6th International Forum on Waterfront and Watershed Restoration
29 September 2009 (Asian River Restoration Network)

Four-River Restoration Project in Korea

2009. 9. 29

KICT 韓國建設技術研究院
Korea Institute of Construction Technology

Contents

I. Outline

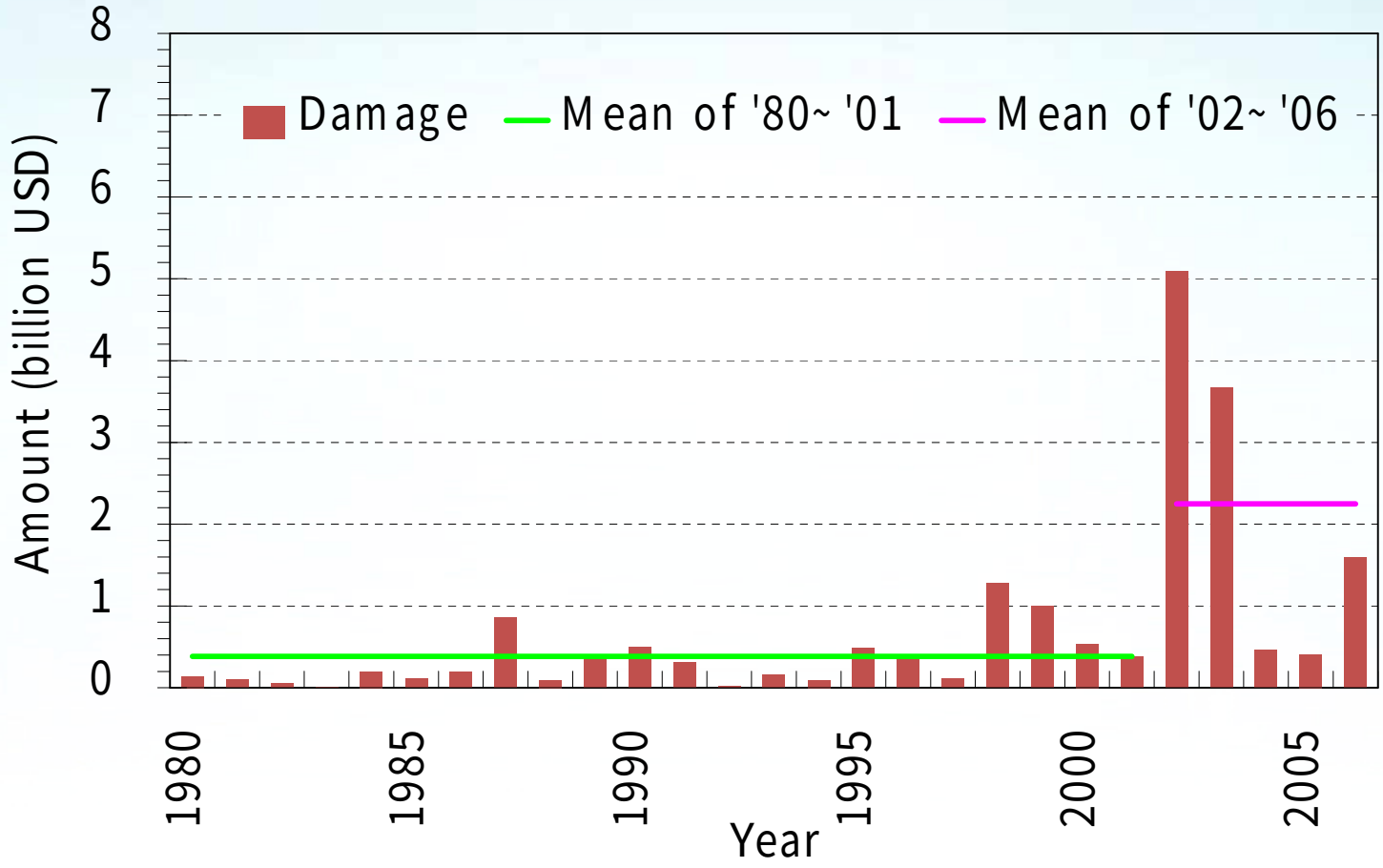
Status of the River

- 文明発祥
- 水力社会
- 治山治水
- 樂山樂水

Background

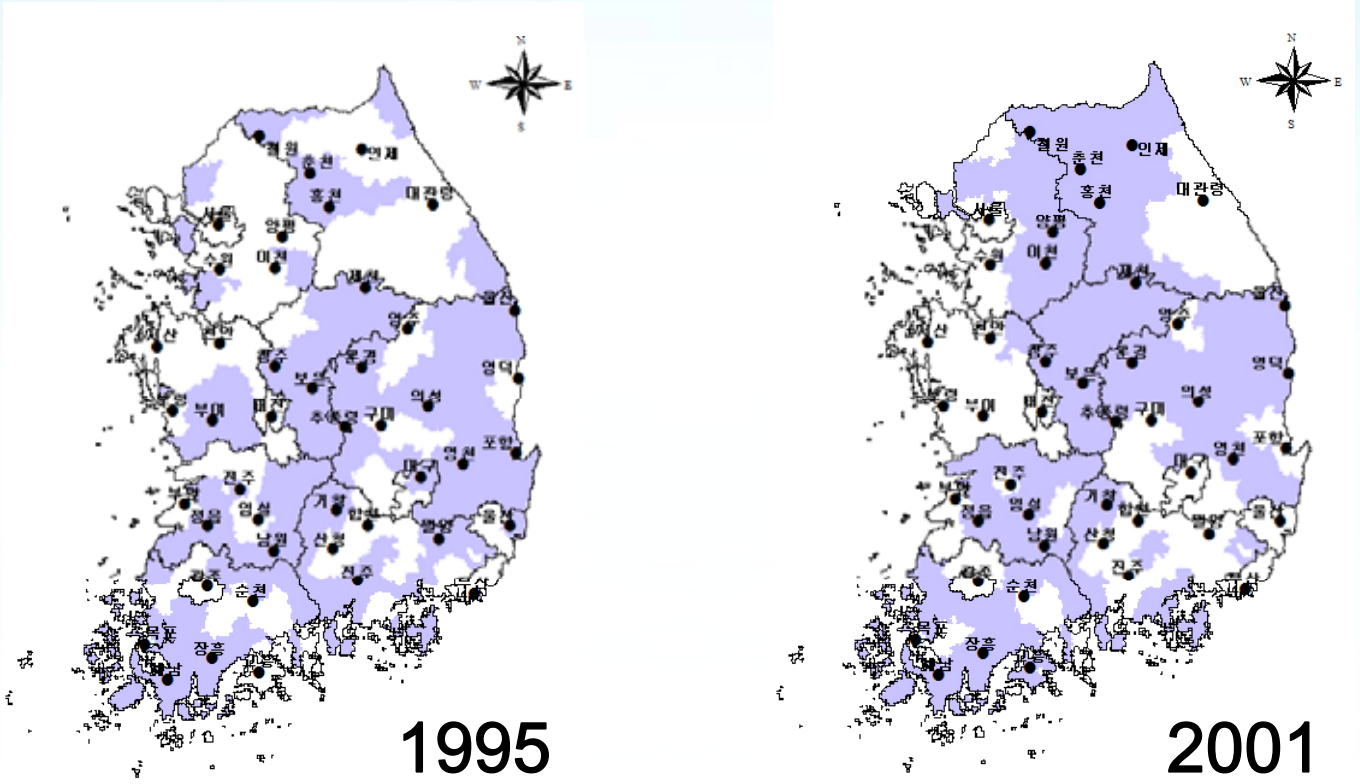
Frequent Flood Damage Due to Climate Change

- Annual Investment $ 0.8 bil., Damage $ 2.3 bil., Rehabilitation $ 3.5 bil.



Frequent Drought Damage Due to Climate Change

- Serious regional water shortage attendant upon periodic drought
- Water shortage of 1 billion m^3 in 2016



Region of Water Shortage (Restriction of Water Supply)

Water Pollution & Ruin of Aquatic Habitat

- Imprudent farming inner river zone
- Aggravation of water pollution due to insufficient water in drought season

