Country / City	China
University / School	Southwest Jiaotong University
Academic year	2017-2018
Title of the project	Redemption of Shrinking City Based on 3D GI
Authors	Jing Yuan, Zhang Ke

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PERFORMATIVE NATURE

Barcelona International Landscape Architecture Biennial

September 2018 Barcelona

SCHOOL PRIZE

X International Landscape Architecture Biennial

Máster d'Arquitectura del Paisatge -DUOT - UPC
ETSAB- Escola Tècnica Superior
d'Arquitectura de Barcelona
Avenida Diagonal, 649 piso 5
08028 Barcelona-Spain

TECHNICAL DOSSIER

Title of the project	Redemption of Shrinking City Based on 3D GI
Authors	Jing Yuan, Zhang Ke
Title of the course	Landscape planning and design
Academic year	2017-2018
Teaching Staff	Yang Qingjuan
Department/Section/Program of belonging	School of Architecture and Design
University/School	Southwest Jiaotong University

Written statement, short description of the project in English, no more than 250 words

Many cities in China face the challenge that urban expansion and shrinkage coexist, which also have threats of population loss, vacant properties emergence, along with inadequate urban infrastructure. Ordos, located in southwest of the Inner Mongolia Autonomous Region of China, is a typical case, that economic growth suffered from prosperity to decline owing to single economic source of coal mine. It has experienced severe city shrinkage, and also faces serious sandstorm and dust, and water resource problems with declining groundwaterlevel.

The design creates the three-dimensional(3D) Green Infrastructure(GI) to help city return to sustainable development track, meanwhile realize ecological and social resilience. The construction of 3D GI with a system of core-hub-link is relying on identifying available vacant properties and existing green space to propose grading principles and strategies. The core formed by public green space has three grades:protection, buffer, and potential zone, which is determined by ecological assessment. The hub based on vacant high-rise, vacant land in shanty towns, and community green space, has three categories: vertical,surficial and island, which is determined by service radius of core and vacant properties potentiality. The link system combined with river, vertical greening, greenway, and temporary structures, consists of three ways: river, vertical and surficial, which is determined by ecological analysis and ENVI-met simulation study on street types. Taking Dongsheng District in Ordos as an example, the 3D GI system construction combined with local conditions is proposed to achieve resilience relationship between society and nature in this region.

For further information
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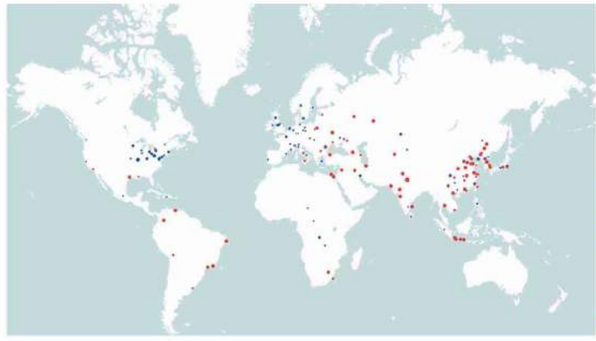
LOCATION



Cities of more than 500000 Inhabitants

- 10%-25%
- 25%-50%
- 50%-100%

Shrinking cities short-term or ongoing population losses of more than 10%

- 10%-100%
- 100%-1000%
- 1000%-10000%

Growinging cities short-term or ongoing population gains of more than 10%

Date based on Oswalt P，Rieniets T.Atlas of Shrinking Cities[M].Ostfildern：Hatje Cantz Verlag，2006.

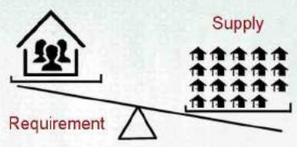
PROBLEMS

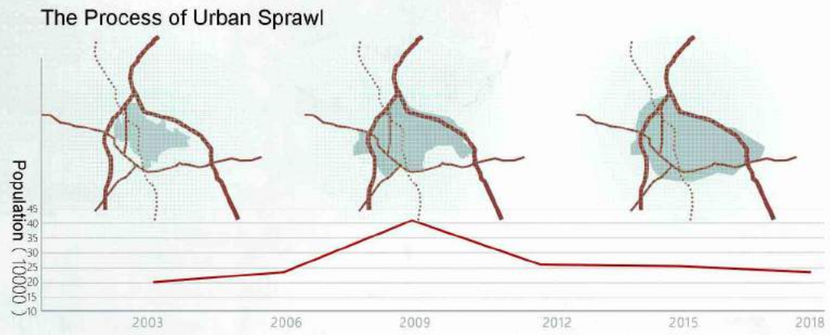
1 City Shrinkage

origin of Shrinking — Bubble Economy

Coal-Based City ····· Demolition ····· Lending

Development Stalls ····· Oversupply ····· Shrinking

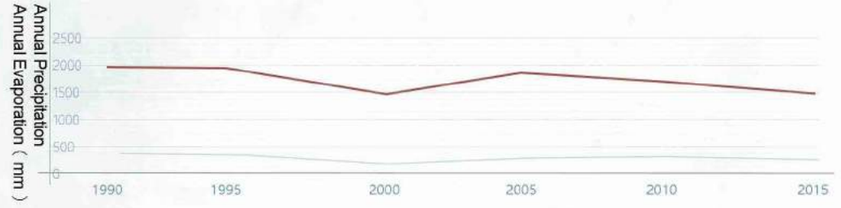




2 Drought

Evaporation **2200mm**

Precipitation 325mm



3 Sandstorm

1.DESERT AREA **57820.2 km²**

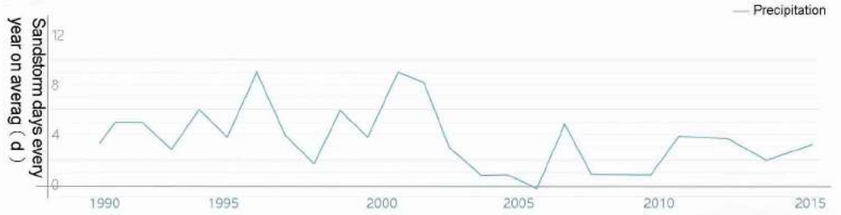
Accounts for **66%** of the total area of Ordos

2.Surface mine

3.Spontaneous combustion of gangue

4.Road dust

5.Coal combustion



SOLUTATIONS

Shrinking City — *Water Shortage* — *Climate & Coal Mining*

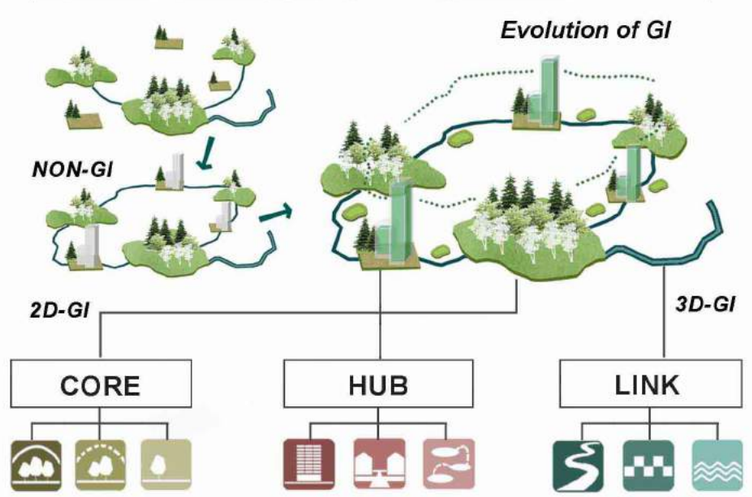
Loss of City Vitality &Vacant Properties

Groundwater Level Rise

Frequent Sandstorm & Dust Pollution

Society Resilience — *Performative Nature*

Three-Dimensional Green Infrastructure



HISTORY

STRATEGY

■ CORE

Core Protection

- Protecting existing high qualty ecological system
- Increasing facilities of biological habitats

Buffer Zone

- Enhancing ecosystem diversity as the buffer zone

Potential Zone

- Extending ecological space in urban potential zone
- Converting the square, street greenland and the pocket park to GI

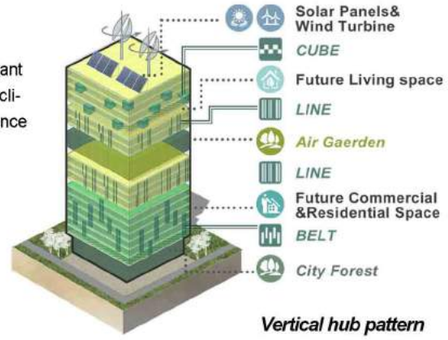
■ HUB

Vertical HUB

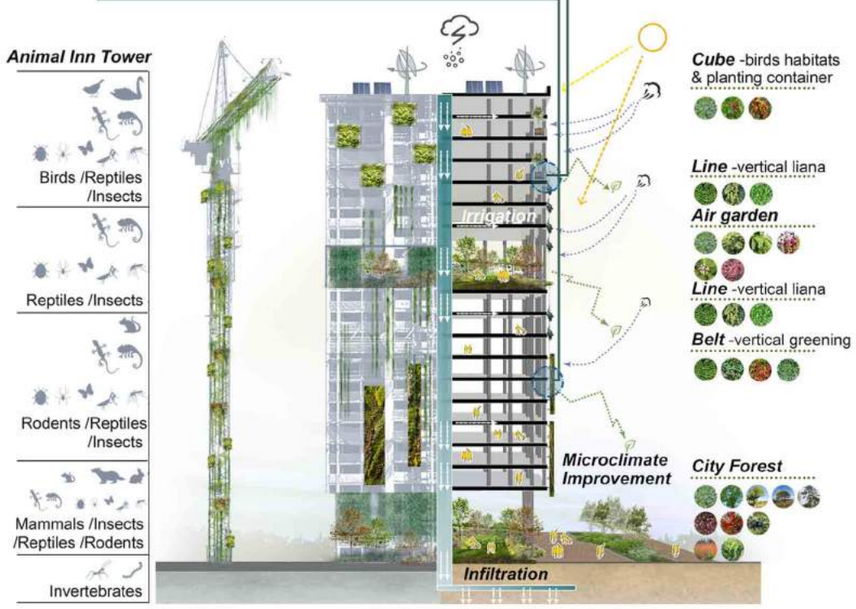
- Existing vacant high-rise in city is regarded as important strategy for 3D GI.Vertical hub could improve microclimate, provide biological habitat and stretching resilience in the process of city shrinkage.

Belt Section

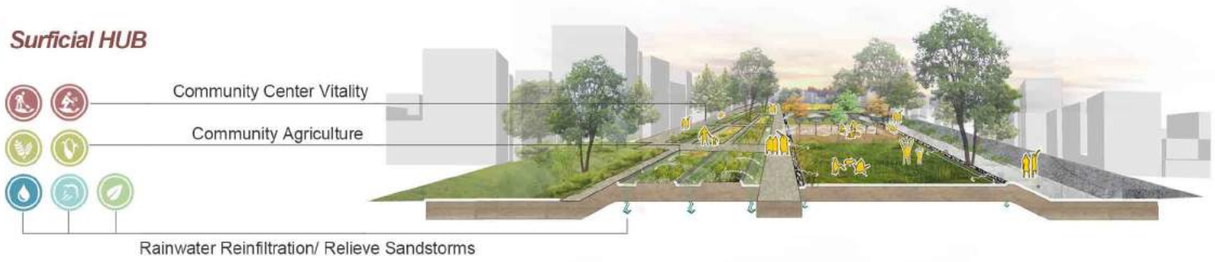
Planting Container Section



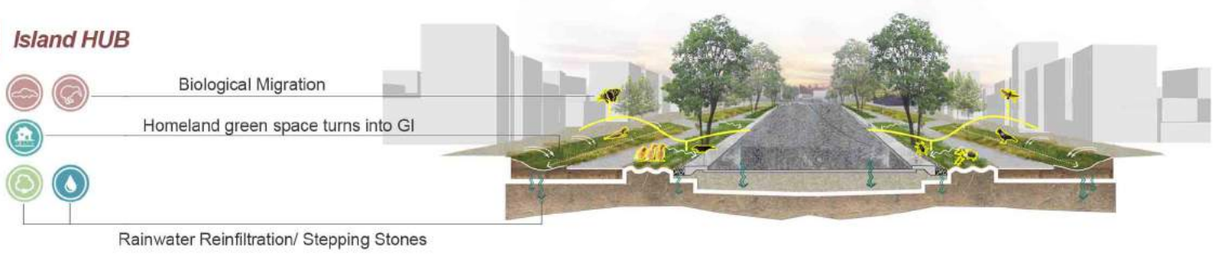
Vertical hub pattern



Surficial HUB



Island HUB



■ LINK

River LINK

■ Vertical LINK

CUBE

LINE

BELT

■ Surficial LINK

SCALE SWALE

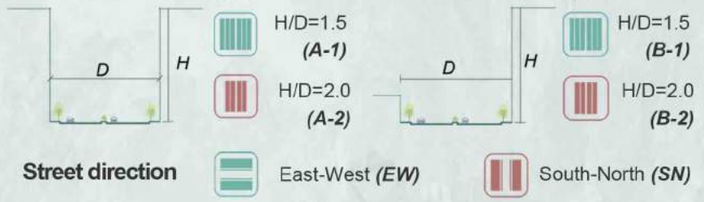
SHELTER

FRAME

Design Basis of Link [Envi-Met Simulation]

Test Type

Type of Depth-width Ratio



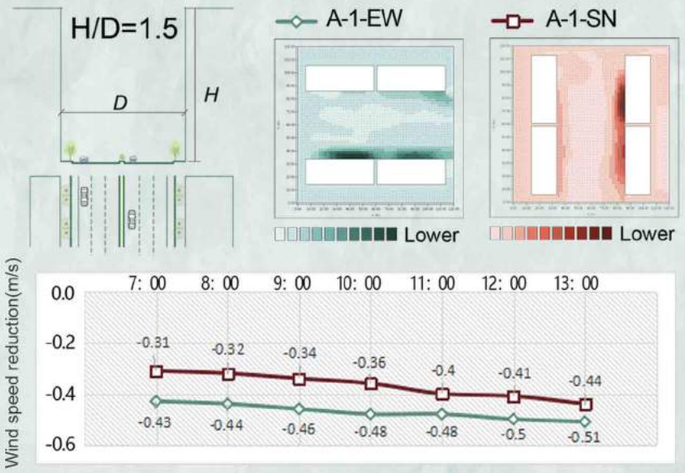
Street direction: East-West *(EW)* | South-North *(SN)*

