

Welcome to K-water

Total Water Service Provider



Integrated Water Resources Management Dept.

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1. Water Resources in Korea
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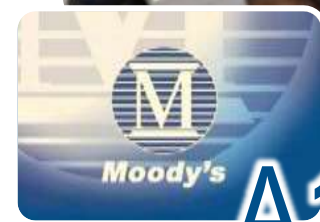




K-water Introduction

K-water Introduction

- **Established in 1967**
- **Responsible for Total Water Resources Management in Korea**
- **Organization**
 - Headquarters (6 divisions, 29 dept.)
 - 3 Regional Headquarters
 - 76 Regional Offices
- **Employees : approx. 4,964**
- **Total Assets : 17 billions USD (2015)**
- **Revenue : 3.6 billions USD (2015)**



A1



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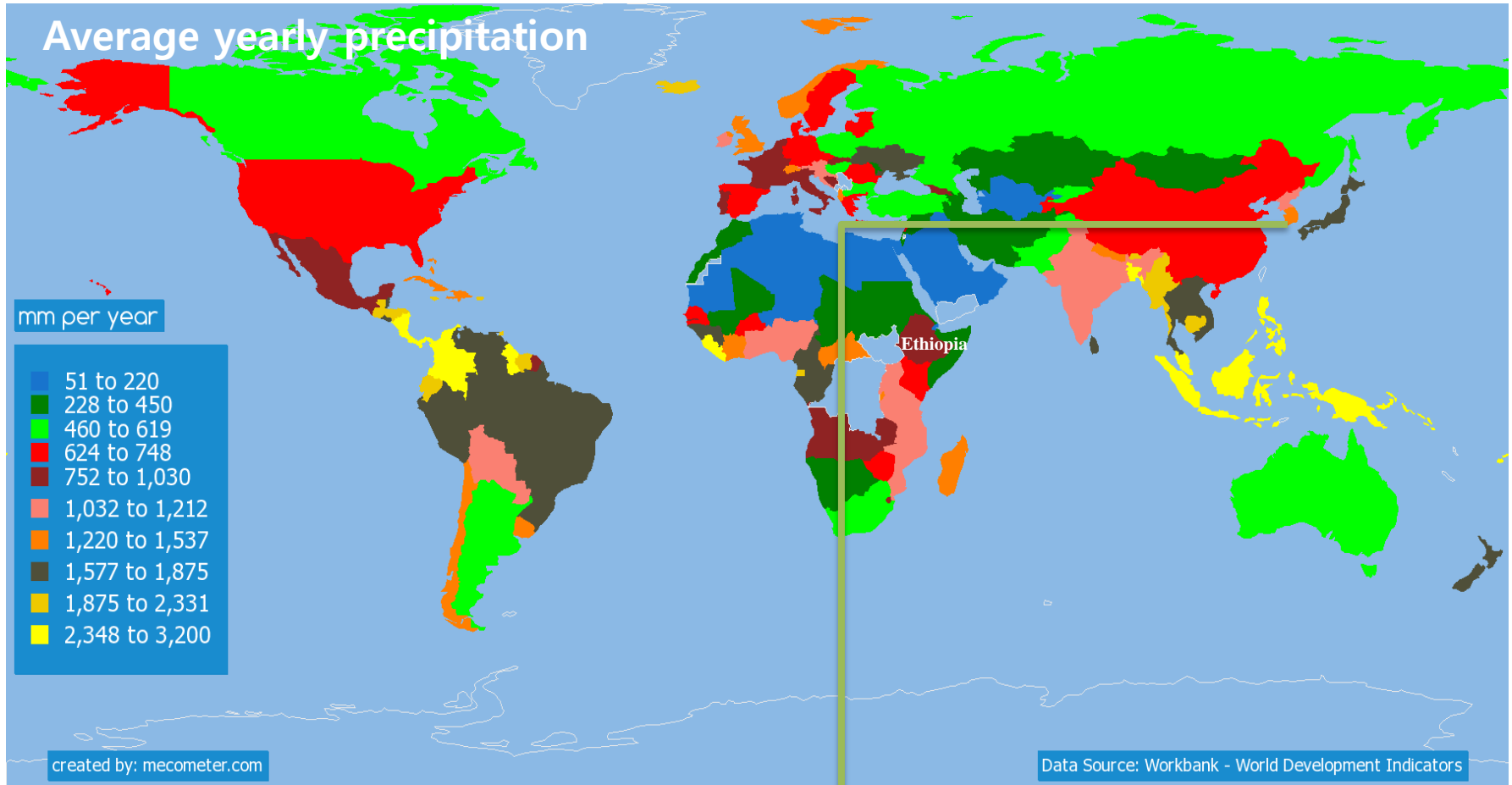
K-water Introduction