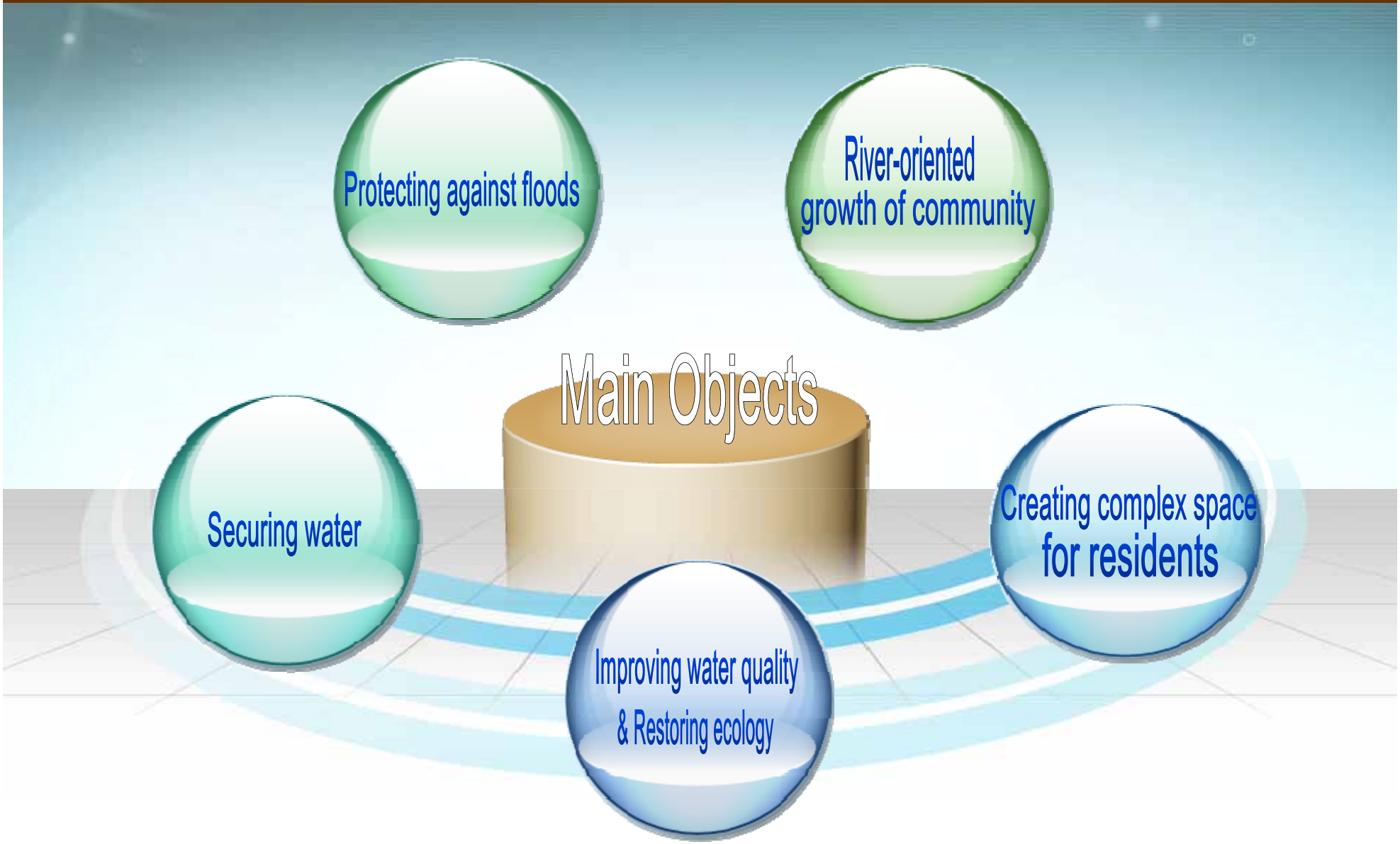
Inadequate use of riverine area

- Parking lot
- Insufficient space for leisure and culture

Economic crisis

- Increase of unemployment rate
- Slowdown in economy of local region

