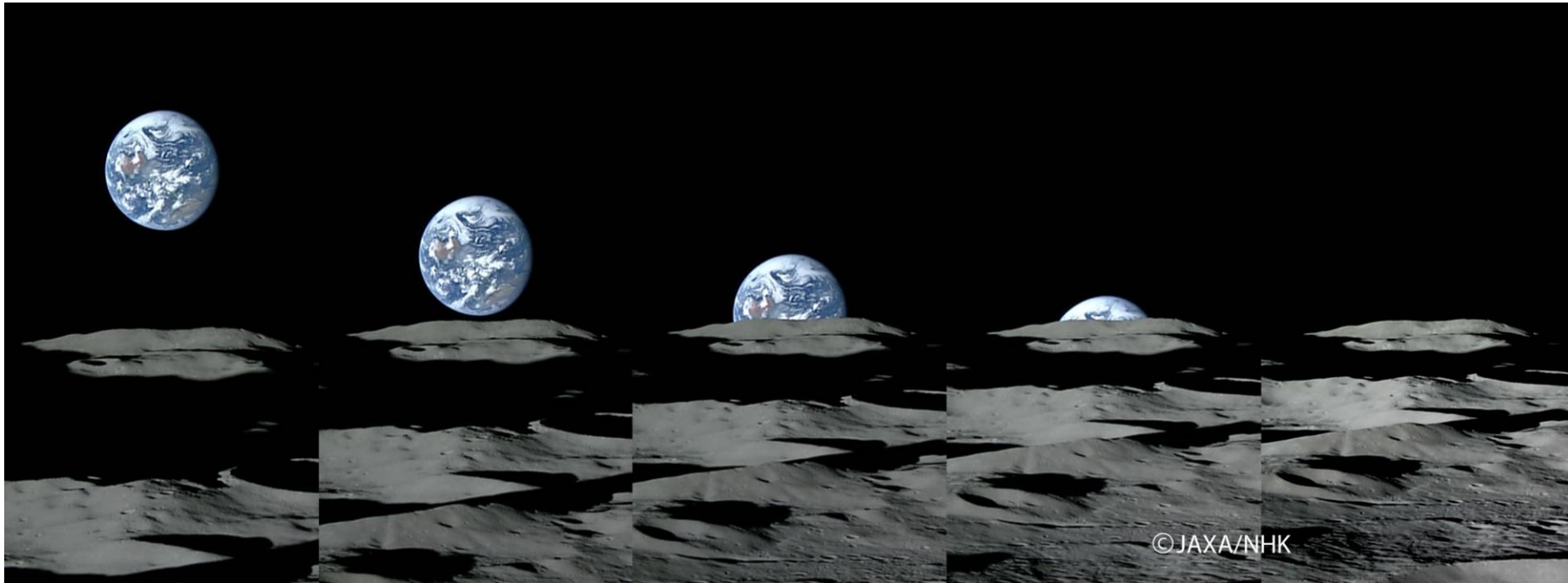


# Japan's Experiences in Water Resources Management and Some Implications to NARBO Members

## 水資源管理における日本の経験と途上国への含意

The Earth from the Moon: an Aqua Planet.



- High-vision photos by a Japan's moon probe satellite “Kaguya” on 7 November 2007. Source: (c)AFP/JAXA/NHK
- The planet earth is sinking behind the moon's horizon.

# Essential Nature of Water(水の本質)

- Water exists and changes in gas, liquid, and solid. (水は3体に変幻自在)
- Water is borderless and global public asset. (水は境なく、地球公共財)
- Water is eternally recycling asset. (水は永久循環財)
- Water can neither owned nor consumed, but only recycled from one person to another, and one place to another. (水は消費されず、人から人へ、場所から場所へ、循環するだけである)
- Water can only borrowed from the nature for a while. (水は所有できるものではない、自然からの一時的な借りものに過ぎない)
- Water is economical, social, ecological, and cultural asset for everyone. (水は経済的、社会的、生態的、そして文化的な価値を有する共有の循環資産である)



# Today's Topics

Aim: Japan's experiences could show some implications to NARBO Members for water resources management.

## Topic 1:

A short review on how Japan received foreign aids after the war.

## Topic 2:

Water Management in Monsoon Asia: 3 Concerns (3つの主要課題)

### ① Too much water (洪水)

Flood endangers human security and industrial assets.

### ② Too little water (渇水)

Droughts endangers people's livelihood and industrial production.

### ③ Conservation of Water Environment (水環境保全)

Asian growth invites serious deterioration of water environment.

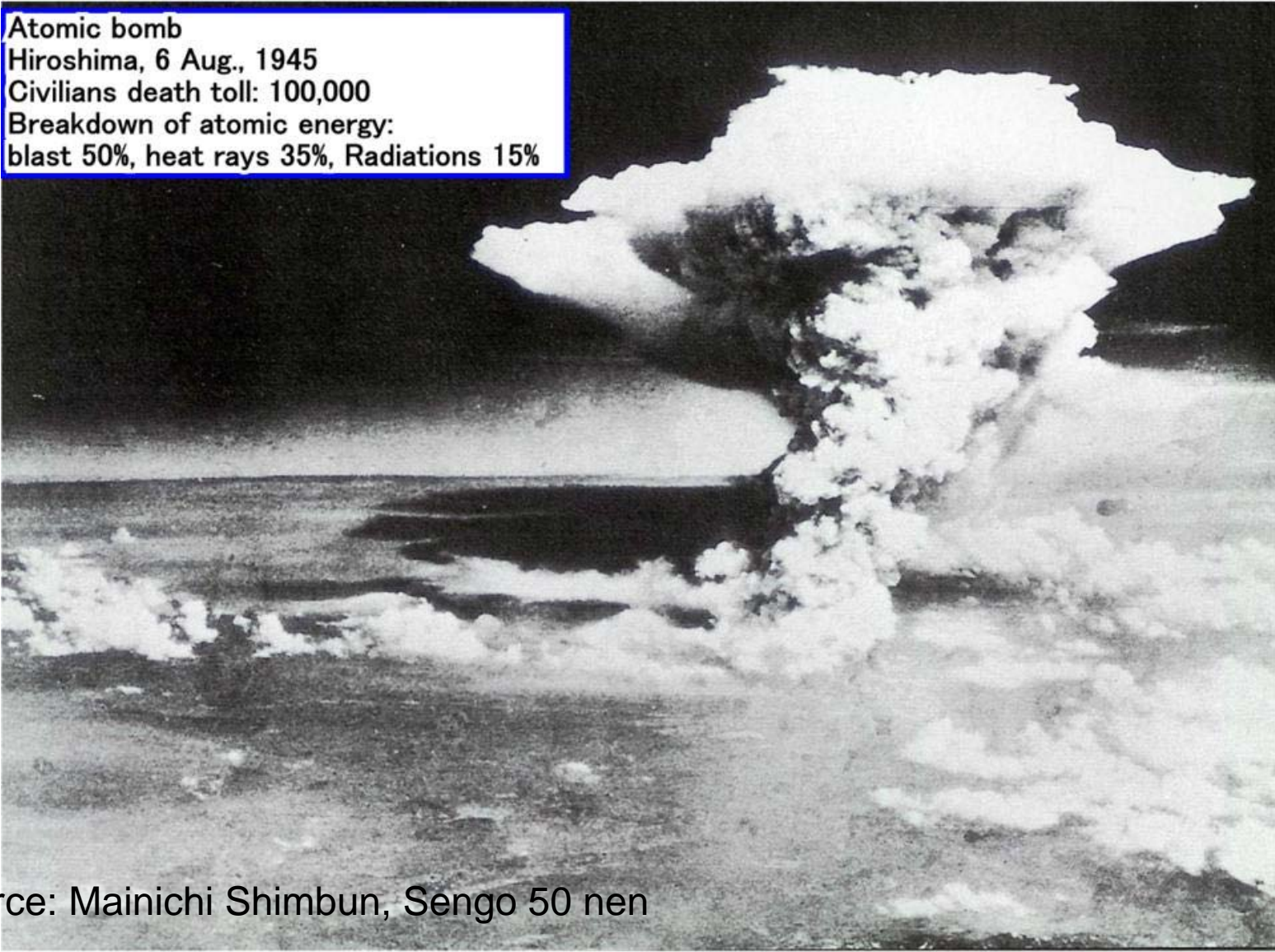
## Topic 3:

