

IFLA AAPME Awards 2024 – Climate Crisis Design

Analysis and Planning Category (Unbuilt Category)

Project Binder for

DEALING WITH CLIMATE CHANGE FLOODS - Qianshudang Park

Project Name: Dealing with Climate Change Floods - Qianshudang Park

Project Address: Yixing Economic and Technological Development Zone

City & Country: Yixing, Jiangsu

Area(sq.m): 145.94 hectares

Year of Completion: While construction is in progress, 2024

Project Category: Analysis and Planning Category (Unbuilt Category)

PROJECT STATEMENT

The design of Qianshudang Park highlights the culture of the water town and uses stormwater management as a key strategy. The design emphasizes ecological heritage, integrating traditional wisdom with local life to enhance people's sense of connection to the ever-changing waterfront while preserving local biodiversity. In the waterfront design, certain areas will reveal mudflats during medium to high water levels, providing alternative pathways for aquatic wildlife and a safe corridor for kayaks. During the dry season, visitors can stroll through the dense tall grasses on the riverbed, experiencing the unique charm of the wilderness. In the expansive marshlands, the rich aquatic vegetation not only provides habitats for waterfowl and fish but also showcases a diverse waterfront landscape for visitors to enjoy.

PROJECT NARRATIVE

The project is located in the Economic and Technological Development Zone of Yixing City, Jiangsu Province. Yixing, as part of the Taihu Scenic Area, is renowned for its picturesque natural scenery and numerous historical and cultural attractions. Yixing blends the unique cultural characteristics of caves, pottery, bamboo, and tea, attracting a large number of tourists for sightseeing, making it truly charming.

Situated within a 2-hour core economic zone of the Yangtze River Delta, the project enjoys convenient transportation. Qianshudang is located in the Nanxi River system of the Taihu Basin, where the terrain is flat, with a dense network of rivers, providing favorable conditions for rain and flood management. The normal capacity of Qianshudang is approximately 1.475 million cubic meters. The inflow of water varies seasonally, with about 60% of the water concentrated from May to September. The seasonal variation of runoff in the lake area is significant, with the most water entering the lake in summer and the least in winter.

The water area within the scope of the project's research is approximately 63.5 hectares, with several fish ponds of various sizes within the design scope. To optimize rain and flood management, measures such as fishery withdrawal and lake restoration will be adopted to increase the area of water storage in the region. These measures not only contribute to the restoration of the natural ecosystem but also effectively enhance the flood control and drainage capacity of the region.

Qianshudang has a good ecological foundation, with the current water area being 0.64 square kilometers, and the total length of the shoreline being approximately 5.65 kilometers. The normal water level is 3.21 meters, and the design flood level is 5.2 meters. Through scientific water resource management and storage measures, the project aims to improve the water quality in the region, enhance rain and flood storage capacity, and build a safer and more sustainable water environment system. These measures not only contribute to the protection of the ecological environment but also lay a solid foundation for the sustainable development of the region.

DEALING WITH CLIMATE CHANGE FLOODS

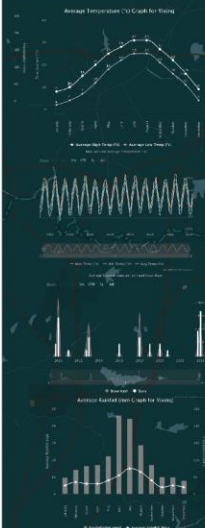
- QIANSHUDANG PARK

15.4 KM² WATERS

10 KM² WOODLAND AND GRASSLAND

50.2 KM² OTHER AGRICULTURAL LAND

HISTORICAL CLIMATE



URBAN BASIC INFORMATION

128,800 PEOPLE

177.012 BILLION

16.9°C AVERAGE



POPULATION



ECONOMY



TEMPERATURE

Qianshudang boasts rare environmental resources and connects several key water systems and lakes in Yixing, playing a crucial role as a regional ecological core and flood control hub.

FLOOD ANALYSIS CHART

SITE

QIANSHUDANG LAKE

THE RELEASE OF UPSTREAM FLOODWATERS CANNOT BE TIMED TO PREVENT FLOODING IN THE CITY.

