Appropriate Adaptation and Mitigation Strategies for Integrated Water Resources Management: In Case of Tsurumi River Watershed, Near Tokyo, Japan

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Purpose of the Presentation

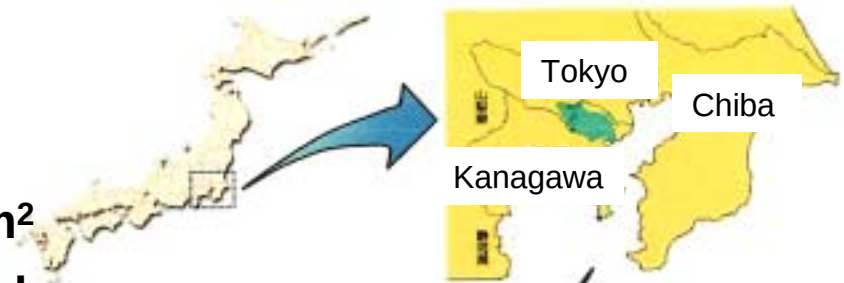
- **The FAO held a regional conference on Integrated Watershed Management: Water Resources for the Future at Sassari Province, Italy on 22-24 October 2003 preparing for the Next Generation of Watershed Management**
- **The following recommendation of the conference is known well as Sassari Declaration**
  - Good planning requires good understanding of links between upstream and downstream hydrologic and land use system
  - WM should be seen as an integrative approach that has value in understanding and solving conflicts between upstream and down stream communities
  - There is an urgent need to build capacity of all stakeholders to understand and manage the effective WM
- **The similar contents of the Declaration are proceeding and carrying out in the Tsurumi River Watershed, near Tokyo, Japan**
- **The presentation will focus on the process and the mechanism of activities proceeding in the watershed**

Location of Tsurumi River Watershed and Land Use Change (1958-1990)

Tsurumi river watershed:

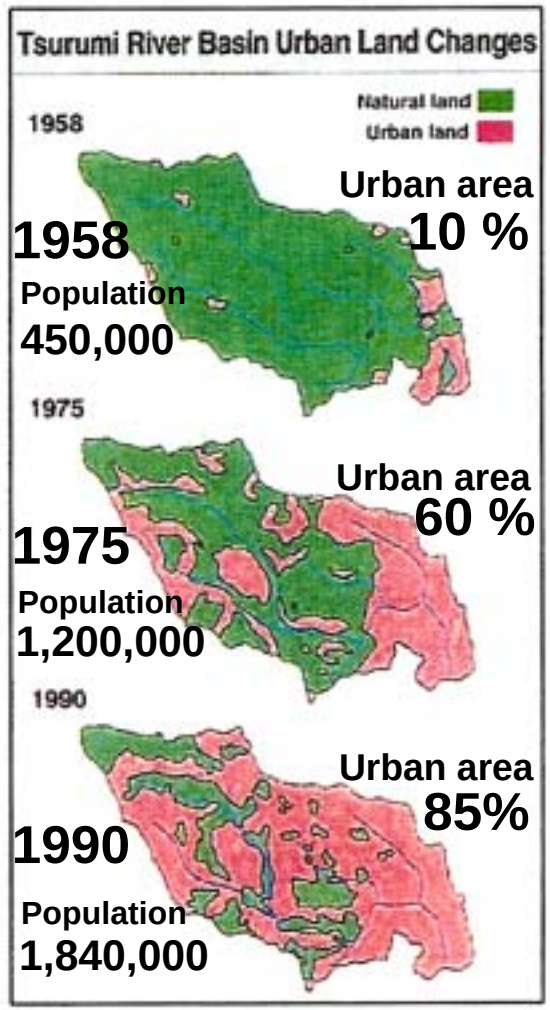
Area: 235 km²

Length: 42.5 km

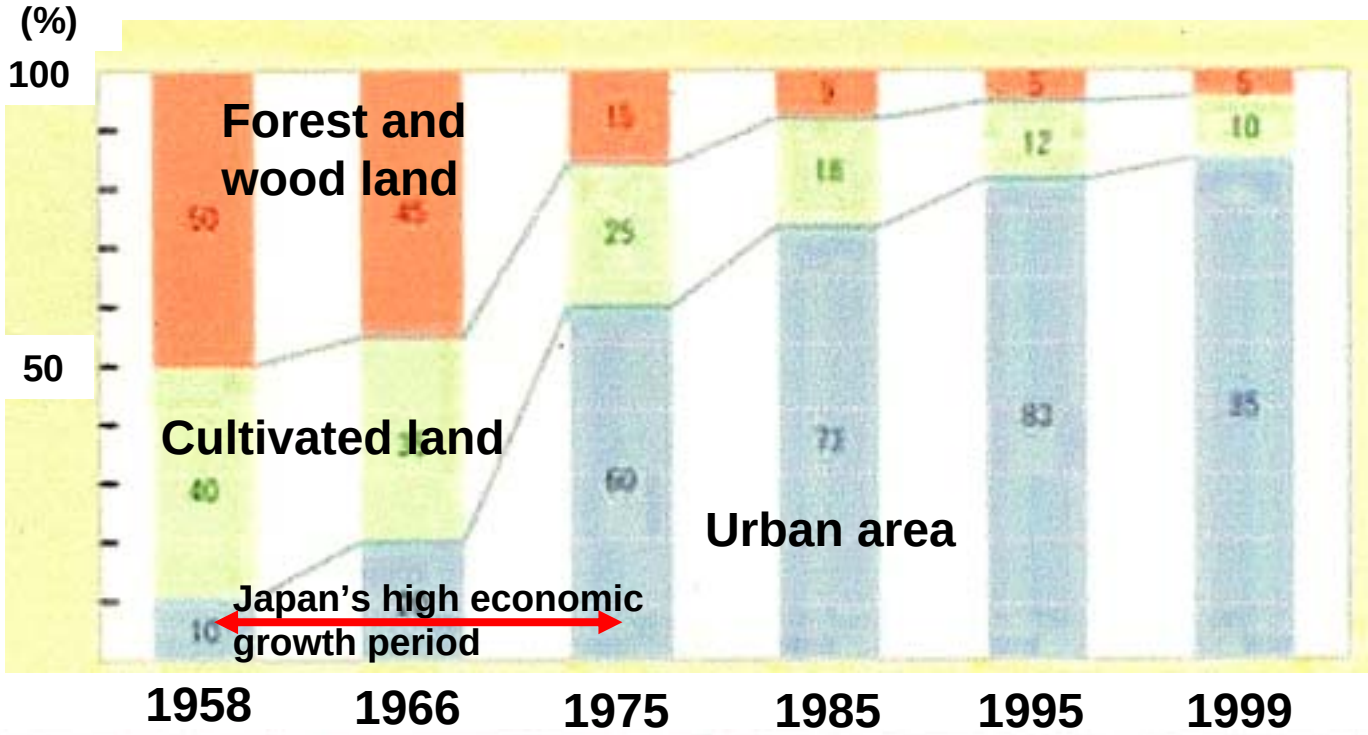


Tsurumi river watershed extents to 2 Local Governments and 4 Cities

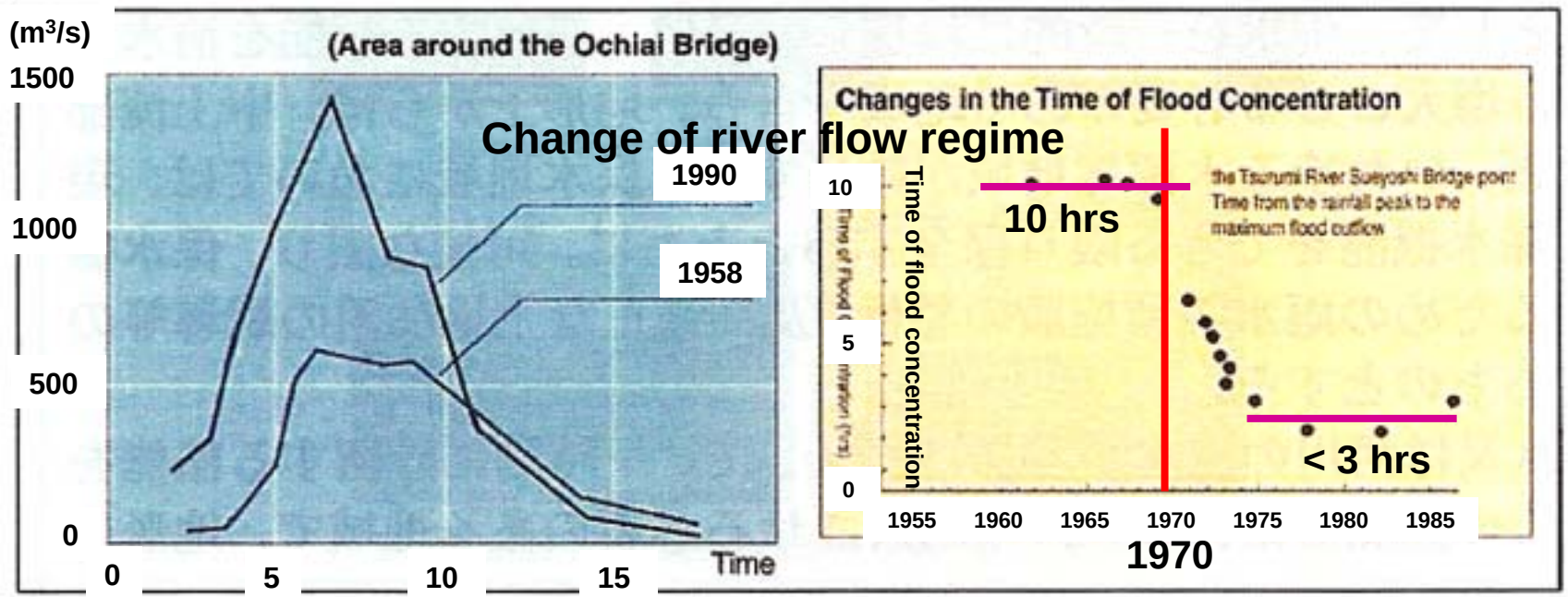
Land use change



Land Use and River Flow Regime Changes of the Watershed

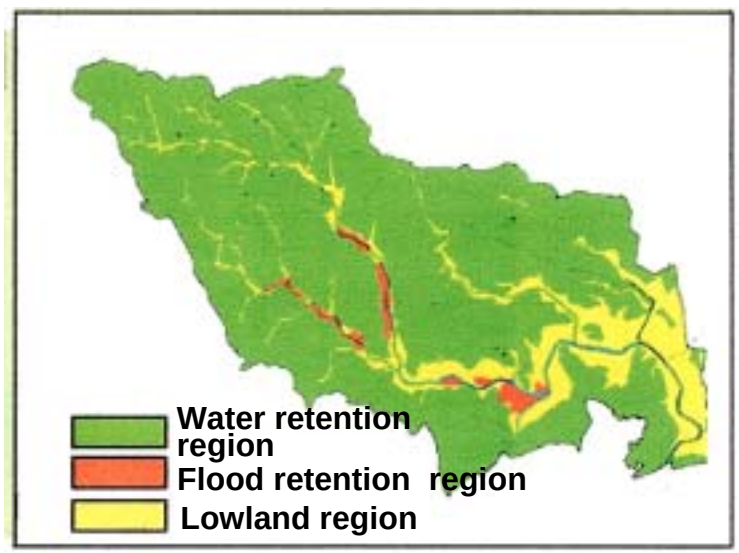


Land use change



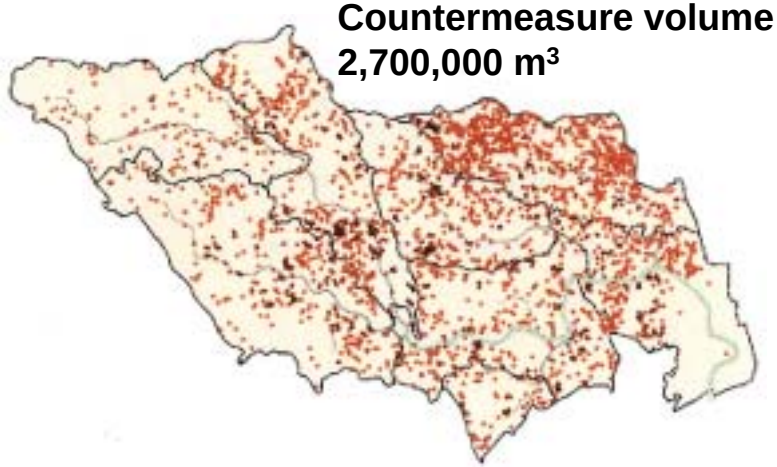
Countermeasures of First Stage (1980s)

- **Establish the Countermeasure Council on Integrated Flood Control of Tsurumi River Watershed in Sept., 1980**
- **This council is consisted from 2 local governments and 4 cities which locate in the watershed and the national government, MLIT (Ministry of Land, Infrastructure, Transport and Tourism)**
- **The council decided 2 Target Action Plans for flood control of the watershed: one is the regional division of the watershed as the countermeasure region against the flood control and the setting of the attenuation (flood detention) reservoirs in the watershed**