An Emerging Crisis of Enormous Flood Disasters in Monsoon Asia:

# Topic 1: Japan was a Major Recipient of Foreign Aids

## An Atomic Bomb in Hiroshima in 1945

Atomic bomb  
Hiroshima, 6 Aug., 1945  
Civilians death toll: 100,000  
Breakdown of atomic energy:  
blast 50%, heat rays 35%, Radiations 15%

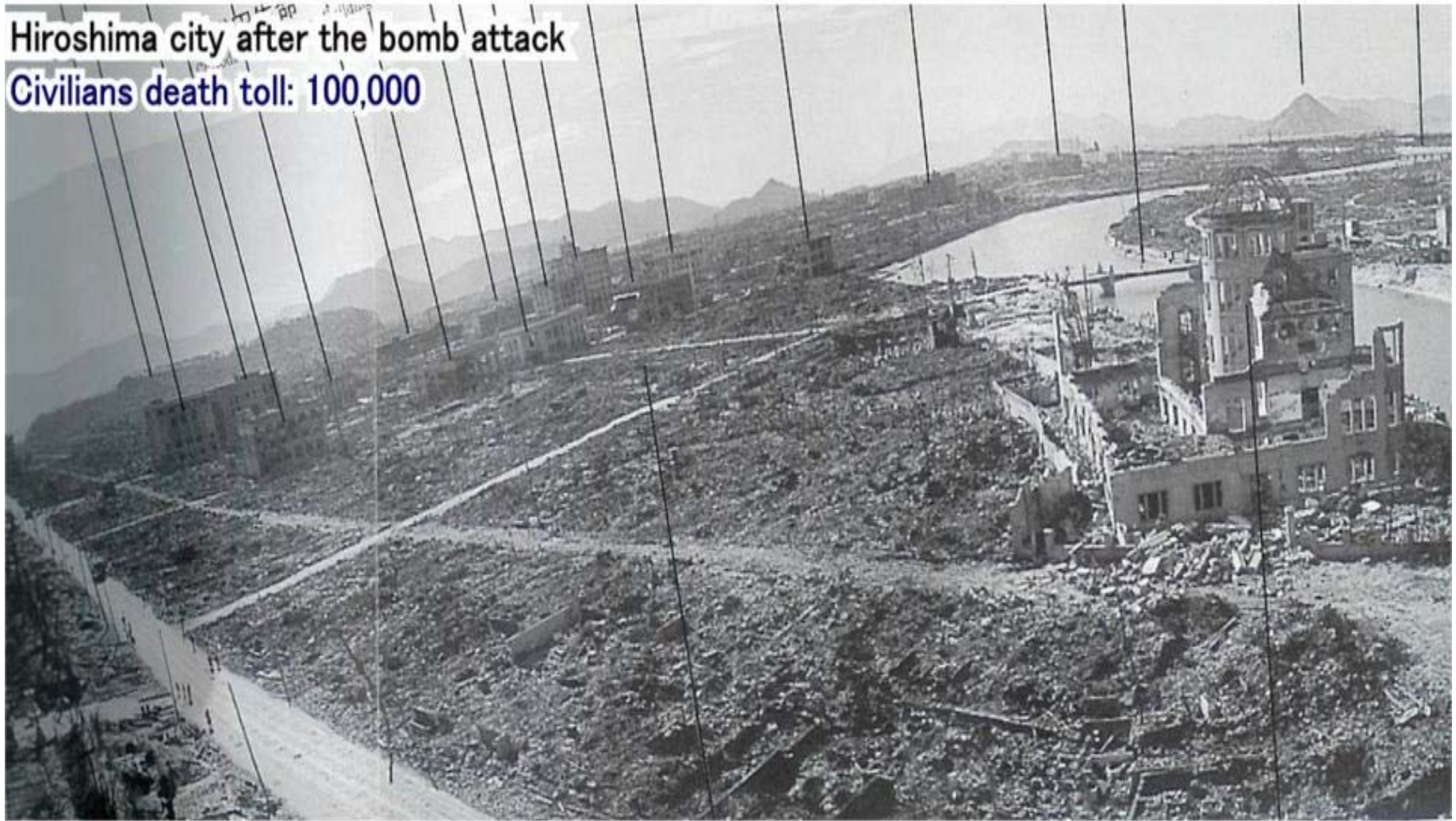


Source: Mainichi Shimbun, Sengo 50 nen



# Hiroshima city after the bomb attack

Hiroshima city after the bomb attack  
Civilians death toll: 100,000



Source: Mainichi Shimbun, Sengo 50 nen



# Tokyo after the war in 1945

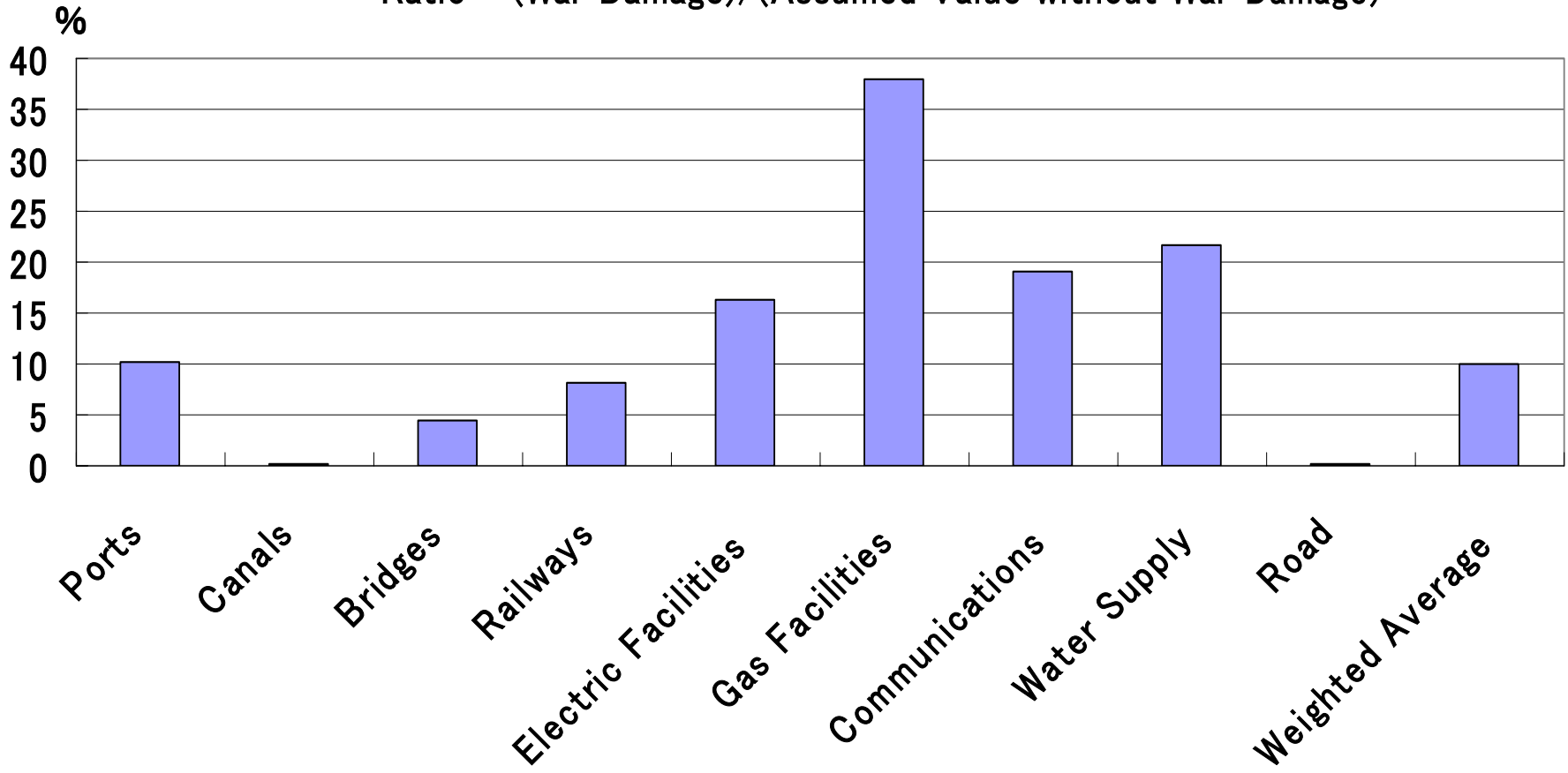


# War Damages on Infrastructure

→ Less damages → A Secret of the Rapid Recovery

