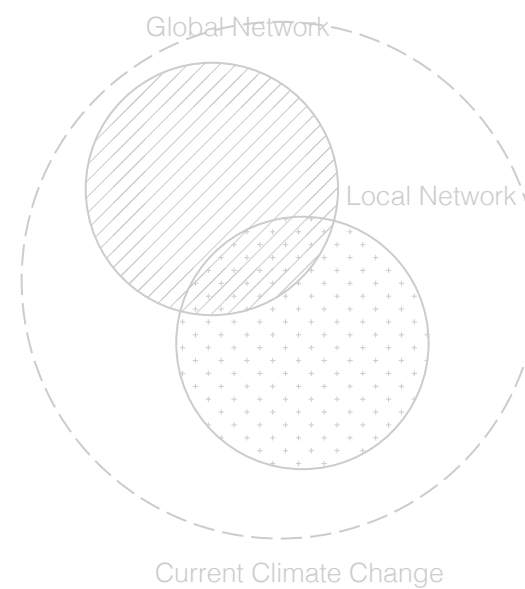
Scenario A: Growth

Socio-economic growth (indicates highly densed urban environment) and rapid climate change



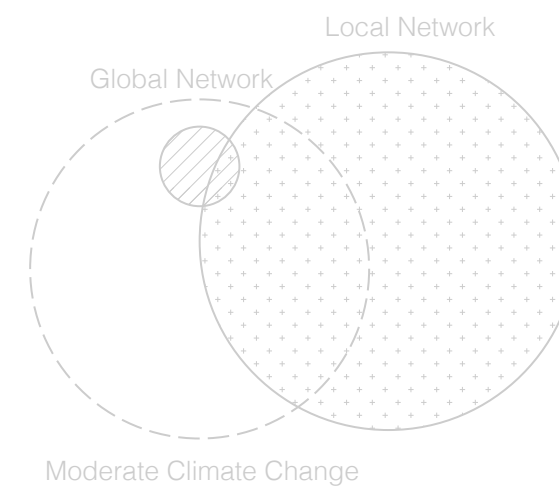
Scenario B: Business as Usual

Socio-economic and climate status stay nearly unchanged in the future. City is seeking new approach of development



Scenario C: Shrinking

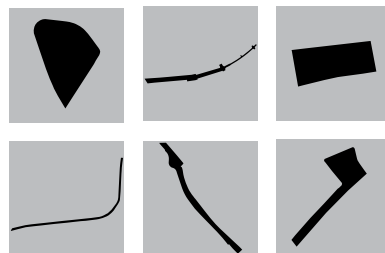
Socio-economic squeeze and moderate climate change. City is challenged by new definition of 'growth' and seeking new development approaches to increase the quality of life



_Scenario Growth

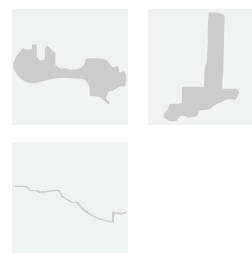
Scenario A: Growth

Socio-economic growth (indicates highly dense urban environment) and rapid climate change



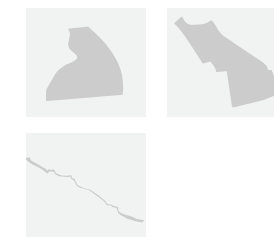
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_Scenario Growth

Scenario A: Growth

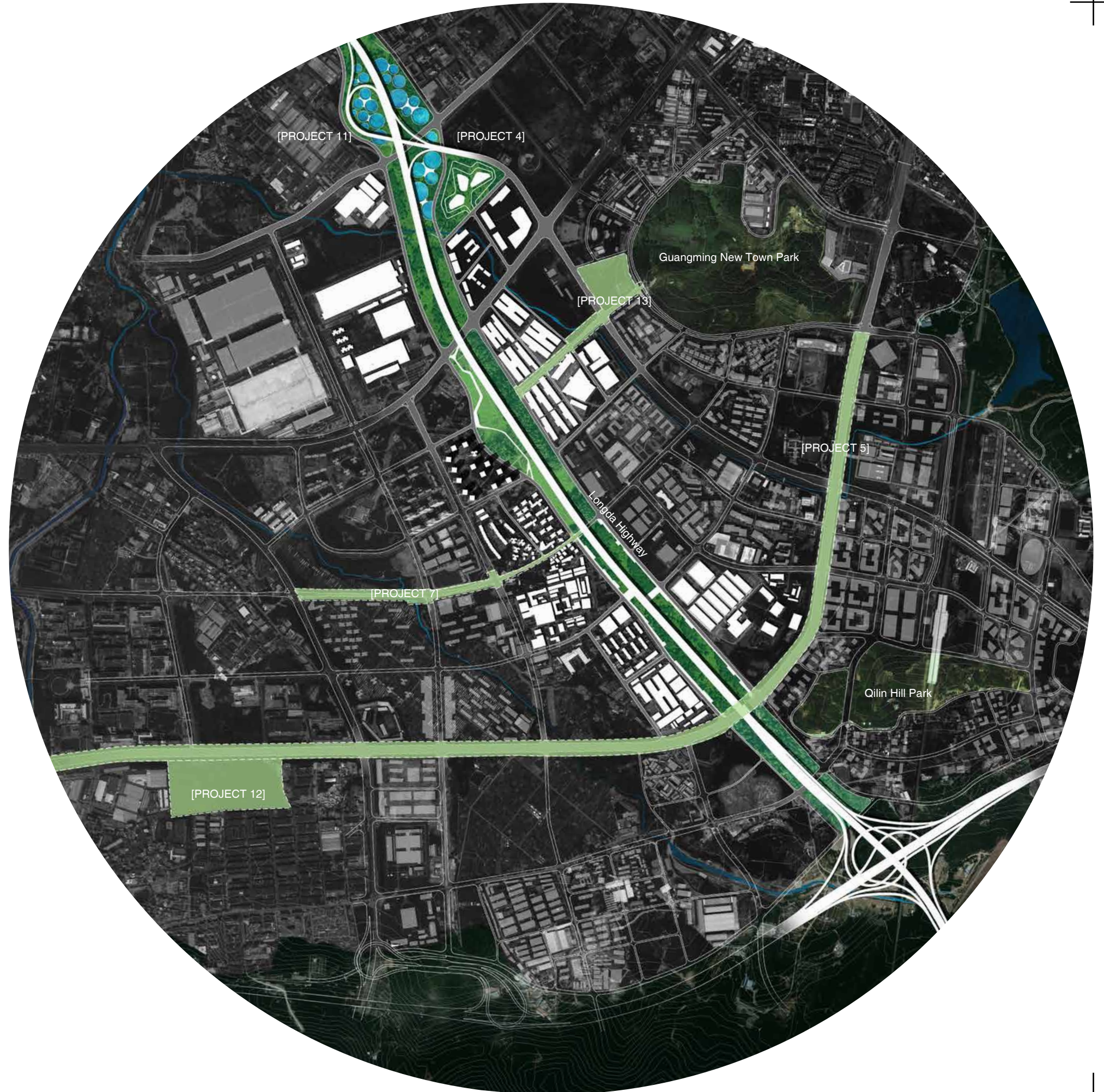
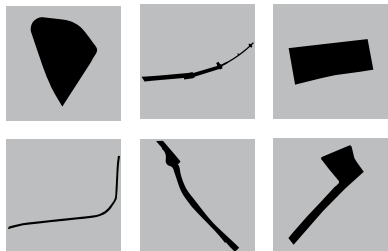
Socio-economic growth
(indicates highly densified urban
environment) and rapid climate
change