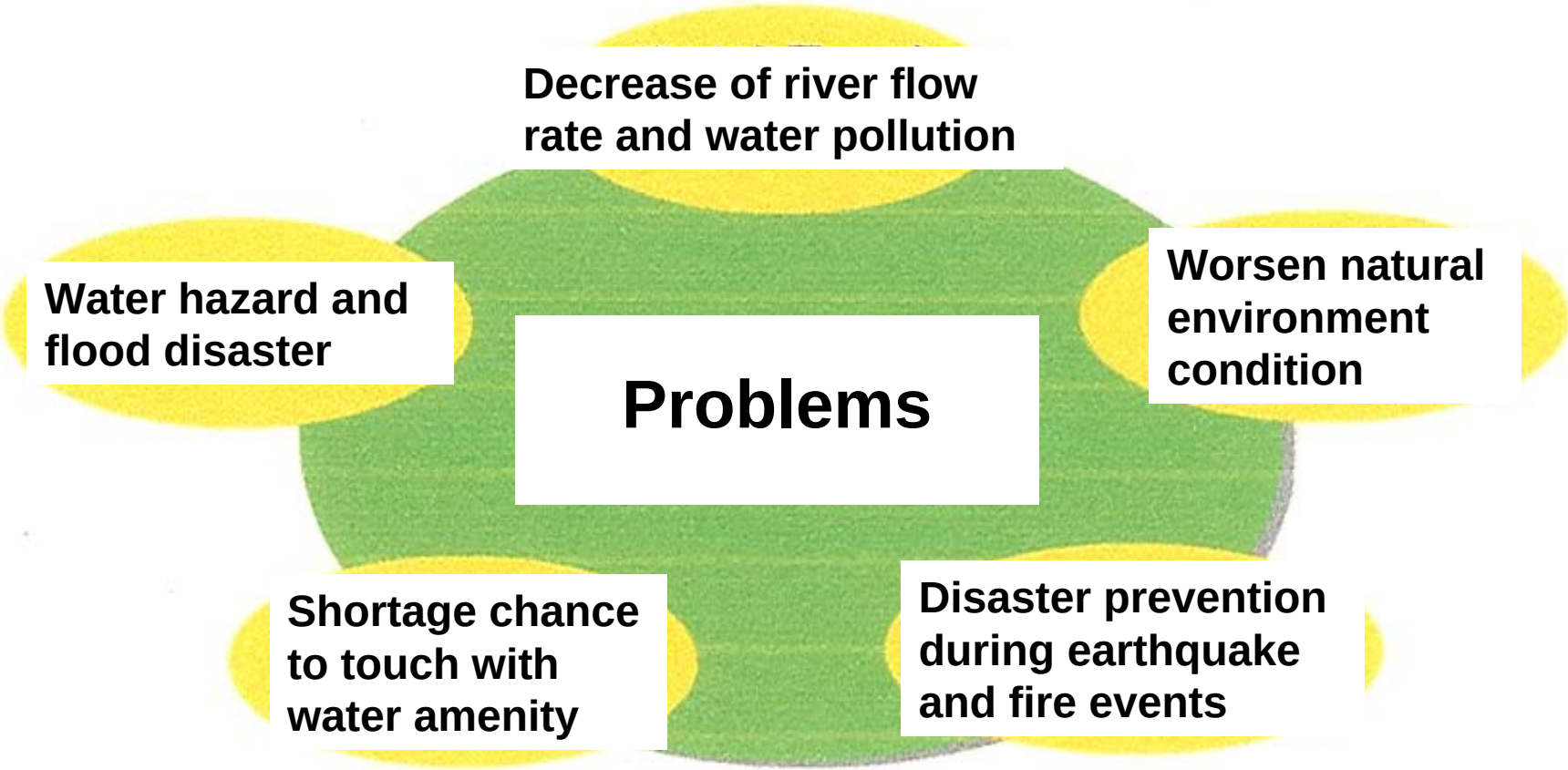
Regional division for flood control

Number of reservoir: 3,300
Countermeasure volume: 2,700,000 m³



Distribution of setting attenuation reservoirs by the end of 2002

Many Problems Occurred in the Watershed

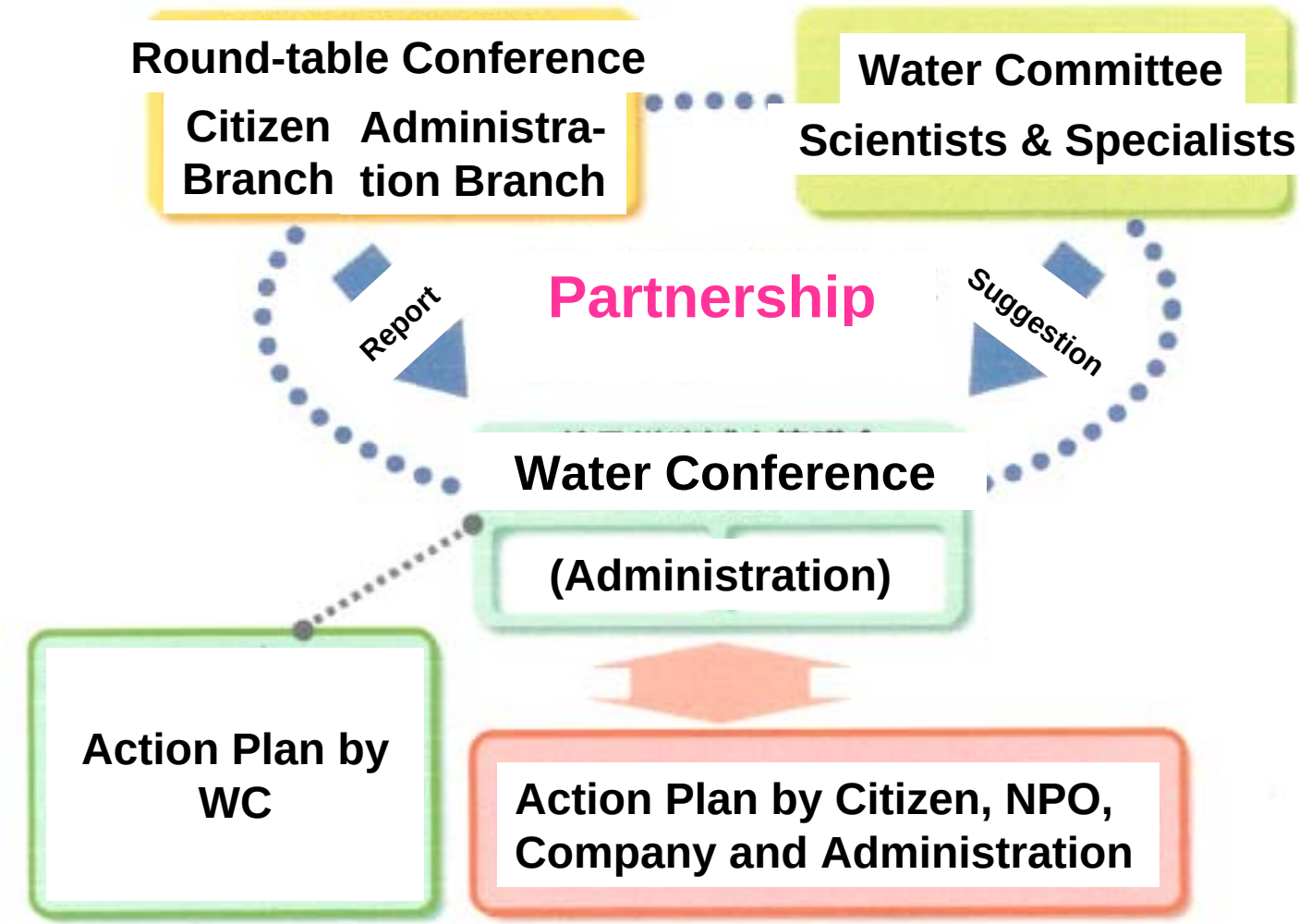


Integrated Watershed Management

Countermeasures of Second Stage (2000s):