## War Damage Ratios of Infrastructure

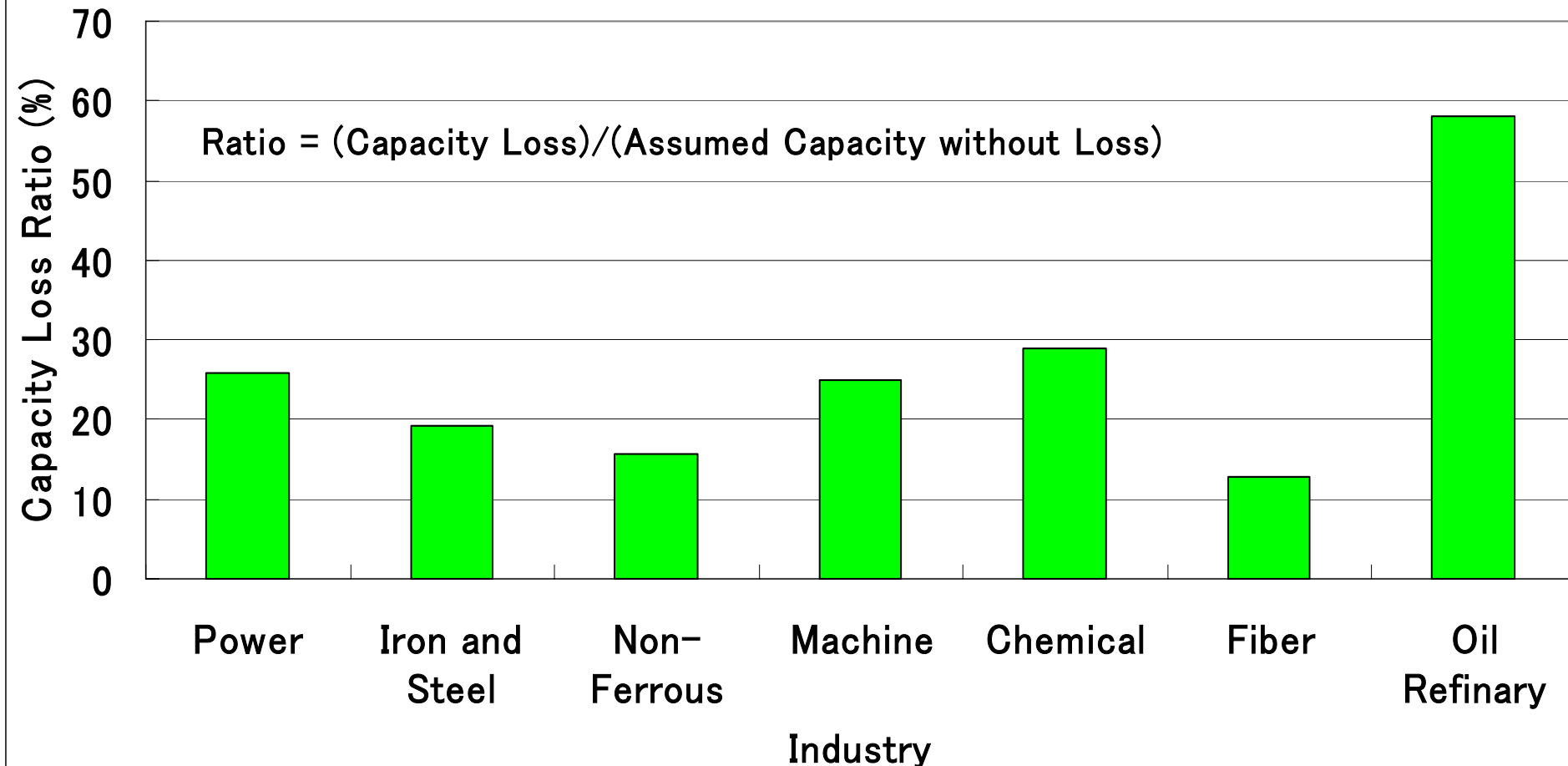
Ratio = (War Damage)/(Assumed Value without War Damage)



# War Damages on Industrial Productive Capacity

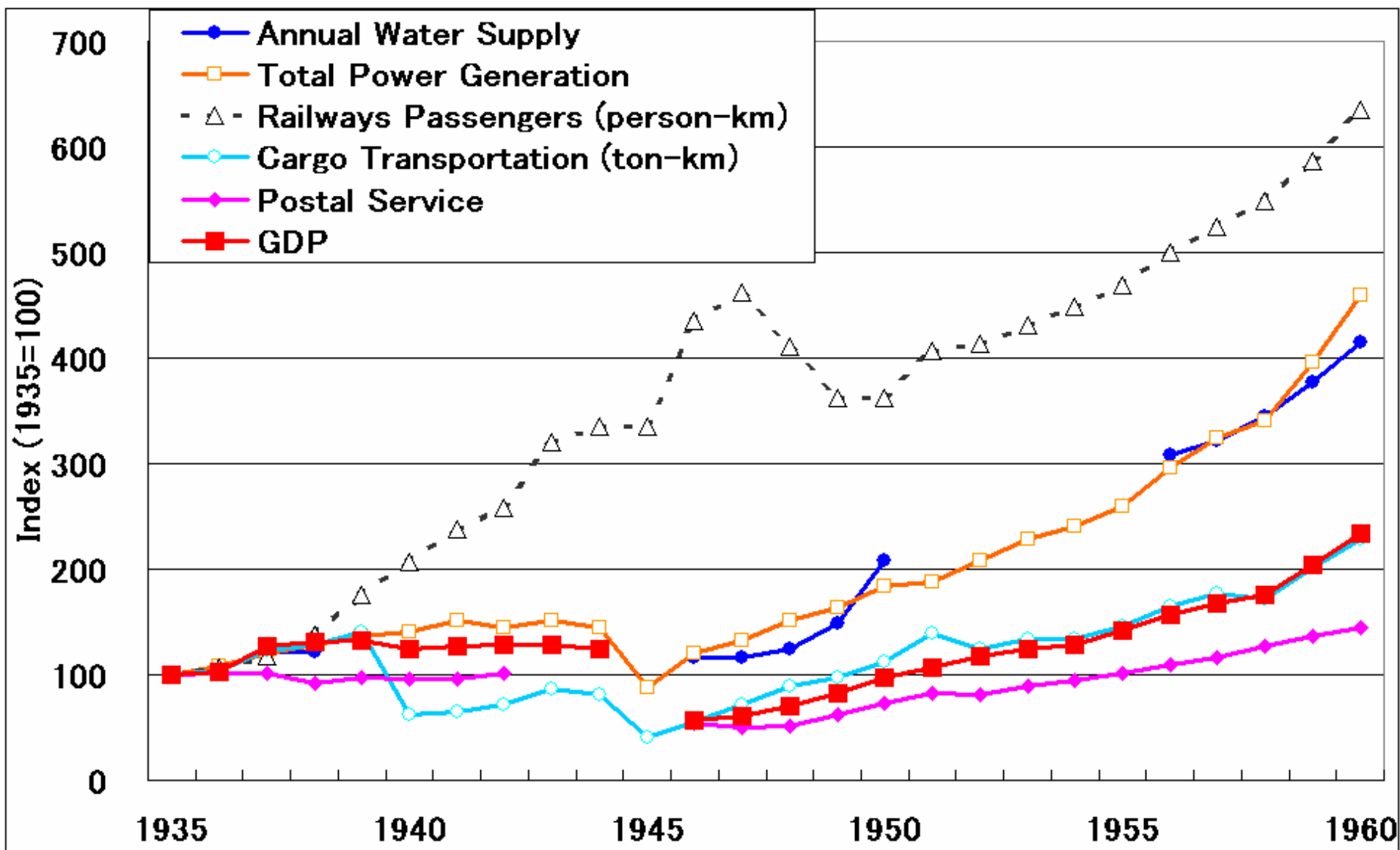
→ The heavy damages gave Japan a chance to introduce innovations in technologies and institutions

Loss of Industrial Productive Capacity by War





# Infrastructure Service Indexes (1935-1960)



# Japan under SCAP's occupation (1945-1952)



MacArthur arrival at Atsugi (near Tokyo) on 30 Aug. 1945

To rule over Japan without troubles, MacArthur quickly recognized “the significance of the Emperor” who was a spiritual/religious leader in Japan.