Strategy

Mitigation

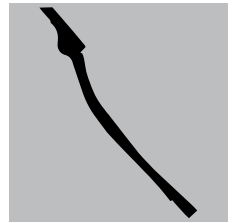
Spatial Interventions

Retrofitting Streets

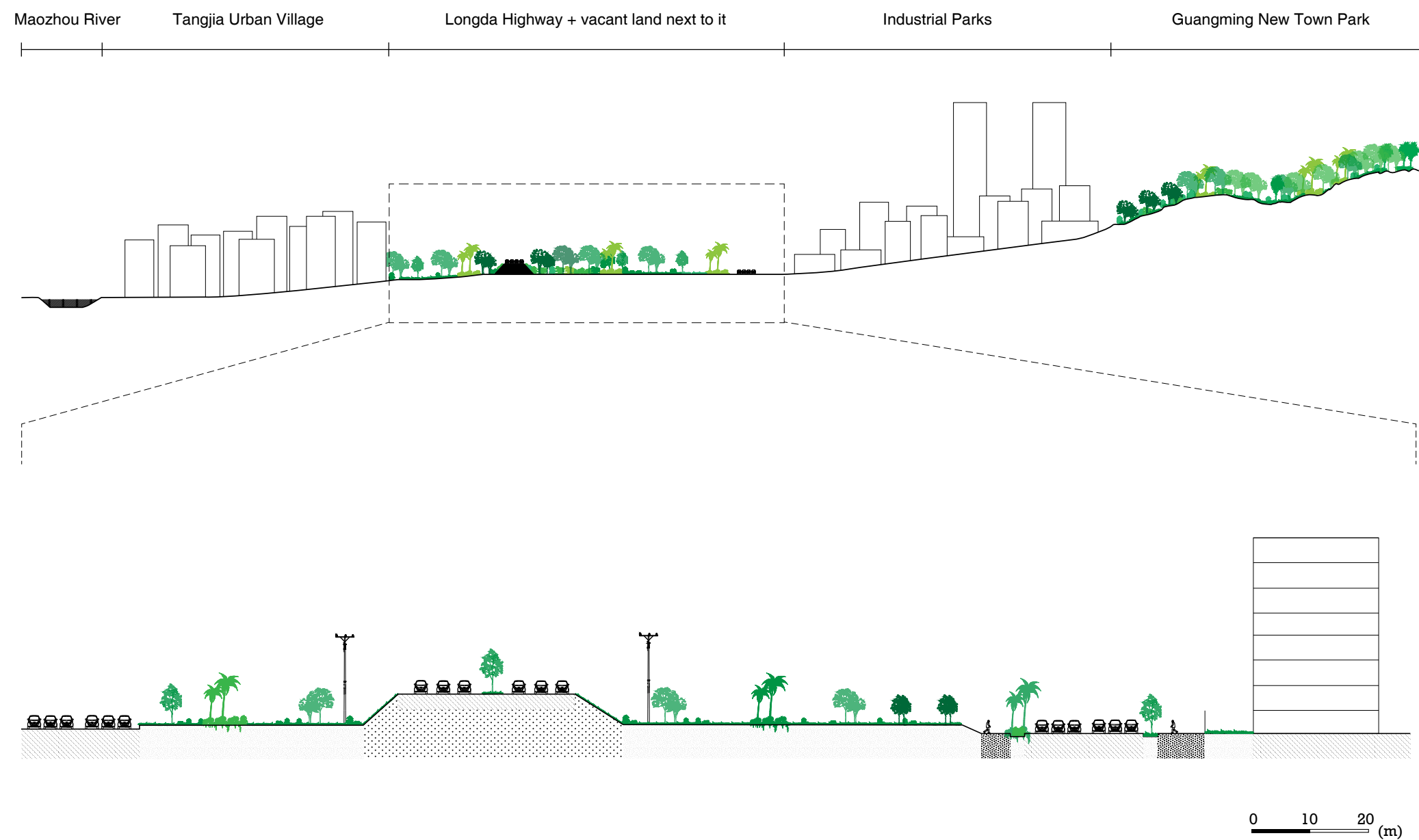


Scenario Growth

Longda Highway Stormwater Boulevard Project

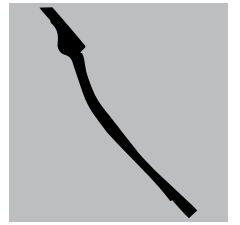


Current Situation

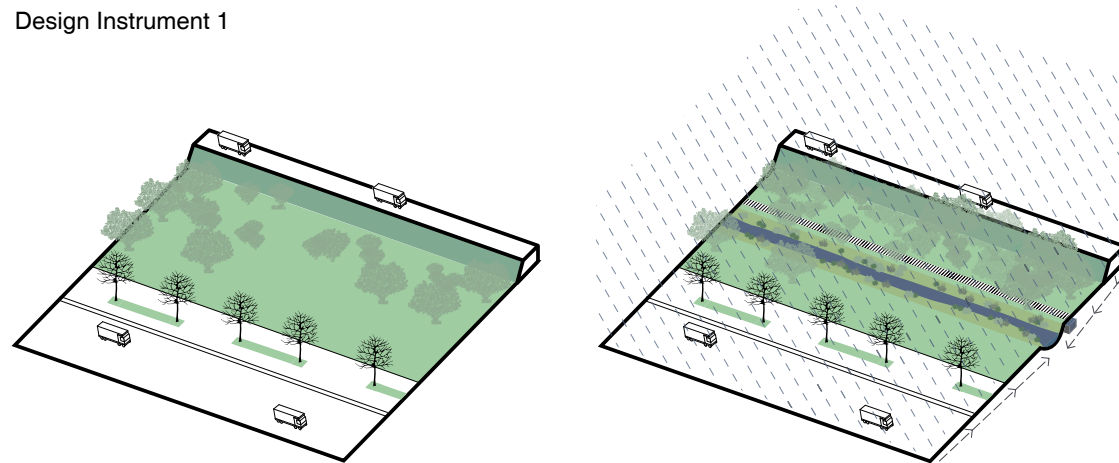


Scenario Growth

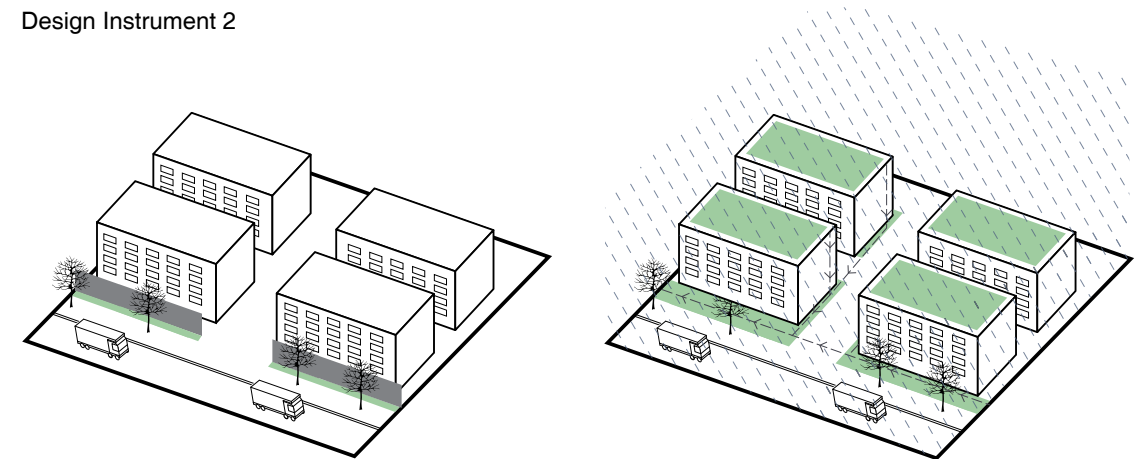
Longda Highway Stormwater Boulevard Project



