

# PROJECT TITLE

## From Inefficient Bare Land to Multi-benefit Greenland Inspired by the Native Nature —— Handan Countryside Forest Park Landscape Design

### PROJECT STATEMENT

Handan is known as one of the cities with the worst air pollution in China. The government has decided to build protective forest belts in the urban fringe areas to create a sustainable and natural succession close-to-natural forest system to reduce bare land and improve the urban air environment.

Under the unfavorable conditions of barren soil and low yield and low efficiency of agricultural land, landscape architects are inspired by the growth laws of native plants and build suitable native plant communities according to soil conditions. Use the terrain height difference and the existing farming irrigation canals to construct a water storage and irrigation system to improve the survival rate of vegetation. The design skillfully handles the relationship between the existing farmland and newly-added woodland, forming a "pastoral forest" landscape with multiple benefits such as production, ecology and leisure, and providing a variety of habitats for local animals. The ecological landscape design combines the agricultural landscape relics and the local industrial culture background, which continues the characteristics and memory of the site.

The completion of the project turned the dusty and inefficient land into an urban oasis close to nature, significantly improved the ecological environment, increased the economic value of the land, and provided Handan citizens with a green leisure destination close to their hearts.

# PROJECT NARRATIVE

## Project Background

Handan is one of the most polluted cities in China. The site locates in the city west - it was the primary industrial production area of Handan. In addition to industrial pollution, dust from raw land is another significant impact of air pollution. The government is determined to build a protective forest on this 200-hectare land area to reduce air pollution.

## Challenges

- ① The soil is barren, the climate is dehydrated, the terrain is complex, water retention is poor, the native vegetation is single, and the biological habitat is missing.
- ② Restricted by climate and soil conditions, the farmland yield is low, and it is difficult to increase the income from traditional crops.

The core task of the project is how to restore the fragile ecological environment relying on unfavourable site conditions, correctly handle the relationship between existing cultivated land and new forest, and build a sustainable, multi-benefit close-to-nature forest.

## Design Strategies

- ① **Follow the example of local nature and build a close-to-natural forest ecosystem.**  
Based on the native community, investigate plants suitable for similar environments around the site, and determine the restoration of six types of 18 groups of native plant communities, mainly barren-tolerant and drought-tolerant plants, and simulate natural plant communities for heterogeneous, different-age, and vertical multi-layer mixing planting to enhance the stability of the forest system.The design combines the planting layout of woodland, shrubs, and grasslands with soil conditions, water catchment conditions, and slope and aspect.  
Protect the original ground cover, screen the drought-tolerant ground cover through in-site experiments, and cover the steep slopes and barren land with

greening to maintain water and soil and reduce the bare surface.  
Guarantee water supply, build recharge irrigation systems and improve the soil to increase the survival rate of trees.

- ② **Consider both ecological and production benefits, and enhance the economic value of the land.**  
Retain the patch mechanism of farmland and build a landscape ecological forest network relying on the edge of farmland.  
Combine soil thickness and water and fertilizer conditions to plant local productive trees to increase land income.  
Replace the low-efficiency agricultural land to create productive Chinese herbal medicine and flower fields.

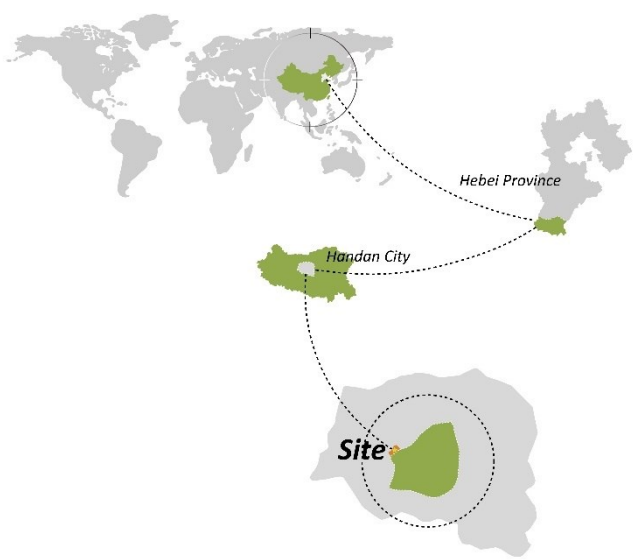
- ③ **Provide an ecological and site-specific tour experience.**  
The overhead steel grid tour footpath maximizes the green soil coverage. Embed grass, stones, gravel and other fields and trails to ensure the water permeability of the ground and conserve the land.  
The abandoned agricultural aqueduct is reused to form a new landmark of agricultural heritage and ecological landscape. The reuse of wasted industrial production facilities continues the memory of regional industrial culture.  
Use natural materials such as wooden piles, stones, and plant branches to create a popular science area for native animals and plants and enhance the interaction between man and nature.