Main Objects

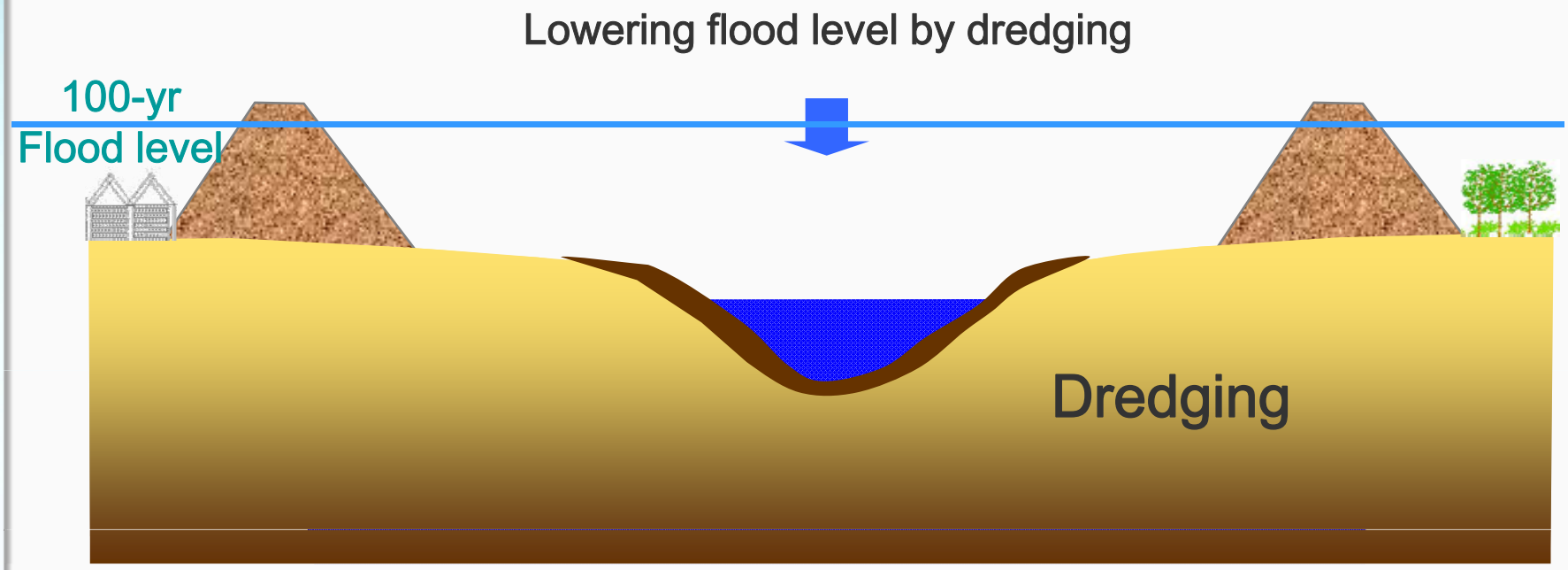


II. Project Strategy

1. Flood Control

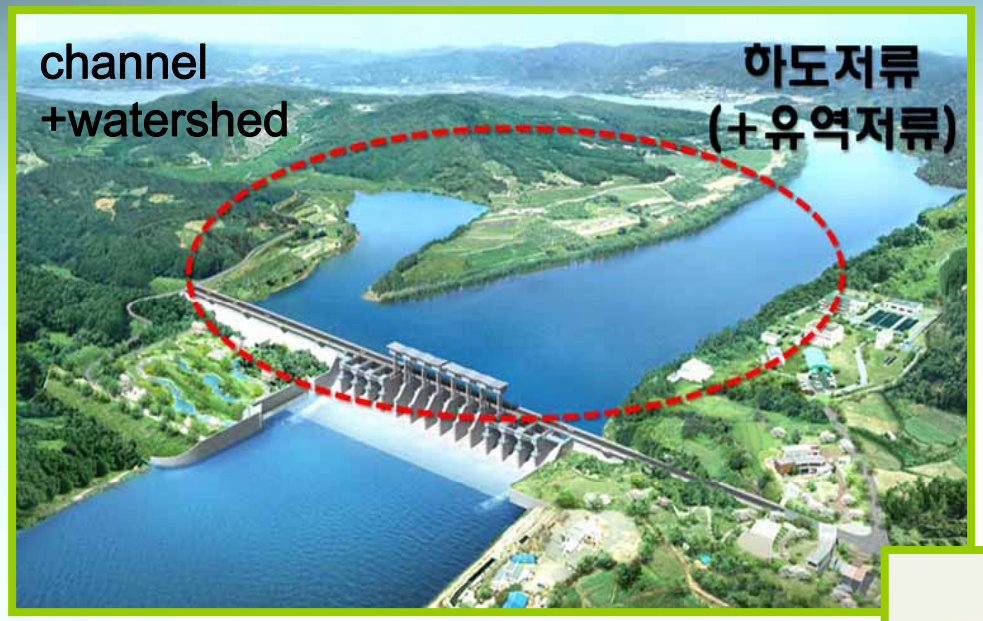
Against 200-year return period (present: 100-year)