Design Instrument 1



Design Instrument 2



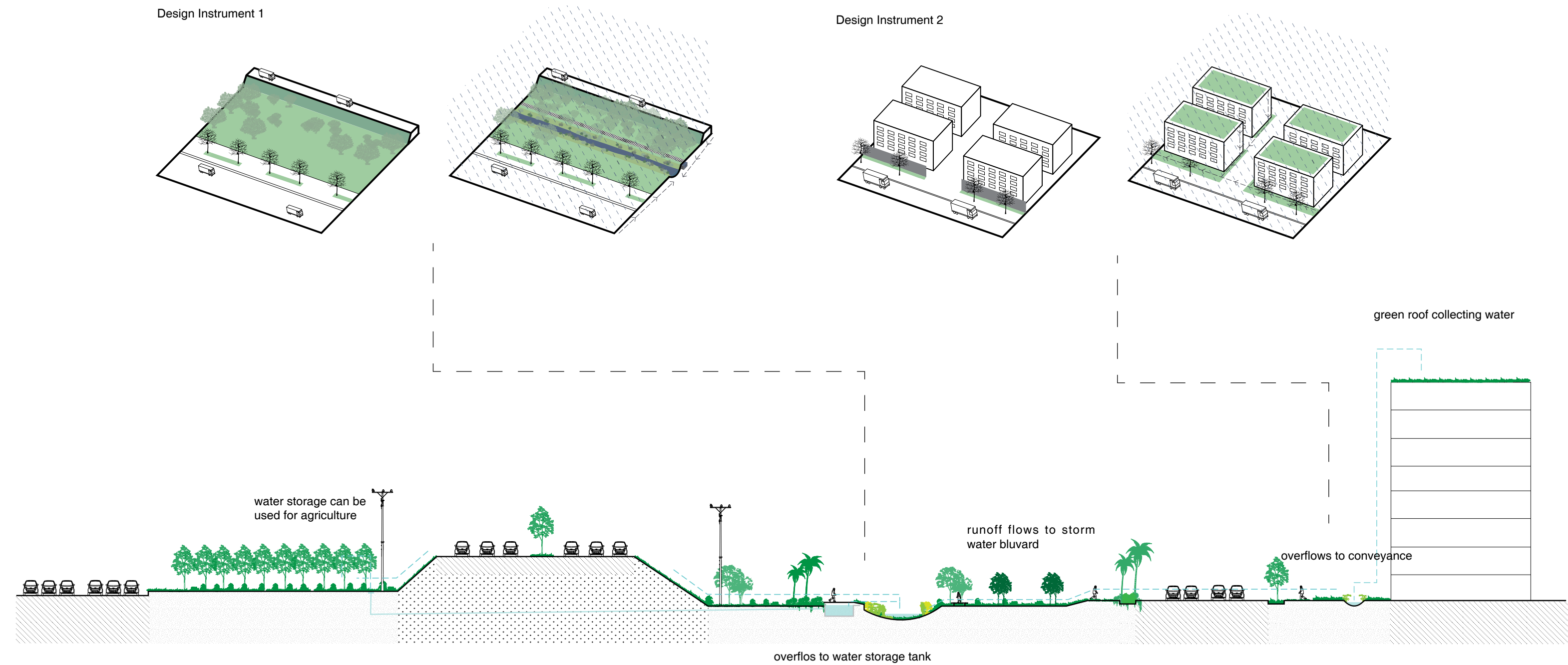
green roof collecting water

water storage can be
used for agriculture

runoff flows to storm
water bluvard

overflows to conveyance

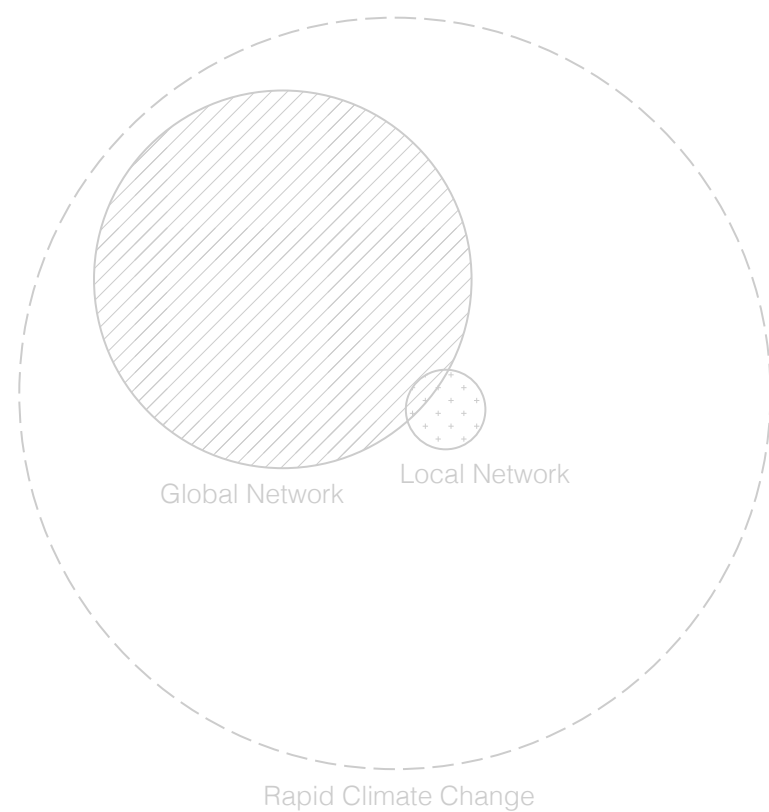
overflos to water storage tank



Scenario Implications

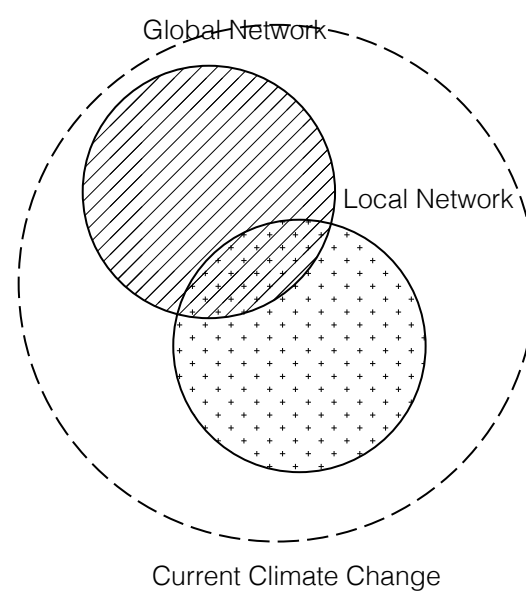
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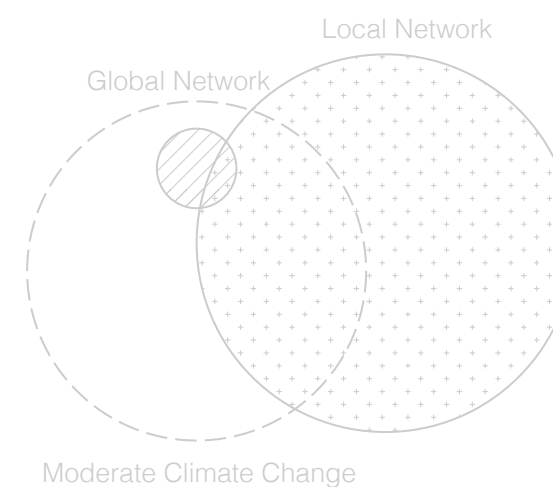
Scenario B: Business as Usual

