Seminar on Keys for Success in the IWRM Process in River Basins

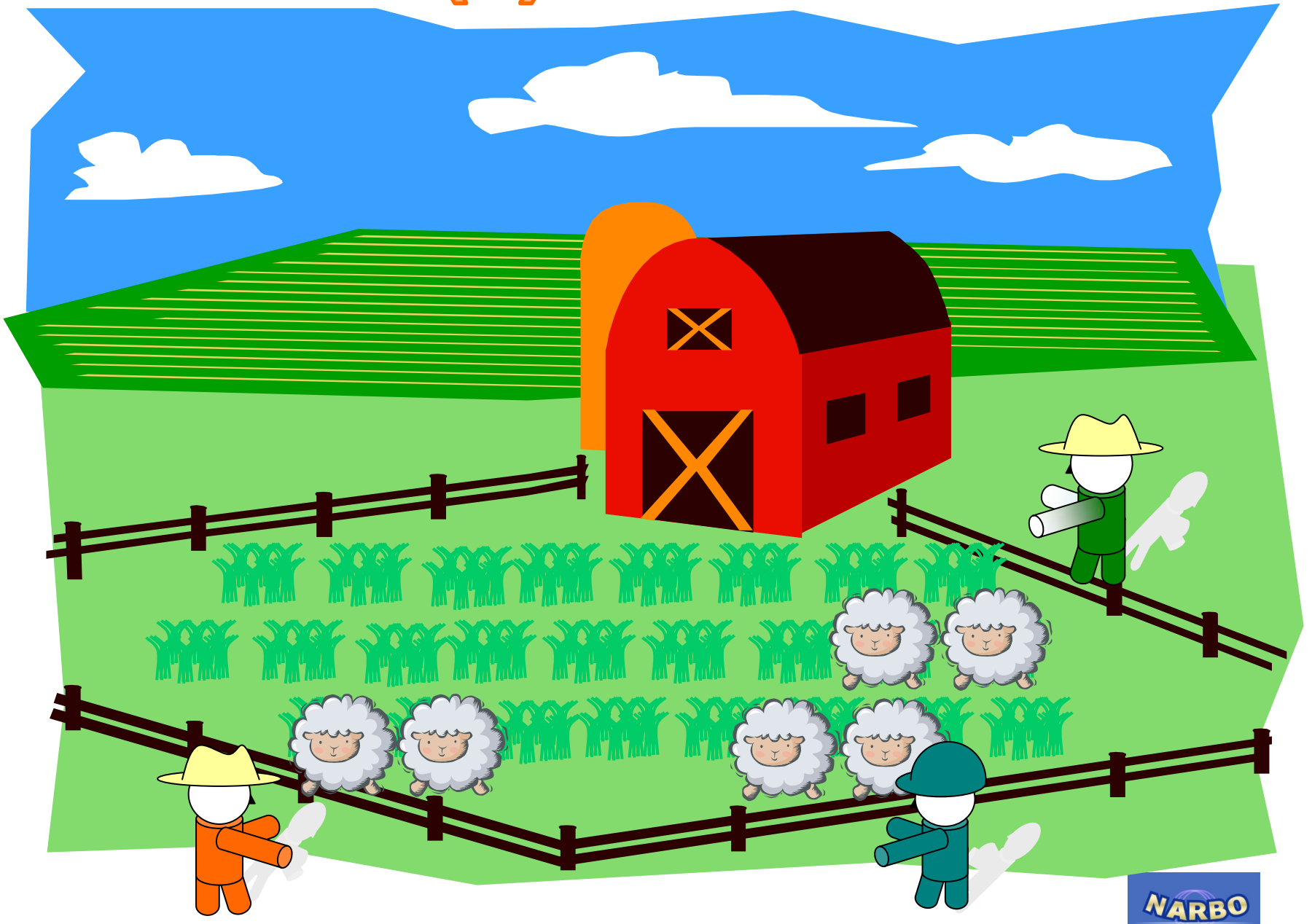
10 NOV 2010
4th NARBO General Meeting
Draft, 05 NOV 2010

IWRM Guidelines at River Basin Level

- Improving Water Security

Koichi Takano
Water Resources Management Specialist
Asian Development Bank

Introduction (1)



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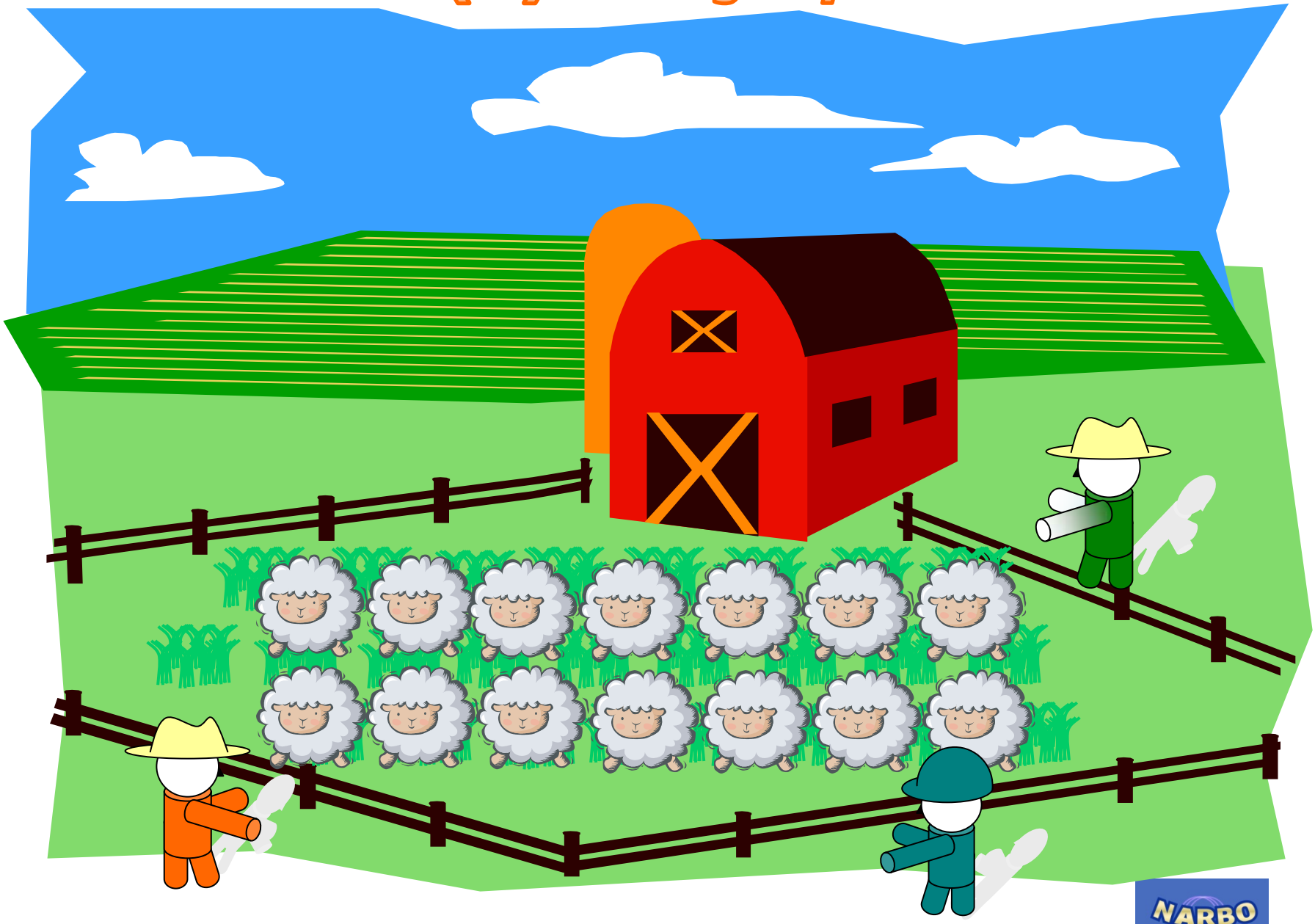
Introduction (1) - Tragedy of the Commons



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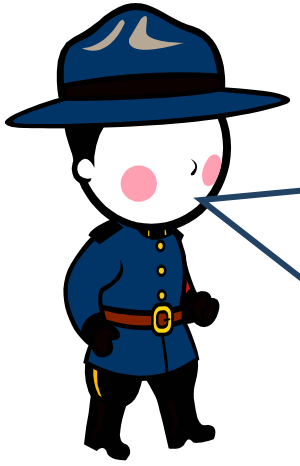
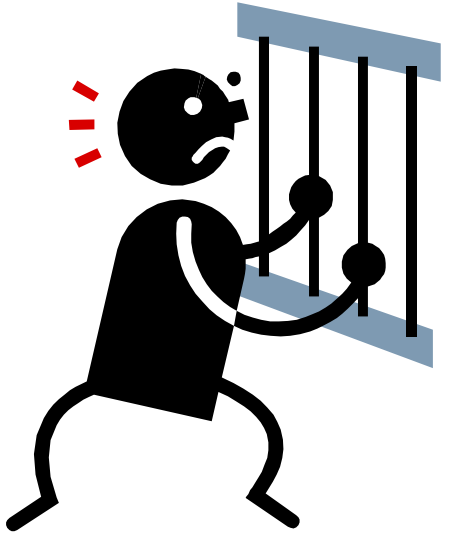
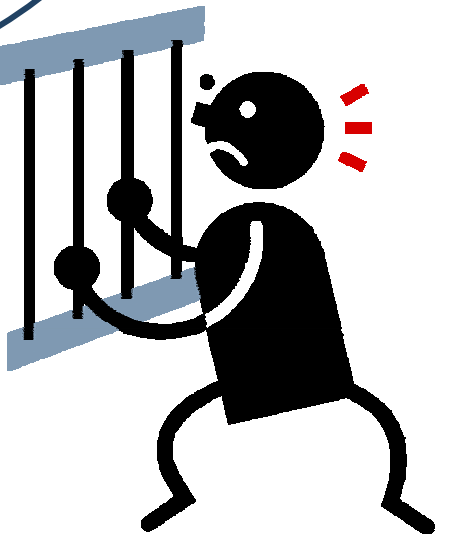
Introduction (2)



	Prisoner B Stays Silent	Prisoner B Betrays
Prisoner A Stays Silent	Each serves 6 months	Prisoner A: 10 years Prisoner B: goes free
Prisoner A Betrays	Prisoner A: goes free Prisoner B: 10 years	Each serves 5 years





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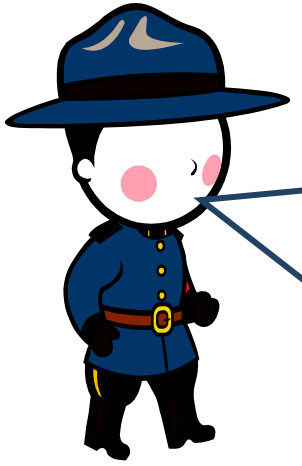
Introduction (2) - Prisoner's Dilemma



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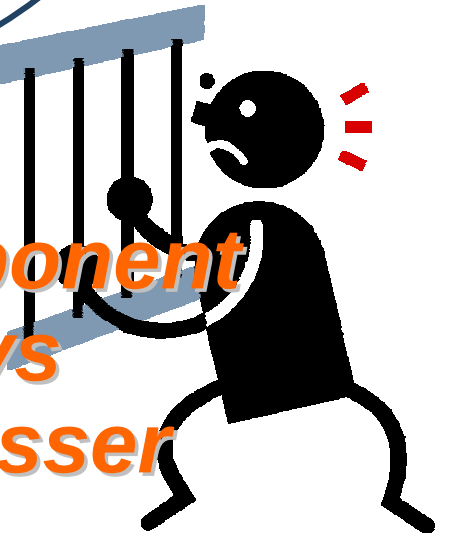

Regardless of what the opponent chooses, each player always receives a higher payoff (lesser sentence) by betraying

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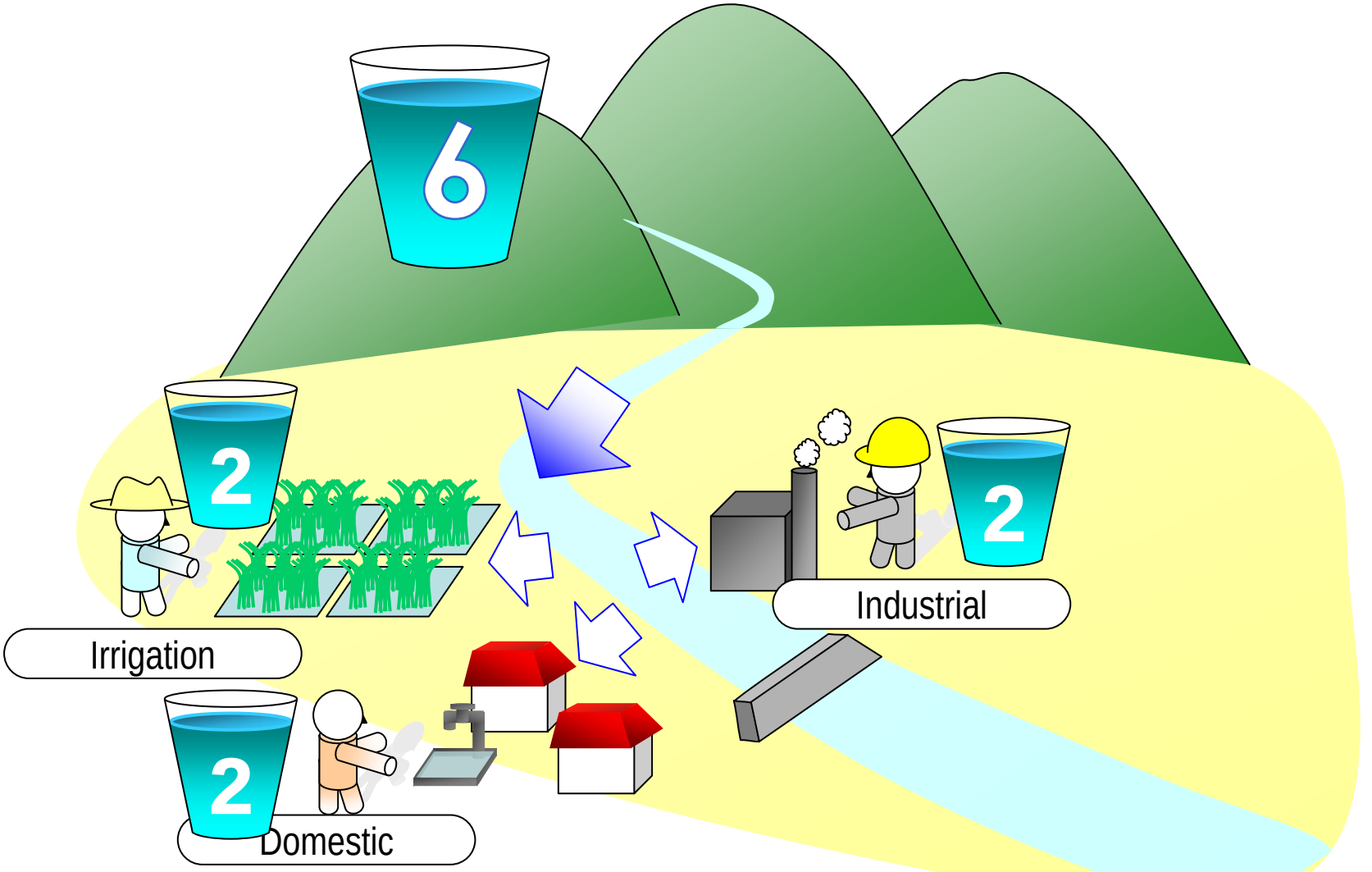
Introduction (3)



(i) DO NOTHING

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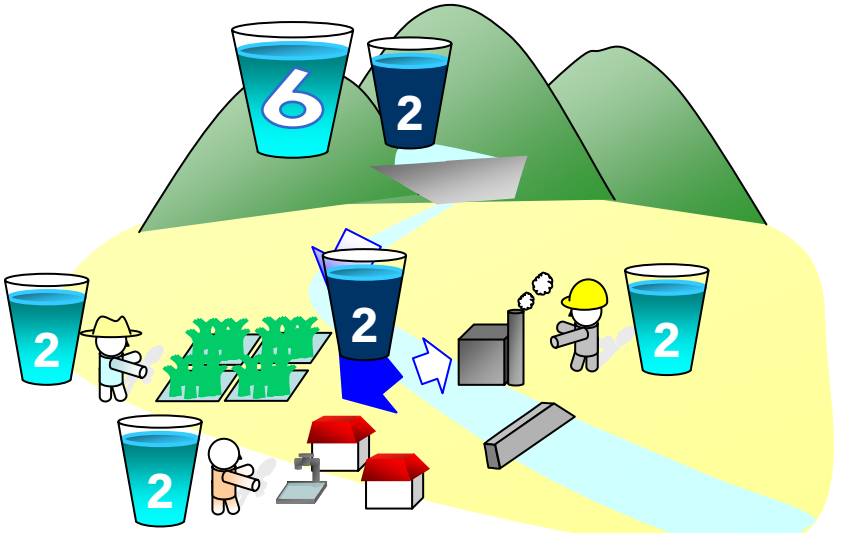
Introduction (3) - Water Allocation



(ii) DOMESTIC and IRRIGATION

(iv) DOMESTIC and INSUDTRY

(iii) IRRIGATION and INDUSTRY

(v) ALL STAKEHOLDERS

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Introduction (3) - Water Allocation

	DOMESTIC	INDUSTRY	IRRIGATION	TOTAL
(i) DO NOTHING	*2*	*2*	*2*	*6*
(ii) DOMESTIC and IRRIGATION	*4*	*2*	*4*	*10*
(iii) IRRIGATION and INDUSTRY	*2*	*4*	*4*	*10*
(iv) DOMESTIC and INDUSTRY	*7*	*7*	*2*	*16*
(v) ALL STAKEHOLDERS	*6?*	*6?*	*6?*	*18*

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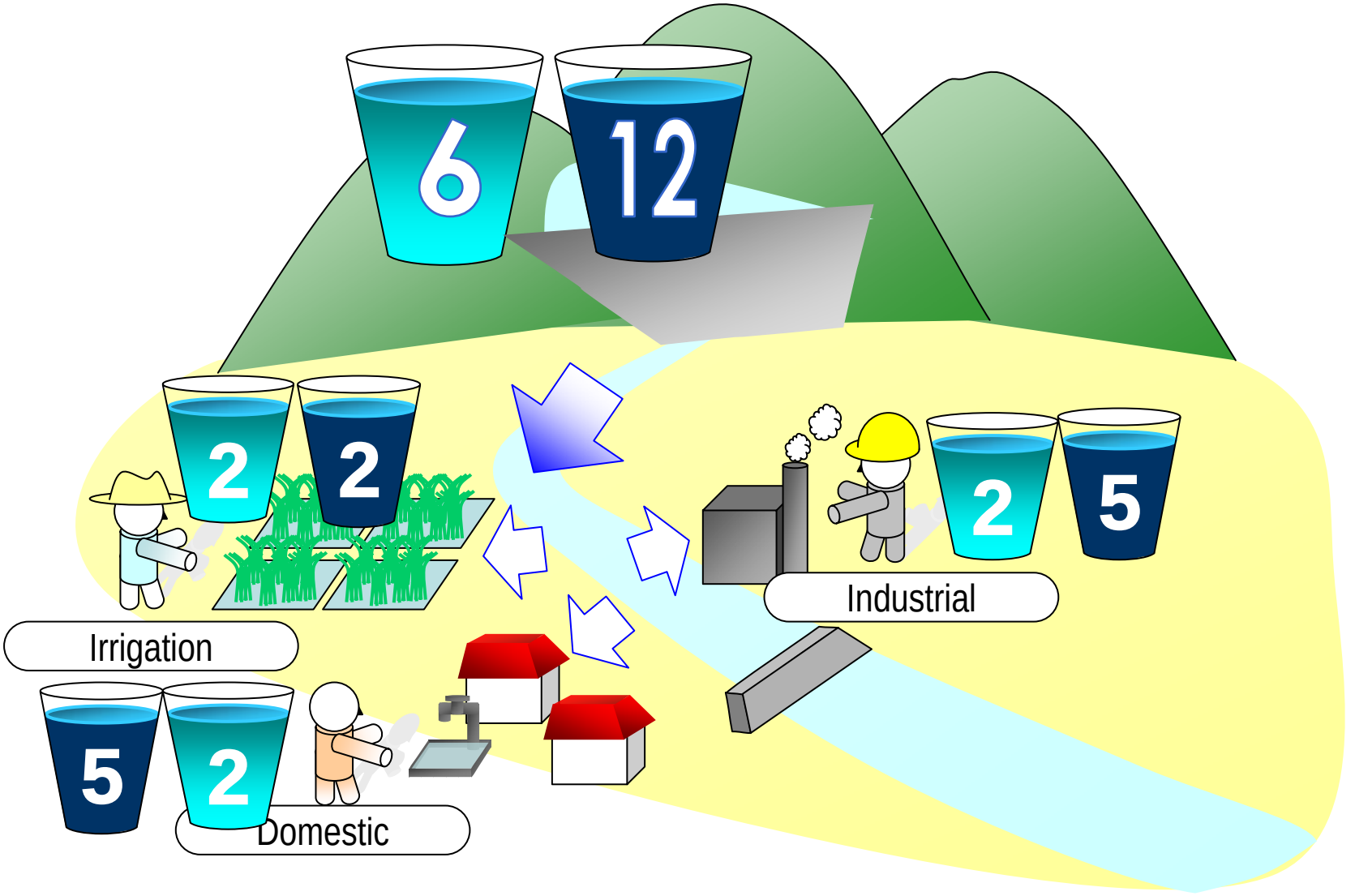
Introduction (3) - Water Allocation



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Lessons from Three Stories

1. **Environmental Sustainability**
   - Tragedy of the Commons

2. **Social Cooperation**
   - Prisoners' Dilemma

3. **Economy: Win-Win Solution**
   - Water Allocation

- Triple Bottom Line

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Outline

- How to operationalize triple bottom line concept?
- What's IWRM Process?
- How do we move up along IWRM spiral?
- How can we learn from Jeneberang river basin?