## Project Impacts

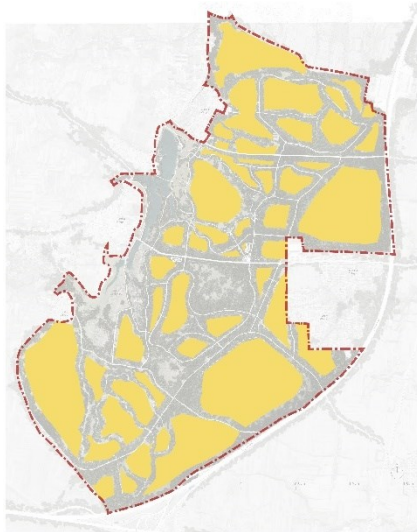
The park's completion has built a green environmental protection barrier for the city. The dusty, low-efficiency bare land has become a multi-functional and multi-benefit rustic forest oxygen bar.  
It has also become a leisure destination for Handan citizens to enjoy the countryside on weekends, jogging and hiking, camping and picking, and popular science education.



# CHALLENGES AND MASTER PLAN LAYOUT



**Woodland Network**



**Nursery and Farmland**

## Master Plan

### LEGEND

- 01 Park Entrance
- 02 The Core Tour Area
- 03 The Grand Aqueduct
- 04 Flower Field
- 05 Agriculture Farmland
- 06 Forest Land
- 07 Productive Nursery
- 08 Seasonal Pond
- 09 Redstone Tour Area
- 10 Kanghu Reservoir
- 11 Tour Trail
- 12 Existing Village
- 13 City Expressway



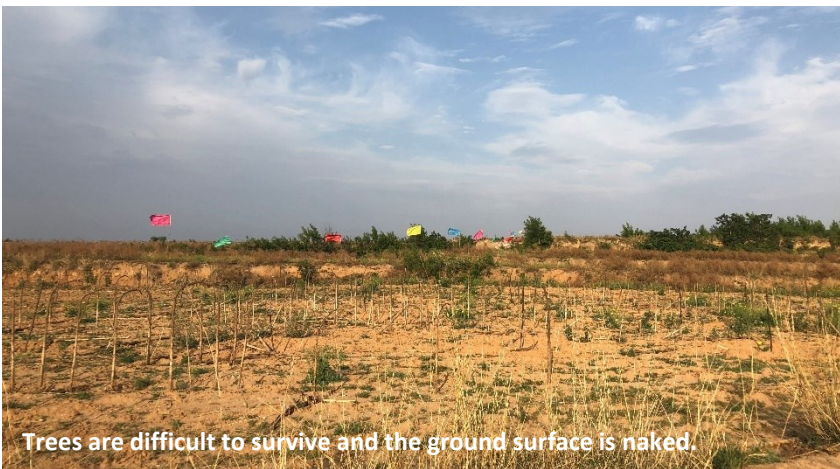
The topography is difficult to retain water due to its complexity.



The vegetation is simple in site and the ecological environment is fragile.



The soil is barren and the farm yield is low.



Trees are difficult to survive and the ground surface is naked.