RAINWATER HARVESTING

COLLECTION



LOW INVOLVEMENT

FILTRATION



IMPROVE URBAN DISASTER

PURIFICATION



WATER PURIFICATION

STORAGE



SUSTAINABLE

RAINSTORM DAMAGE

Yixing City is located downstream of the Huxi District, with the East banking on Taihu Lake and the West receiving upstream water from the Nanhe River, making it a true flood corridor. Due to the changes in rainfall, hydrological and water conditions in the drainage basin, the high water level in Taihu Lake holding back the water, and the pressure from southern mountain torrents, the inflow of flood peaks is increased and accelerated, leading to frequent flood disasters.

BC278-1948

121 TIMES

major floods



1954

1669MM

rainfall

1.38 TIMES

542,000 ACRES cropland



1984

837.6MM

rainfall

500 HOUSES

destroy

120,000 ACRES cropland



1991

899 MILLION YUAN loss

1000 HOUSES

destroy

430,000 ACRES cropland



1999

568 MILLION YUAN loss

374,000 ACRES cropland



01.SITE ANALYSIS

The base, located within Peiyuan Science City in Yixing's Economic Development Zone, serves as the eastern gateway of Yixing. Nestled among mountains and waters, Qianshudang boasts rare environmental resources and connects several key water systems and lakes in Yixing, playing a crucial role as a regional ecological core and flood control hub.

HISTORY AND CULTURE

Yixing is a city with a long history and rich cultural heritage.

CHARACTERISTIC LIFE



CULTURE

POTTERY POT



ECOLOGY



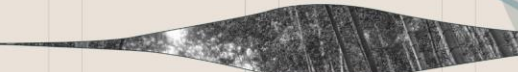
TEA



ANCIENT TOWER



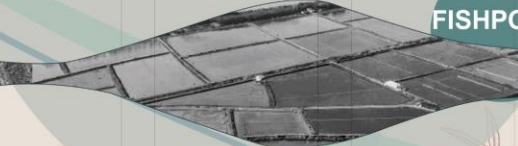
BAMBOO GROVE



LAKE



FISHPOND



02.HISTORY AND CULTURE

Yixing City is a typical water town in the Jiangnan region, with a network of intersecting rivers and streams. There are 2,424 rivers and streams within Yixing, serving as the main water source for irrigation of the city's farmland.

WATER SYSTEM

East longitude : 119°53 '17.55"
Northern latitude : 31°22 '38.28 "

- QianShuDang is located in the West Lake area of Taizhou, and belongs to the Nanxi water system of Yixing City. It is the main flood discharge and navigable river in Yixing and Liyang cities, and bears the drainage function of more than 1/4 of the area in the west of Taihu Lake.
- The current situation within the design scope is mainly farmland and vegetable fields, and scattered villages are distributed around.

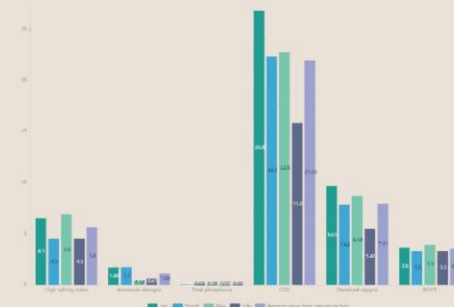


PHOTO

The surrounding ecological structure is good, and some areas have reduced some vegetation due to the gradual construction of agriculture and residential areas



THE PROPORTION OF CURRENT SHORELINE IN QIANSHUDANG

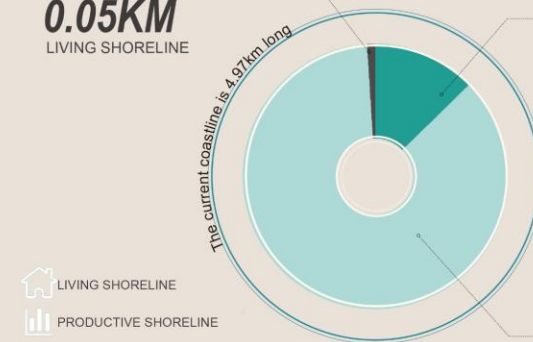


THE PROPORTION OF CURRENT SHORELINE IN QIANSHUDANG

1.0%
0.05KM
LIVING SHORELINE

12.7%
0.63KM
PRODUCTIVE SHORELINE

86.32%
4.29KM
ECOLOGICAL SHORELINE



- LIVING SHORELINE
- PRODUCTIVE SHORELINE
- ECOLOGICAL SHORELINE

03.WATER RESOURCES ANALYSIS

Yixing City is a typical water town in the Jiangnan region, with a network of intersecting rivers and streams. There are 2,424 rivers and streams within Yixing, serving as the main water source for irrigation of the city's farmland.