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How to operationalize the triple bottom line concept?

Water Security

Guiding Vision

"Societies can enjoy water security when they successfully manage their water resources and services to:

1. Satisfy **household** water and sanitation needs in all communities
2. Support productive **economies** in agriculture and industry
3. Develop vibrant, livable **cities** and towns
4. Restore healthy **rivers and ecosystems**
5. Build **resilient communities** that can adapt to change.

Improving water governance cuts across these 5 key dimensions. "

Adopted by AWDO 2010 Team in January 2010 and disseminated through news release in February 2010

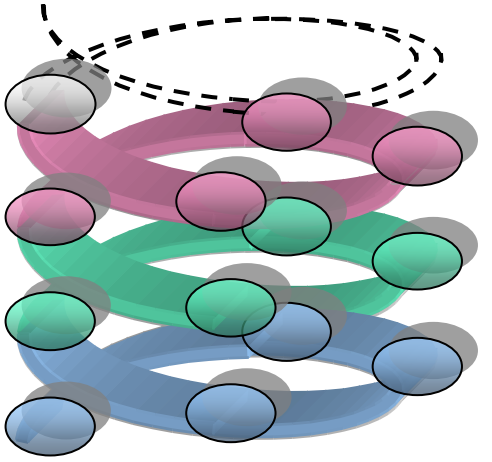
For reflection

Models of IWRM

IWRM Process Approach:

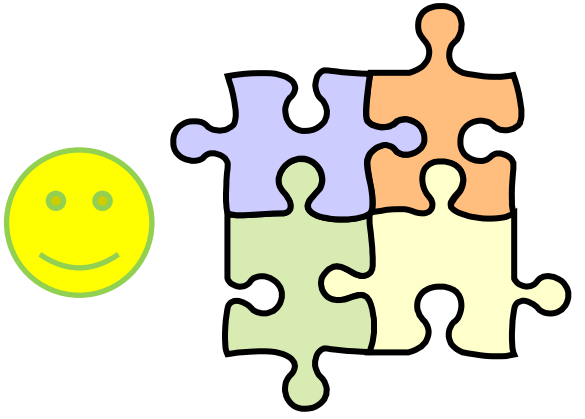
Increase a **triple bottom line**

- **Economic benefits $**
- **Social benefits $**
- **Environmental benefits $**



Optimize **stakeholder satisfaction**

- **Adopt inclusive approach**
- **Find win-win solutions**
- **Generate buy-in for IWRM**

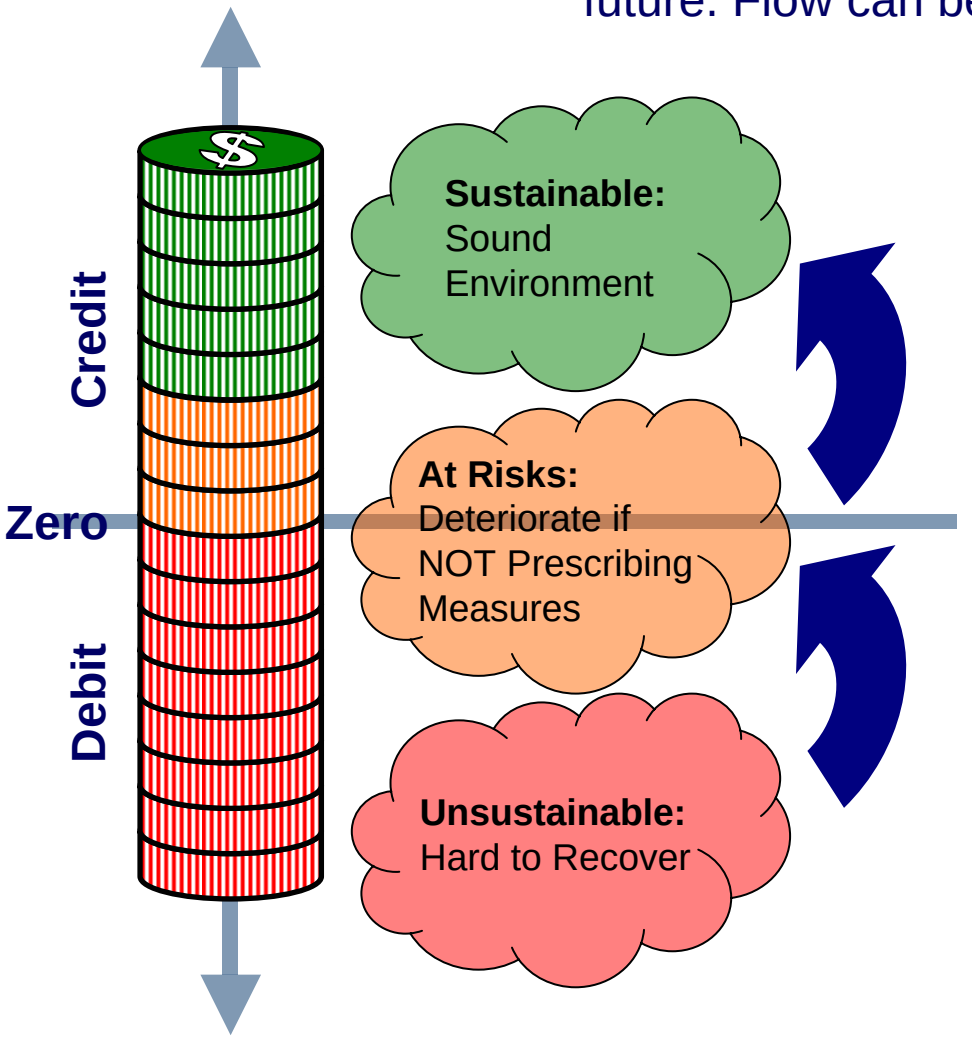


Source: Lincklaen Arriens 2009

Visualization of Triple Bottom Line

Natural (Environmental) Capital

Natural Capital is stock of natural ecosystems that yields a flow of valuable ecosystem goods or services into the future. Flow can be indefinitely sustainable. (Wikipedia)



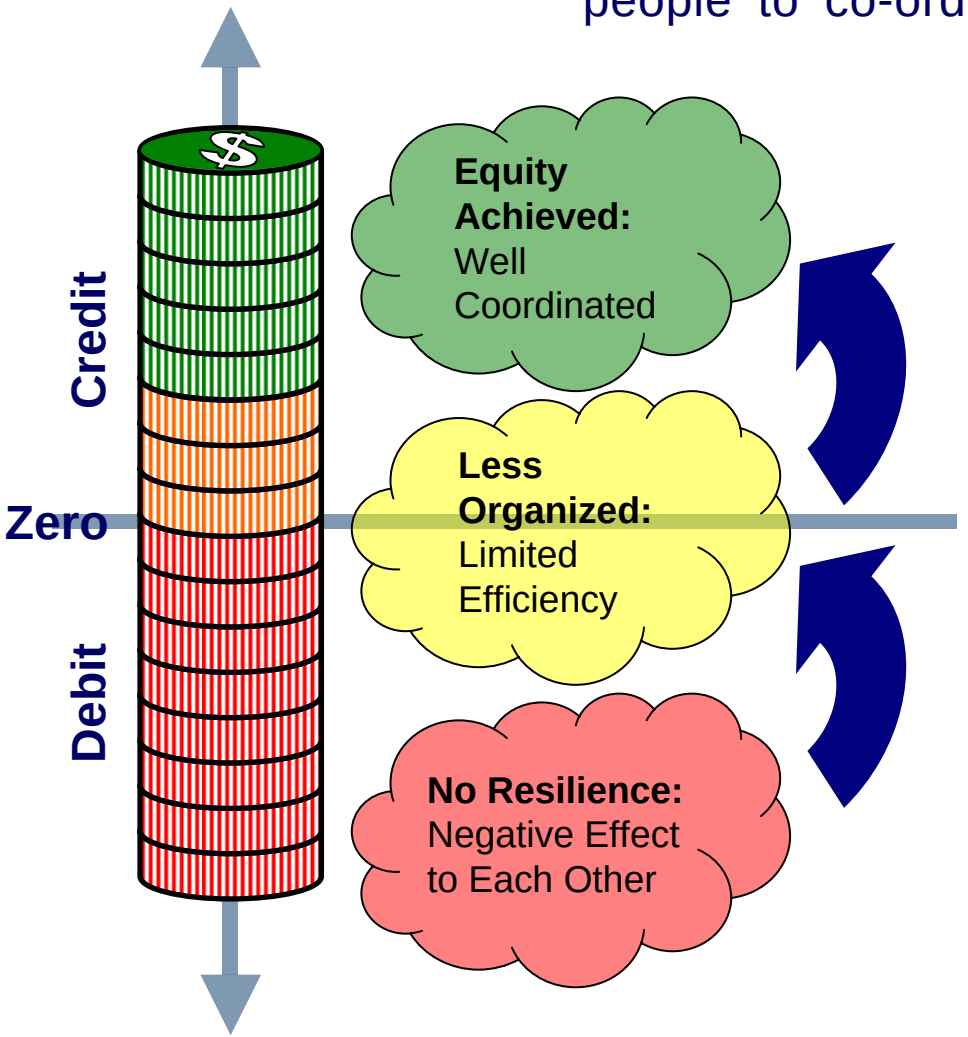
Environment and Ecosystem Service

- Watershed
- Water Quality
- Wetland
- Habitats
- Environmental Flow

Visualization of Triple Bottom Line

Social Capital

Social capital is defined as the norms and social relations embedded in the social structures of societies that enable people to co-ordinate action to achieve desired goals.
(The World Bank)



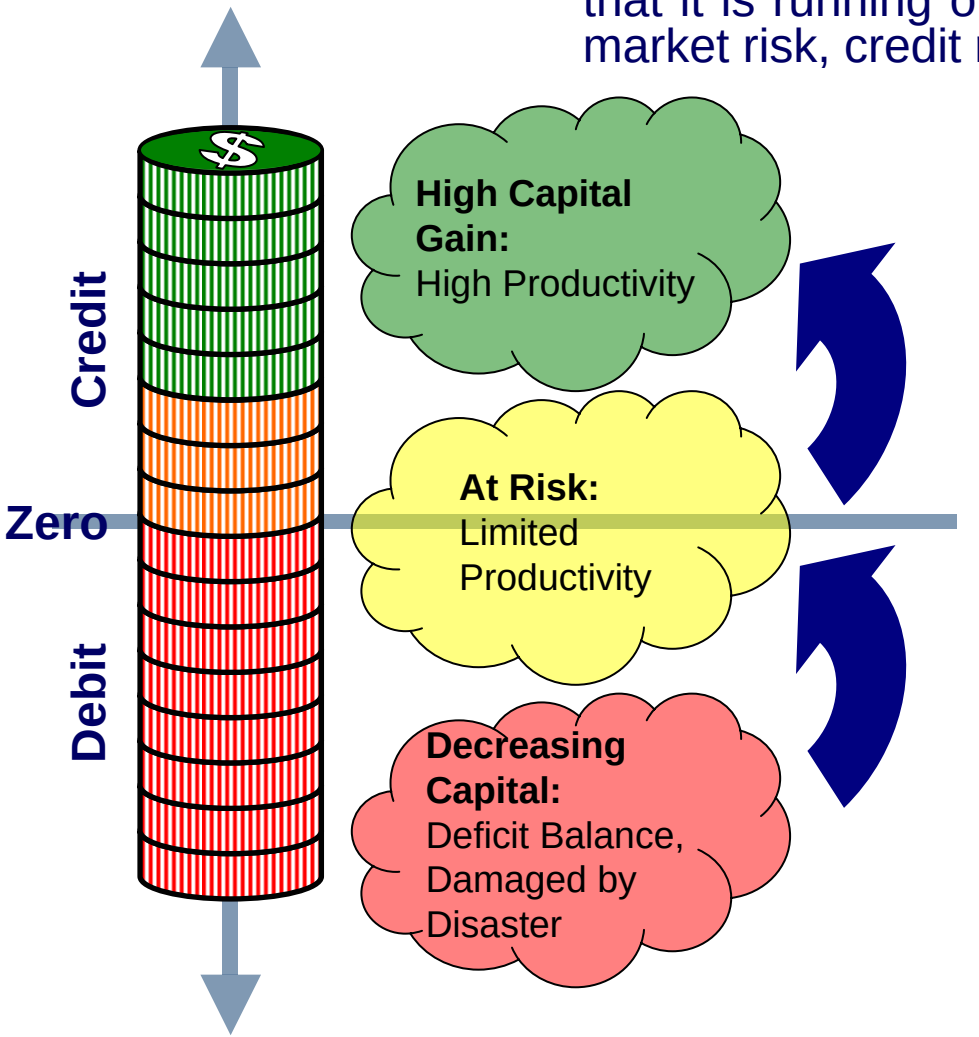
Items for Social Capital

- Water and Sanitation for Basic Human Needs
- Equity
- Resilience
- Institutions
- Organizations:
  Government, RBO, Civil Society, Private Sector

Visualization of Triple Bottom Line

Economic Capital

Economic capital is the amount of risk capital, assessed on a realistic basis, which a firm requires to cover the risks that it is running or collecting as a going concern, such as market risk, credit risk, and operational risk. (Wikipedia)



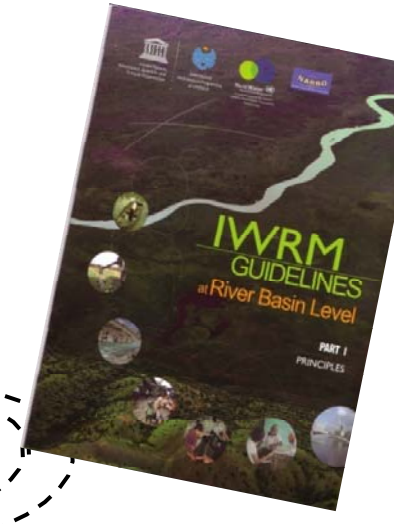
Economic Capital in IWRM

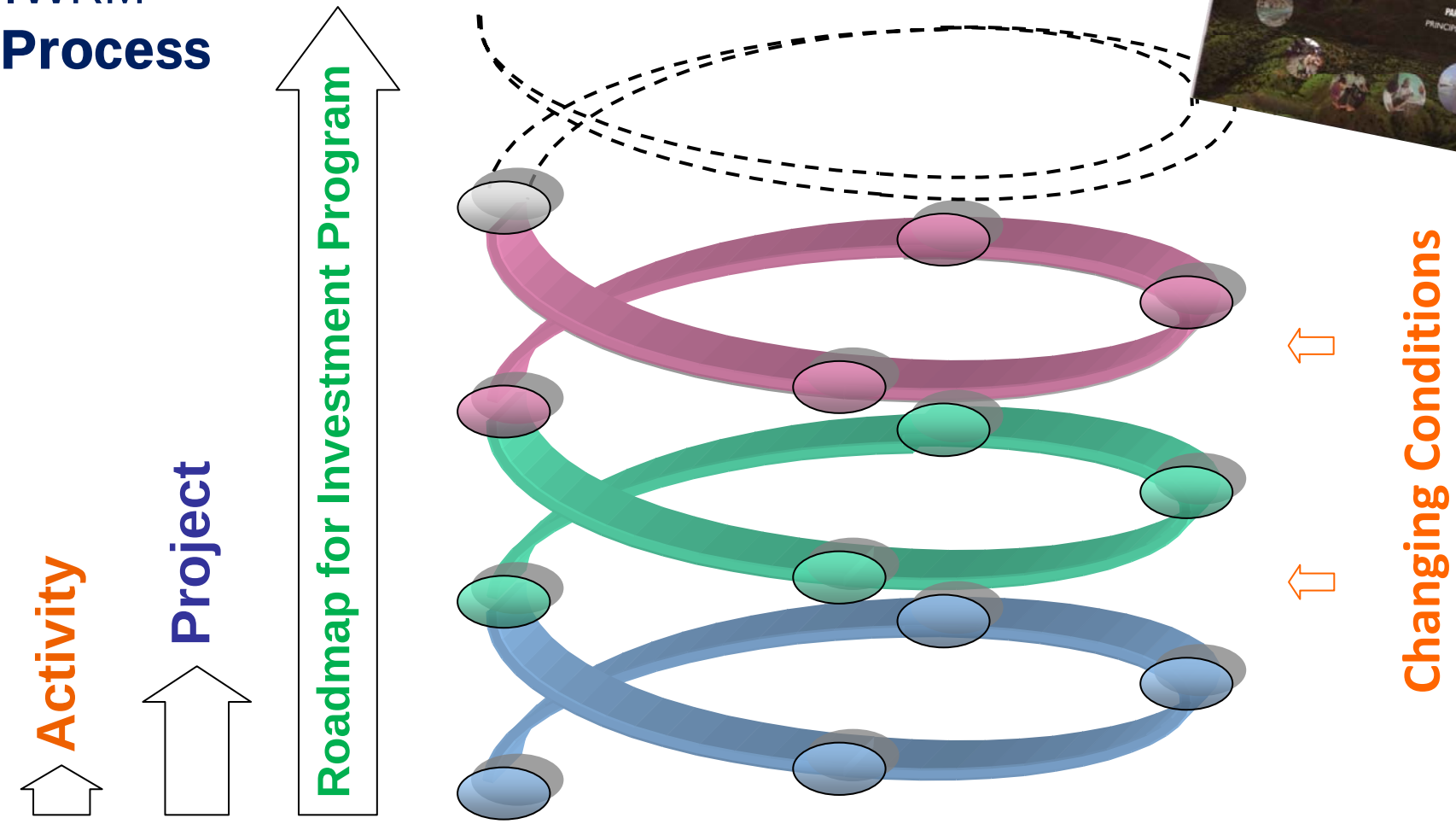
- Agriculture, Fishery, Forestry Production
- Industry
- Energy
- Productivity
- Risk