- **Establishment of Water Conference of Tsurumi River Watershed in 2004 for not only flood control but also making sustainable water utilization and sound water cycle**
- **Making of Water Master Plan of Tsurumi River Watershed by Water Conference in 2004**
- **MLIT (Ministry of Land, Infrastructure, Transport and Tourism) has introduced the “Act on Countermeasures Against Flood Damages of Specified Rivers Running Across Cities” in 2003 as the National Law of No. 77**
- **The Act asks (requires) the management for a watershed unit not a local government unit**
- **Also Act requires permission and countermeasures for actions to protect damage of rainwater infiltration by causing land use and cover changes (LUCC)**
- **The Act was applied firstly in Japan to the Tsurumi River Watershed in 2005**

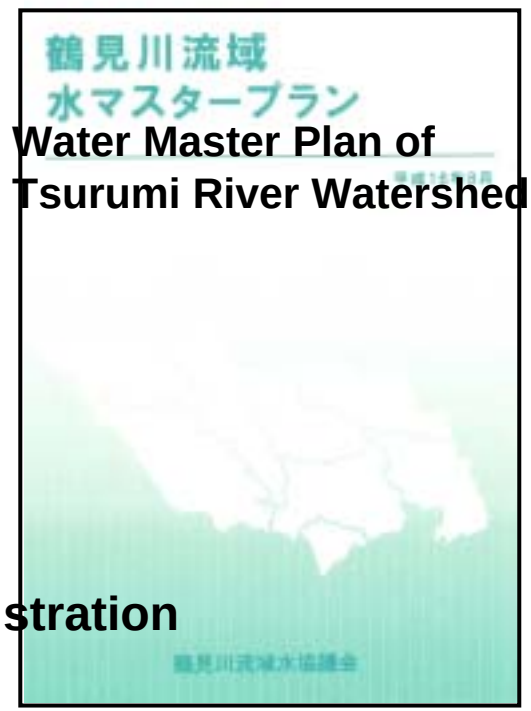
Establishment of Water Conference of Tsurumi River Watershed



Organizations for Carrying Out of the Integrated Watershed Management

Making of Water Master Plan

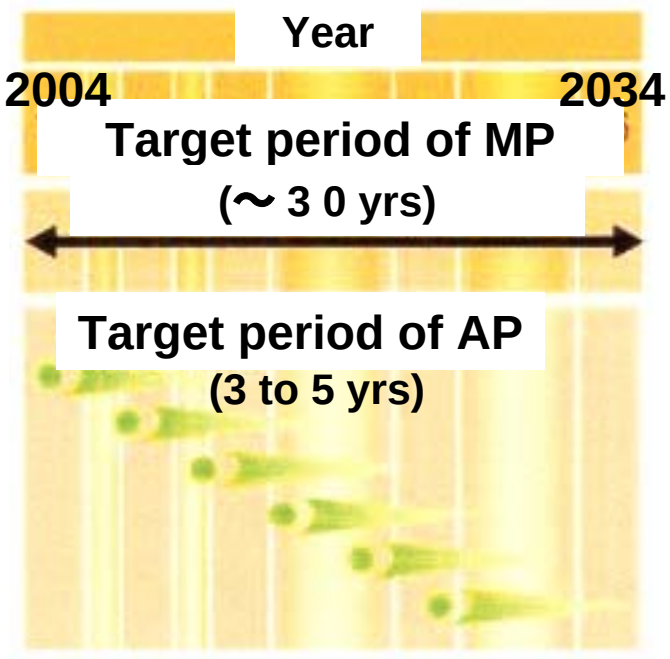
- **WC made the Water Master Plan of Tsurumi River Watershed in 2004**
- **Basic idea:**
  Watershed rehabilitation from view point of sound of water cycle system
- **Mechanism:**
  1. **Making of water master plan and integrated management**
  2. **Cooperative action with different stakeholders and suitable share of their role**
- **Basic scheme:**
  1. **Water management during flood time**
  2. **Water management in ordinary time**
  3. **Management of natural environments**
  4. **Management in earthquake and fire events**
  5. **Management of water amenity**
- **Action plan:**
  Proposed by WC
  Proposed by Citizen, NPO, Company and Administration