**Let's take a look at
K-water video of business**



Water Resources in Korea & Water Management in K-water

1. Water Resources in Korea



Annual Precipitation



158%

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Korea 1,277_{mm}

Global 807_{mm}

High population density



Possible Water use per capita



17%

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Korea 2,629_{m³}

Global 16,427_{m³}

1. Water Resources in Korea

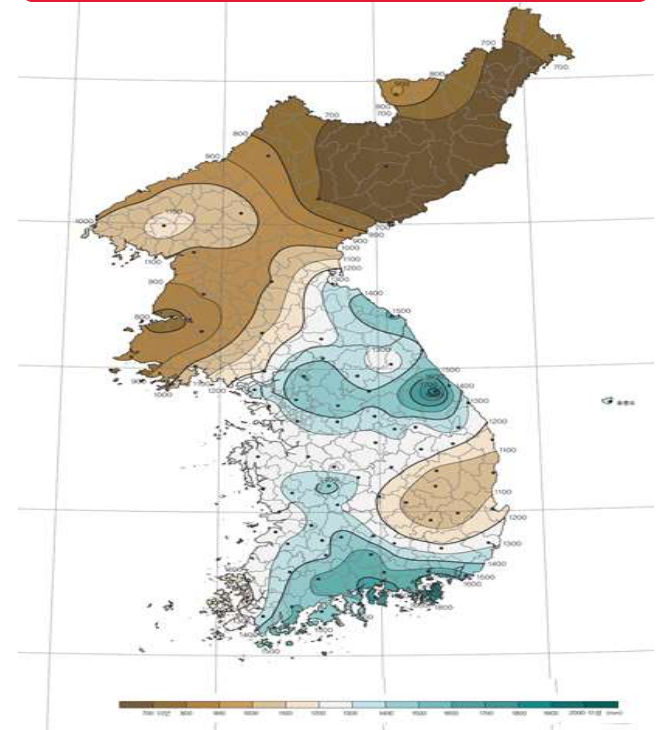
- Unfavorable condition

Unbalance1 (Annual Precipitation, 754~1,756mm)



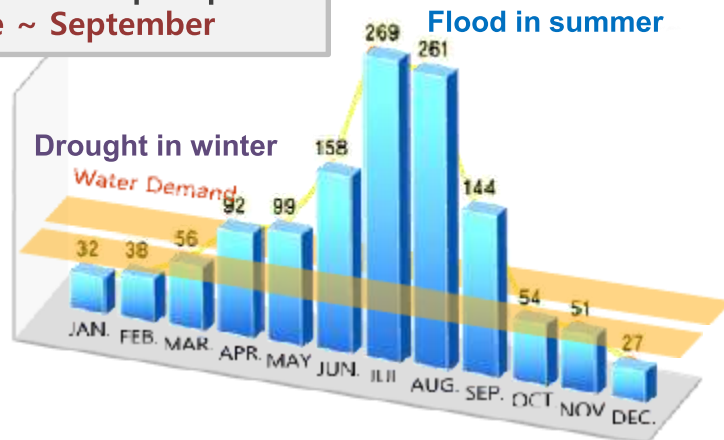
Unbalance3 (Regional Rainfall)

- Nakdong River 1,100mm/yr
- Southern coast/YoungDong Region 1,400mm



Unbalance2 (Seasonal difference during the year)