Lowering the design flood level (0.4~3.9m) by dredging (0.57 bil m^3)



- Using a new-concept flood control measure instead of embankment raising

Installing flood control reservoirs and retention ponds (0.05 bil m^3)



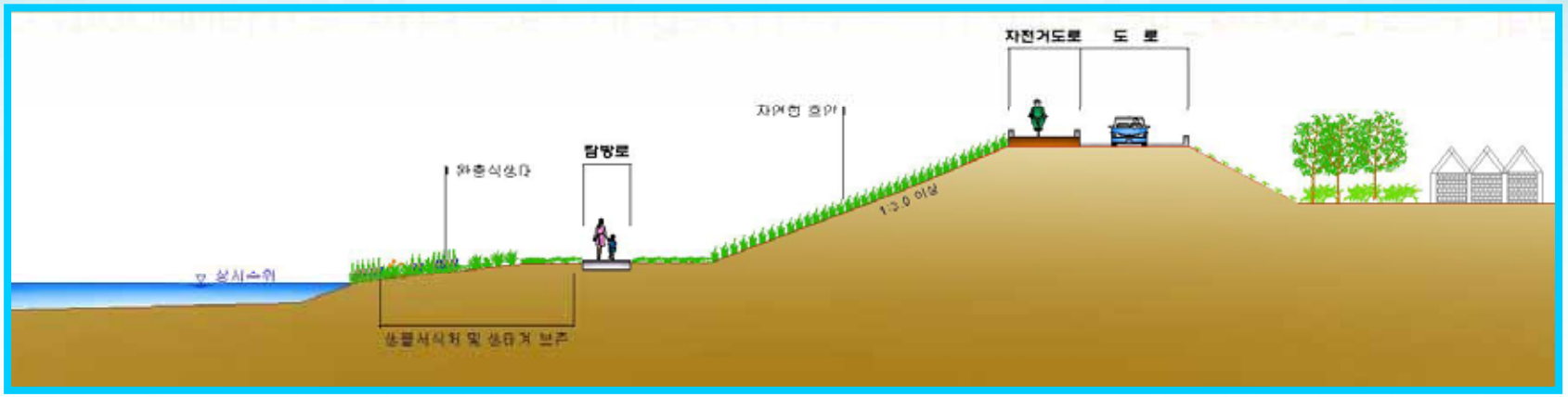
Flood Control
Reservoirs (2 sites)

space for stream ecology improvement in ordinary time

Retention Ponds (4 sites)

Reinforcement of deteriorated embankment & Expansion of drainage gates at estuary barrier

Reinforcement of deteriorated embankment (620km)



Quick flood drainage by expansion of drainage gates

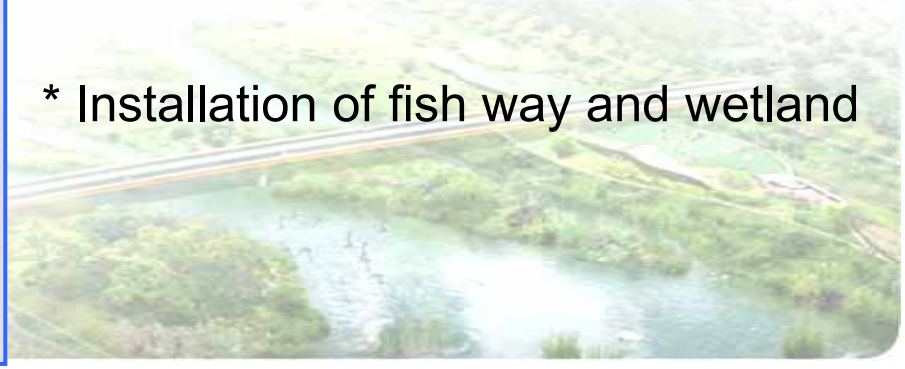
- Nakdong river : 475m → 760 m (expansion of 6 gates)
- Yeongsan river : 240 m → 480 m (expansion of 8 gates)

2. Abundant Water Resources

Provision against water scarcity (1.0 bil m^3 in 2016) & drought
Securing water resources (1.3 bil m^3)

Water resources of 0.8 bil m^3 by dredging & installation of 16 weirs

- River maintenance water
- Installation of weirs as a landmark considering the surroundings



