IFLA AAPME AWARDS 2024

AWARD CATEGORIES

Unbuilt Analysis and Master Planning
lFLAAPR Corporate Member

PROJECT TITLE

Rural X：
Rural Futurism of resilience and inclusiveness in Yiqiao, Hangzhou

PROJECT STATEMENT

Sanjianghui is the strategic node of Hangzhou's “Going South” policy, with an ecological centre called Green Heart Park. Yiqiao, as part of the Park, is a rural area surrounded by two rivers and a mountain. The site is about 820ha, including 560ha permanent agricultural land and five villages (5453 villagers). It has a long agrarian history and remains a direct connection to traditional agricultural activities.
This project responds to pressing needs by addressing resilience, biodiversity, and inclusiveness. A future-oriented capital framework is proposed that revitalizes the circulation and accumulation of natural capital and allows it to flow formally into the economic production process, to realize development-led conservation.The future Yiqiao will maintain its rural quality that restores ecology and biodiversity with a more sophisticated agriculture industry chain, and be more suitable and inclusive for various groups to live, work and visit.

PROJECT NARRATIVE AND CONTENTS

Yiqiao is mostly occupied by traditional agriculture and has limited access to amenity, services and jobs. The agriculture land blocks ecological activities and limits the diversity of jobs, which led to a serious loss of young people, and restricted the new commers. Although nature restoration began to get more attention, natural capital was still isolated from the traditional economic capital cycle and undervalued. A new capital framework is proposed to revitalize the circulation and accumulation of natural capital and allows it to flow formally into the economic production process, to realize development-led conservation. Ecology and hydrology experts are involved and conducted profound site analysis. Based on the analysis, Yiqiao is an ecological turning point and crucial for bird and fish migration while the ecosystem is highly homogenized due to agriculture developments.

· Establish Ecological infrastructure as foundation for development

We interpretate landscape ecology and layered approach to establish a reasonable ecological infrastructure as the foundation for development. A symbiosis of nature, agriculture and people is possible to reach through light interventions and management. A safe and adaptive riverbank with composite three-layer dyke is designed to activate the waterfront and protect the land. A comprehensive water network is then established, which contributes to various functions such as flood protection, agriculture, transportation, tourism and habitat creation.

·· Improve the Complexity and Functionality of the Farmland

We add diversified habitat patches to create livable condition for different species while ensuring the agriculture functions. For instance, the fish ponds are improved to mulberry fish ponds with running water system. The migration corridors for birds and fish are restored by adding eco patches in the agriculture field as steppingstone for birds and bats. A fish corridor connecting the river and the mountain is designed and restores the blocked ecological communication.

A detailed habitat management guideline is defined considering human activity and sensitive season for different species. For instance, during the winter migration period, tourists are not allowed in the polder wetland conservation area.

∴ Agriculture X： A more inclusive industrial chain of agriculture for Yiqiao

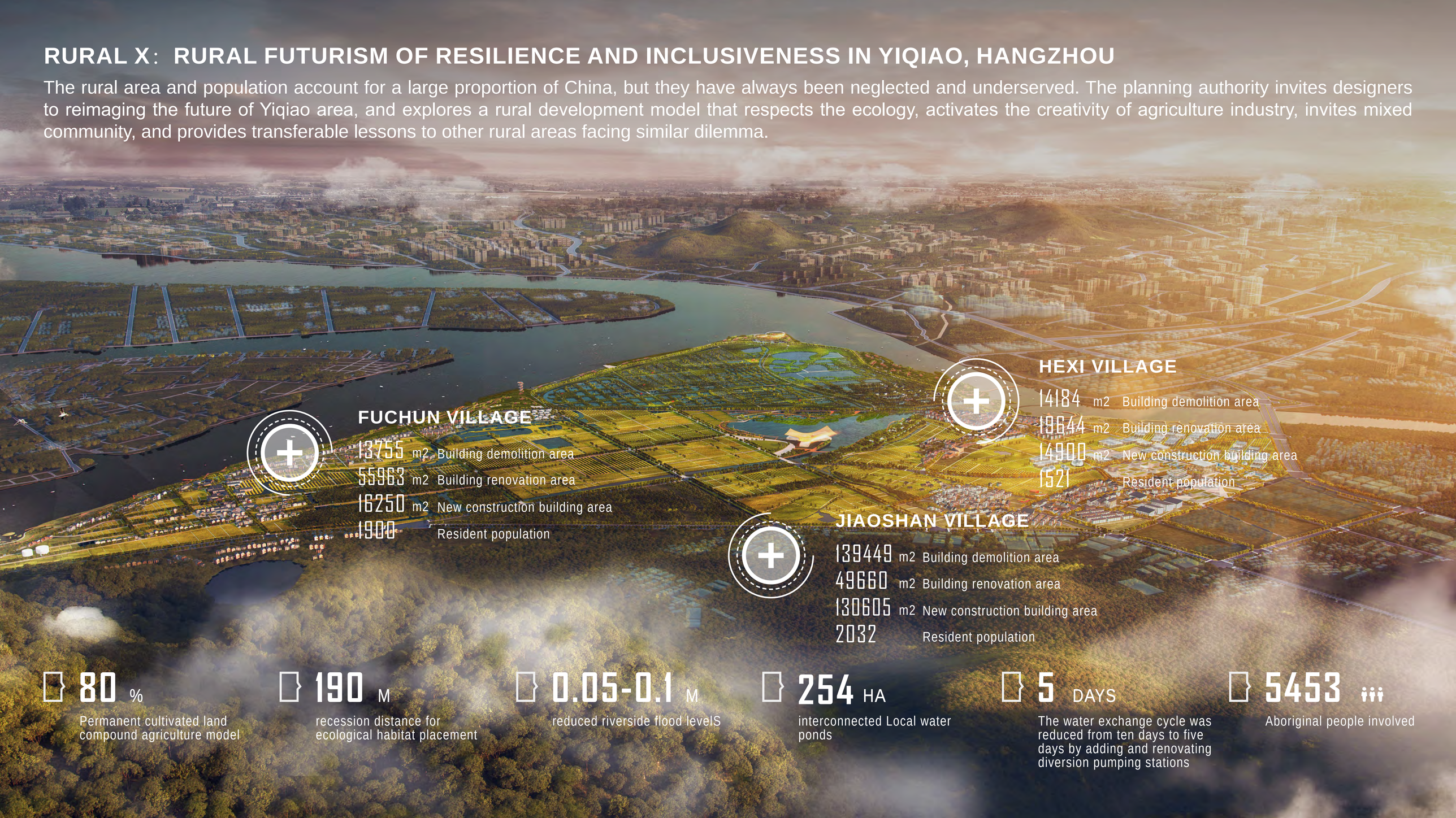
New industries such as R&D, tourism and creative industry are introduced. The R&D cluster invites local university and institution and the polder museum, based on the mulberry fish ponds with nature-education facilities, is a place where agriculture, birds and people meet. The ECO farm park encourages permaculture. Establishing the chain of eco-agriculture enables us to take advantage of biodiversity and microbial technology to form a virtuous cycle among multiple modules of agriculture. Villages are crucial to offer more services and attract diverse groups to settle. Farming plots, workshops and eco-housing are encouraged to create a sustainable and self-sufficient community.

Rural Futurism of Yiqiao

This project offers strategic planning that addressing resilience, sustainability and inclusiveness as a guidance for future development. The investigation and design provide profound planning basis and address the attention of the client so that the natural capital is valued and involved in the development process and could result in a well-served rural park that is more biodiverse, industrially richer and socially diverse.

RURAL X：RURAL FUTURISM OF RESILIENCE AND INCLUSIVENESS IN YIQIAO, HANGZHOU

The rural area and population account for a large proportion of China, but they have always been neglected and underserved. The planning authority invites designers to reimaging the future of Yiqiao area, and explores a rural development model that respects the ecology, activates the creativity of agriculture industry, invites mixed community, and provides transferable lessons to other rural areas facing similar dilemma.



FUCHUN VILLAGE

13755 m2 Building demolition area
55963 m2 Building renovation area
16250 m2 New construction building area
1900 Resident population

HEXI VILLAGE

14184 m2 Building demolition area
19644 m2 Building renovation area
14900 m2 New construction building area
1521 Resident population

JIAOSHAN VILLAGE

139449 m2 Building demolition area
49660 m2 Building renovation area
130605 m2 New construction building area
2032 Resident population

80 %
Permanent cultivated land compound agriculture model

190 M
recession distance for ecological habitat placement

0.05-0.1 M
reduced riverside flood levelS

254 HA
interconnected Local water ponds

5 DAYS
The water exchange cycle was reduced from ten days to five days by adding and renovating diversion pumping stations

5453
Aboriginal people involved

MASTERPLAN

Yiqiao area, as part of the green heart park, is a small, rural community surrounded by two rivers and the shiniu mountain, with 80% of the land assigned for permanent agricultural use.The plan responds to pressing needs by addressing resilience, biodiversity, and inclusiveness.

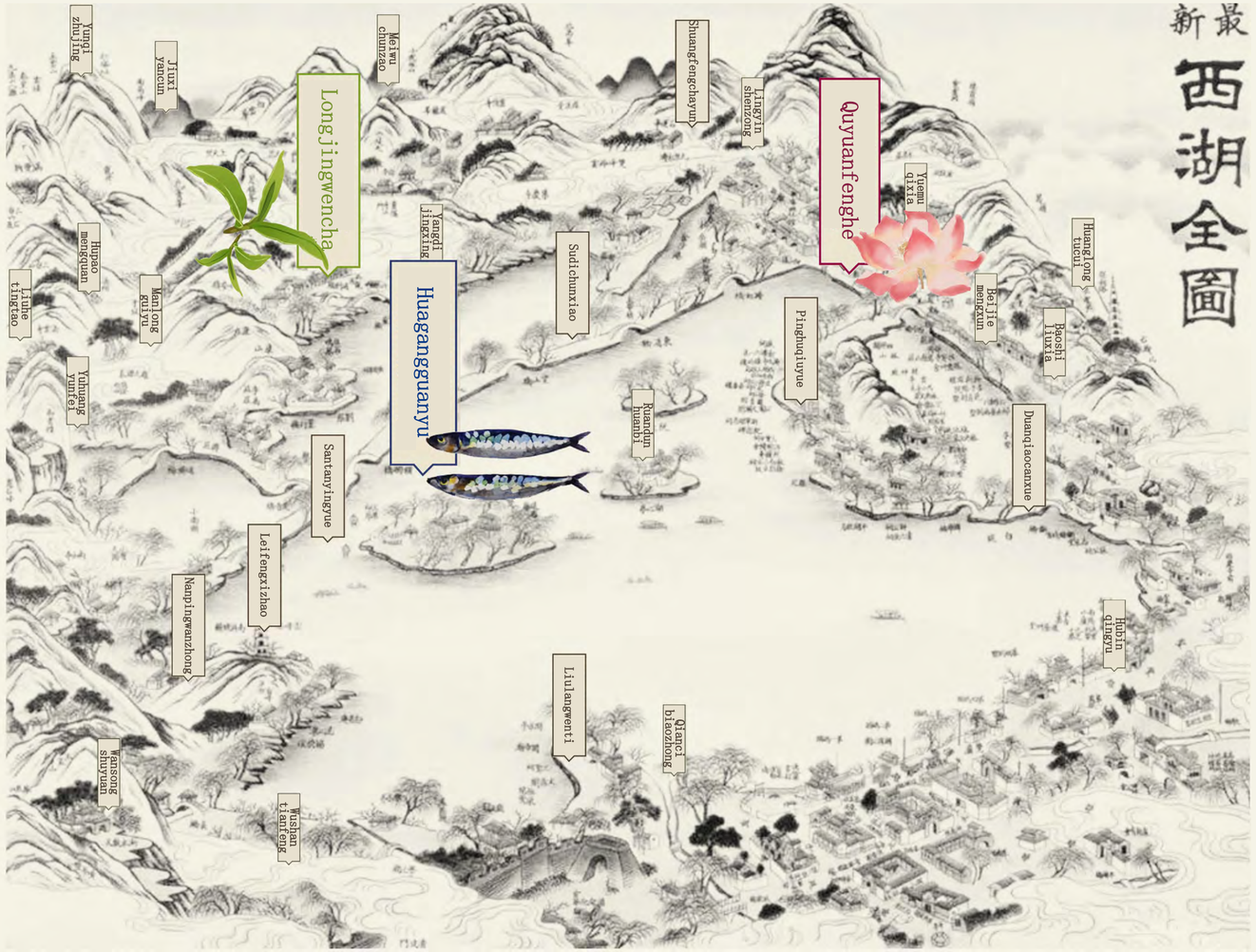
RURAL GENES OF HANGZHOU

Rural X and Rural Futurism, is a way of life rooted in the genes of Hangzhou.

Su Dongpo,
a renowned poet and hydraulic engineer,
Dredging West Lake to protect farmland.

Lin Hejing,
a reclusive poet,
Retired to Hangzhou's Gushan.

Emperor Song Gaozong,
the founding emperor,
Farming by himself.

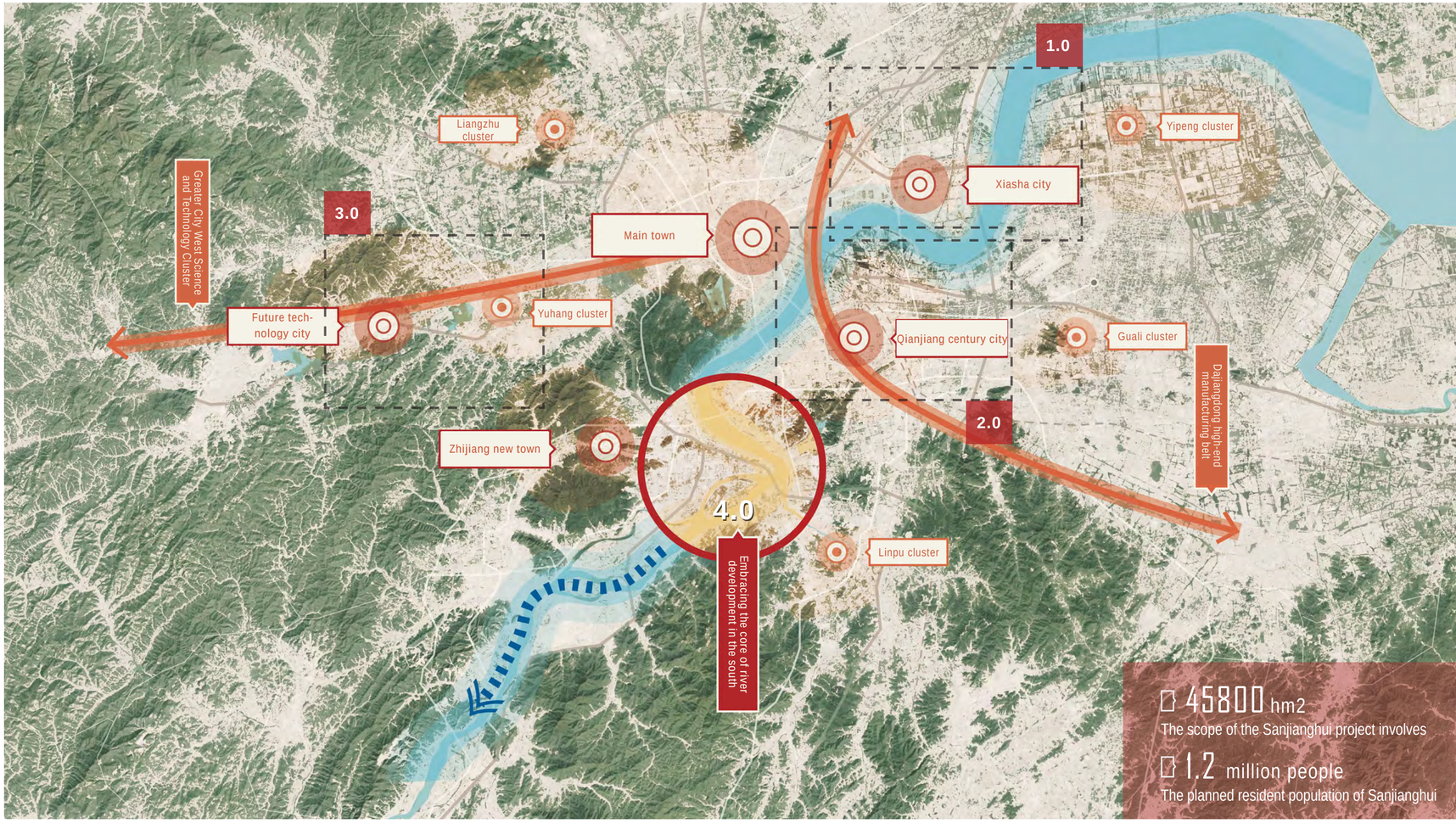


THE STRATEGIC NODE OF HANGZHOU'S "GOING SOUTH" POLICY

Like many rural areas, Yiqiao area has limited accessibility to transportation, amenity, leisure and educational services and more importantly, jobs.
The Going South Policy brings great challenge but also unique opportuny to Yiqiao area to regenerate in a way that enhances its overall resilience and inclusiveness – social, economic and environmental.

