



Nature-Based Ecological Restoration of the Yongding River

Haihe River Water Conservancy Commission, MWR

2025. 10

Basic Information about the Yongding River



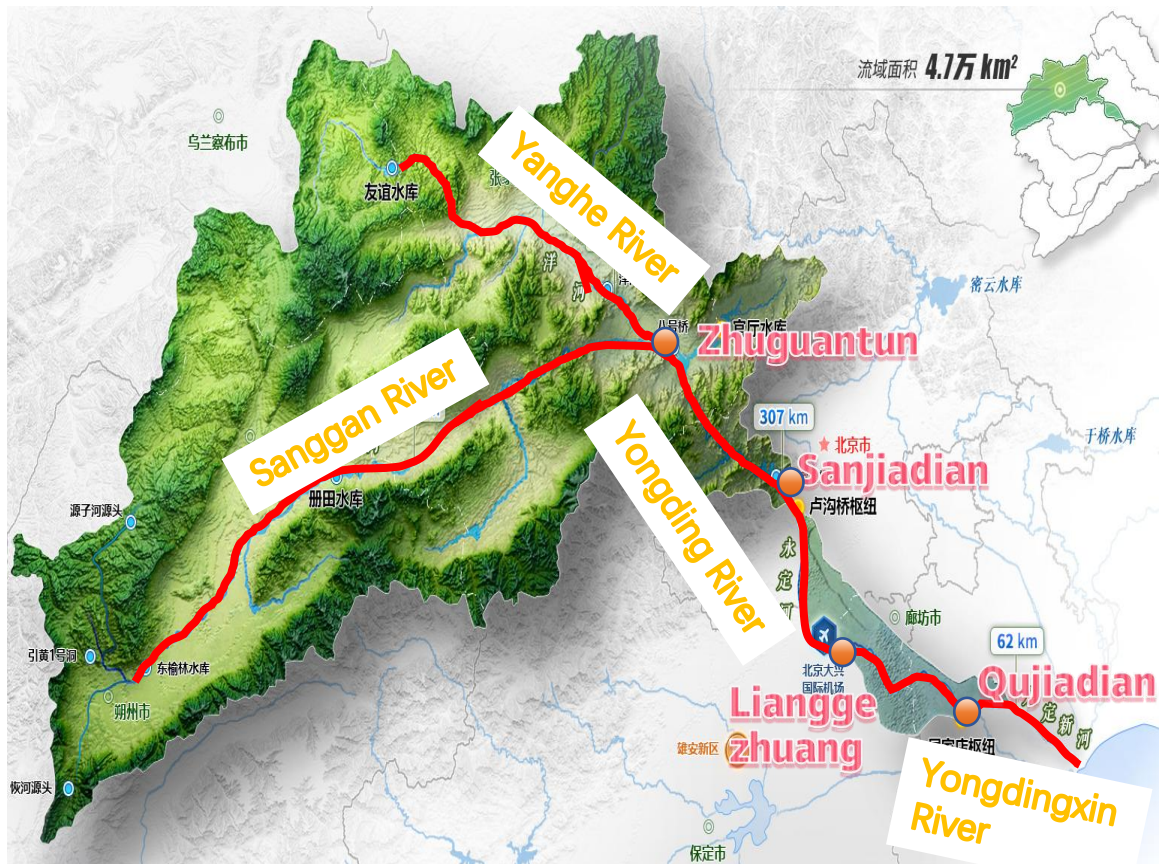
- ❑ The Yongding River basin is one of the seven major basins in the Haihe River Basin. The area spans five provinces including Inner Mongolia, Shanxi, Hebei, Beijing, and Tianjin, with an area of 47000 km². The mountainous watershed area accounts for 95.8% and the plain watershed area accounts for 4.2%.

