

Exploration of a Good Water Management System for Both Human Development and Ecosystem Sustainability

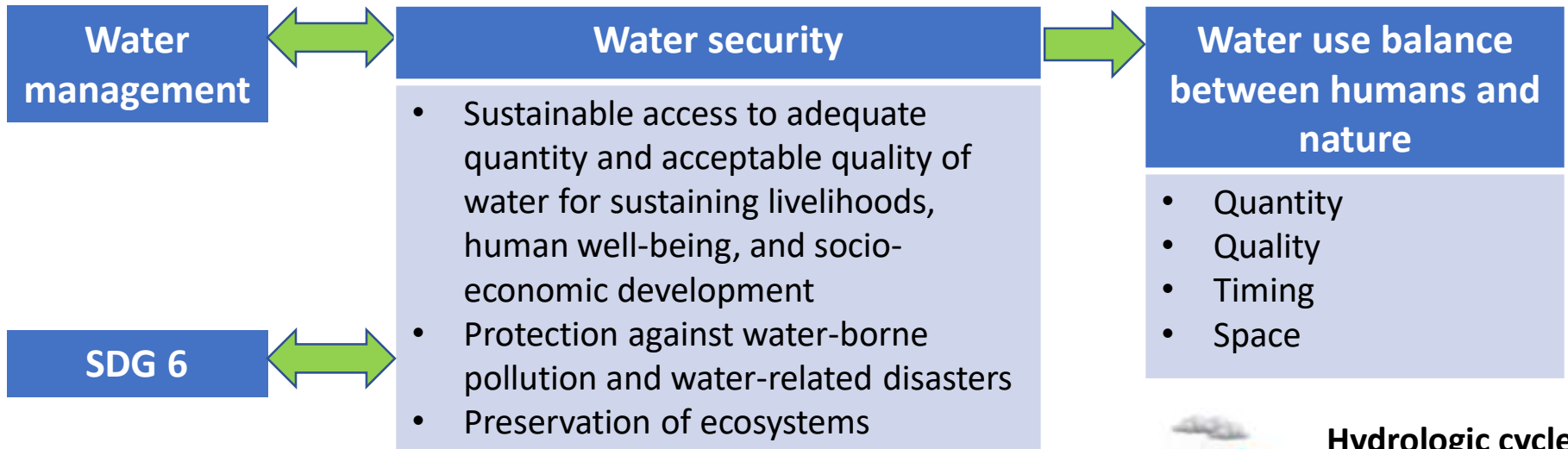
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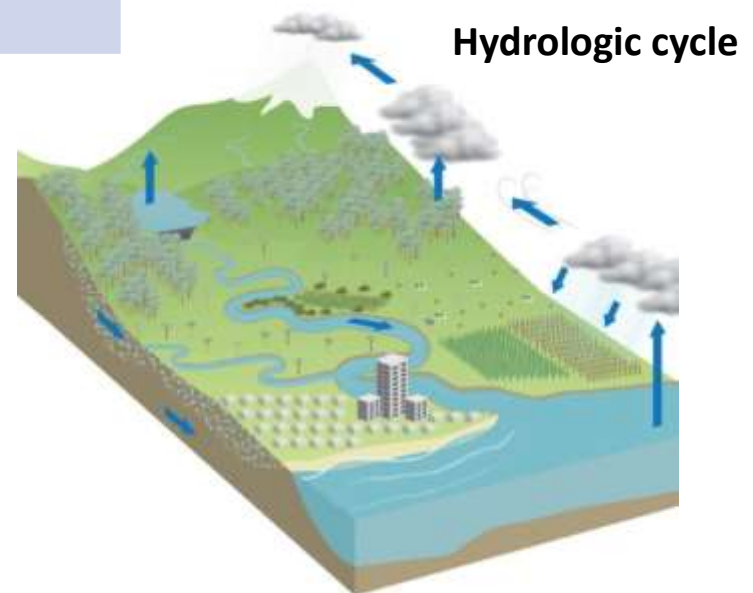
Ministry of Water Resources, P. R. China