Traditional farming

Traditional agricultural production



CHALLENGE: UNDERSERVED RURAL, NEGLECTED NATURAL CAPITALT

The site is facing pressing challenges: underserved and exclusive rural, demographic vulnerability and the neglected natural capital.
Because of the excessive human interference, the natural development and ecological processes are limited, and the undifferentiated management measures aggravate the destruction of the fragile habitats.Therefore, we propose different targets for different period.

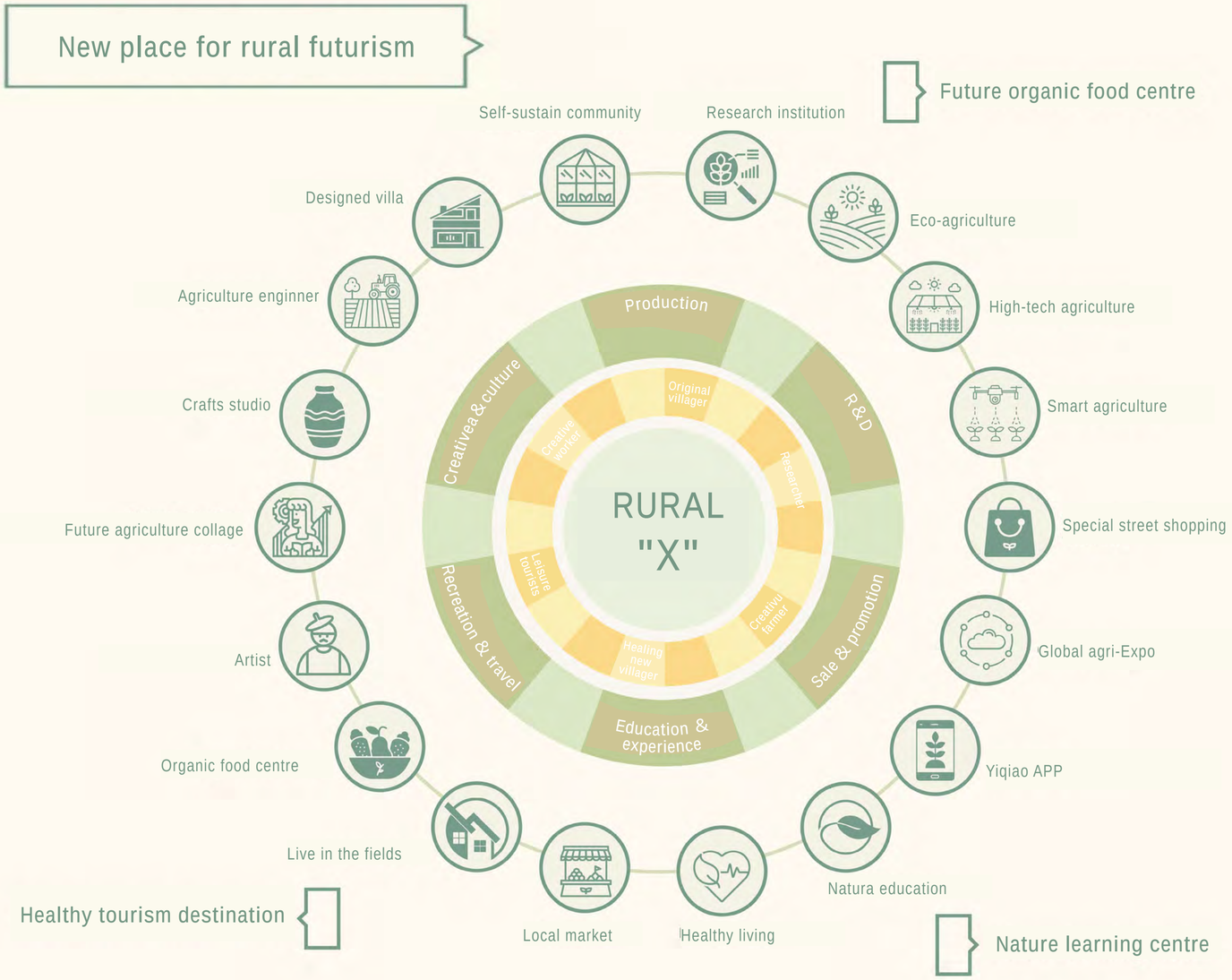
Improve the complex structure and functionality of the productive farmland and forest

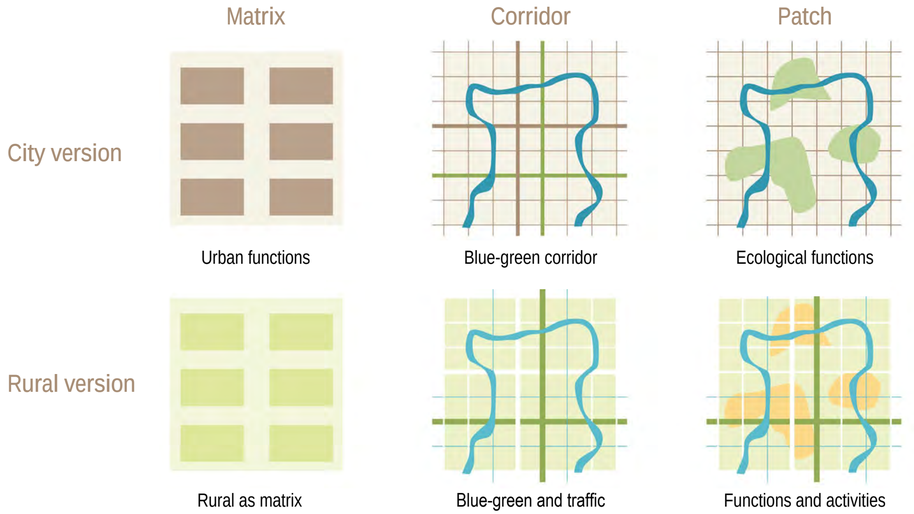
Diversify the approaches to capitalize the natural resources

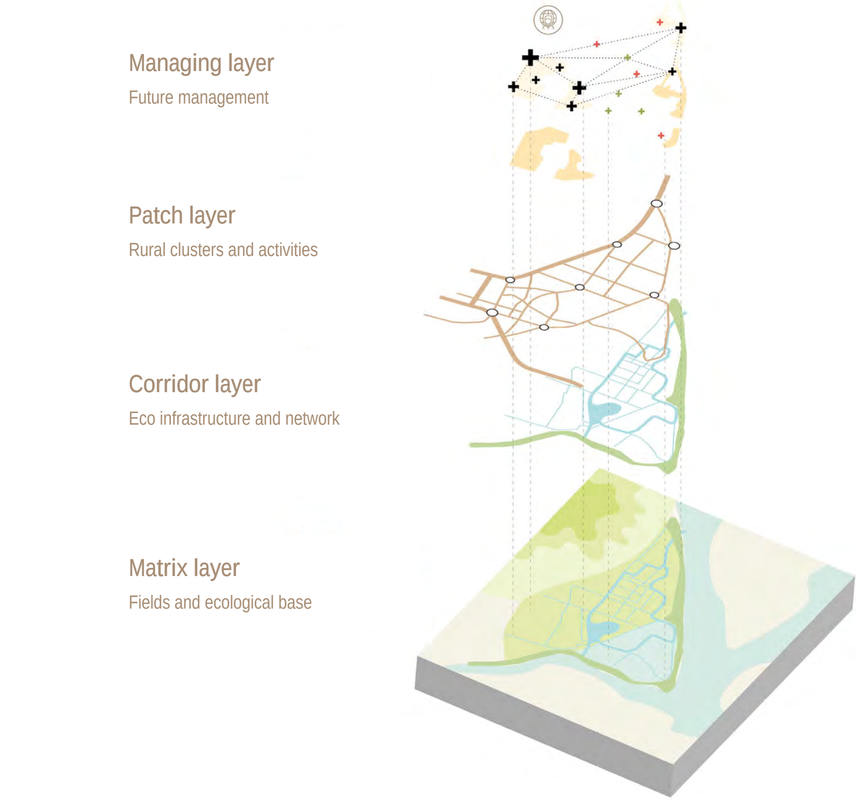
Brownfield restoration

RURAL X MODEL

We interpretate landscape ecology and layered approach to establish a reasonable ecological infrastructure, and create the Rural X model.



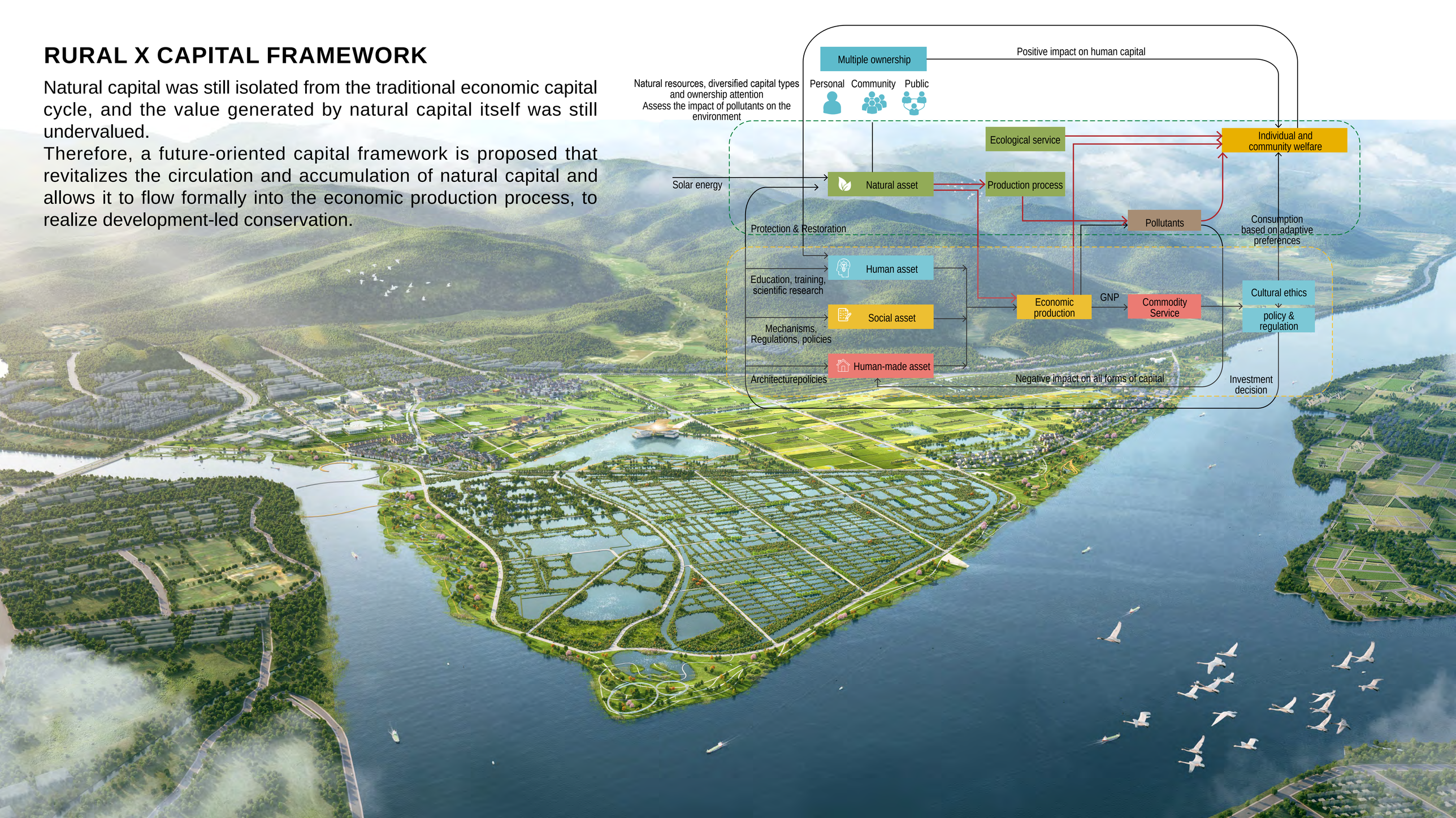




RURAL X CAPITAL FRAMEWORK

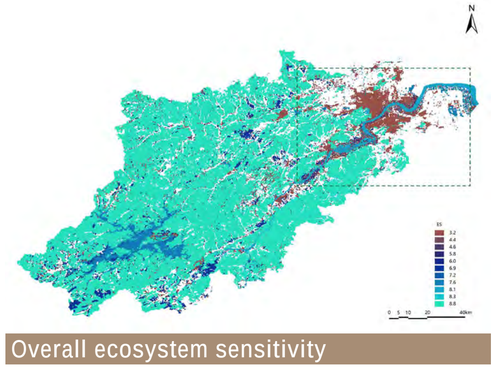
Natural capital was still isolated from the traditional economic capital cycle, and the value generated by natural capital itself was still undervalued.

Therefore, a future-oriented capital framework is proposed that revitalizes the circulation and accumulation of natural capital and allows it to flow formally into the economic production process, to realize development-led conservation.

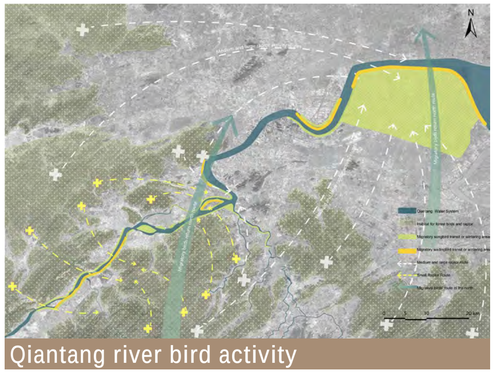


● ESTABLISH ECOLOGICAL INFRASTRUCTURE AS FOUNDATION FOR DEVELOPMENT

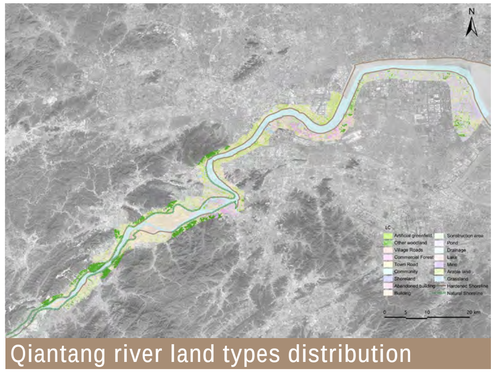
We analyze and assess the quality and sensitivity of the Yiqiao ecosystem to understand the functions and services offered by the existing ecosystem.