For reflection

Models of IWRM

IWRM
Process

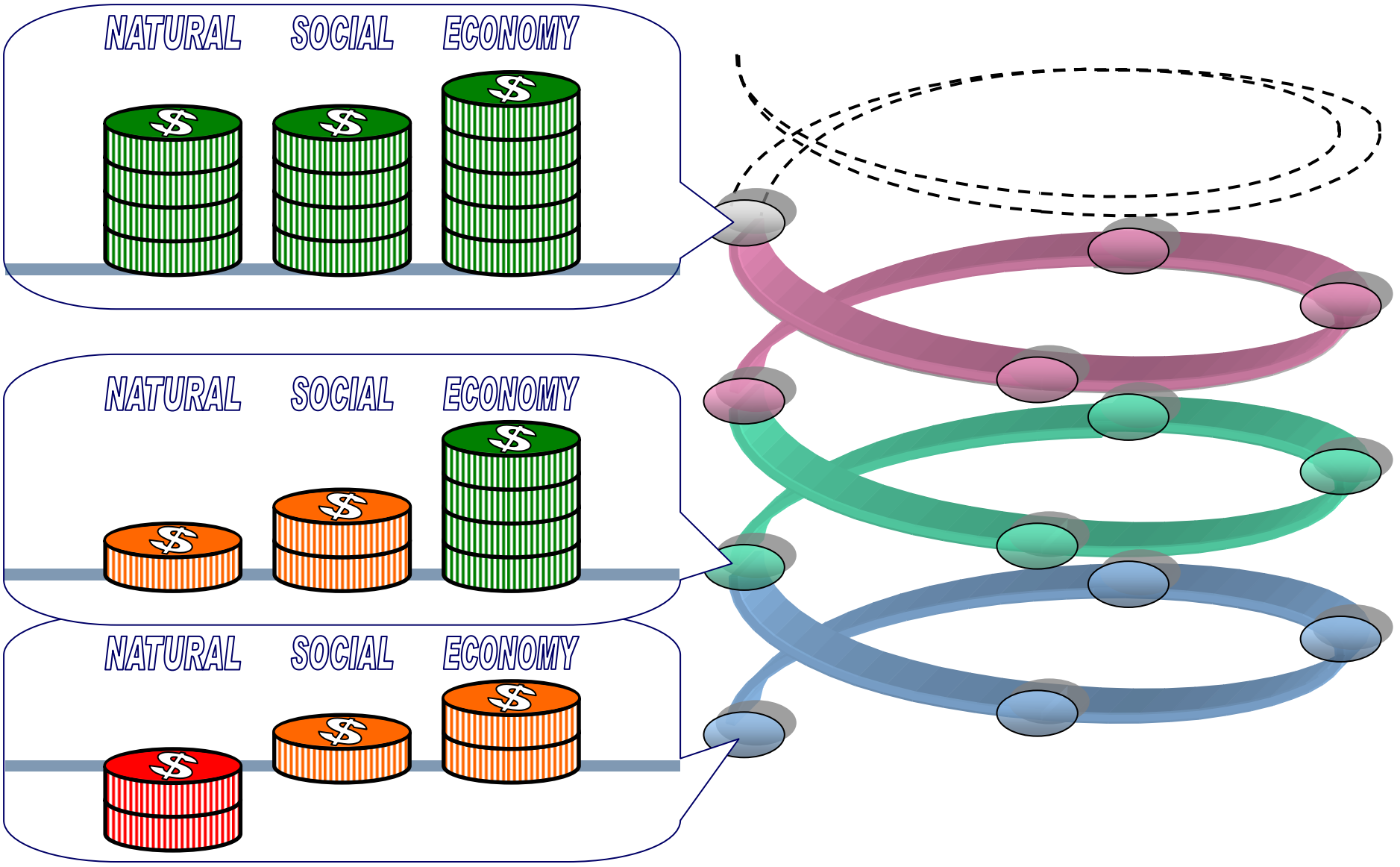




Source: Lincklaen Arriens 2009
Adapted from UNESCO-NARBO Guidelines

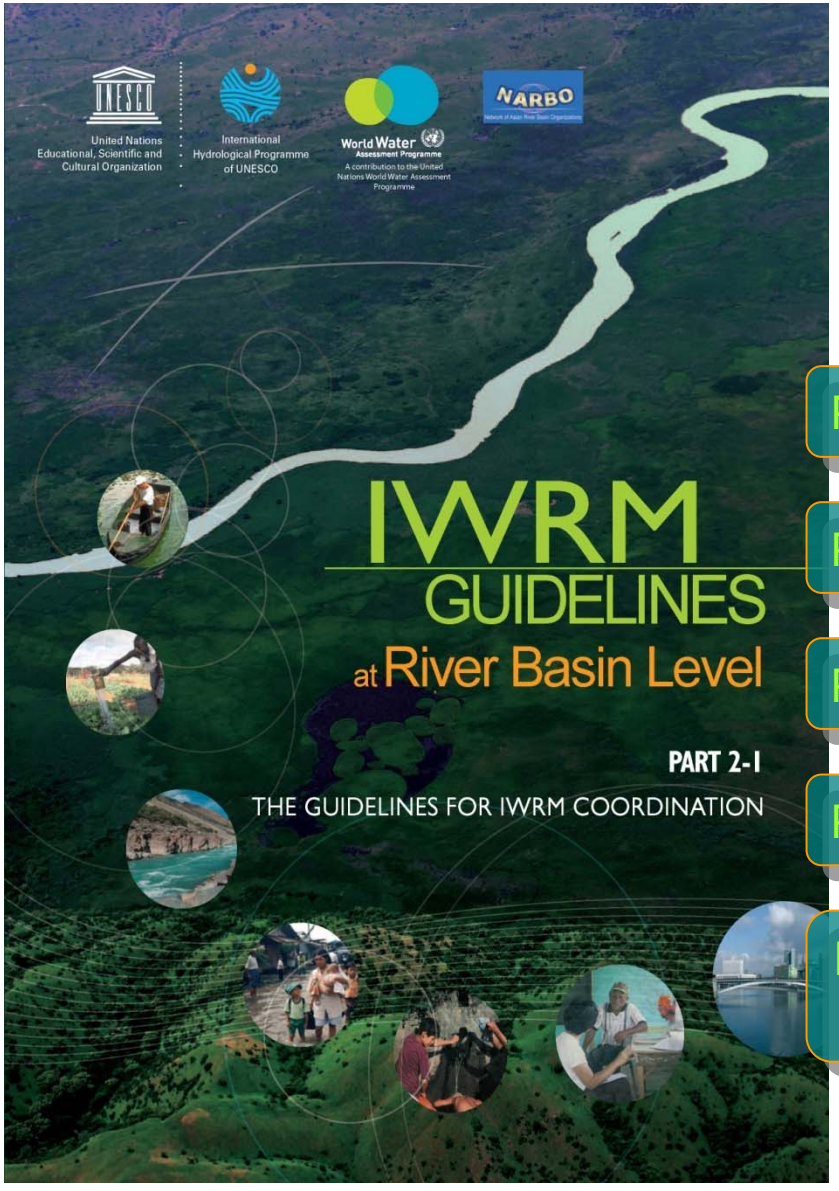
Increasing Triple Bottom Line

Moving up IWRM Spiral



What's IWRM process?

IWRM Guidelines at River Basin Level



- Part 1 Principles
- Part 2-1 The Guidelines for IWRM Coordination
- Part 2-2 The Guidelines for Flood Management
- Part 2-3 Invitation to IWRM for Irrigation Practitioners
- Part 2-4 The Guidelines for Managing Environmental Sustainability

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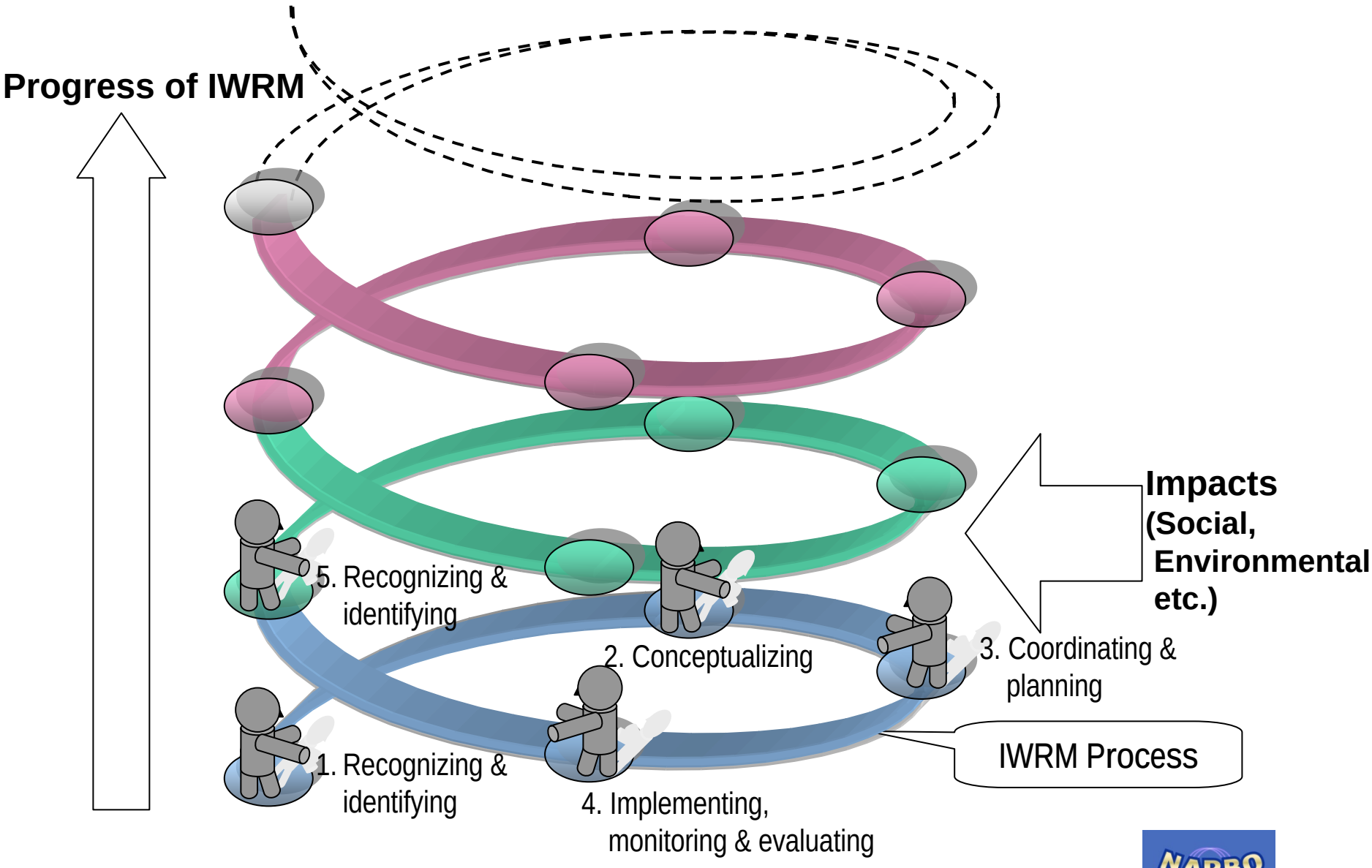
IWRM Spiral

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



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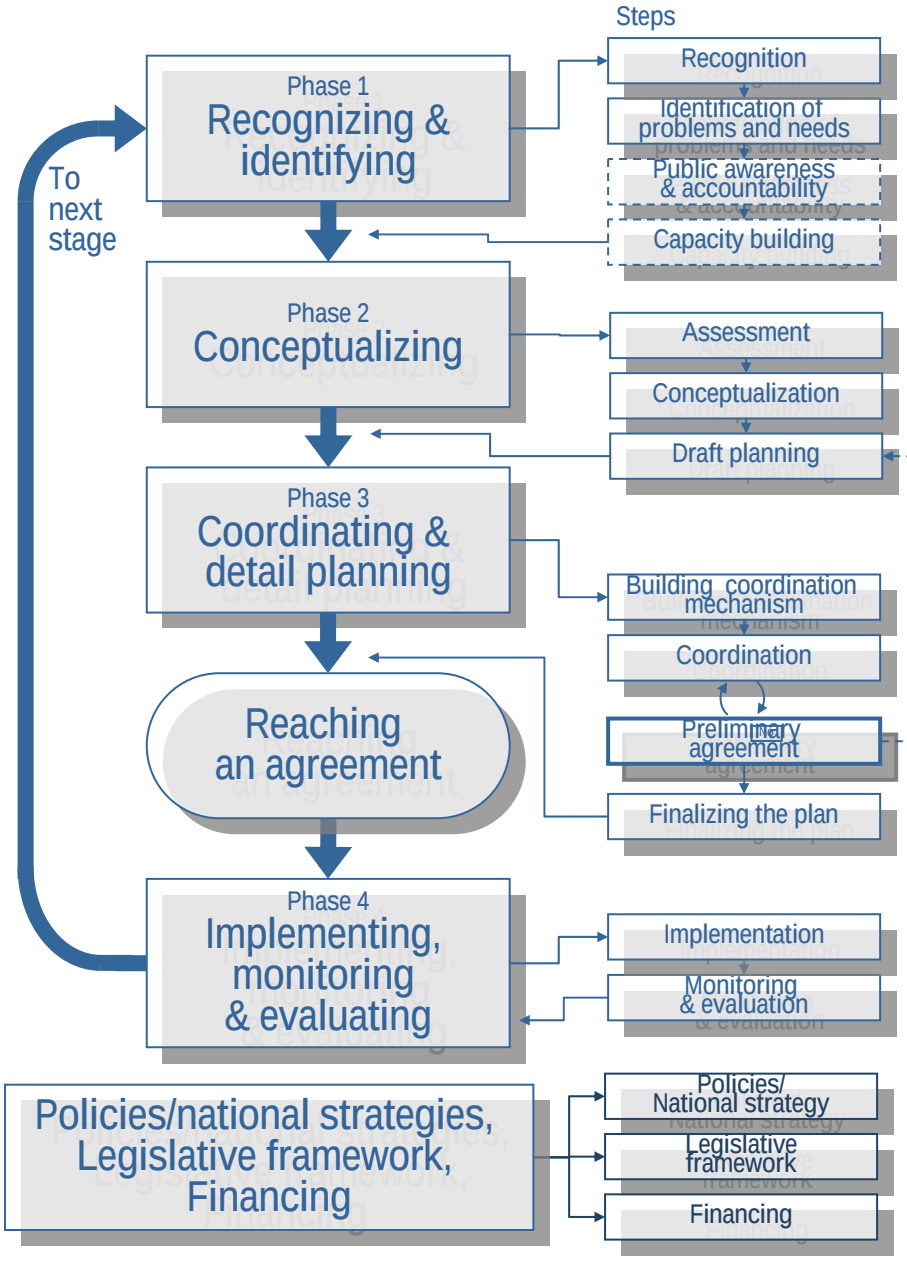
IWRM Process

Guidelines Part2-1 pp.51-58
4. IWRM Process



Main part of this phase will be to "recognize" the needs for IWRM and to grasp the overall picture of the issues existing in the basin.

This phase is to understand the overall structure of the problem and conceptualize future actions.

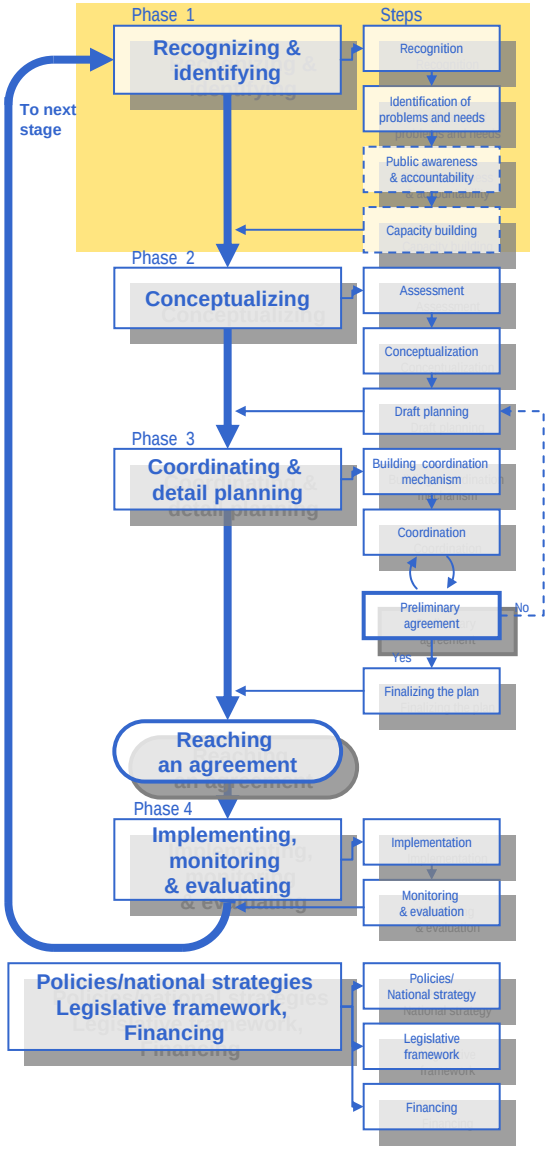
This phase finalizes the draft plan formulated in the Phase 2 into a detailed plan and coordinate with stakeholders towards reaching an agreement.

It represents a moment in time when an agreement is reached among stakeholders as the results of Phase 3. It is a milestone to ensure the future effectiveness of what is being planned.

This phase is to implement, develop, manage and operate the agreed scheme or framework (includes infrastructure development or establishment of legislation or institutional framework).

Policies/national strategies, legislative framework and financing are important throughout the overall IWRM process.

Things to Keep in Mind: Phase 1



Phase 1: Recognizing and identifying

- ✓ Do you understand the needs and problems? Are you in need for IWRM?
- ✓ Are you aware of the past evaluation results and the current situation?
- ✓ Are you thinking into the future?

Guidelines Part2-1 p.54
Fig. 4.3 Phase 1: Recognizing and Identifying

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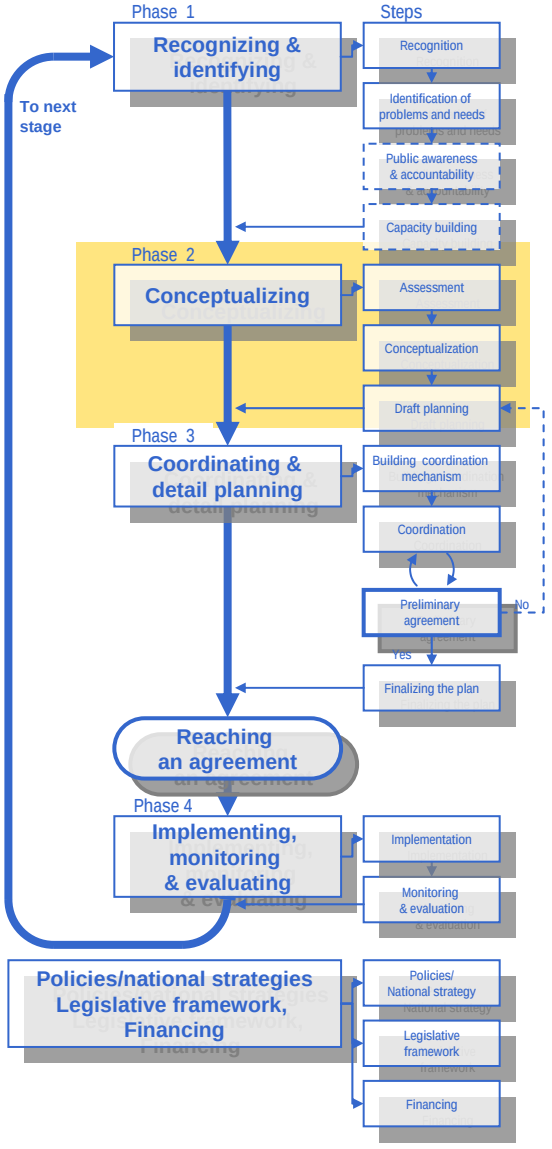
Things to Keep in Mind: Phase 2



Phase 2: Conceptualizing

- ✓ Is it in line with the social demands?
- ✓ Is it well-balanced?
- ✓ Do you understand the constraints and are you exploring “what you can do?”?