Socio-economic and climate status stay nearly unchanged in the future. City is seeking new approach of development



Scenario C: Shrinking

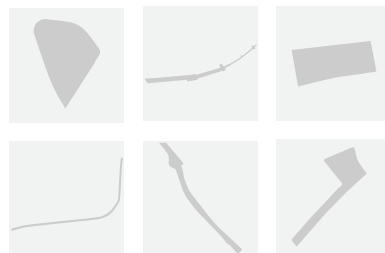
Socio-economic squeeze and moderate climate change. City is challenged by new definition of 'growth' and seeking new development approaches to increase the quality of life



_Scenario Business as Usual

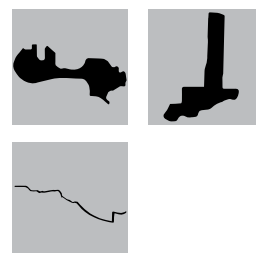
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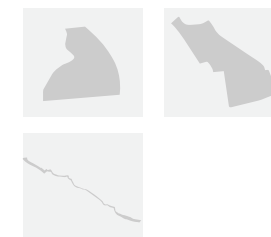
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Scenario Business as Usual

Scenario B: Business as Usual

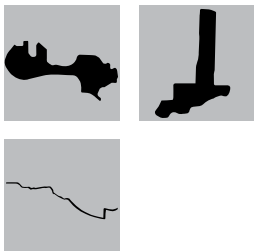
Socio-economic and climate status stay nearly unchanged in the future. City is seeking new approach of development