MacArthur decided to try to do his business “on behalf of” the Emperor.



The first meeting on 27 Sept. 1945

# National Security and Reconstruction

State Security



Food Security



Economic and Social Recovery



# Lessons during the Occupation Period with regard to infrastructure reconstruction

## Occupation Period (1945-1952):

Post-war Major Reforms by SCAP(USA) or GHQ

- Demilitarization, Introduction of Democracy and Human Rights
- Social and Economic Transformation

3 revolutions in Japan, (645, 1868, 1945)

Principles for the Infrastructure Reforms introduced by SCAP(USA)

- Public goods: who serves?

Demarcation among local, central and private sectors

Utility tariffs determined by “public utility committee”

- Self-financing for tariff-chargeable public service
- Market oriented service delivery (promotion of privatization)

Lessons → 3 types of reforms: own initiative, compromised, and instructed.

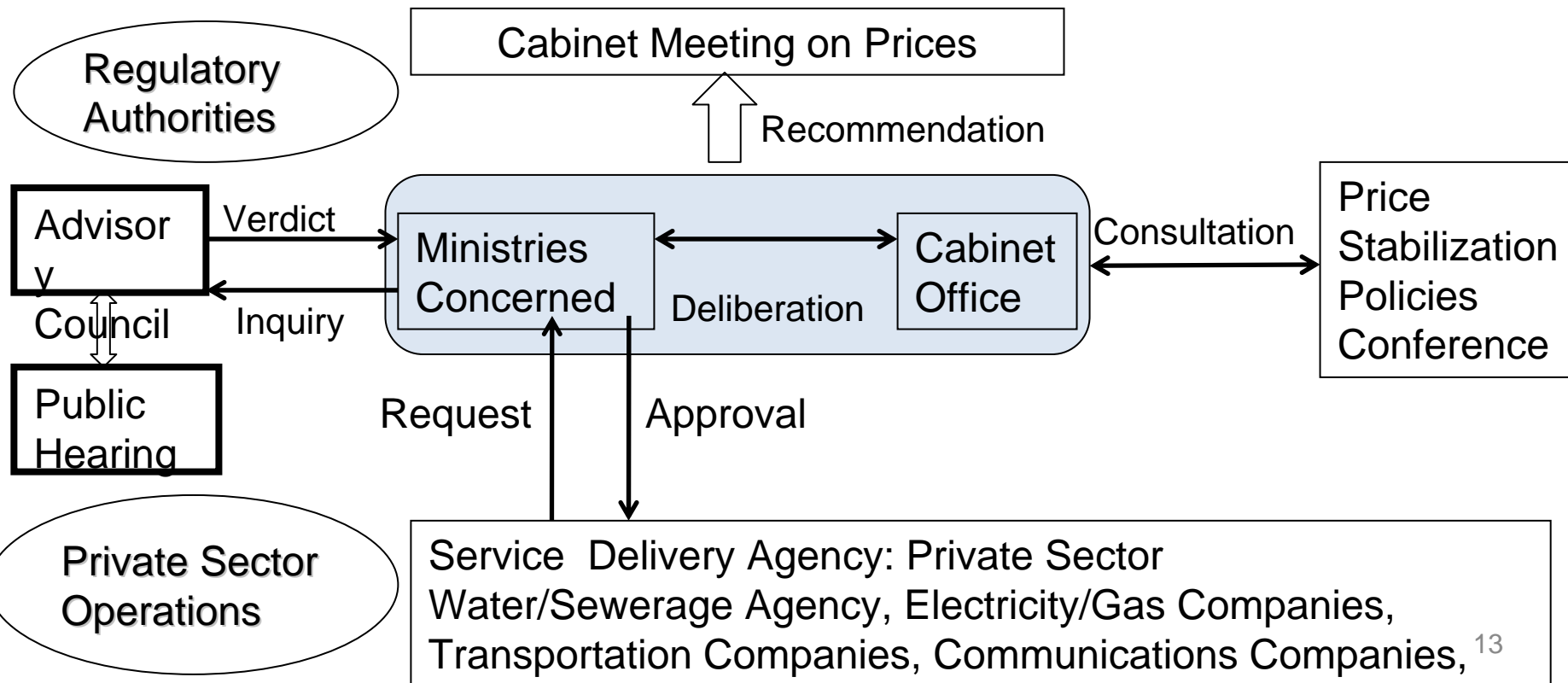
## “Cultural and Institutional Transfer”

- A Prelude to World Bank's Assistance (1953-1966)

# An Example: Financial Autonomy and Public Involvement in Infrastructure Service

- Revenue = reasonable cost = cost for efficient operations + fair profit reward
- Beneficiary pays principle: beneficiaries should pay in accordance with the benefits they receive.
- Self-financing principle: sustainable service delivery without external subsidies.

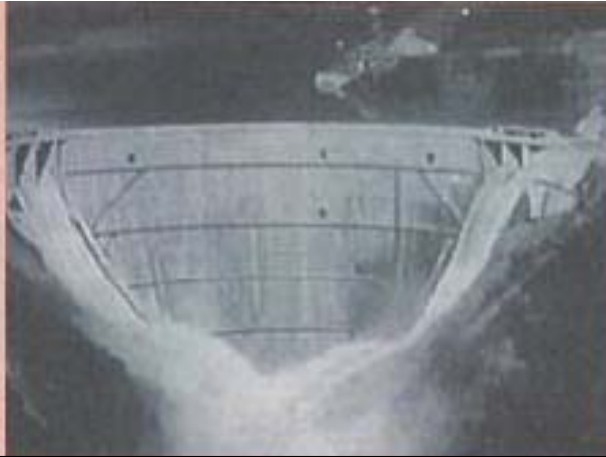
## Tariff Decision Mechanism for Public Utilities in General