* Installation of fish way and wetland

Benchmarking of foreign weirs

Hagestein Weir of Rhine River, The Netherlands

Watergate closed

Watergate opened

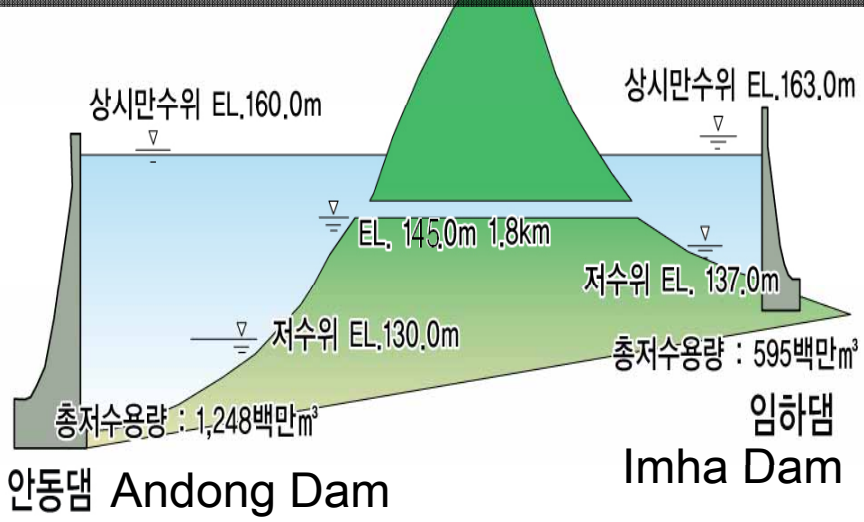
Conceptual design of weirs

Construction of medium sized multi-purpose dams (0.25 bil m^3)

- Yeongju dam & Bohyeon dam in Nakdong rive basin
- Connection of existing Andong dam & Imha dam (1.8km)

Yeongju dam

Connection of existing dams

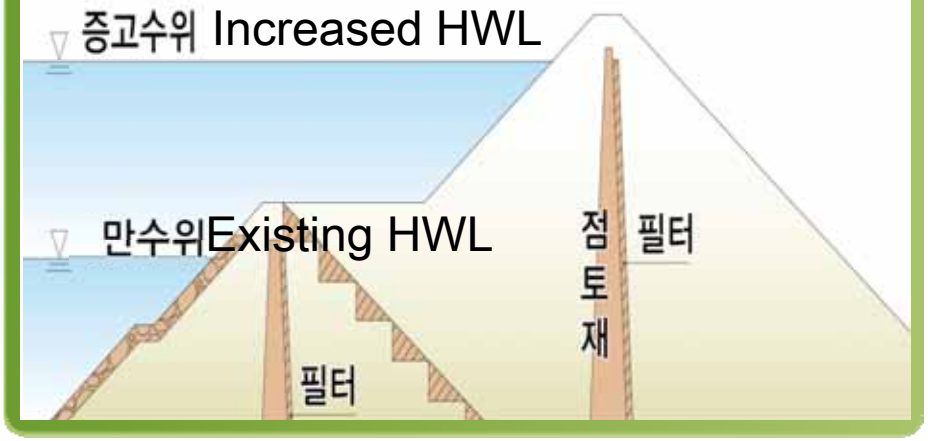


Raising the existing agricultural reservoirs (0.25 bil m^3)

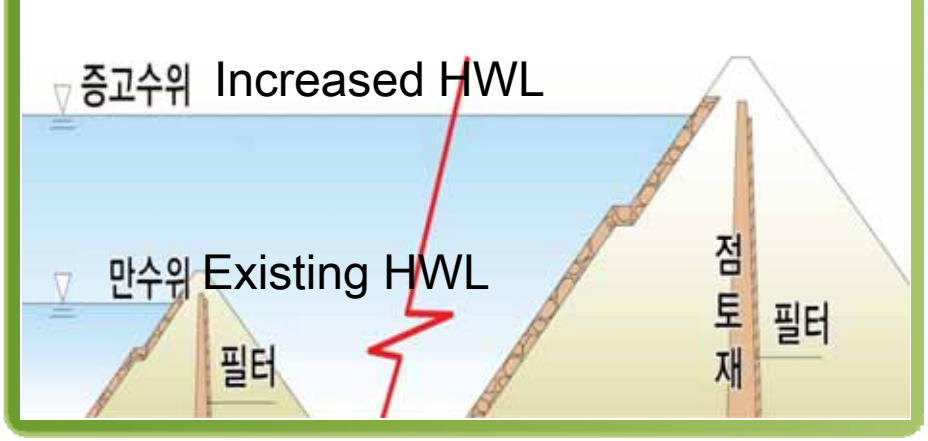
Selection of 96 sites among about 17,600 sites

Intensive release of water in dry season

Raising method type I



Raising method type II



Water Quality Improvement

- Expansion of sewage plants and high standardization
  - Installation of 750 sewage treatment plants until 2012
  - Newly establishing the stream environmental standards for COD and TP

Restoration of ecosystem

Clearing the farmland such as removing vinyl greenhouses

Restoring ecosystem such as creating ecological rivers and urban stream along 929 km of river zone

- Creating 35 ecological wetlands along 43.5km area
- Restoring abandoned streams (2 sites)

4. Creation of complex space along rivers

Leisure Space

Installation of bike way along rivers (1,728km)

- Building of network connecting National & Provincial roads

Promenade, link of inline skates, facilities for water sports

Waterfront (illustration)

Linking between rivers and urban areas

- International Business Center & Commercial Center, etc.