Test Result

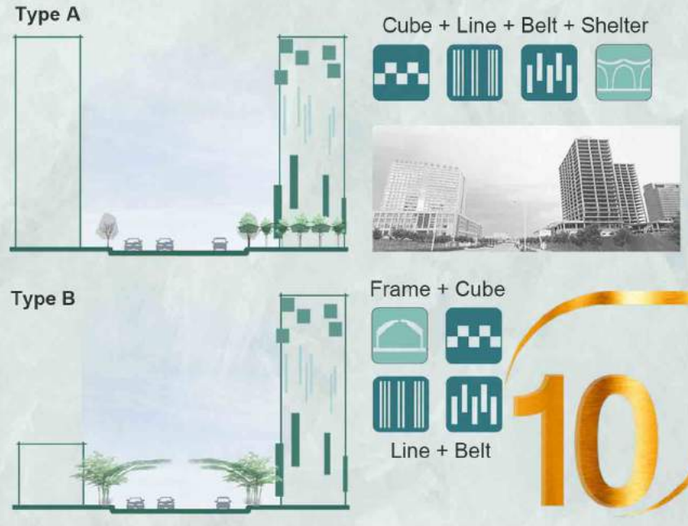
Degree of wind speed reduction *(Different Types)*

A-1-EW		B-1-EW	
A-1-SN		B-1-SN	
A-2-EW		B-2-EW	
A-2-SN		B-2-SN	

Data of wind speed reduction *(Suitable Types)*



Application of Link



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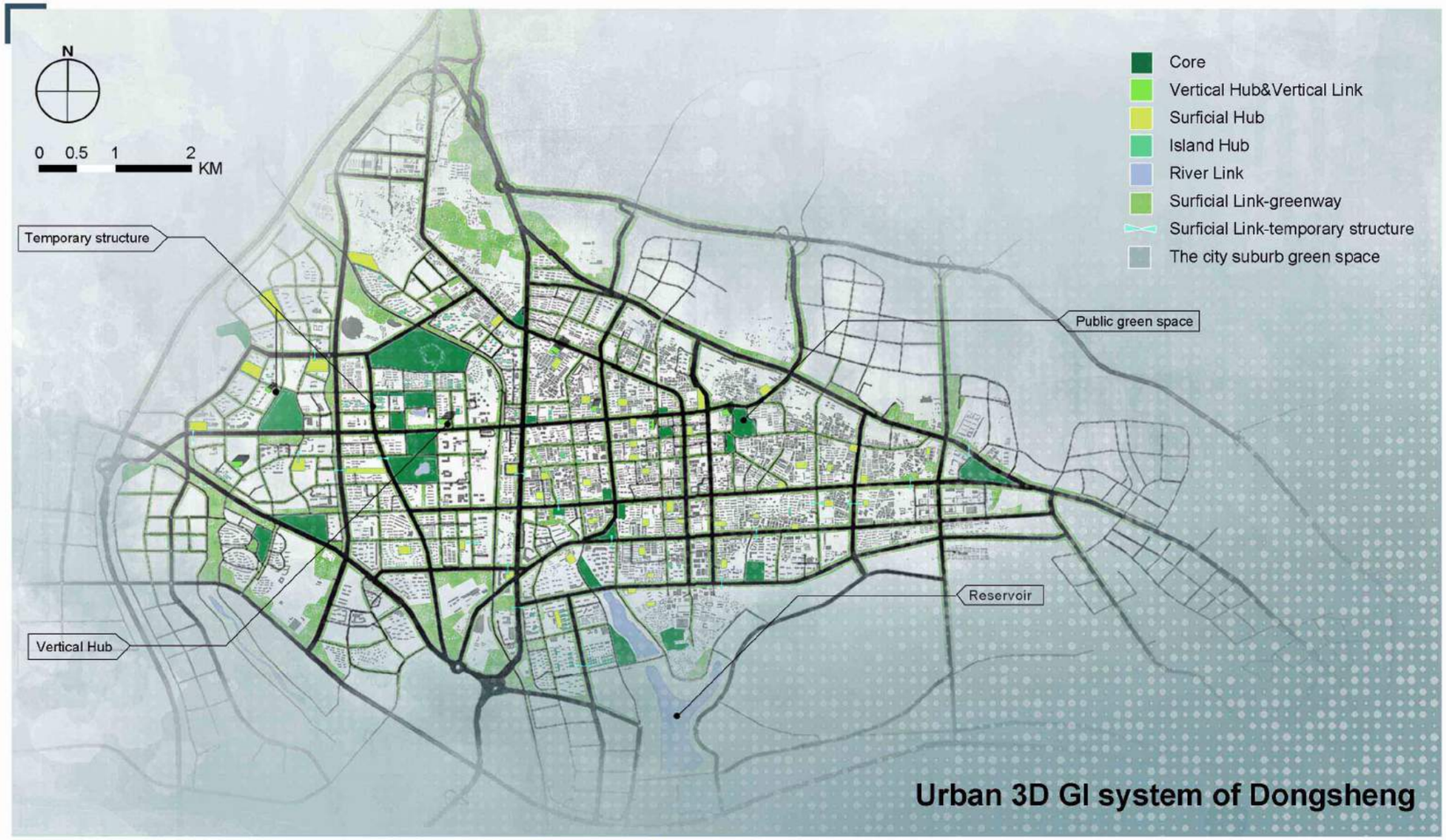
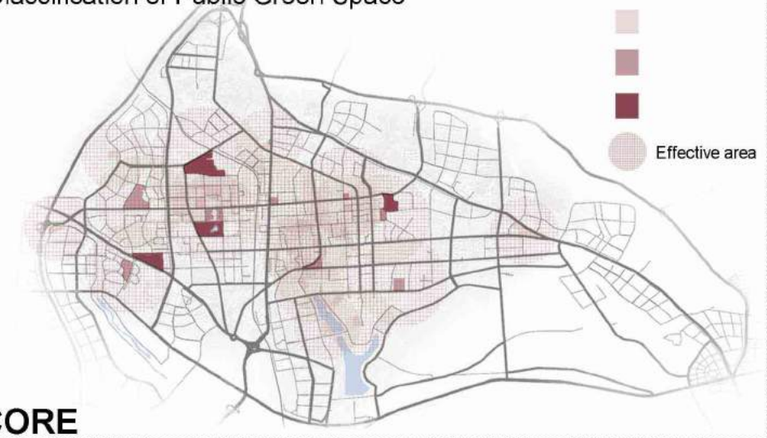
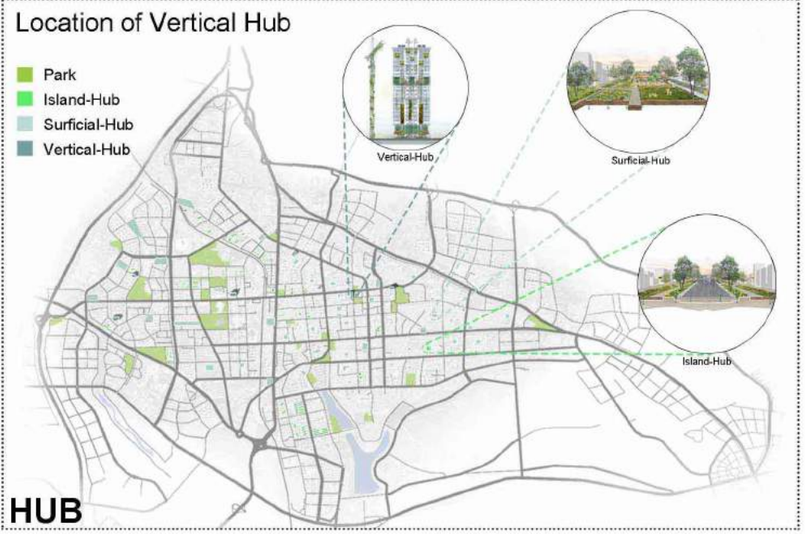


Classification of Public Green Space



CORE

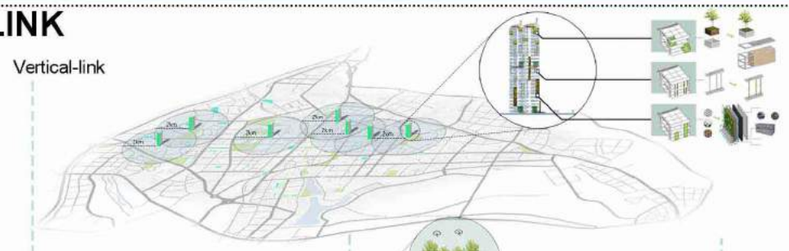
Location of Vertical Hub



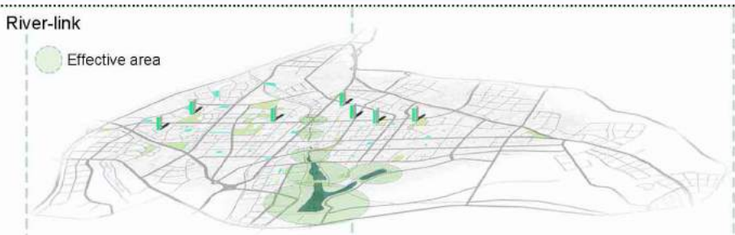
HUB

LINK

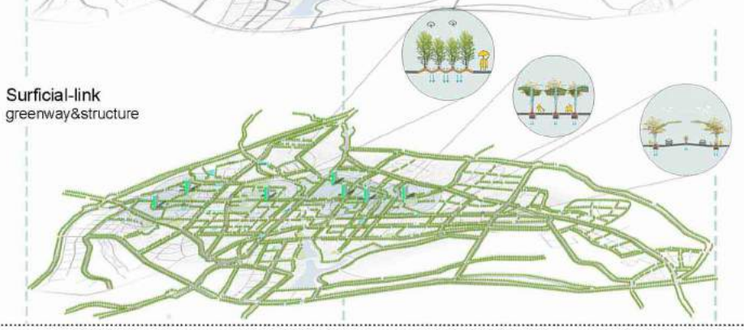
Vertical-link



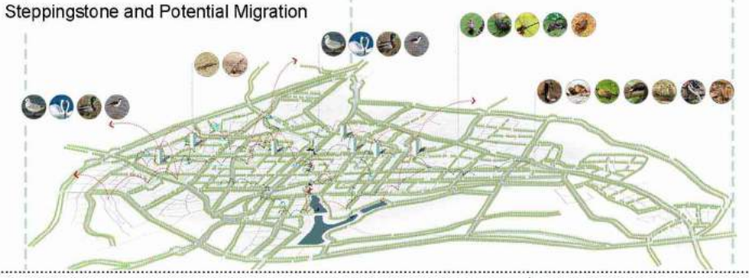
River-link



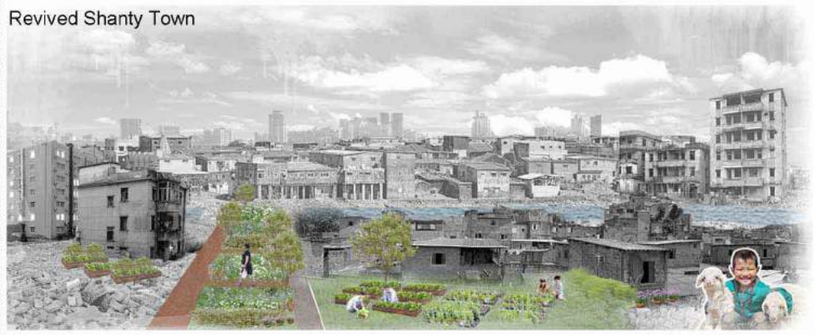
Surficial-link
greenway&structure



Steppingstone and Potential Migration

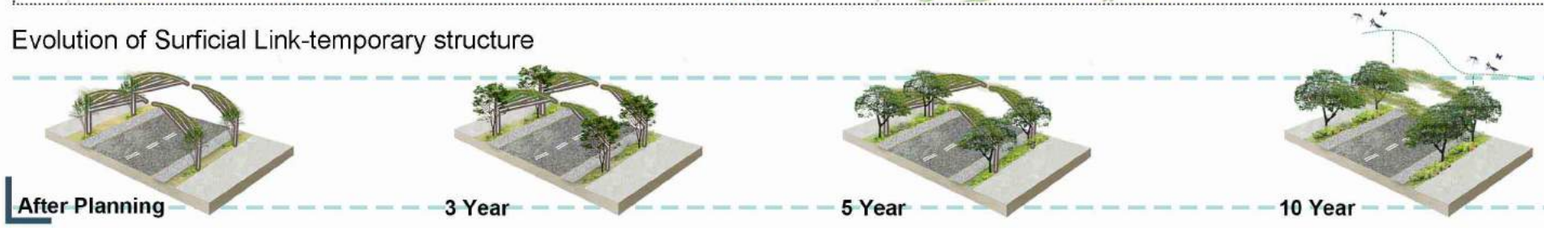


Revived Shanty Town



Revived Vacant Properties

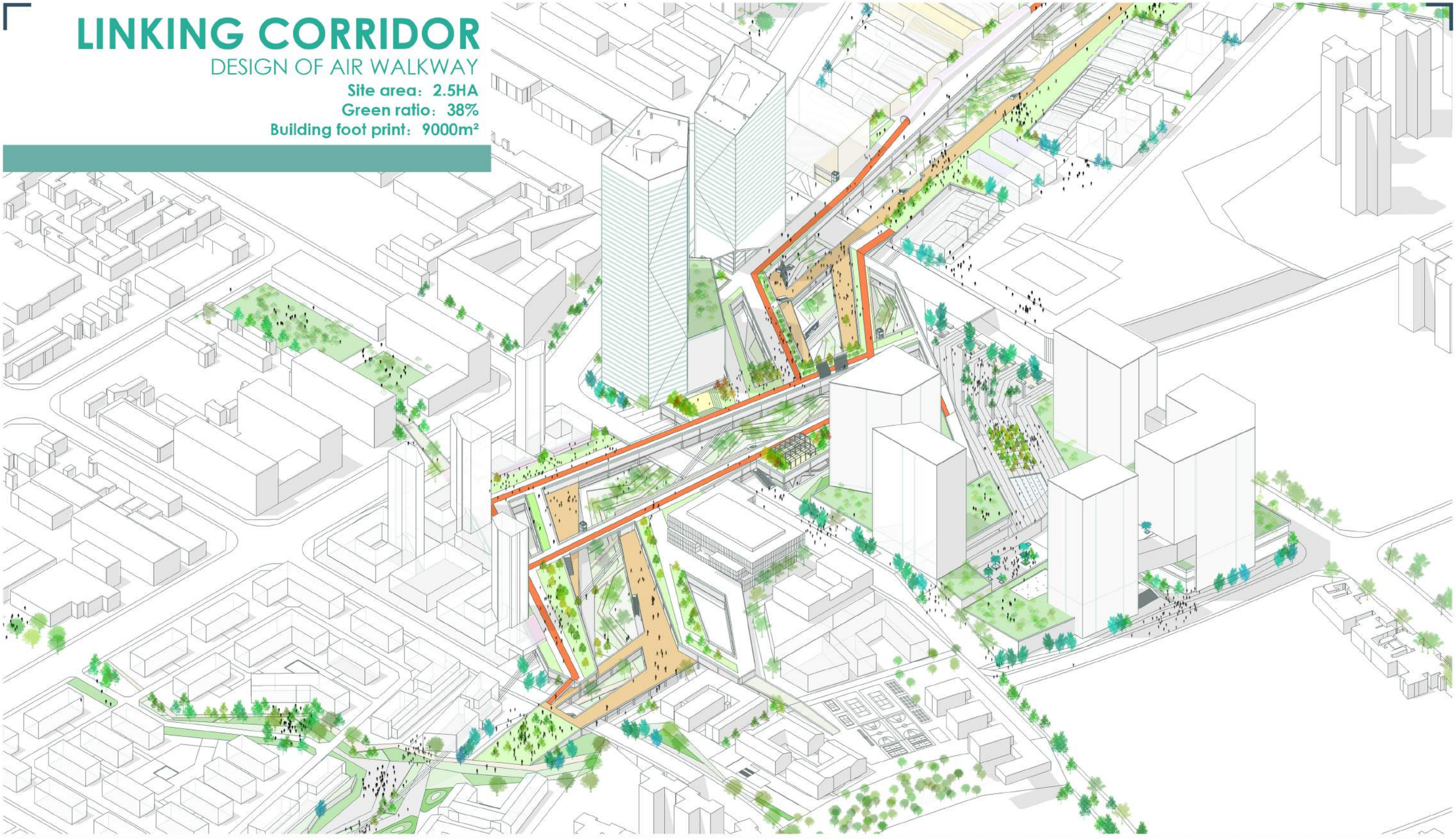
Evolution of Surficial Link-temporary structure