# World Bank Assistance (1953-66)



Sinkansen



Hydropower



Irrigation

Steel Plant



Highways



Truck Industry

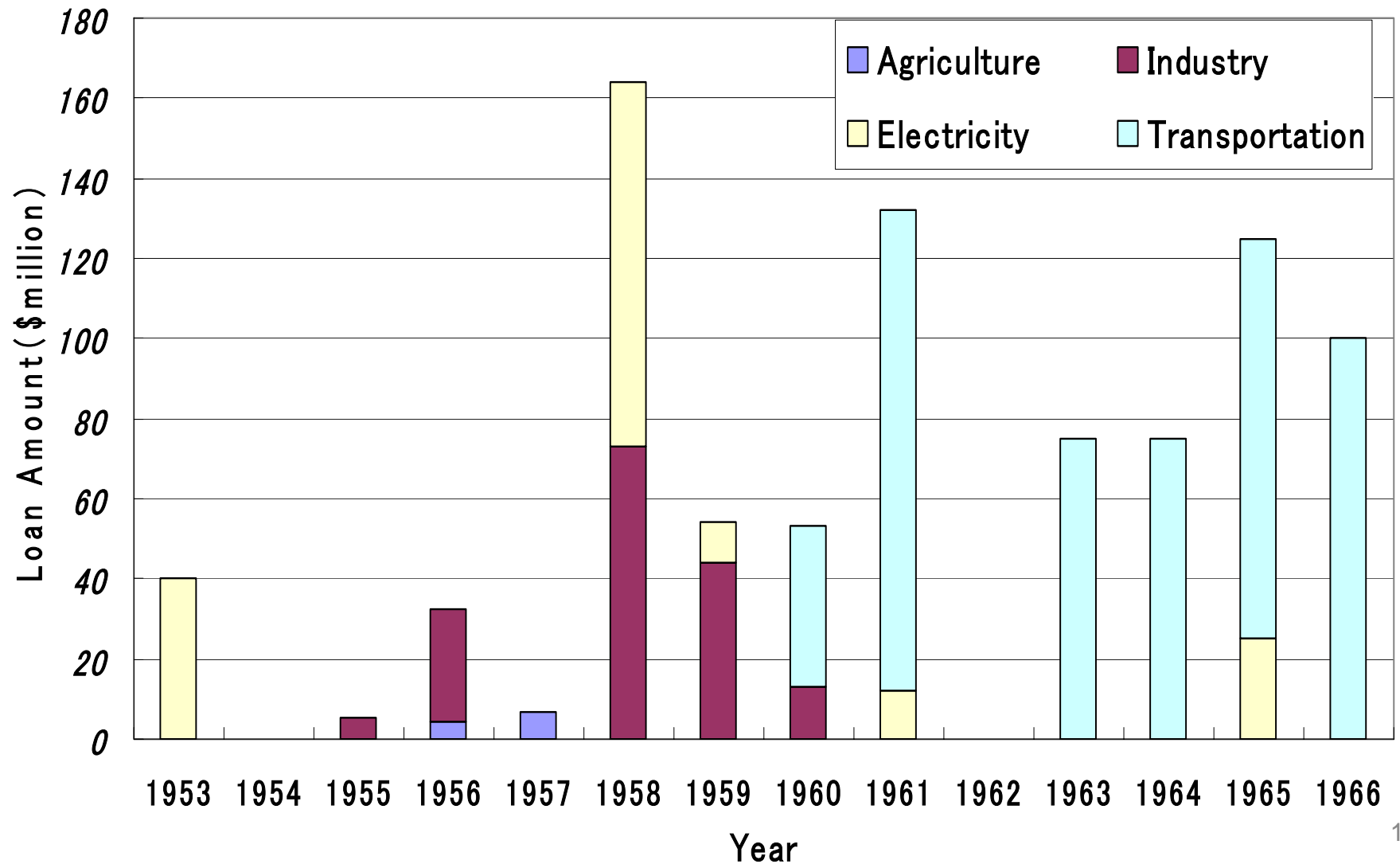


Source: World Bank, Tokyo Office



# World Bank Assistance by Sector

## Loans from World Bank by Sector



# Lessons Learned from the WB Assistance

In General, transferred were:

- Institution building including laws and regulations.
- Planning and evaluation methods of public projects.
- New design methods, but not for procurement management.
- Advanced technologies.
- Mechanical construction methods.
- Financial management skills.

In Particular for Infrastructure, transferred were:

- New designing and planning methods.
- Construction technologies
- Construction management .
- The consistent approach between macro-economic policies and project investments.
- Evaluation method for project viability.
- Practical method of Project analysis and evaluation from microscopic view or financial sustainability.

## Topic 2 Three Major Concerns in Japan and Monsoon Asia

### ① Too much water (洪水)

Flood endangers human security and industrial assets.

### ② Too little water (渇水)

Droughts endanger people's livelihood and industrial production.

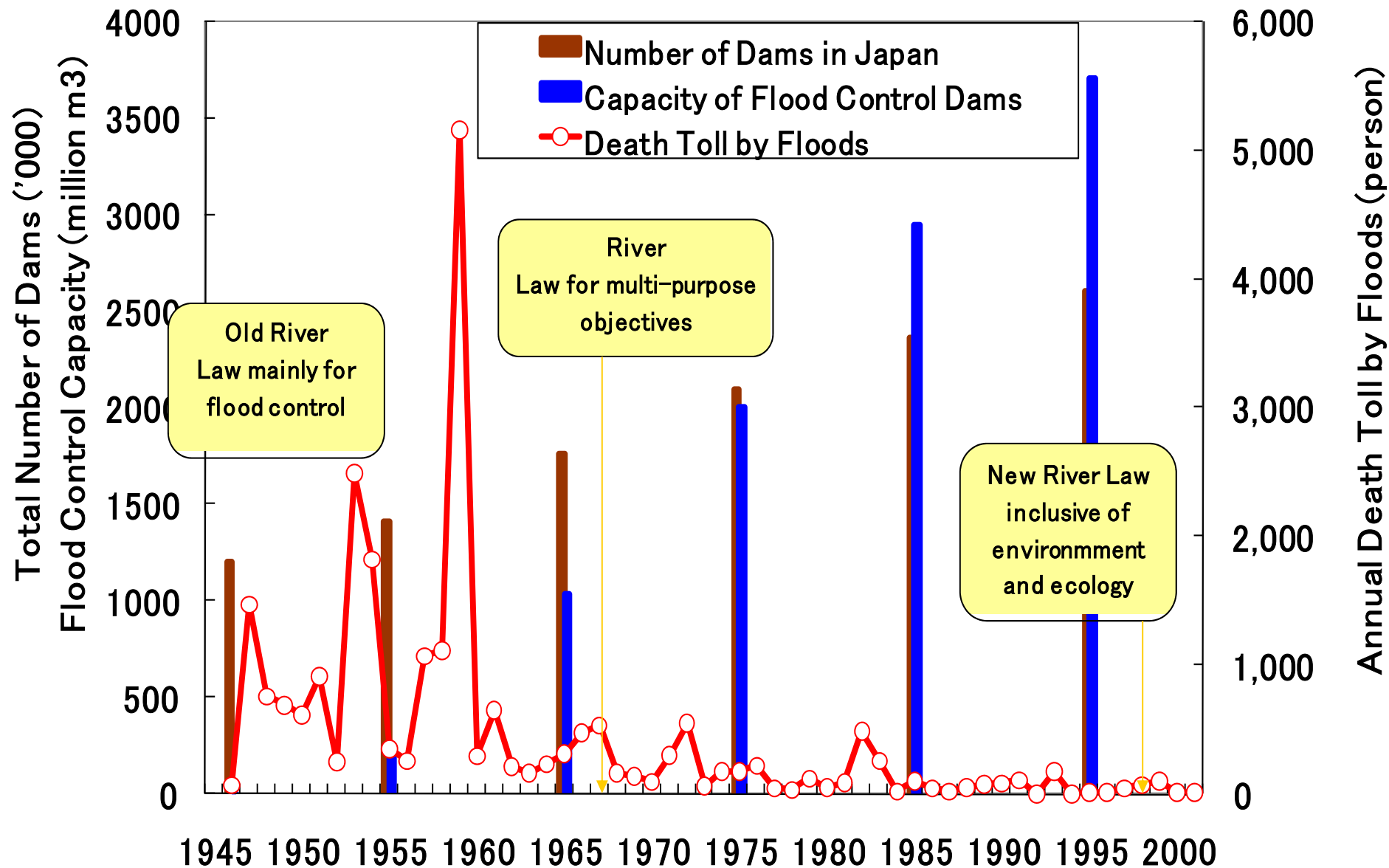
### ③ Conservation of Water Environment (水環境保全)

Asian growth invites serious deterioration of water environment.