2/3 of annual precipitation
: June ~ September

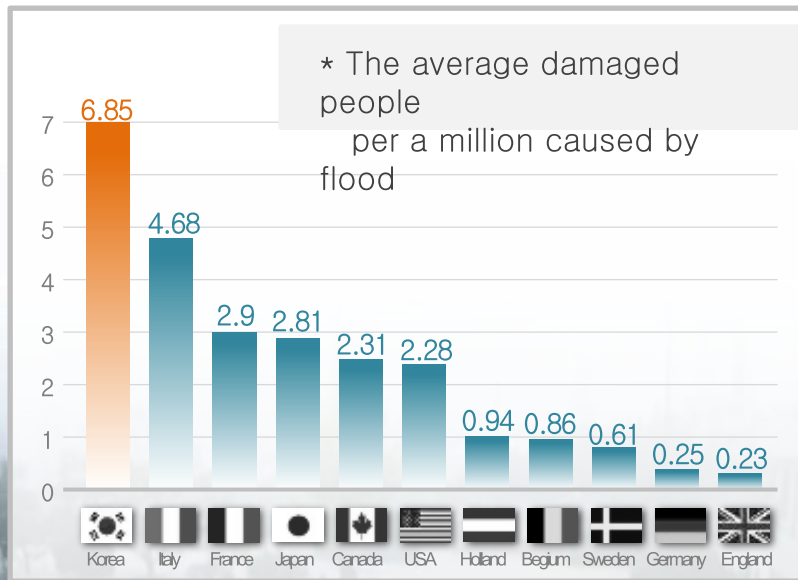


1. Water Resources in Korea

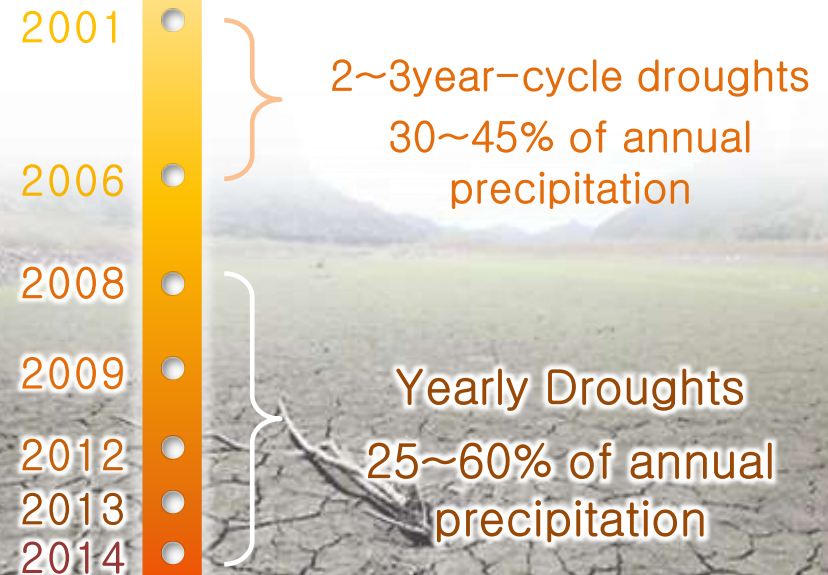
High risk for water management

Difficulties in Water Management of Korea

Highest Flood-risk index In OECD countries



Drought frequency is deepening



1. Water Resources in Korea

- History of water resources development

Water resources development ➔ **Disaster** ↓ , **Economy** ↑

- Starting with 5 River basin survey(1966~1972) : Loan from Advanced countries
- Establish 5-year economic development plan (1972)
- Construct 6 large dams under the loan of IBRD, OECF(JPN), ADB

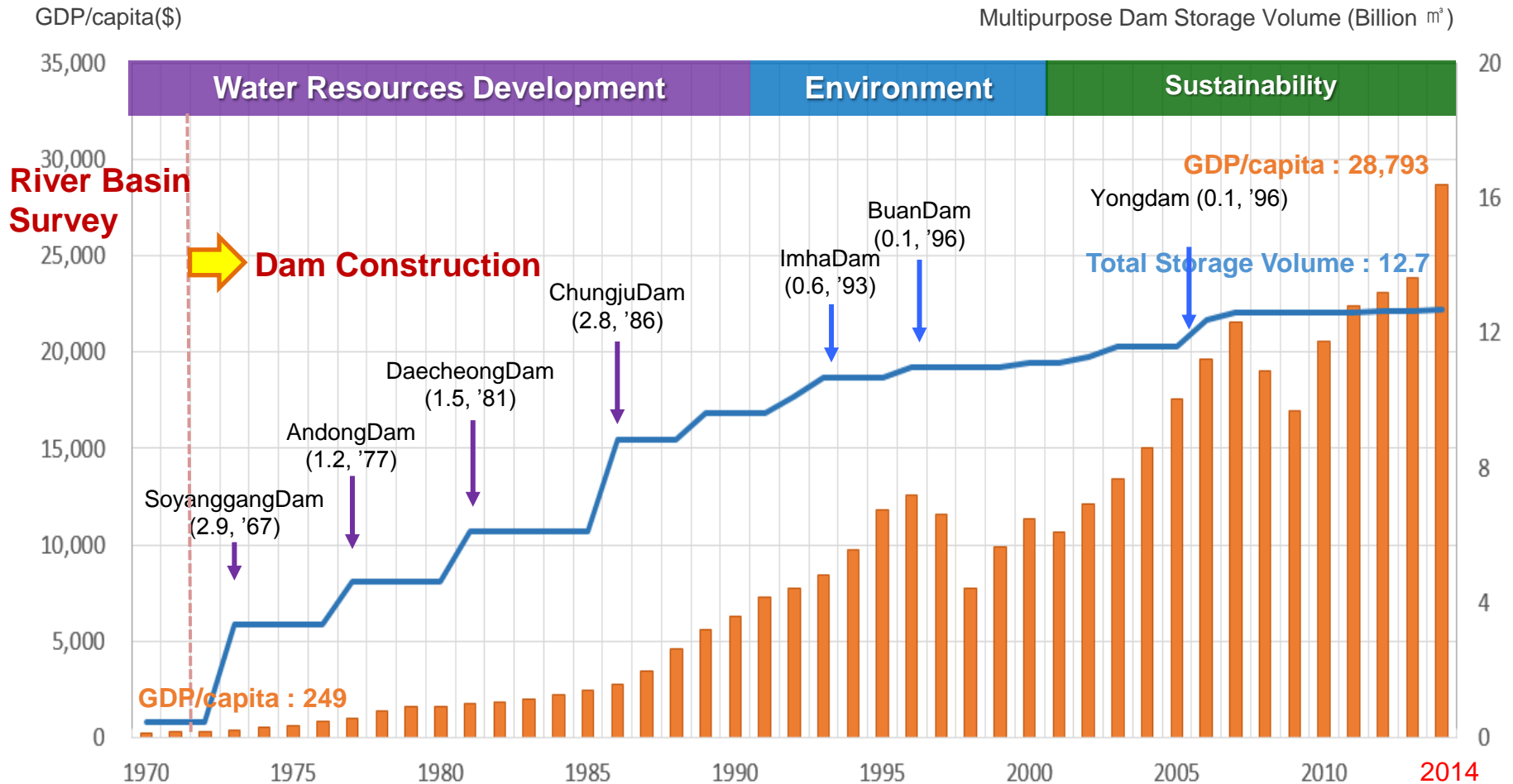


“ South Korea is **the unique country which required** to get the official aid in the past turns into the country to provide the aid ”