LINKING CORRIDOR

DESIGN OF AIR WALKWAY

Site area：2.5HA
Green ratio：38%
Building foot print：9000m²



Country / City	China
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Academic year	2017-2018
Title of the project	Linking Corridor
Authors	Zhong Heli

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TECHNICAL DOSSIER

Title of the project	Linking Corridor
Authors	Zhong Heli
Title of the course	Landscape planning and design
Academic year	2017-2018
Teaching Staff	Fu Ya
Department/Section/Program of belonging	School of Architecture and Design
University/School	Southwest Jiaotong University

Written statement, short description of the project in English, no more than 250 words

With the continuous development of the city and the rapid shortage of urban space resources, how to build an ideal future city and create a good human settlement environment and urban ecology under the increasingly prominent urban intensification? The concept of urban three-dimensional design was proposed by many urban researchers. The construction of urban three-dimensionalization realized the integration of land resources and eased the contradiction of urban space resources development.

This design takes the urban rejuvenation of the old industrial zone of the Happy Forest Zone in Xi'an as an example, explores the three-dimensional pedestrian system, open space, and landscape construction in the core area of the city, and proposes the design methods and elements of the urban three-dimensional construction, to summed up the city's three-dimensional development trend.

For further information
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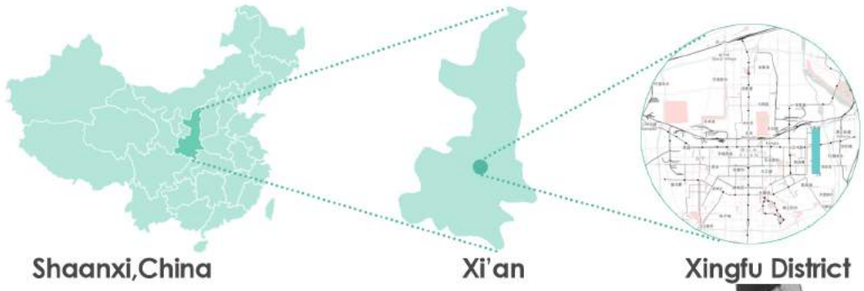
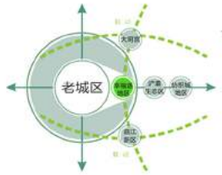
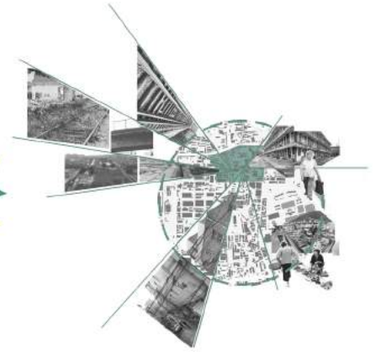
Location







Xi'an Xingfu Forest Zone is located on the west bank of the Weihe River in the eastern suburbs of Xi'an, south of the Bohai Railway.

History

Problems

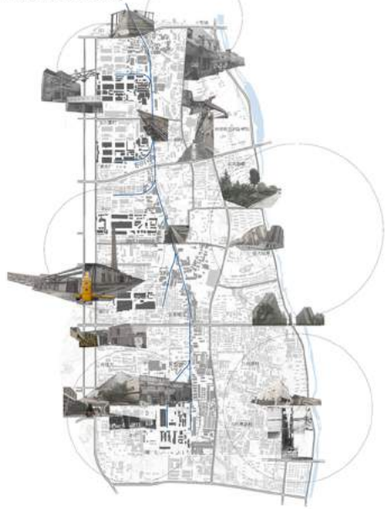
Life
separation of daily life and society


Local worker


Freelancer


Retirees


Students



Culture
cultural fragmentation in time and space

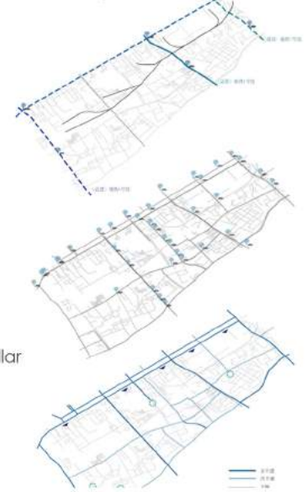
Development
contradictions in urban development


Migrant workers


Children


Surround white collar


Visitors



Ecology
separation of daily life and society

Design process

Fragmentation

Expectation

Happiness Green Net

Happiness Innovation green valley

Go to the Green Valley!

Strategy

Overall landscape concept - a valley and three areas, ecological suture, functional suture, life suture

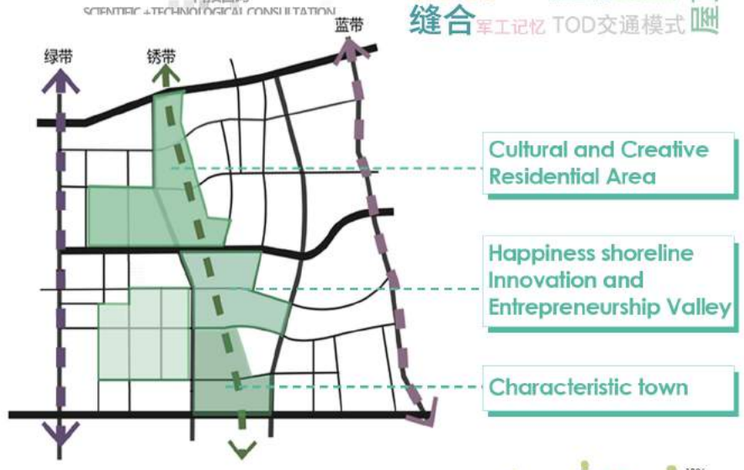
Urban three-dimensional
Realizing green value from broad

Air corridor landscape system
Uninterrupted green experience instantly activates the site.

Advantage

Improve the traffic environment
Developing City Business
Optimize land use
Inspire the vitality of the crowd

Concept

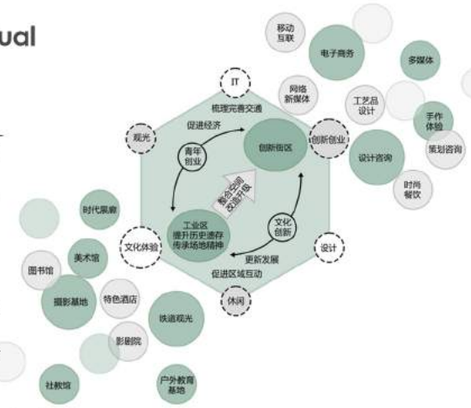


Sratego

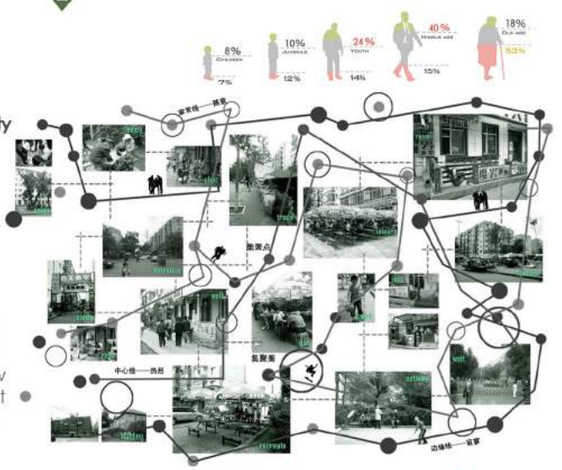
Activate——Spiritual

Industry

Activate land parcels, promote economic development and youthfulness, promote cultural regeneration and increase the flow of people through cultural experiences, and strengthen linkages with the surrounding areas. The two industries will support each other and form a virtuous circle.



Population vitality



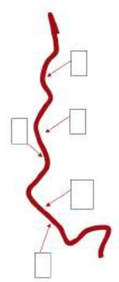
After injecting new innovative industries, they will provide new jobs and attract young people.

Stitching——Material

Ecological

Functional

Life stitching

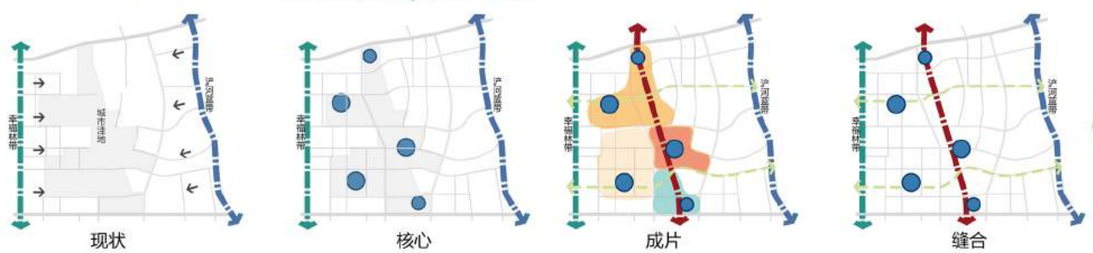


Scale

L

M

S



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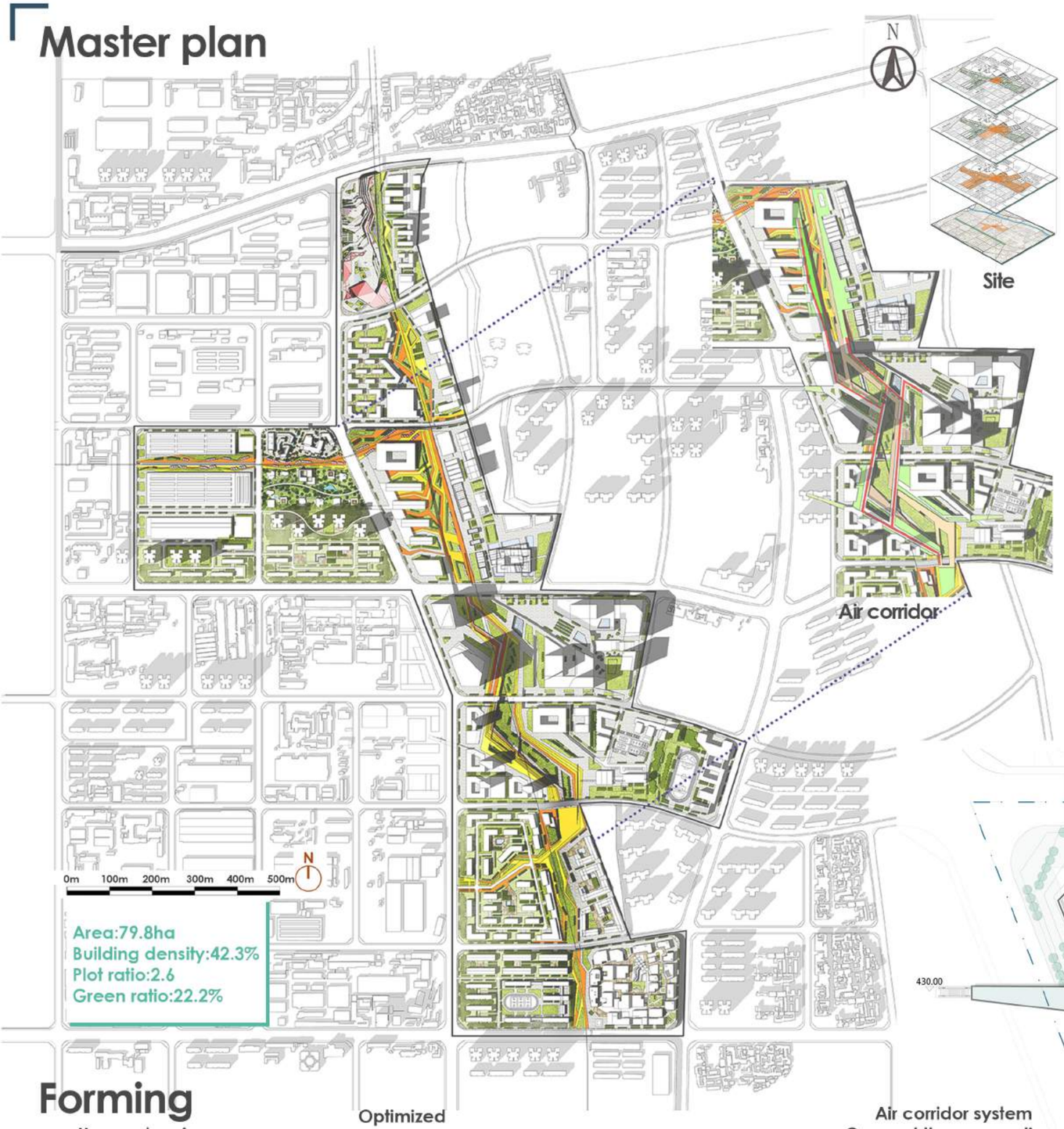
Master plan