Goal of Water Resources Management

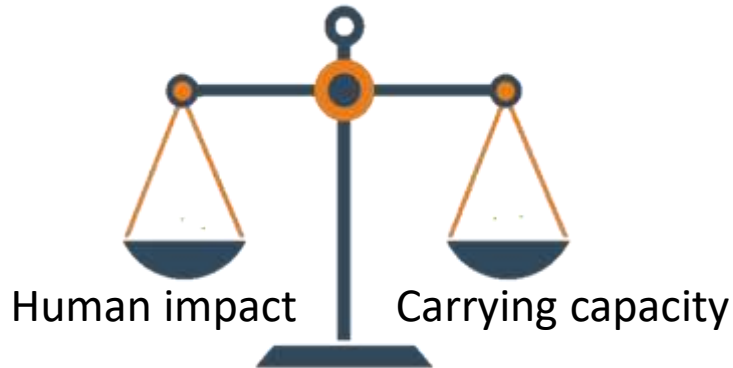


Four key elements of a river system:

- Quantity
- Quality
- Timing
- Water and riparian space



Principles of Water Management

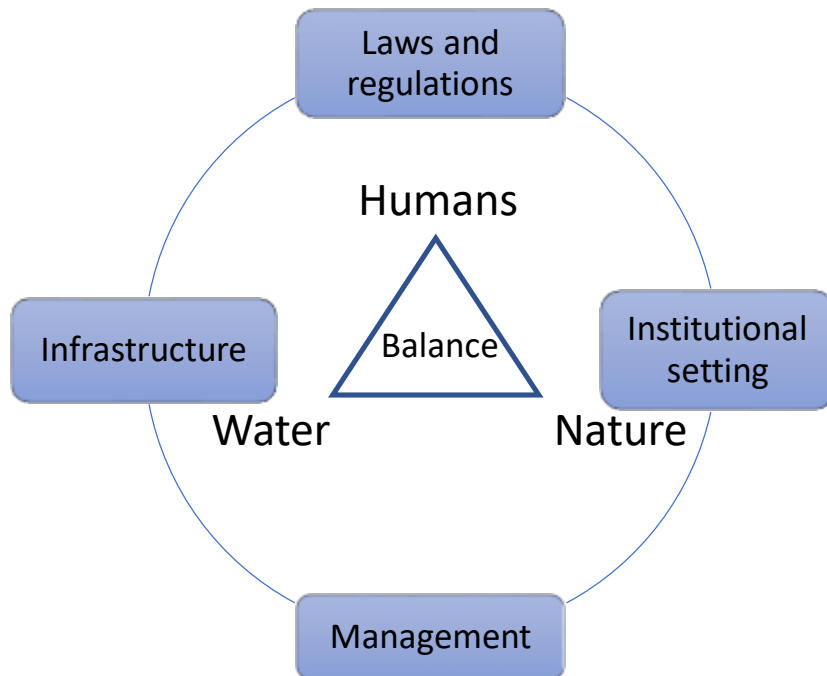


General Approaches

- Reduce human impact
- Increase water resources carrying capacity

Water resources carrying capacity:

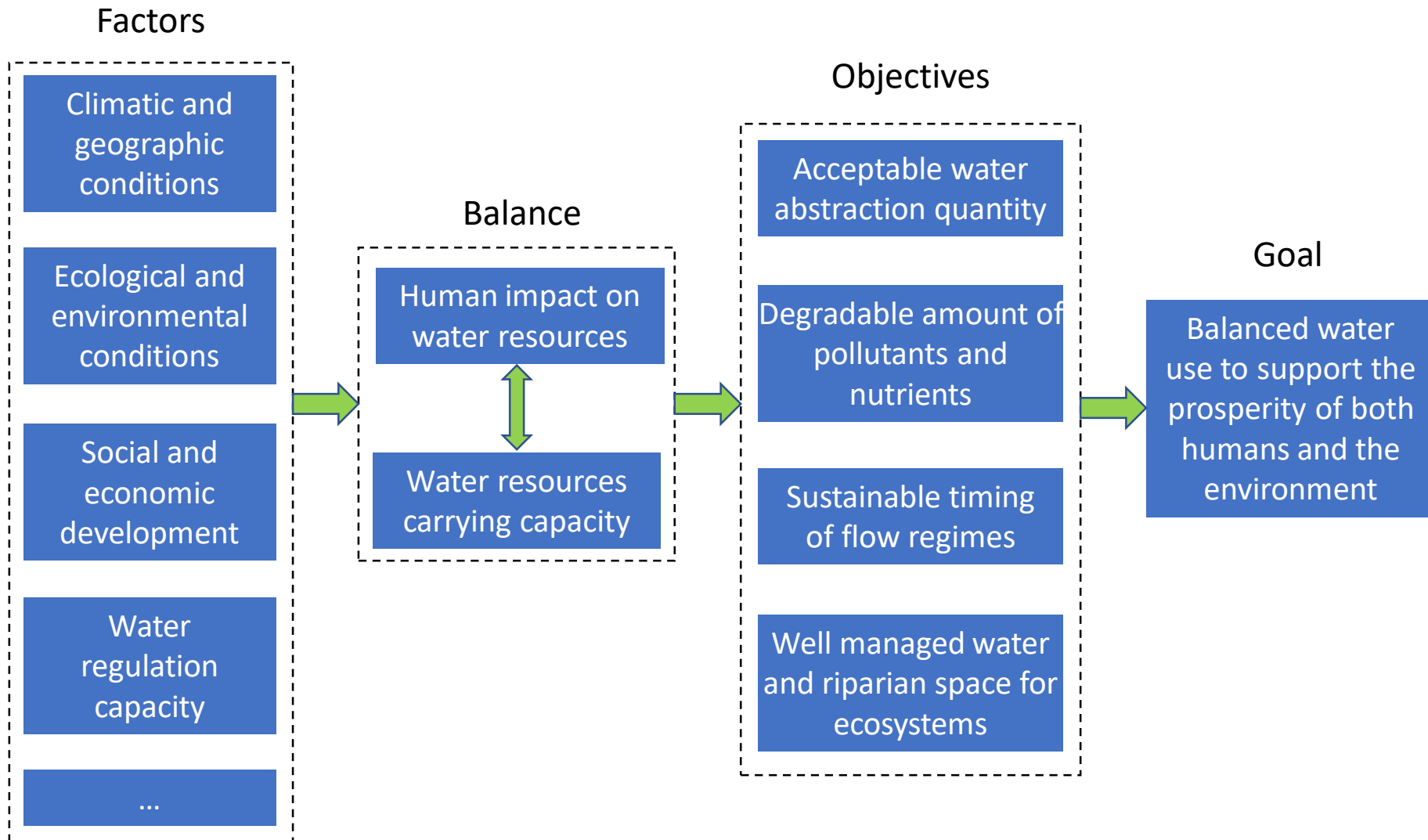
- Maximum sustainable socioeconomic scale that can be supported by available water resources while maintaining defined environmental conditions



Supportive environment

- Effective laws and regulations
- Well structured institutional setting
- Appropriate management mechanism
- Functioning water infrastructure