River System

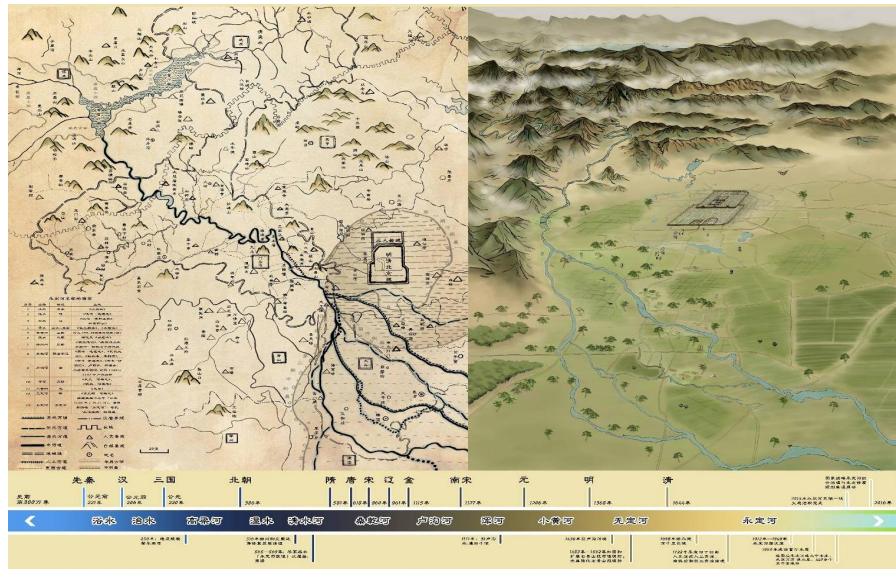
- » two major tributaries, Sanggan River (437km) and Yanghe River (278km)
- » Sanjiadian is the boundary between mountainous and plain areas
- » entering the Yongding River floodplain from Lianggezhuang
- » Below Qujiadian is Yongdingxin River

Hydrometeorology

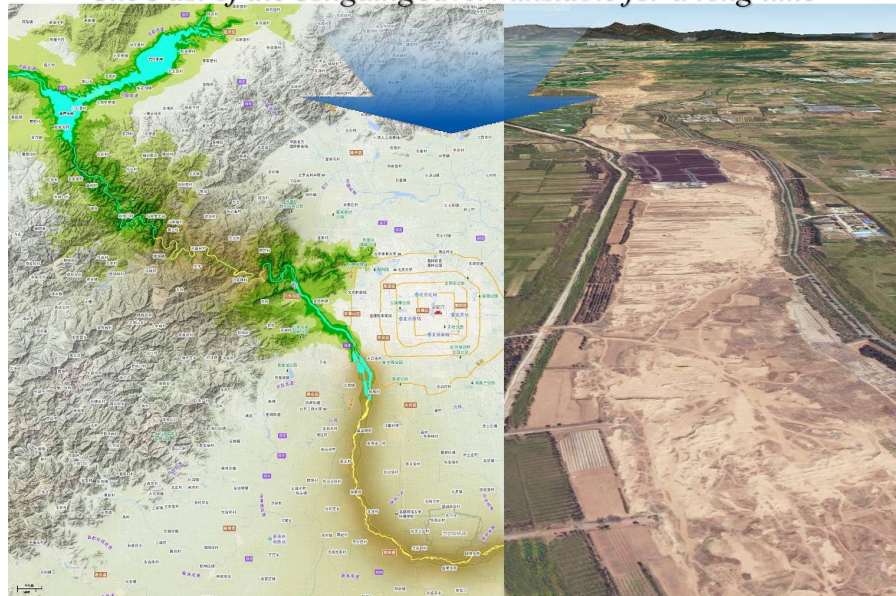
- ✓ Temperate Continental Monsoon Climate
- ✓ transition zone of semi humid and semi-arid climate
- ✓ the average annual precipitation between 254-621mm
- ✓ annual average runoff of 1.042 billion m³



Origin and Objectives of the Plan



The Past of the Yongding River: unstable for a long time



Before the Yongding River was restored: a dry river

Problems

- Overexploitation of water resources
- rivers drying up and flowing intermittently
- The natural hydrological processes of rivers basically disappeared
- inadequate environmental carrying capacity
- severe water contamination
- The ecological status of river corridors severely degraded

File

国家发展和改革委员会
水利部文件
国家林业总局

发改农经〔2016〕2842号

On December 30, 2016, the nation issued and implemented the "Overall Plan for Comprehensive Management and Ecological Restoration of Yongding River"

Objective

2020

Preliminarily form the green ecological river corridor of the Yongding River

2025

Build the Green Ecological River Corridor.