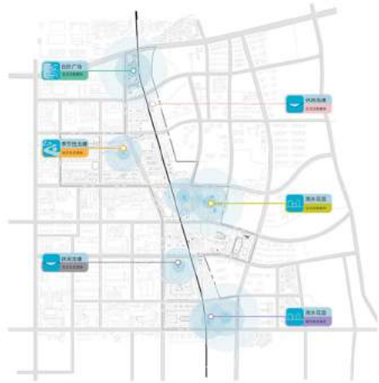
Landscape analysis

Structure

Function

Feature

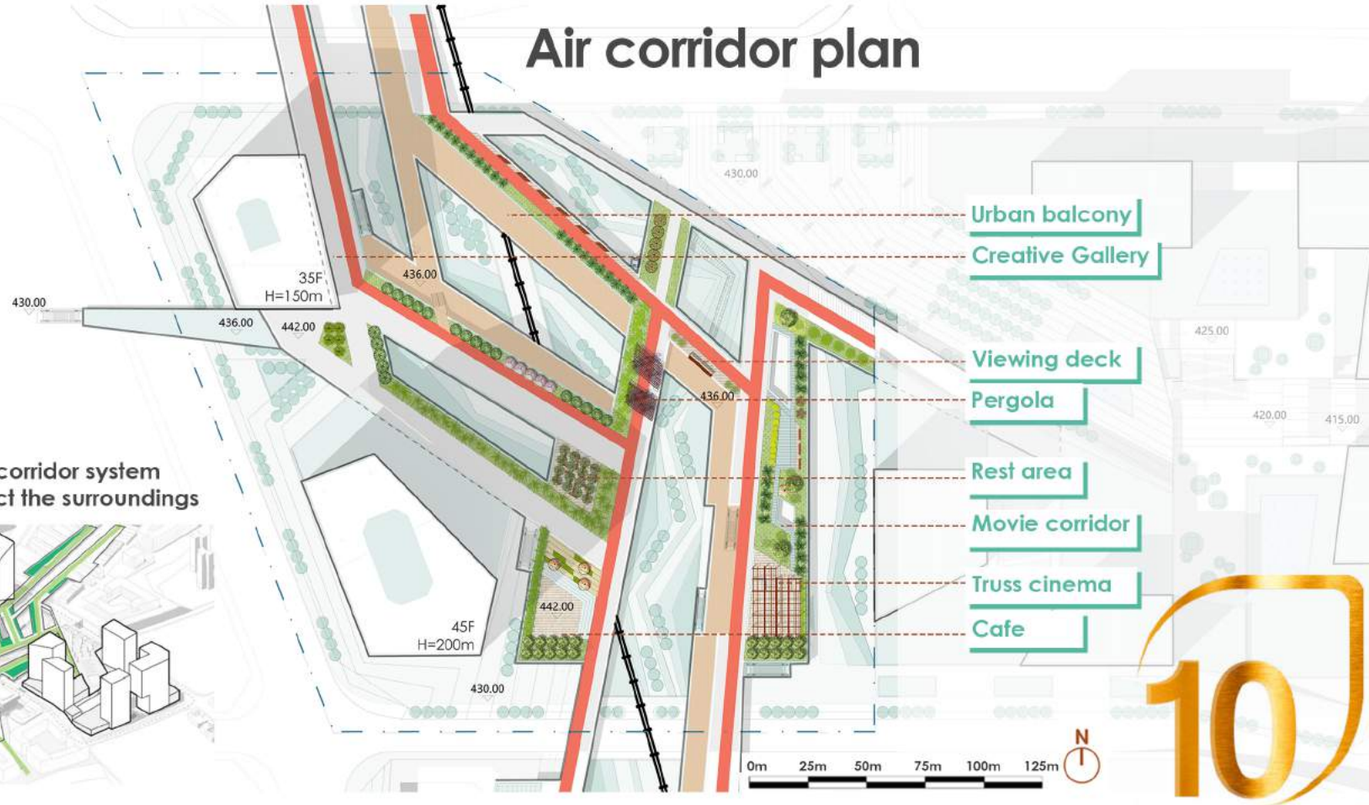
Public activities



Water loop system

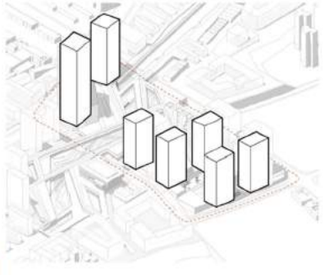
Lighting system

Air corridor plan

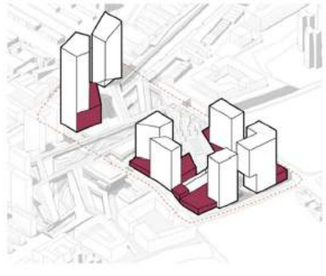


Forming

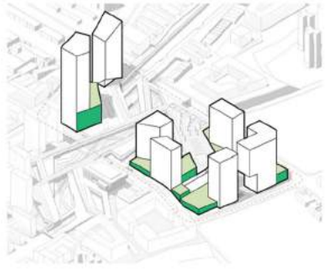
Upper planning



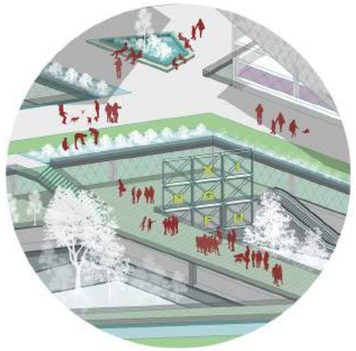
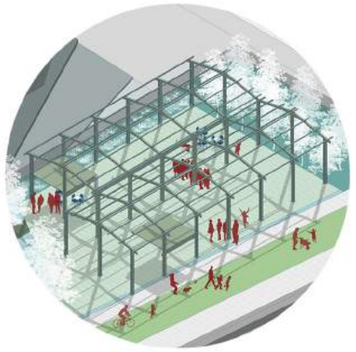
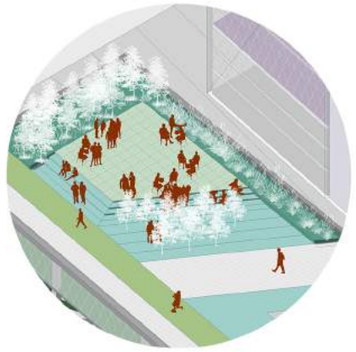
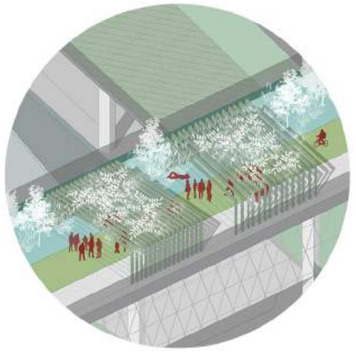
Optimized Connection

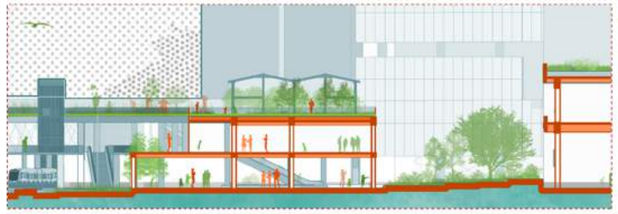


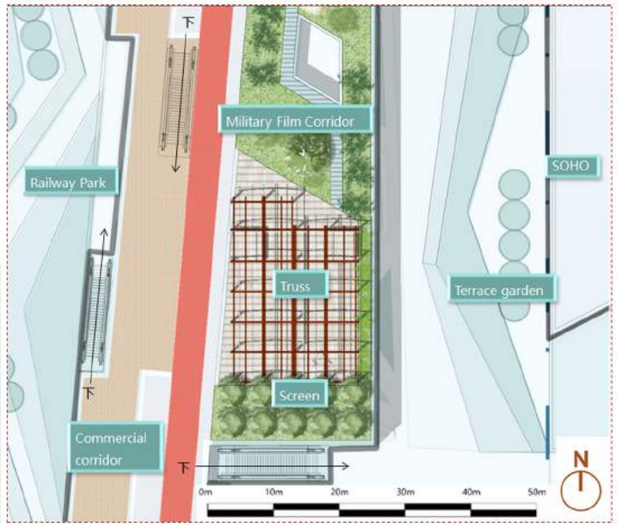
Placed in the Garden



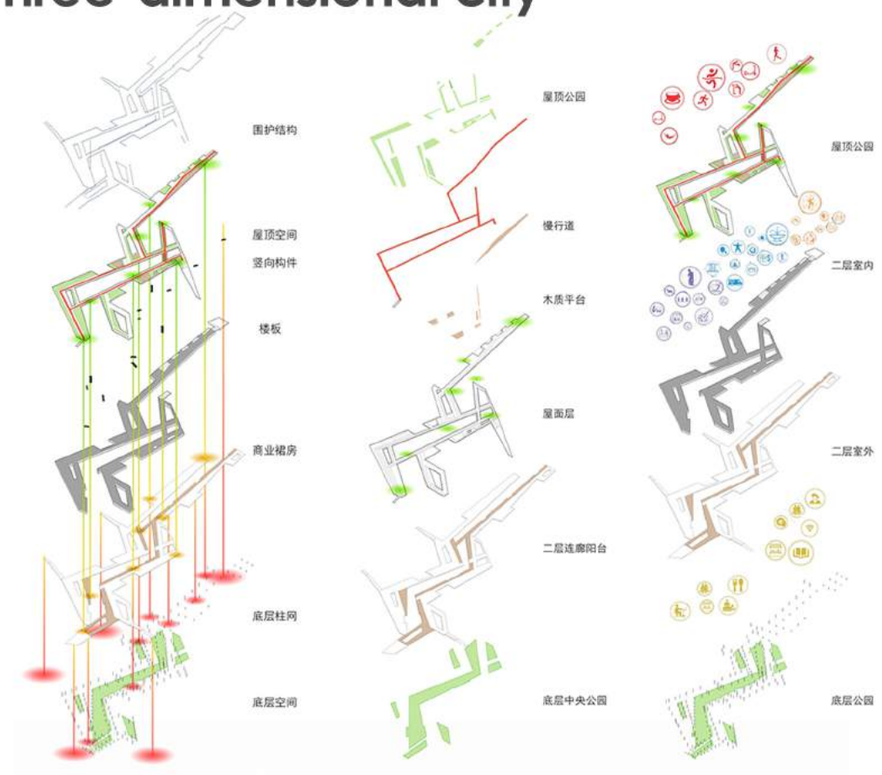
Air corridor system
Connect the surroundings

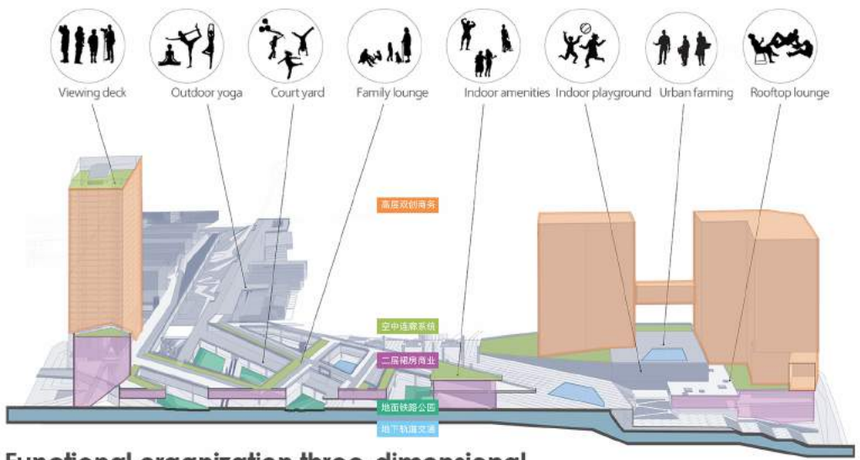





Three-dimensional city



Traffic organization　　Open space　　Activities

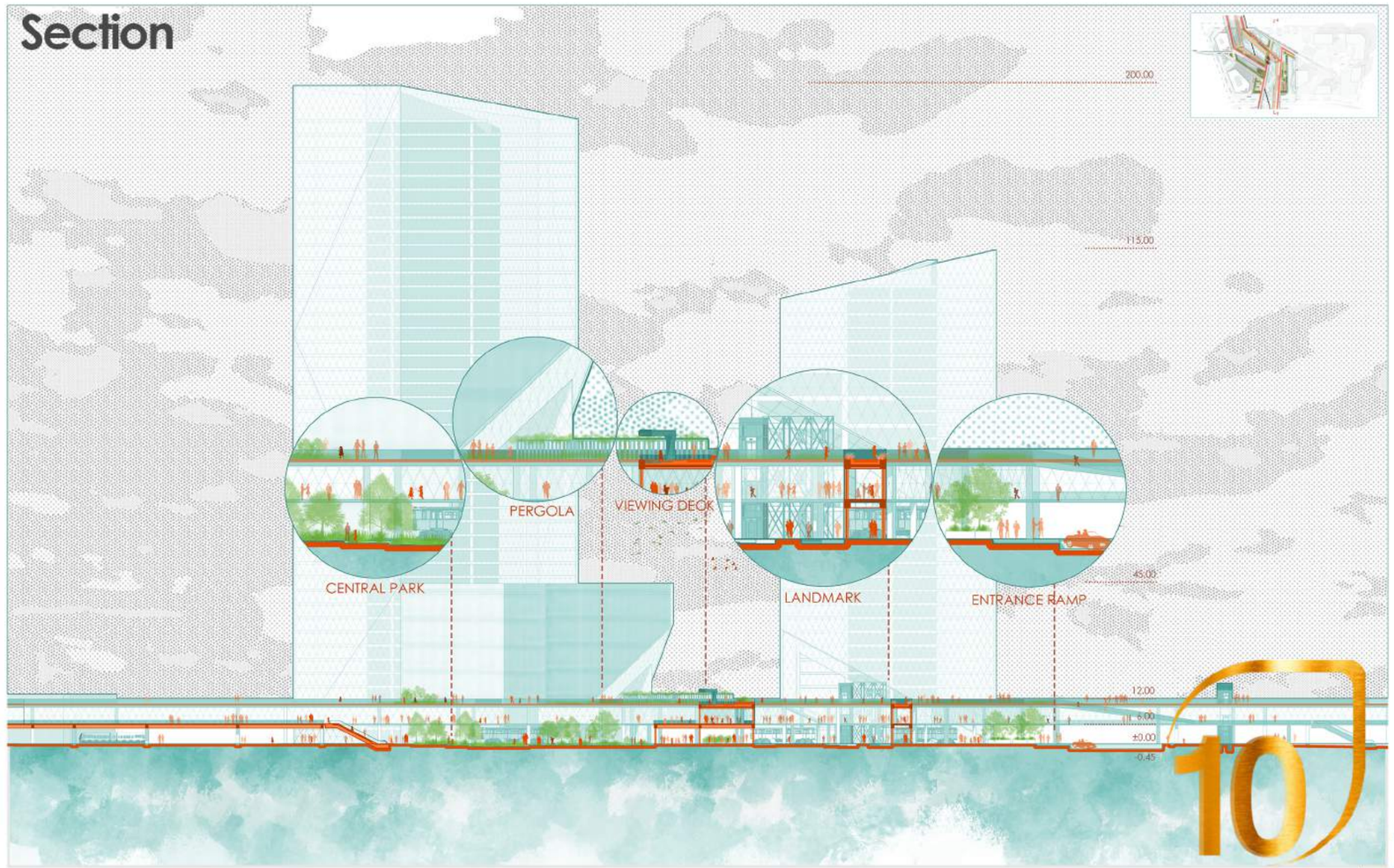


Functional organization three-dimensional

Green valley

Air truss cinema

Section



Country / City	China
University / School	Southwest Jiaotong University
Academic year	2016-2017
Title of the project	Chinese classical garden design——Yi Yuan
Authors	Chenzhongdi,Penghui Tutor:Zhousixiang Wuran Zhangyu

PERFORMATIVE NATURE

Barcelona International Landscape Architecture Biennial

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SCHOOL PRIZE

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ETSAB- Escola Tècnica Superior
d'Arquitectura de Barcelona
Avenida Diagonal, 649 piso 5
08028 Barcelona-Spain

TECHNICAL DOSSIER

Title of the project	Chinese classical garden design——Yi Yuan
Authors	Chenzhongdi, Penghui
Title of the course	Landscape planning and design
Academic year	2016-2017
Teaching Staff	Zhousixiang,Wuran,Zhangyu
Department/Section/Program of belonging	School of Architecture and Design
University/School	Southwest Jiaotong University

Written statement, short description of the project in English, no more than 250 words

Chinese classical gardens are a great creation of the Chinese nation. Chinese classical gardens have a long history, dating back to 1500 BC and dating back 3,500 years. Traditional gardens can be divided into royal gardens, private gardens, temple gardens and other gardens. Chinese classical gardens are full of poetry and painting, which is closely related to poetry and painting. However, with the development of society, Chinese classical garden culture has gradually fallen into an embarrassing situation. Due to the privacy and delicacy of the garden, it cannot carry a large number of people. Therefore, it is difficult to be used as a public garden. Gradually, the classical garden became a small point of encirclement in the city. The project is located in a university, which is an open and active place. By constructing a public open space for a large number of people, we hope to revitalize Chinese classical gardens. First, we must adhere to its characteristics. Secondly, we should make sure that it can be integrated with modern society. How to realize the re-creation of classical garden in the new era is the key point of this project.