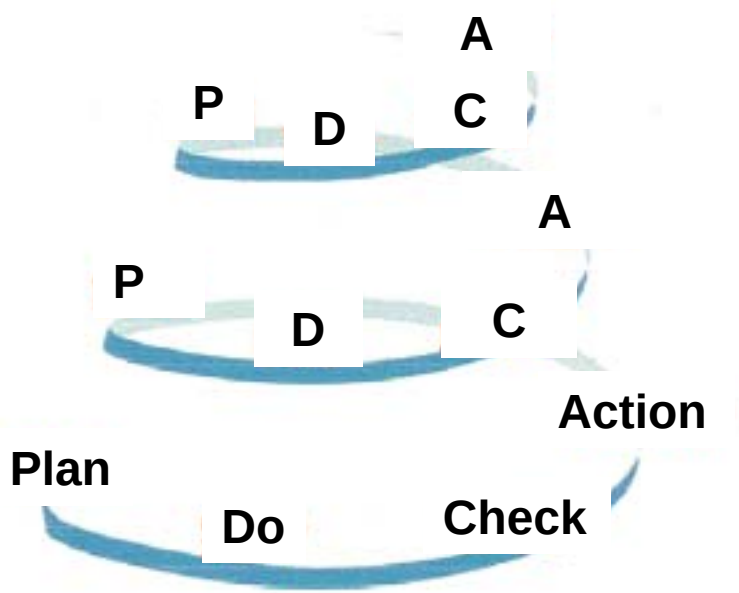
Water Master Plan of Tsurumi River Watershed

Operating Action Plans

1. Adjustment plan of Tsurumi river water system (2007)
2. Countermeasure plan for flood disaster in Tsurumi river watershed (2007)
3. Action plan for water quality improvement (2008)
4. Action plan for secure water and using in earthquake and fire events (2008)
5. Action plan for increasing users of water amenity (2009)
6. Action plan for conservation of an important species (2009)