**The project's core task is restoring the fragile ecological environment, building a healthy and sustainable close-to-natural forest system, and dealing with inefficient farmland.**



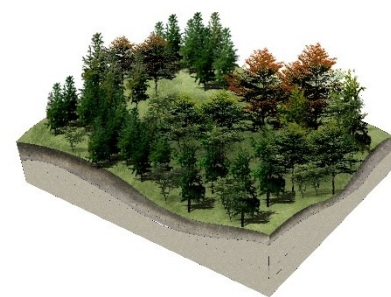












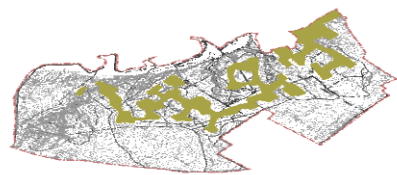




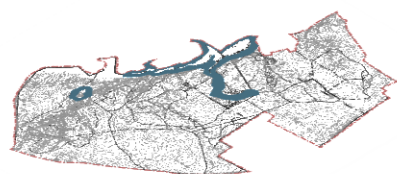
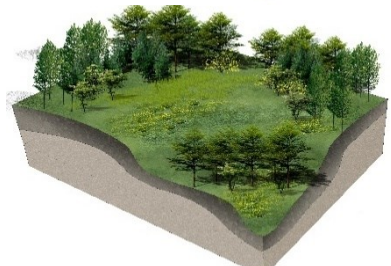









**From Inefficient Bare Land to Multi-benefit Greenland Inspired by the Native Nature**  
**—— Handan Countryside Forest Park Landscape Design**



**Inspired by the law of native vegetation growth, build a rural forest landscape close to nature and a green ecological barrier for the city to protect the environment.**



# NATURALIZED FOREST CONSTRUCTION | NATIVE PLANT COMMUNITIES

	  		<b>Drought tolerant mixed coniferous deciduous forest</b>
	  		<b>Native mixed deciduous forest</b>
	  		<b>Barren field shrub and ground cover</b>
	  		<b>Waterfront mixture vegetation</b>
	  		<b>Steep slope ground cover</b>
	  		<b>Mixture and productive nursery</b>

Mixed forest of conifer and deciduous trees



Mixed forest of trees, shrubs and ground covers

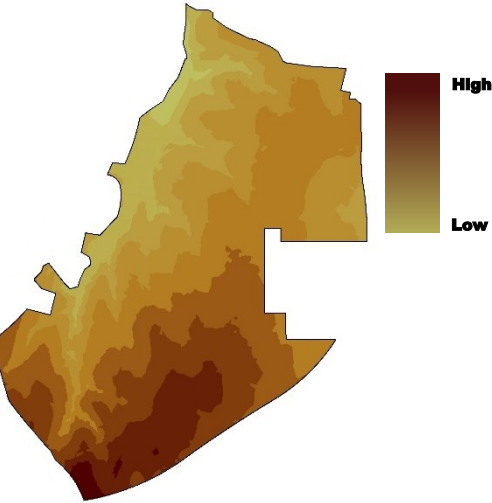


Restore six types of distinct native plant communities to create a diverse biological habitat environment; different species, different ages, and mixed planting to enhance the stability of the forest system.