International Business Center

Commercial Center

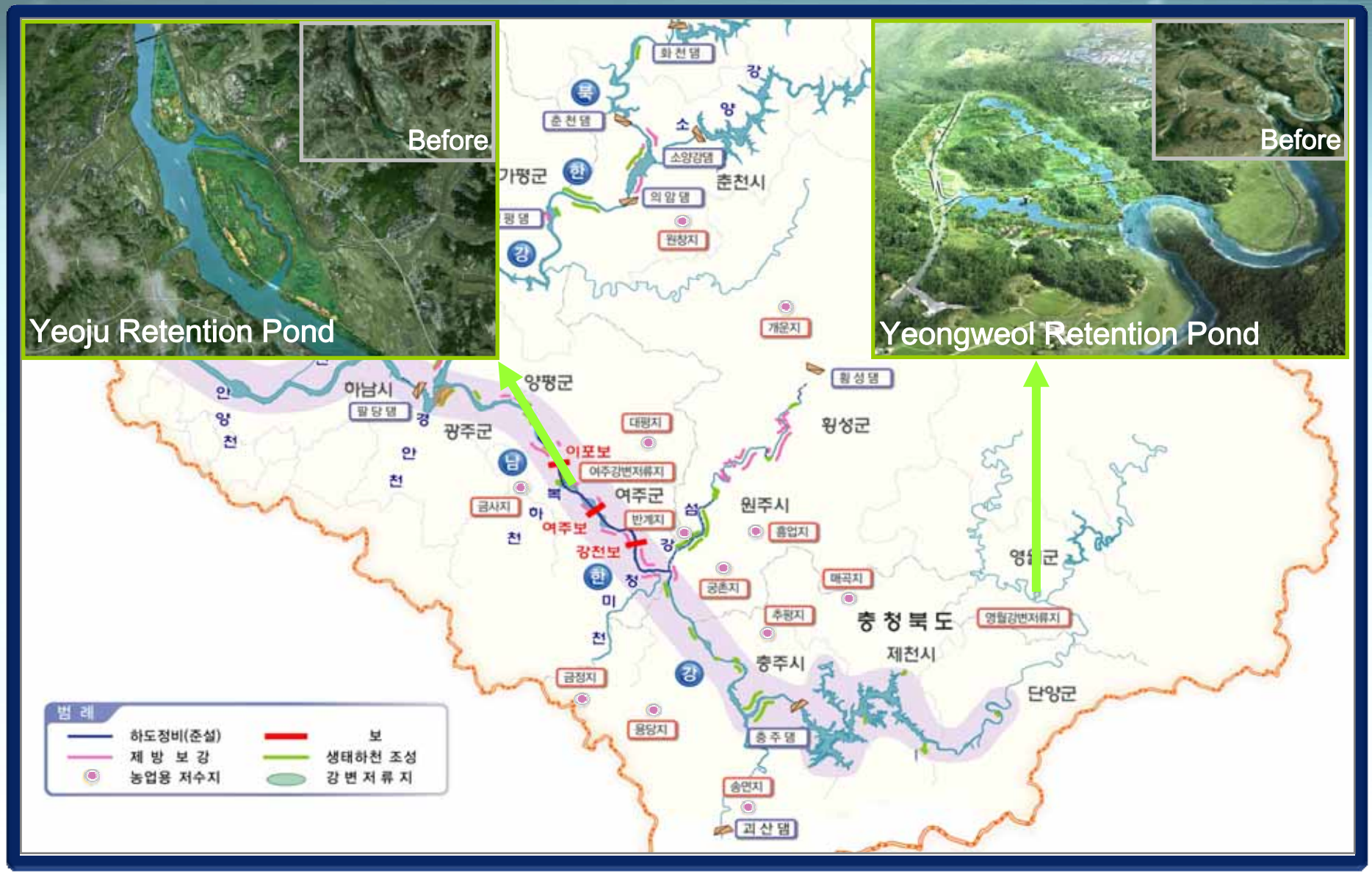
5. Budget

Total budget : 18.5 billion USD

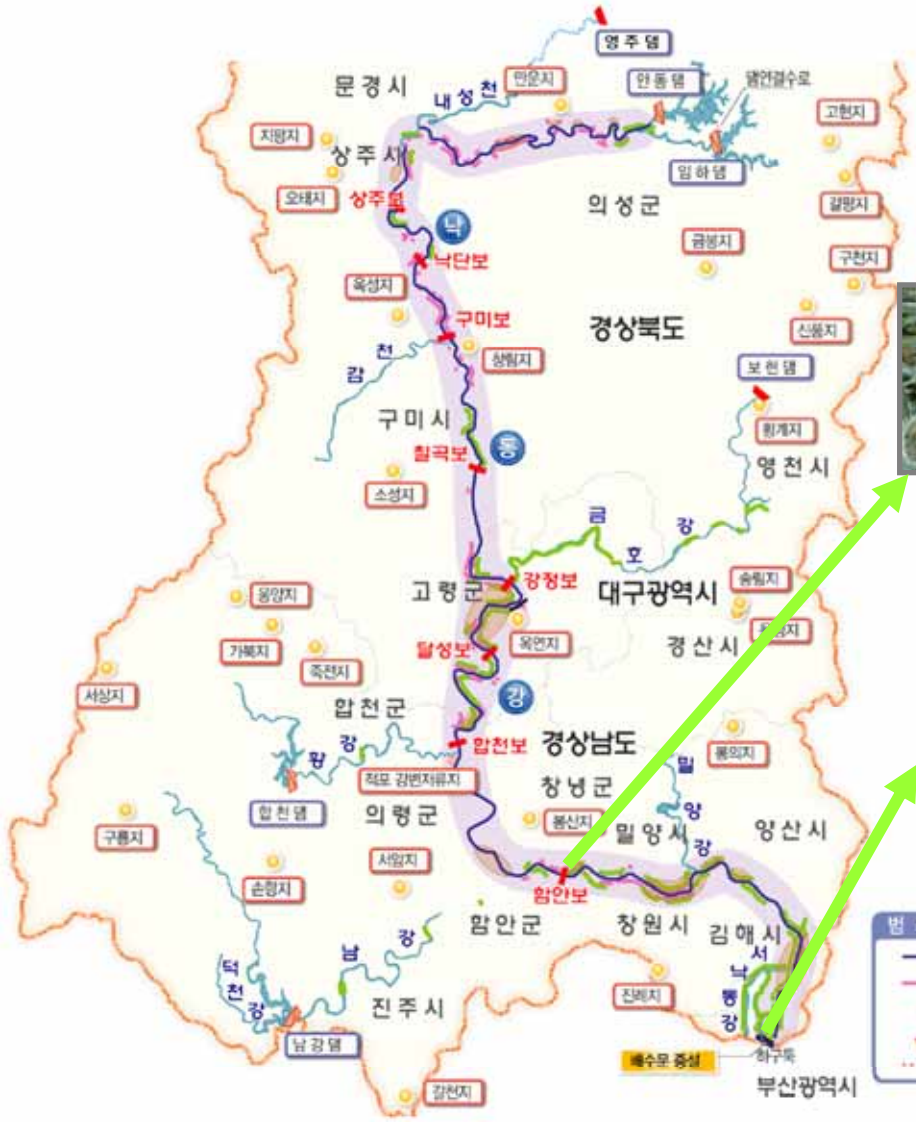
- **Main projects : 14.1 billion USD**
  - Projects of main streams
  - River regulation, weirs, dams, retention ponds
- **Directly linked projects : 4.4 billion USD**
  - Projects of tributaries
  - Regulation of river environment, water quality improvement
- **Linked projects**
  - Annual accomplishment by other ministries