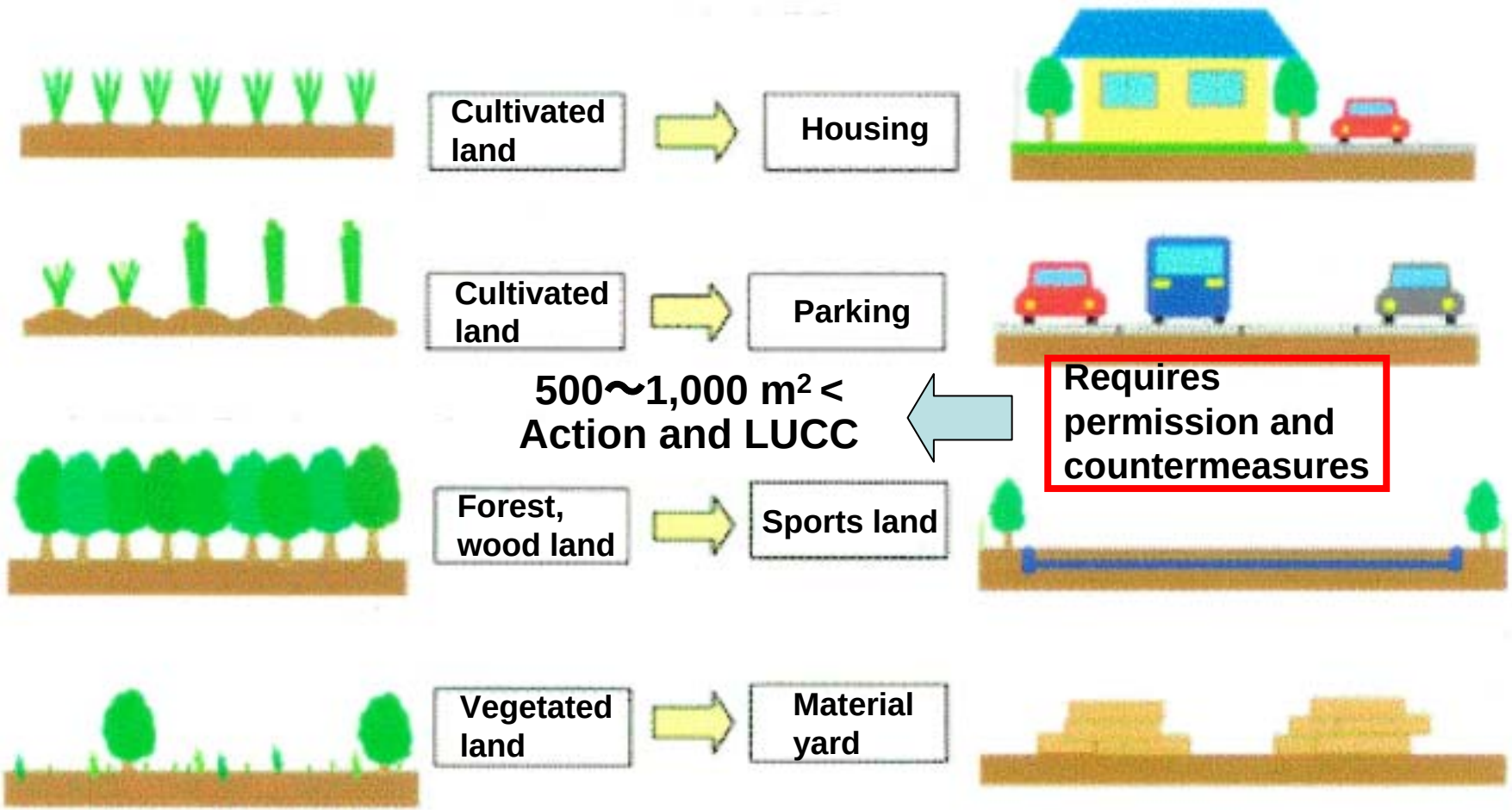
Relationship between MP and AP



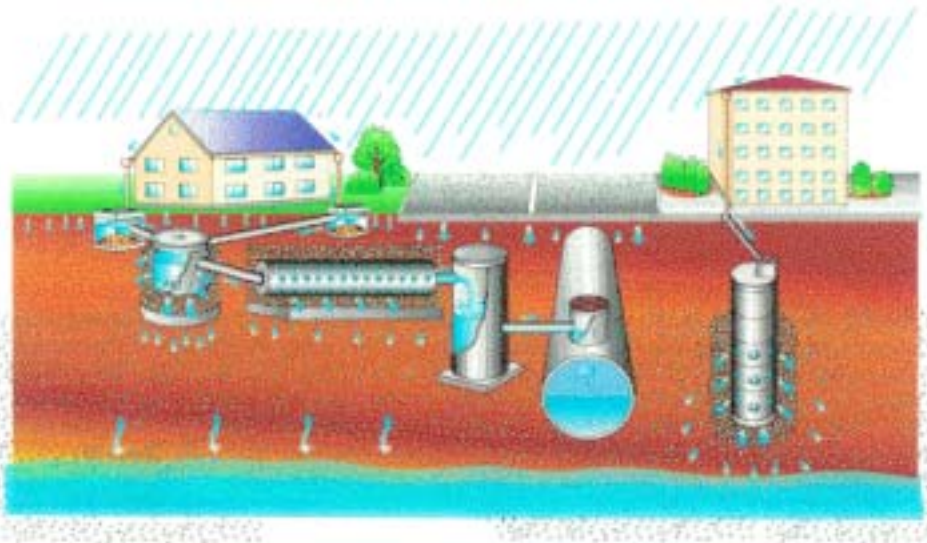
Management Cycle of Spiral PDCA Cycle

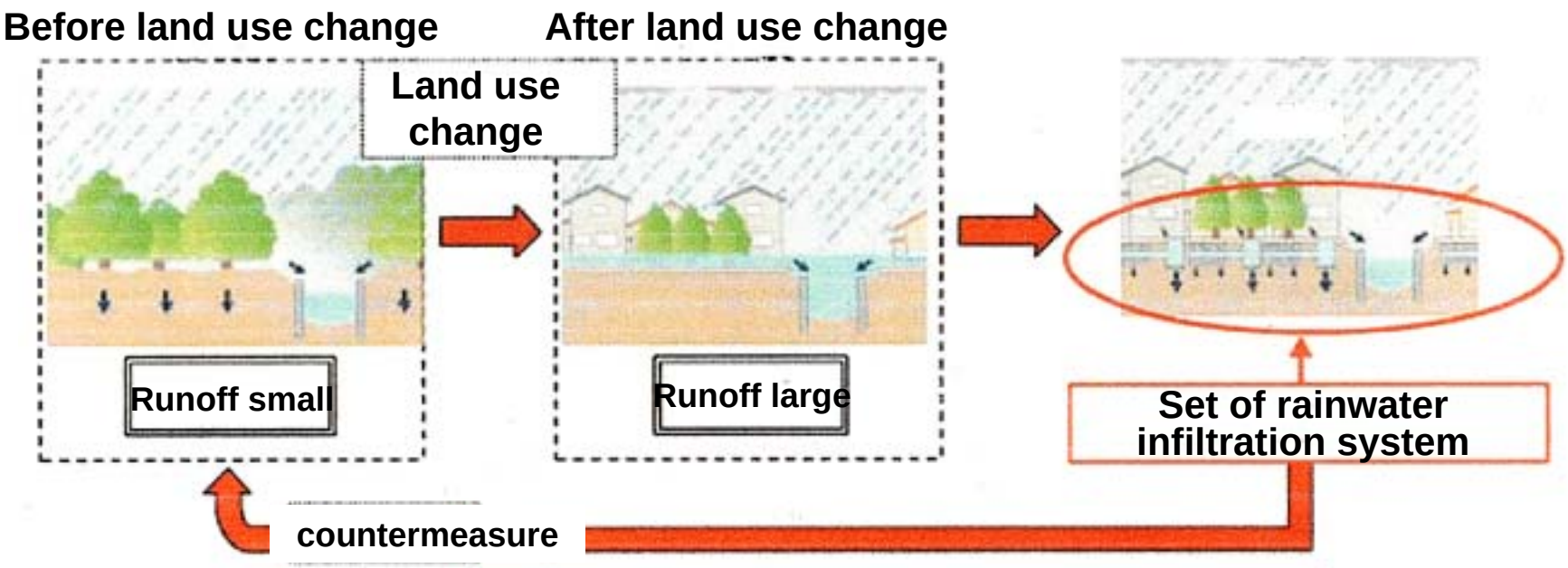
Introduce Corporate Social Responsibility (CSR)

Examples of Actions for Protect Damage of Rainwater Infiltration by Causing Land Use and Cover Changes (LUCC)