Future

Be restored as a "flowing river, green river, clean river, and safe river"

Governance measures:fully embody the principles of NbS



**Efficient
utilization and
conservation of
water resources**



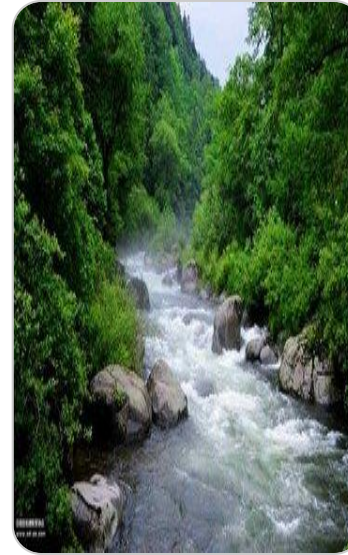
**Water network
construction**



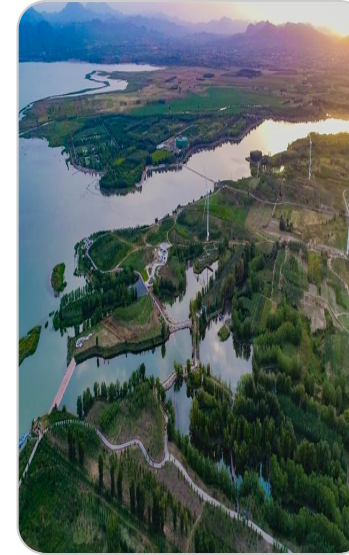
**Comprehensive
river regulation
and restoration**