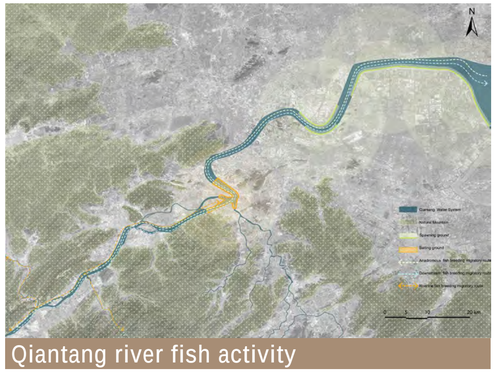
Overall ecosystem sensitivity



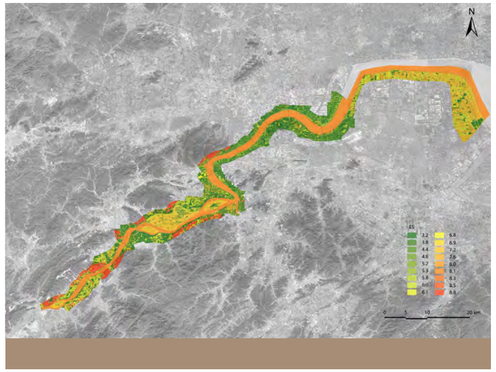
Qiantang river bird activity

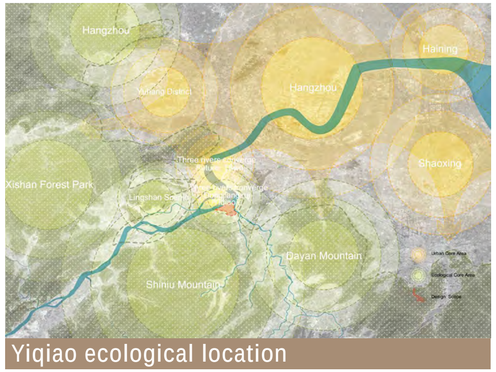


Qiantang river land types distribution

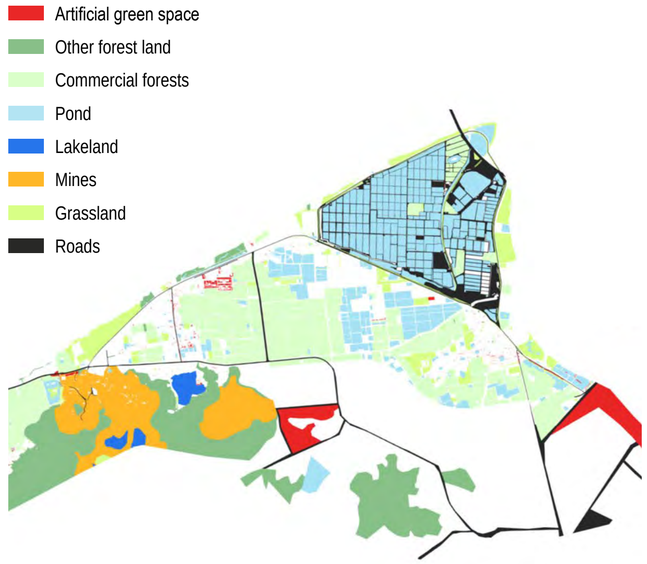


Qiantang river fish activity

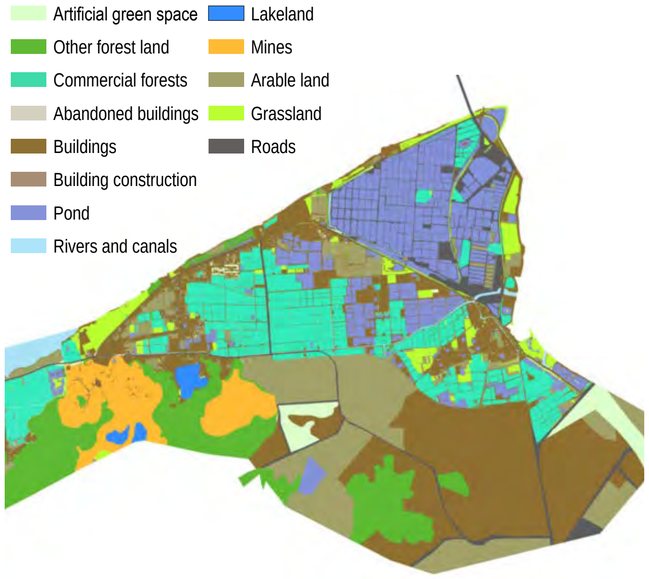




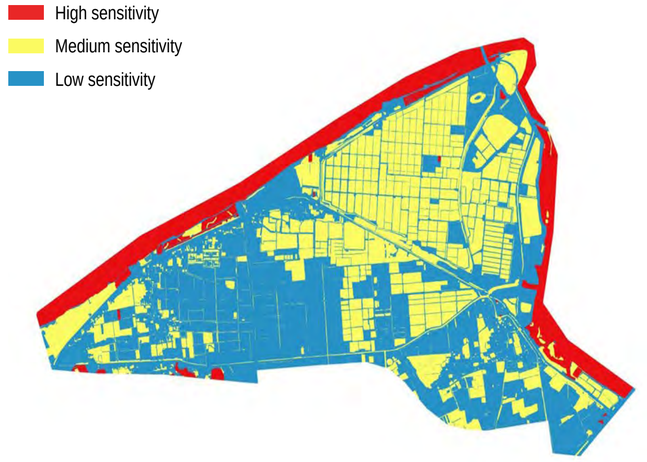
Yiqiao ecological location



High-functioning ecosystem patches analysis



Geographic analysis



Ecological sensitivity analysis

Ecological quality analysis

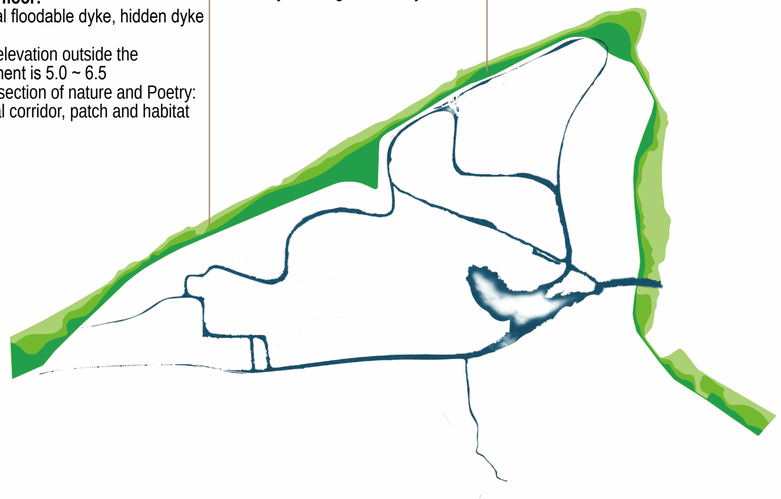
● ECOLOGICAL INFRASTRUCTURE： SAFE AND ADAPTIVE DYKE SYSTEM

A safe and adaptive riverbank with composite three-layer dyke is designed to activate the waterfront and protect the land: floodable layer, temporary floodable layer and safe layer (50y risk).

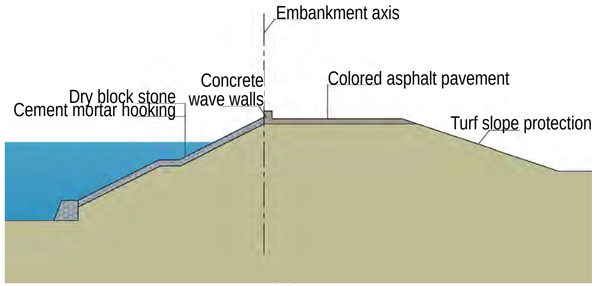
The first floor:
Ecological floodable dyke, hidden dyke line 6.5,
The site elevation outside the embankment is 5.0 ~ 6.5
The intersection of nature and Poetry: ecological corridor, patch and habitat

The second layer:
Occasionally, the dike can be flooded, and the hidden dike line is 7.8,
The site elevation is 6.5 ~ 7.8
The intersection of industry and Humanity: nostalgia, life story

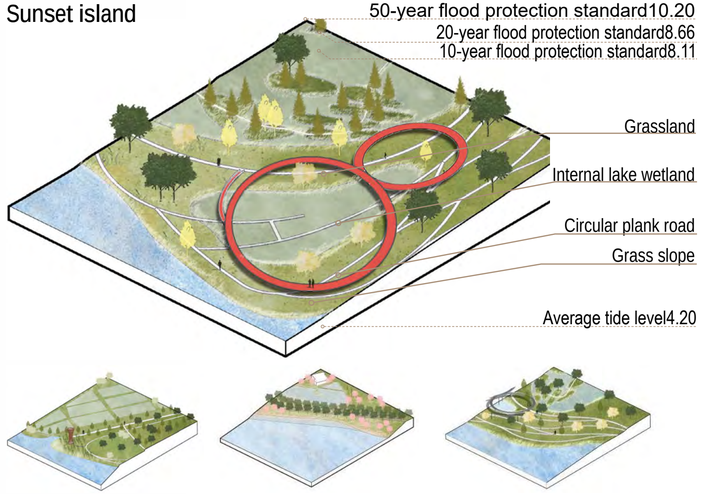
The third layer:
The top line of flood control dike is 10.20
Site elevation 7.8 ~ 10.00
The intersection of tradition and future: historical culture, future agriculture and lifestyle



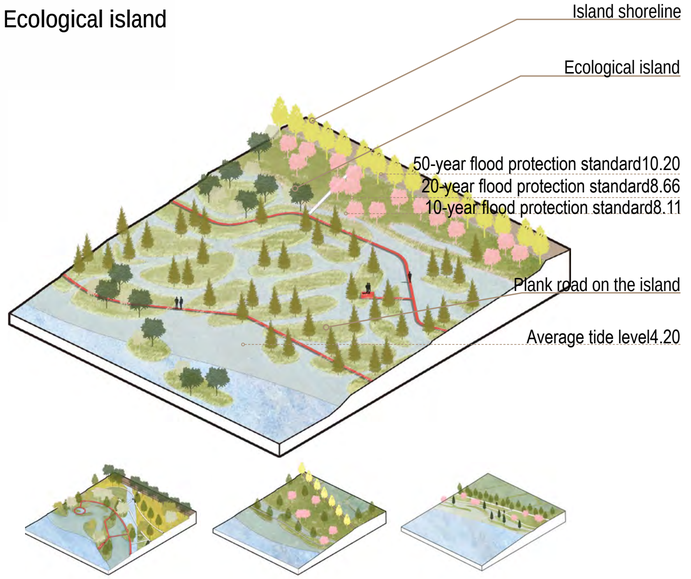
The Puyang river embankment is a two-stage slope structure
The upstream slope is protected by dry block stone.
The pavement on the top of the embankment is colored asphalt pavement, and the top of the embankment is used as a pedestrian path.
The inner slope of the embankment is protected by turf and planted with landscape trees.



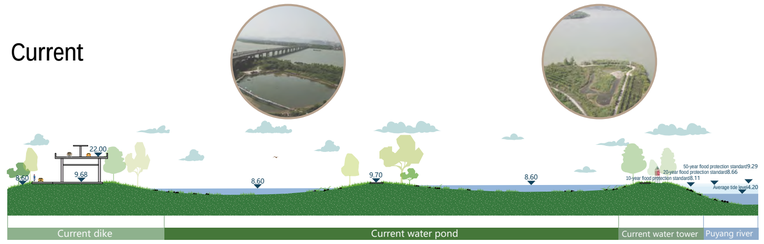
Sunset island



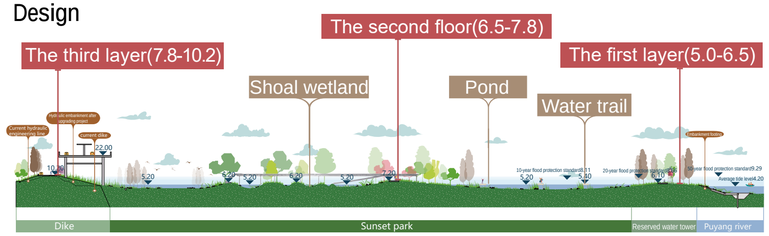
Ecological island



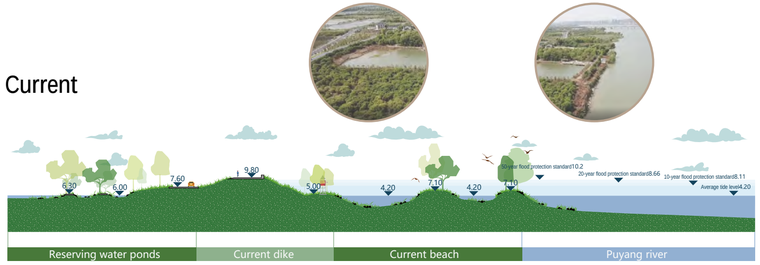
Current



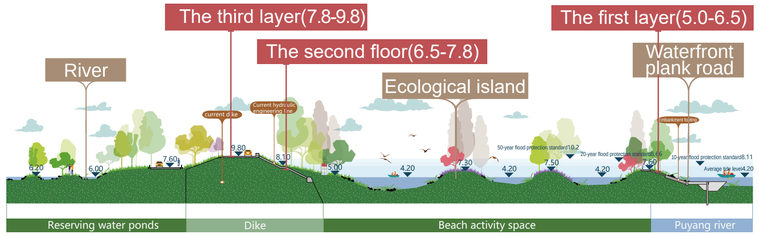
Design



Current

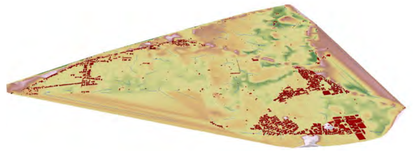


Design

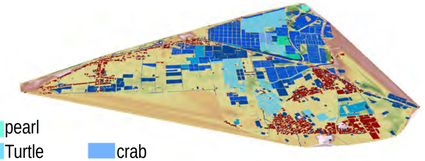


● ECOLOGICAL INFRASTRUCTURE： COMPREHENSIVE WATER NETWORK

Water is a key element of the site. We conducted very detailed on-site surveys and hydrological analyses. On the basis of the existing rivers, irrigation channels, ponds and fish ponds, a new and comprehensive water network is established.