ECOLOGICAL RESOURCE ANALYSIS

There are rich resources in Yixing city. There are three major green cores in the city, including Yinan Ecological Green Core, Huake Ecological Green Core, and Taihu Ecological Green Core. Among them, Yinan Ecological Green Core has many biospheres and is one of the regions in Jiangsu with the richest wildlife and plant resources.

63.5 HA
6 TYPES

WATERS

Habitat Types

CREATE SHALLOW WETLANDS FOR BIRDS TO ROOST IN

THE CONSTRUCTION OF CITIES, THE DESTRUCTION OF VEGETATION, THE TOTAL NUMBER OF INSECTS DECREASED BY 40%. INCREASE THE NECTAR SOURCE OF HOST PLANTS AND TREES

CONTINUE THE MEMORY OF THE FISH POND AND ENSURE THE PRODUCTION AND LIVE OF RESIDENTS

HABITATS

PLANT RESOURCES



AQUATIC PLANT RESOURCES



BIRD RESOURCES



FISH RESOURCES



ANIMAL RESOURCES



04.ECOLOGICAL RESOURCE ANALYSIS

Yixing City boasts rich resources and three major green cores: Yinan, Huake, and Taihu Ecological Green Cores. Yinan is especially notable for its numerous biospheres and rich wildlife and plant resources, making it one of the most biodiverse areas in Jiangsu.

PROJECT STATEMENT-MASTERLAN

I. PRESERVATION OF ECOLOGICAL TEXTURE

Construct a natural and stable biome Construct a stable plant community that simulates nature and has a long life span.

II. RESTORATION OF AQUATIC ECOLOGY

Promotes water circulation in ponds and wetland systems, thereby improving water quality, enhancing visual effects and optimizing flood detention capacity.

III. ENHANCEMENT OF ECOLOGICAL EDUCATION AND ENGAGEMENT

By providing ecological education facilities and activities, we aim to enhance public environmental awareness. This includes education centers, nature trails, informational signage, eco-tours, and workshops to encourage community and visitor participation in environmental protection.

LEGEND

- | | | |
|-------------------------------|-----------------------------|---------------------------|
| ① Flood Regulation Zone | ⑥ Wetland Conservation Zone | ⑪ Green Conservation Area |
| ② Floating island Bay | ⑦ Energy square | |
| ③ Waterfront Garden | ⑧ Waterside Viewing Area | |
| ④ Fish, rice and water Street | ⑨ Office space | |
| ⑤ Floating garden | ⑩ Rainwater Garden | |