**Water
conservation and
ecological
construction**



**Water ecological
governance and
protection**



**Construction of
digital twin
platform**



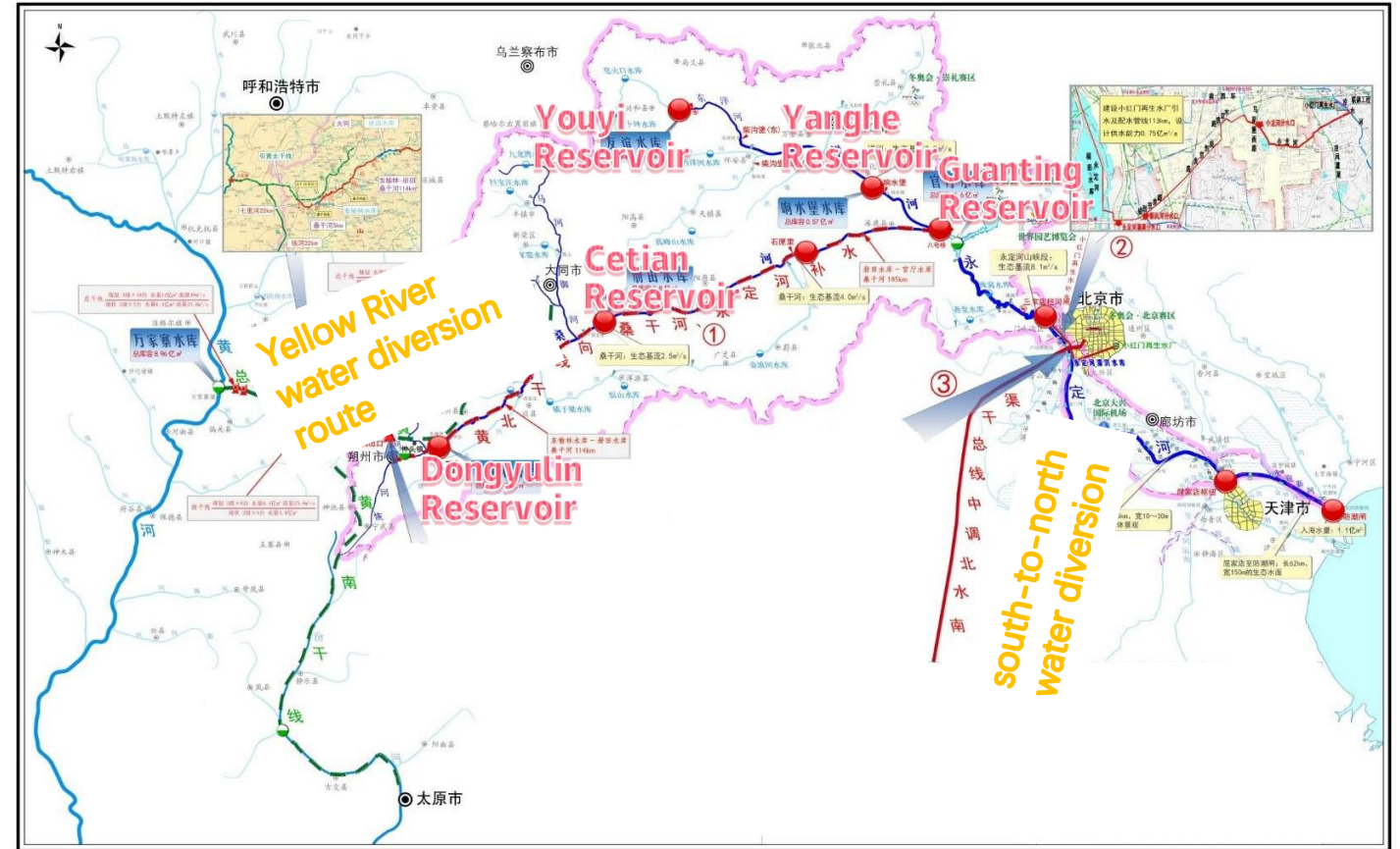
The comprehensive management and ecological restoration of the Yongding River fully embodies the core principles of Nature-based Solutions. It emphasizes being "guided by human efforts and driven by natural restoration" through systematic planning, achieving synergistic ecological, economic, and social benefits.

Multi-Source Joint Scheduling for Ecological Water Recharge



Water scarcity has been identified as the core issue driving the ecological degradation of the Yongding River. This challenge is being addressed by implementing water resources optimization allocation oriented towards ecological flow requirements and multi-reservoir joint operation strategies aimed at ecological water replenishment, thereby securing the essential water demand for river ecosystem maintenance .

- ✓ **four types of water sources**
- ✓ **5 reservoirs**
- ✓ **3.53 billion cubic meters**



2017

Initiated ecological water replenishment

2021

achieved full-line flow of 865 km into the sea for the first time since 1996

2022

realized full-line flow into the sea again .

2023

the entire line remained watered throughout the year for two consecutive years, with the full-line flow reaching 261 days.The goal of a "flowing river" has been basically achieved.

2024

River Morphology Restoration

Main problems to solve

*The southern plain section of the river:
long-term cutoff
numerous sand and gravel pits
a severely degraded riverbed morphology.*



Using water to open the way, employing water to guide the path

Using ecological approaches to solve ecological problems: Under the premise of ensuring safety, a natural force-driven restoration method is simulated. In plain river sections, relatively high flow rates suitable for the current riverbed substrate and slope are adopted to restore the natural river morphology, promoting the natural recovery of river channel geomorphology and the ecological environment.



wetting the riverbed

scouring to form a channel

stabilizing the channel morphology

restoring the ecosystem



Wetland Ecological Restoration



Problems

riverbed sandified
vegetation degraded
occupation of riparian lands
widespread non-point source pollution
poor water quality of the upstream inflow

- ✓ *Returning farmland to wetland and water, creating riverine wetlands*
- ✓ *Setting up check dams in secondary channels to divert water onto the floodplain*
- ✓ *Transforming the floodplain through wetland restoration, establishing water purification wetlands*

Before

After



River Ecological Management and Restoration

Measures include main channel regulation, riverbank greening, and ecological revetment construction to advance ecological rehabilitation.