Guidelines Part2-1 p.55
Fig. 4.4 Phase 2: Conceptualizing

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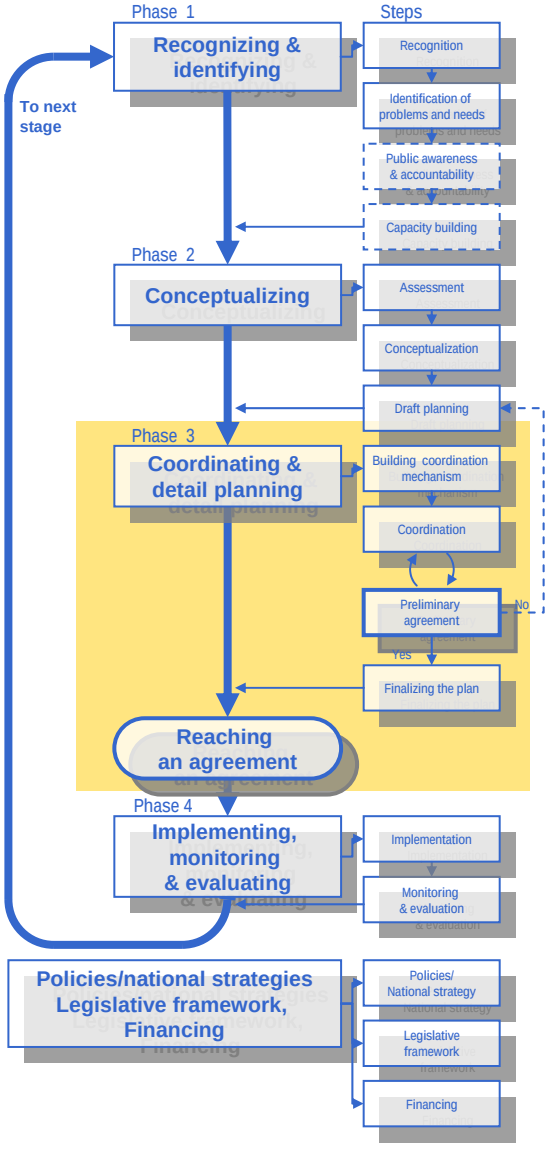
Things to Keep in Mind: Phase 3



Phase 3: Coordinating and detail planning

- ✓ Is transparency secured (satisfying to the reason)?
- ✓ Are stakeholders convinced (satisfying to the heart)?
- ✓ Is it socially fair (satisfying to the law)?

Guidelines Part2-1 p.56
Fig. 4.5 Phase 3: Coordinating and detail planning

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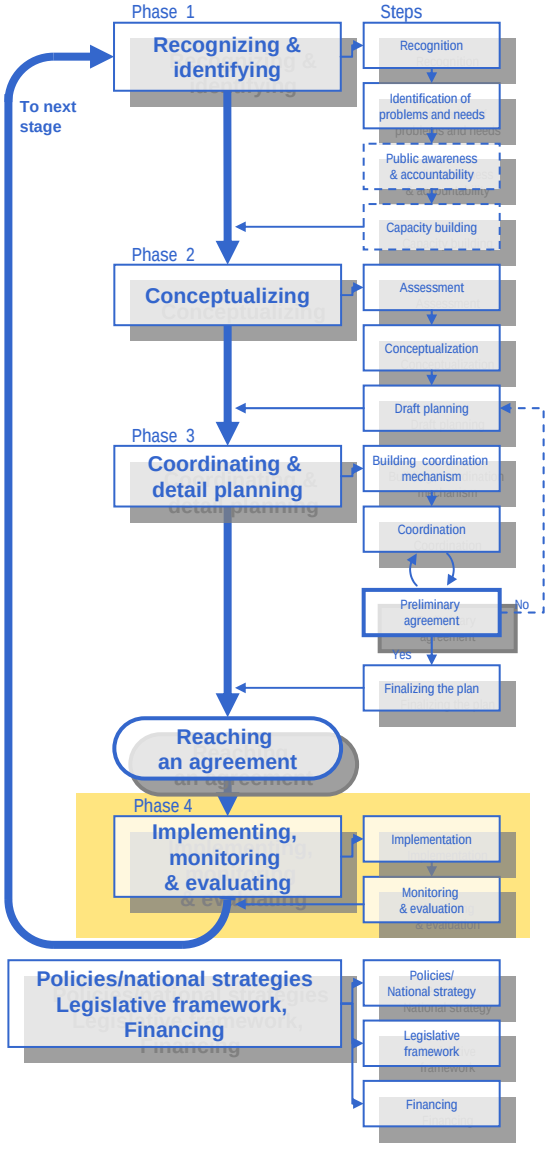
Things to Keep in Mind: Phase 4

Guidelines Part2-1 0.57
Fig. 4.6 Phase 4: Implementing, monitoring and evaluating



Phase 4: Implementing, monitoring and evaluating

- ✓ Is the implementation program executed promptly?
- ✓ Is the system adapted and functioning?
- ✓ Are there any new problems with the new approach/scheme?

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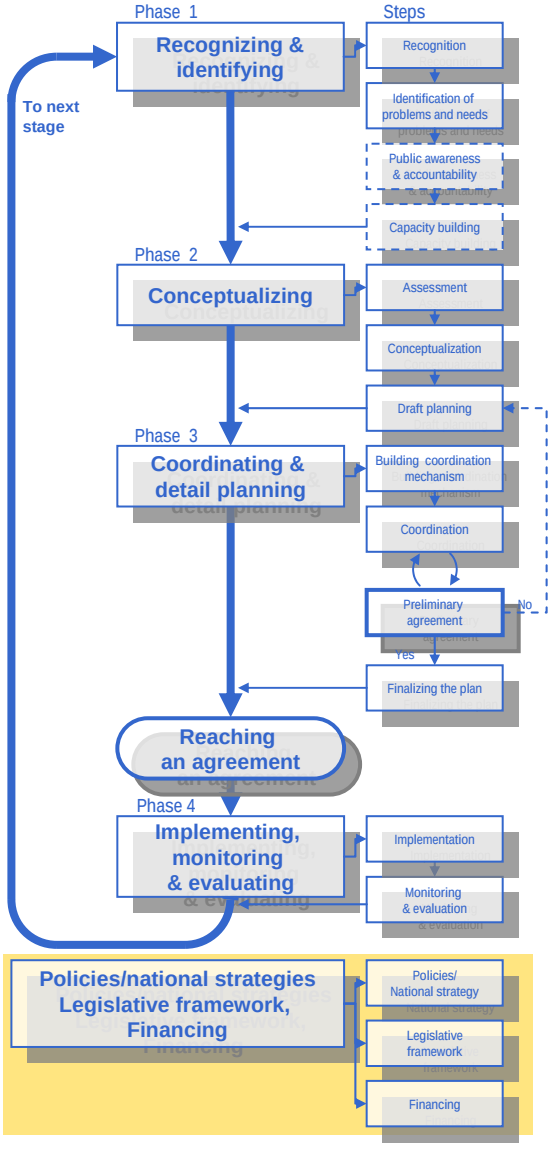
Things to Keep in Mind: Important aspects

Guidelines Part2-1 p.58
Fig. 4.8 Important aspects of IWRM: Policies/national strategies, legislative framework, financing



Important aspects of IWRM process: Policies/national strategies, legislative framework, financing

- ✓ Can you move ahead just with the consensus built among the stakeholders or do you need a formal framework?
- ✓ Are you working bottom-up to influence the national or higher level organizations?
- ✓ Do you have financial sources in mind?

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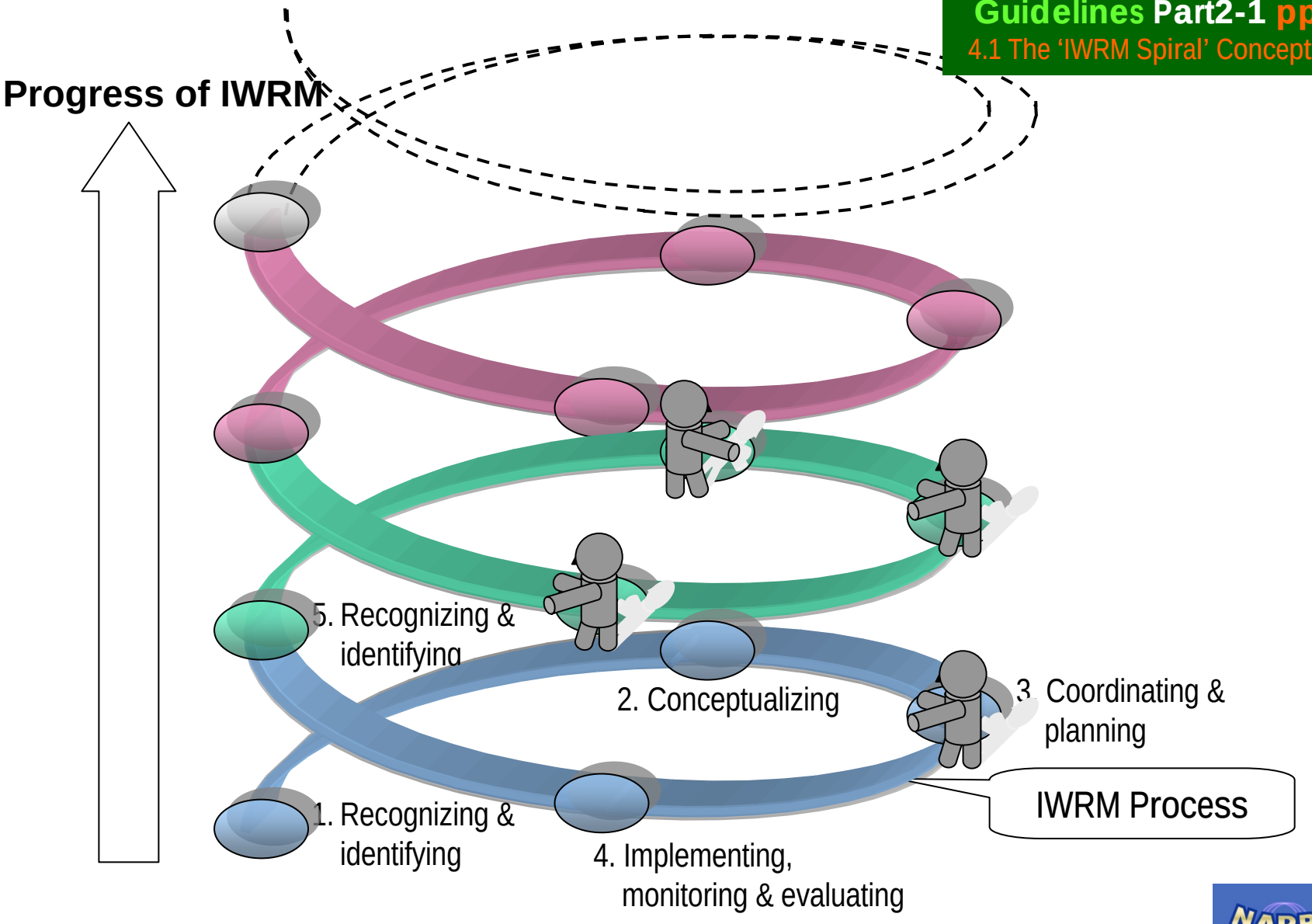
Where do you stand in the spiral? - to find a suitable KfS

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



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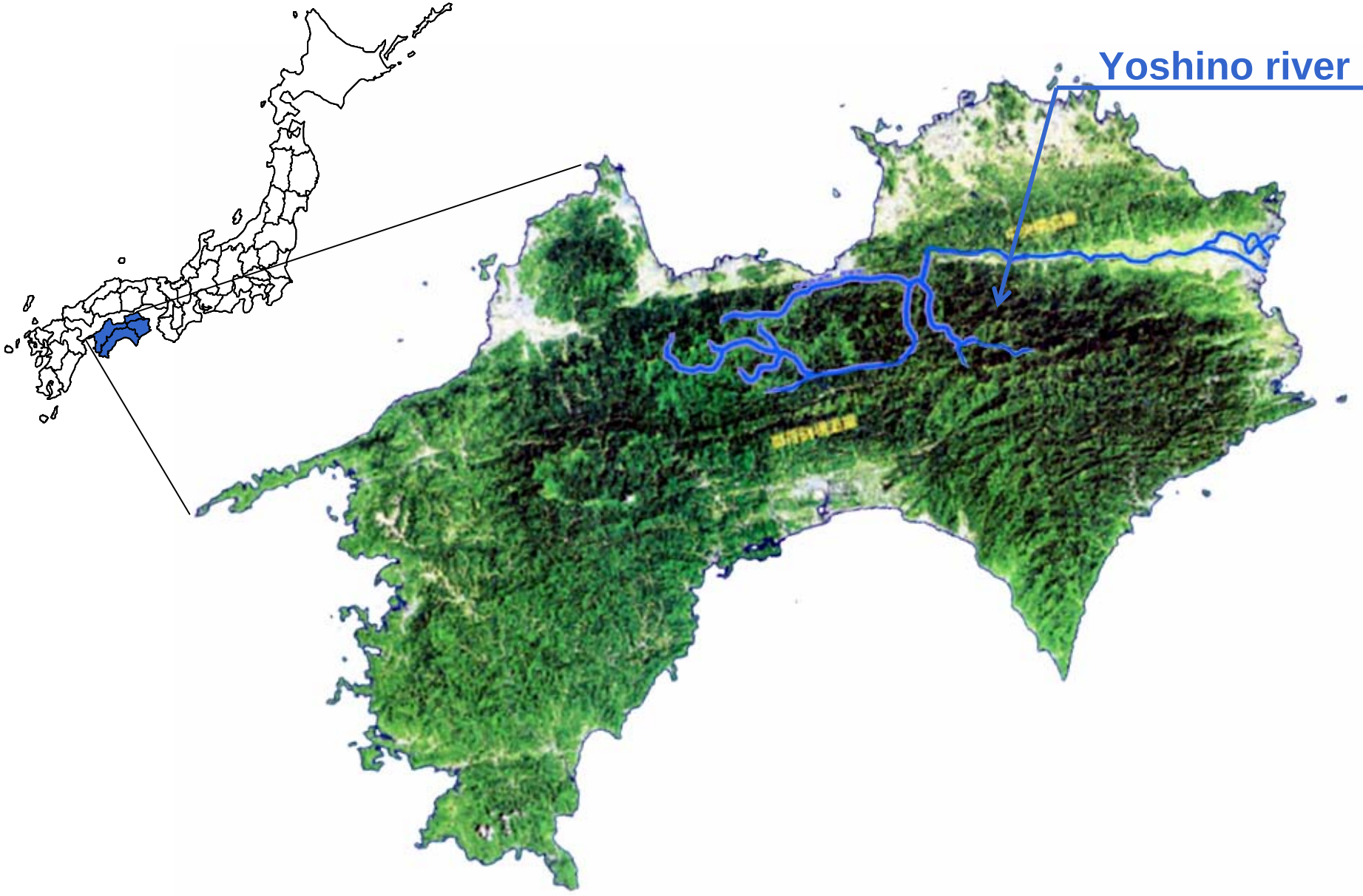
How do we move up along IWRM spiral?

Case Study: Yoshino River, Japan

Location of Shikoku Island



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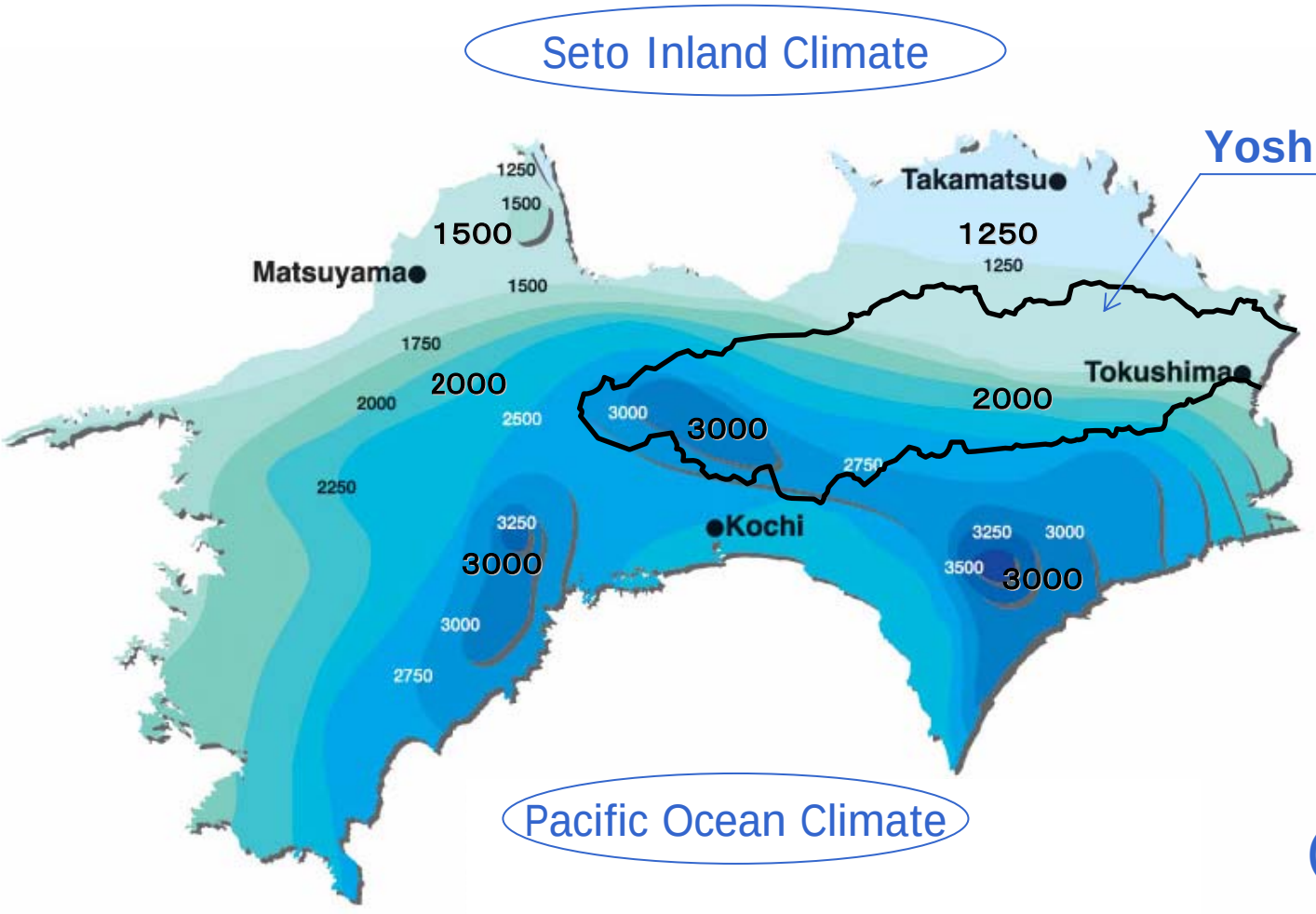
Satellite image

Annual Rainfall in Shikoku



(Source: MLIT, Shikoku Regional Development Bureau)