IMPORTANT NODE

A

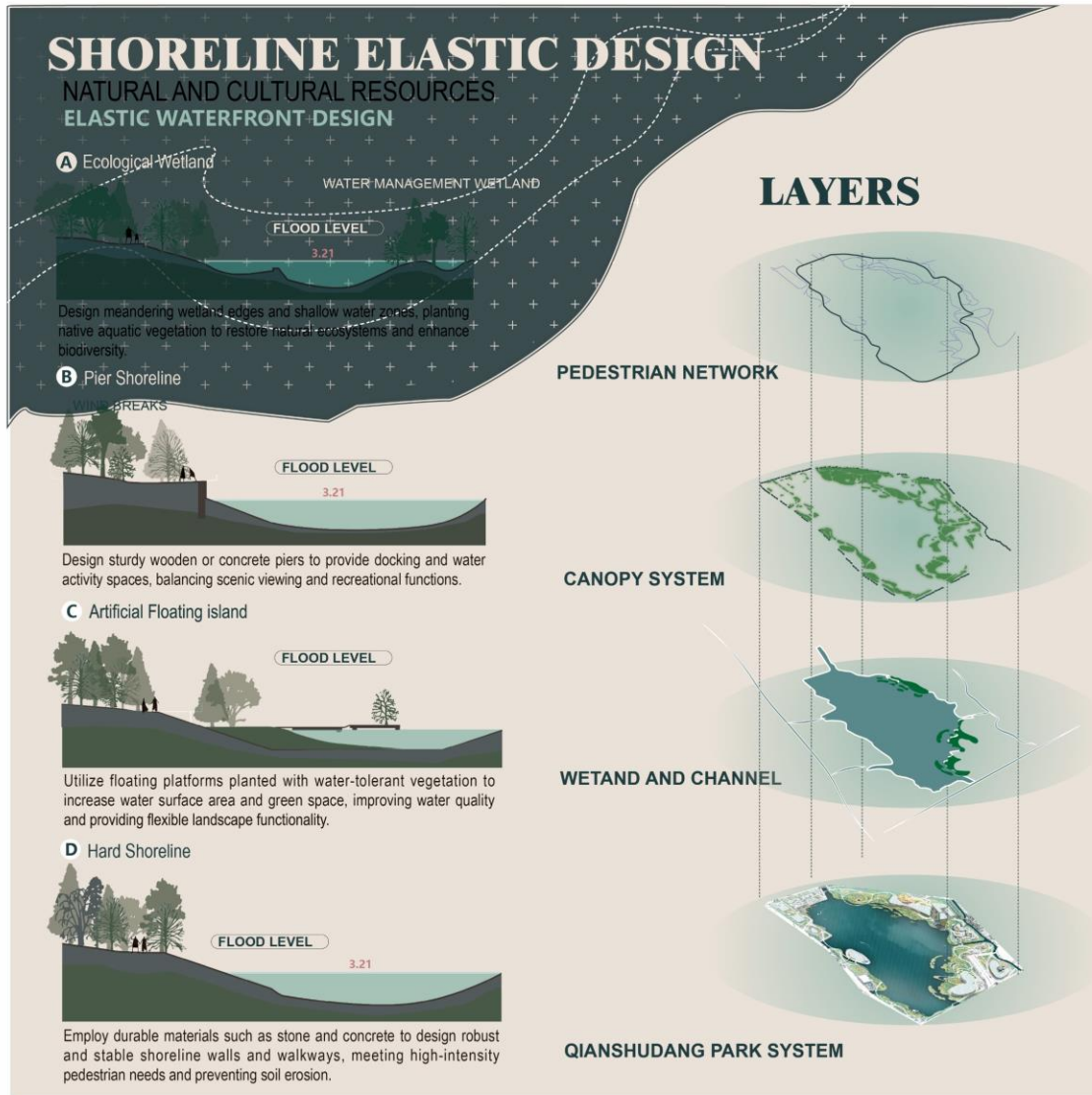


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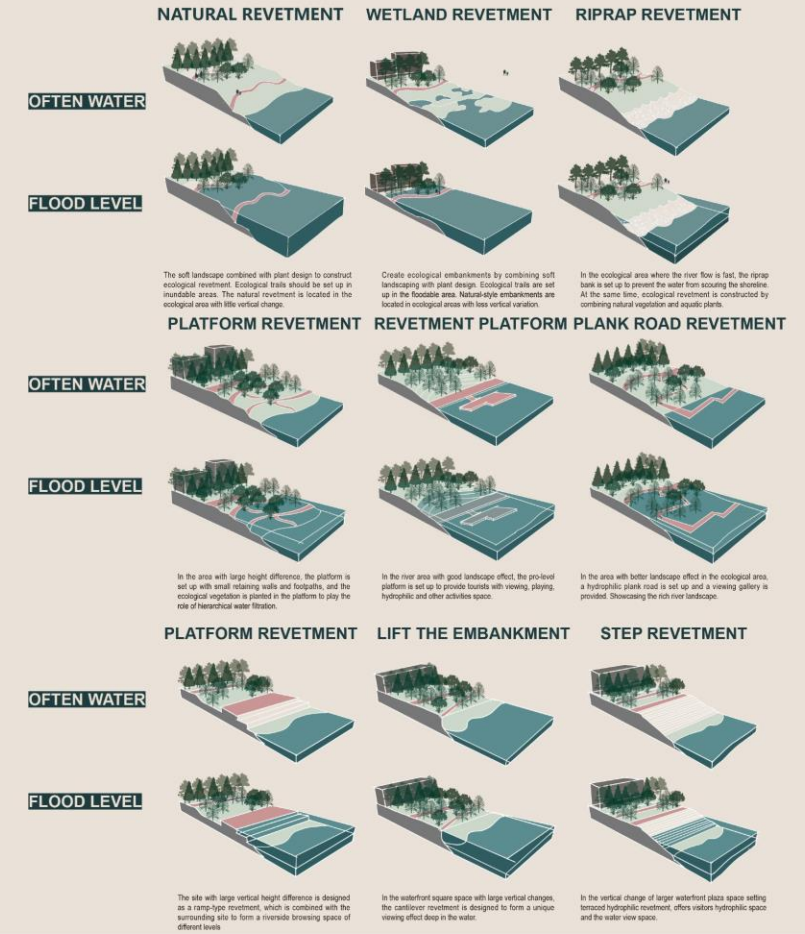