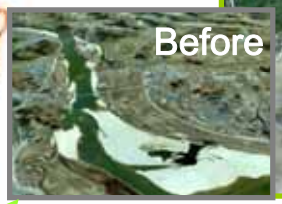
III. Core Projects

Han River – Flood Control, Restoration of Ecosystem, Recreation Spaces



Nakdong River – Flood Control, Securing Water & Restoration of Ecosystem





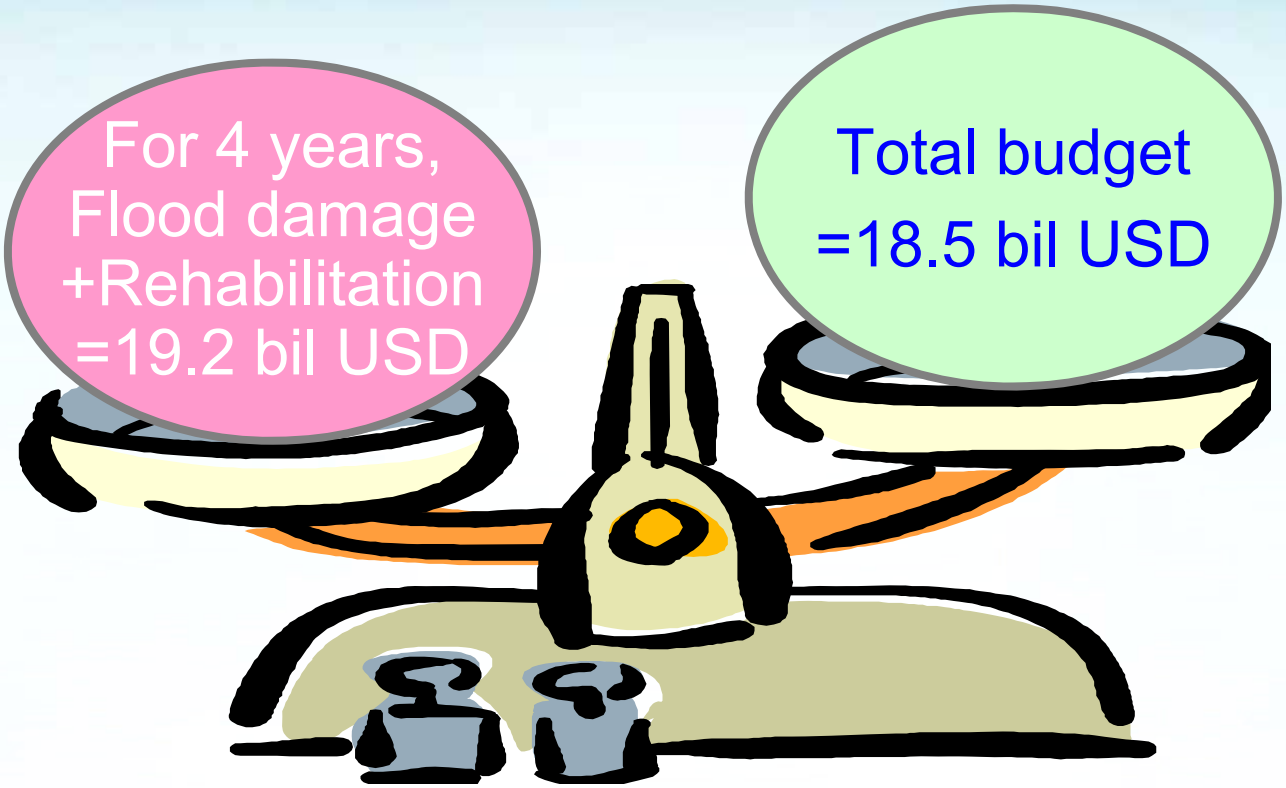
Geum River – Regional development linked with Baegje Cultural Inheritance

Yeongsan River – Flood Control & Water Quality Improvement

IV. Expected Effects

Leap to “the Advanced Country in Water Management”

