

# **River Restoration in Asia and Connection between IWRM and River Restoration**

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# Problems of Rivers and Waterfront Environment

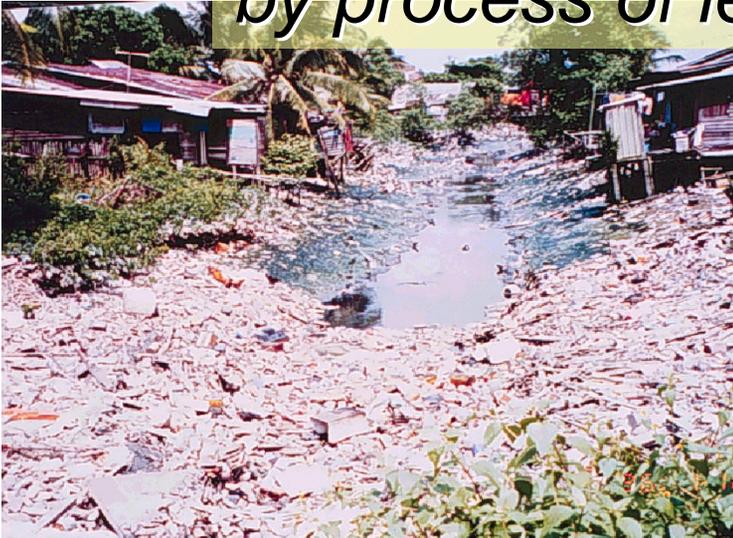


Japan

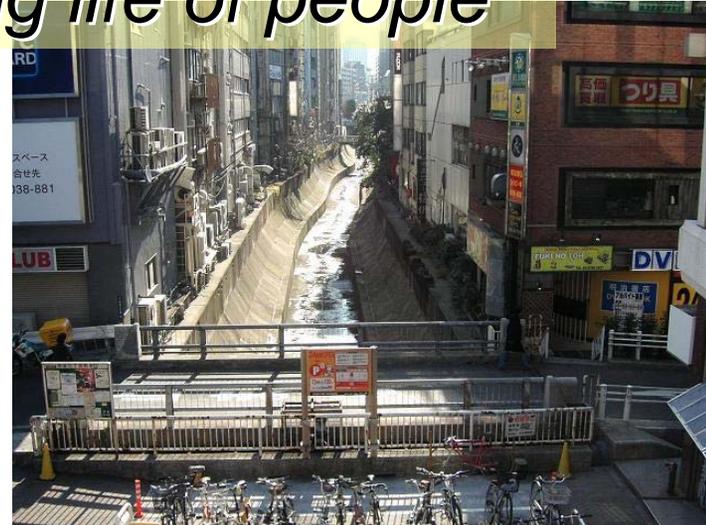


Korea

*River environment was weeded out by process of leading life of people*

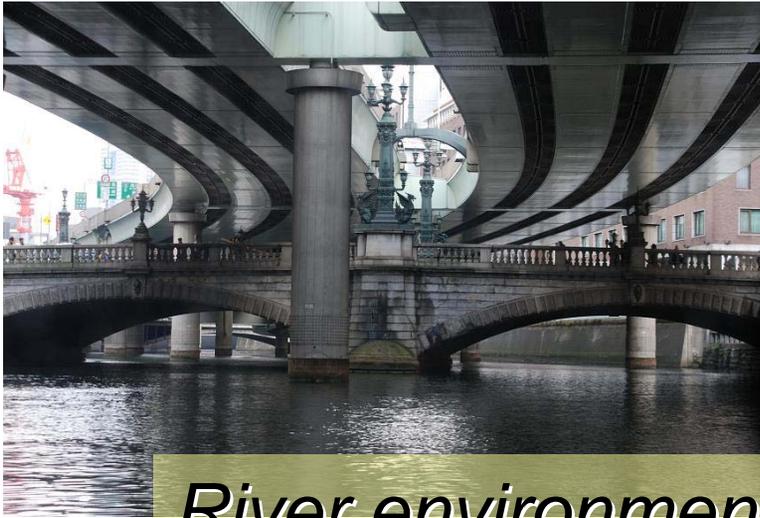


Malaysia

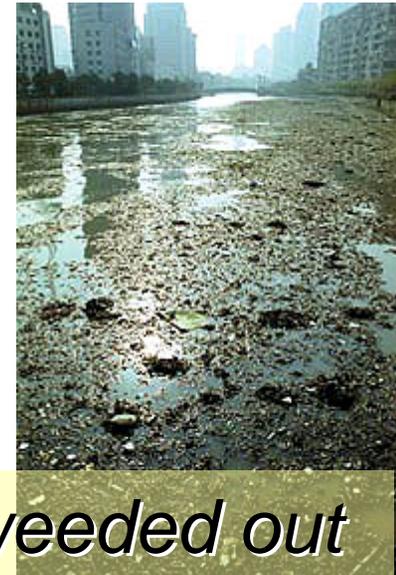


Japan

# Problems of Rivers and Waterfront Environment



Japan



China

*River environment was weeded out by process of leading life of people*



Cambodia

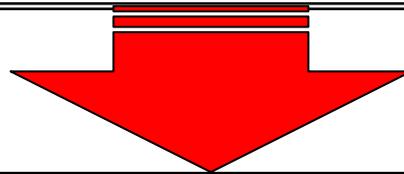


Philippines

# Problems of Rivers and Waterfront Environment

By the rapid population increase and development according to economic growth...

- Water quality deterioration
- Reclamation of river
- Deterioration of habitat
- Disappearance of hydrophile property etc.



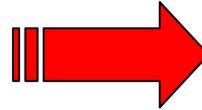
Activities and research on river and watershed restoration are being carried out throughout the world.

These activities are broad in scope, and include....

- Improvement of water quality and quantity
- Improvement of urban landscaping, riverfront amenities
- Restoration of the natural environment, ecosystem
- Urban and human relationship restoration etc.

# Some Efforts for River Restoration in Asia

## ■ Example (1) *Sumida River, Japan*

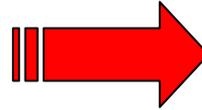


Before (70's-80's)

After (now)

# Some Efforts for River Restoration in Asia

## ■ Example (2) *Tama River, Japan*



Before (70's)

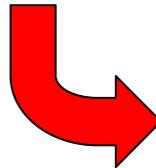
After (now)

# Some Efforts for River Restoration in Asia

## ■ Example (3) *Old Naka River, Japan*



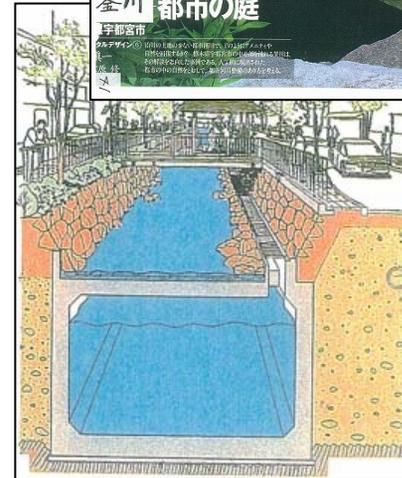
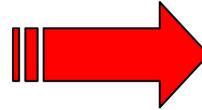
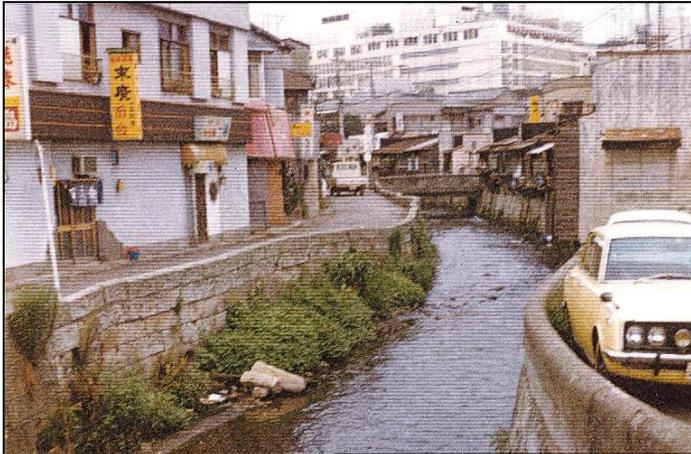
Before (70's)



After (now)

# Some Efforts for River Restoration in Asia

## ■ Example (4) *Kama River, Japan*



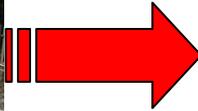
Double-bottomed River

Before (70's-80's)

After (now)

# Some Efforts for River Restoration in Asia

## ■ Example (5) *Batch River, Japan*



Before (80's)

After (now)

# Some Efforts for River Restoration in Asia

## ■ Example (6) *Izumi River, Japan*



Before (80's)



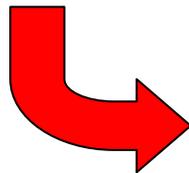
After (now)

# Some Efforts for River Restoration in Asia

## ■ Example (7) *Moizari River, Japan*



Before (80's)



After (now)

# Some Efforts for River Restoration in Asia

## ■ Example (8) *Cheonggyecheon, Korea*



Before the removal of the highway

Before (2002)



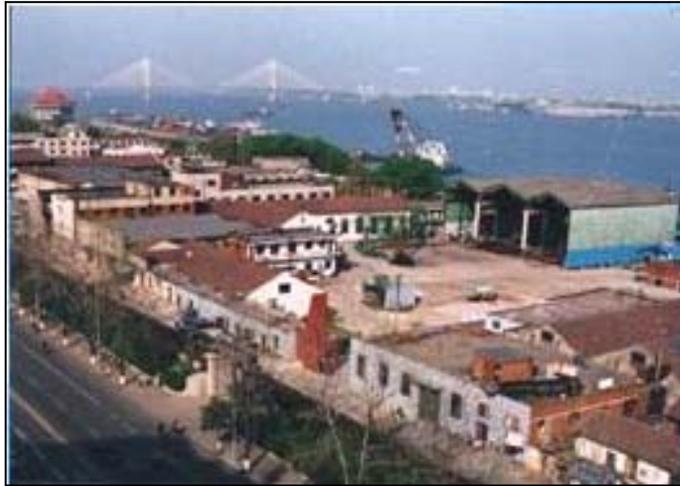
After (now)

After the removal of the highway



# Some Efforts for River Restoration in Asia

## ■ Example (9) *Yangtze River, China*



Before (90's)



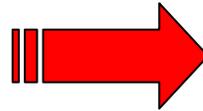
(source: Wuhan Water Authority )



After (now)

# Some Efforts for River Restoration in Asia

## ■ Example (10) Suzhou Creek, China



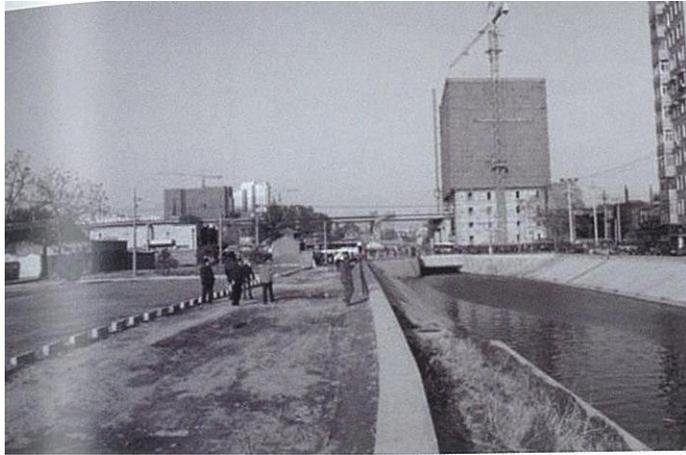
Before (90's)

After (now)

(source: Shanghai Water Authority )

# Some Efforts for River Restoration in Asia

## ■ Example (11) *Zhuanhe River, China*



Before (90's)

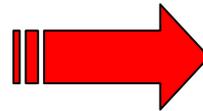


After (now)

(source: Beijing Zhuanhe River)

# Some Efforts for River Restoration in Asia

## ■ Example (12) *Singapore River, Singapore*



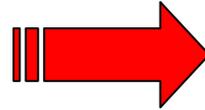
(source: Singapore Public Utilities Board )

Before (80's)

After (now)

# Some Efforts for River Restoration in Asia

## ■ Example (13) *Love River, Chinese Taipei (Taiwan)*



(source: Kaohsiung City Government)

**Before (80's)**

**After (now)**

# Connection between IWRM and River Restoration

## ■ Transition of River Law (Japan)

1896

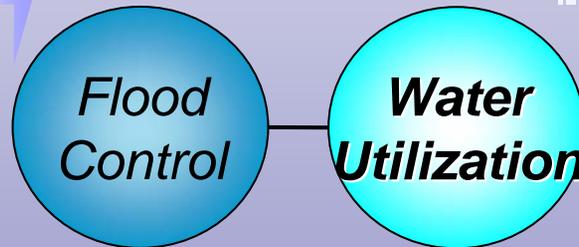
*Birth of modern law for river improvement*



1964

*Systematic maintenance system for 2 contents*

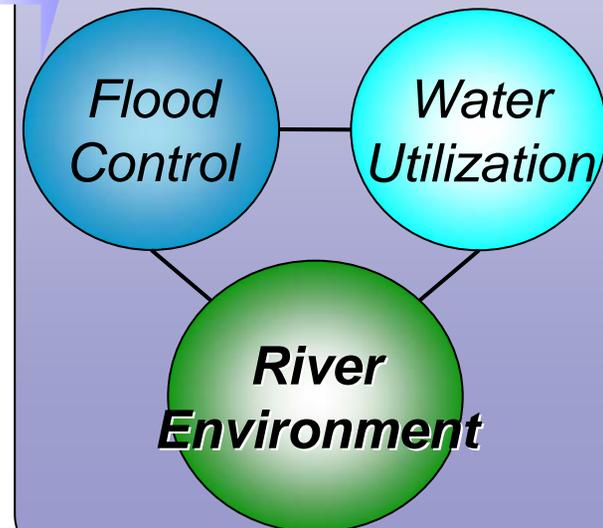
- Introduction of basin consistent management system
- Adjust the relation of 2 factors



1997

*The overall maintenance of 3 contents*

- Maintenance and preservation of river environment
- Reflection of regional opinion
- Introduction of planning system



# Connection between IWRM and River Restoration

## ■ Transition of policy or events for river environment (Japan)

Year	Items	Contents
1958	Beginning of survey of water quality	Improvement for water contamination
1965	Establishment of procedures of occupancy of the river zone	Ensuring of open spaces
1981	Establishment of general plans for rivers and watersheds environment management	Improvement of hydrophilic nature
1987	Establishment of the Foundation for Riverfront Improvement and Restoration	Riverfront improvement, preservation, research
1990	Beginning of Nature-Oriented River work	Focusing on ecosystems
1995	National Biodiversity Strategy has started	Focusing on biodiversity
1997	<b>Amendment to River Law (establishment of basic policy for river improvement and river improvement)</b>	<b>Concern about environment issue</b>
2002	Natural Restoration Project has started	Requesting of nature regeneration
2003	Natural Restoration Law	Concern about natural restoration
2006	Amendment to Nature-Oriented River work	Focusing on ecosystems and human

# Connection between IWRM and River Restoration

## ■ Historical solution for river environment restoration (Japan)

- 1950's ● Continuous survey of water quality
- 1960's ● Developing sewerage systems and WTP
- 1980's ● Promotion of accessibility between rivers and urban  
● Improvement of urban landscaping, riverfront amenities
- 1990's ● Regeneration project of nature, ecosystem
- 2000's ● Improvement of relationship between river and human, community and nature

(Main Target)

Water quality

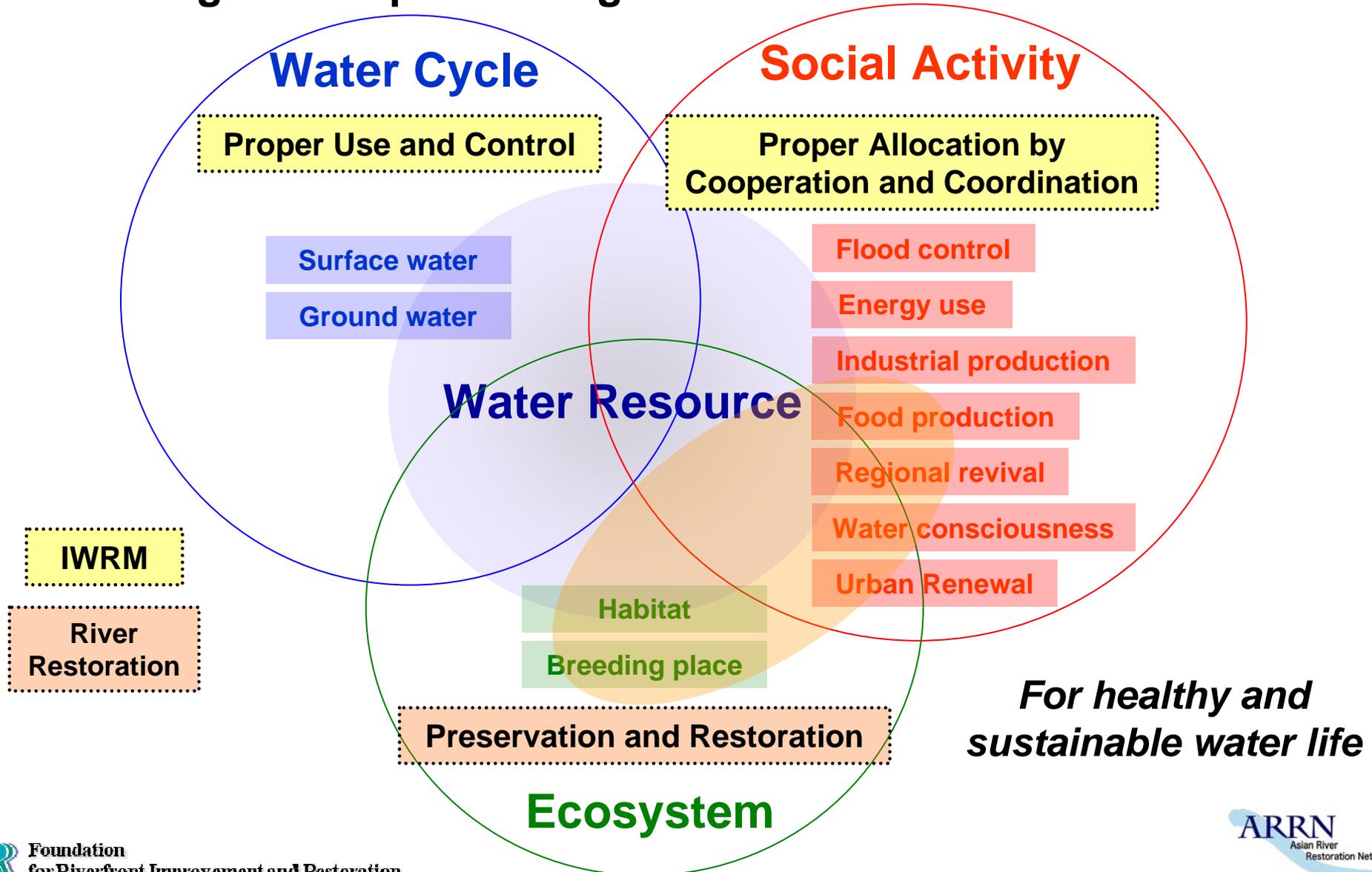
Landscape, Amenities

Nature, Ecosystem

Human and Community

# Connection between IWRM and River Restoration

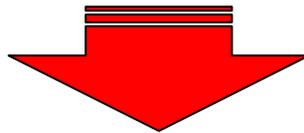
- Image of the positioning of River Restoration in IWRM



# Measures to promote River Restoration in Asia

## ■ Background surrounds River Restoration

- River restoration is a new technology compared with flood control and water utilization.
- Applicable technologies are required based on accumulated experiences and knowledge.
- Asia Monsoon region has specific characteristics.
  - Extensive variation of seasonal rainfall or discharge
  - Growth of rice cultivation on river plains
  - Various organisms in paddy fields
  - Rapid concentration of the population into urban areas

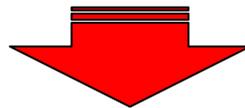


Discussion between countries/regions in similar geological and meteorological condition will provide more improved technology for rich river environment restoration.

# Measures to promote River Restoration in Asia

## ■ Summary of Discussion in the Session on WWF4

- River restoration is of vital importance to socio-economic sustainable development in parallel with flood and water use management.
- Basin is a basic unit for river environment management.
- Establishing suitable methodological technology for river restoration that suit for Asian monsoon region is necessary.
- In Asia monsoon region, human-influence to a cultural landscape is harmonized with the ecosystem traditionally.
- It is important to develop a database of projects and knowledge of international experts in river restoration, and this activity should be supported by engineers, scientists, ecologists, managers and public.
- It is urgent to establish a river restoration guideline suitable for the Asian monsoon region for countries with similar social and natural conditions.



**Asian River Restoration Network (ARRN)**

**Thank you for your kind attention.**