05. MASTER PLAN

Three Landscape Design Strategies: 1) Preservation of ecological texture. 2) Restoration of aquatic ecology. 3) Enhancement of Ecological Education and Engagement.



FLOOD-RESISTANT EMBANKMENTS TO COPE WITH FLOOD CHANGES



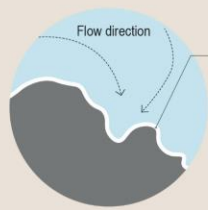
06. LAKESHORE DESIGN

For different lake shorelines, design diverse activity spaces, waterfront areas, and ecologically natural soft shorelines that also address flood impacts caused by climate change.

ECOLOGICAL FILTER MODEL

Utilize the site's ecological texture to enhance the sponge function, coordinate ecological flood control technology, constructed wetland technology, and habitat restoration technology to create a Taihu ecological purification system that restores the natural regulation function of riverbanks while ensuring the safety of river channels and rationally utilizing riverbank space.

STEP 1

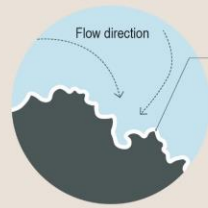


ORIGINAL SITE

PRESENT SHORELINE

•The shoreline may be affected by erosion and sedimentation, leading to instability of the shoreline.

STEP 2



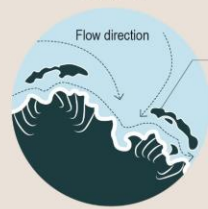
CHANGE OF SHORELINE

BENT SHORELINE

+9.5%

•Horizontal subsurface flow constructed wetlands use the horizontal flow of water through the wetland fill material to achieve contact and reaction.