1. Water Resources in Korea

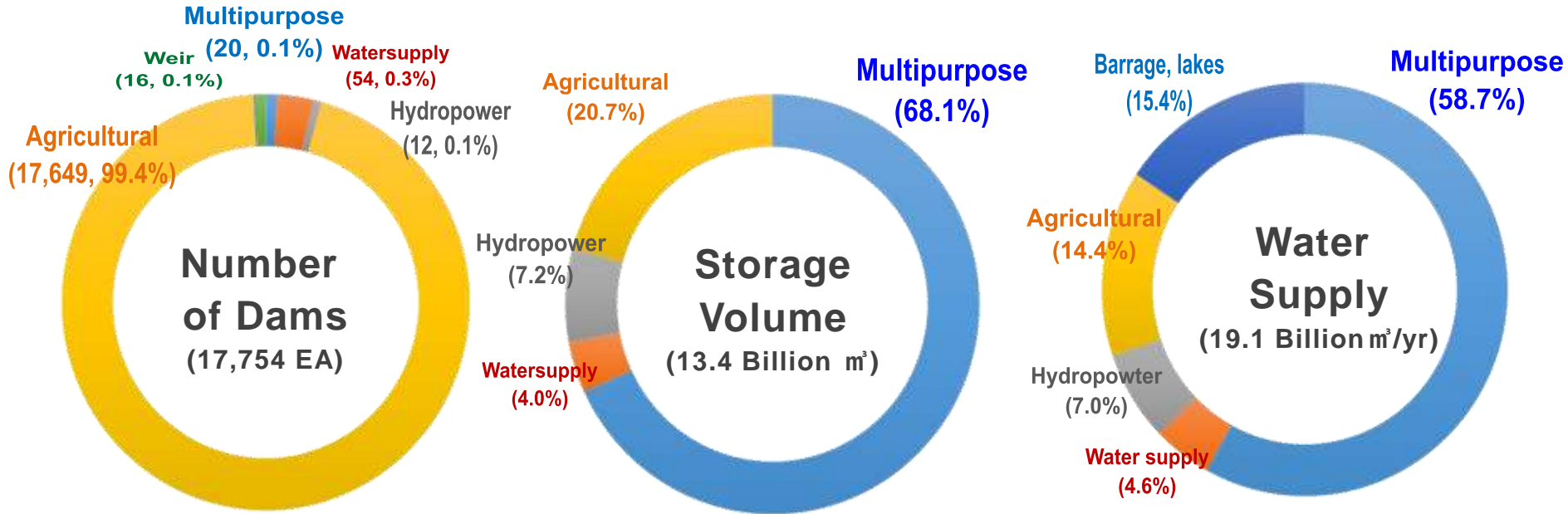
- Water Management History

GDP per capita vs Multipurpose dam storage volume



1. Water Resources in Korea

- Dams in Korea

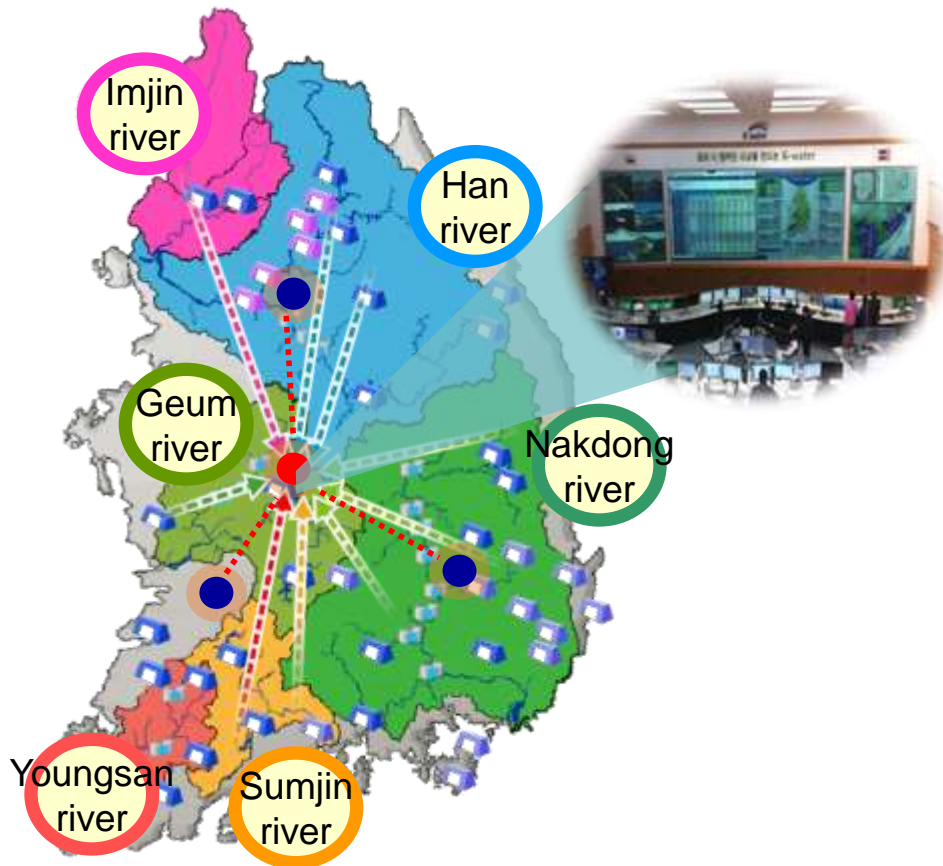


	Water Supply(Dam)	Flood Control Capacity	Hydro Power Generation	Water Supply System Capacity
Korea	20.9 B m ³ /yr	5.5 B m ³	1,785MW	36.3 M m ³ /day
K-water	13.2 B m ³ /yr	5.3 B m ³	1,075MW	17.5 M m ³ /day
Percentage (%)	63%	96%	60%	48%