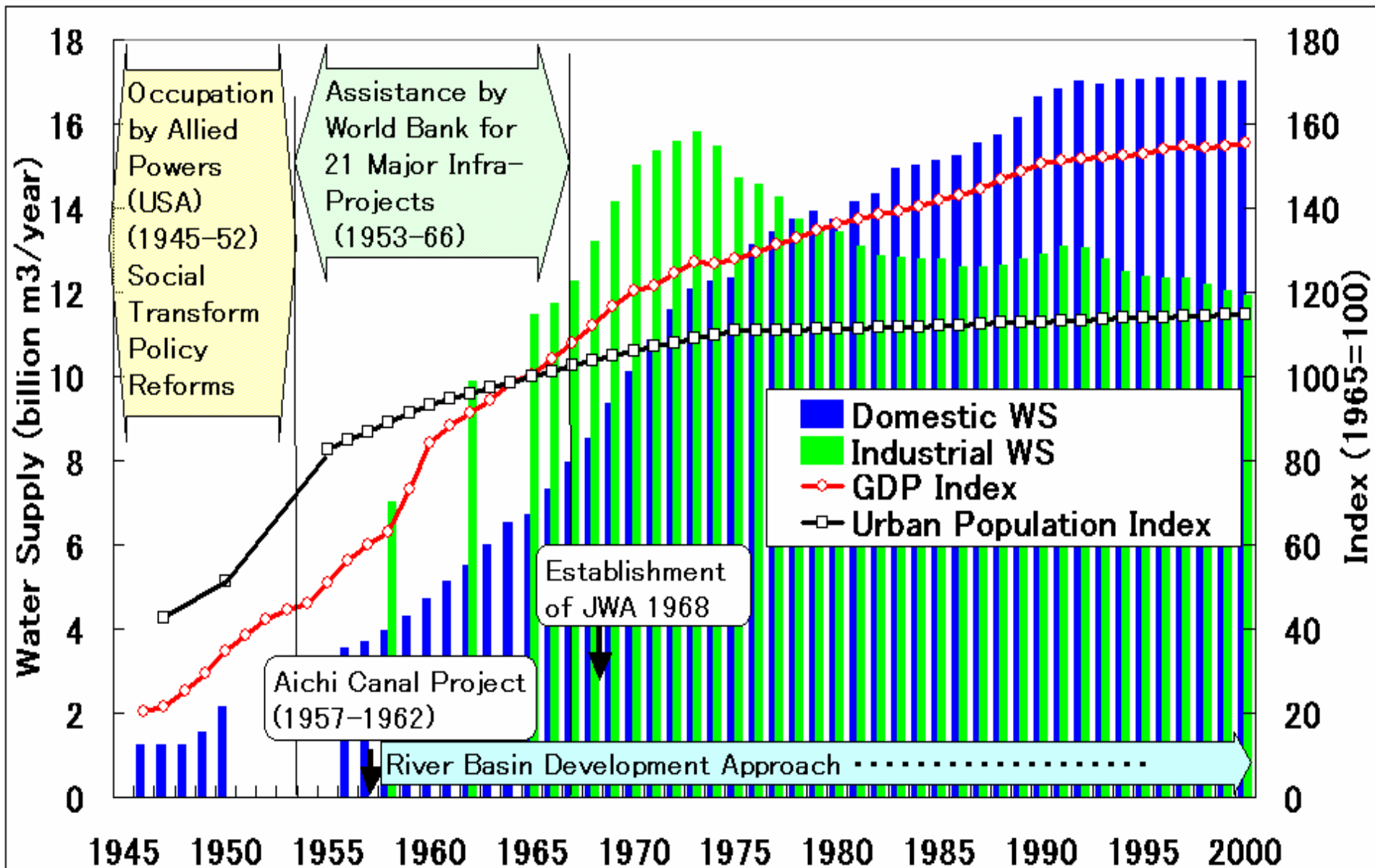
How is Japan challenging to these issues?



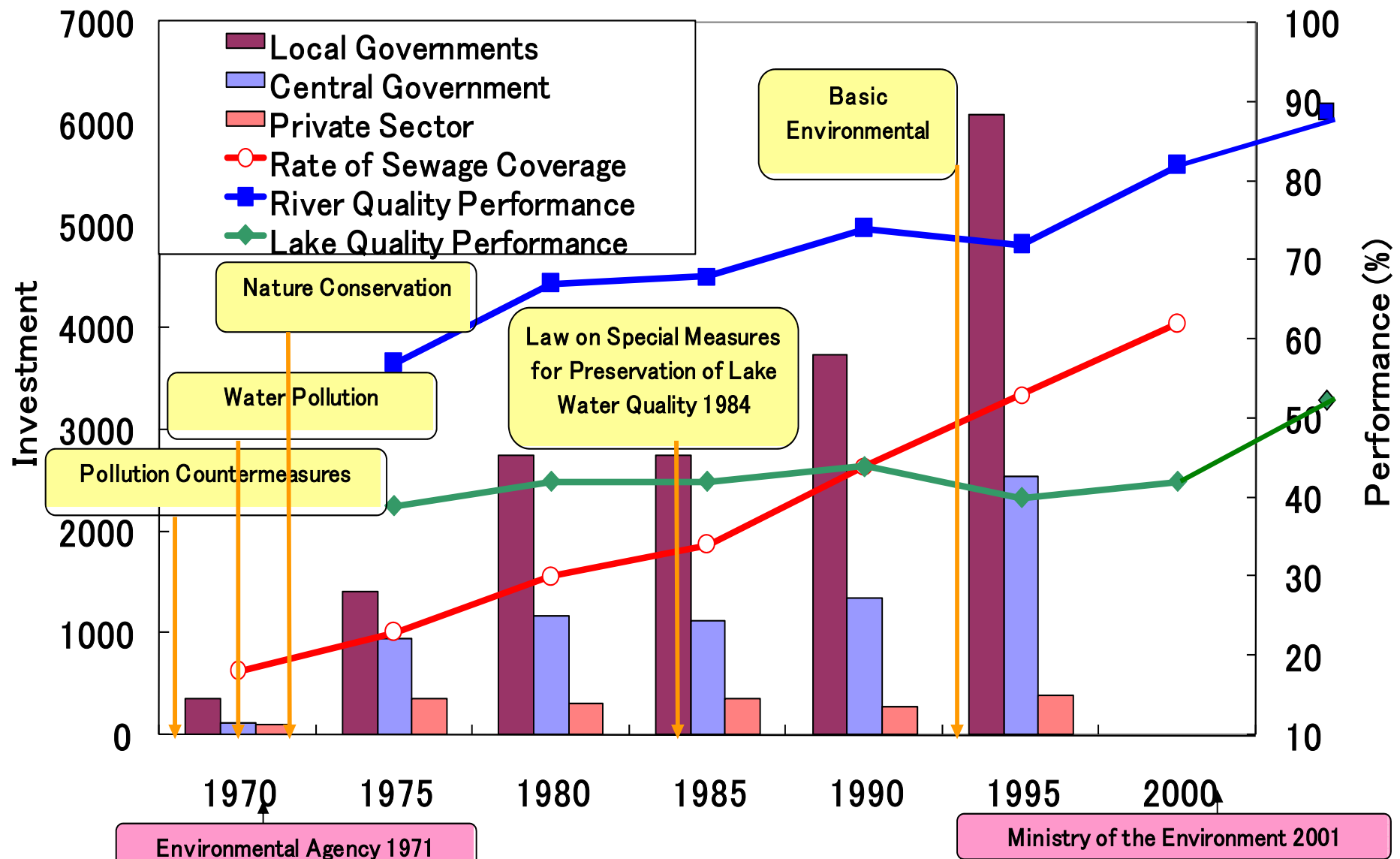
# Flood Control: Mitigation of Flood Disasters in Japan



# Water Supply: Meeting with Increased Water Demand



# Water Quality: Laws, PPP-Investment and Performance



Note: River water quality by BOD 1mg/l~10mg/l depending on 6 categories with about 2500 sites. Lake water quality by COD 1mg/l~8g/l for 4 categories with about 200 sites. Data Source: 環境庁「公共用水域水質測定結果報告書」[環境白書]、通産省「公害設備投資調査」、国交省「下水道白