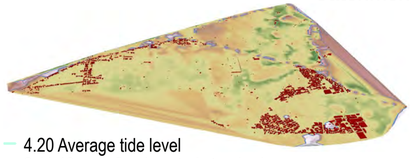


Catchment



pearl
Turtle
shrimp
clam
crab
fish
pond

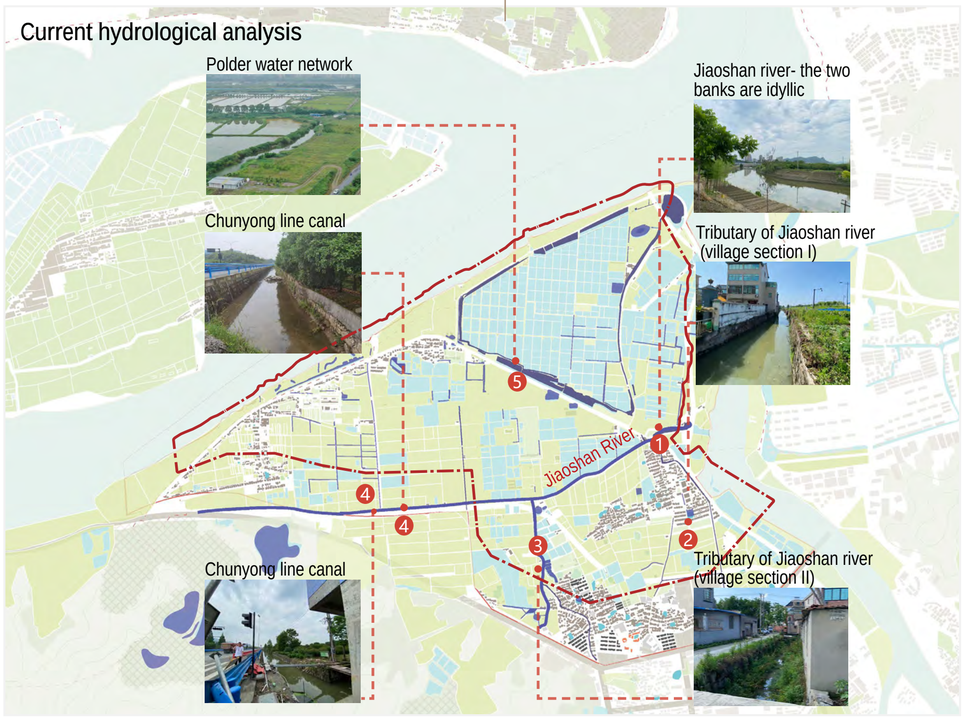
Pond classification

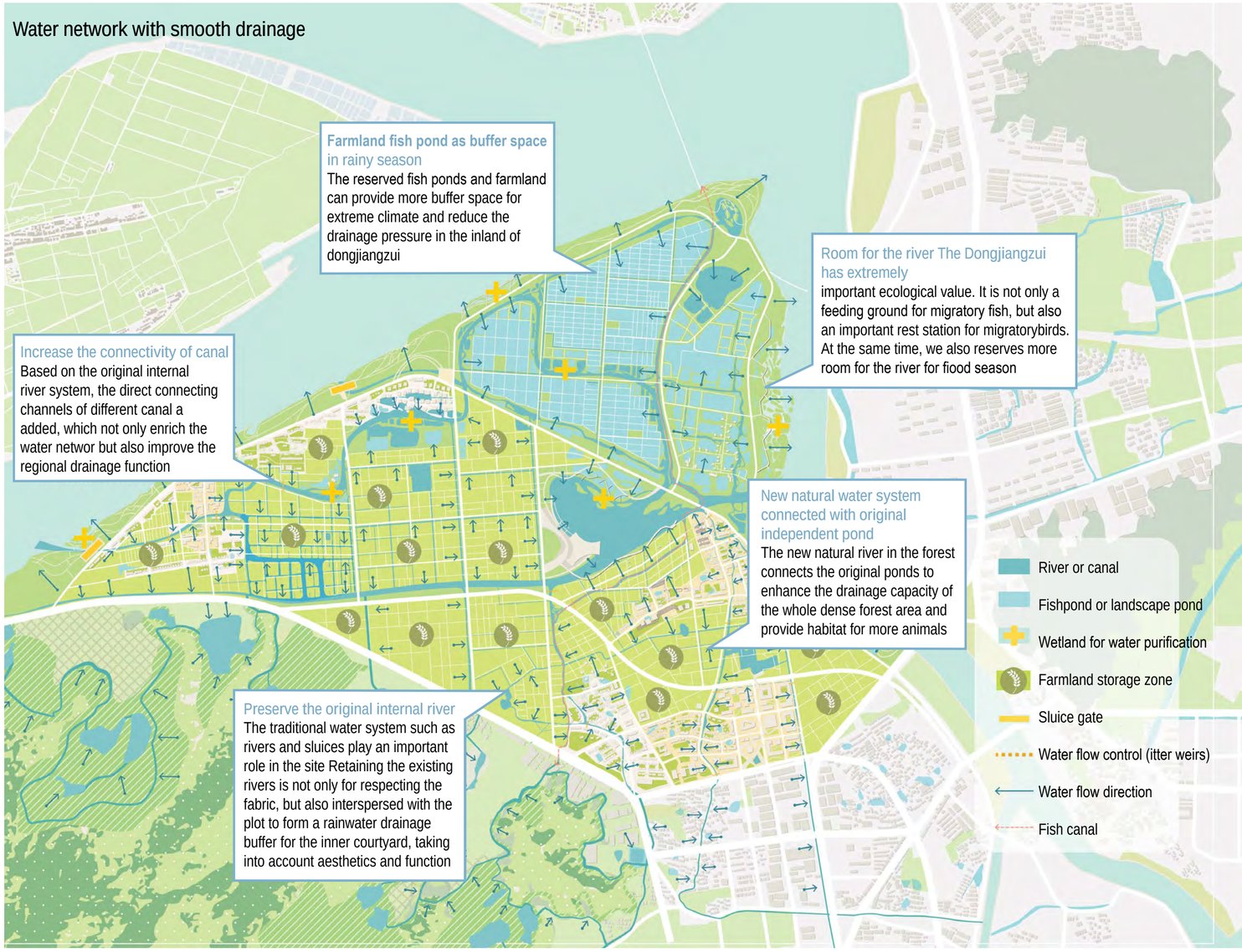


4.20 Average tide level
8.11 10-year flood control standard
8.66 20-year flood control standard
9.29 50-year flood control standard

Waterline

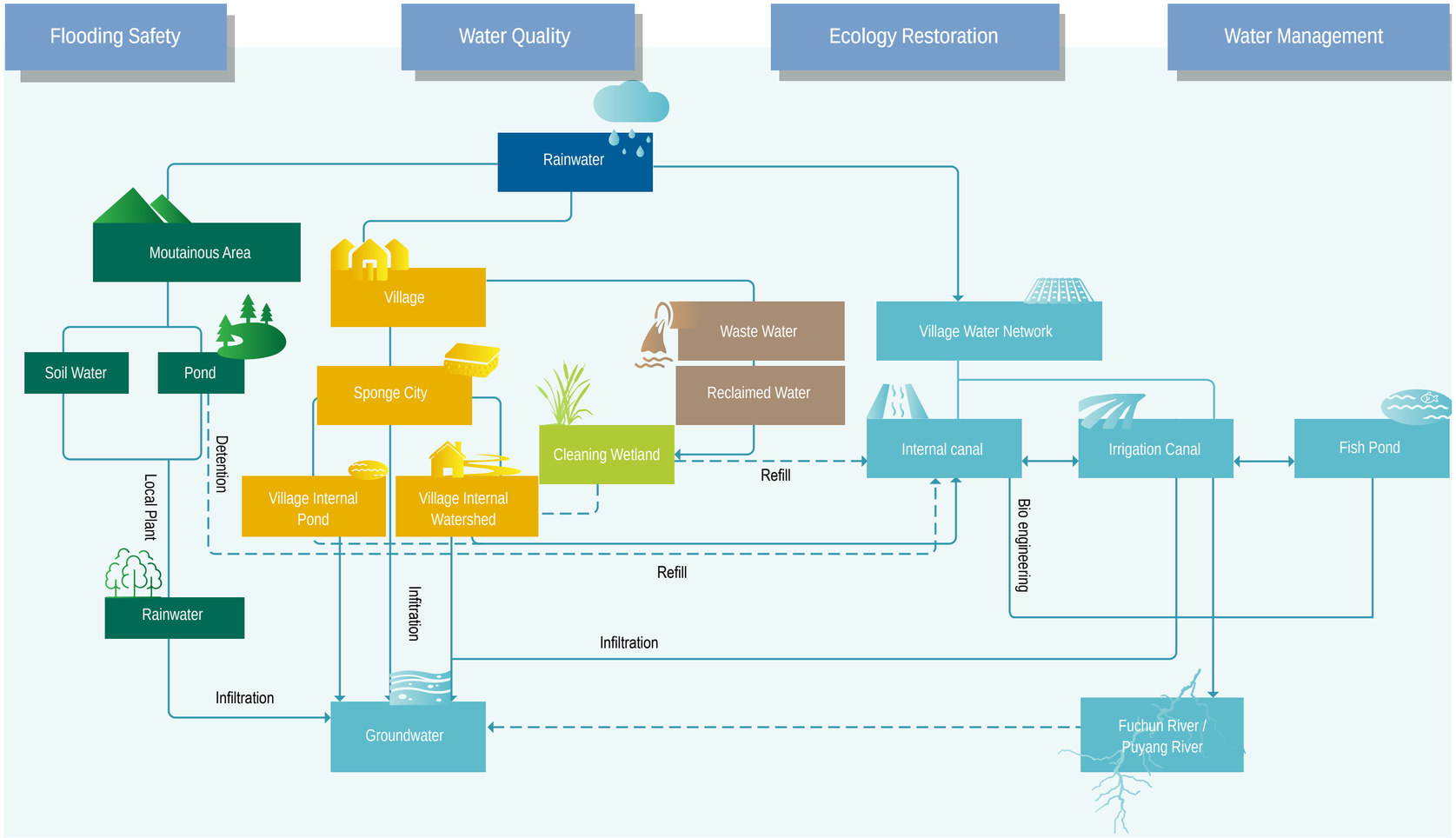
GIS hydrological information analysis (based on the latest surveying and mapping data of the Consortium 1:2000) : Use the engineering results of DEM-based hydrological feature extraction in the GIS field to analyze water catchment, flood control, and industry.

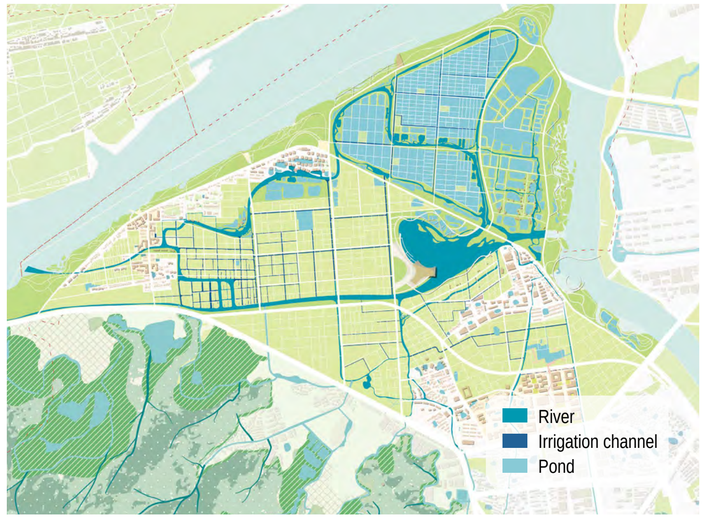


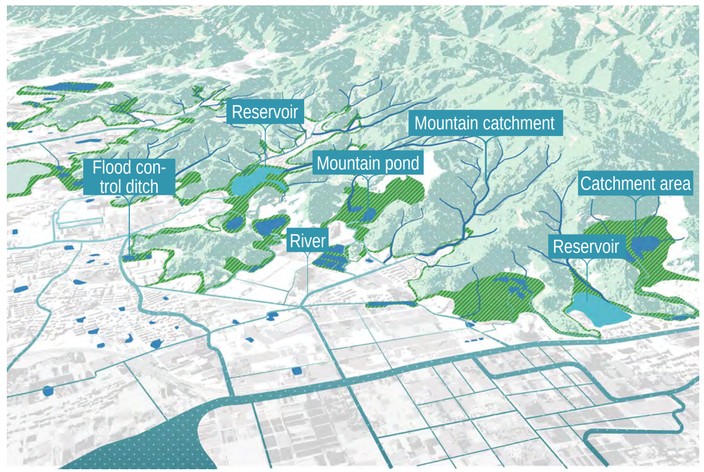


● ECOLOGICAL INFRASTRUCTURE： HYDROLOGICAL ANALYSIS

Enlarge the vision to the surrounding mountains and urban areas, design Yiqiao multi-dimensional water network to ensure regional flood safety, while the water network combines the production, living, ecology and leisure of the area, becoming the source of regional development.

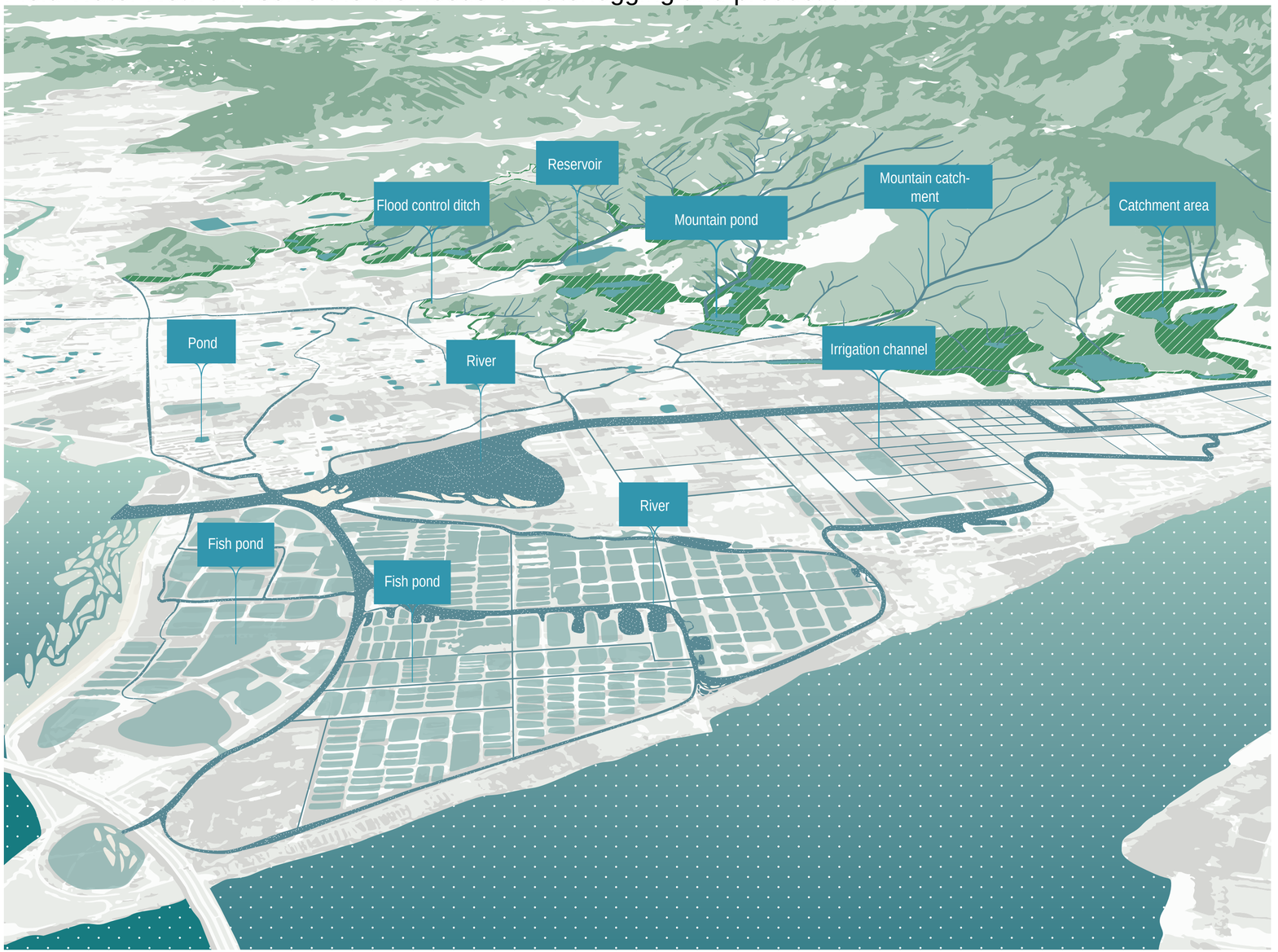




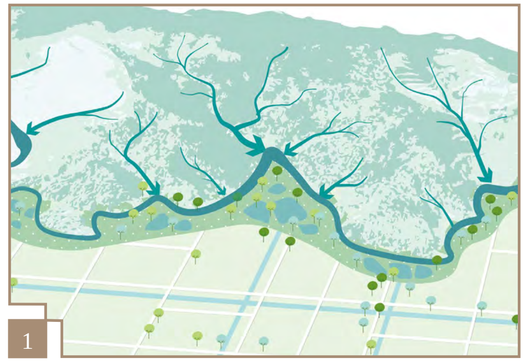


● ECOLOGICAL INFRASTRUCTURE： MULTI-DIMENSIONAL WATER NETWORK

Valley Sponge :inspired by ancient wisdom, reduce runoff through mountain streams.
Field Water Network: solve the the needs of waterlogging and production.

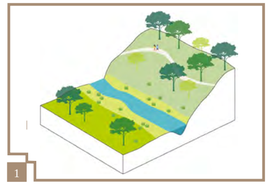


Valley Sponge

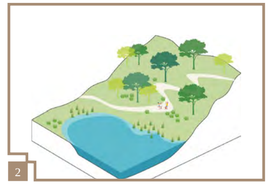


Waterways in the Forest

Waterways in the Village



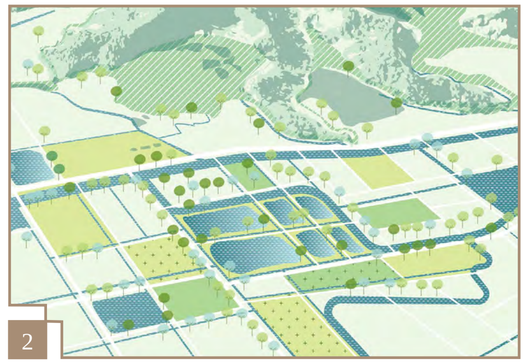
Flood control ditch



Mountain pond

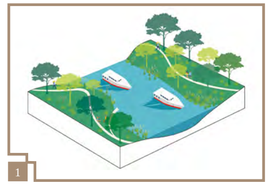
Catchment area

Field Water Network

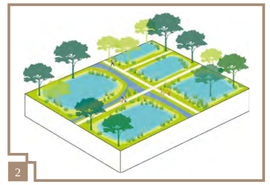


Waterways in the Field

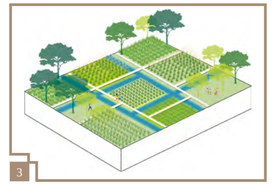
Waterways in the Pond



River



Fish pond



Irrigation channel

● ECOLOGICAL INFRASTRUCTURE： MULTI-DIMENSIONAL WATER NETWORK

The site has idyllic scenery: farmland, woodland, fish ponds, villages, etc., which are all combined with water and grow by water.