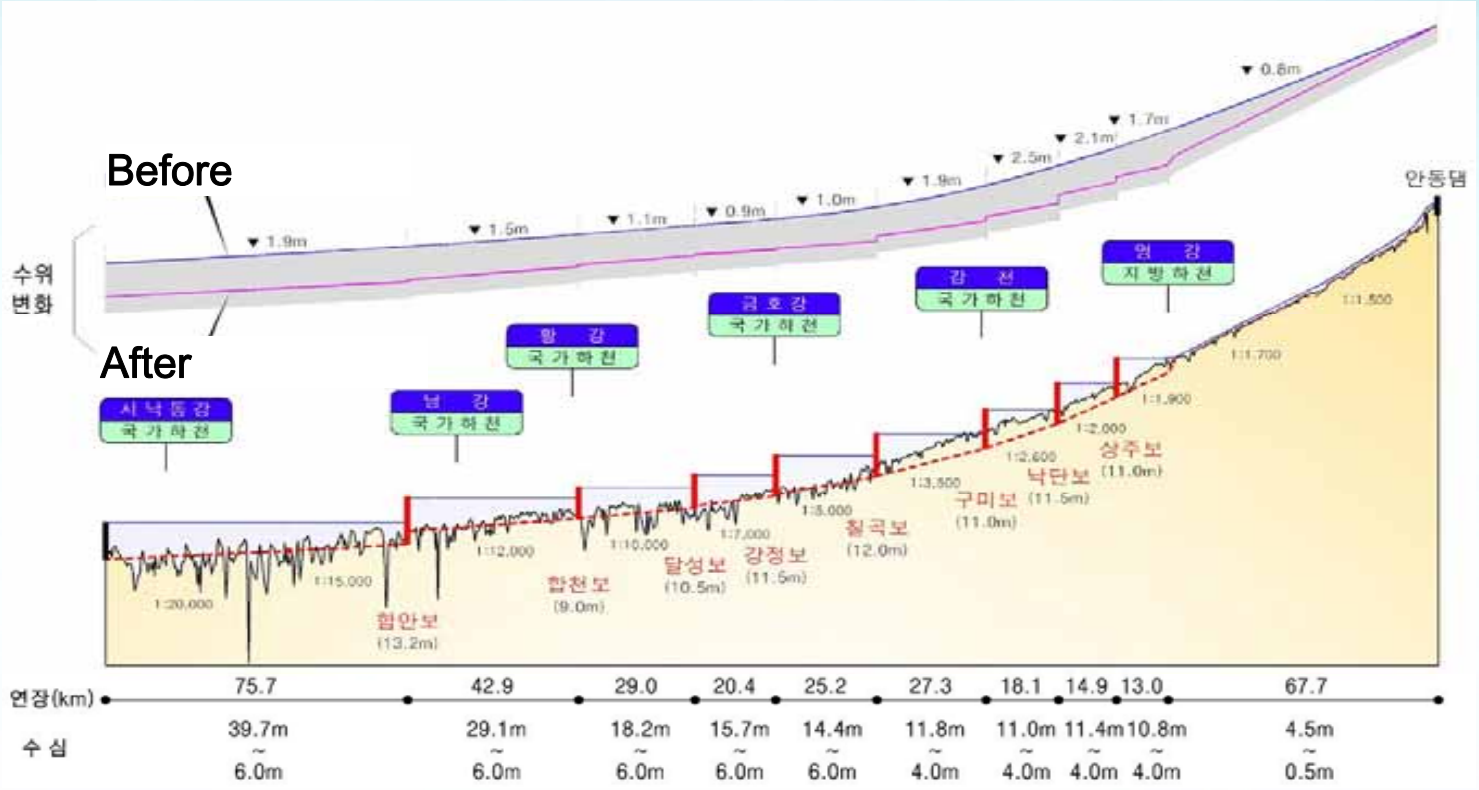
Economic effects



※ Annual flood damage (2.3 bill)+Rehabilitation (3.5 bill)=4.8 bill USD

Basic solution to flood damage & water shortage

- Improvement of flood safety from 100-year to 200-year return period



- Dealing with extreme drought by securing additional water resources of 1.3 billion m^3

Sound ecosystem by water quality improvement & river restoration

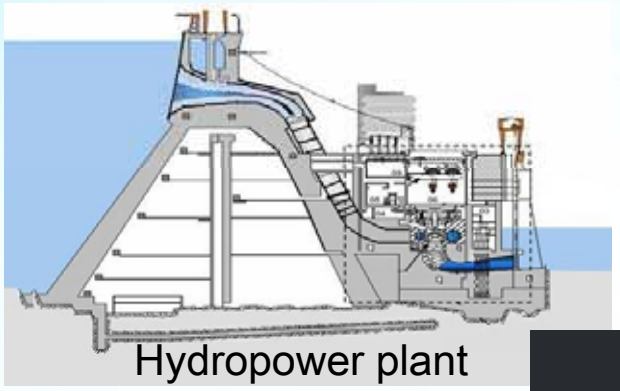
- Improvement to ‘Swimmable Water’ (better than water of grade-2)
  - Water of Grade-2 : BOD below 3 mg/L
- Restoration of ecosystem by creation of wetlands in floodplains (35 sites, 44km)

Rise of the standard of living and level of leisure and culture

- Increase of water surface : 0.8 billion m^2 (40%)
- Increase of water surface width : additionally 50~180m
- Provision of spaces for culture, leisure and sports

Activation of local economy by Green New Deal project

- Clean energy of 280,000 MWh/yr by small hydropower plants installed at 16 weirs
- New jobs for 340,000 persons


Hydropower plant


Spread of economic effects


New jobs

Epoch-making flood control measures

Re-creation of national land

Preparedness for 21C Water Era (low carbon)

Provision of more spaces for recreation according to the increase of national income


Thank you for your attention.
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