STEP 3



CONSTRUCTED WETLAND

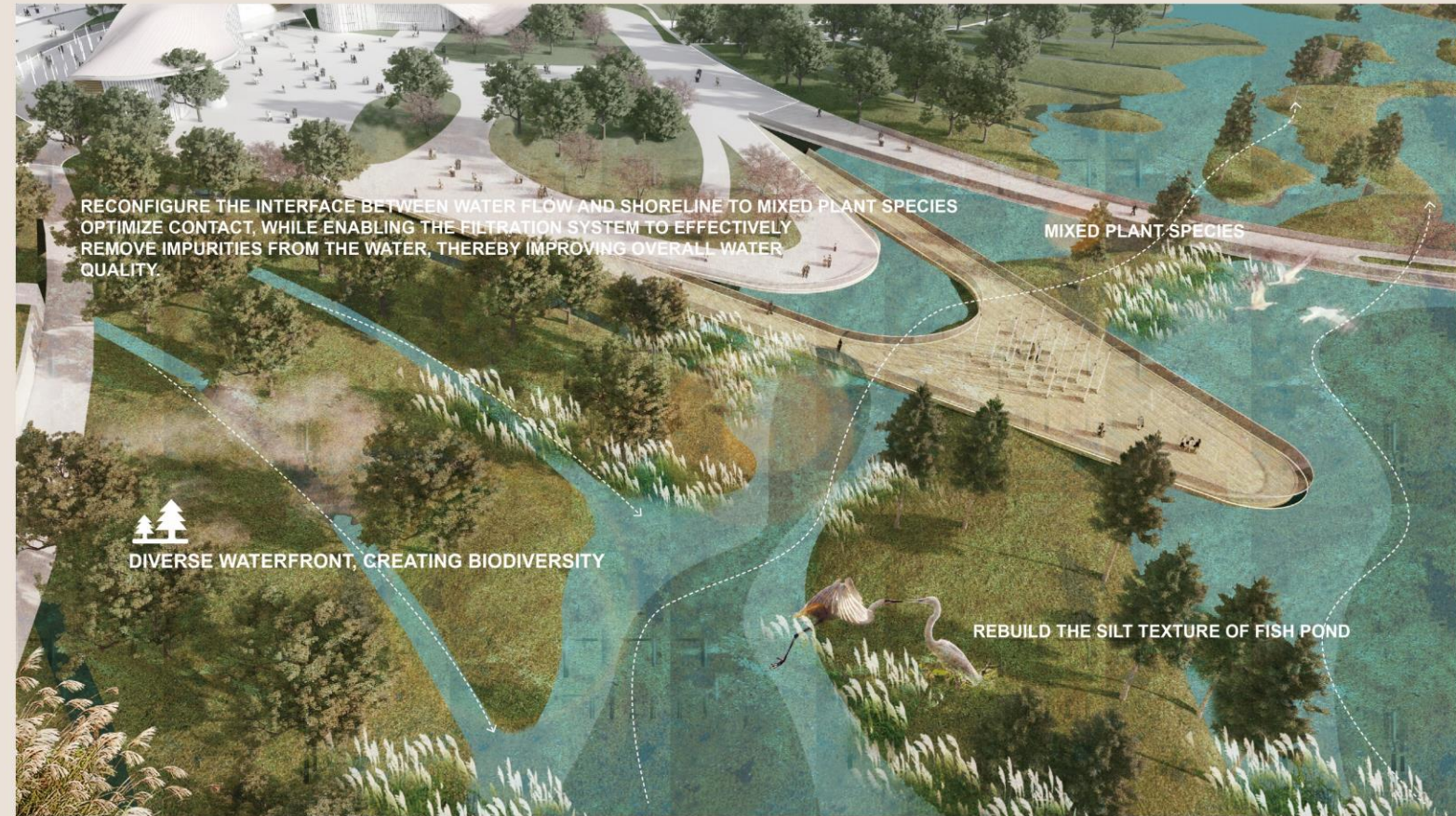
ECOLOGICAL ROUNDABOUT

+24.4%

•The design increases the contact surface of water flow, so that more water can contact the wetland and produce contact reaction

RENDERING-ECOLOGICAL WATER BAY

Take ecological space as the central focus, enhance the site's texture, establish diverse water banks and islands, create a thriving ecological water environment, and integrate biodiversity to form a natural low-carbon lake.