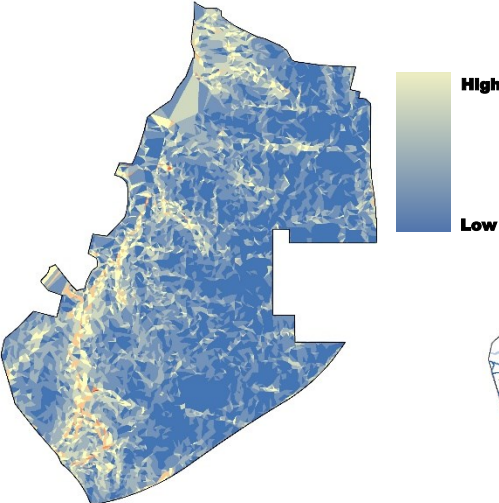


# NATURALIZED FOREST CONSTRUCTION | PLANTING LAYOUT

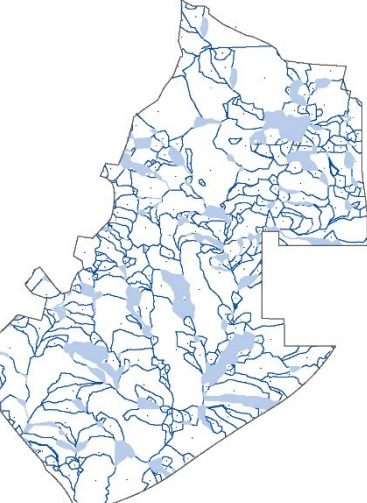
Elevation



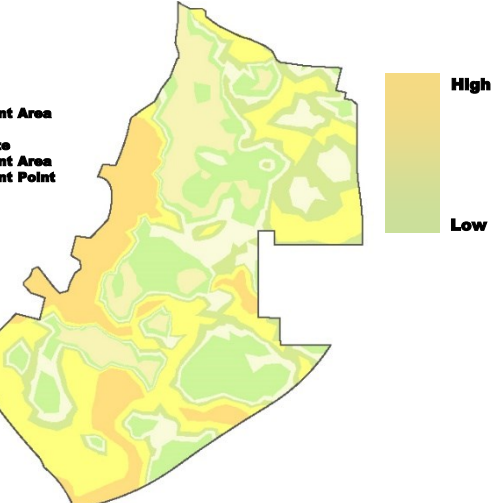
Slope



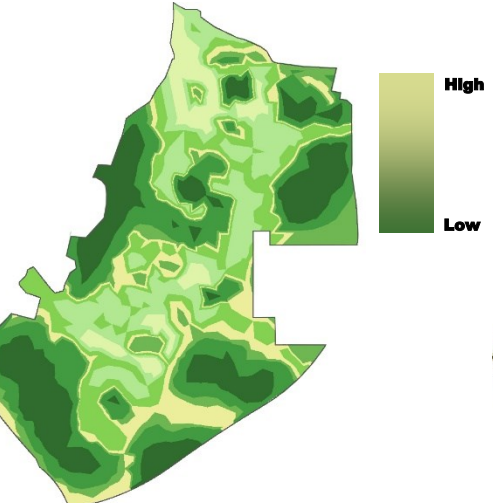
Watershed



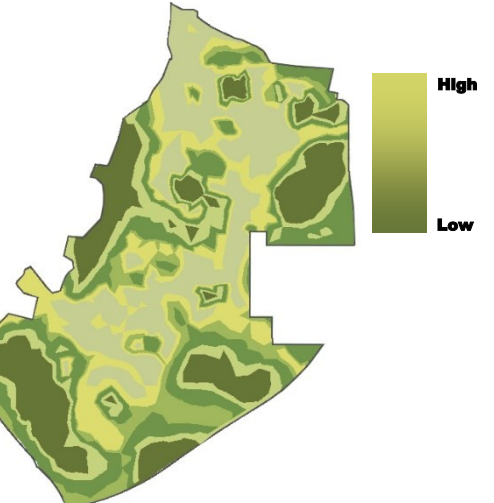
Infiltration Rate



Soil Sickness



Soil Fertility



**Woodland**

In the area with thick soil layer and good irrigation conditions, multilayer native plant communities with trees, shrubs and ground covers are used to construct close-to-natural woodland with high ecological benefits.



**Shrub and Grassland**

In the area with thin soil layer and barren land, the native ground cover plants with drought tolerance, barren tolerance and low maintenance are planted.



Plant trees, shrubs and ground covers in combination with conditions such as soil, water catchment, and slope aspect to effectively improve the problem of bare soil.