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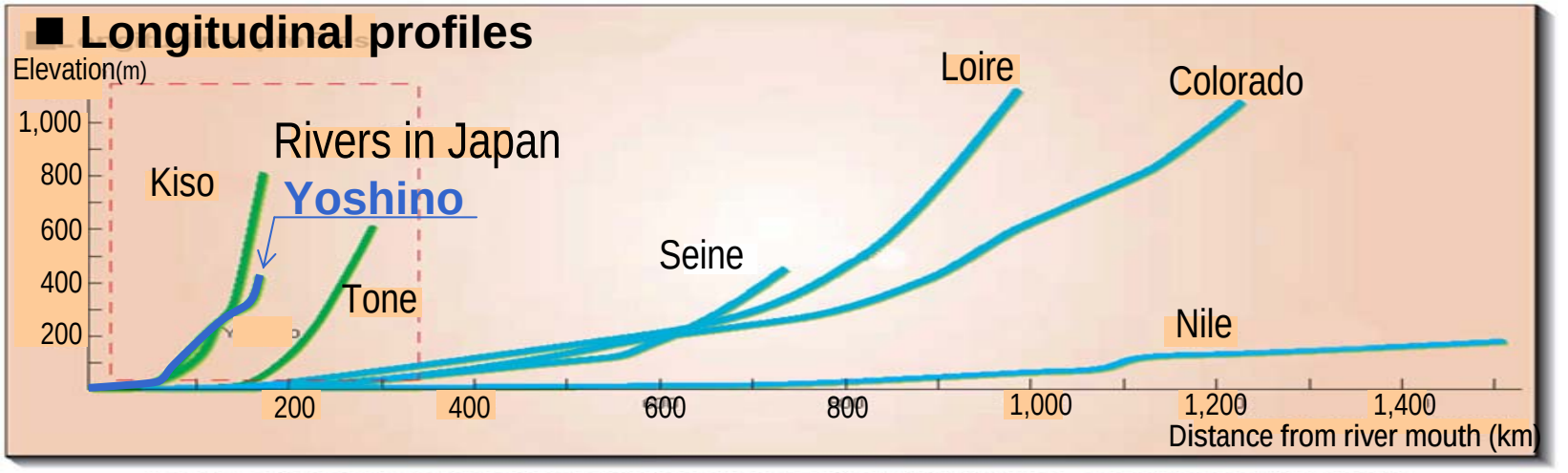
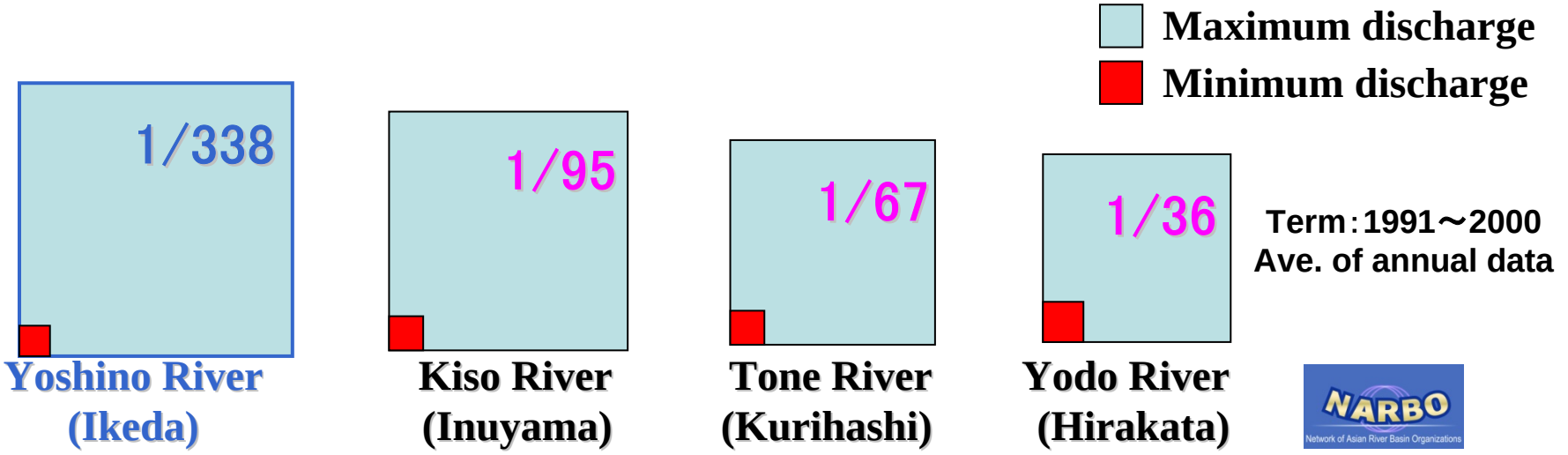
Characteristics of World Rivers

The rivers are remarkably steeper than continental rivers.

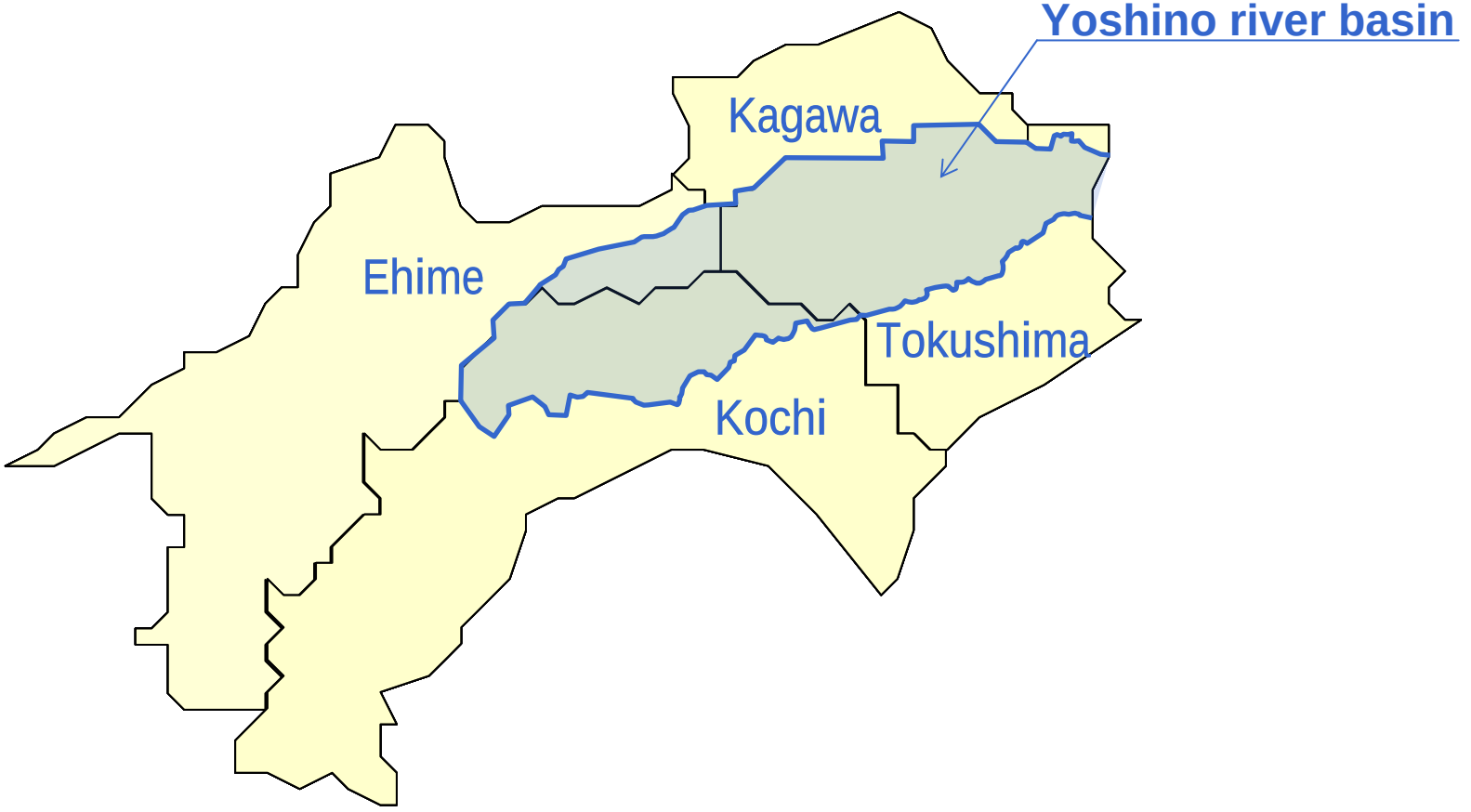


Sourece : "River Engineering" by Yutaka Takahashi and "Safe Land, Beautiful Land" by MLIT

Fluctuating River Flow (Minimum discharge/Maximum discharge)



4 Prefectures in Shikoku Island



Prefectures : the large-area local governing unit

Current prefectural system in Japan was established in 1871 after the new government abolished fiefs run by feudal clans known as *"Han"*.

Source: wikipedia

Characteristics and Problems of 4 Prefectures

	Characteristics	Problems	
		In each Pref.	Common in 4 Pref.
Tokushima	➢ Downstream of the Yoshino river	Needs for ➢ Flood control ➢ Stable water intake	
Kochi	➢ Upstream of the Yoshino river ➢ Much rainfall	Needs for ➢ Compensation	Needs for ➢ Land Rehabilitation ➢ Hydroelectricity Power Generation ➢ Development (Emergence from backwardness)
Ehime	➢ Sub-basin of the Yoshino river (Dozan river) ➢ Water shortage	Needs for ➢ Water diversion	
Kagawa	➢ Outside of Yoshino river basin ➢ Water shortage	Needs for ➢ Water diversion	

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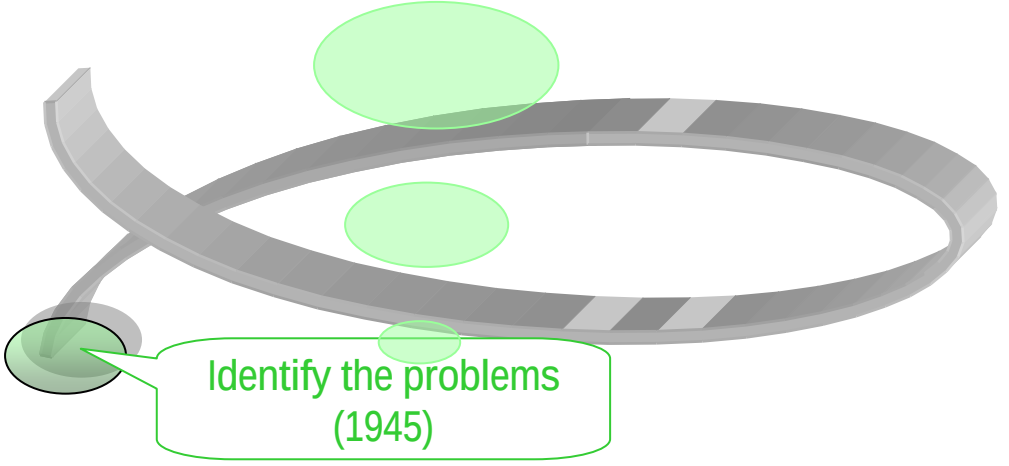
Identify problems

- **Need for Land rehabilitation**
  (Flood and Earthquake occurred right after the war)
- **Demand for electricity**
  (Hydroelectric power generation)
- **Water shortage**
  (Demand for both irrigation and urban water)



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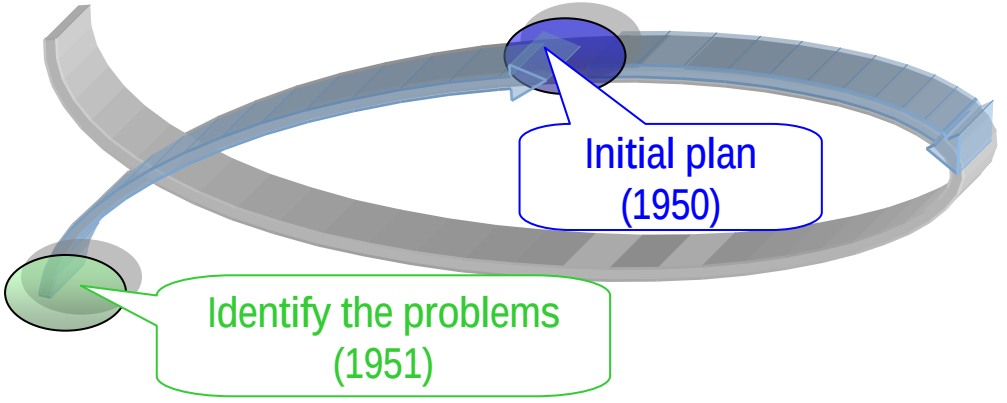
Serious Disaster (Drought and Flood) in Shikoku

Drafting an initial plan



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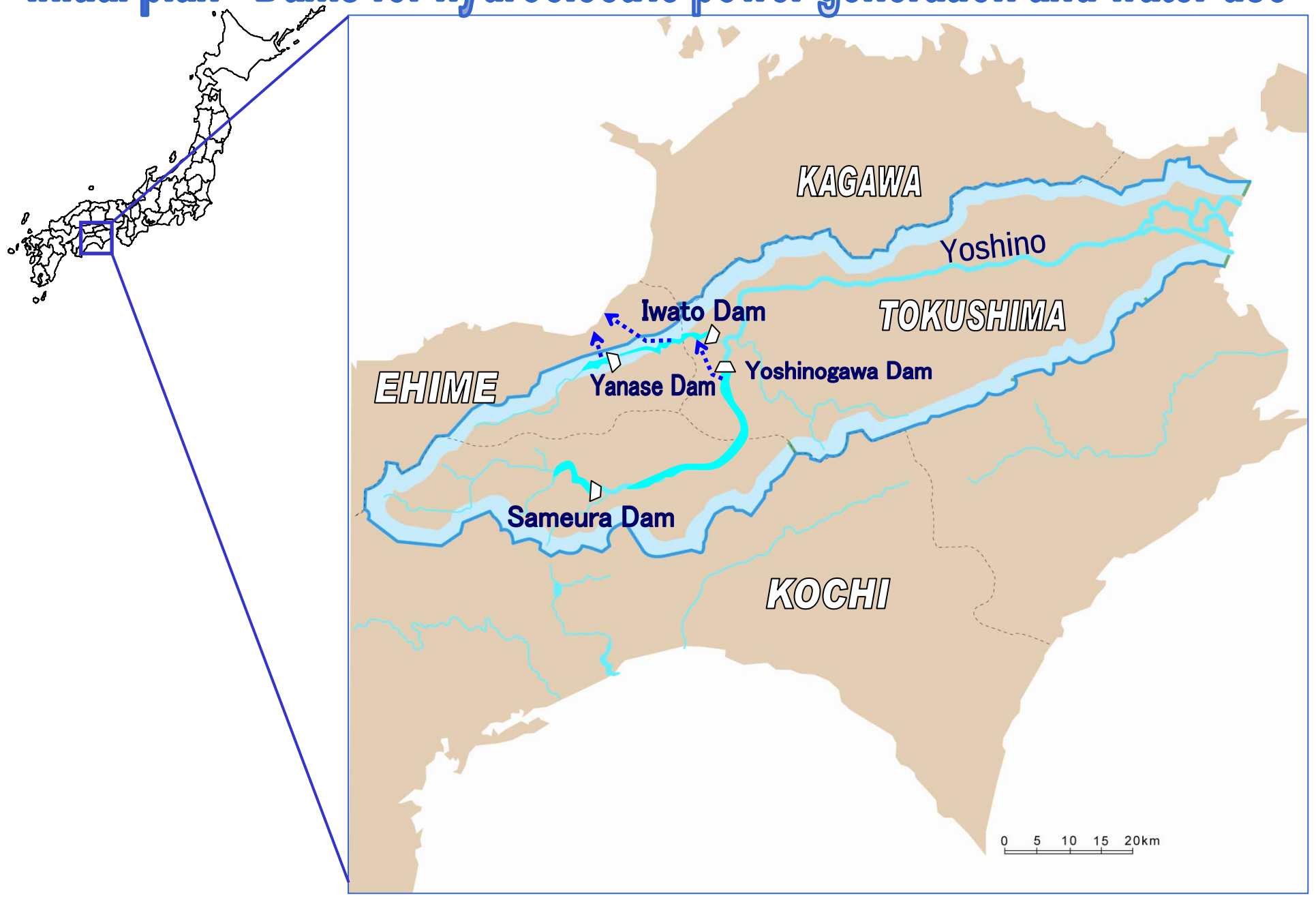
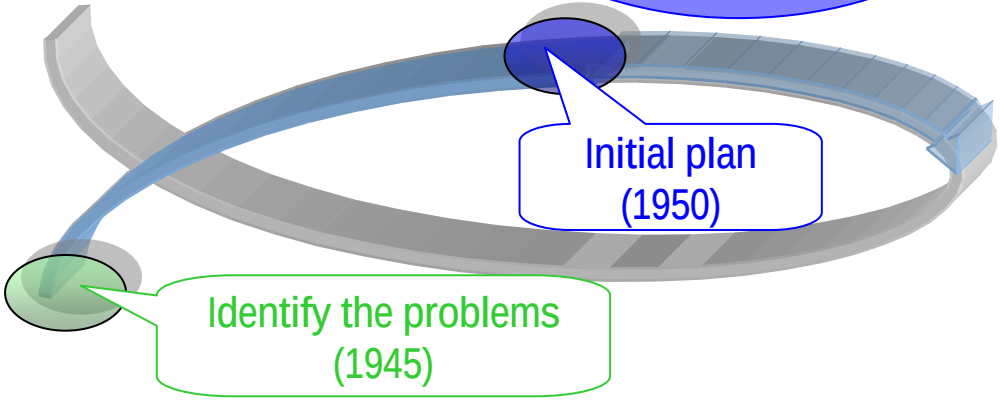
Initial plan - Dams for hydroelectric power generation and water use



Stakeholders' reaction to the initial plan

Stakeholders	Reaction
➢ Tokushima (Riparian residents)	: Unhappy as the flood control will not be achieved, river flow will decrease during drought season and place of scenic beauty will be underwater
➢ Kochi (Upstream residents)	: Unhappy as residents will be relocated by dam const.
➢ Ehime (Transboundary water use)	: Happy as water will be allocated.
➢ Kagawa (Transboundary water use)	: Unhappy as water will not be allocated.