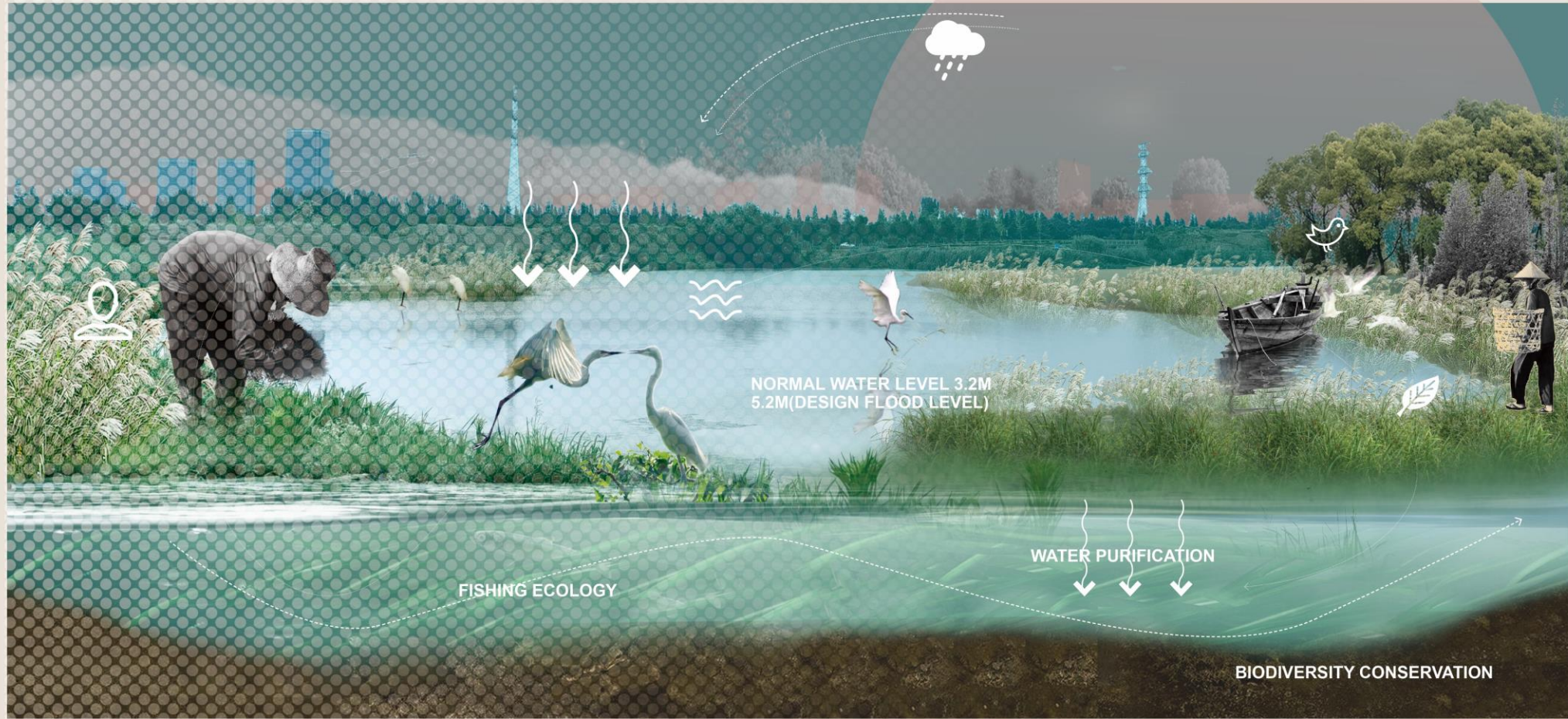


07. ECOLOGICAL WATER BAY

Focusing on ecological spaces, we aim to enhance the texture of the site, create diverse shorelines and islands, and foster a high-quality ecological water environment. By integrating biodiversity and natural low-carbon lakes, we strive to create a harmonious natural ecosystem.

SUSTAINABLE STORMWATER MANAGEMENT AND HABITAT

There are no shortage of residential production activities around Qianshuzhang, which is a unique fish pond development method created by the people of southern China in their long-term efforts to manage fields and waterways. It is a healthy ecological space where water and greenery work together, and we will explore the dynamic balance and ecological logic between fish and rice diet and rainwater regulation. We will also enhance the auxiliary functions of ecosystem services through measures such as flow regulation, water quality purification, biodiversity protection, waterfront settlement, and waterfront aesthetics.