# Lessons from Japan's Experiences

## Policy Mix Approach in Water Resources Management

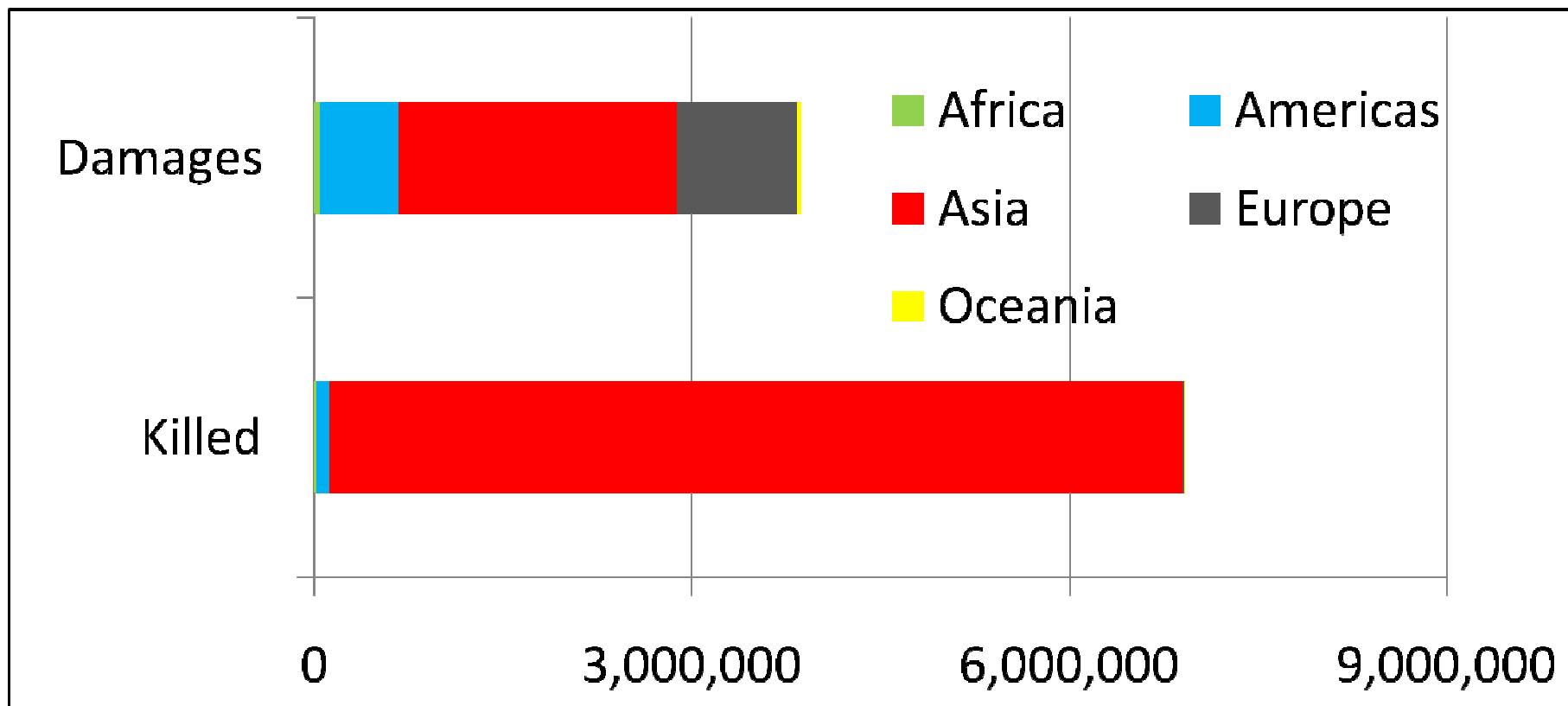
Policy Mix depends on changing priority and values of the citizens.

Policy Mix consists of:

- Laws and Regulations and Institutions
  - Responsibility sharing between local and central governments
- Investment
  - Public Private Partnership in Investment
- Pricing and Subsidies
  - Regional and personal income distribution
- Technology Development
  - Public sector's R&D
- Human Resources Development
  - In-house training by both public and private sector
- Public Awareness



### Topic 3 Floods Disaster in Asia (1900-2007)



Note:

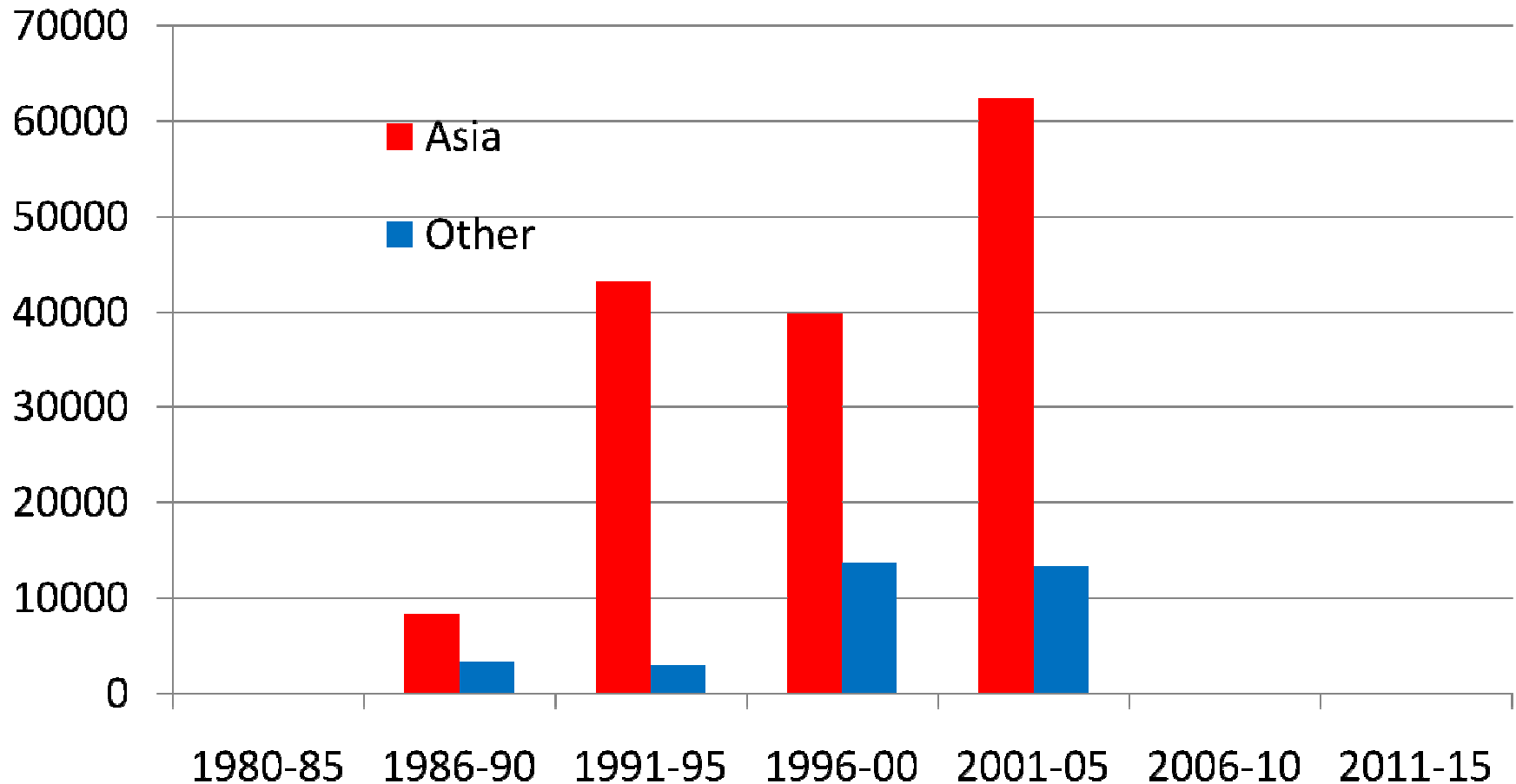
Damages (\$ '00,000), Total damage of \$386 billion

Killed in persons, Total death toll of 6.9 million

Source: OFDA/CRED International Disaster Database

(<http://www.cred.be/>)