Smart Water Management of K-water

HUB of Water Management in Korea



Hydraulic Structures

- 37 dams
- 16 run-of-river weirs
- 36 hydropower plants
 - * 89 generators (1,074MW)
- 407 Gauging Stations
- 230 Warning Stations

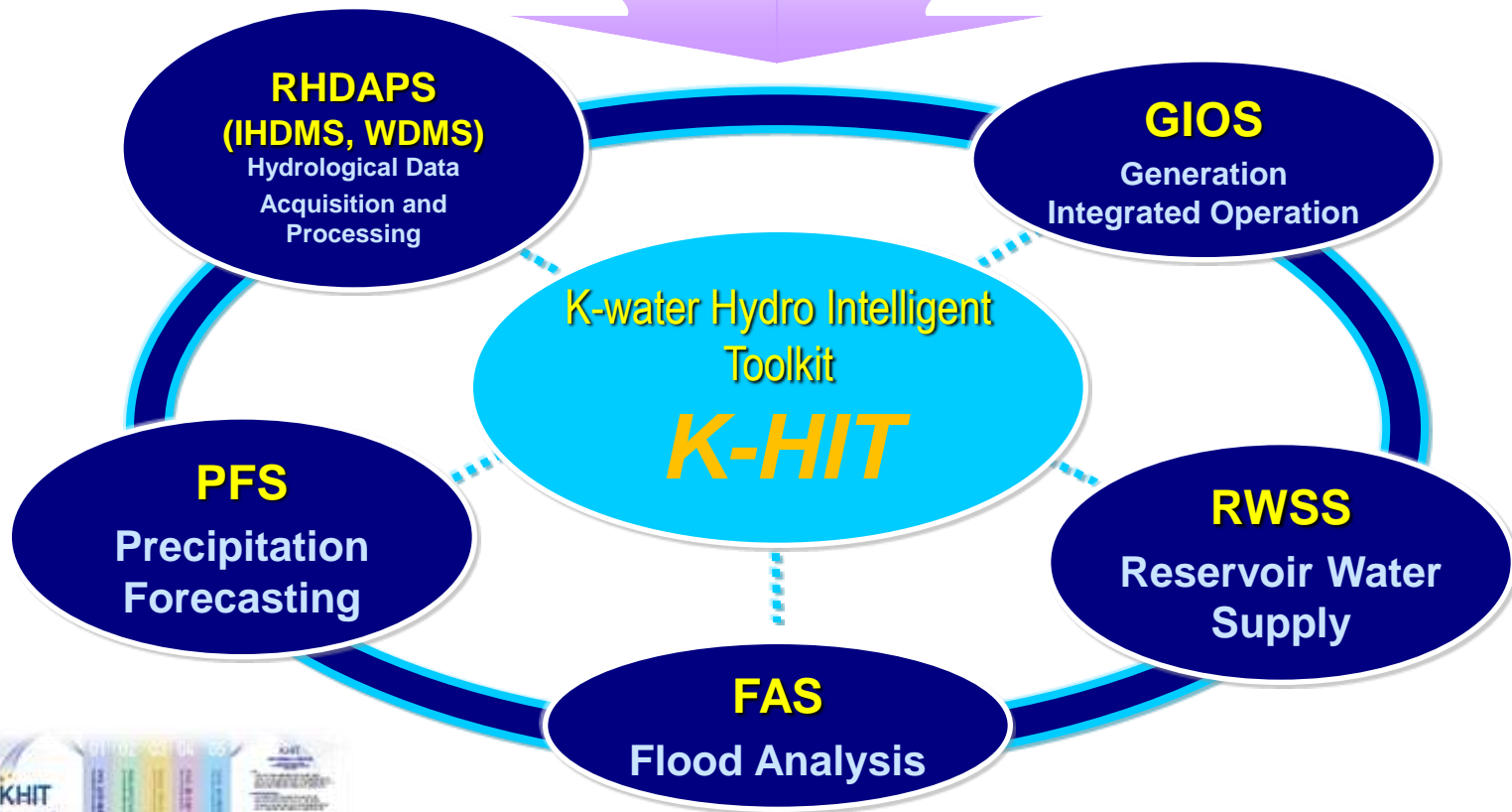
Main Works

- Precipitation Forecast
- Real-time Hydrological data Management
- Hydraulic structure operation (Flood Control, Water Supply Hydro Power Generation & Water Quality Management)
- Research & Development