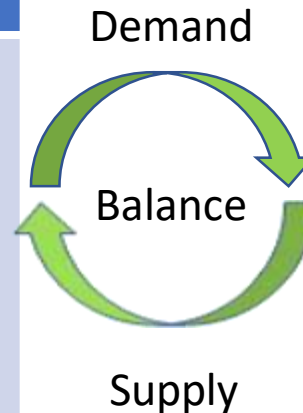
Approach to Water Use Balance



Balance Water Demand and Water Supply

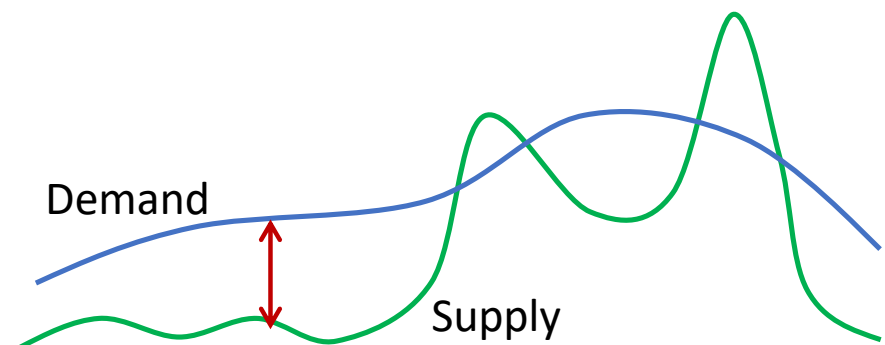
Reduce and control water demand of humans

- Establish and enforce laws and regulations to control maximum water use
- Consider water as a constraint in socio-economic development
- Promote water savings and enhance water use efficiency
- Improve marketing mechanisms and water pricing policies



Increase water availability and water supply capacity

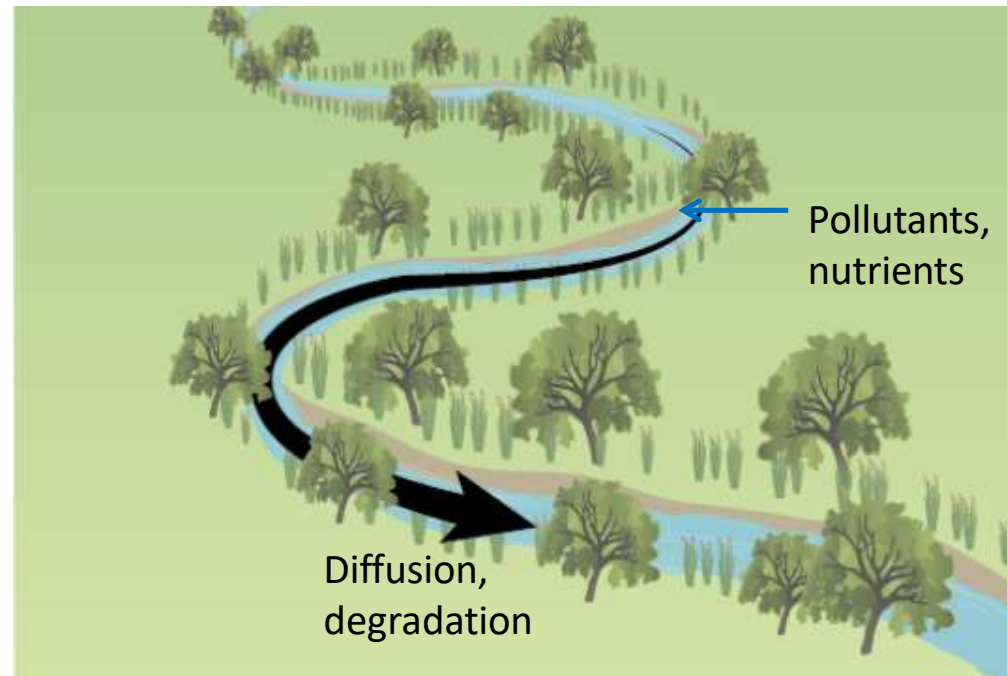
- Optimize water allocation
- Diversify water to mitigate scarcity
- Enhance water storage capacity
- Encourage non-conventional water use
- Motivate water recycling and reuse