Sunset Island

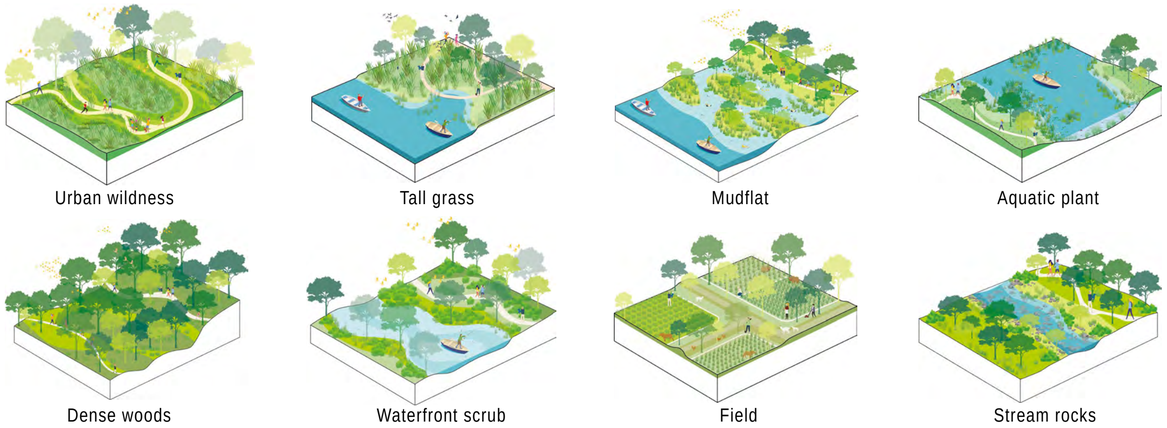

Ecological dyke

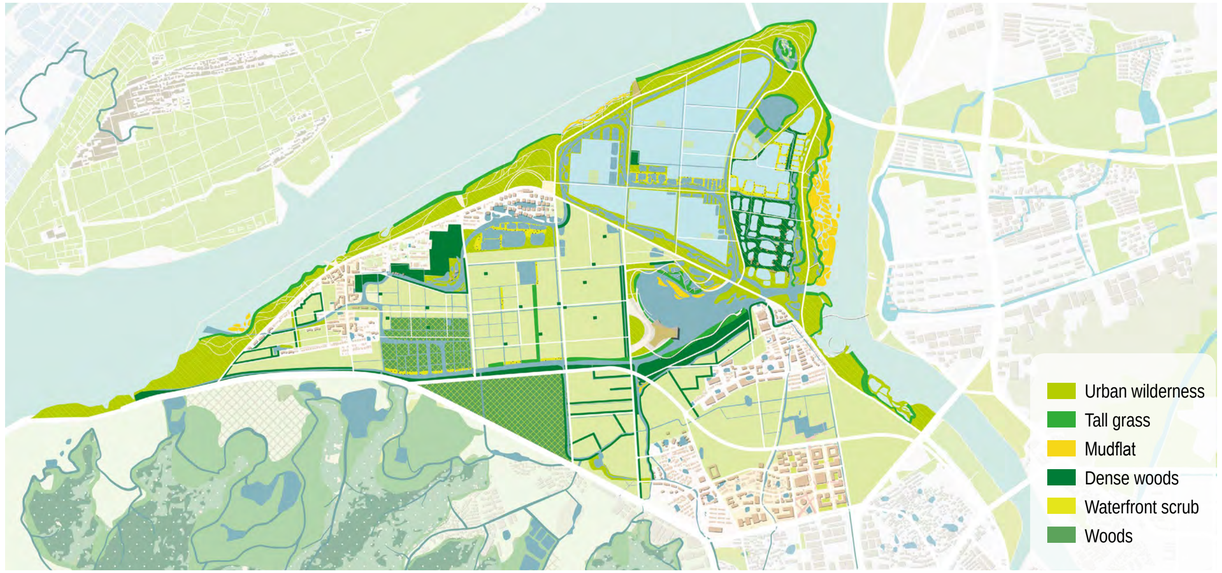

Healing Community

●● IMPROVE THE COMPLEXITY AND FUNCTIONALITY OF THE FARMLAND

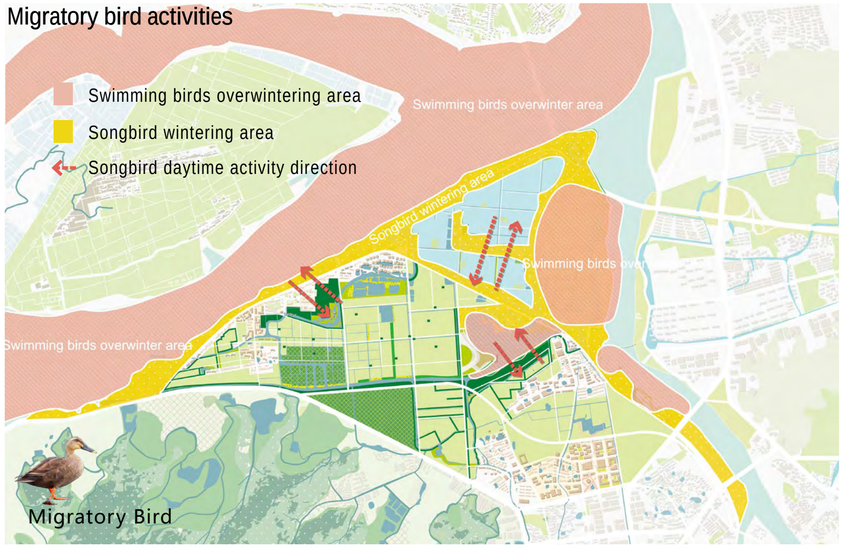
We increase diversified habitat patches in the site to create suitable living condition for different species while ensuring the agriculture functions.

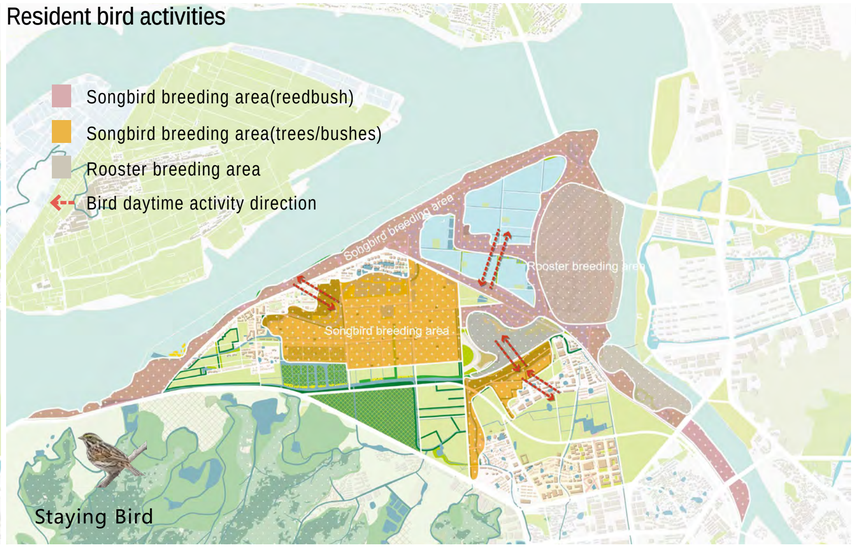
Strategy 1: Increase the patch of diverse habitats

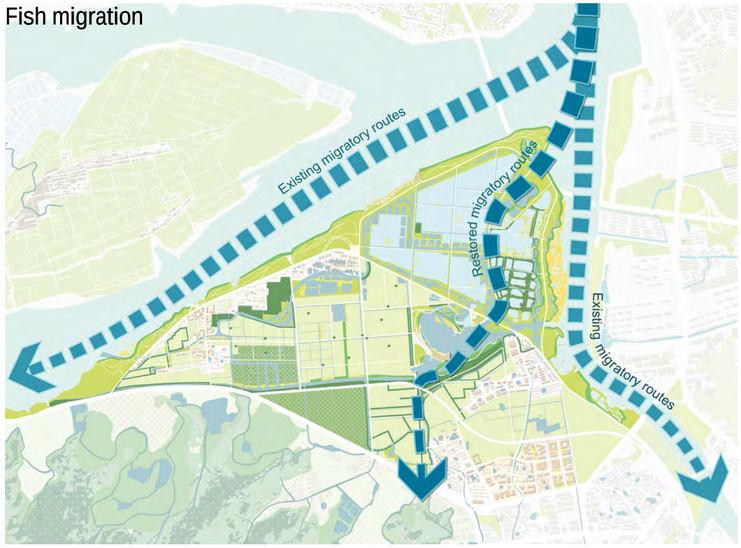




Strategy 2: Restore migration and migration corridors

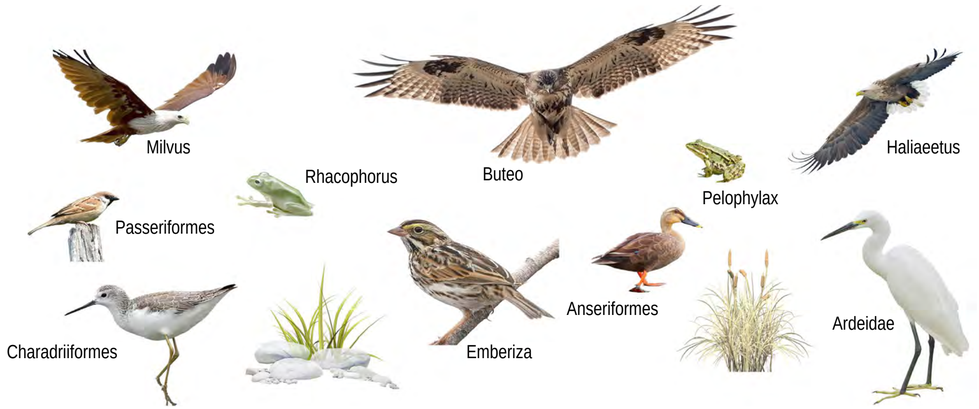


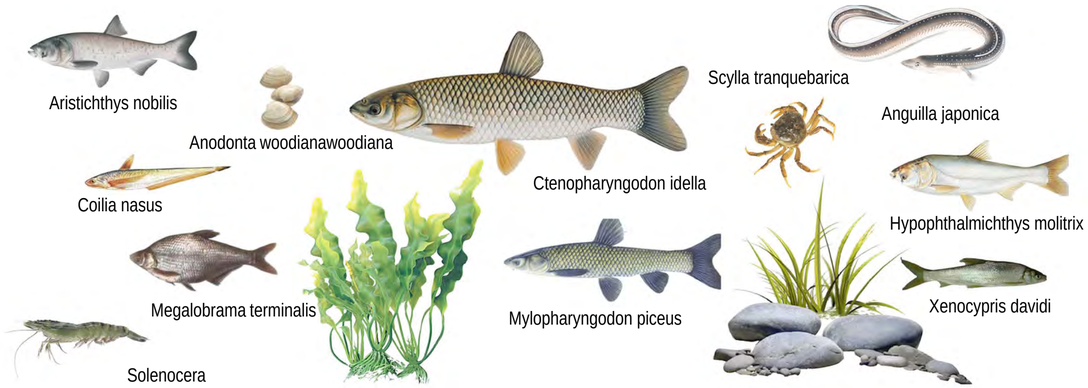




●● COMPLEXITY AND FUNCTIONALITY: CREATE MICRO-HABITAT FOR TARGET SPECIES

While ensuring the basis for the operation of the whole chain of ecological agriculture, it also creates diverse ecological habitats for different species to ensure their lives and create a future paradigm of field development with multiple integration of human, animal and life production.





Target species

Terrestrial/amphibian target species groups		Activity habitat	Activity season	Habitat creation requirements	
				Place of residence and temporary shelter	Feeding grounds
Birds	raptor: kite, buzzard, sea eagle	Open plains, cultivated grassland	Migration: March-May, September-November Breeding: April-September	Forest edge or forest canopy of tall trees and overhanging rock cliffs	Rivers and seas, open plains, cultivated areas and forest edge meadows
	songbirds: buntings, finches	Streams, valleys, mudflats and rocks, mountain forests, reeds/grasses	March-August	Mountainous river valleys, streams, rocks	Streams or streamsides
	swimming bird: eider duck and grebe	Water surfaces, reed thickets, shoals and sand bars	November-April	Waterfront grass/reeds, tidal flats, water surfaces	A gentle body of water rich in submerged plants
	waders:shorebirds and herons	Shoals, shallow wetlands, islands	Migration: March-May, September-November Breeding: April-September	Waders:Waterfront grass/reeds, tidal flats Herons:Waterfront trees in the middle of a canopy or dead branch	Shallow wetlands, tidal flats, sandbanks
Amphibians	terrestrial frog frogs, side-folded frogs, tree frogs, etc	Rice fields, swamps, grasses	April-September	Ponds, weeds on the water's edge, soil holes on the water's edge	Aquatic plants, weeds on the water's edge

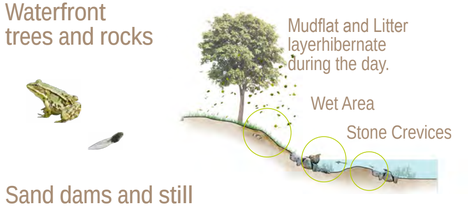
Target species

Aquatic target species groups		Season of activity and habitat requirements		
		reproduction	wintering	Foraging and migratory habitat
Fish	Analomous migratory fish: swordfish	The middle and lower reaches of the Qiantang River are still water and many algae (March to August)	Shallow seas and bays with less wind and waves	Coastal and offshore bottom pelagic turbid waters (rest of the year)
	Migratory fish in the descending river: eel	Shallow nearshore estuarine (November-February)	/	Brackish water/freshwater river bodies (rest of the year)
	River migratory fish: four major fish	Middle and upper reaches of Qiantang River and its tributaries or affiliated water bodies (April to July)	Sediment or aquatic weeds in the depths of river beds or lakes (November to April)	Brackish water/freshwater river bodies (rest of the year)
	Freshwater fish: triangular bream, yellowtail bream	On pebbles with flowing water in shallow freshwater (April-July)	Freshwater deep water crevices (November to April)	Freshwater middle and lower calm flows, sediment and sediment substrate with aquatic weeds (rest of the year)
Benthic soft bottom	Shrimp, crab, snail, mussel, etc	A flowing water area with abundant aquatic plants and a silty bottom		

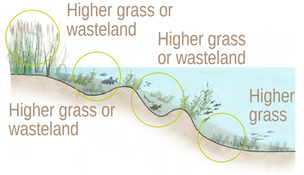
Raptor

Wader

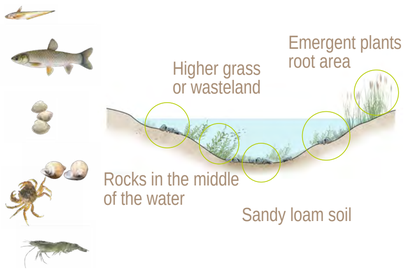
Waterfront trees and rocks



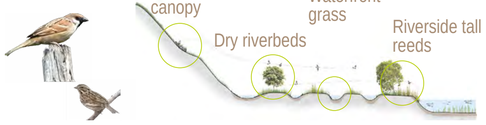
Salty-fresh confluence area



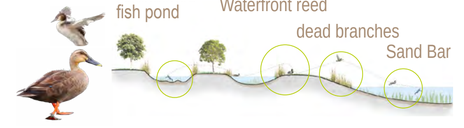
Naturalization of small shallow water aqueduct



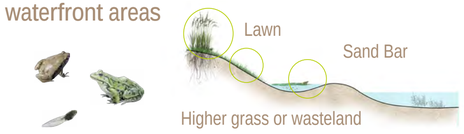
Song bird



Natatores



Sand dams and still waterfront areas

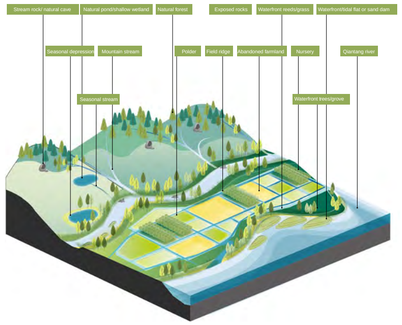


Pebble shoal in fresh water area

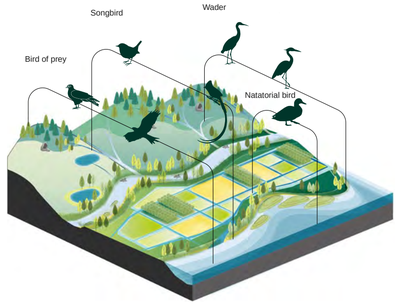
●● COMPLEXITY AND FUNCTIONALITY: DIFFERENTIATE HABITATS MANAGEMENT

Detailed habitat management guidelines are designed based on human activities and sensitive seasons of different species.