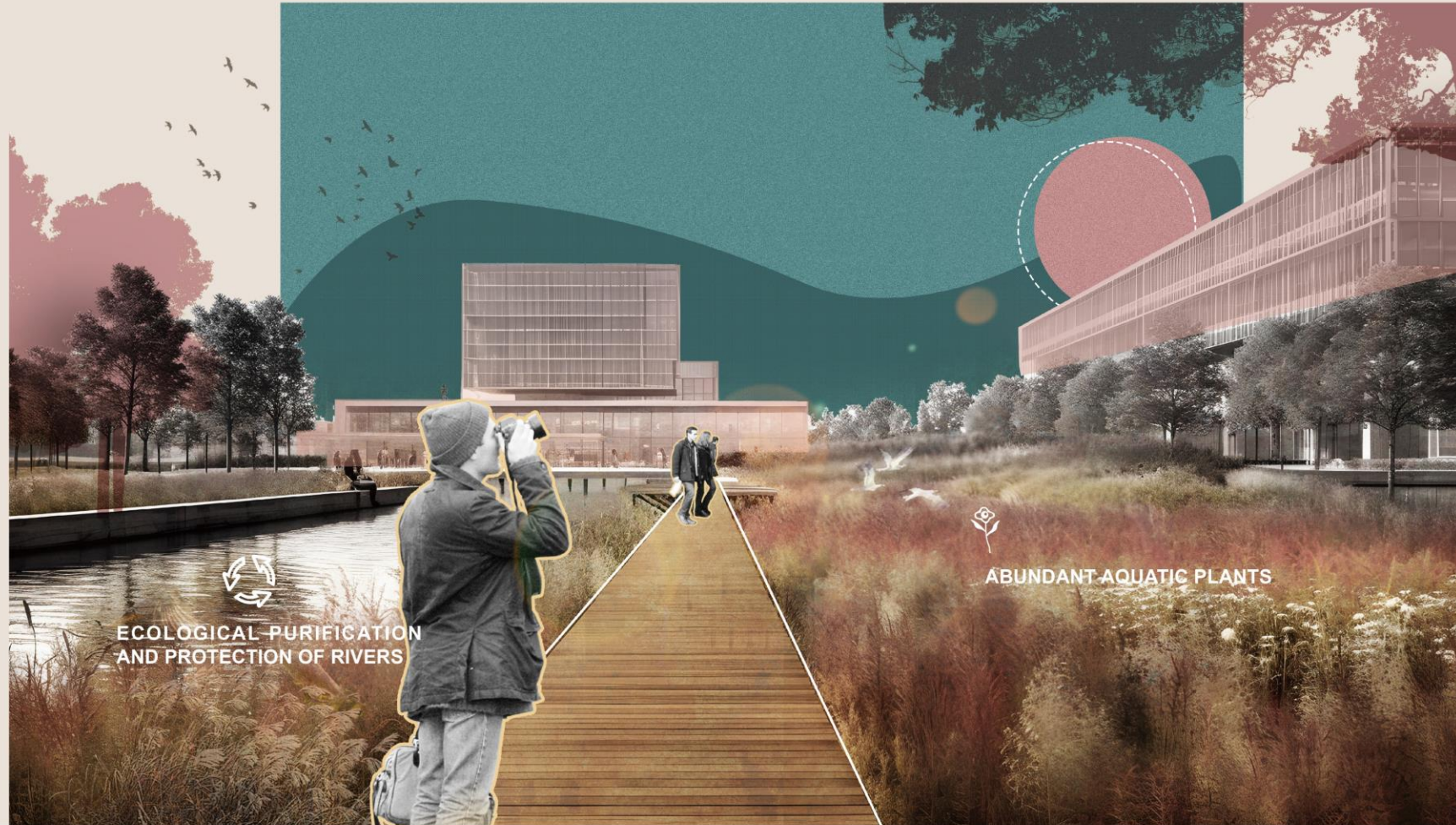


08. SUSTAINABLE STORMWATER MANAGEMENT AND HABITAT

It is a vibrant ecological space where water and greenery coexist harmoniously. We will explore the dynamic balance and ecological interplay between aquaculture and rainwater management. Additionally, we will enhance the auxiliary functions of ecosystem services through measures such as flow regulation, water quality purification, biodiversity protection, waterfront settlement, and aesthetic improvements along the waterfront.

RENDERING-WETLAND GARDEN

Enhance perception ability and stimulate people to return to nature. Build wetland and marsh plant communities, promote ecological diversity, and maintain urban ecological balance. Create a participatory landscape space node to improve the living environment. It has become an ideal place for Yixing citizens to walk into nature and get close to the waters.



09.WETLAND GARDEN

Creating wetland and marsh plant communities to promote ecological diversity and maintain urban ecological balance, we aim to develop interactive landscape spaces that improve the living environment. This will become an ideal place for Yixing residents to connect with nature and enjoy the water.