2. Smart Water Management of K-water

Smart Water Management System

based on Ubiquitous Concept

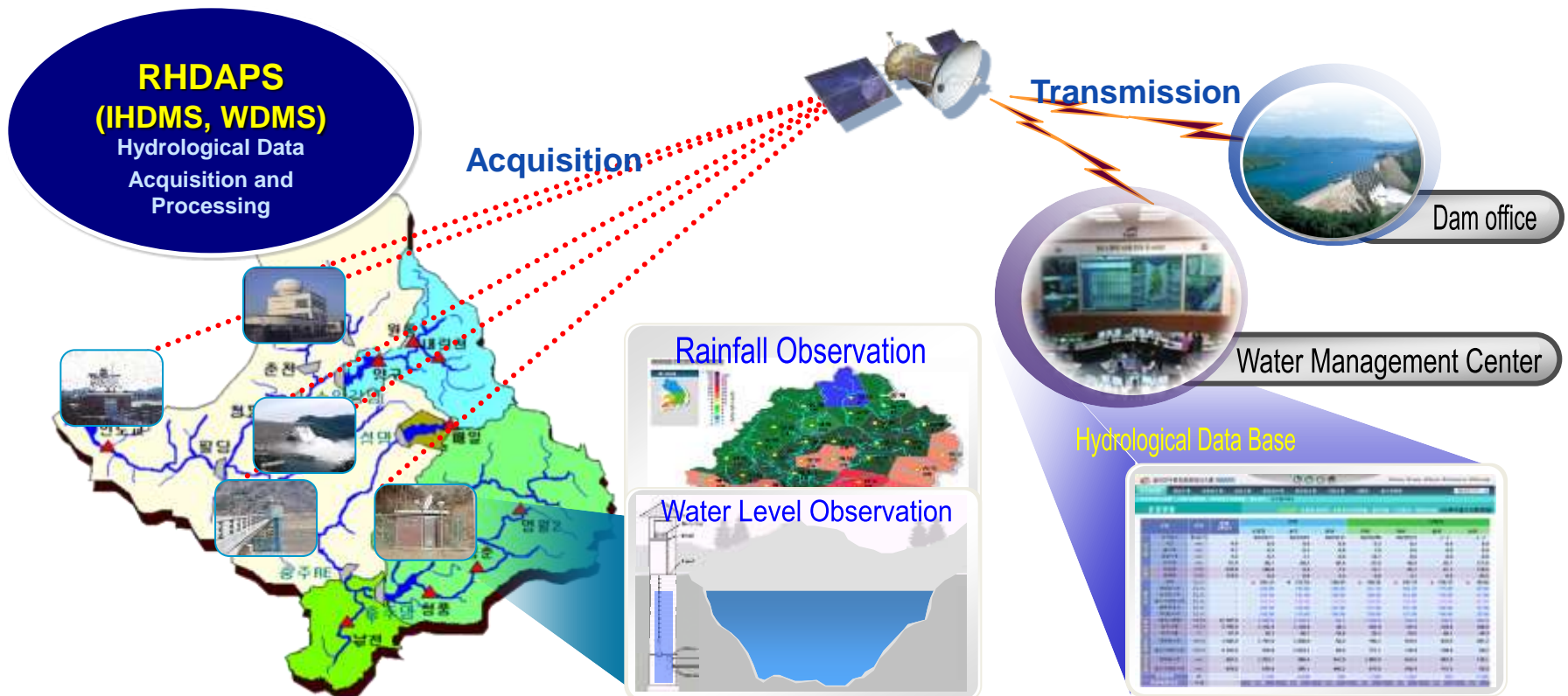


2. Smart Water Management of K-water

1. Real-time Hydrological Data Acquisition & Processing System (RHDAPS)

Gathering and Processing Real-time Hydrological Data

- (Gathering) Rainfall, water level, discharge & water quality data from 417 Stations
- (Data Management) 1 minute real-time base (1, 10, 30, 60 min)
- Dual Communication Network (Satellite + CDMA)



2. Smart Water Management of K-water

2. Precipitation Forecasting System(PFS)

Provide Precipitation Forecast for Dam/Weir Operation

Collection of weather data

PFS run on HPC

(4times/1day, 5days forecast)

Precipitation forecast

Korea Meteorological Administration (KMA)



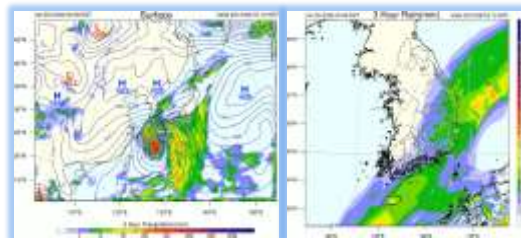
Collect Weather Data
Temperature, Humidity, etc



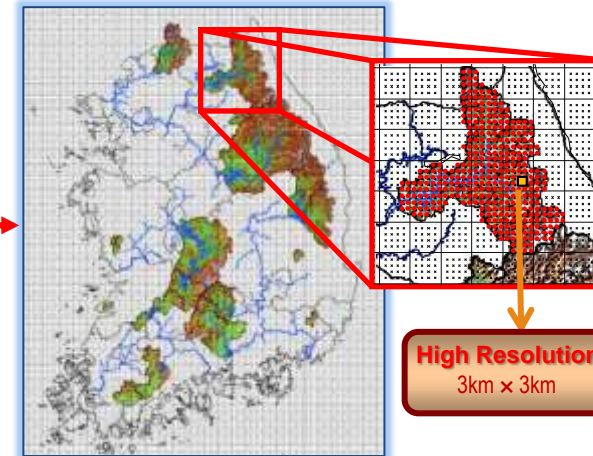
K water High Performance Computing (HPC)