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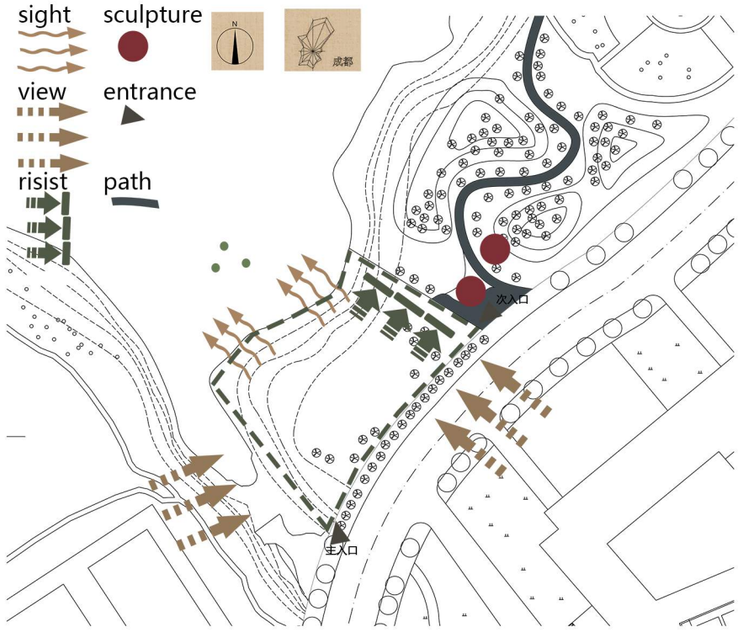
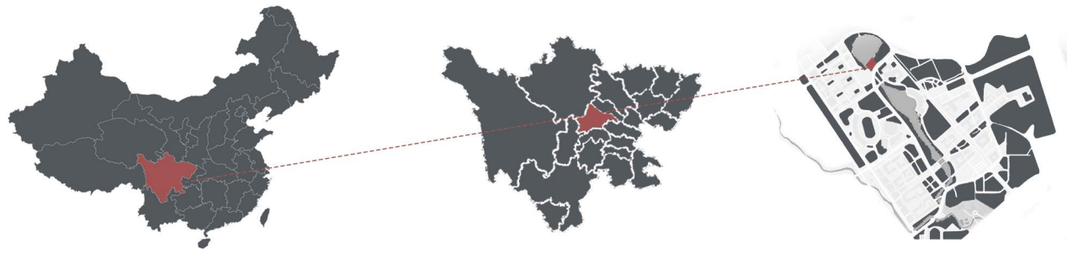
Landscape view analysis

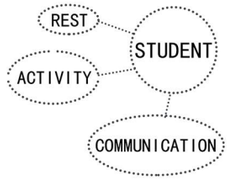


Location



Objects

Firstly, we should make it clear that objects and their behaviors here.



The site is located in Chengdu,Sichuan,China,and it is in a university called Southwest Jiaotong University in Chengdu.
Hence,the main service objects who we should consider will be students teachers and other visitors.

Origin

Chinese Landscape Painting

Classical Chinese Poetry

Mooring by MapleBridge At Night

At moonset cry the crows, streaking the frosty sky;
Dimly lit fishing boats'neath maples sadly lie.
Beyond the city wall, form Temple of Cold Hill.
Bells break the ship-borne roamer's dream and midnight still.

Chinese Classical Garden

Surrounding

Network analysis

The analysis of road network structure is primary.

Flow analysis

The flow of people will determine entry and exit.

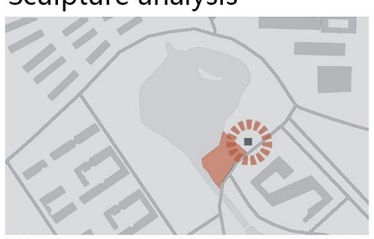
Architecture analysis

Surrounding buildings will impact garden view.

Landscape analysis

Great and awful scenery make us choose to show or hide.

Sculpture analysis



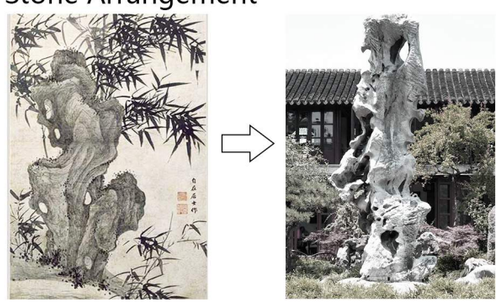
We must consider the impact of original sculpture in site.

Grove analysis

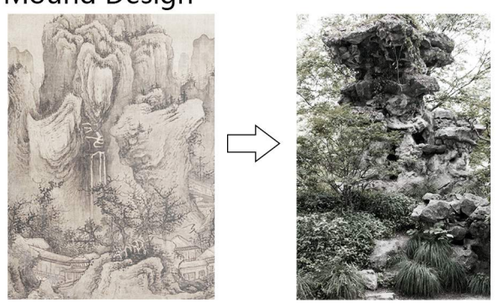
There are grove largely in site.

Stone Arrangement

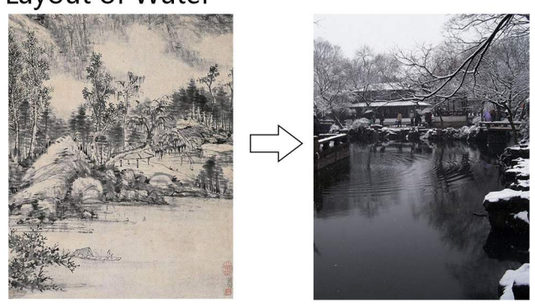
Stone Arrangement



Mound Design

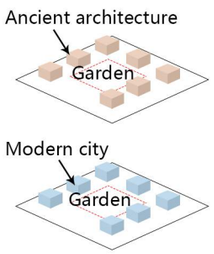


Layout of Water



Contradiction

Surroundings

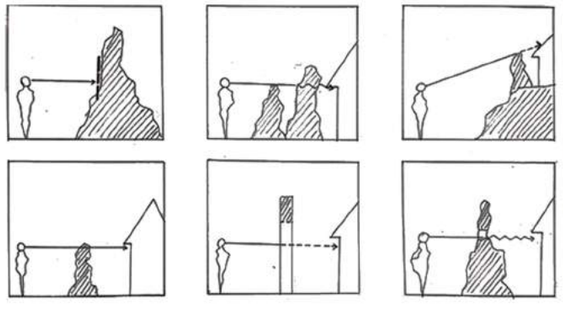


Users

Design specification

This plan is located in Southweat Jiaotng University,and it is Chinese clThis plan is located in Southweat Jiaotng University,and it is Chinese classical garden.The concept is bout "hide".In Chinese acient poems,Chinese poet often talk about "hide".That means people live in city but it still like they are living in nature.It reflects people's desire for natureassical garden.The concept is bout "hide".In Chinese acient poems,Chinese poet often talk about "hide".That means people live in city but it still like they are living in nature.It reflects people's desire for nature

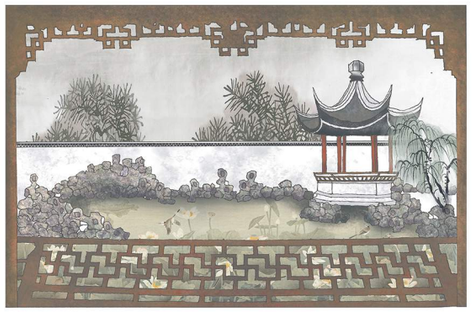
Design Methods

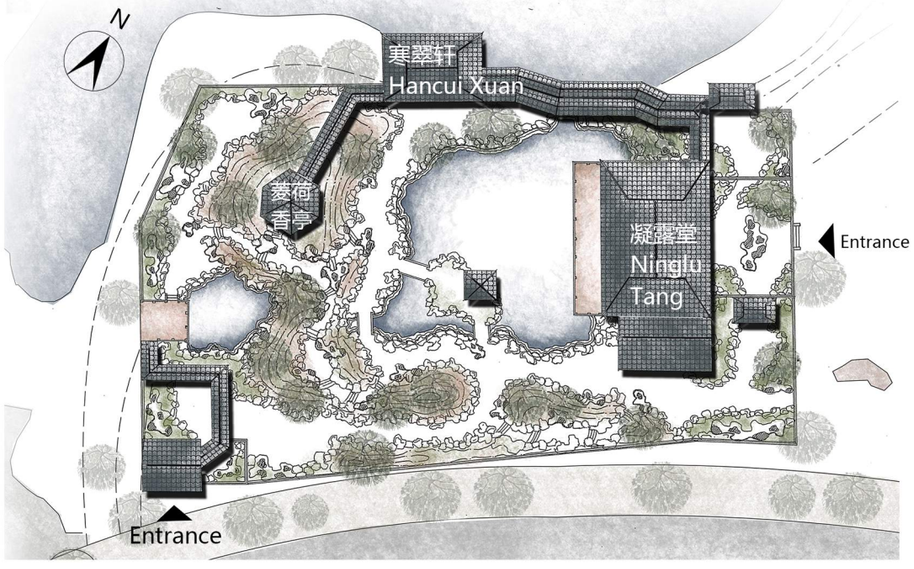


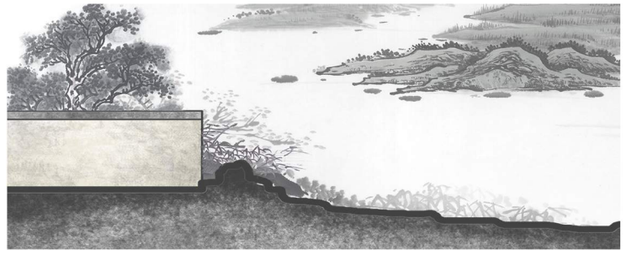
Design specification

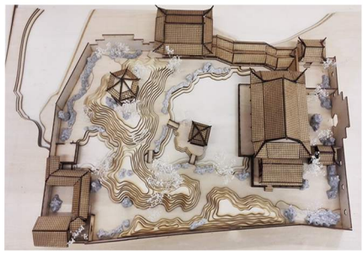
This plan is located in Southweat Jiaotng University,and it is Chinese classical garden.The concept comes from "paradise on earth".The garden is a place to relax people who live in busy life.Hence,influenced by Chinese poetry ,the plan creates a public recreational urban garden for everyone.

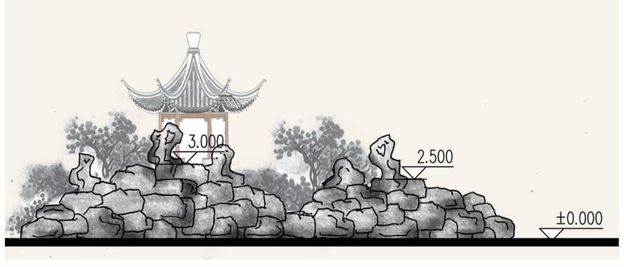
逸園

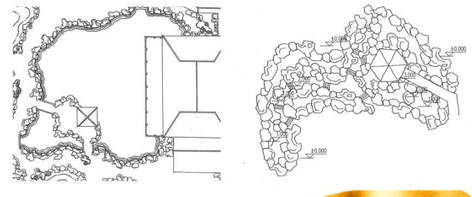


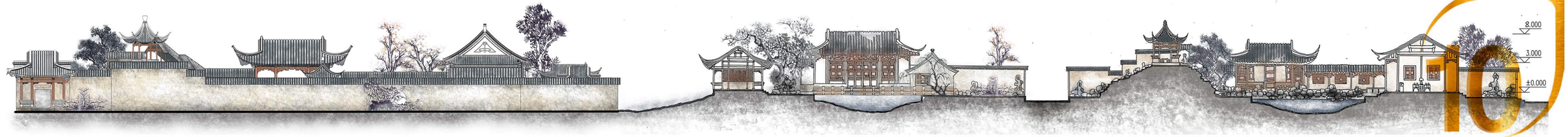












Fantasy Of GreenWave

——Design Flood by Reshape the Earth

Country / City	China
University / School	Southwest Jiaotong University
Academic year	2018-2019
Title of the project	Fantasy of GreenWave ——Design Flood by Reshape the Earth
Authors	LiXiu , YuPianpian

PERFORMATIVE NATURE

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TECHNICAL DOSSIER

Title of the project	Fantasy of GreenWave ——Design Flood by Reshape the Earth
Authors	LiXiu , YuPianpian
Title of the course	Landscape planning and design
Academic year	2018-2019
Teaching Staff	Yang Qingjuan
Department/Section/Program of belonging	School of Architecture and design
University/School	Southwest Jiaotong University

Written statement, short description of the project in English, no more than 250 words

The project is located in Huyanghe City, Xinjiang, China. Due to nature and human factors, salinization is the most prominent problem, which leads to a series of ecological and environmental problems such as the decline of agricultural production and the destruction of precious Populus euphratica forest. This program, through the replanning of the local water system, makes full use of the seasonal flood caused by melting water in summer, washes the surface, and deals with the problem of salinization.