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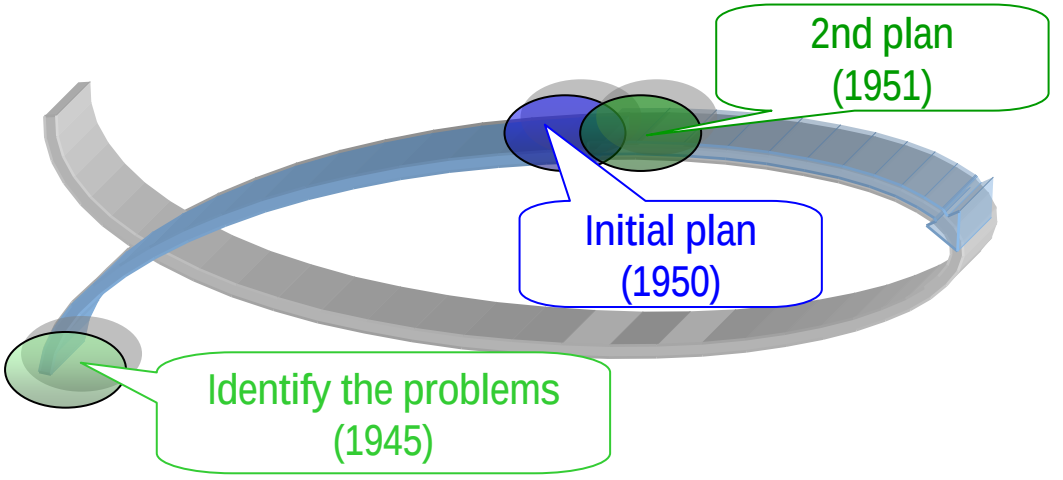
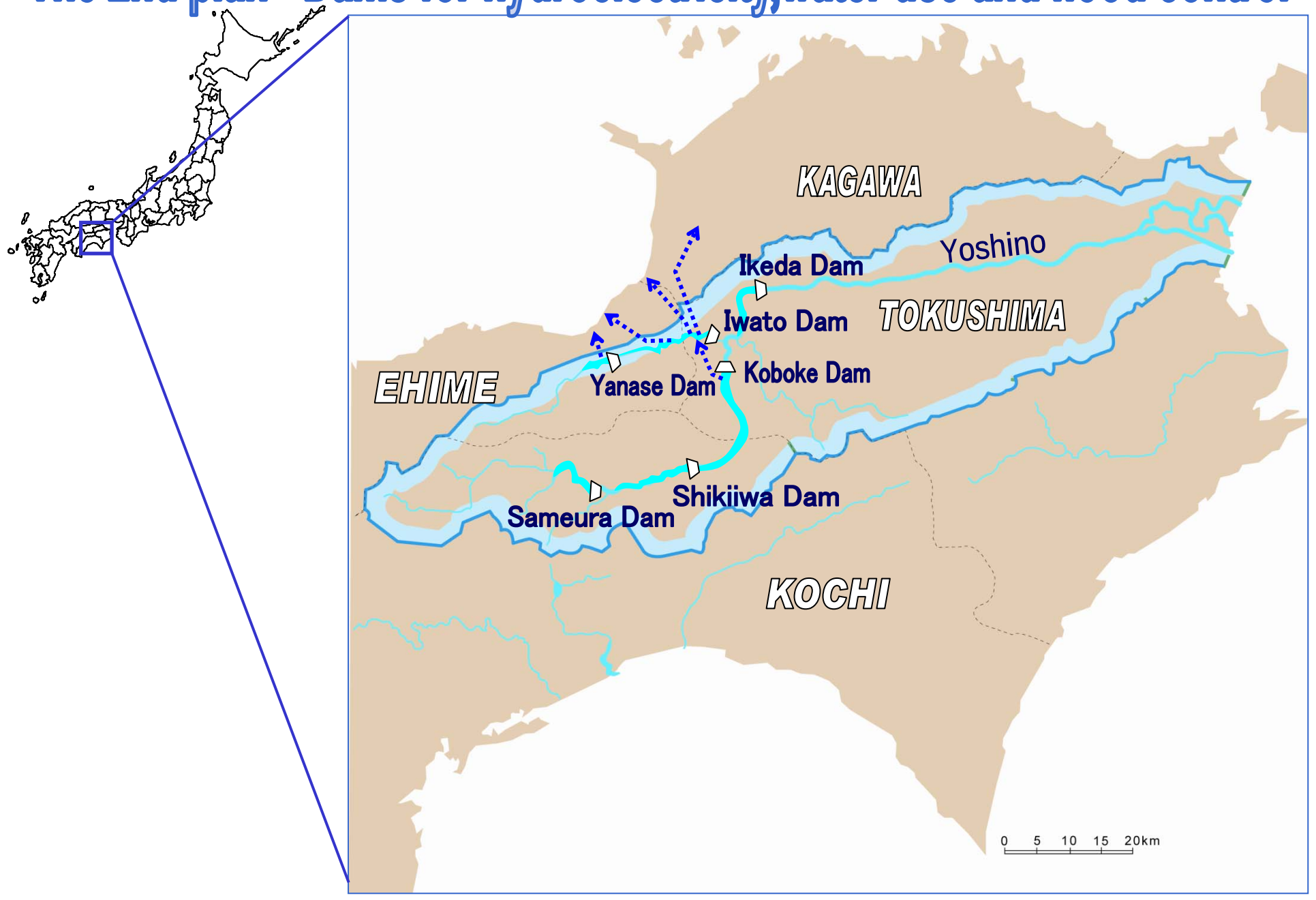
Drafting the 2nd plan

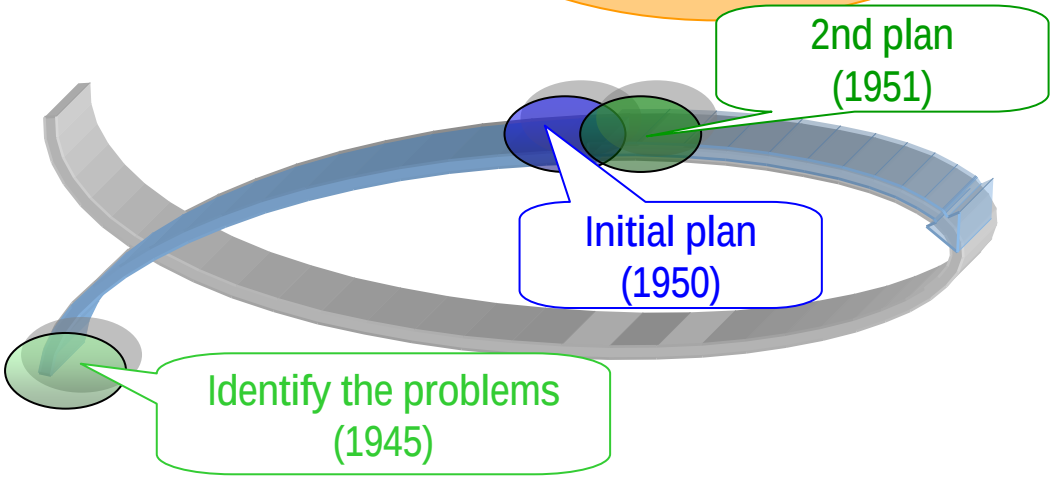


The 2nd plan - Dams for hydroelectricity,water use and flood control



Stakeholders' reaction to the 2nd plan

Stakeholders	Reaction
➢Tokushima (Riparian residents)	: Unhappy as river flow will decrease during drought season and place of scenic beauty will be underwater
➢Kochi (Upstream residents)	: Unhappy as residents will be relocated by dam const.
➢Ehime (Transboundary water use)	: Happy as water will be allocated.
➢Kagawa (Transboundary water use)	: Moderately happy as water will be allocated but not met the demand.



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Question

Why they couldn't proceed next phase, 'Coordinating and detail Planning'?

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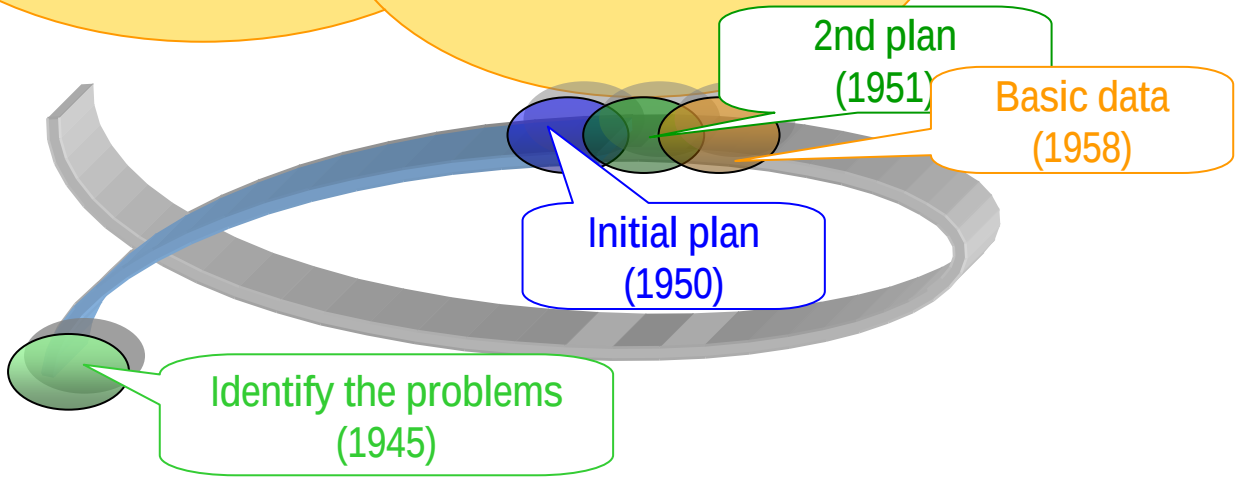
[Problem] Basic data for the plan...

Each sector had determined its basic data for the plan,
which was based on their respective data

⇒Therefore,
Plans based on their own data
were not understood by other sectors.



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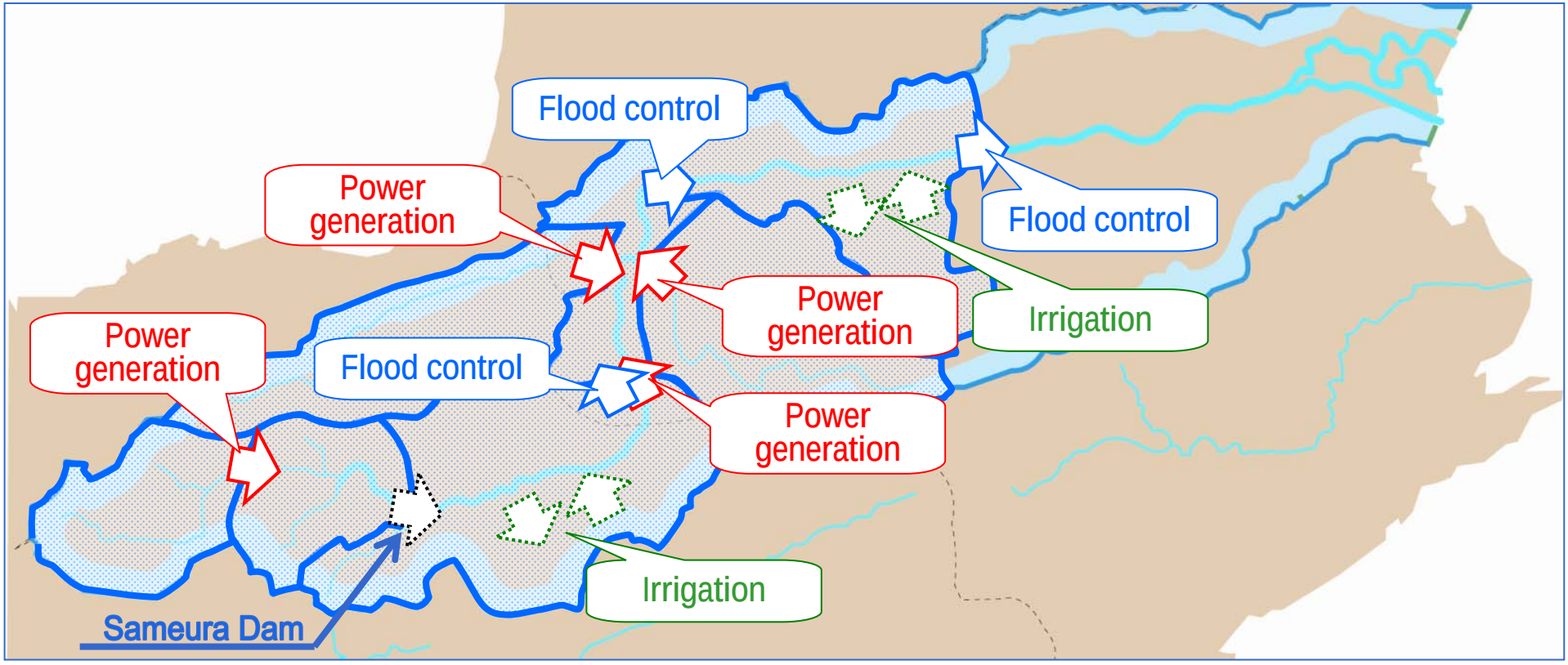
Formulating water budget for an integrated plan



The proposal by Shikoku Regional Bureau of MOC
to work out common data and to recognize the importance of all stakeholders ensured that all parties participated in the processes.

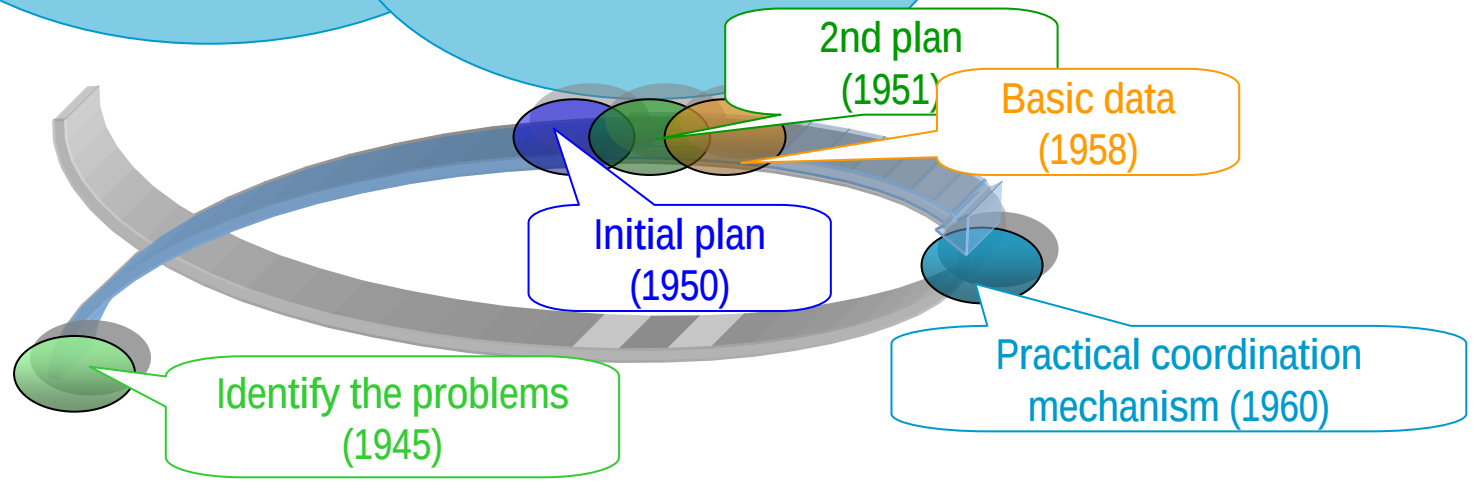
[The Key]

☞ [1.2.1] Identify potential priority areas (critical locations and key issues) for IWRM implementation in the basin.
[1.3.1] Proactively disclose information as it is a fundamental activity in IWRM.

[Problem] Coordination didn't proceeded...

Lack of motivation for agreement among Pref.s

⇒Central government facilitates
Comprehensive Development Plan of Shikoku

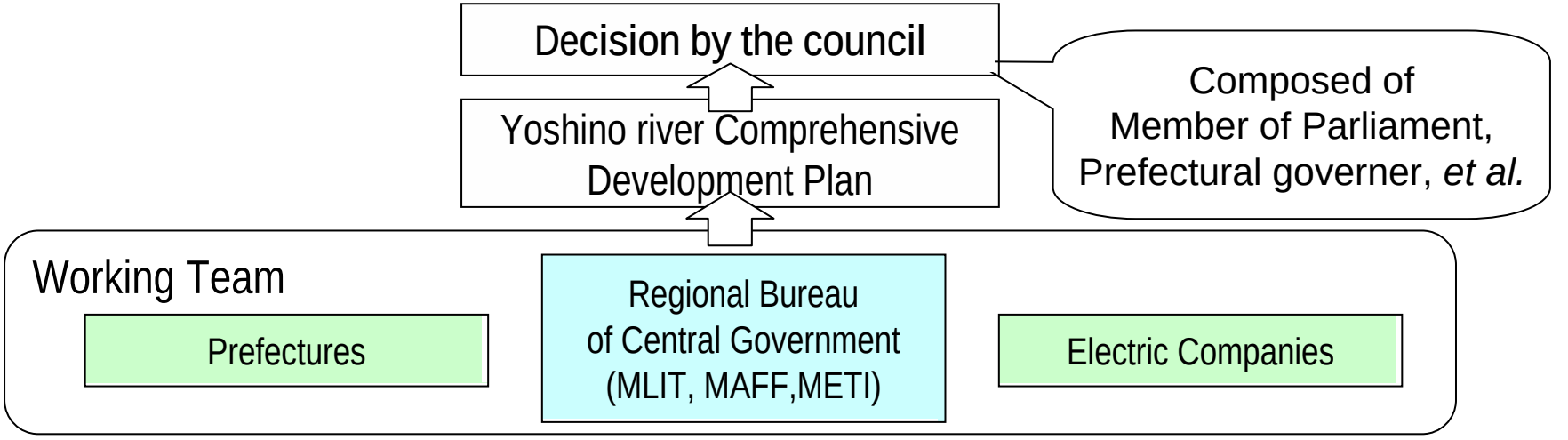


Practical coordination mechanism by working group

Shikoku Comprehensive Development Council
Based on Shikoku Regional Development Promotion Law

Purpose; To promote regional comprehensive development of Shikoku from the viewpoint of infrastructure, natural resources (including water resources)

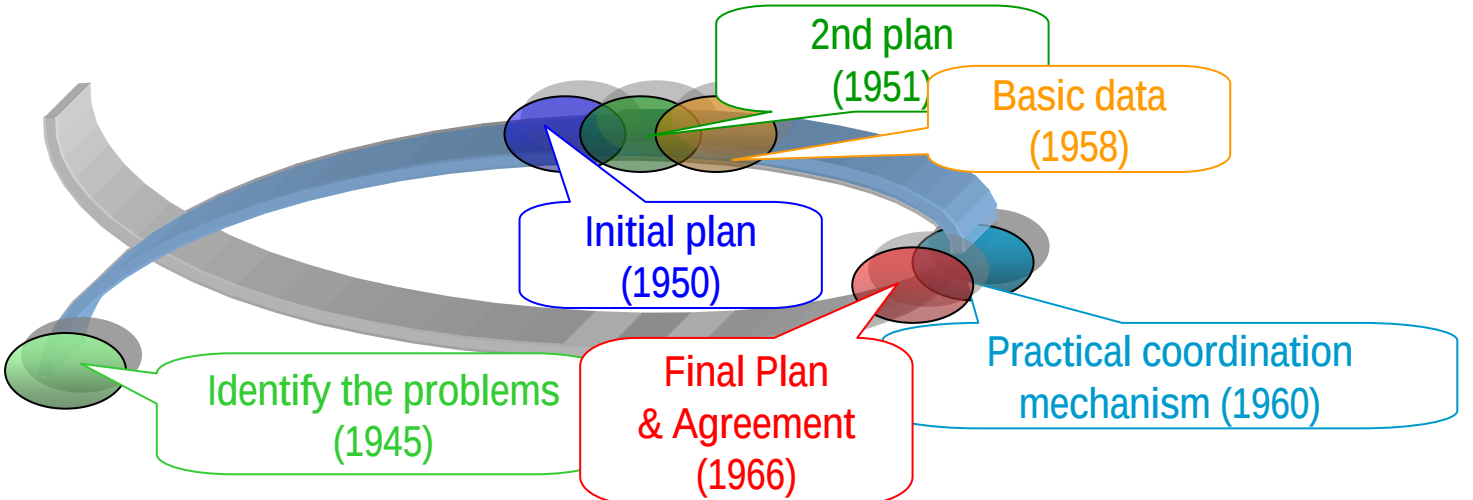
Stipulates; Establishment of Comprehensive Development Plan including Yoshino river Comprehensive Development Plan (YCDP)



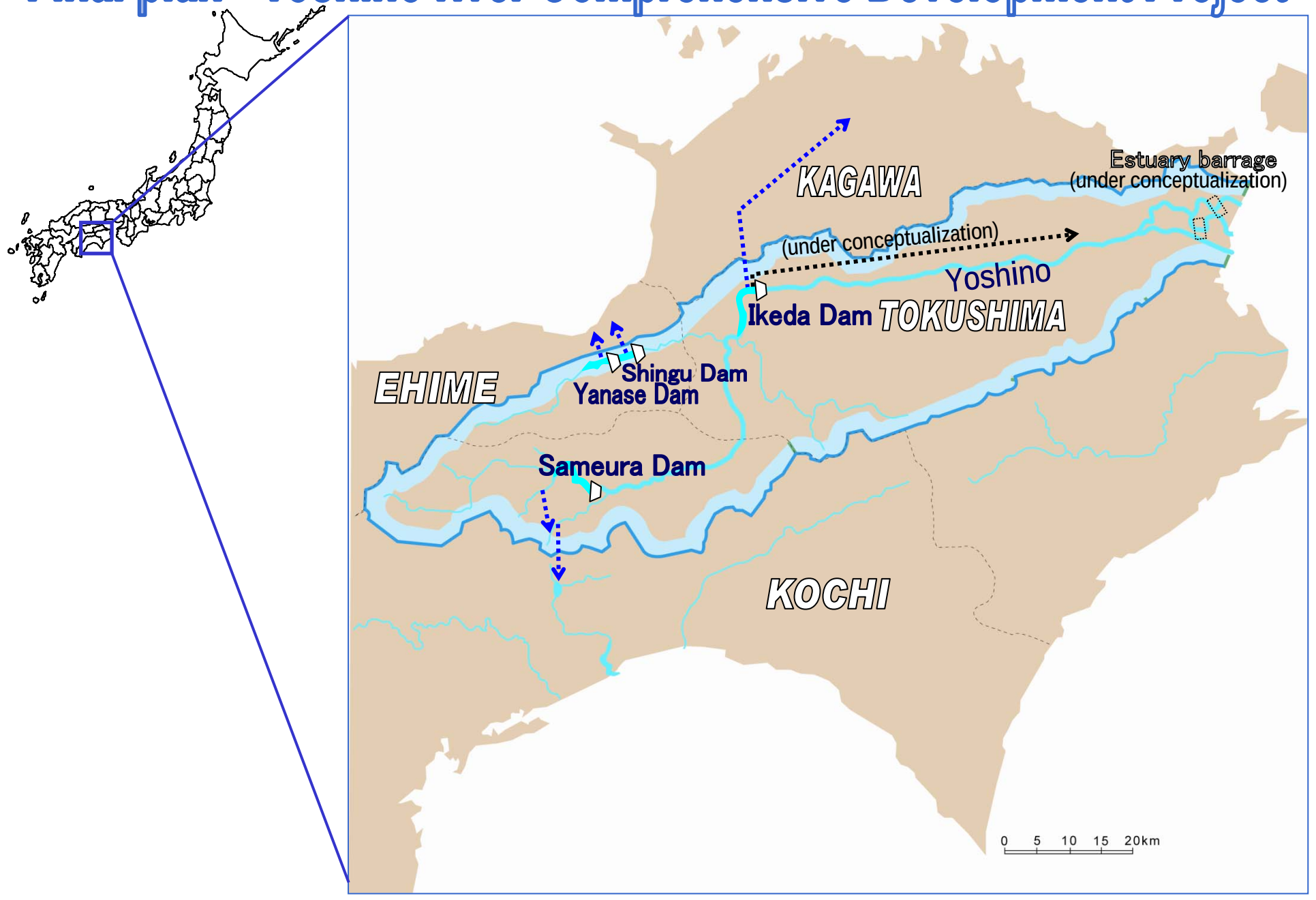
A council created a top-down system based on the law.
A working group (bottom-up system) was also set up.
Coordination within the WG led to an agreement being reached.