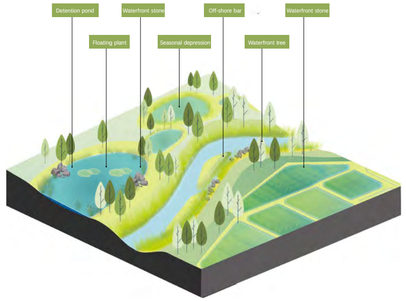
Strategy 3: Create microhabitats for target species



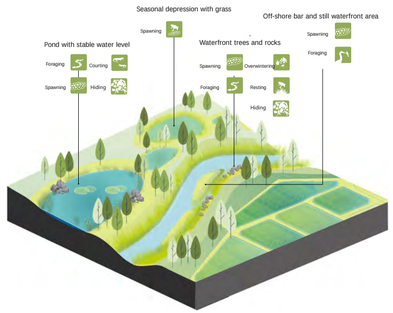
Bird habitat: highly functional & diverse habitat natural unit



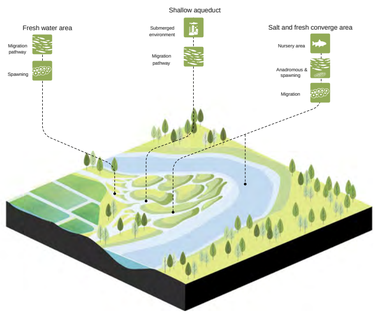
Bird habitat: the range of activities of different species



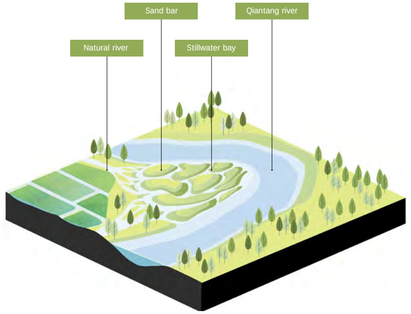
Amphibian habitat: high-functional waterfront habitat Unit



Amphibian habitat: areas where different life activities occur

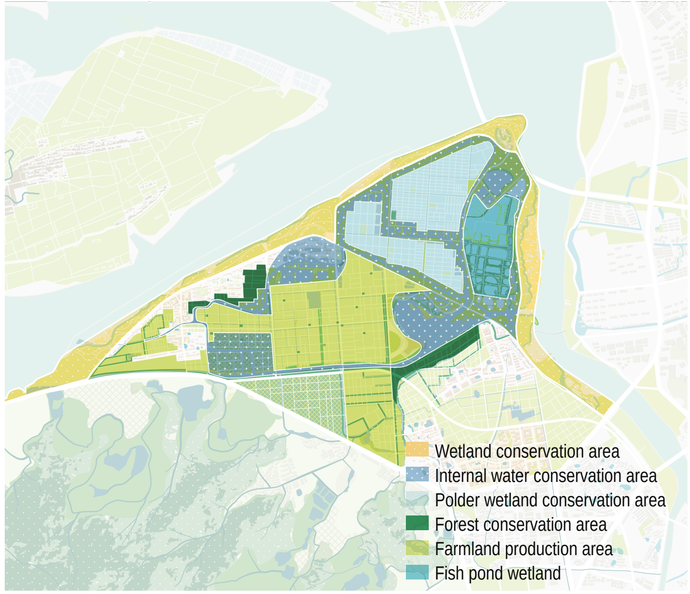


Habitats of fish and benthic animals: the range of activities of different species

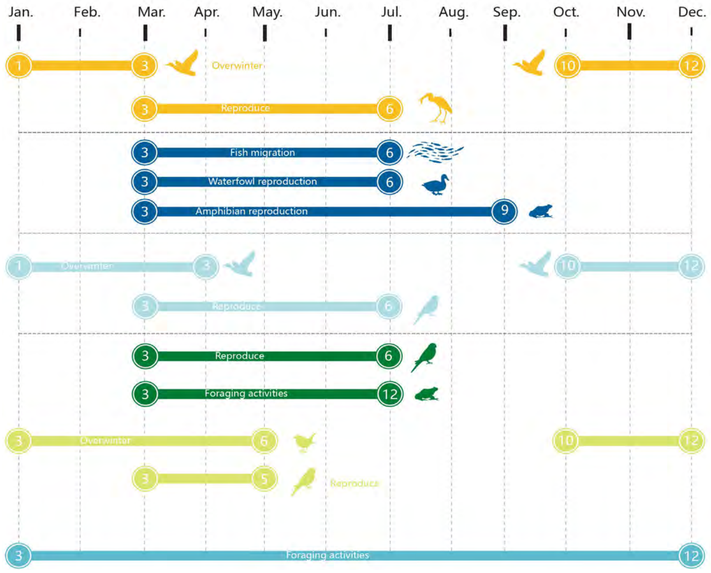


Fish and benthic Animal habitat: healthy Underwater Ecological Unit

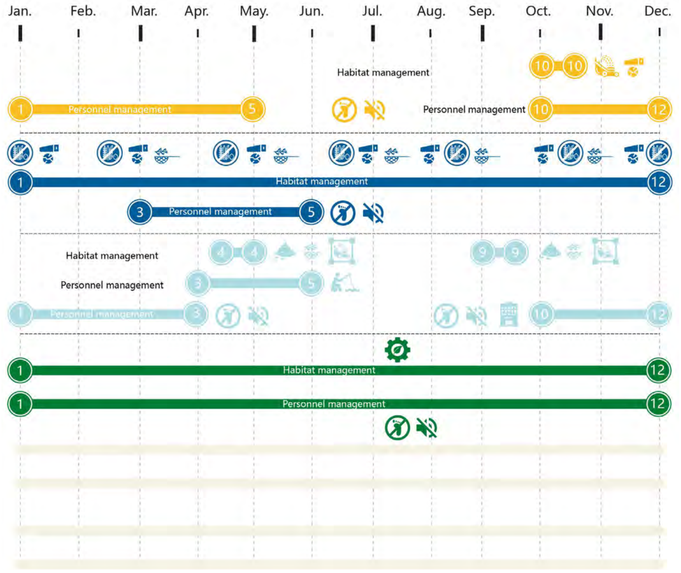
Strategy 4: Habitats guidelines



Ecological management zone - Important ecological functions and their high sensitivity seasons



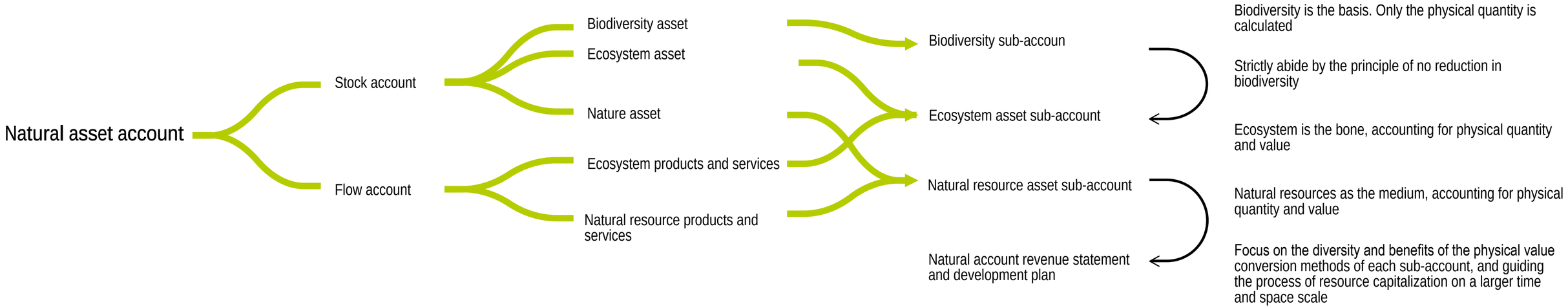
Ecological management zone - Habitat management and people management



Ecological management zone - Habitat management and people management

●● COMPLEXITY AND FUNCTIONALITY: ENRICH APPROACHES TO CAPITALIZE NATURAL RESOURCE

A future-oriented capital framework is proposed that revitalizes the circulation and accumulation of natural capital.

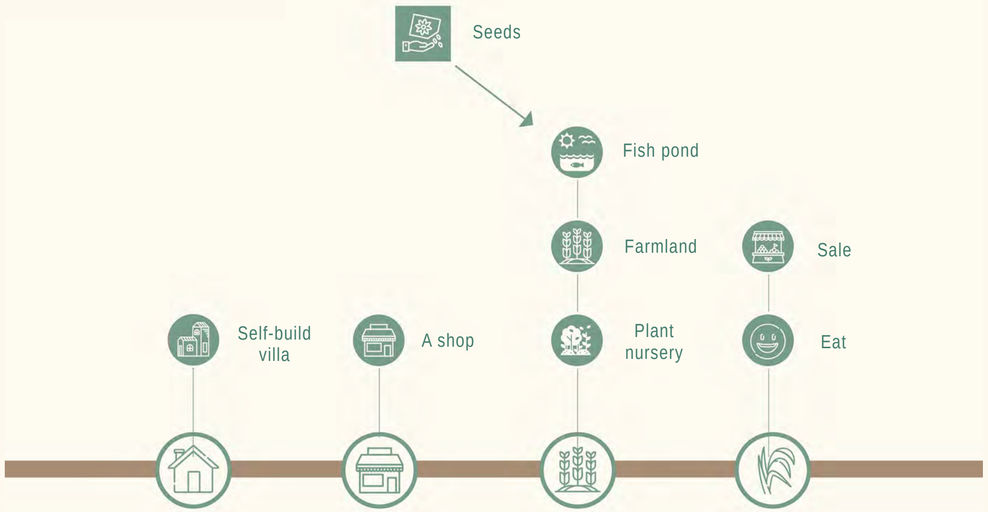


Assets acount	Content	Description
Nature asset account	Land resource	Land use and its changes in natural spaces such as cropland, foreest land and grassland
	Water resource	inventory and flow, quantity and quality of water sets,and reflect the impact of water use on the ecological environment
Biodiversity	Ecosystem	Including natural ecosystems such as woods, irrigation, grasslandsrivers, etc., and the distribution and changes of artificial ecosysterms based on natural ecological processes such as farmland, planted forests, artificial grasslands, and town greens
	Ecosystem services	Supply (agricultural products, forestry products, livestock products,fishery products, water resources, etc.), regulation (water conservaation, water conservation, flood storage, carbon sequestration and oxygen release, air purificaon, climate regulation, etc.), cultural services (cultural tourism and artcreation etc.), changes in the situation, and changes in the proportion of the three types of services
Ecosystem asset account	Wild animals and their habitats	Distribution of key protected wildlife populations, habitat areaa and protected status, changes in key species populations
	Wild animals and their habitats	Key protected wild plants and their distribution and protected statuss, changes in populations of key species

AGRICULTURE X: A MORE INCLUSIVE INDUSTRIAL CHAIN OF AGRICULTURE FOR YIQIAO

As a future rural park that is suitable for living, working and visiting, Yiqiao will go beyond an agricultural countryside.
Based on the current single industry of traditional agricultural production, we expand the agricultural industrial chain.