Strategy

Steering for Change

Spatial Interventions

Re-identify Public Space



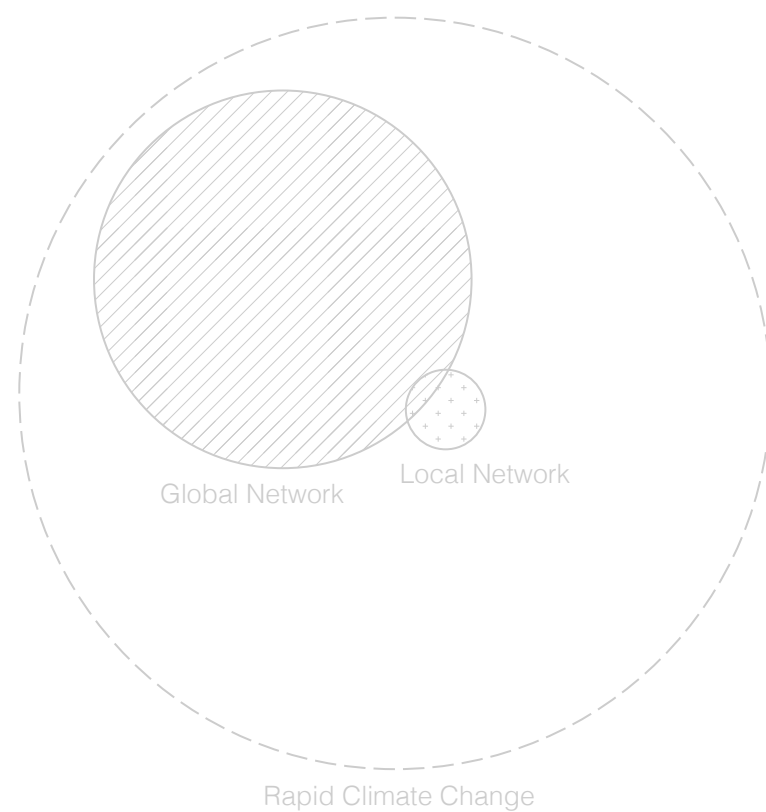




_Scenario Implications

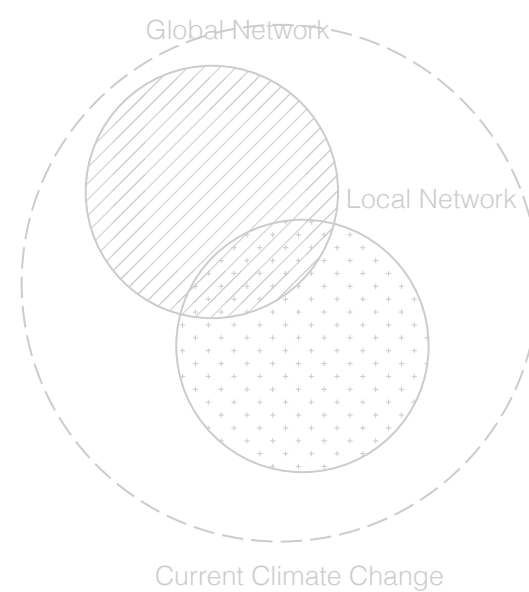
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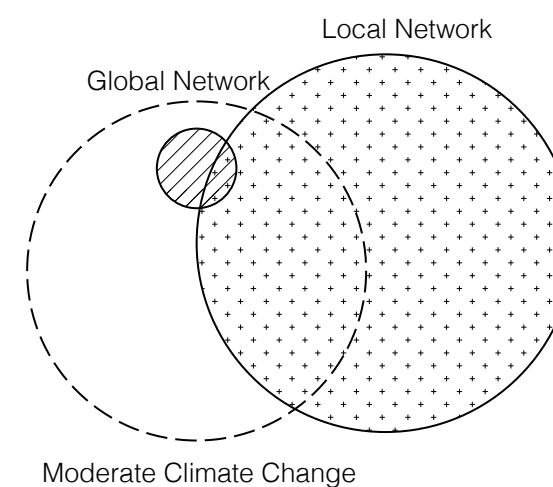
Scenario B: Business as Usual

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Scenario C: Shrinking

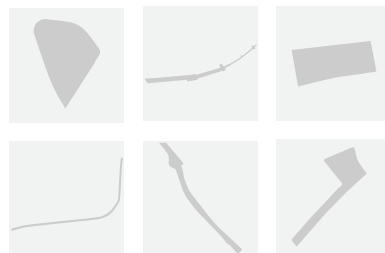
Socio-economic squeeze and moderate climate change. City is challenged by new definition of 'growth' and seeking new development approaches to increase the quality of life



_Scenario Shrinking

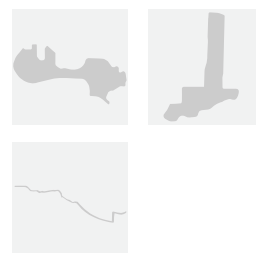
Scenario A: Growth

Socio-economic growth (indicates highly densed urban environment) and rapid climate change



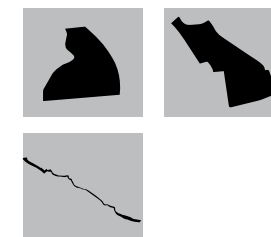
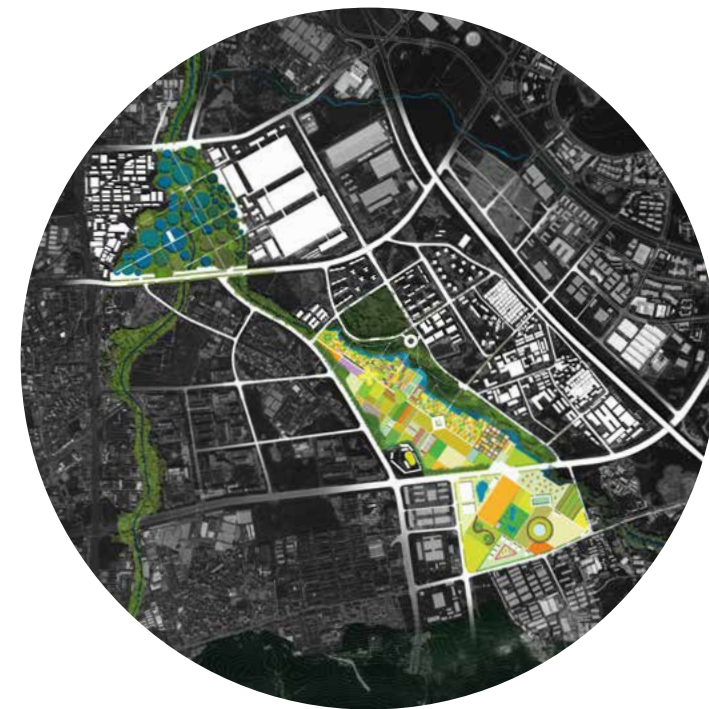
Scenario B: Business as Usual

Socio-economic and climate status stay nearly unchanged in the future. City is seeking new approach of development



Scenario C: Shrinking

Socio-economic squeeze and moderate climate change. City is challenged by new definition of 'growth' and seeking new development approaches to increase the quality of life