[The Key]
☞ [3.1.1] Prepare a framework for stakeholder participation in order to build consensus among stakeholders.

Final plan and agreement

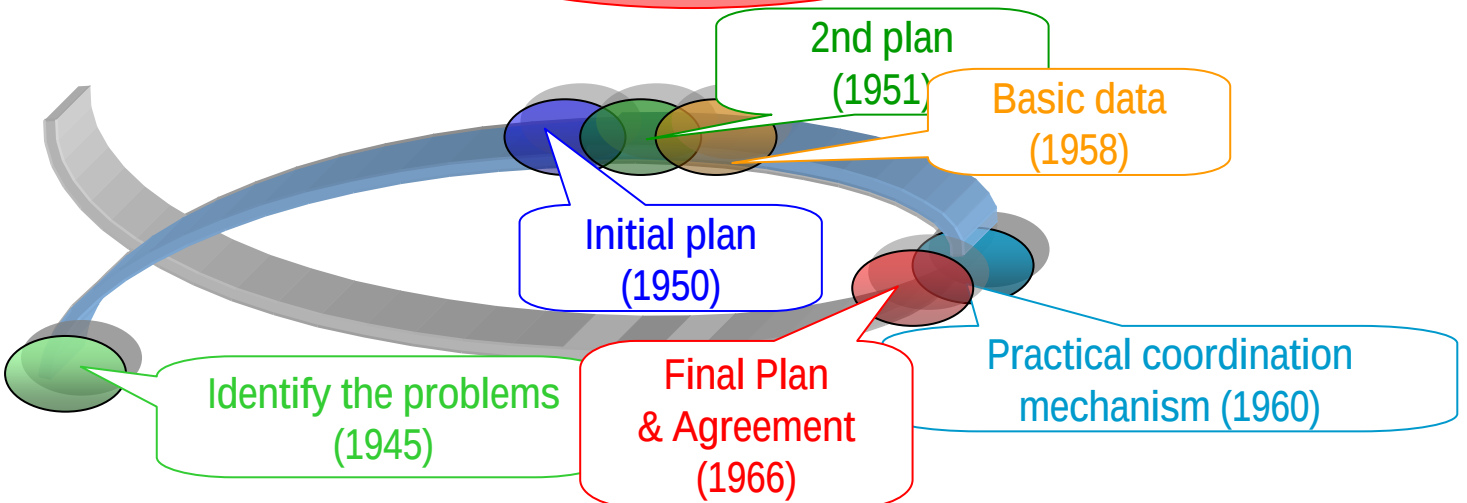


Final plan - Yoshino river Comprehensive Development Project

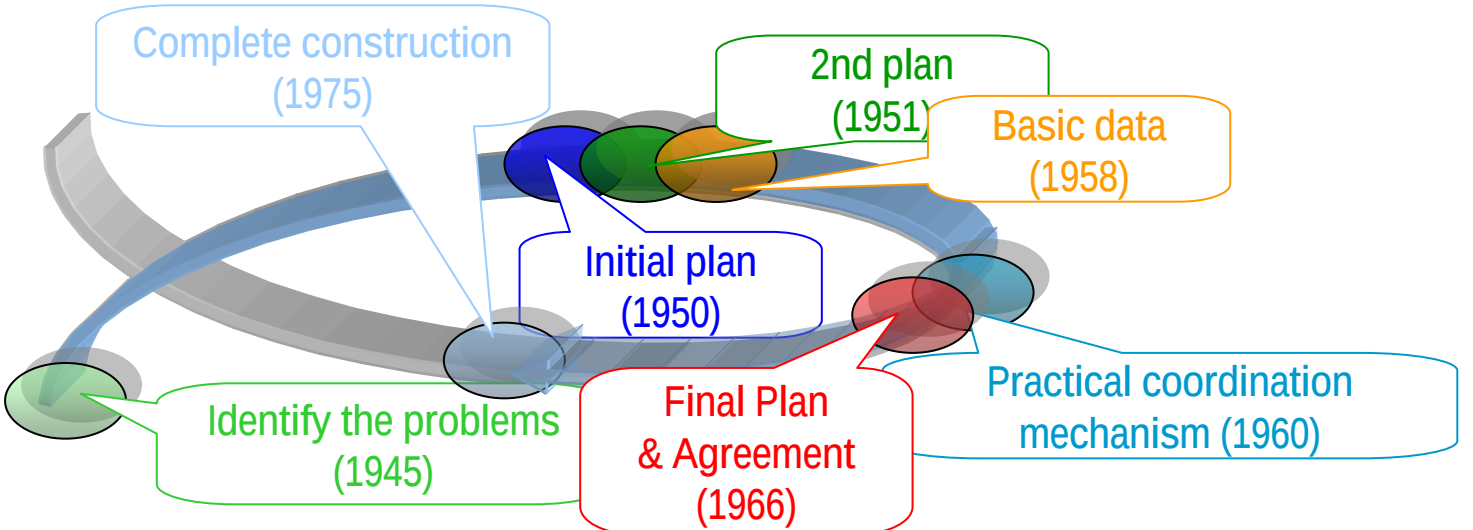


Stakeholders' reaction to the final plan

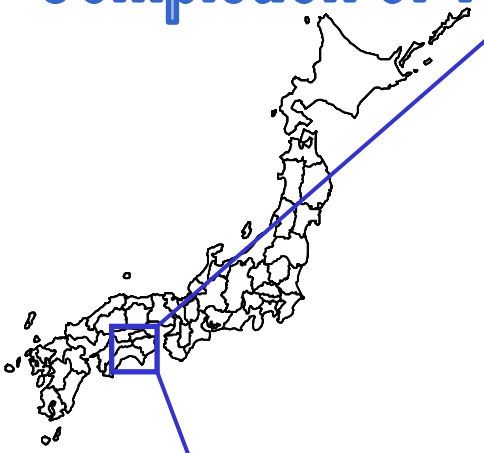
Stakeholders	Reaction
➢Tokushima (Riparian residents)	: Moderately happy though river flow will decrease during drought season, agricultural water will be extracted from midstream dam.
➢Kochi (Upstream residents)	: Moderately happy Compensation is agreeable, and some water is diverted to Kochi city.
➢Ehime (Transboundary water use)	: Happy as water will be allocated.
➢Kagawa (Transboundary water use)	: Happy as water will be allocated.

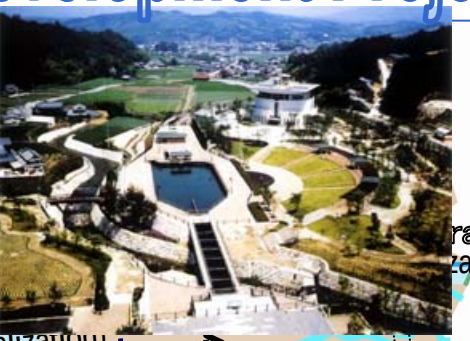


Complete construction



Completion of Yoshino river Comprehensive Development Project





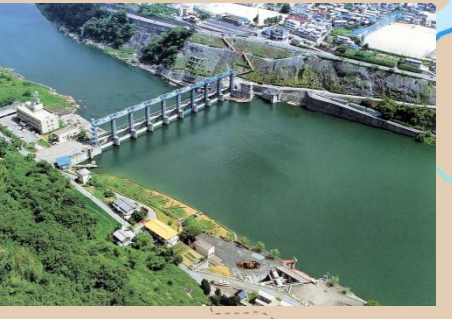
KAGAWA

(under conceptualization)

Yoshino

Ikeda Dam

TOKUSHIMA



EHIME

Shingu Dam

Yanase Dam

Sameura Dam

KOCHI

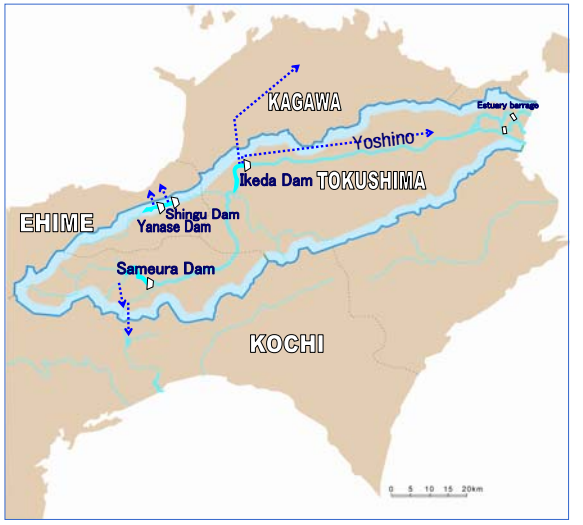
0 5 10 15 20km

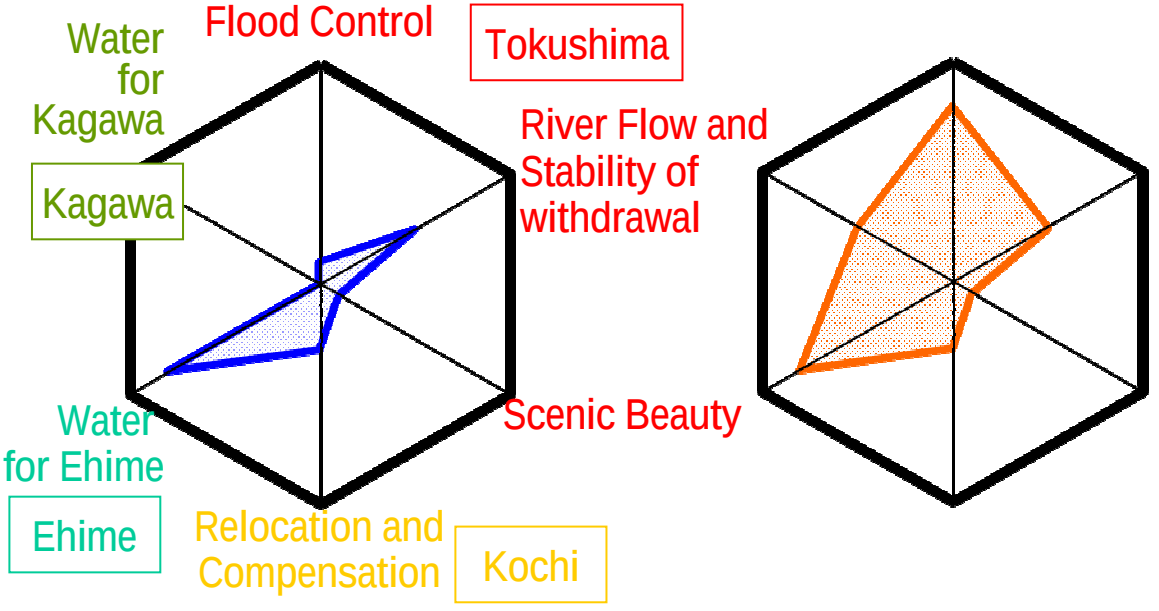
Evaluation Method - Hexagram

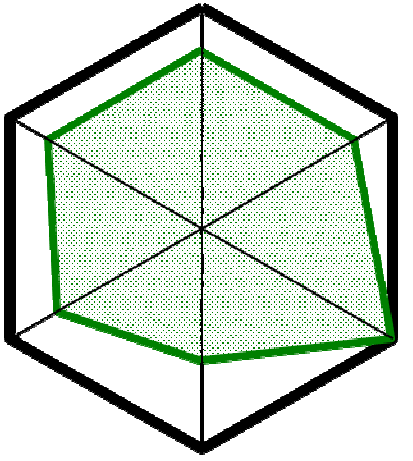
Initial plan

2nd plan

Final plan







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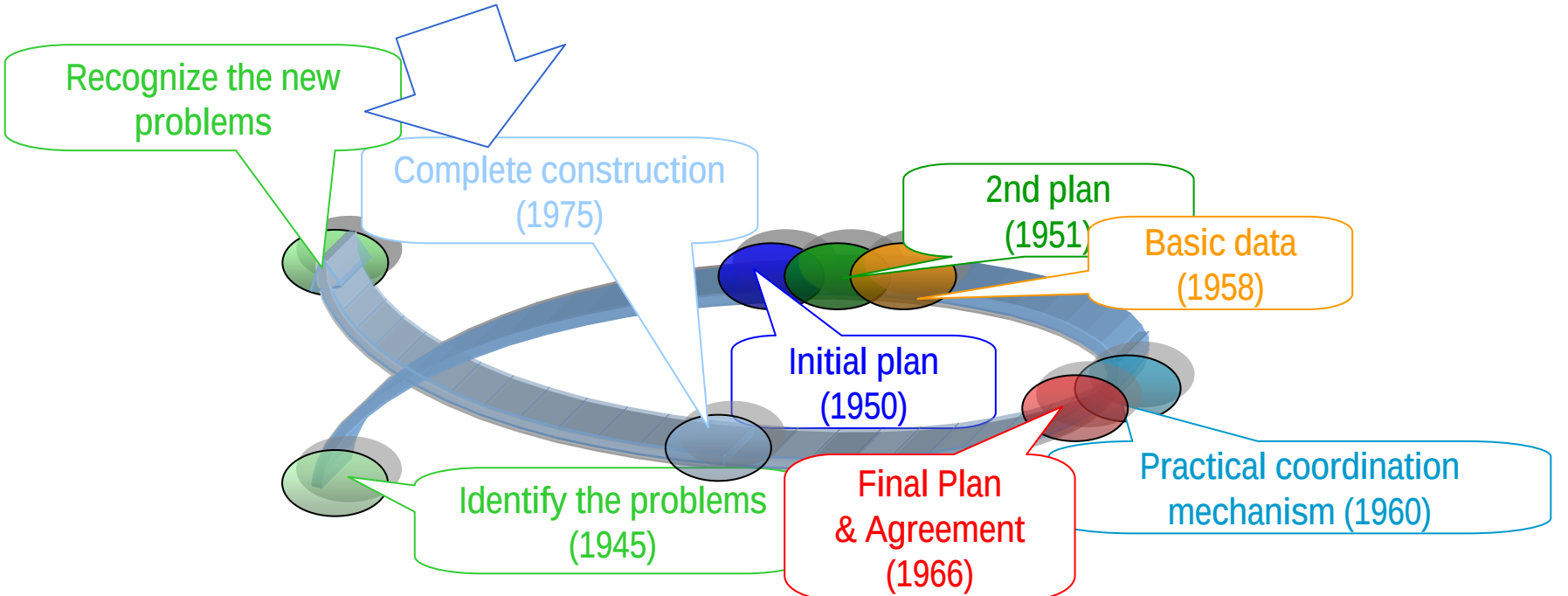
Monitoring & evaluation