NATURALIZED FOREST CONSTRUCTION | ADAPTABLE GROUND COVERS

Preserved well-grown  
vegetation in site



Selected native vegetation  
adaptable to the site



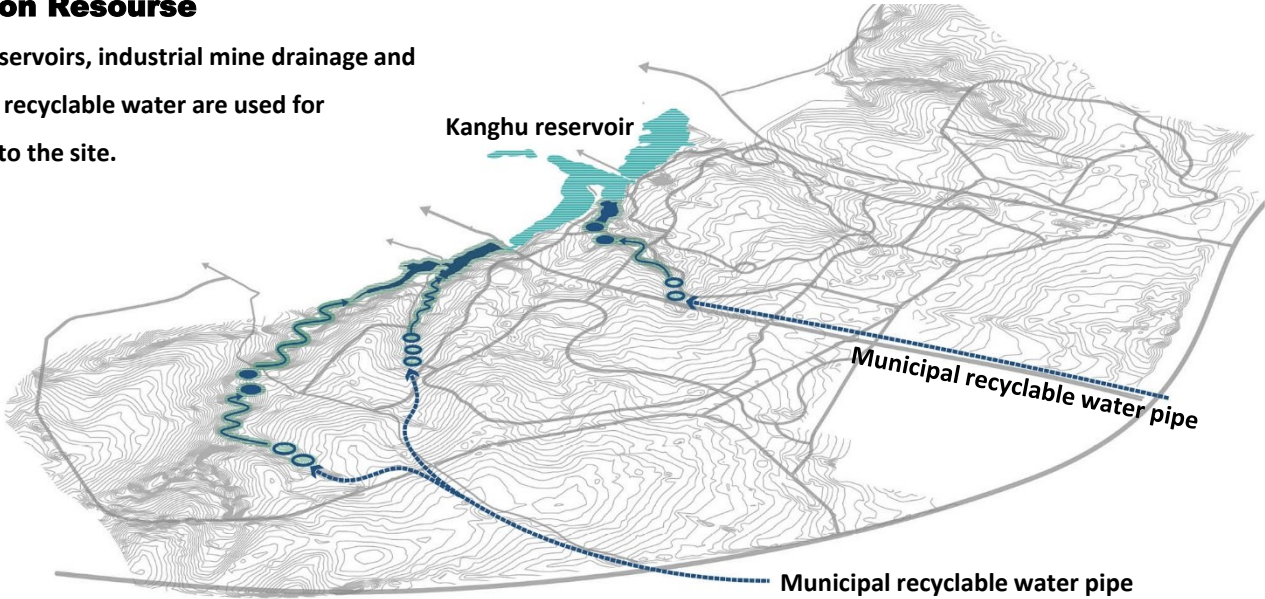
Preserve the native vegetation with good growth, test and screen the drought-tolerant vegetation in site, and form a beautiful, low-maintenance and management native ground cover plant landscape.