Scenario Shrinking

Scenario C: Shrinking

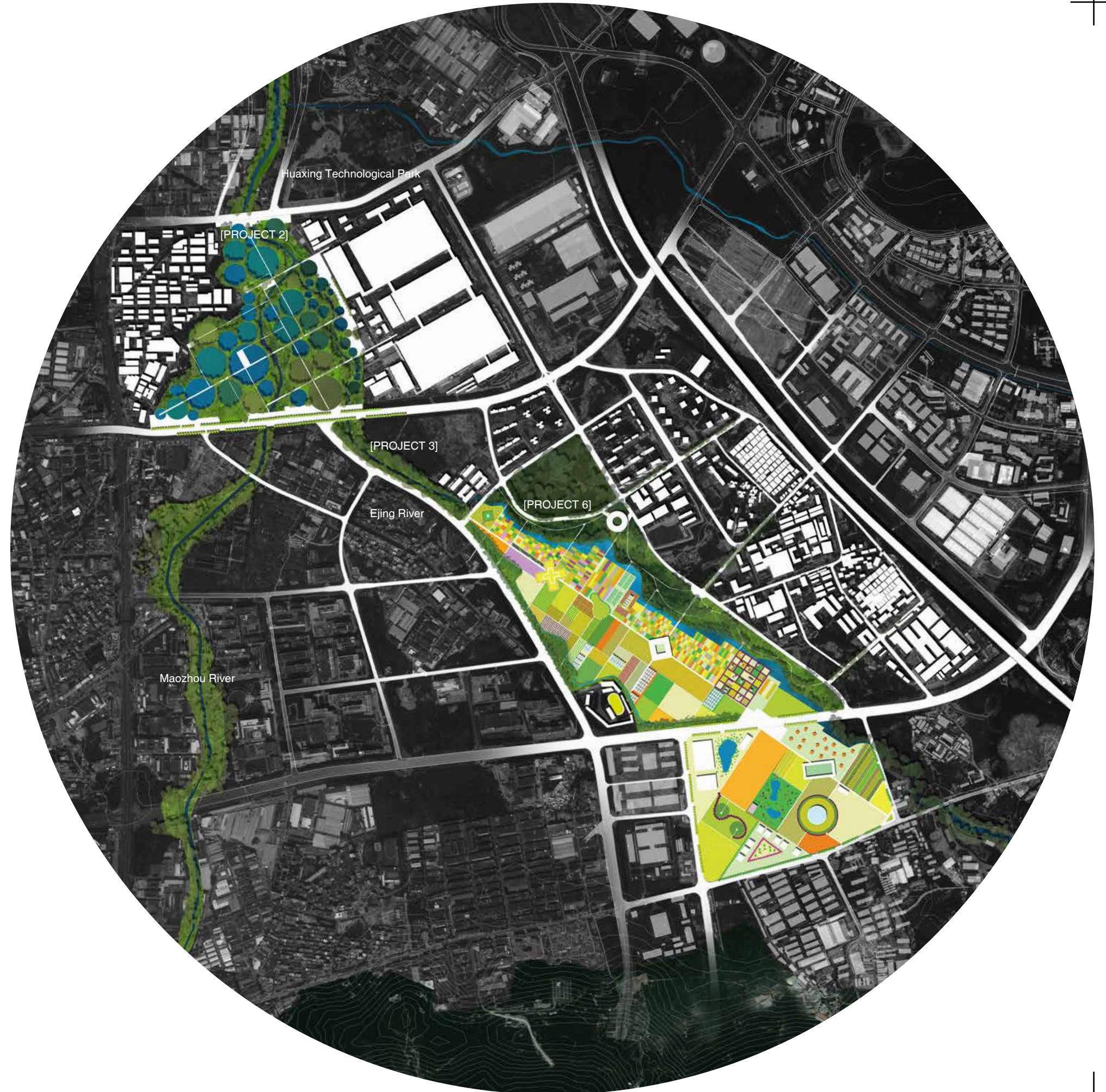
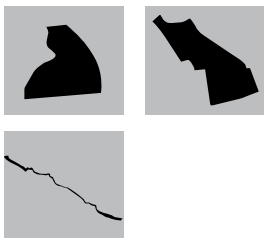
Socio-economic and climate status stay nearly unchanged in the future. City is seeking new approach of development