# Flood Death Toll in Asia and Other Regions

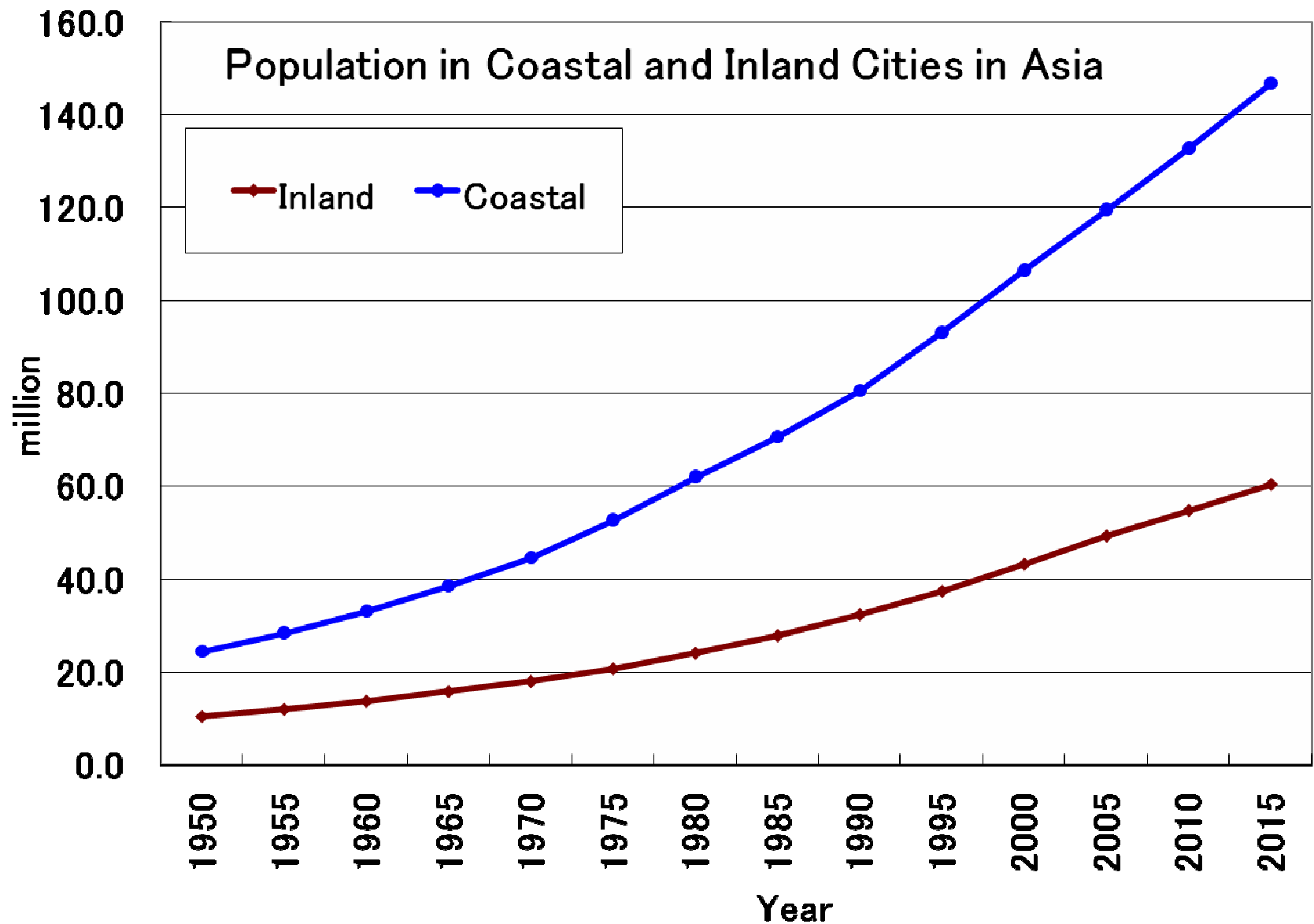


Note: Death toll is an annual average during 5 year period.

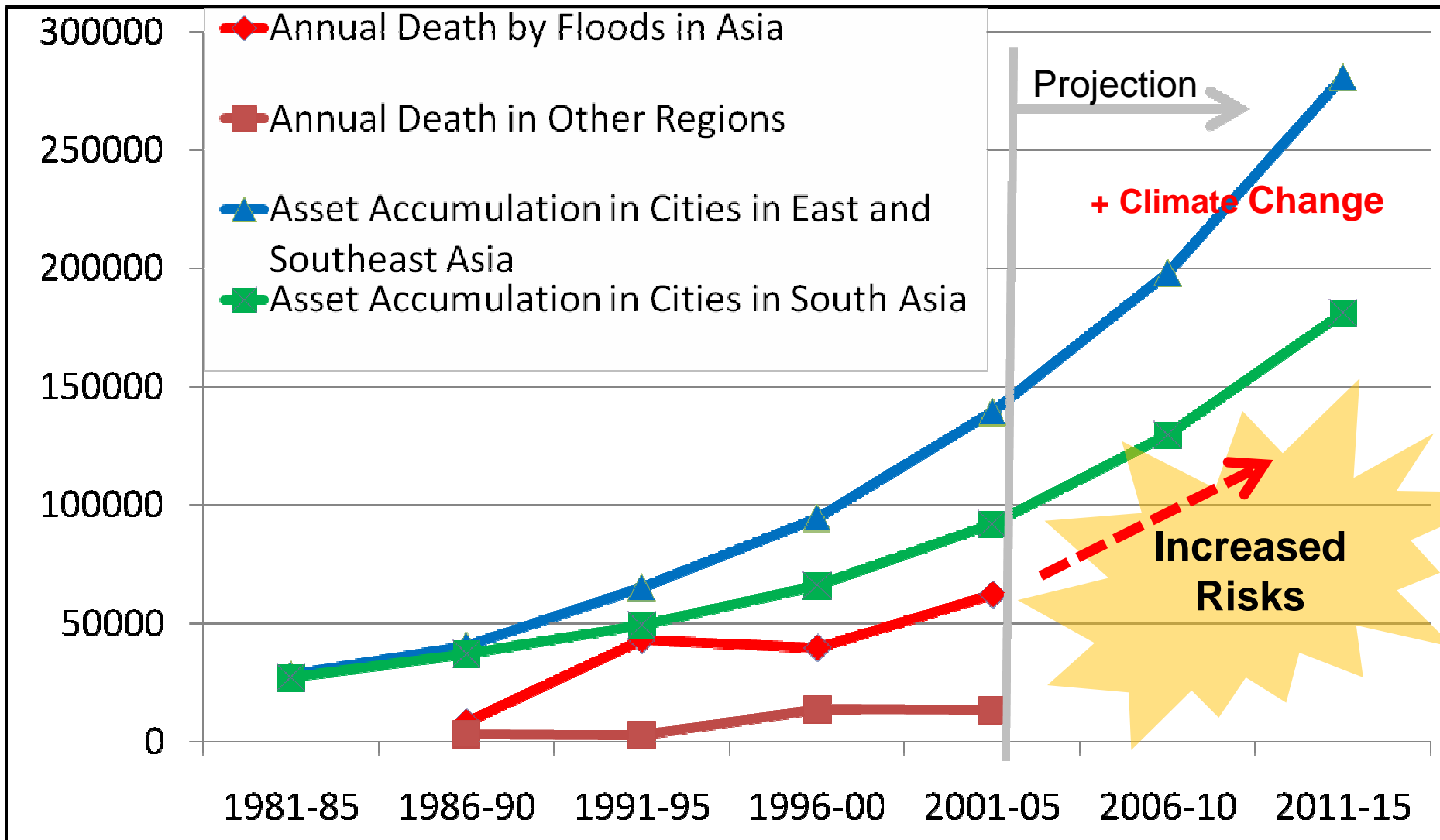
Source: OFDA/CRED International Disaster Database

(<http://www.cred.be/>)

# Growing Population in Flood Prone Coastal Cities in Asia



# Flood Disaster Projection



Source: OFDA/CRED International Disaster Database (<http://www.cred.be/>)

Population projection by UN Population database

Economic growth by ADB Emerging Asia



## Summary

- Japan was a major recipient of foreign aids and learnt a lot as a developing country, which gives Japan a comparative advantage in working together with NARBO members.
- Policy Mix Approach is critically important in effective and timely management of water resources.
- Monsoon Asia is at an increasing risk of flood disasters in the coming decades.

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Thank you for your kind attendance.