The district is divided into four parts: farmland, wetland, Populus euphratica forest and construction area,meanwhile,there are four strategies. strategy1: in the farmland area, dissolving and removing saline and alkaline with water and plants.Based on the analysis of the catchment, rainfall, and surface runoff, combined with the texture of the current farmland ,concept from the folding of the desert dunes, the surface texture of the farmland is recreated.The foldings guide water flow, wash saline and alkaline. Strategy2: in the wetland area, after salt washing, the run off will be discharged into the wetland to be purified to save fresh water resources. Strategy3: in the populus euphratica forest area ,redesigning the surface and terrain,leading the flood from up stream to sweep the salt water in summer. Strategy4: After the ecological restoration of the site, the base resists better the interference and destruction caused by urban development and human activities. Different crops are planted in a group. Each group has a wetland to purify irrigation water and eventually forms a stable ecosystem.

For further information
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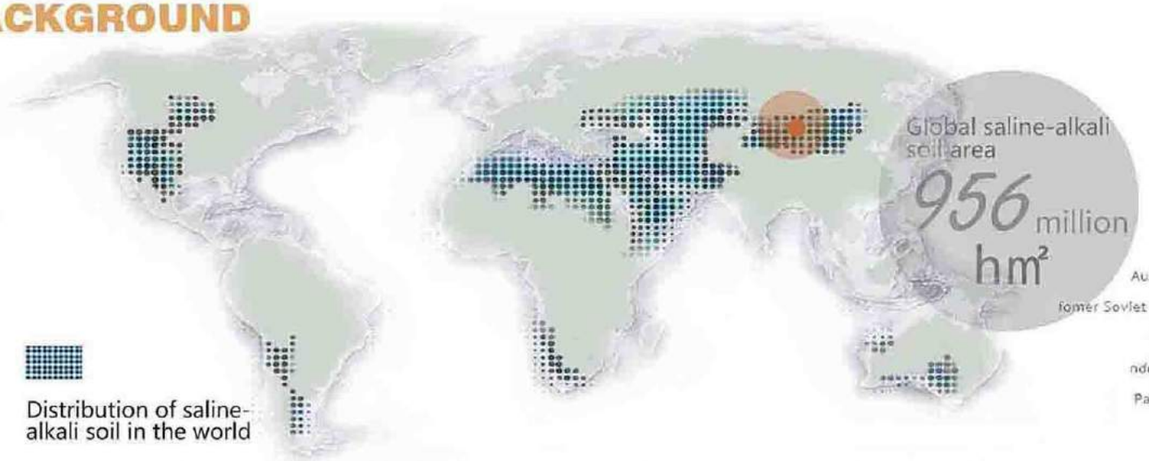
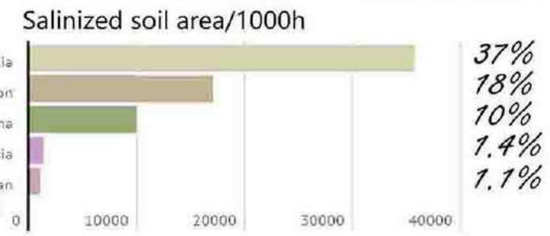
BACKGROUND

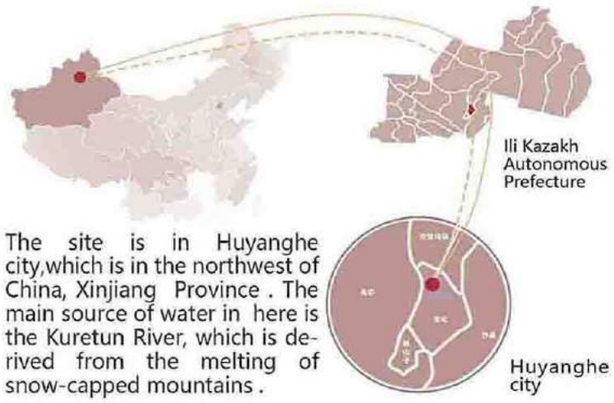


Waste of land resources



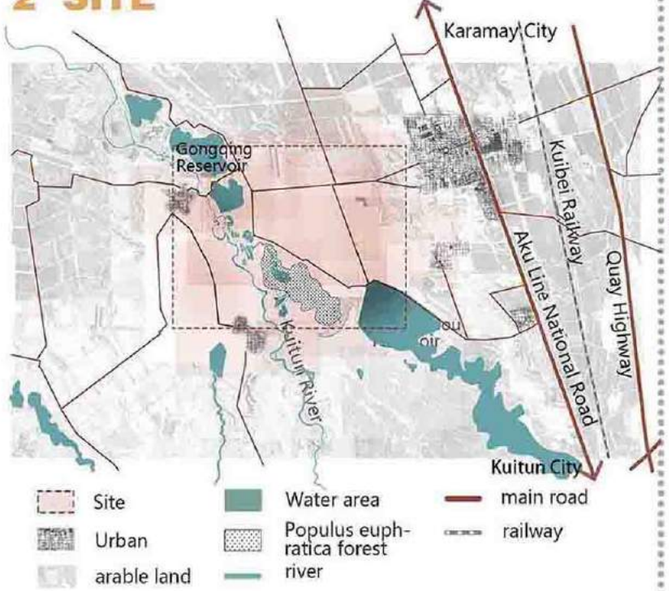
In the 21st century, because of the growing population, shrinking arable land, a large number of forests and grasslands have been reclaimed to cultivated land, the destruction of the original vegetation and soil structure, leading to salination.Saline soils is widely distributed all over the world, it is estimated that the growth rate of the global saline soils is increasing by $1x10^6$-$1.5x10^6$hm² per year.

1 LOCATION



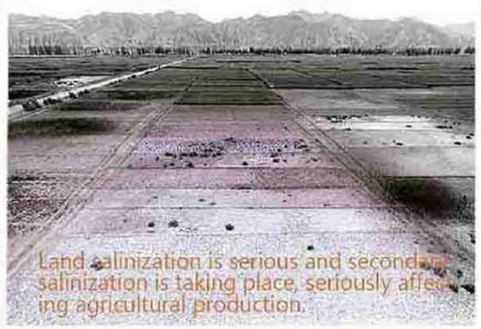
The site is in Huyanghe city,which is in the northwest of China, Xinjiang Province . The main source of water in here is the Kuretun River, which is derived from the melting of snow-capped mountains .

2 SITE

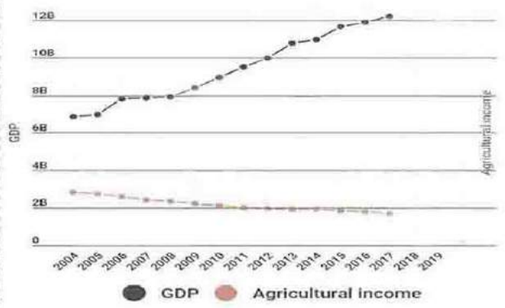


The site is located in the western part of the city and mainly includes a heavily saline farmland and the threatened Populus euphratica.

3 PROBLEMS



4 CAUSES



Soil salinization

Strong sunshine

Improper irrigation

Groundwater level rises

The populus euphratica is dying

Logging

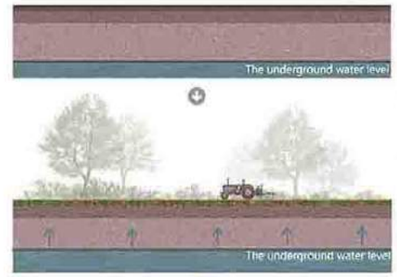
Biodiversity is decreasing

Overgrazing

High salt and alkali content in wetland water

Interception of water

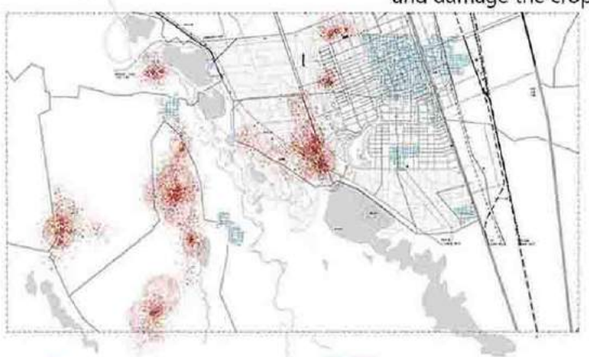
5 THE PROCESS OF SALINATION



The site was originally a wasteland. With the continuous expansion of human activities, the process of desertification was exacerbated.

People reclaimed arable land, irrigated land and neglected drainage, resulting in a amount of water infiltration and an increase in groundwater level.

With the strong sunlight of the local area, the salt in the groundwater will accumulate on the surface with the rapid evaporation of water and damage the crop.



saline soils

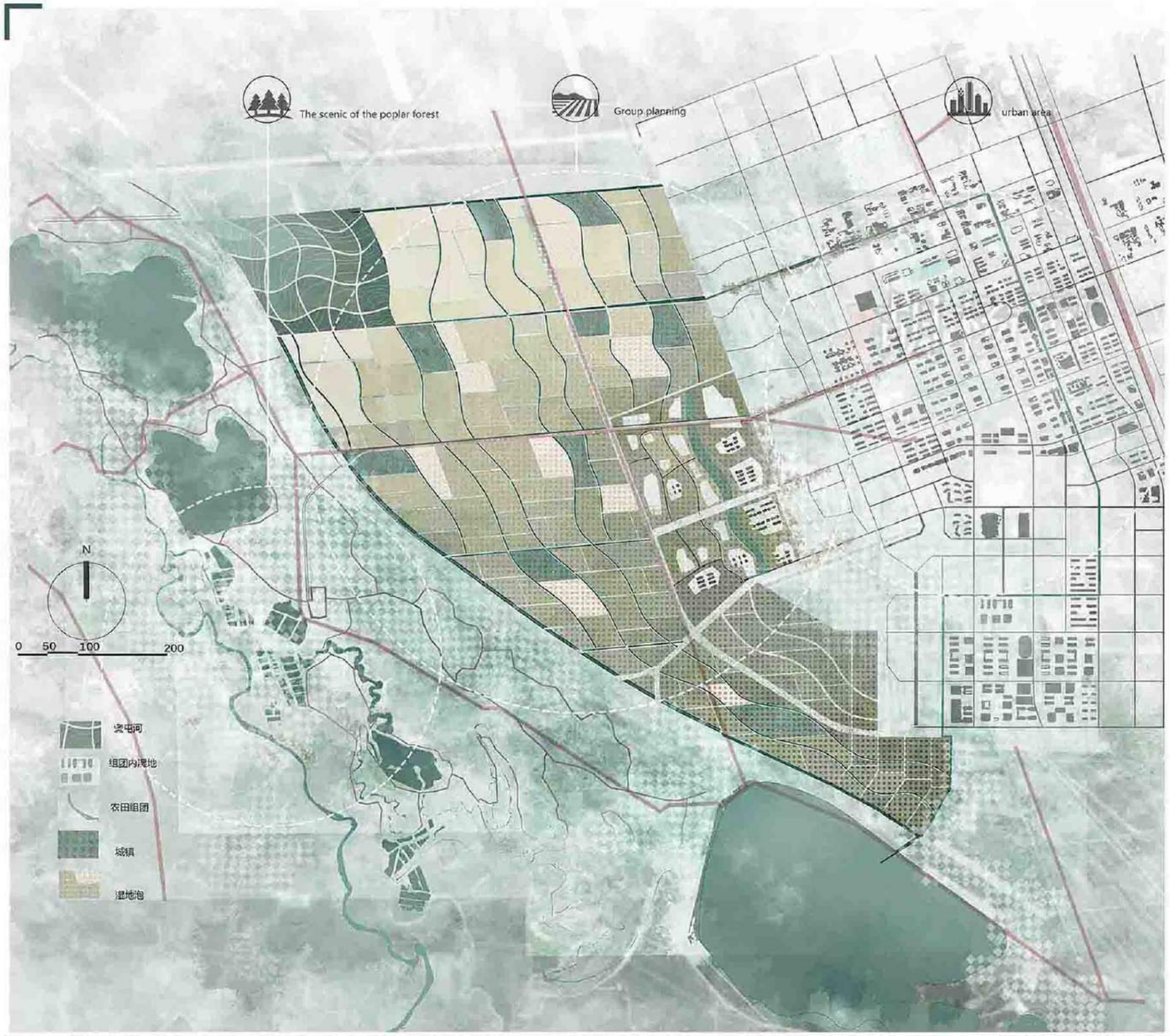
citiy and villages

The current situation of severe salinization is mainly in areas where human activities are frequent, close to citiy and villages, and they are used to be farmland but now abandoned.

Mild

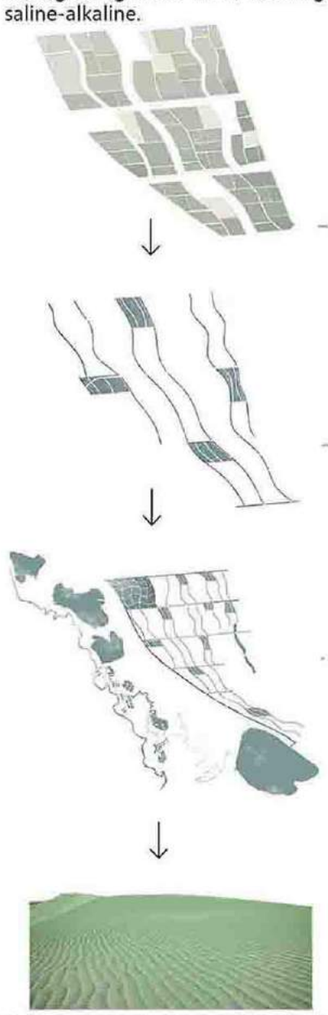
Moderate

Severe

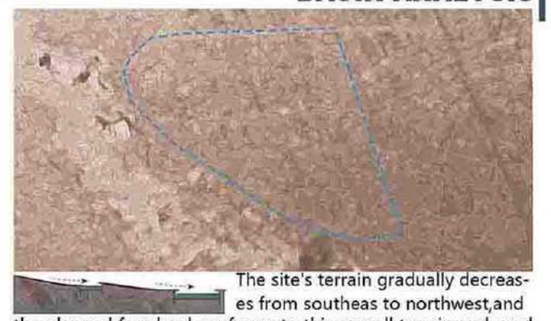


EVALUATION

Based on the analysis of the catchment zoning, rainfall, and surface runoff,combined with the texture of the current farmland and the folds of the desert sand dunes, the surface texture of the farmland is recreated creatively with minimal disruption to the original site, resulting in surface folds,guiding water flow, washing saline-alkaline.