Safeguard Freshwater Quality

- Control water pollution

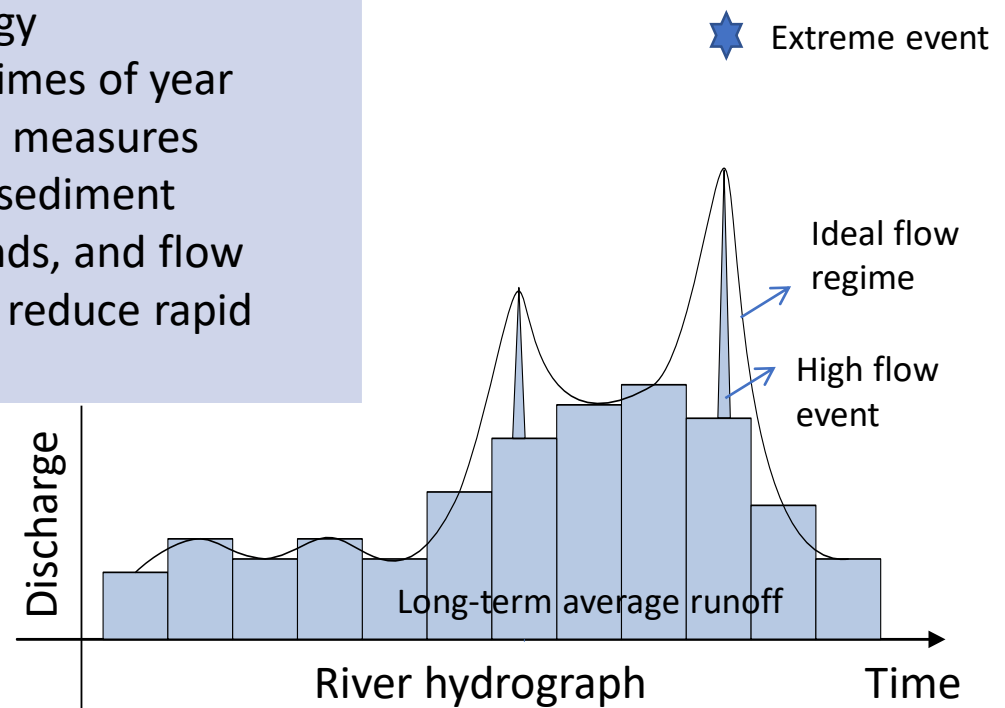
- Establish and enforce laws and regulations to control pollutant discharging
- Control nutrient input from agricultural production
- Adopt cleaner production
- Manage stormwater runoff
- Improve wastewater treatment
- Rebuild water connectivity
- Introduce constructed wetlands



Ensure Reasonable Timing of River Flows

Achieve a healthy water flow regime

- Develop flood control and drought relief systems
- Optimize flow control works to mimic natural flow regimes
- Keep minimum flows for ecology
- Release pulse flows at critical times of year
- Strengthen water conservation measures
- Prevent soil erosion to control sediment
- Build structures (ponds, wetlands, and flow regulators) to retain water and reduce rapid runoff into rivers



Coordinate Water and Riparian Space Management

Riparian zones are important

- Buffer between the river and activities in the surrounding catchment
- Trap sediment runoff, filter nutrients, maintain the food-web
- Link terrestrial and aquatic environments
- Harbour a high diversity of plant and animal life



Coordinate the management of water resources and riparian zones

- Control erosion and siltation
- Restrict land use change
- Restore ecological habitats
- Return aquatic ecological space
- Enhance groundwater recharge
- Rehabilitate riparian zones