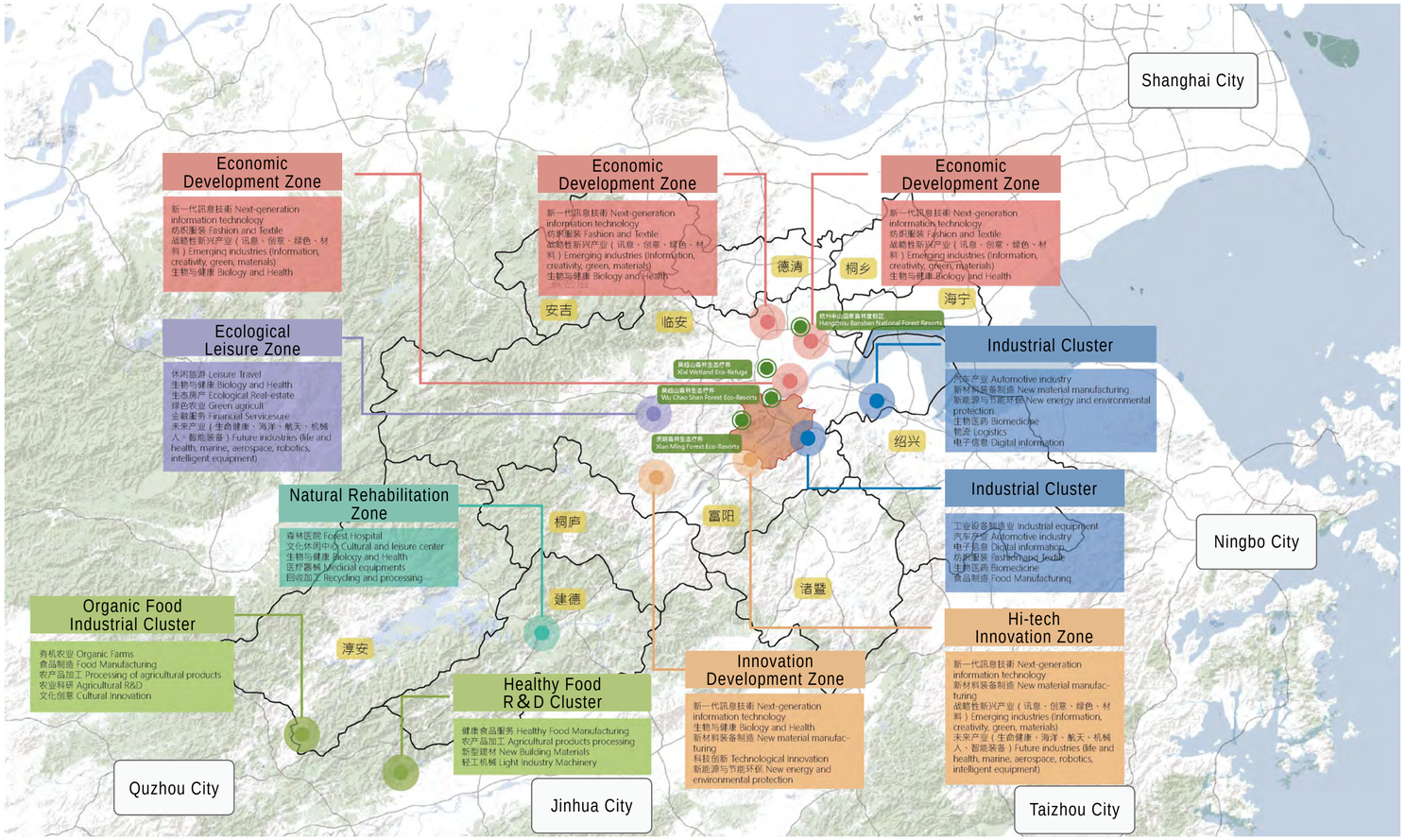
Current rural activity

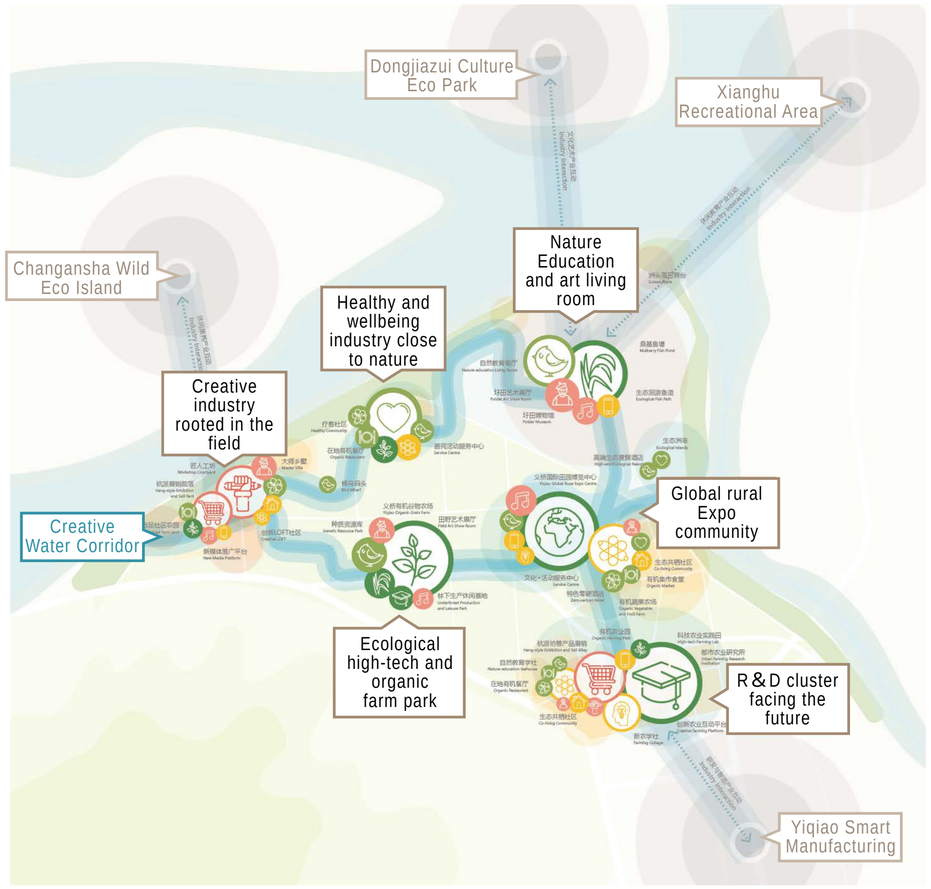


Future rural activity

AGRICULTURE X: FUTURE IDYLLIC CHARACTERISTICS OF THE YIQIAO BRAND

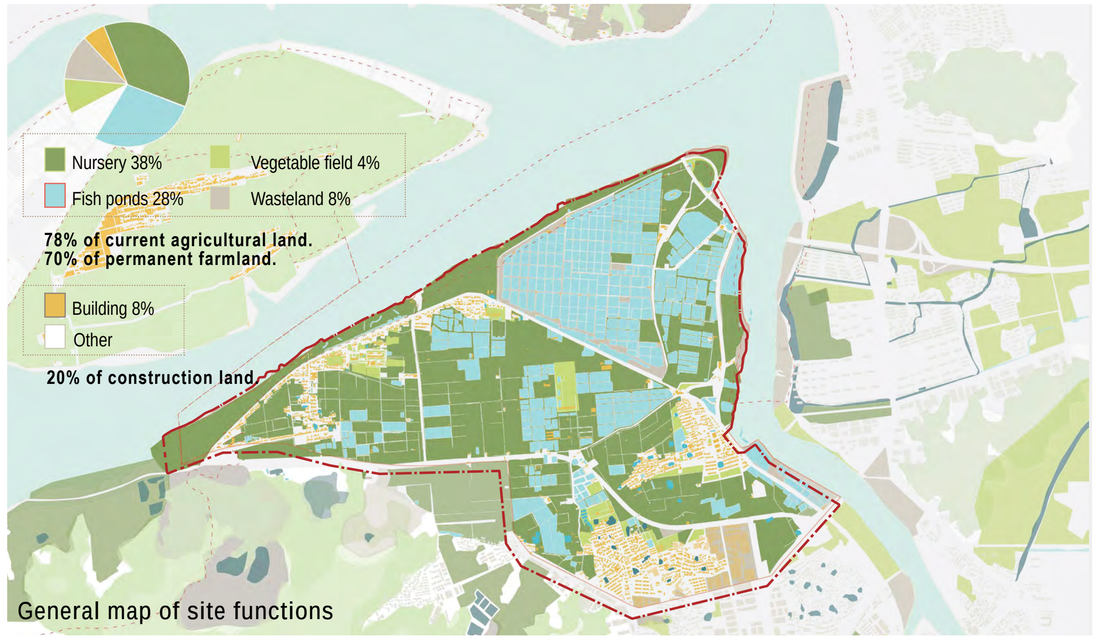
Combining the original resources of the site and the industrial development of the surrounding area, the future field industrial framework and special industrial clusters of Yiqiao are proposed: technology agriculture and leisure tourism as the core pillar industries, branding Yiqiao's special future agriculture and field leisure; field creative industry as an enabling industry, attracting creative nomadic community; and providing rich daily and leisure support services.

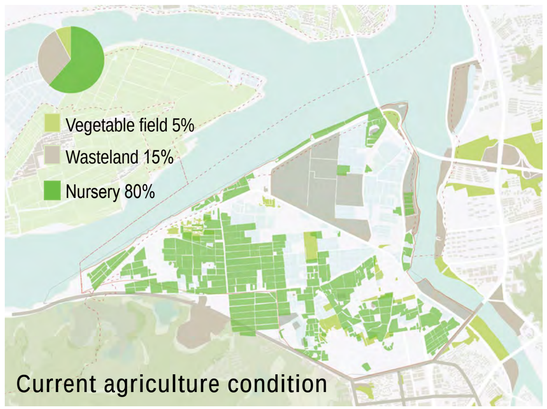


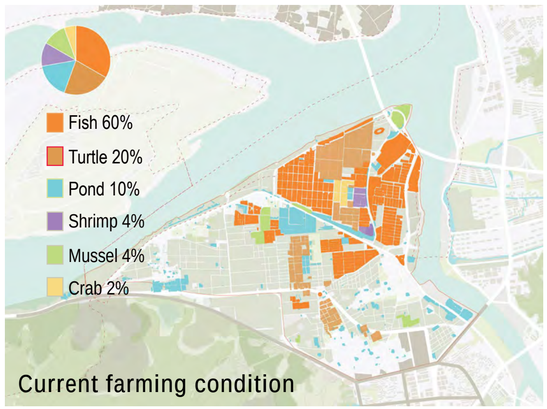


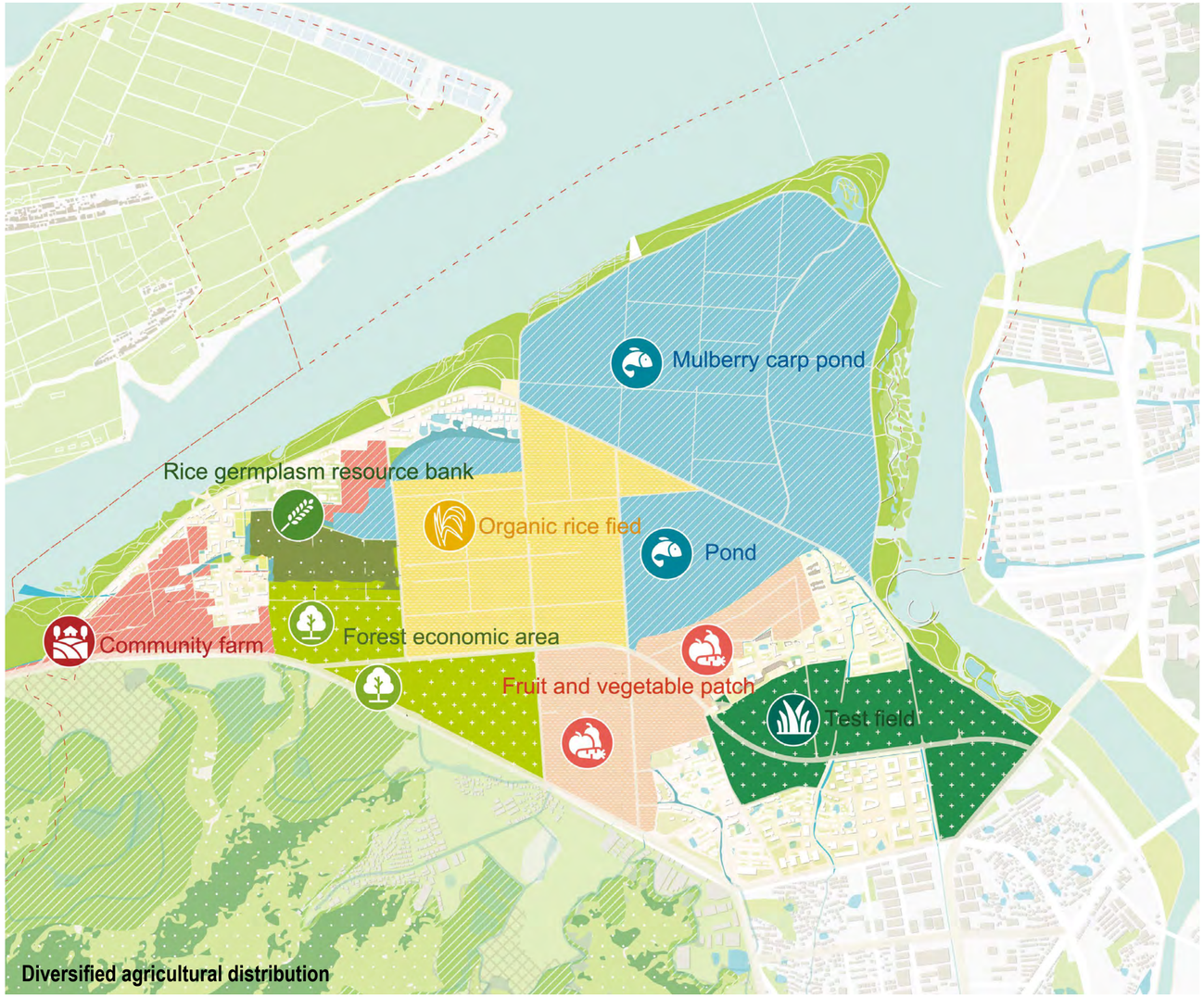
AGRICULTURE X: SUSTAINABLE ECO FARM PARK

Farming and fishing, always the main theme of the field of Yiqiao Park, we combine the characteristics and traditions of the site to establish the chain of eco-agriculture enables us to take advantage of biodiversity and microbial technology to form a virtuous cycle among multiple modules of agriculture, forestry, stock farming and fishery.



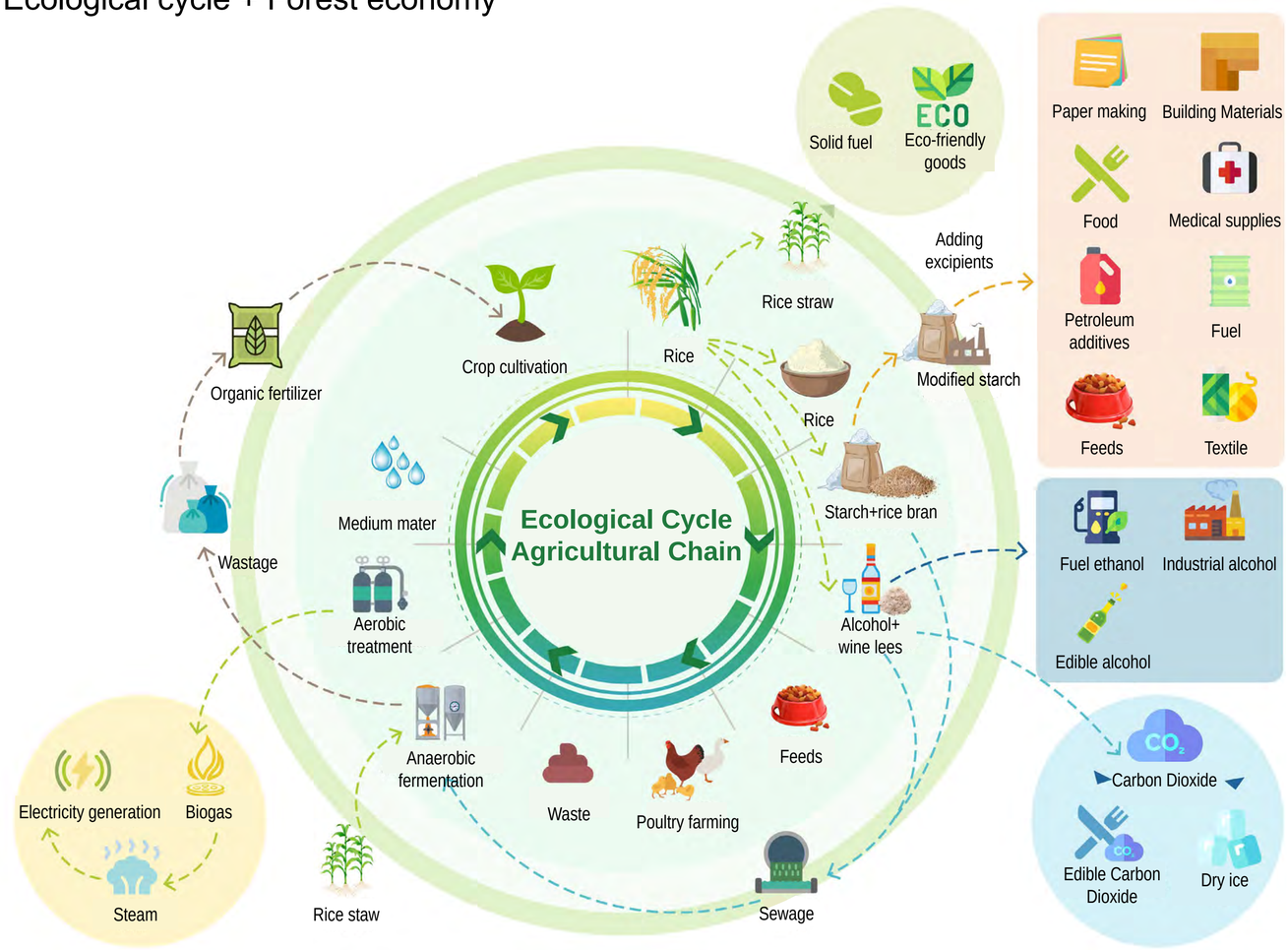


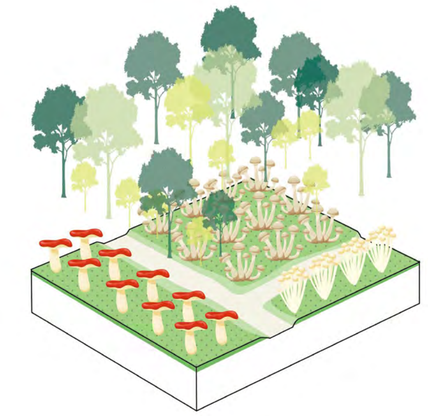




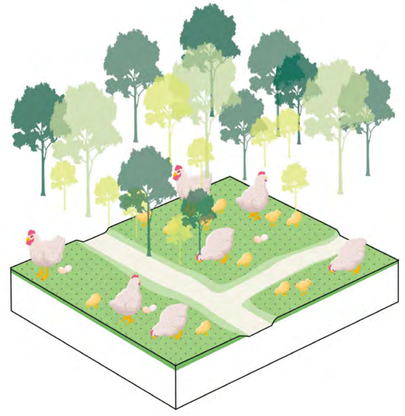
AGRICULTURE X: CREATE ECO-COMPLEX SUSTAINABLE AGRICULTURE