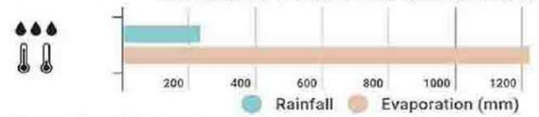


BASIN ANALYSIS



The site's terrain gradually decreases from southeas to northwest,and the planned farmland conforms to this overall terrain and gradually decreases from south to north, forming a "green wave" - texture, allowing water to be drained in time to avoid excessive groundwater level caused by excessive infiltration.

RAINFALL &EVAPORATION

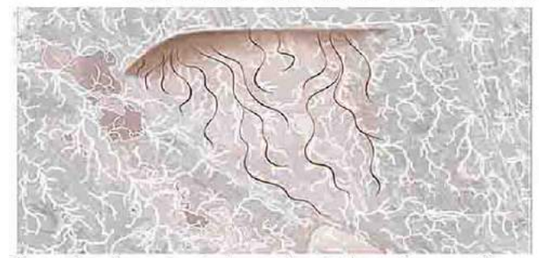


Huyanghe belongs to the temperate continental desert-semi-arid desert climate,the annual evaporation is about six times of the precipitation, which makes it impossible to rely on natural precipitation to alleviate salination.In the plan, the water channel and the green wave form will be fitted together so that it will have both irrigation and salt washing functions.

RIVER FLOW

Kuitun River have large disparities in water flow in the winter and summer.This design makes full use of flood for irrigation, drainage wash salt farm, supplemented by rice cultivation and purification of wetland. In the dry season, crops and land-cultivation plants with low water demand are planted.

SURFACE RUNOFF ANALYSIS



The surface is constructed according to the surface runoff analysis. Longitudinal canal irrigation, salt washing, horizontal canal drainage, and finally it is discharged into the Kuitun River after purification in the northwest side wetland.

7 STRATEGY

problem

Soil salinization
- Arid climate
- Irrigation without well drainage

Populus euphratica protection
- Upstream water reduction
- Accumulation of saltwater in low-lying land

urban development
- Arable land demand

flood

Solution

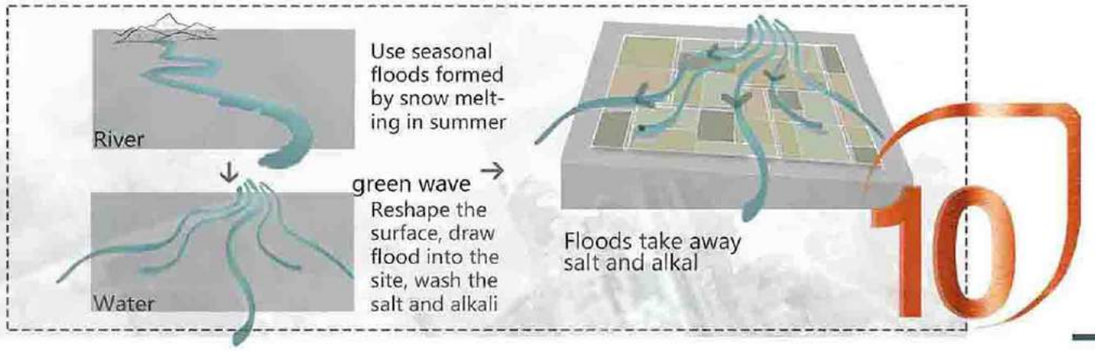
stratage1
Dissolve and remove salt and alkali with water and plant

stratage2
Purify water to save fresh water resources

Blocking and purifying salt water

stratage3
regeneration of populus euphratica forest with water

stratage 4
propsed plant mode



STRATEGE1 .

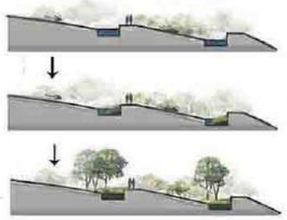
——Dissolve and remove salt and alkali with water and plants

TARGET:To improve saline-alkali problems, restore soil vitality, and provide assistance for urban agricultural development and agricultural tourism development

Flood season:Drain washing salt

Using the flood during flood season reasonably, so that it can quickly flow through the saline soils, and take away the salt from the surface of the soil, drain into the "green wave" and then quickly add to the wetland

Gren wave evolution



phase 1
The surface is washed by water, and the sediment is deposited in the swale.

phase 2
The sediment accumulated over time and formed a mound to meet plant growth conditions and gradually emerged plants.

phase 3
In the end, the salinity condition improved, the swale are not needed, and are filled with silt to form

Dry season: Plant salt absorption

When soil salinity is 1 to 1.5%, plants with severe salt absorption, such as saltgrass, etc.

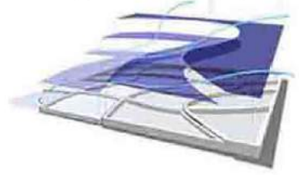
When the soil salt content drops to 0.5-1%, plant moderately saline plants. A plant such as the splendens.

STRATEGE2 .

——Purify water to save fresh water resources

TARGET:After purifying saline-alkali wastewater and washing wastewater after salt washing, save or reuse irrigation, save fresh water resources, and coordinate with neighboring tourism agriculture to provide oasis for recreational activities for residents.

Water purification process

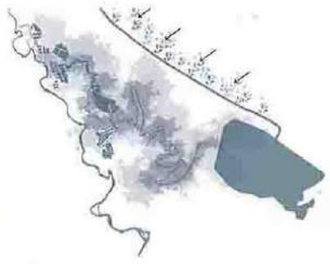


STRATEGE3 .

——regeneration of populus euphratica forest with water

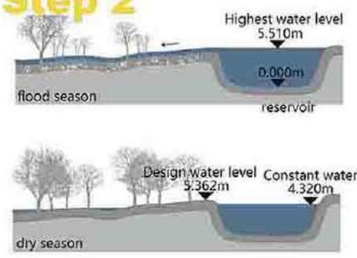
TARGET:To improve the problem of deterioration of forest habitat conditions and the large-scale death of the Populus euphratica forest, provide a good ecological base for urban development, and develop tourism to create economic income.

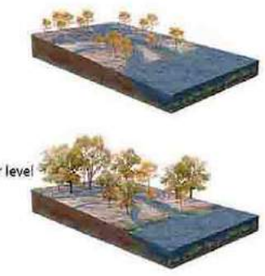
Step 1



A drainage ditch was dug between the scenic spot and the farmland to intercept the saline-alkaline water discharged from the high-lying farmland in the northeast and discharged into the wetland for purification.

Step 2





To connect the Populus euphratica Oliv. and reservoir through overflow buffers, to irrigate Populus euphratica forests during the summer flood season, combined with fine-tuning and diversion of the terrain to enhance the water circulation and promote the regeneration of Populus euphratica forests.

Country / City China

University / School South west jiaotong university

Academic year 2017-2018

Title of the project Symbiosis with plants: positive

Authors Hening Zhou, Lan Yao, Zhengkai Niu

PERFORMATIVE NATURE

Barcelona International Landscape Architecture Biennial

September 2018 Barcelona

SCHOOL PRIZE

X International Landscape Architecture Biennial

Máster d'Arquitectura del Paisatge -DUOT - UPC
ETSAB- Escola Tècnica Superior
d'Arquitectura de Barcelona
Avenida Diagonal, 649 piso 5
08028 Barcelona-Spain

TECHNICAL DOSSIER

Title of the project	Symbiosis with plants: positive
Authors	Hening Zhou, Lan Yao, Zhengkai Niu
Title of the course	Landscape and architecture planning and design
Academic year	2017-1018
Teaching Staff	Sixiang Zhou
Department/Section/Program of belonging	School of Architecture and Design
University/School	South west jiaotong university /School of Architecture and Design

Written statement, short description of the project in English, no more than 250 words

With the continuous expansion of cities, urban heat island, air pollution, drought, waterlogging and other urban problems have become increasingly prominent. In many urban old towns, because of constructed early, either the urban wind environment or the green environment could not meet the current demographic conditions and citizens' needs. However, it is more difficult to re-plan and construct the old towns because the urban space has already been established and the population of resident is large. At present, landscape architects propose solutions such as LID and Sponge City for urban interior problems, but most of solutions to the urban microclimate problems are still to ease urban space and increase urban green space. The design site was located in Suqian, which is a new city and the old town develop together. Based on the theory of smart city, this design uses smart urban furniture to improve the city's microclimate, promote air circulation, and use the condensate in the air to save water and irrigate plants. Street furniture connects urban streets and green areas to create an environment suitable for the growth of human and natural elements, and provides necessary water and wind environment for plant growth and reproduction while improving the road space. At the same time, the design will also track urban air and climate conditions, record the growth of each plant, establish an urban natural climate database, constantly adjust the urban environment, and improve the city's operating efficiency.

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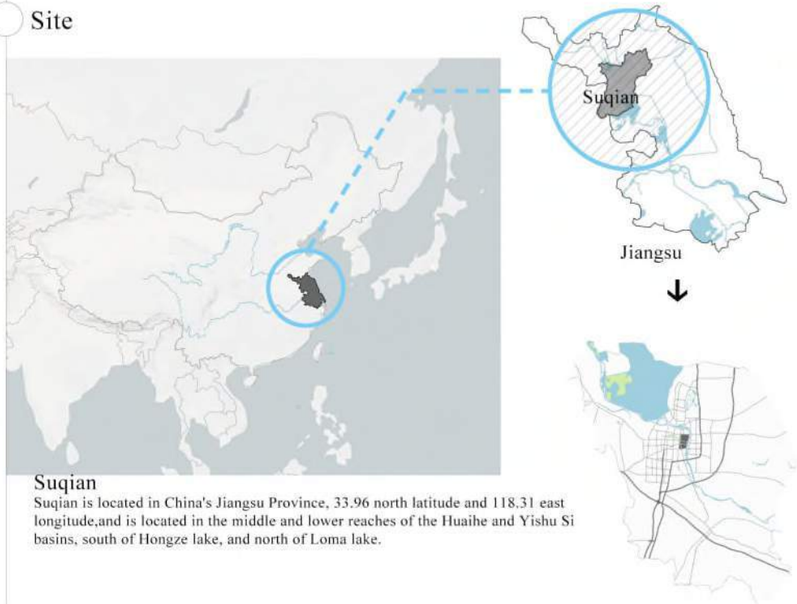
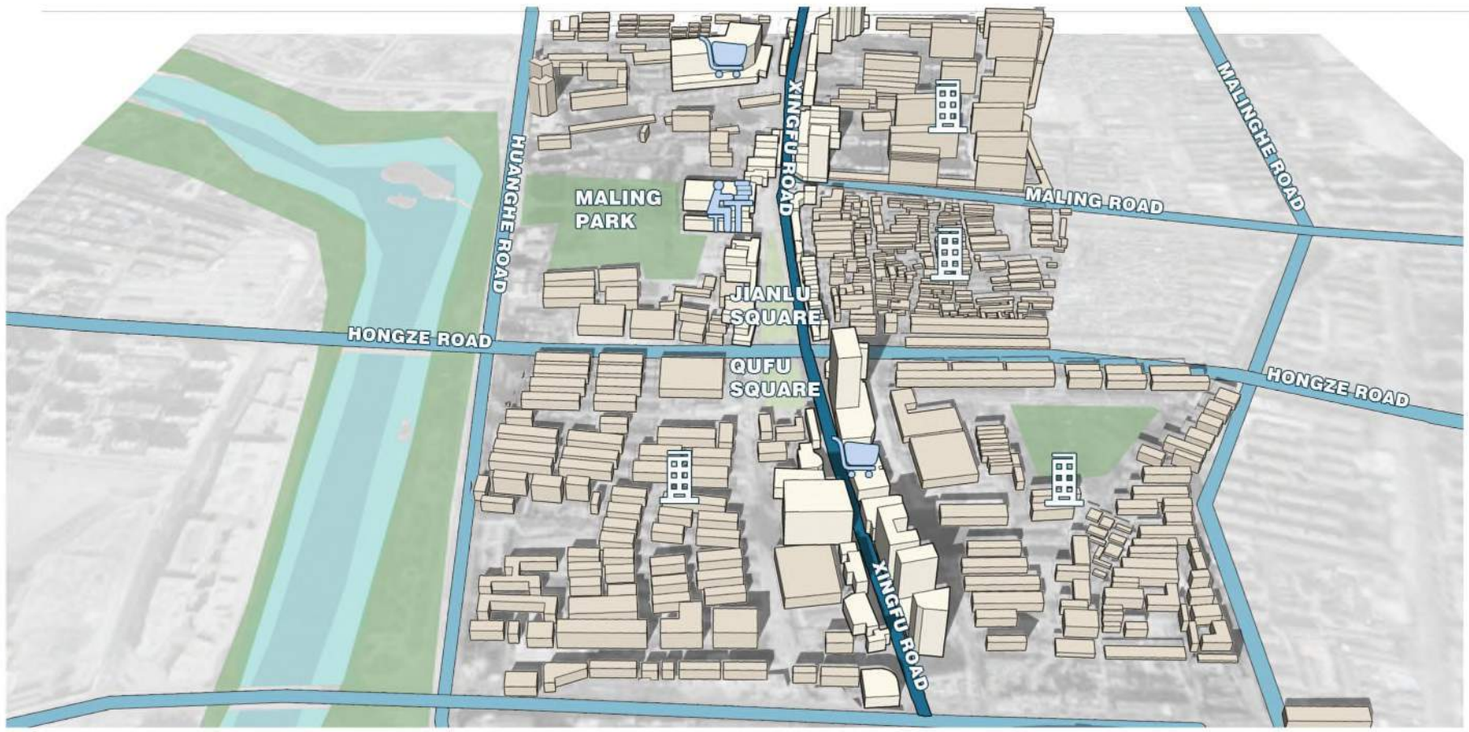
Site



Suqian

Suqian is located in China's Jiangsu Province, 33.96 north latitude and 118.31 east longitude,and is located in the middle and lower reaches of the Huaihe and Yishu Si basins, south of Hongze lake, and north of Loma lake.