Longitudinally, a continuous lake-pool-riffle structure is formed; laterally, a natural configuration of native woody vegetated buffer strips - floodplain - river channel is established, thereby creating diversified biological habitats.

Before



After



Collaborative River Basin Governance

The Joint Ministry-Province Coordination and Leadership Group provided oversight and guidance for key tasks

The Haihe River Commission strengthened the management functions of the basin authority



The four provinces and municipalities of Beijing, Tianjin, Hebei, and Shanxi played their coordination roles

The Yongding River Investment Co.,LTD. was established to create a platform for multi-objective management, multi-source water trading, multi-resource operation, and multi-factor regulation

- *Measures for the Management of Water Quantity Dispatching of the Yongding River*
- *Cooperation Agreement on Ensuring Ecological Water Use of the Yongding River*
- *Mechanism for Joint Meetings of Municipal (District)-Level River and Lake Chiefs in the Yongding River Basin*
- *Cooperation Framework Agreement on Water Legal System Construction in the Yongding River Basin*

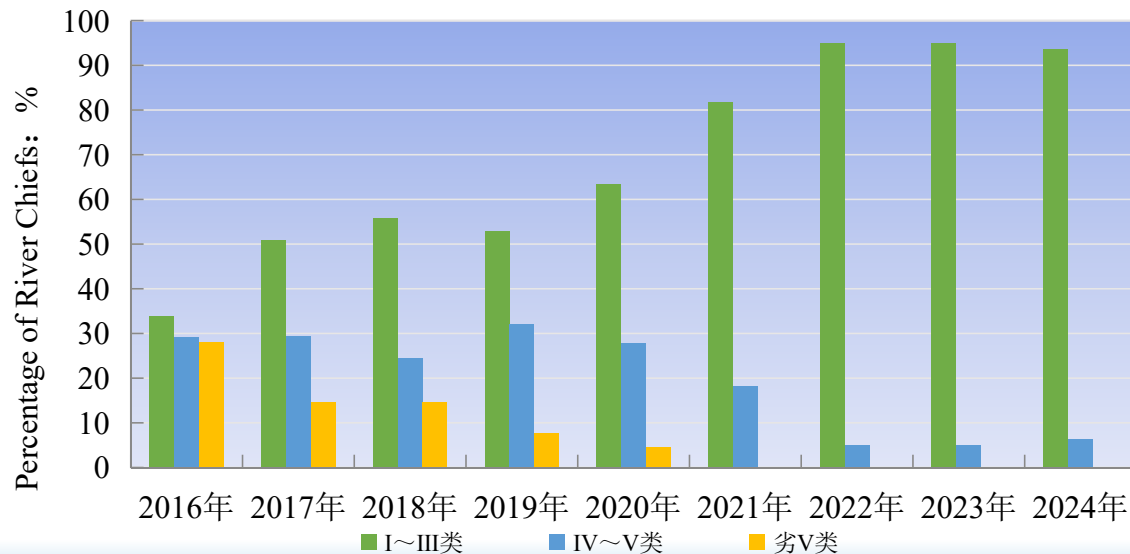


Implementation effectiveness



- The length of river sections with water quality at Grade III or better has reached 1,582.5 km, increasing from **34%** in 2014 to **93.7%**. River sections with water quality worse than **Grade V** have been basically eliminated.
- The groundwater level in plain areas has risen significantly.

Changes in water quality in the river basin



- Surveys have found **441 species of higher plants** and **51 species of fish** in Yongding River, with **370 species of birds** in Guanting Reservoir.
- The population of wetland birds has been increasing year by year, and various rare birds such as black storks, red crowned cranes, and feathered cranes have reappeared in Yongding River and Guanting Reservoir.





Thank you!