Ecological cycle + Forest economy

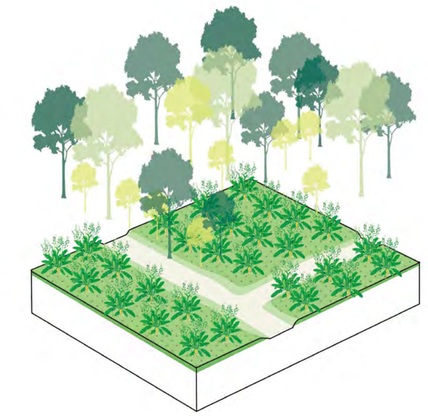




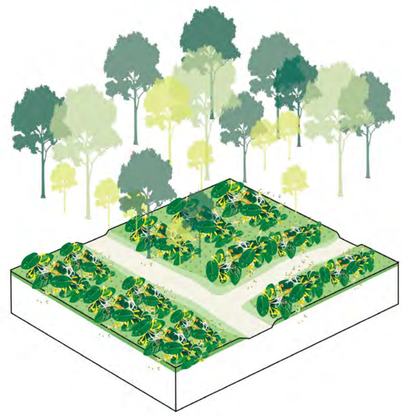
Forest fungus model



Forestry and Animal Husbandry Model



Forest vegetable model



Forest Medicine Model

Ecological cycle of agricultural production chain

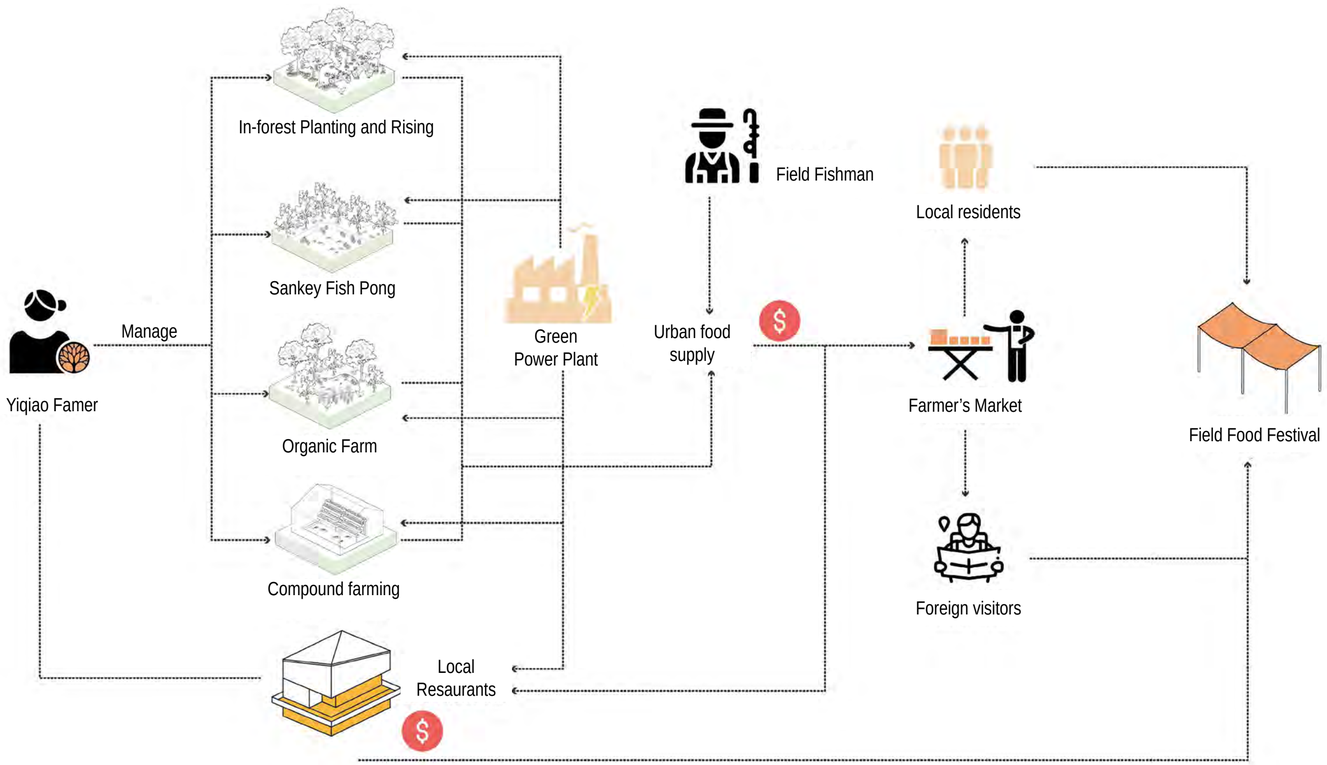
The ecological recycling agricultural chain forms an integrated management method for industries organically linked to the processing industry, such as planting and animal husbandry, and uses the core technology of species diversification microbial technology to form a virtuous cycle of the overall ecological chain among multiple modules of agriculture, forestry, animal husbandry and fishery.

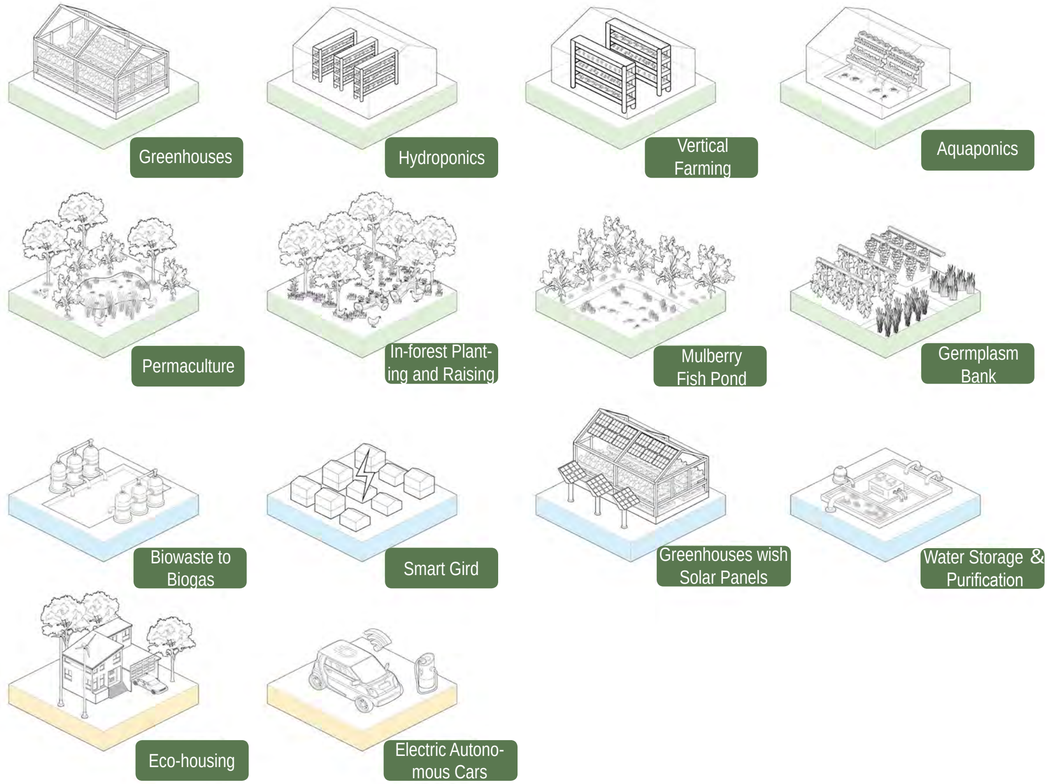
Forest economy to create ecological composite sustainable agriculture

In Yiqiao, we mainly introduce four kinds of forest economy models: forest mushroom model, forest animal husbandry model, forest vegetable model and forest medicine model.

AGRICULTURE X: ENCOURAGES PERMACULTURE AND SMART AGRICULTURE

CSA Organic Community + High-tech Agriculture Units





CSA Organic Community

CSA is community supported agriculture, which forms a sustainable production method through organic production. The forest economy, organic farmland, mulberry-based fish ponds, compound farming, Yiqiao farmers, field fishermen, and farmers' markets work together to form a sustainable ecological and economic system. There are also green energy technology displays and crop gardens to fulfill the display and education function.

High-tech Agriculture Units

Introducing cutting-edge technological agricultural research institutions to practice the future of efficient production agricultural methods and ecological agriculture, exploring the integration of technological ecological agriculture and idyllic lifestyles.

AGRICULTURE X: HEALING COMMUNITY

Combining the characteristics of farming and fishery, we create a natural education facility in Yijiao Park, implanting it in a dotted way and creating a museum living room that touches nature with a string of dots.

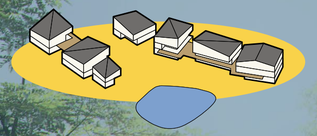
AGRICULTURE X: POLDER MUSEUM

The polder museum, based on the upgraded mulberry fish ponds nature-education facilities would become a place where agriculture, birds and people meet.

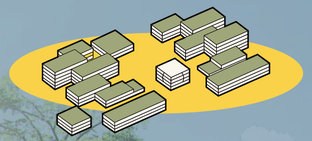
AGRICULTURE X: GLOBAL RURAL EXPO

The expo cluster provides a platform to promote local rural products.

Specialty Lane Shopping Street

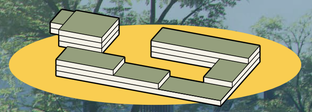


Organic Agriculture Research Center



Innovation Agricultural Society

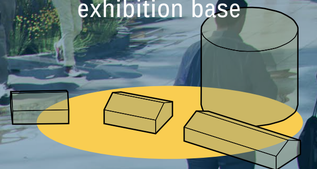
Innovation Agriculture Research Center



Innovation Community Center

Tourist Center

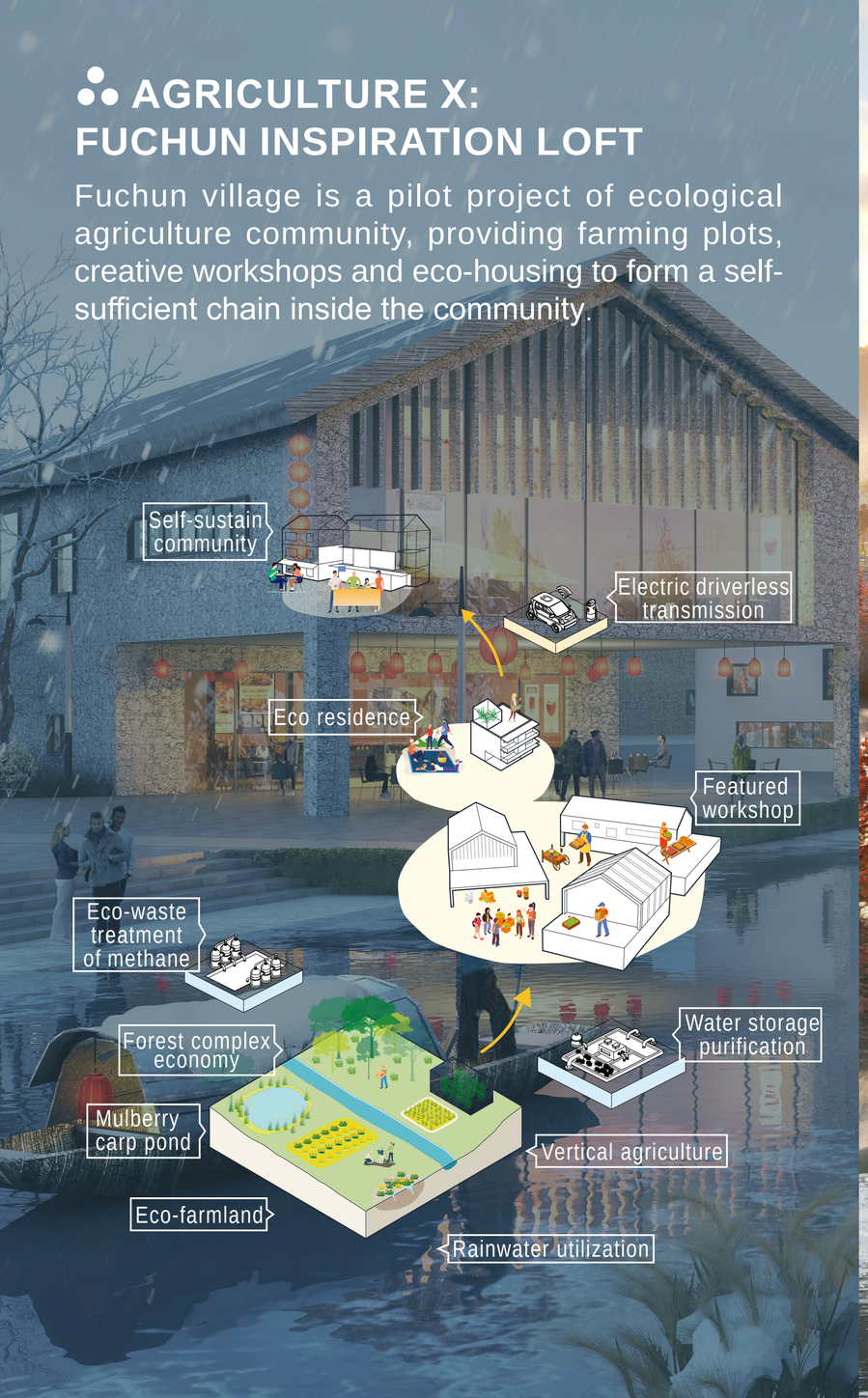
Agricultural interactive exhibition base



Innovation Agricultural Products Exhibition and Sales Hall

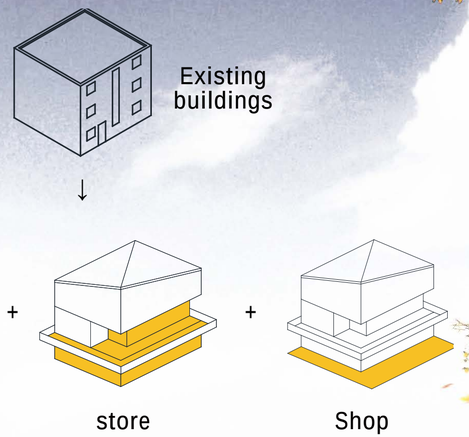
AGRICULTURE X:
FUCHUN INSPIRATION LOFT

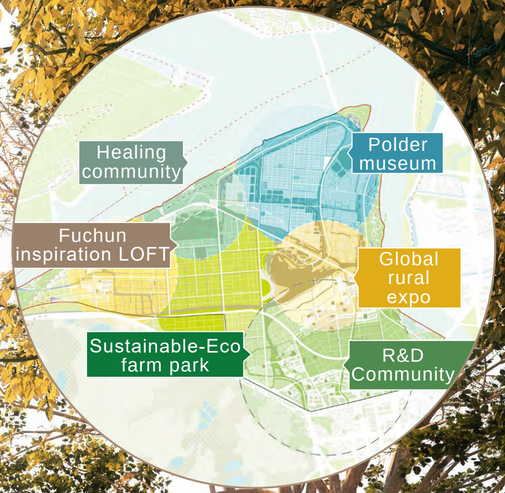
Fuchun village is a pilot project of ecological agriculture community, providing farming plots, creative workshops and eco-housing to form a self-sufficient chain inside the community.



AGRICULTURE X: R&D COMMUNITY

The R&D cluster could invite local and global university and institutions to settle.





RURAL FUTURISM OF YIQIAO AREA

The future Yiqiao area will maintain its rural quality, be a resilient eco-agro park that restores ecology and biodiversity while a more sophisticated and smart agriculture industry is established, and be more suitable and inclusive for various groups to live, work and visit.

Fuchun Inspiration Loft

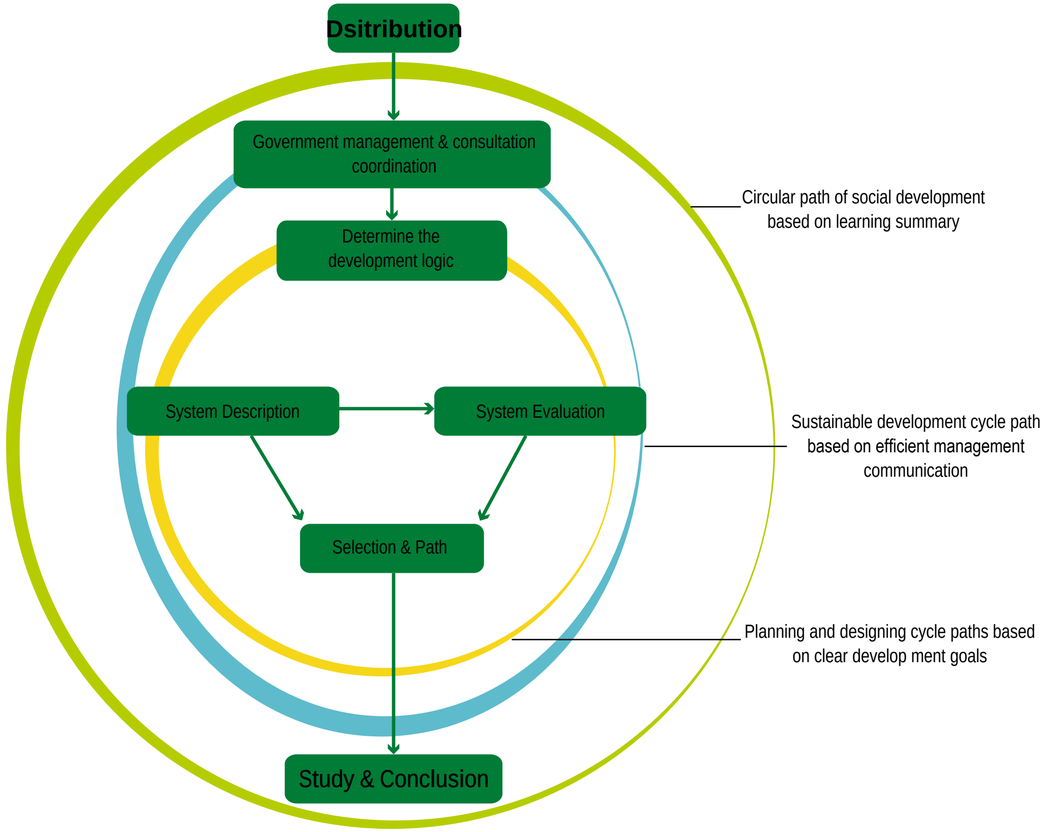
Future Rural Life

Local temple

RURAL X MANAGEMENT PLATFORM

This project offers strategic planning that addressing resilience, sustainability and inclusiveness of Yiqiao area as a guidance for future development and to avoid uncontrolled development.

Yiqiao future development path



The future development model of semi-agricultural and semi-X communities