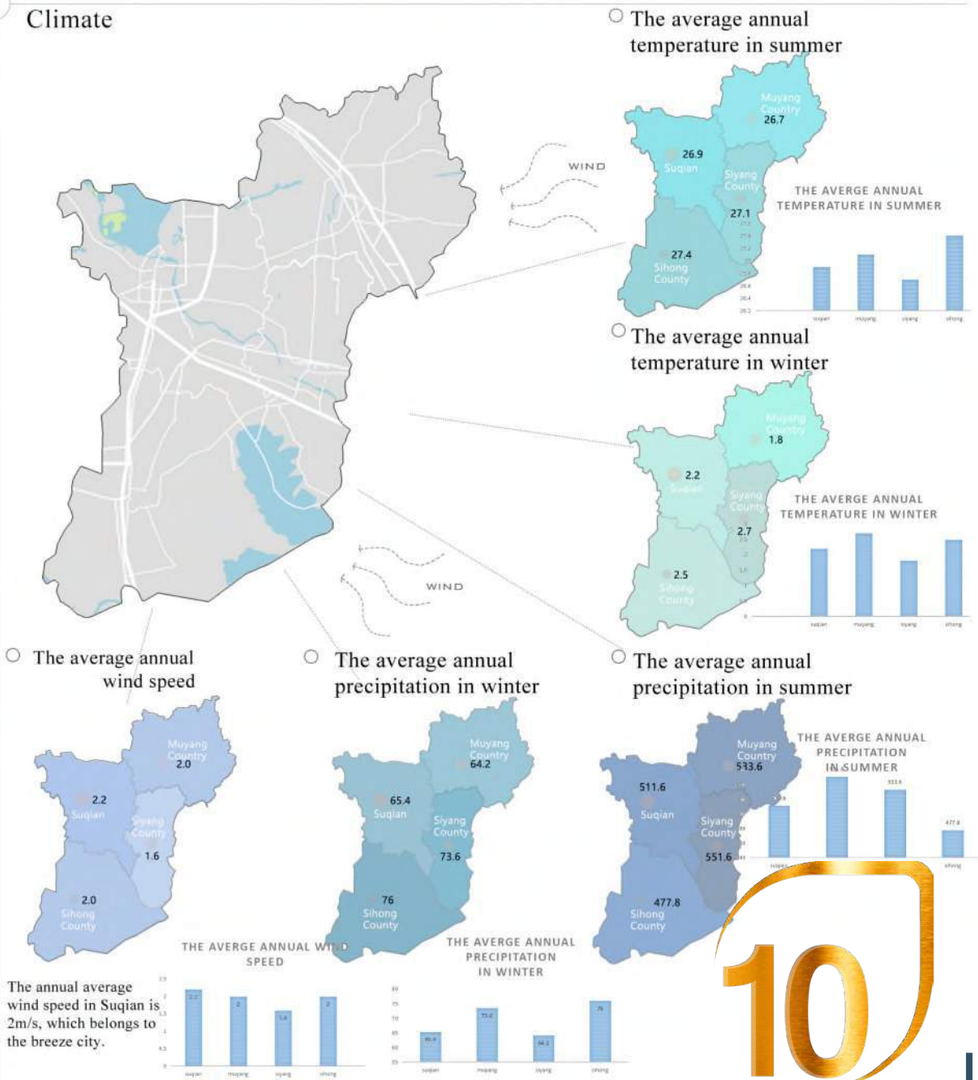
Surroundings



Cultrual

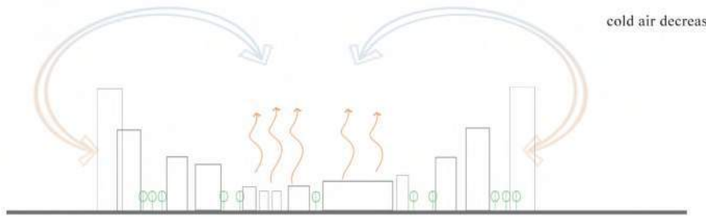
VIsta of Xingfu Road

Climate



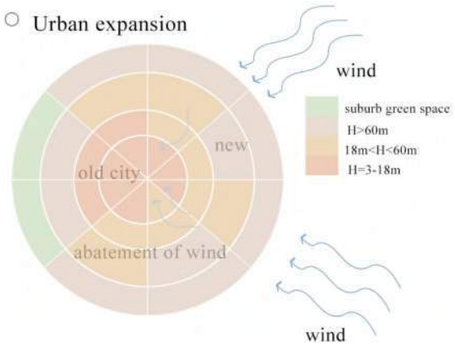
The annual average wind speed in Suqian is 2m/s, which belongs to the breeze city.

Heat island circulation

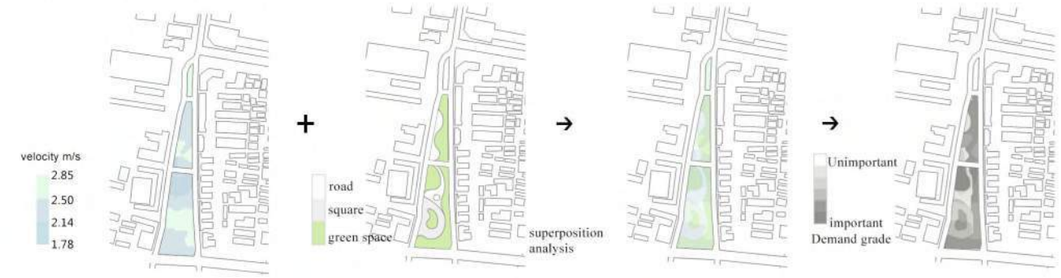


Inversion layer

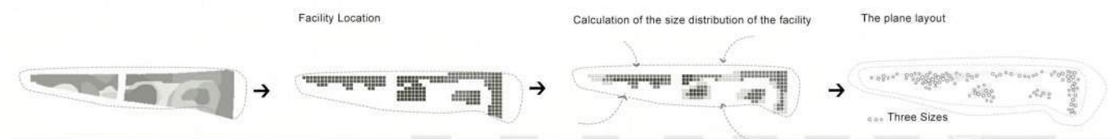
Urban expansion

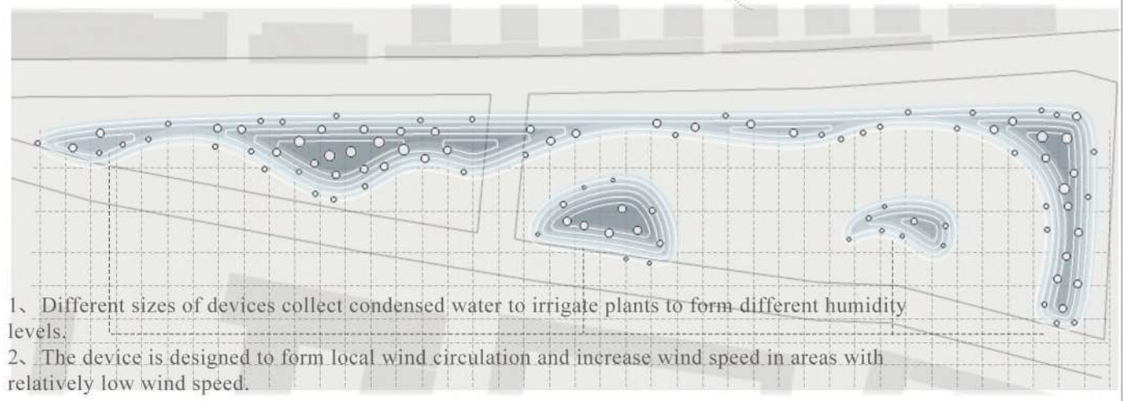


Superimposed pattern



Plane layout

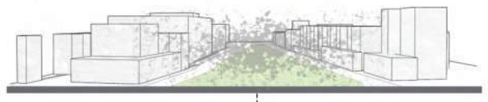


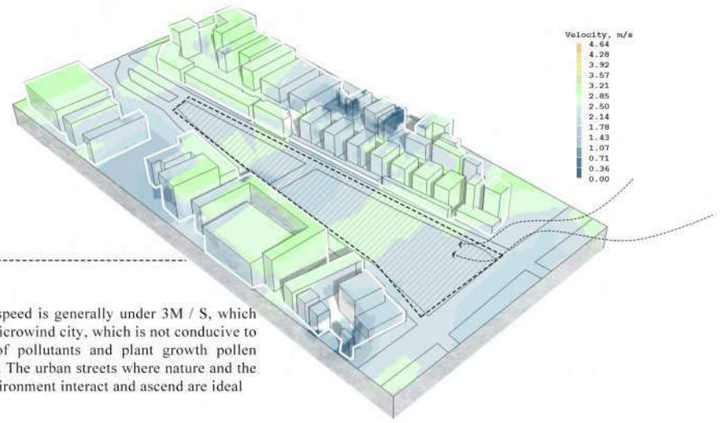


1、Different sizes of devices collect condensed water to irrigate plants to form different humidity levels.
2、The device is designed to form local wind circulation and increase wind speed in areas with relatively low wind speed.

Pattern generation

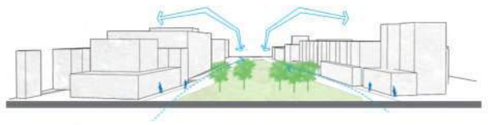
Current state



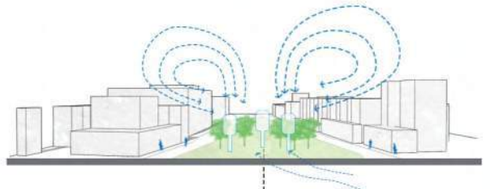


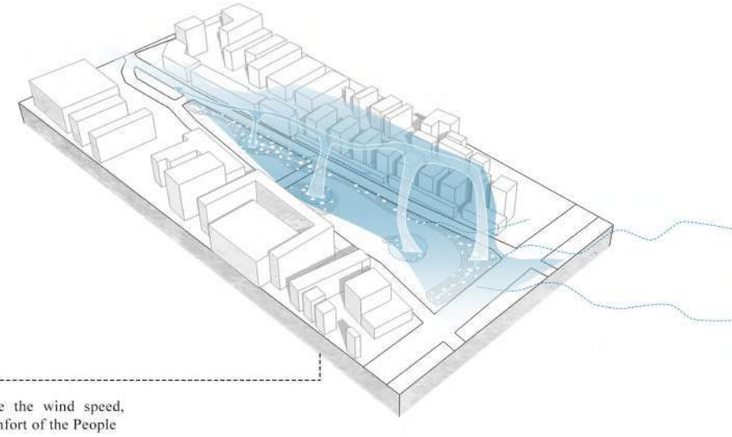
1.The wind speed is generally under 3M / S, which belongs to microwind city, which is not conducive to the spread of pollutants and plant growth pollen transmission. The urban streets where nature and the artificial environment interact and ascend are ideal

Ideal mode



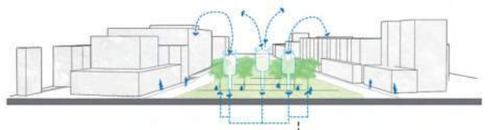
Improved wind environment



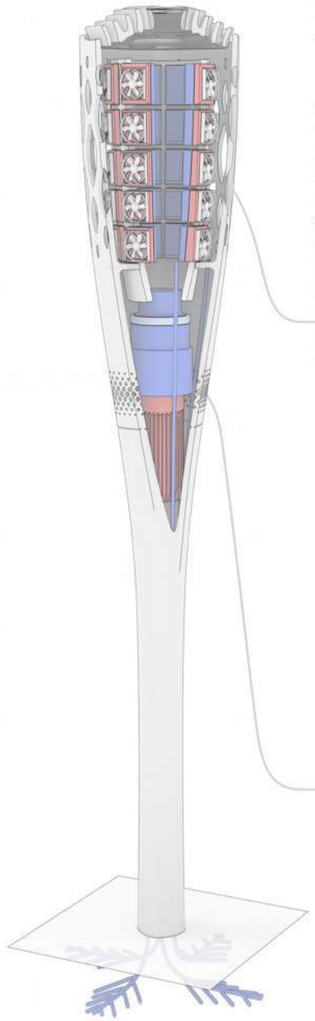


2.Through the active facilities, improve the wind speed, enhance the air flow, and improve the comfort of the People

Improved plant growth environment



3.By alternately condensing water vapor in the air through the cold and hot environment, the collected water can be fed by drip irrigation, and the growth of each plant can be tracked

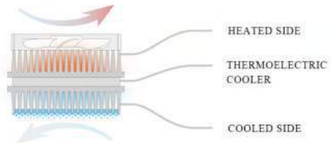


MODULE:

AIRWATER CONDENSER

(Peltier Effect)

Airwater condenser uses the thermoelectric cooler to collect condensate water from air. The thermoelectric cooler uses the Peltier effect to create a heat flux between the junction of two different types of materials.
The double side of the thermoelectric cooler would produce a temperature difference when it get electricity so that the water in the air could be condensated by the cooled side of it.

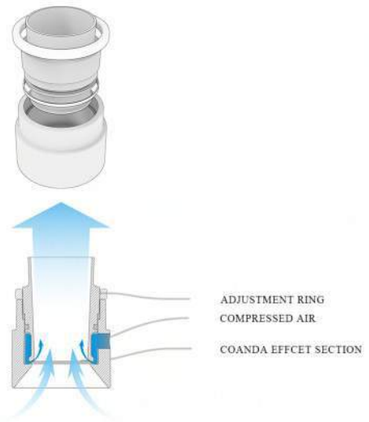


MODULE:

AIR AMPLIFIER

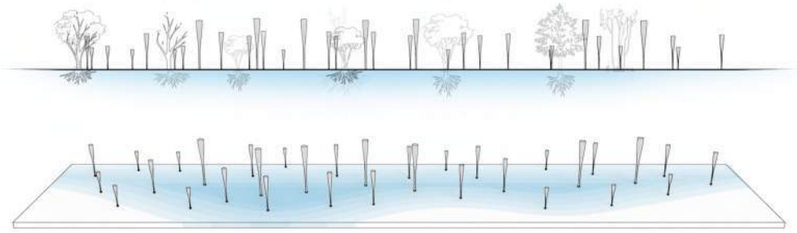
(Coanda Effect)

Air Amplifier, which is an application of Coanda Effect, releases a tiny amount of compressed air at near-sonic velocity through an adjustable, internal, ring-shaped nozzle. The high-speed "tube" of air relteased through the front creates a strong vacuum behind itself, pulling additional surrounding air through the rear of the amplifier, while pushing the ambient air in front.
On account of quiet, safe, maintenance-free air moving and conveying, Air apmlifier is suited to urban water resources regulation and microclimate improvement.



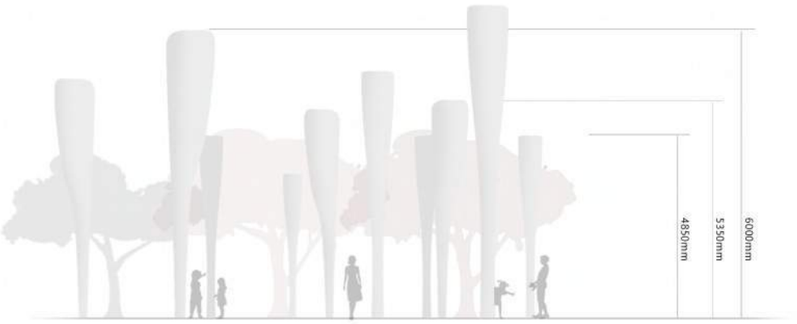
RUNNING PROCESS :

The environment air would be discharged vertically upwards by means of taking in the air amplifier. During the process, the vapour in air would be condensated into water by airwater condenser, then flow into the drip irrigation pipes.



FEATURES:

The drip irrigation system under the soil layer can sample the soil moisture so as to comprehensively adjust the power output of the nodes in the system. The system is devised to achieve the goal of intelligently controlling the humidity level.



PRACTICE: