

# Integrated Water Resources Management in Asia

## IWRM Guidelines at River Basin Level

October, 2009

Tatsuo KUNIEDA

International Affairs Division

Water Resources Engineering Department

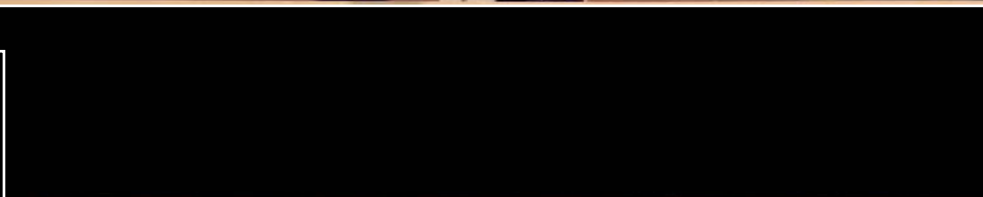
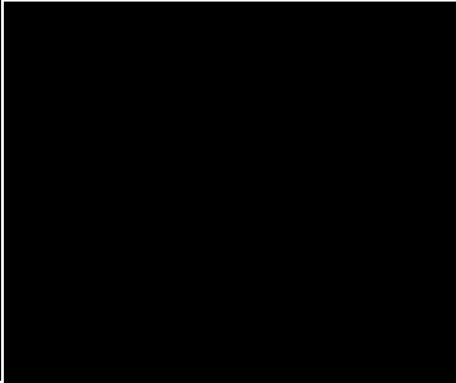
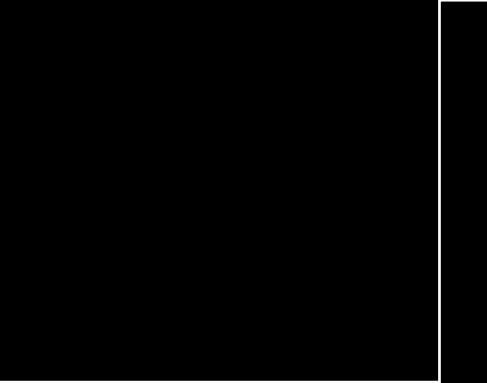
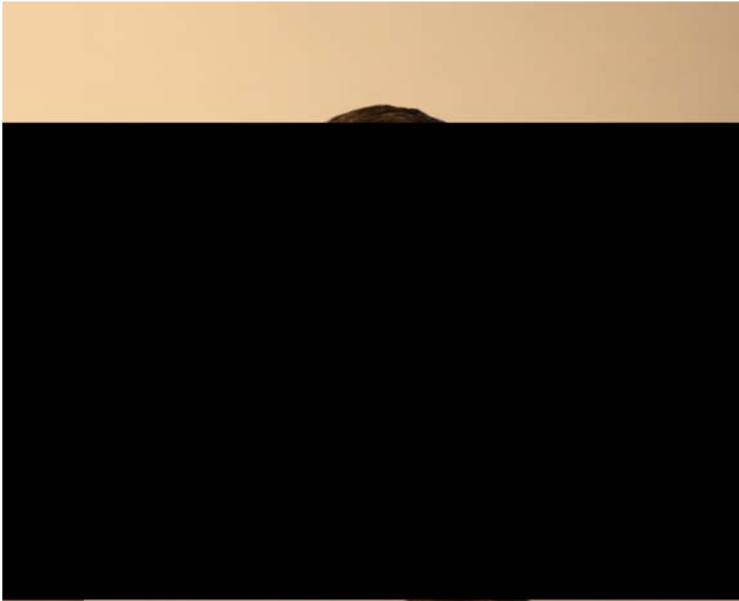


Incorporated Administrative Agency  
Japan Water Agency

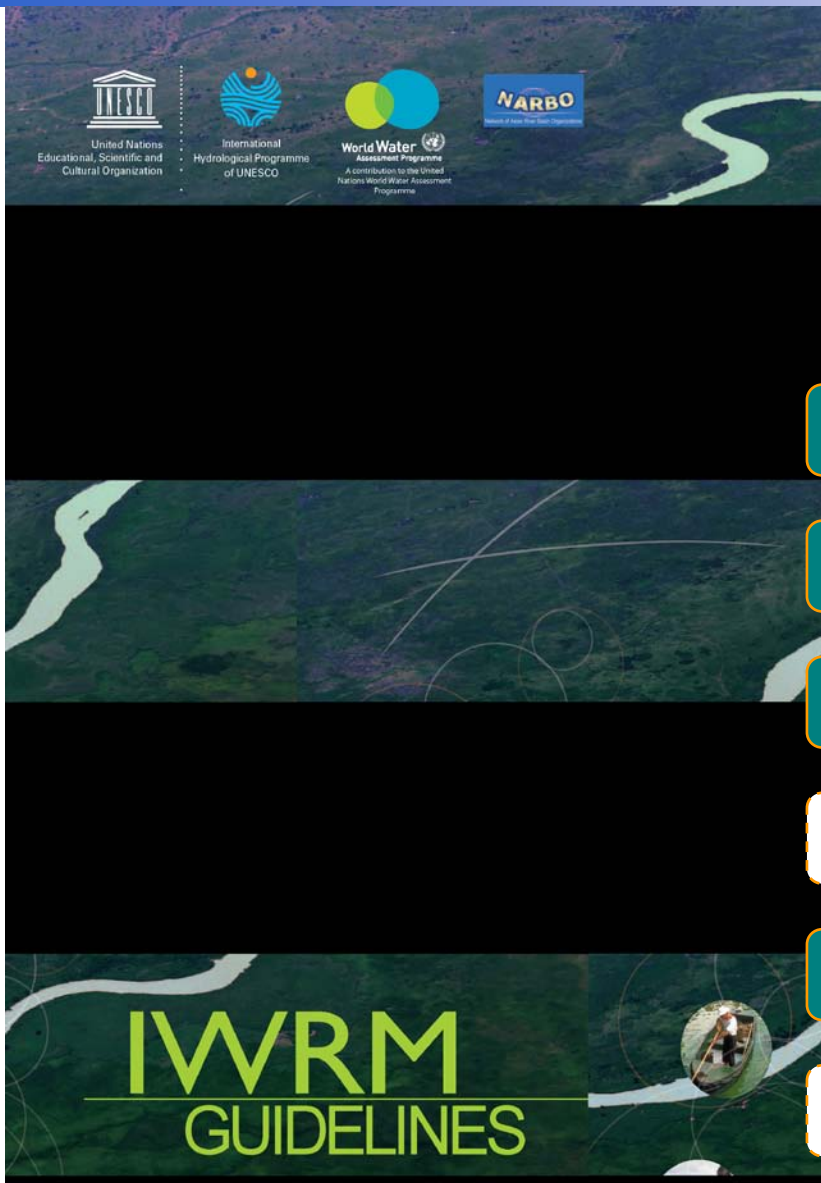
# IWRM Guidelines at River Basin Level

# IWRM Guidelines Launched

at the 5th World Water Forum in Istanbul



# Components of the Guidelines



Part 1 Principles

Part 2-1 The Guidelines for IWRM Coordination

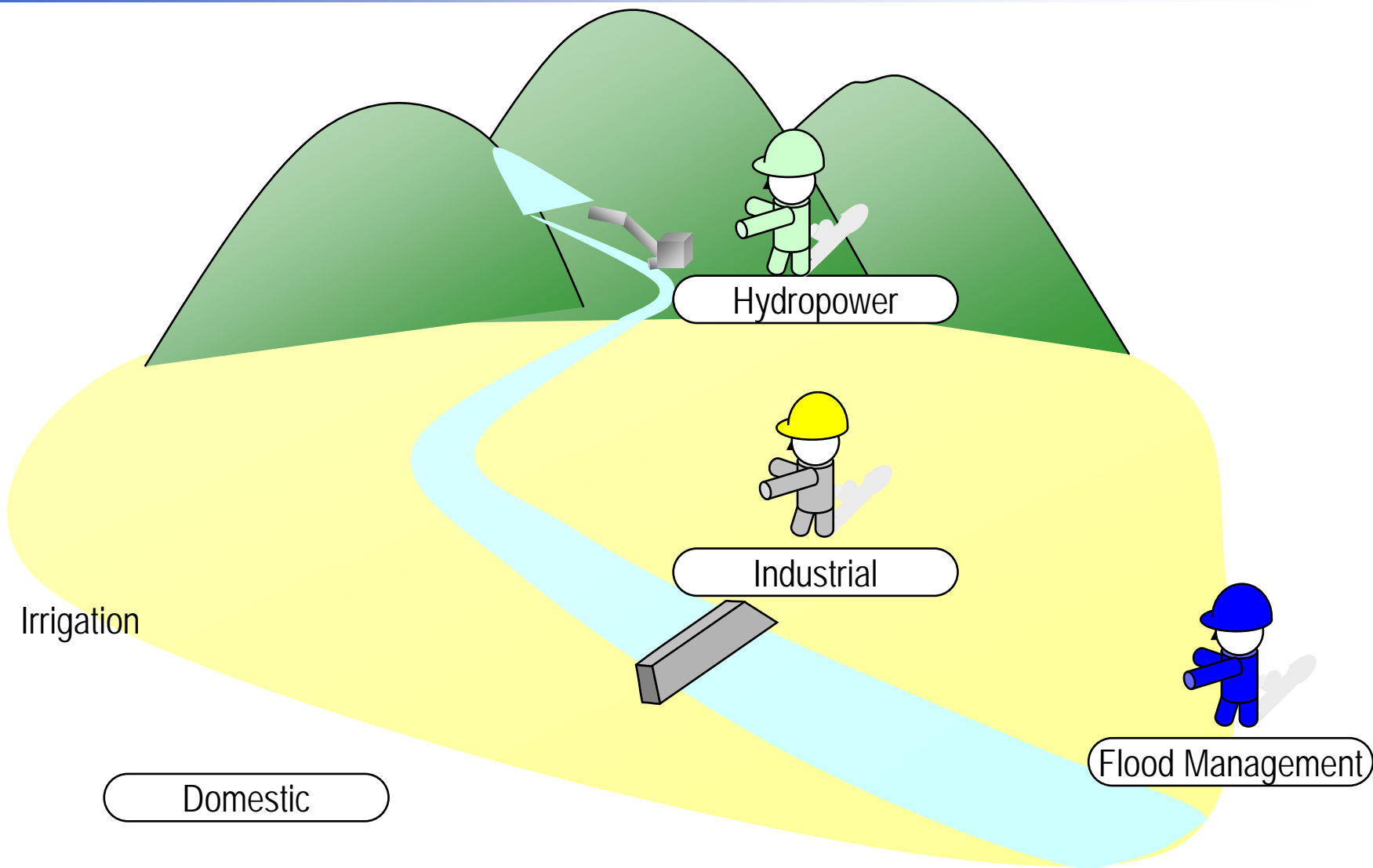
Part 2-2 The Guidelines for Flood Management

Part 2 Guidelines for Environment

Part 2-3 Invitation to IWRM for Irrigation Practitioners

Part 2 ...

# Sectors related to water in a river basin



# "IWRM Spiral" concept model

Progress of IWRM

Guidelines Part2-1 pp.51-52  
4.1 The 'IWRM Spiral' Conceptual Model

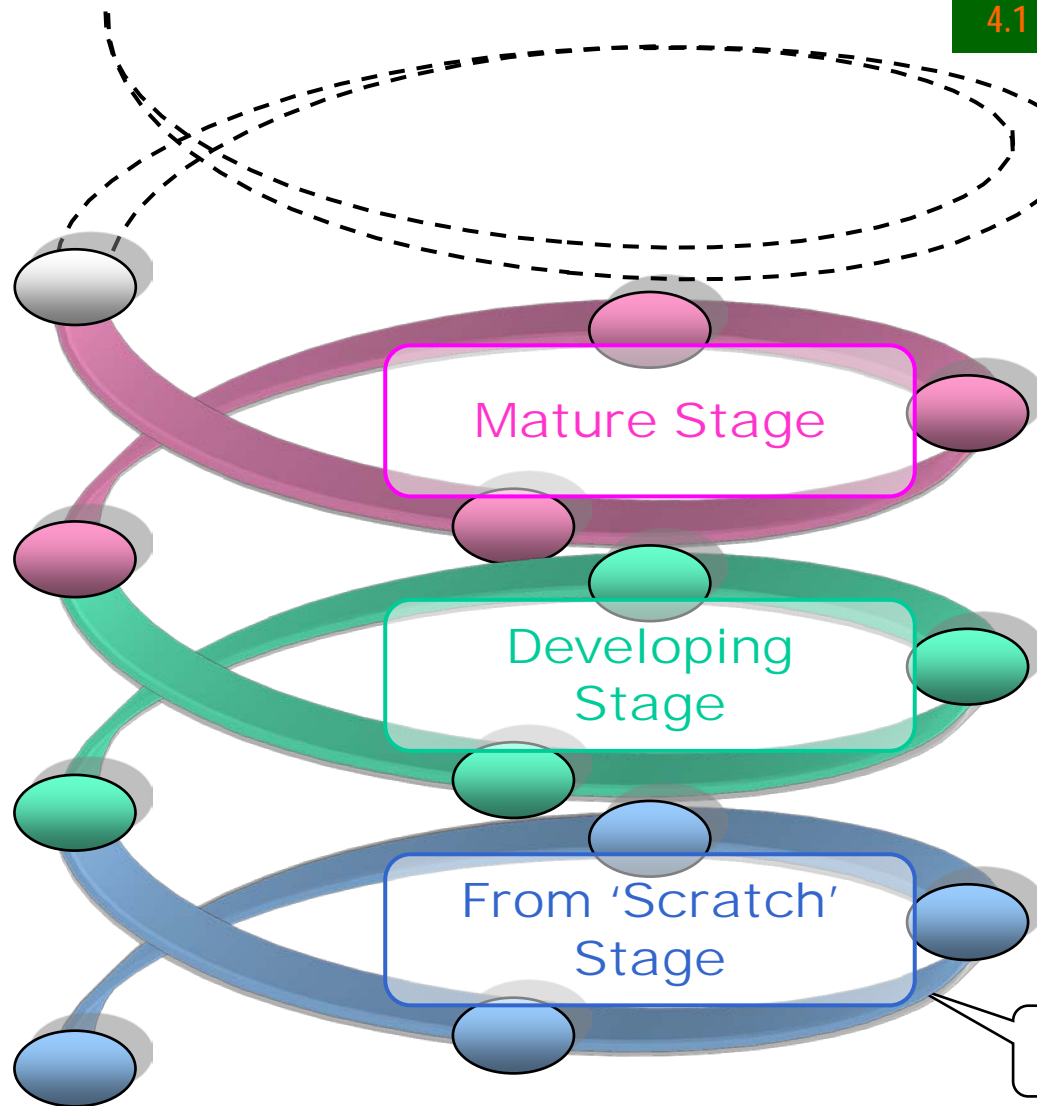
• Ideal Goals  
(Added Value)

• Environmental  
conservation

• Re-allocation of  
water  
• Renovation of  
facilities

• Water use  
• Flood control  
• Hydropower

IWRM Process

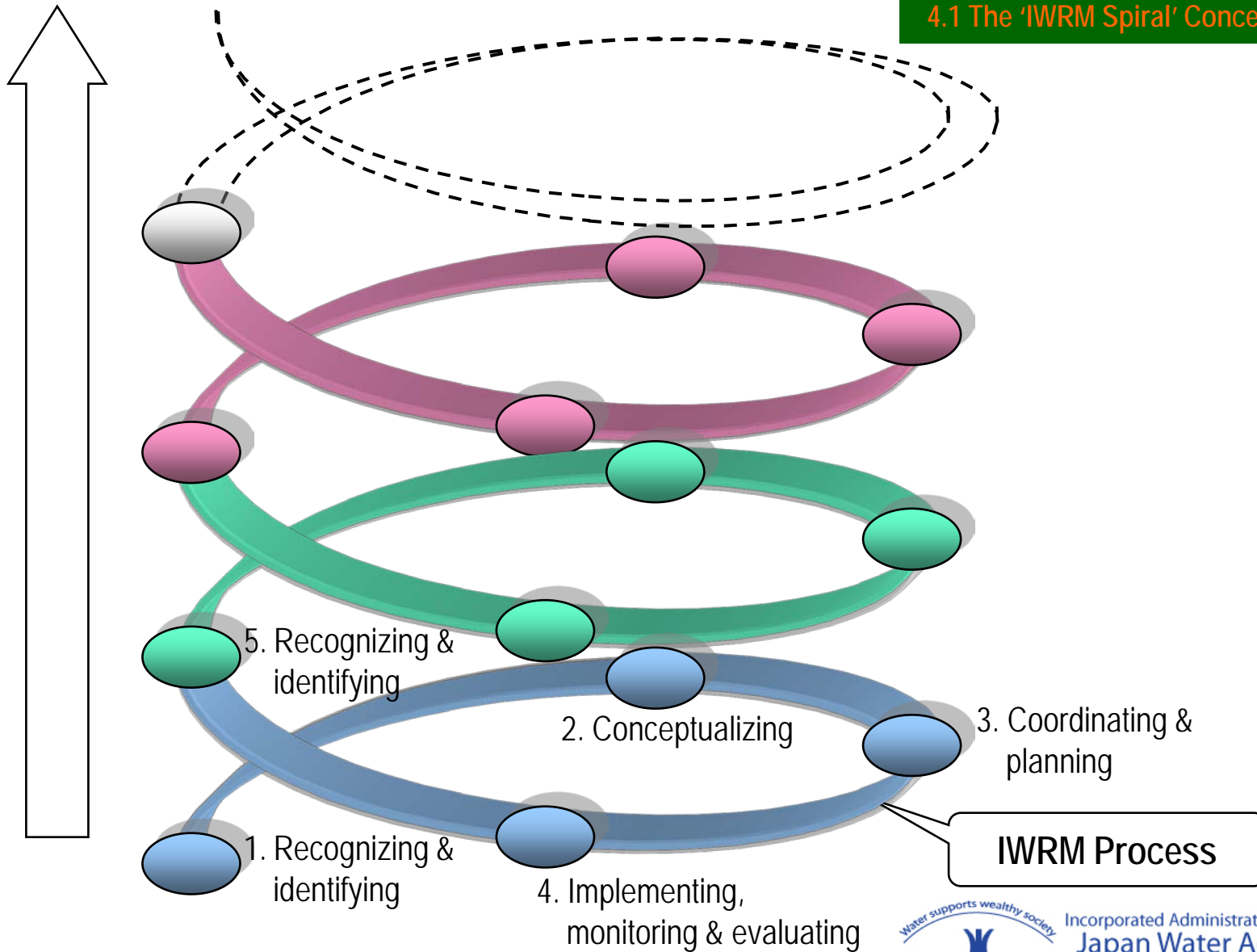




# "IWRM Spiral" concept model

Progress of IWRM

Guidelines Part2-1 pp.51-52  
4.1 The 'IWRM Spiral' Conceptual Model

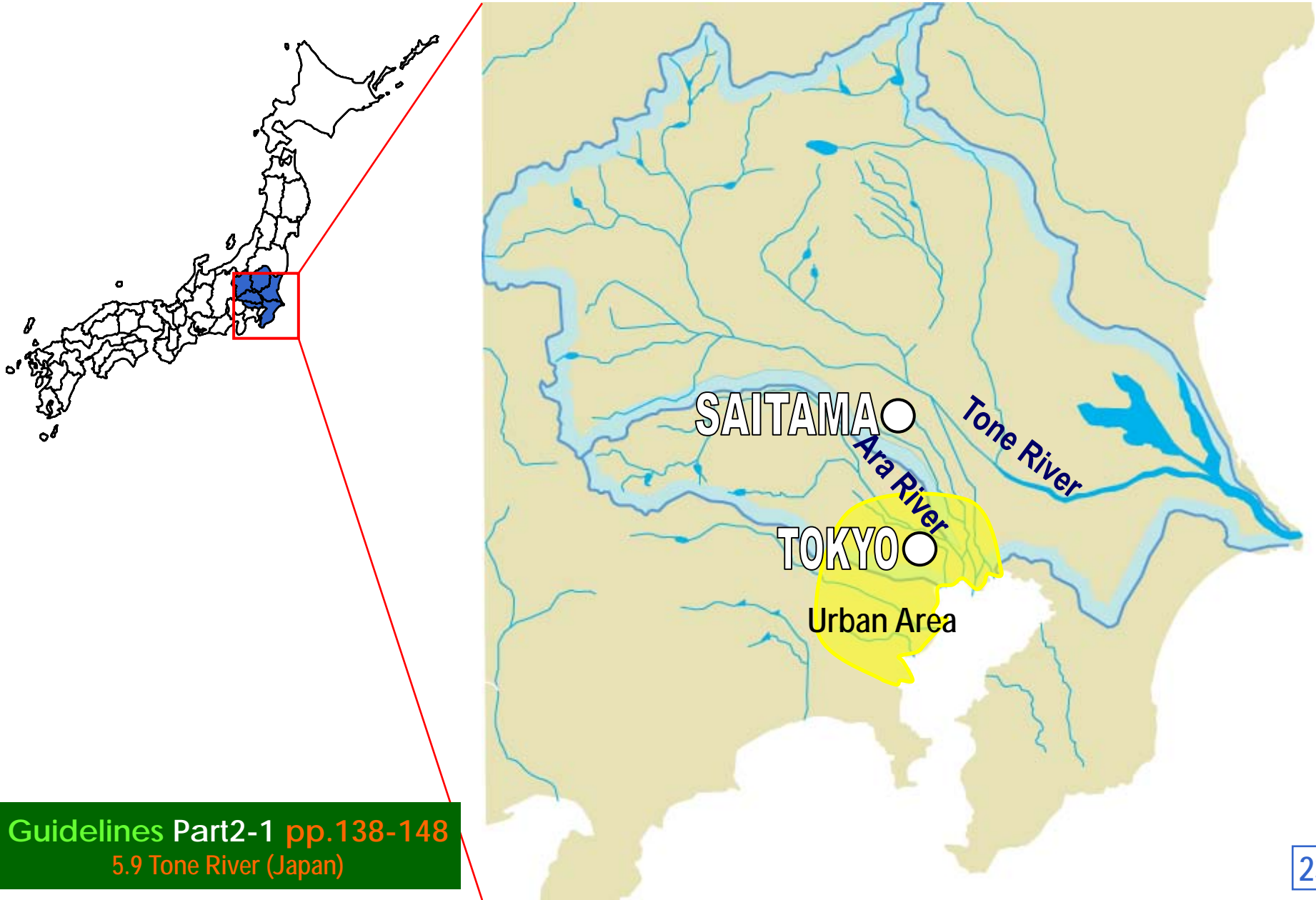


**IWRM Guidelines at River Basin Level**

**Good Example of IWRM implementation  
Case of Tone river, Japan**



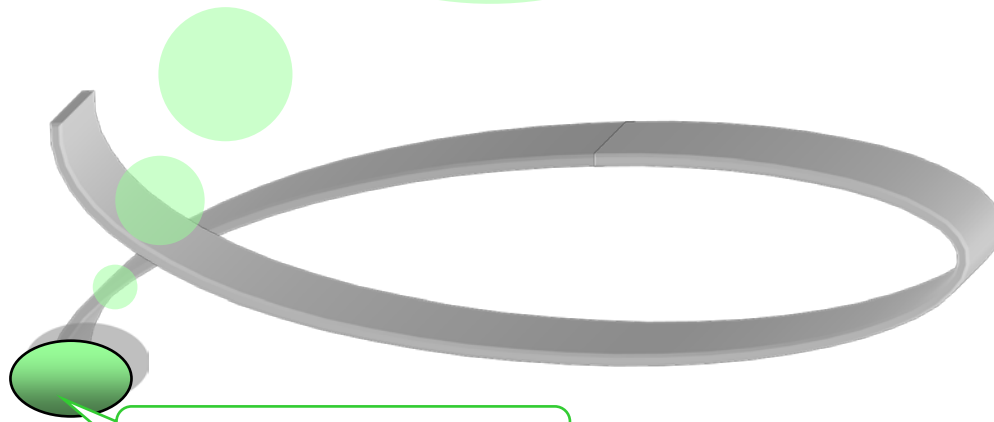
# IWRM in Japan — Tone and Ara River Systems



Guidelines Part2-1 pp.138-148  
5.9 Tone River (Japan)

# Identify problems

- Serious water shortage  
(domestic and industry)
- Pollution in Urban river
- Unreliable water intake facilities  
(irrigation)

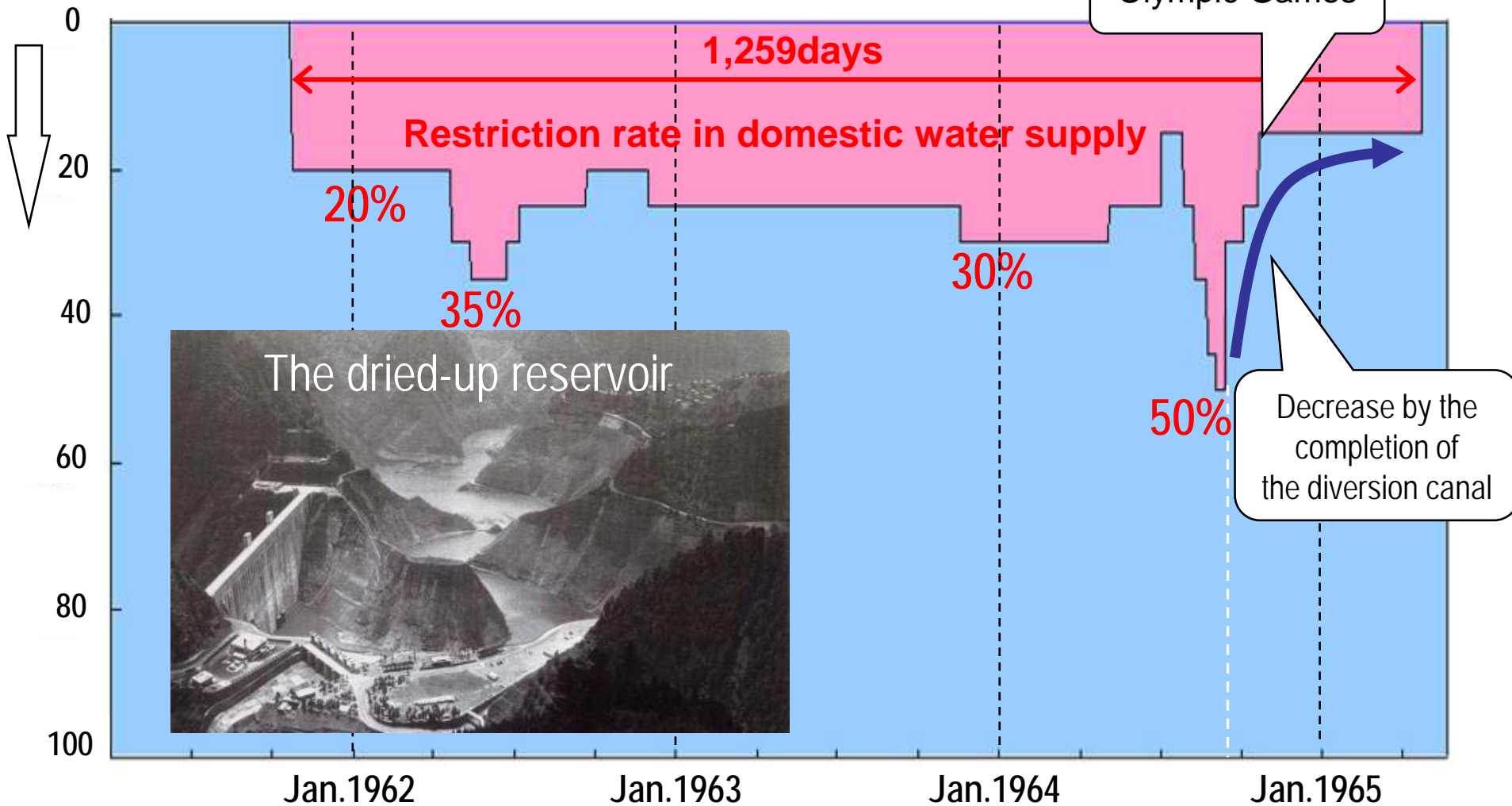


1960

Identify the problems

# Example of Problems - just before Olympic games

## Domestic Water Restriction Rate(%)



# Serious Water Shortage in Metropolitan Area

- supply through water tank truck





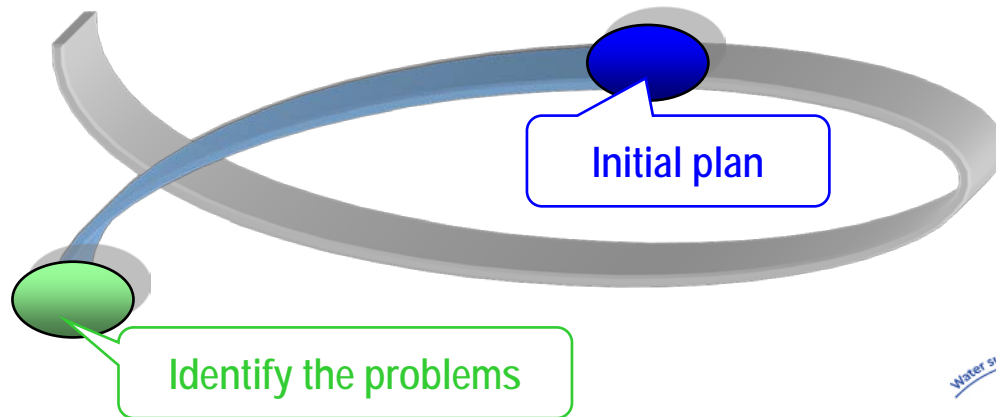
# Pollution in Urban river

- smelled badly and no fish



# Unreliable irrigation intake without barrage

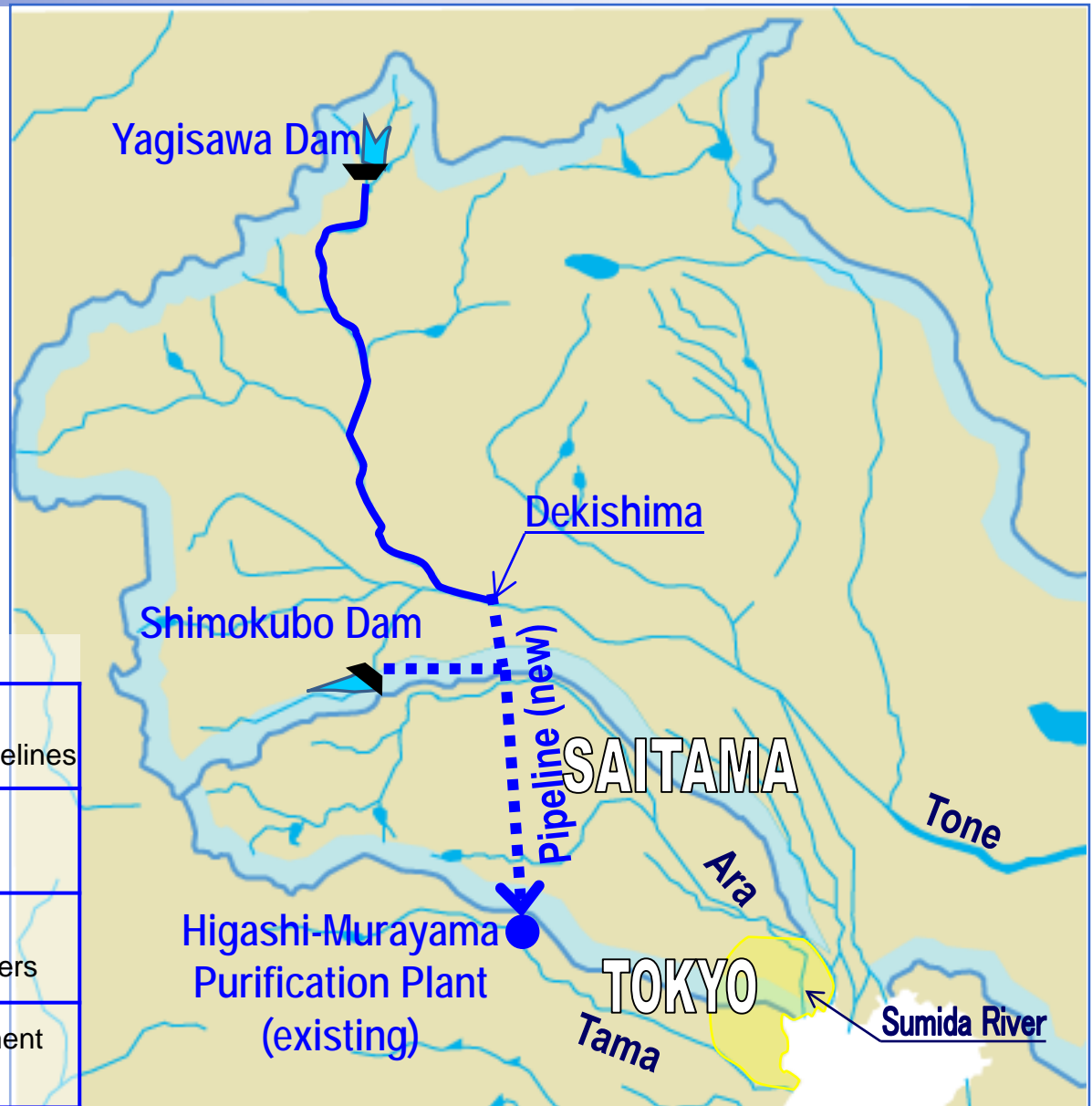
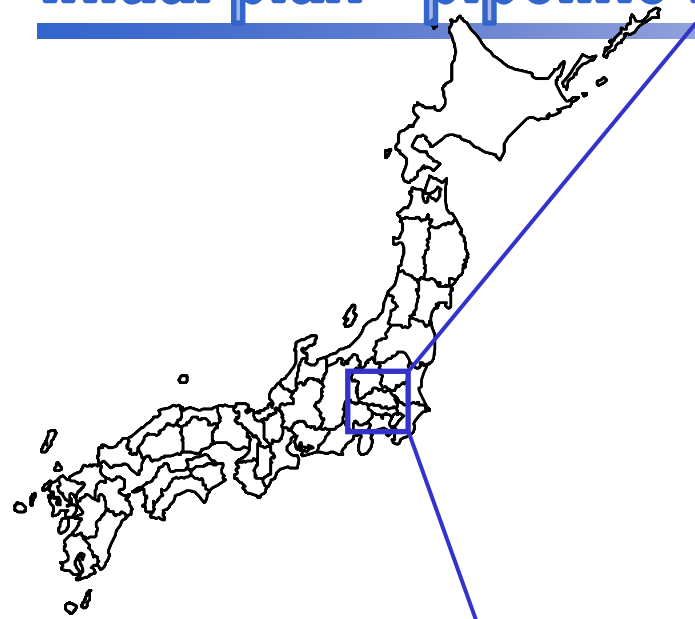
# Drafting an initial plan



1960



# Initial plan - pipeline from upstream to the purification plant



## The Set of solutions

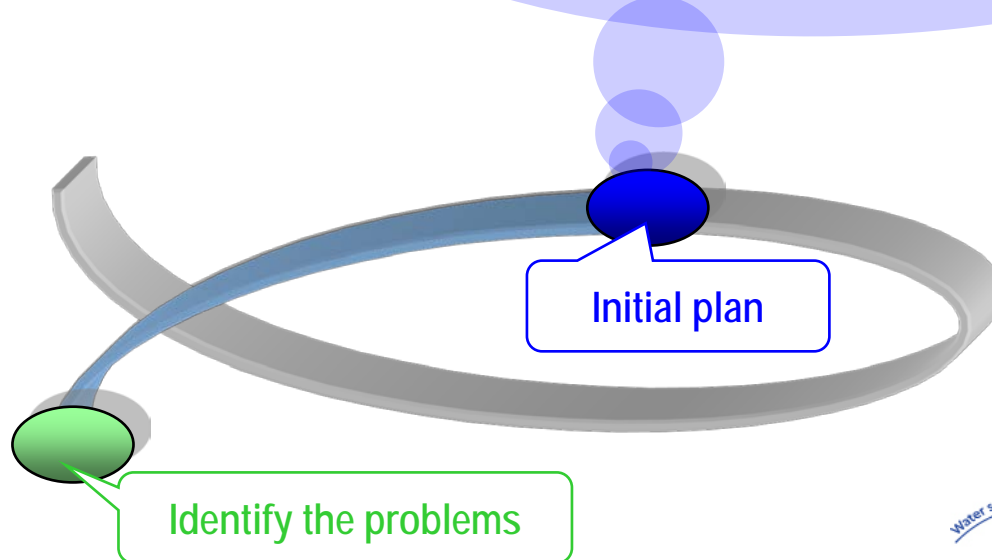
Technical	hard	Construction of Dams, barrages and pipelines
	soft	-
Financial	Cost Allocation between domestic and industrial water users	
Social	Laws (e.g. Water Res. Development Promotion Law)	

# Stakeholders' reaction to the initial plan

## Stakeholders

## Reaction

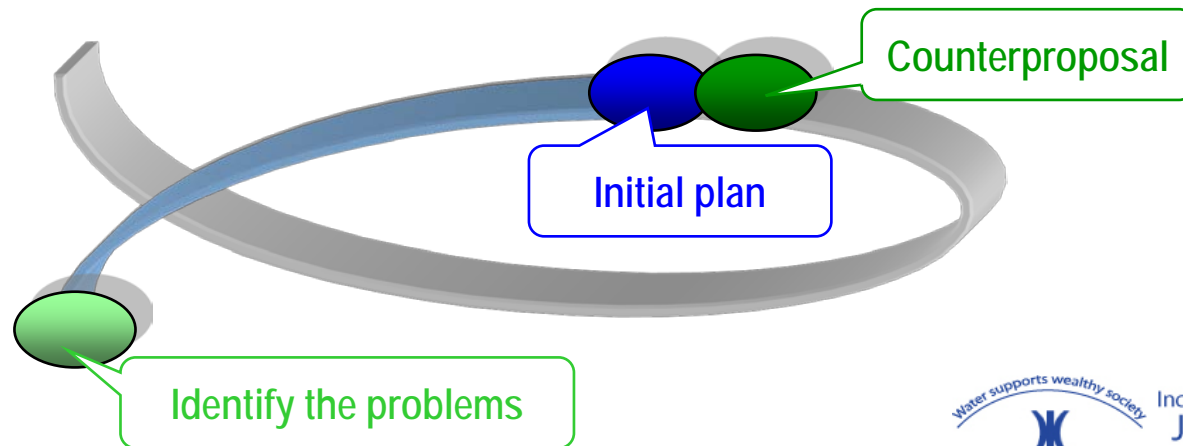
- Residents in Tokyo : **Happy**  
as cleaner water from upper stream will be delivered.
- Riparian residents (Urban river) : **Unhappy**  
because pollution in the urban river will not be improved.
- Riparian residents (Tone river) : **Moderately unhappy**  
because river water flow will be decreased.
- Farmers : **Unhappy**  
because decreased water flow for their intake.



1960

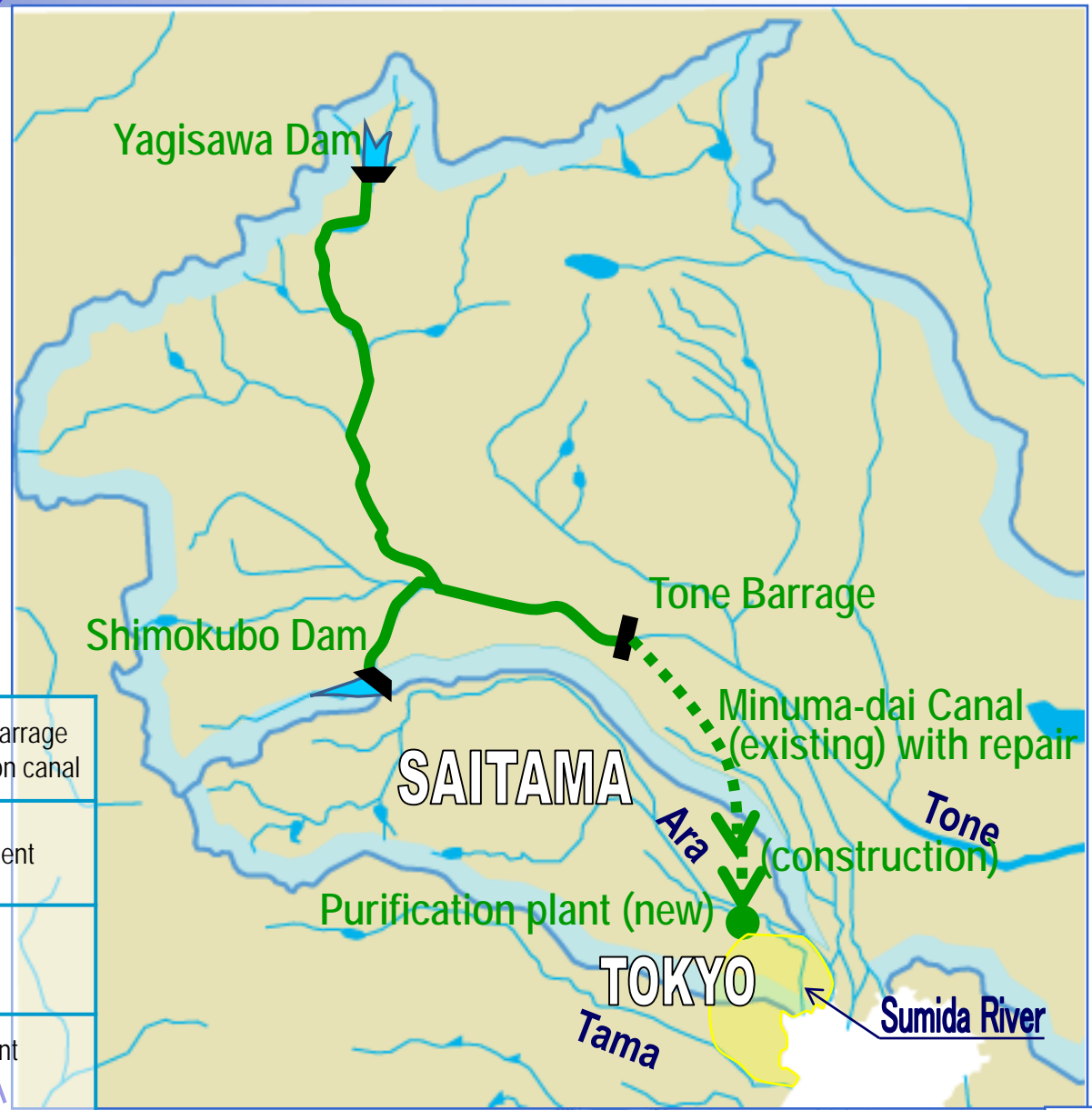
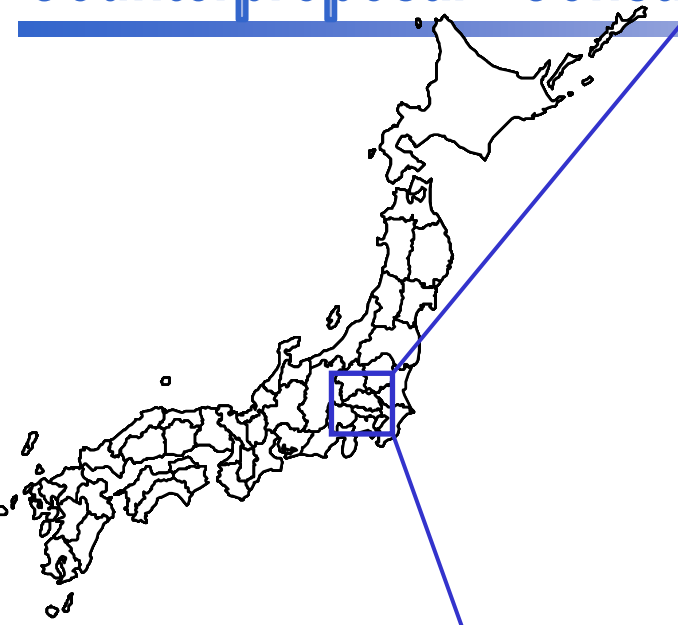
Identify the problems

# Counterproposal by Agricultural Sector



1960

# Counterproposal - Construction of weir and repairing irrigation channel



## The Set of solutions

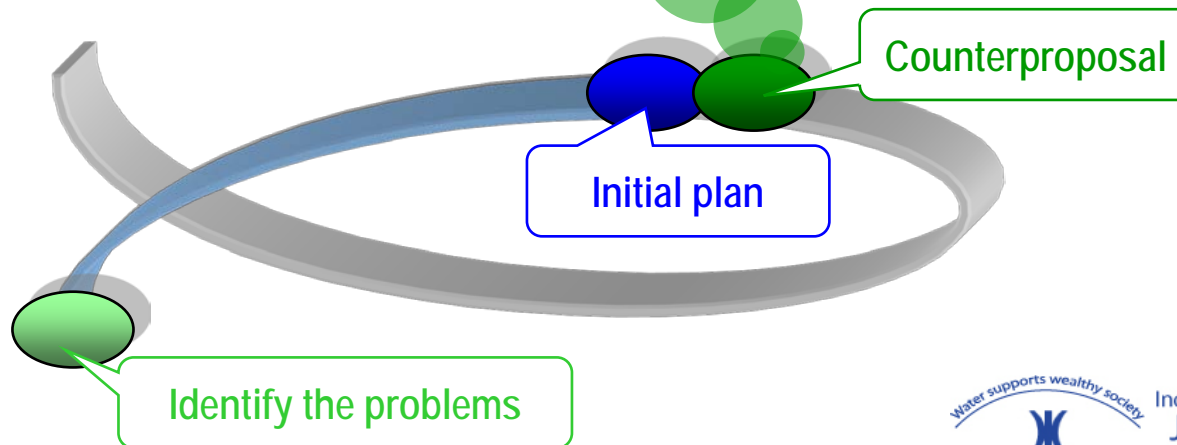
Technical	hard	Construction of dams, barrage Repair of existing irrigation canal
	soft	Integrated management
Financial	Cost Allocation among multi-purpose water users Due consideration to farmers	
Social	Laws (e.g. Water Res. Development Promotion Law)	

# Stakeholders' reaction to the counterproposal

## Stakeholders

## Reaction

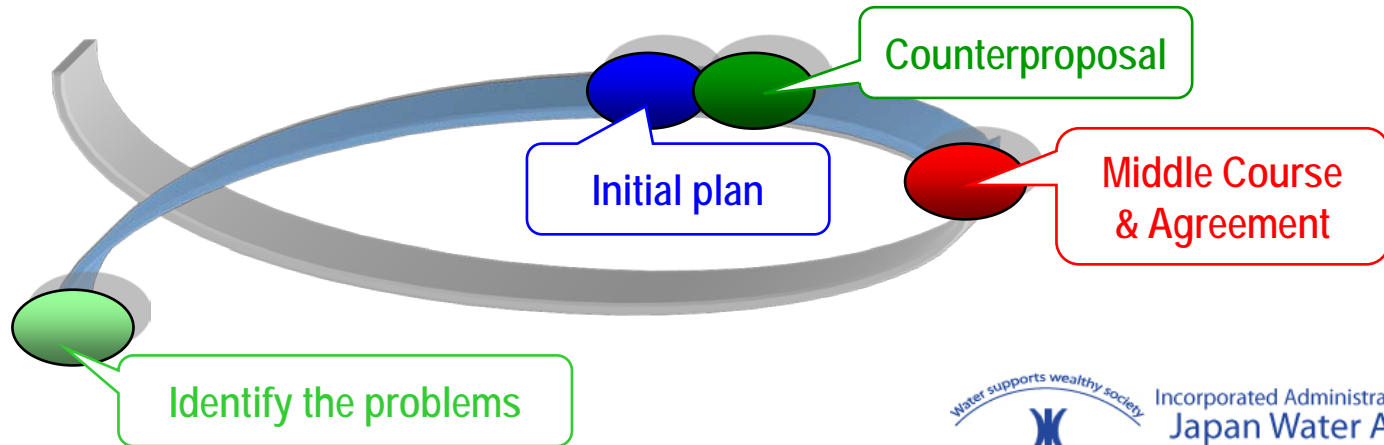
- Residents in Tokyo : **Unhappy**  
as delivery of water from upper stream will be delayed.
- Riparian residents (Urban river) : **Unhappy**  
because pollution in the urban river will not be improved.
- Riparian residents (Tone river) : **Happy**  
as the water flow is kept as before.
- Farmers : **Happy**  
as water flow for their use is kept intact  
and new barrage enables reliable water intake



# Middle Course proposed by Coordinator

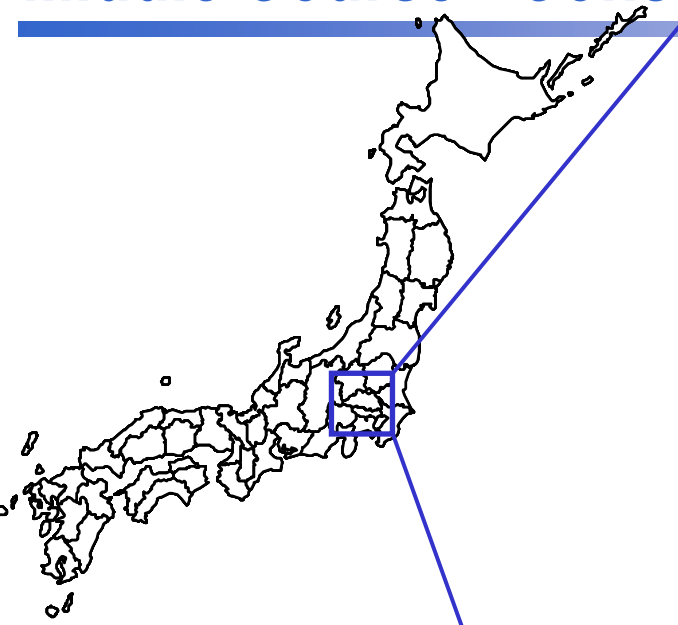
1963

1960





# Middle Course - Construction of weir and connecting channel



## The Set of solutions

Technical	hard	Construction of Dams, barrage and diversion
	soft	Integrated management Supply flow for environment
Financial	Cost Allocation among multi-purpose water users Due consideration to farmers	
Social	Laws (e.g. Water Res. Development Promotion Law)	



# Reach to the agreement

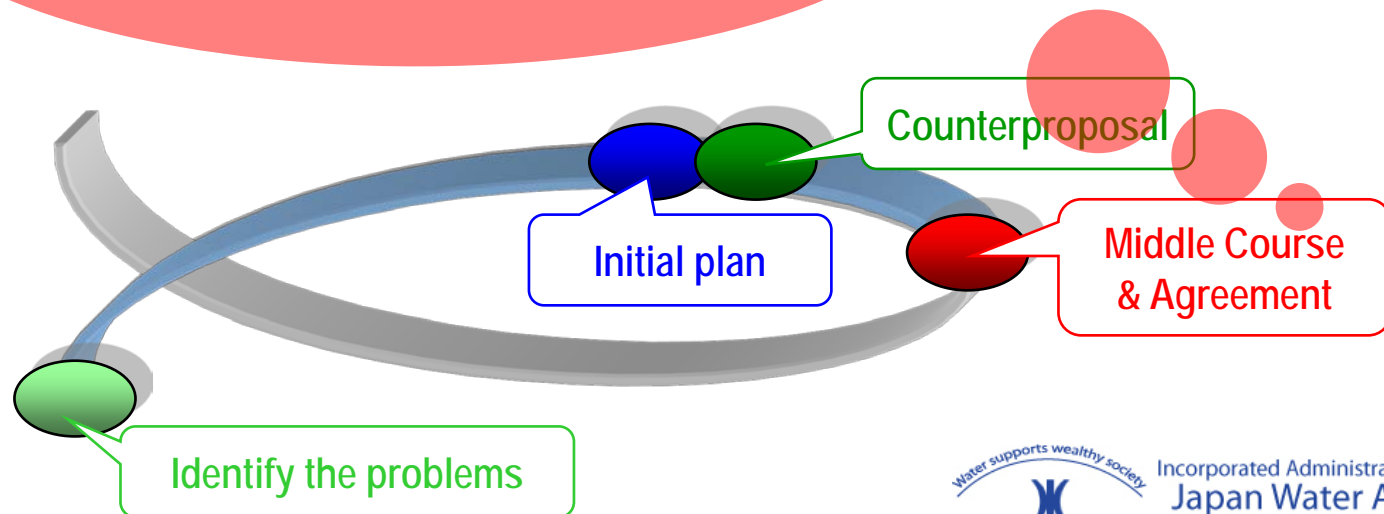
## Stakeholders

- Residents in Tokyo : Moderately happy  
still as the demand for water is met.
- Riparian residents : Happy  
(Urban river) as river environment is improved.
- Riparian residents : Happy  
(Tone river) as the water flow is kept as before.
- Farmers : Happy  
as water flow for their use is kept intact  
and new barrage enables reliable water intake.

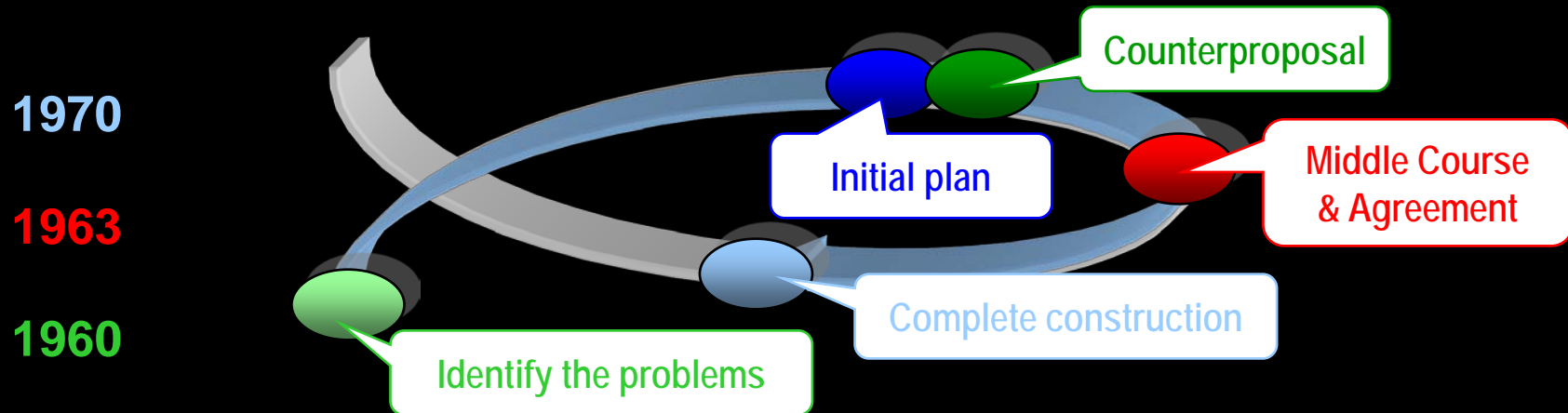
## Reaction

1963

1960



# Complete construction

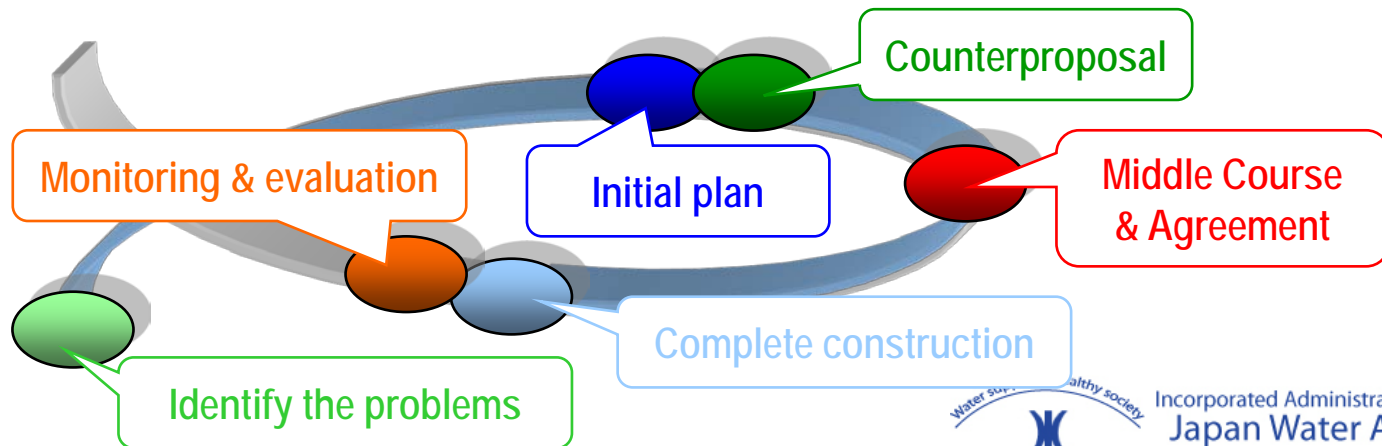


# Monitoring & evaluation

1970

1963

1960



# IWRM Pentagram of the plans

## Initial Plan



## Counterproposal



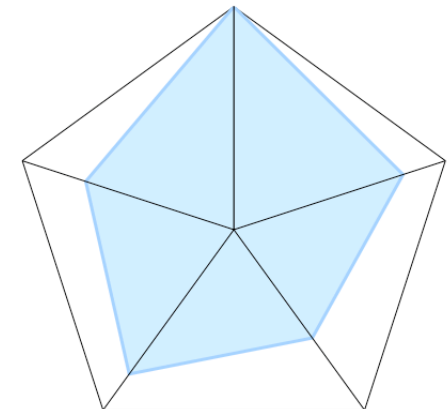
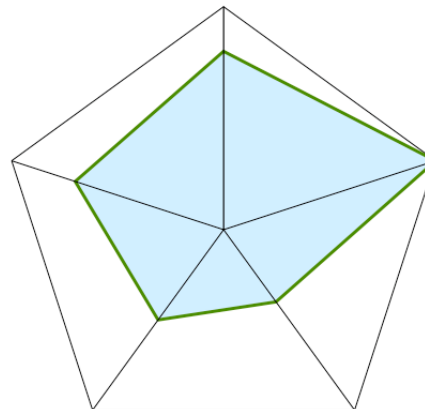
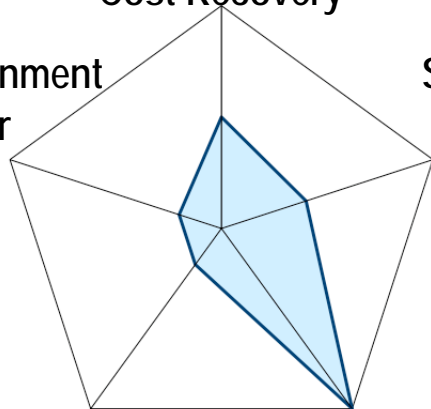
## Middle Course



### Cost Recovery

Environment  
& River  
Flow

Safety  
for  
Irrigation



Water Quality  
in Urban river

Safety  
for Domestic & Industry

# IWRM Spiral in Tone River, Japan