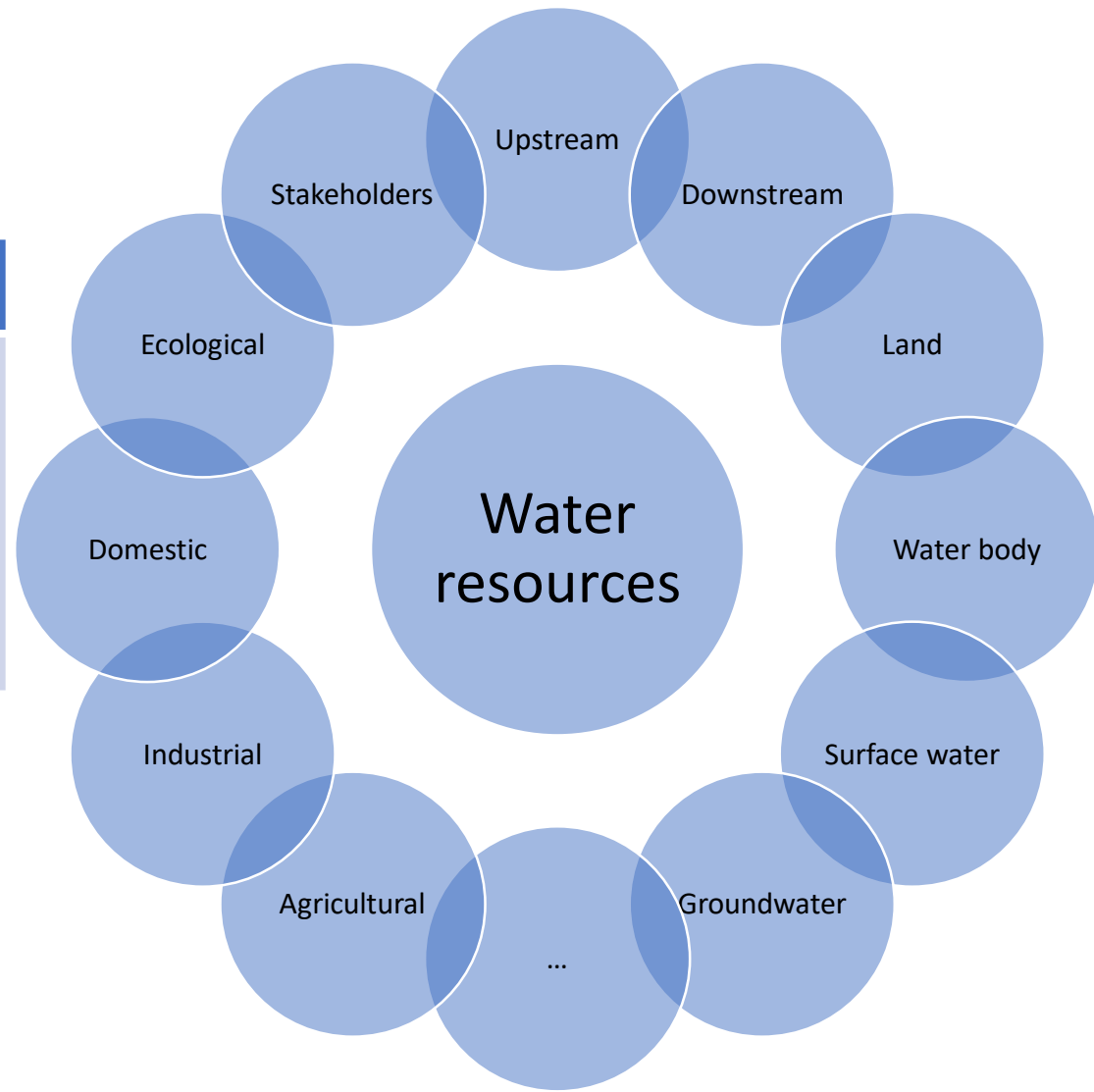
Restoration of Yongding River (Beijing, China)



Integrated Management at Basin Scale

Holistic management of

- Upstream and downstream water use and discharge
- Land and water
- Surface water and groundwater
- Water-related sectors
- All stakeholders



Thank you
for your attention