# IRRIGATION SYSTEM SUPPORT

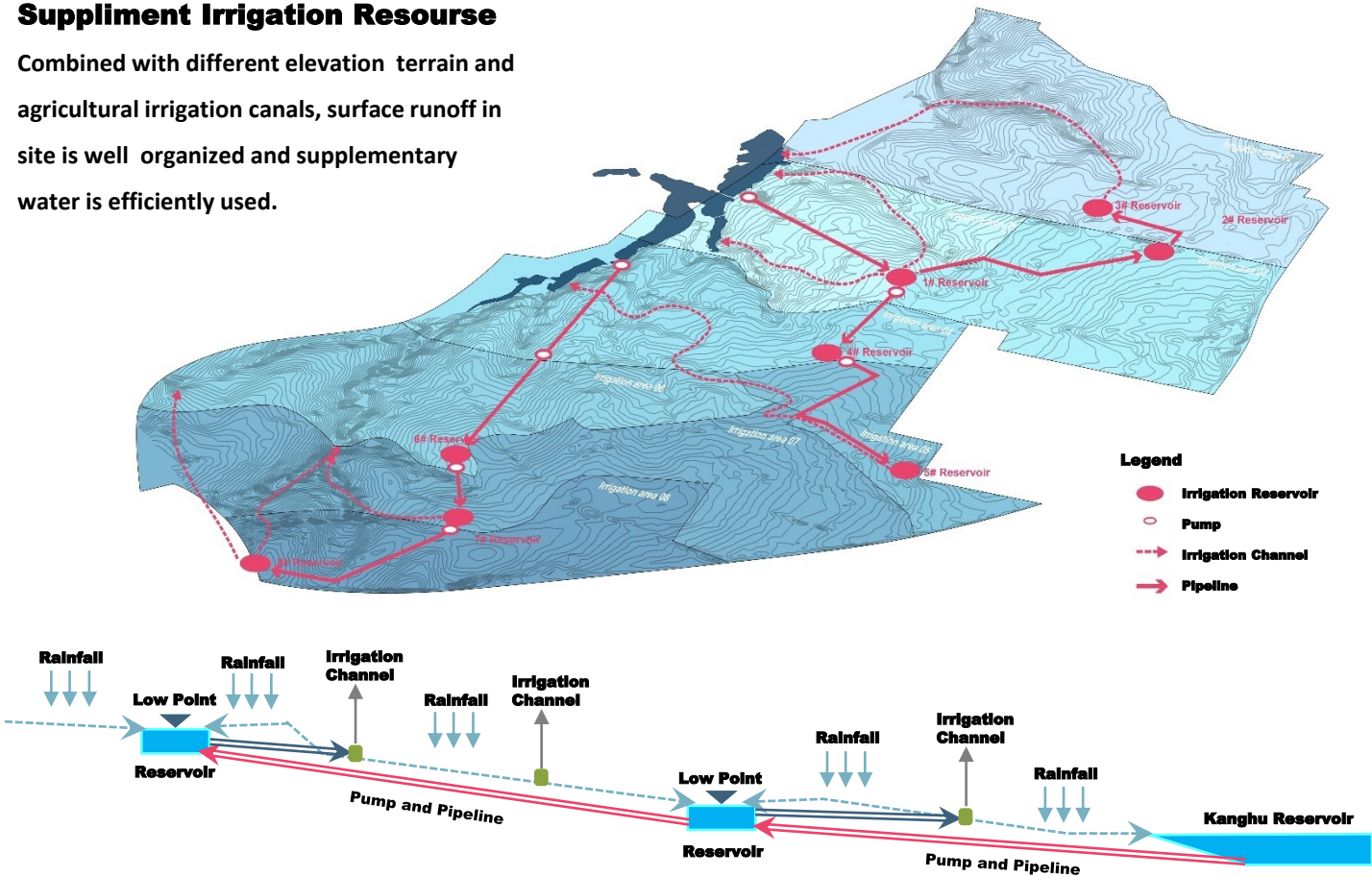
## Irrigation Resource

Nearby reservoirs, industrial mine drainage and municipal recyclable water are used for irrigation to the site.



## Suppliment Irrigation Resource

Combined with different elevation terrain and agricultural irrigation canals, surface runoff in site is well organized and supplementary water is efficiently used.