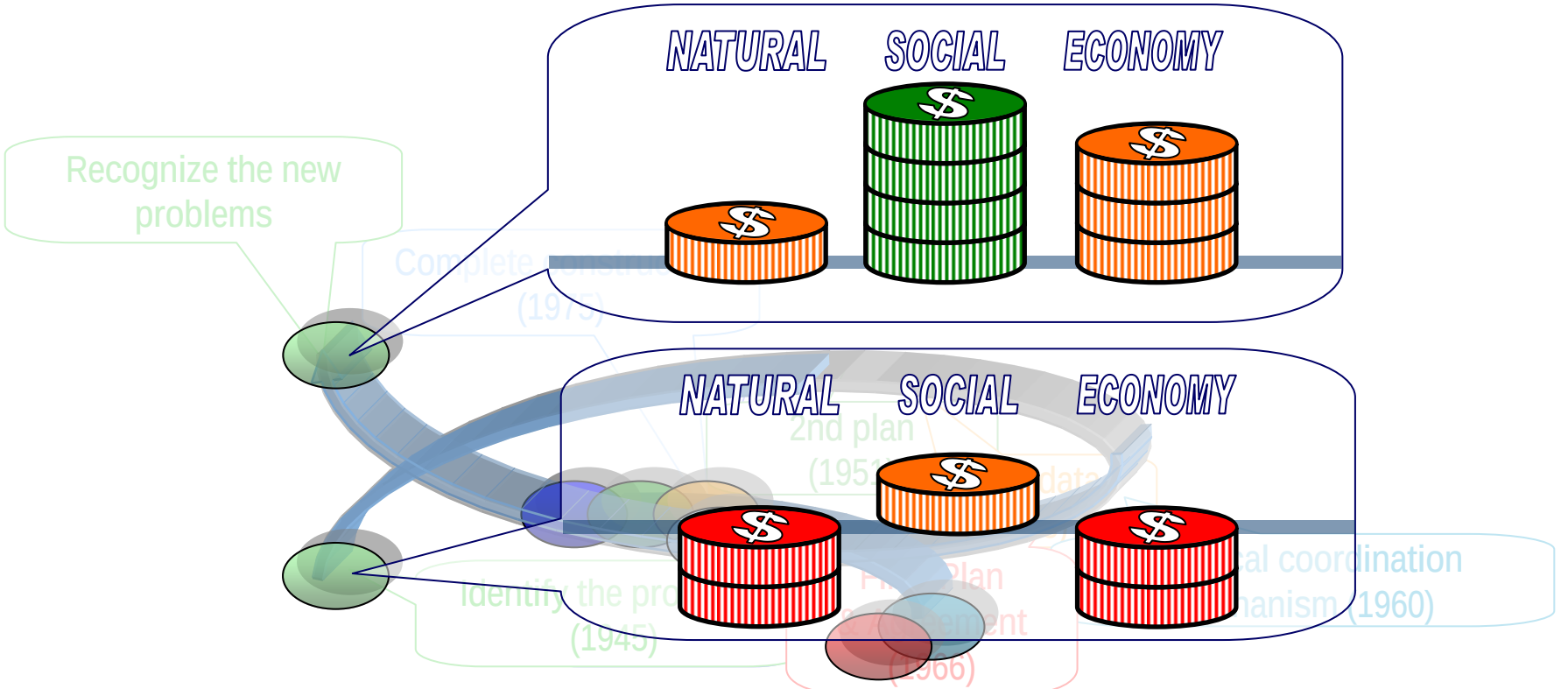
Social Impacts

✓**Necessity of drought conciliation mechanism**

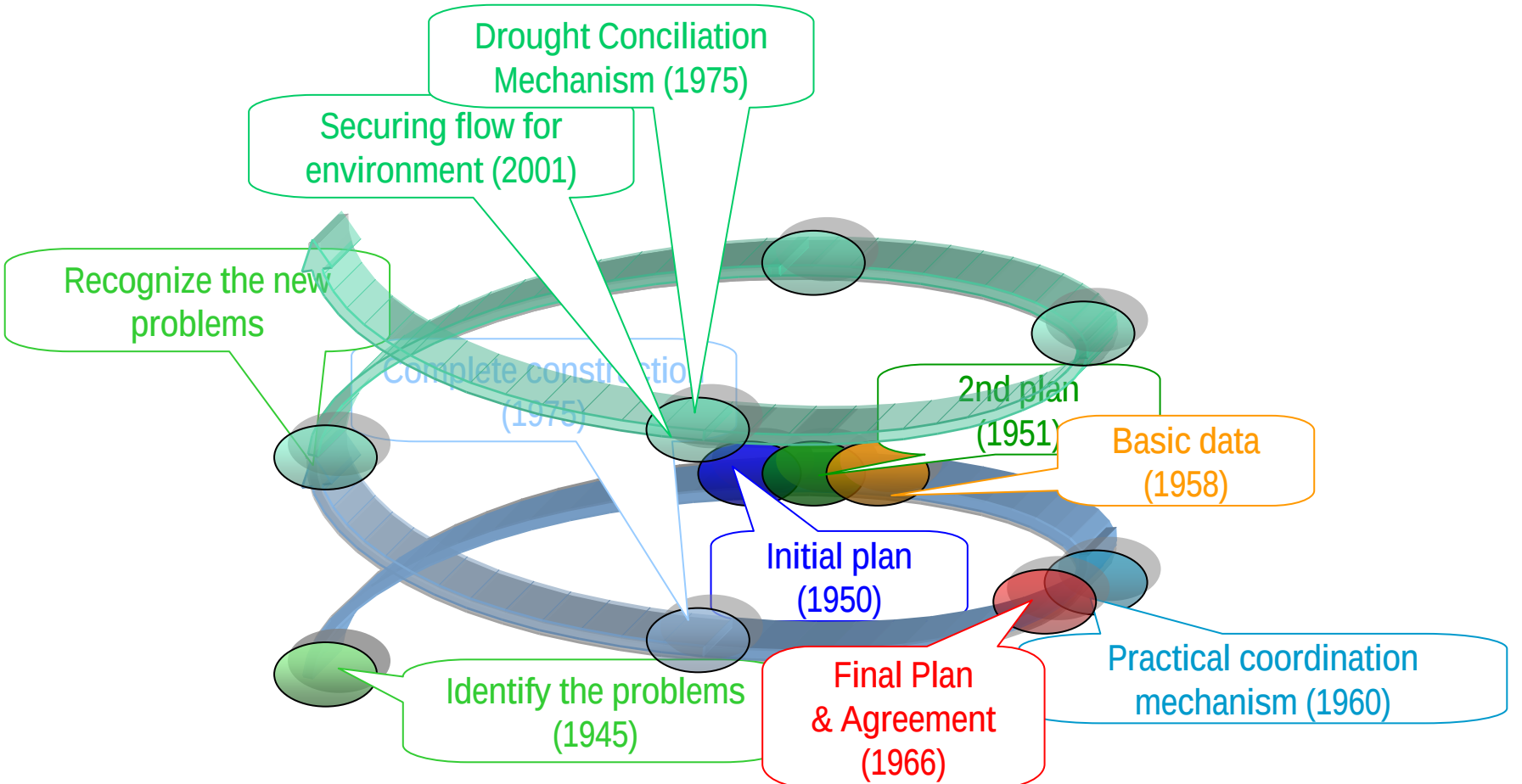
✓**Necessity of flow for environment**



Capitals on Triple Bottom Line

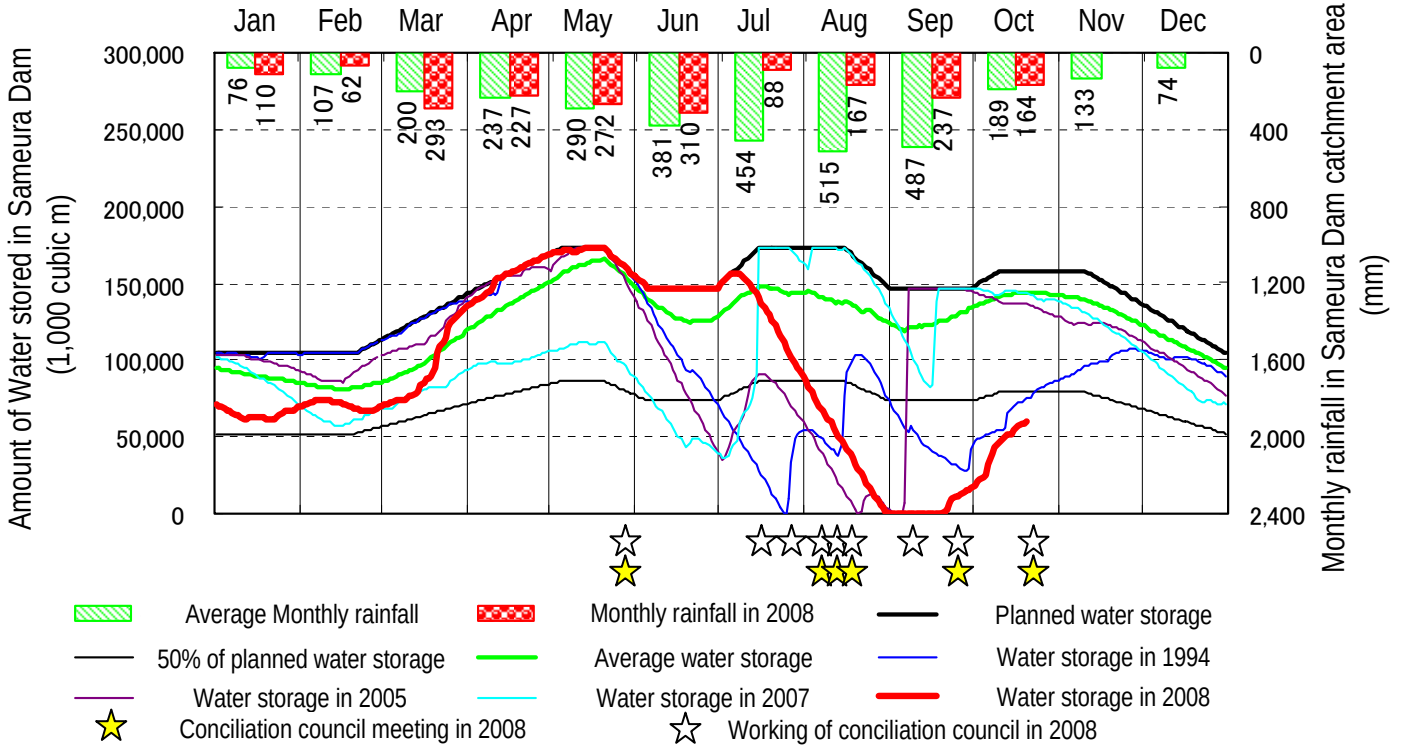


Next turn of the "Spiral"



Creation of mechanism for drought conciliation

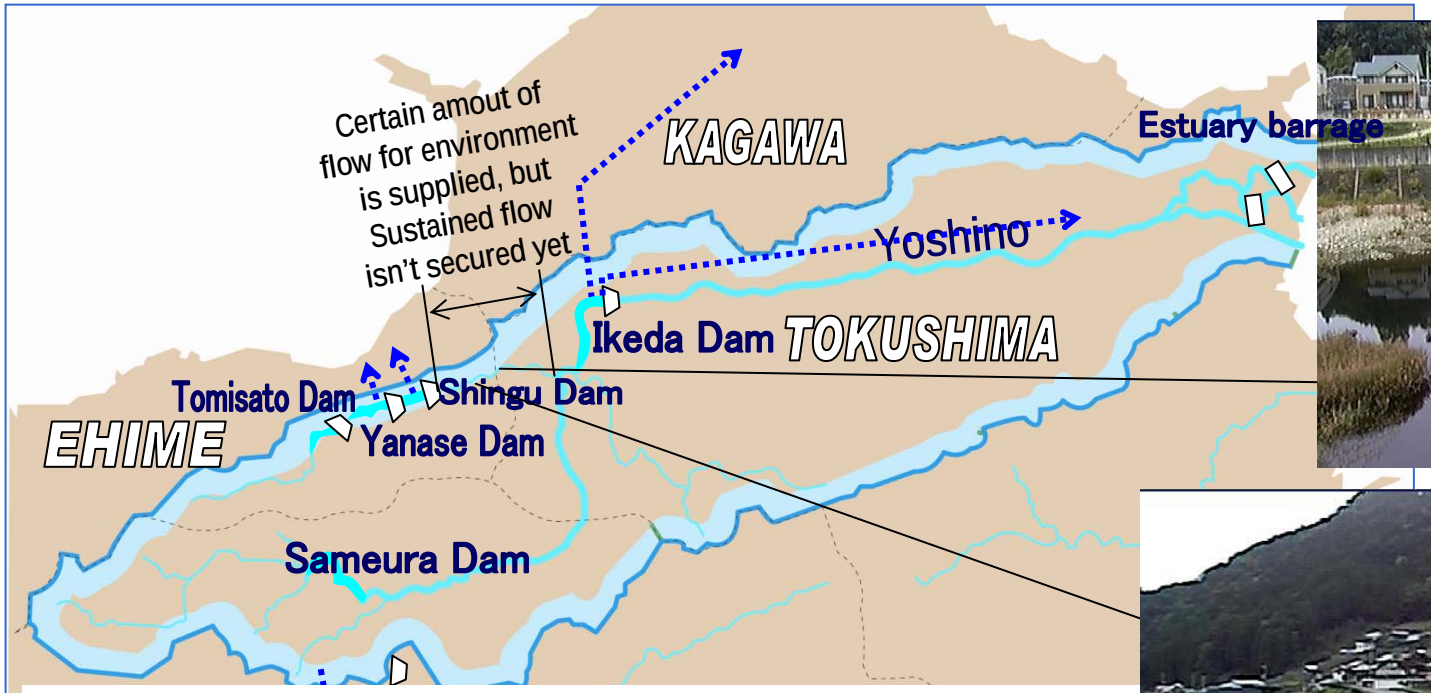
Conciliation Council for Water Use in the Yoshino River



[The Key]

☞ [1.1.2] Consider a significant change in the basin as a chance to move IWRM forward, and recognize and understand such changes as early as possible.
[3.2.4] Consider ways, including policy interventions, to secure water supply during extreme events.
[4.1.2] Keep the coordination scheme for planning and share information among stakeholders.

Securing flow for the environment so as to improve IWRM in the next stage



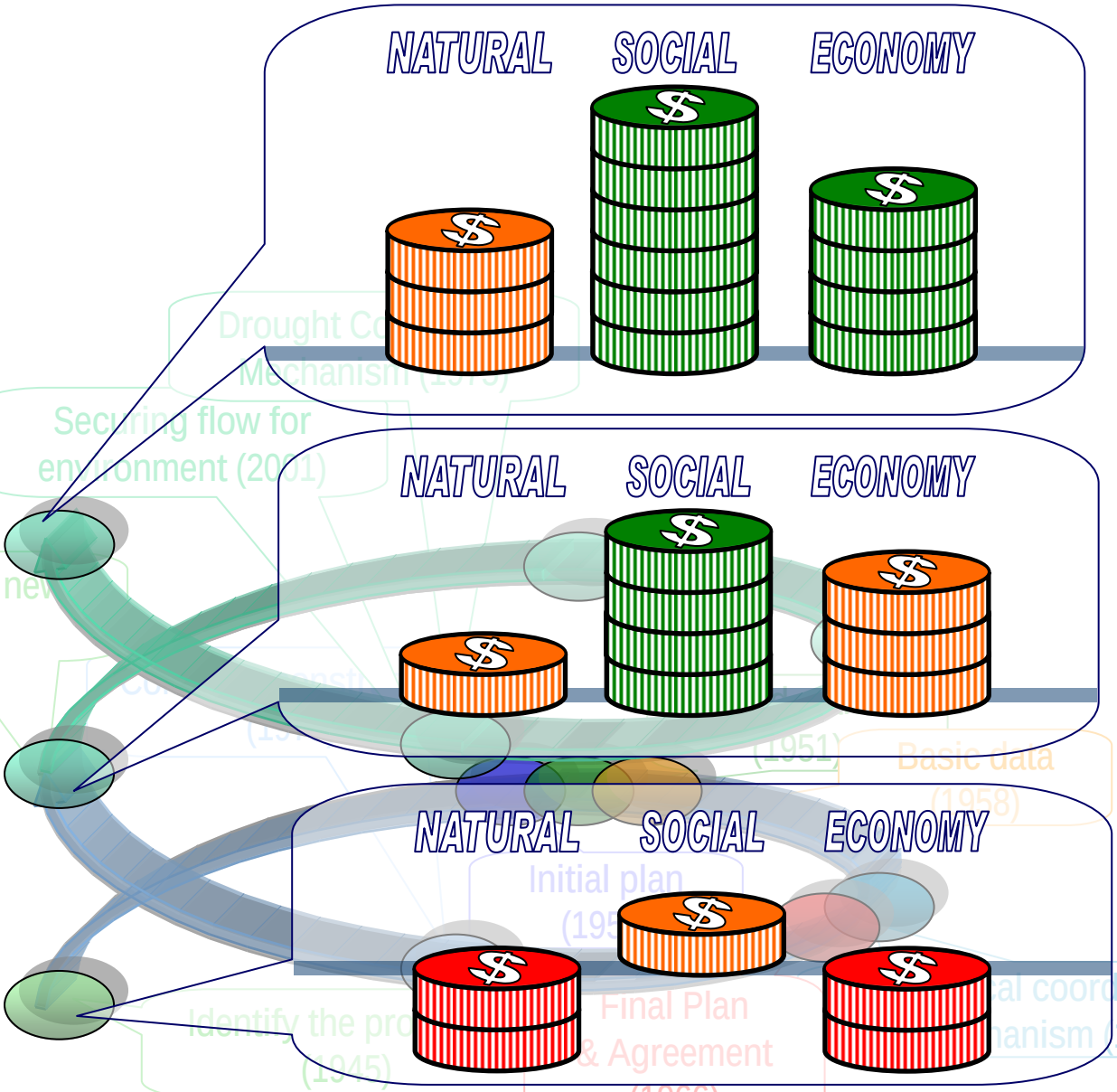
Sustained flow for the dowmstream of Singu dam isn't considered in YCDP.

In Tomisato dam project, certain amount of environment flow is supplied for riparian residents.

[The Key]

- [1.2.1] Identify potential priority areas (critical locations and key issues) for IWRM implementation in the basin.
  [4.2.3] Examine evaluation results and identify/analyze changes occurring in the basin through broad and long-term perspectives at each turning point of the IWRM process. Translate into a driving force to improve IWRM into the next stage.

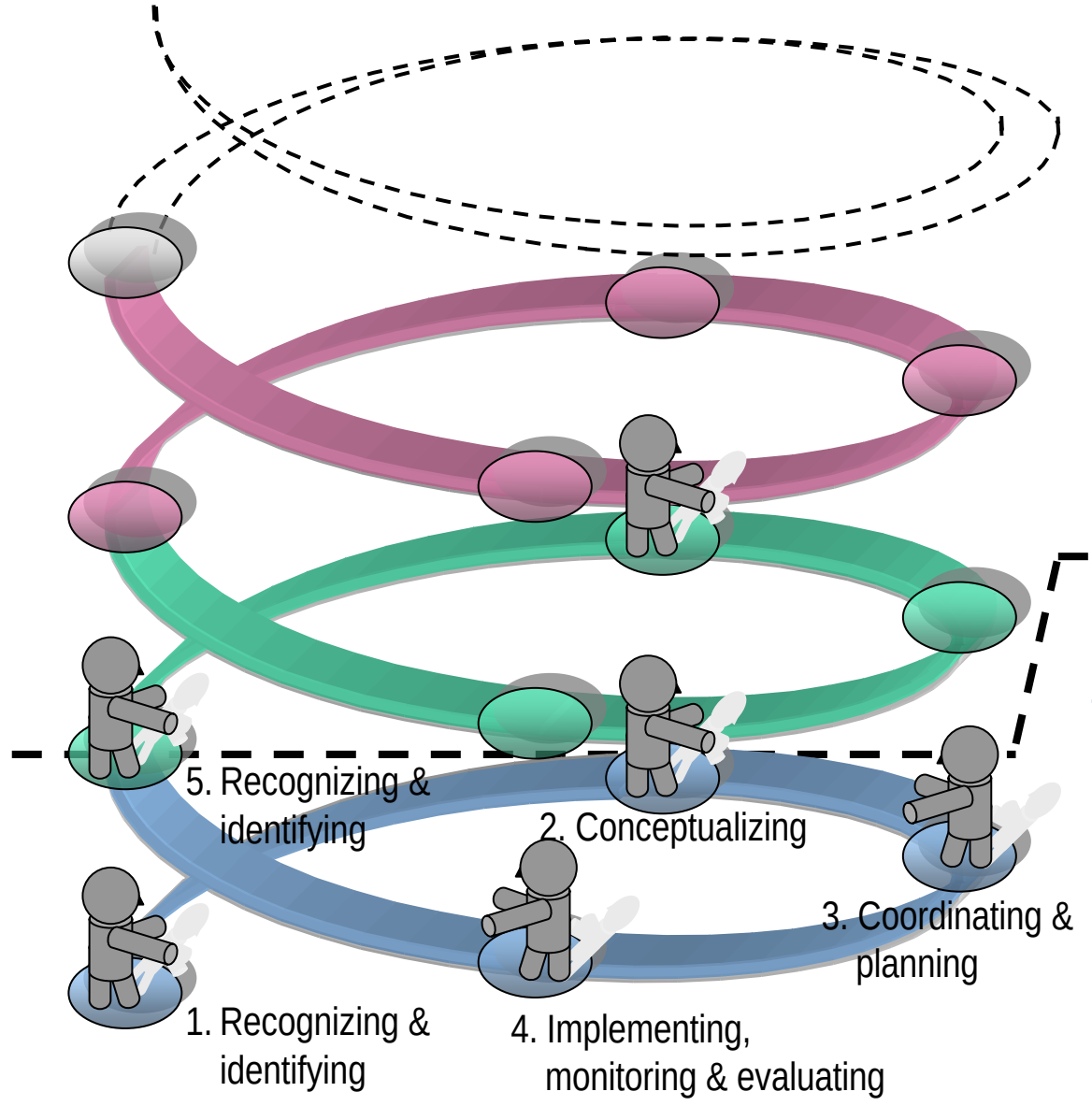
Capitals on Triple Bottom Line



Introduction of how to learn from the VGTB basin

Applying the "Spiral" model of IWRM to the VGTB

Case based Learning in Jeneberang River Basin



8. Discuss alternative action to optimize triple bottom line and stakeholder satisfaction
7. Apply lessons for future activities
6. Understand relationship among stakeholders
5. Understand priority issues

4. Find “Keys for Success” to improve IWRM
3. Discuss issues and lessons
2. Understand history of activities
1. Basic info of the basin

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Thank you for your participation!

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