Strategy

Reclamation

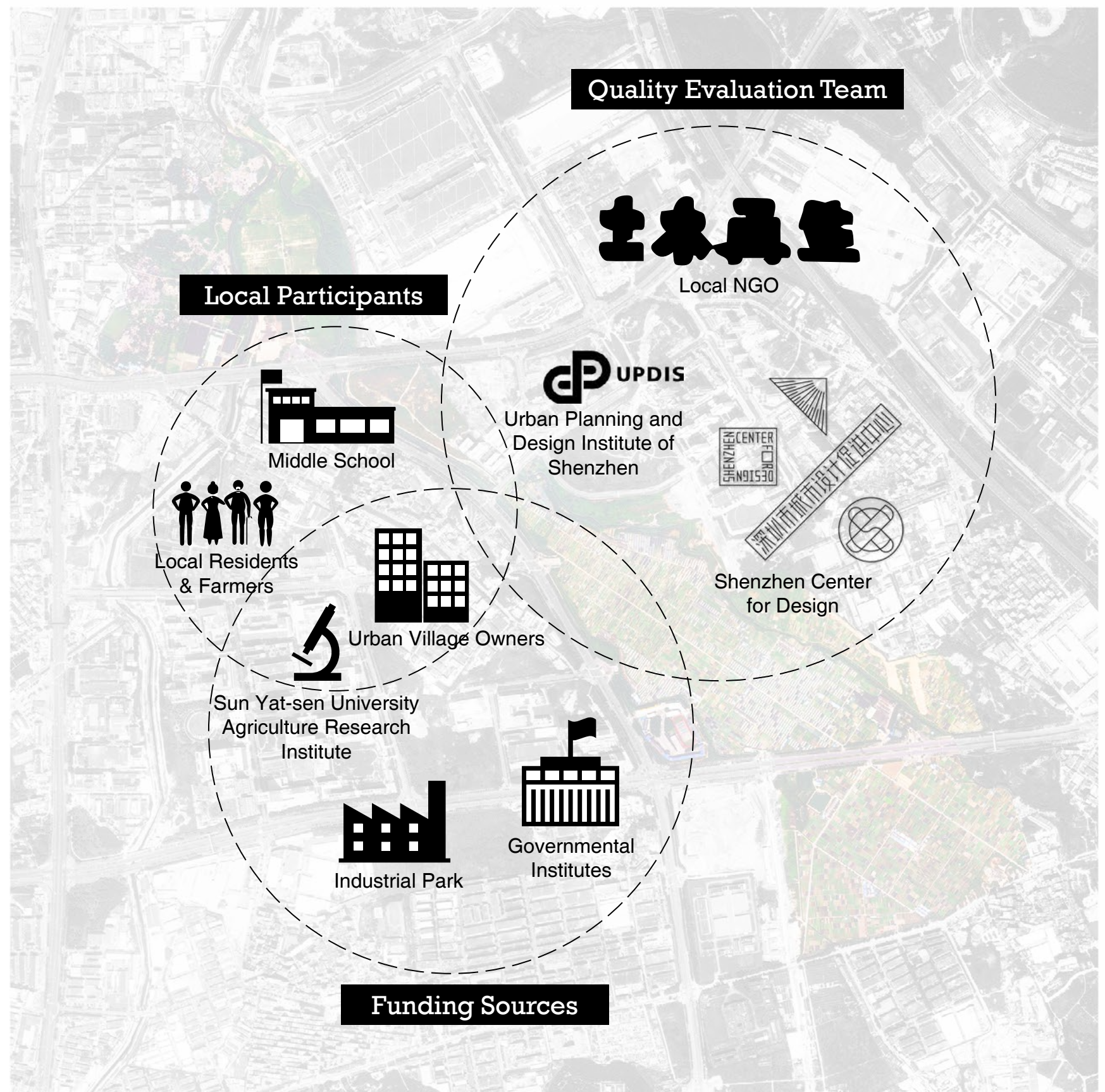
Spatial Interventions

Urban + Agriculture



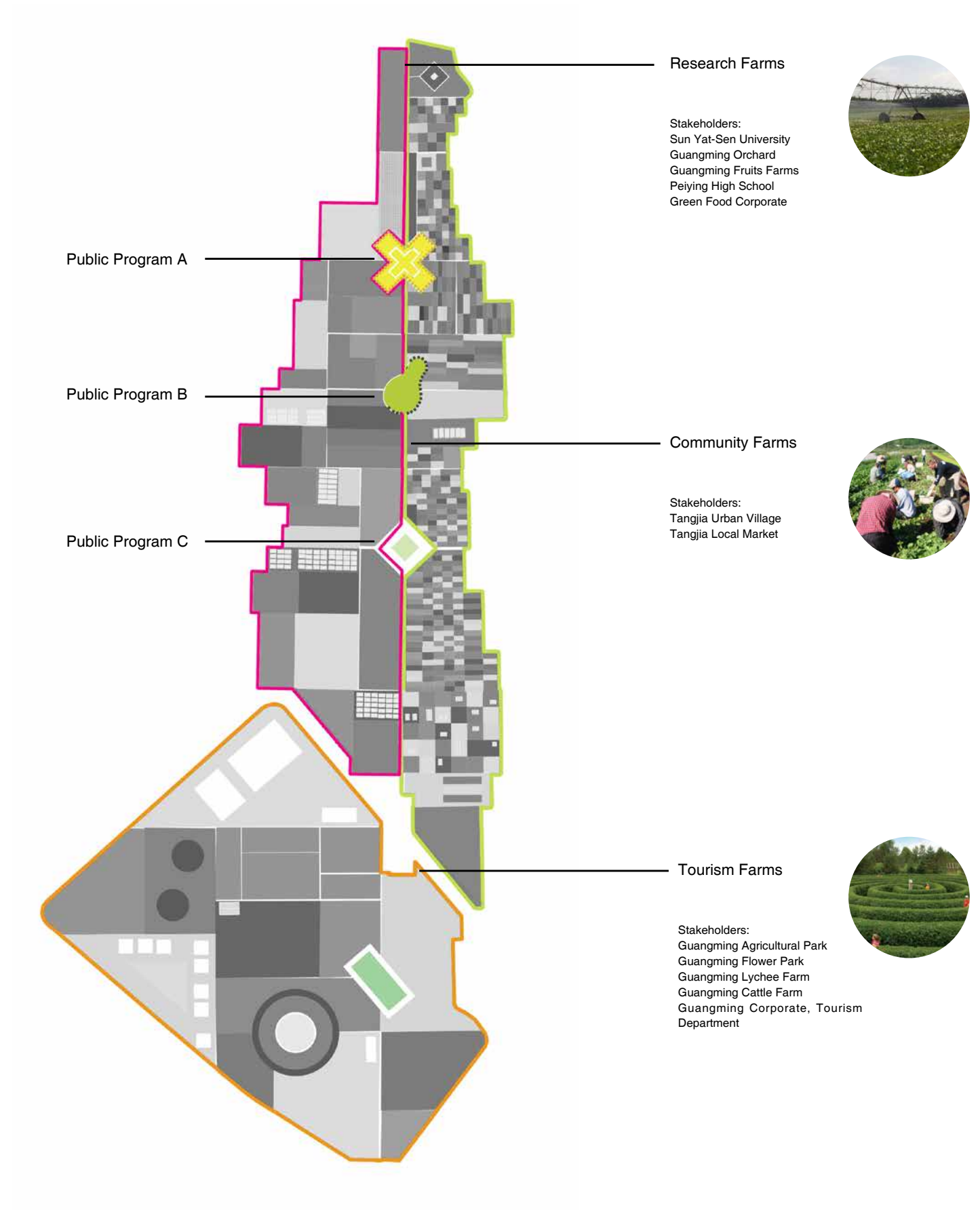
Scenario Sinking

Process1 Organization



Scenario Sinking

Process3 Design



Scenario Sinking

Process4 Implementation

Dike-pond agricultural park



Thank you!

Green is the New Black

In search of an alternative vision for Chinese eco-city development

P5 Presentation - Wenchi Yang

Mentors: Marta Relats, Taneha Bacchin, Marcin Dabrowski

Studio: Happy Cities