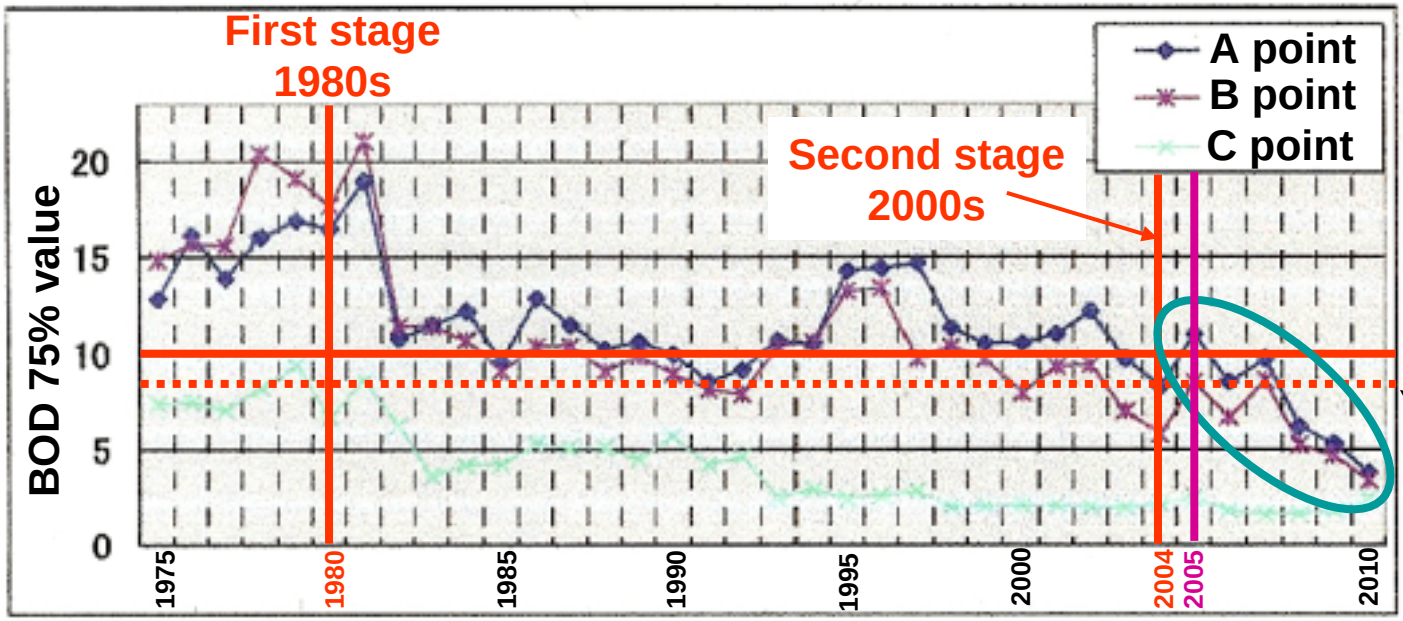


Example of Rainwater Infiltration System





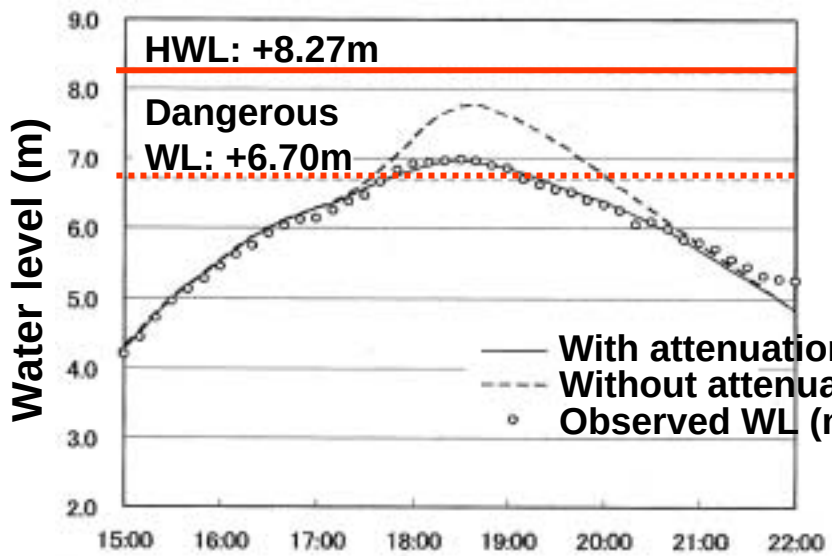
Effective Results



Changes of water quality

Environ. ST value at B and C points

Environ. ST value at A point



9 Oct., 2004 Typhoon 22

Observed water level and simulated water level at A point at Typhoon 22 on 9 Oct., 2004

Setting of attenuation (flood detention) reservoirs decrease WL of 0.8m successfully at the peak discharge of the Typhoon

Concluding Remarks

- **Watershed management should be integrated as including academic research, capacity building, governance and decision making**
- **Establishment of a Water Conference and making a Water Master Plan are needed for proceeding cooperate activities among different stakeholders**
- **Introducing an Action Plan concept based on a Water Master Plan is effective way to stimulate cooperative activities with different stakeholders and suitable share of their role in watershed management**

- **Another important aspect in the watershed management is to introduce the concept of Corporate Social Responsibility (CSR)**
- **In case of Japan, CSR is working well by introducing the Act as a National Law regarding countermeasures against flood damages**
- **CSR relates mainly to the land use and cover changes (LUCC)**
- **Integrated watershed management addresses to the next generation watershed management: water resources for the future**


Thank you very much !