# WATER AND SOIL CONSERVATION

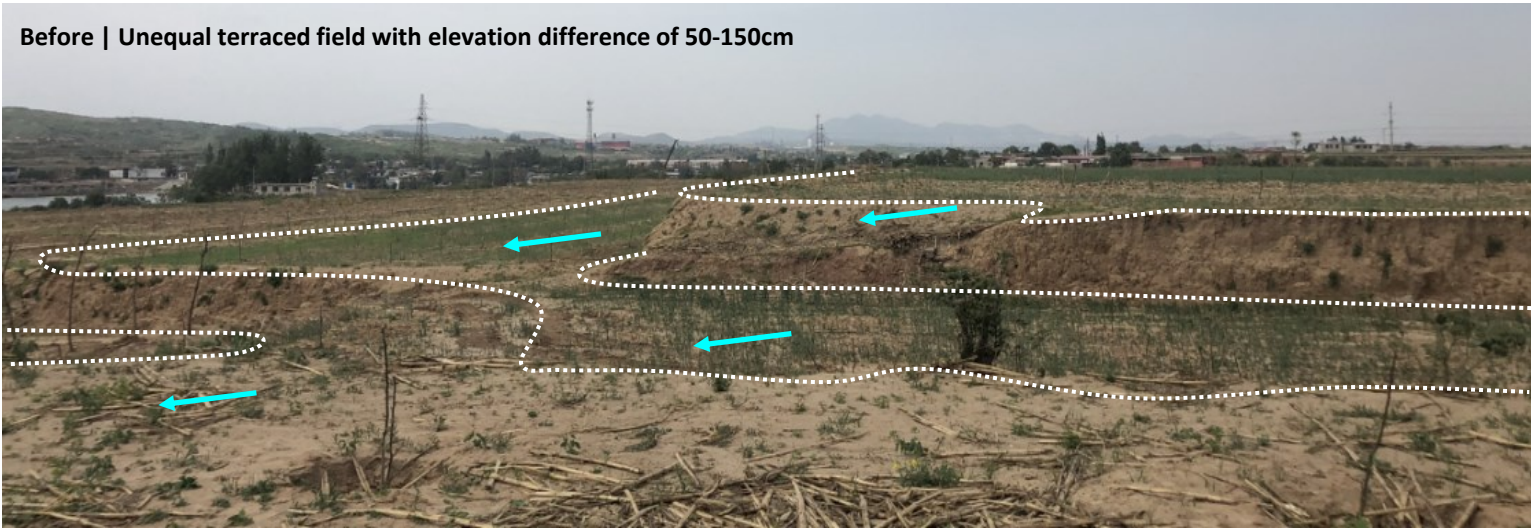
Fertilization measures are used to optimized soil.



Topographic reconstruction increased water flow area and water storage area.



Before | Unequal terraced field with elevation difference of 50-150cm



After | Platform with elevation difference of 30-50cm



Sustainable and intensive use of water sources, water storage and water conservation, and soil improvement can effectively improve the survival rate of plants.



# ECONOMIC VALUE OF LAND PROMOTION

## Productive Nursery

Plant productive nursery woodland with economic value according to water, fertilizer and soil conditions.



## Productive Flower Field

Low-yield agricultural land is replaced by adaptable flower field with medicinal value and economic value.



Native oil trees and fruit trees with economic value are used to plant in site.



*Juglans*



*Crataegus pinnatifida* Bunge



*Idesia polycarpa* Maxim.



*Pyrus sorotina*.



*Hippophae rhamnoides* Linn.



*Ailanthus altissima* (Mill.) Swingle

Productive varieties are planted to improve the low-yield and low-efficiency state of the original agricultural land, and improve the economic benefits of the land.



ECO-FRIENDLY DESIGN



The project uses natural materials such as rocks, gravel, stakes, branches, etc., to create an eco-friendly landscape environment and popular science interactive facilities.



SITE MEMORY PRESERVATION



The project uses wasted industrial facilities and abandoned aqueduct to create a landscape that blends with the environment, continues the site's cultural memory, and provides a unique tour experience.



POSITIVE SOCIAL INFLUENCE



With scenic viewing, outdoor sports, team building, and camping, the park has become a green leisure destination for Handan citizens on weekends.





Productive Farmland

Productive Flowerbed

Productive Nursery

Ecological Woodland

**141ha** Area of Ecological Woodlands and Nurseries

**47** Types of Native Arbor

**23** Types of Native Shrubs

**28** Types of Native Herbs and Water Plants

**22ha** Area of Productive Chinese Herbal Plant and Flowerbed

**14.4km** Open Pathways and Trails for Leisure

**10ha** Ecological Interactive Tourist Areas

**5 Villages** Nearby Benefit from the Land Harvest and Tourist Reception

Extra Income of **18 million RMB** per year for the nearby villagers

**MULTI-BENEFIT ECOLOGICAL GREEN BARRIER**

The once dusty and low-efficiency bare land has become a multi-benefit suburban green forest oxygen bar, benefiting the villagers nearby and the people of Handan.