Weather chart



Calculate precipitation



High Resolution
3km x 3km

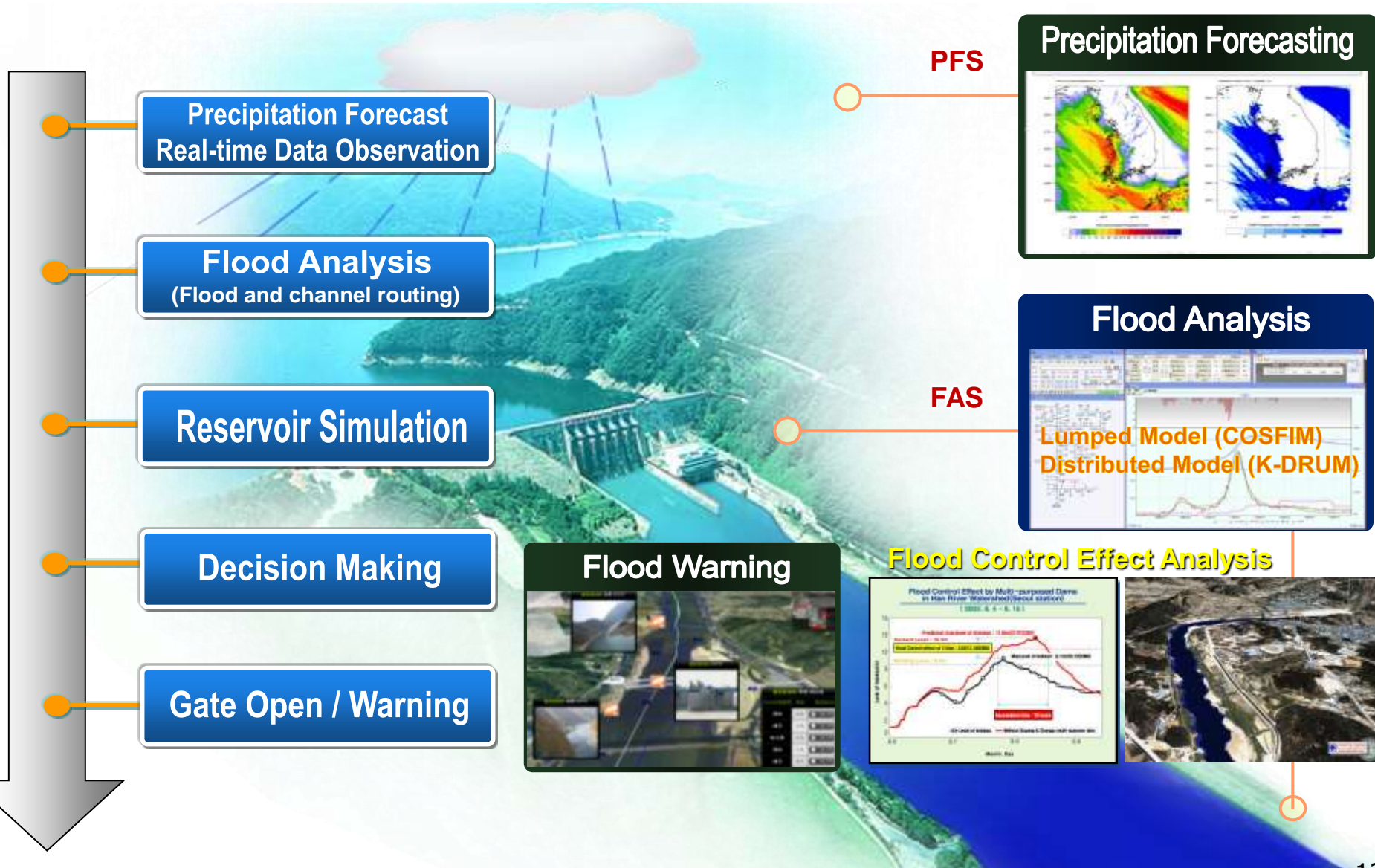
Flood Analysis System



Watershed based weather forecast
Optimized for dam/weir operation

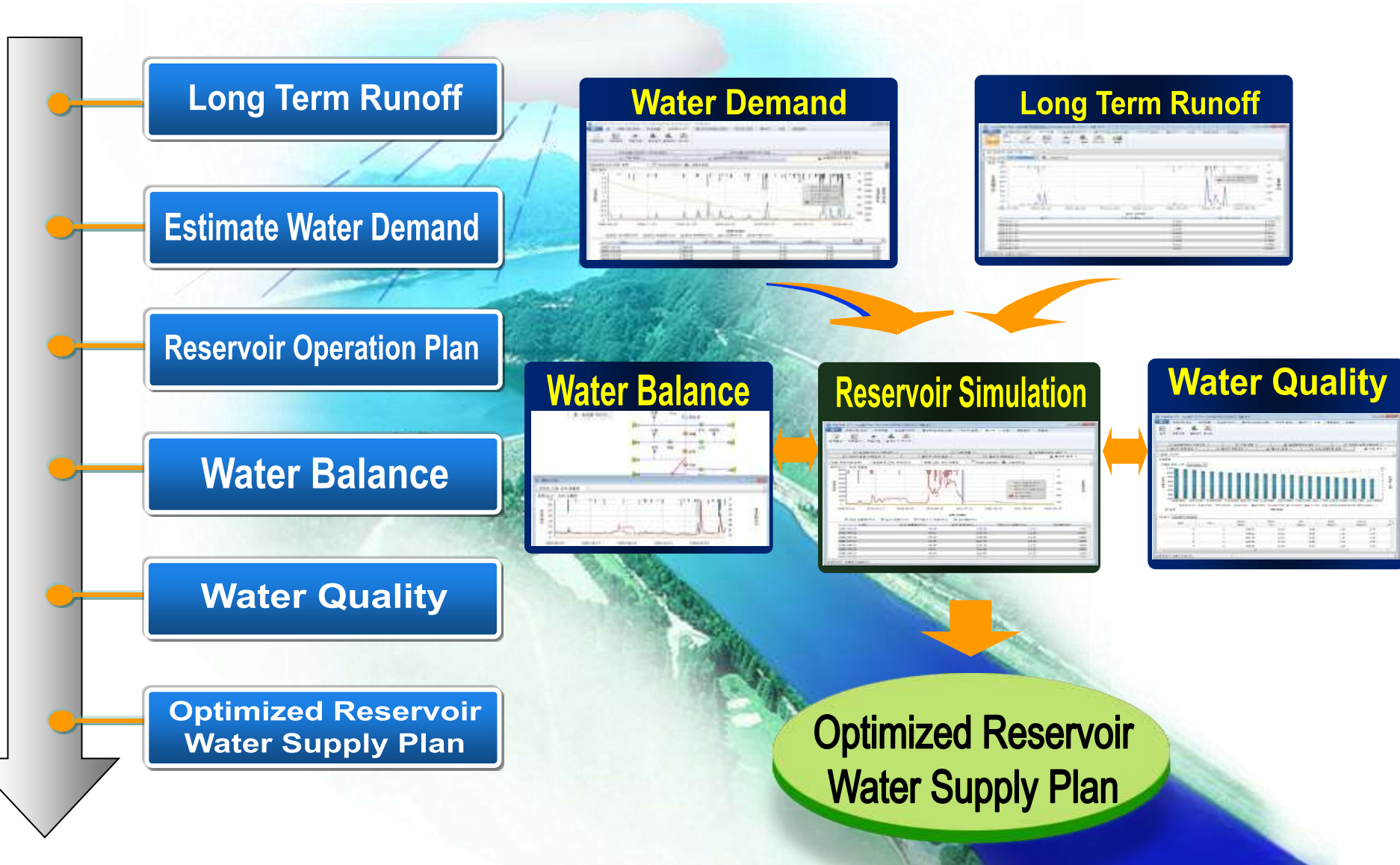
2. Smart Water Management of K-water

3. Flood Analysis System (FAS)



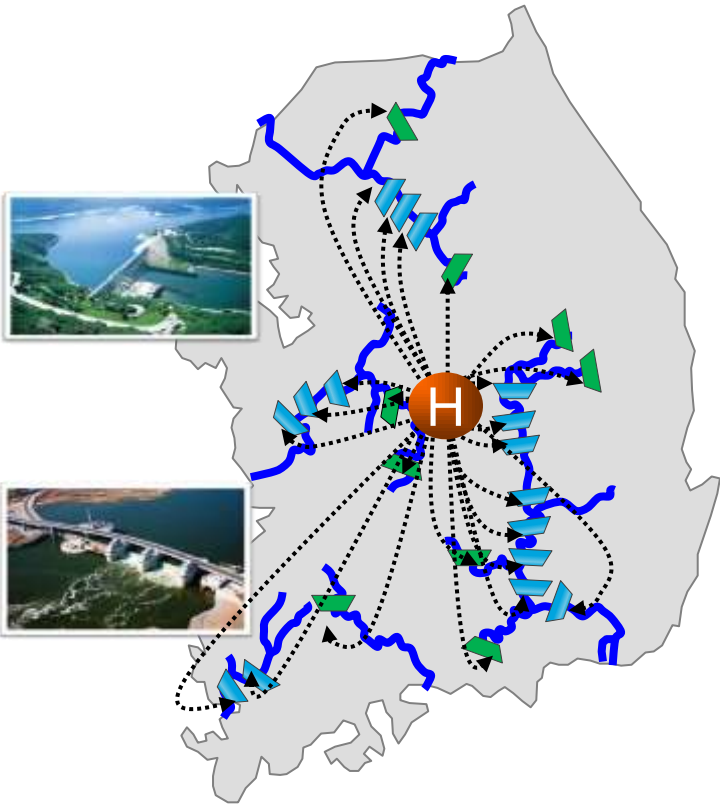
2. Smart Water Management of K-water

4. Reservoir Water Supply System(RWSS)



2. Smart Water Management of K-water

5. Generation Integrated Operation System (GIOS)



Remote Control & Monitoring

발전통합운영시스템 GIOS

2013-02-18 17:42:33

Net Login Not Login

Sub Menu Bird Feed Login Exit

전체 현황

- 주파수: 60.00 Hz
- 발전출력: 474 MW
- 소비용량: 1,333 MW

발전사업 현황

수양강댐

수양강댐

송주댐

안동댐

남강댐

임해댐

4대강소수력 : 51 MW

25 hydropower plants (79 generators 1,074 MW)

- 9 Multipurpose Dams (38 Generators, 1,011 MW)
- 16 Weirs (41 Generators, 51 MW)
- New Renewable Energy (etc. 12 MW)



Hydropower Plants

Monitoring

Remote Control

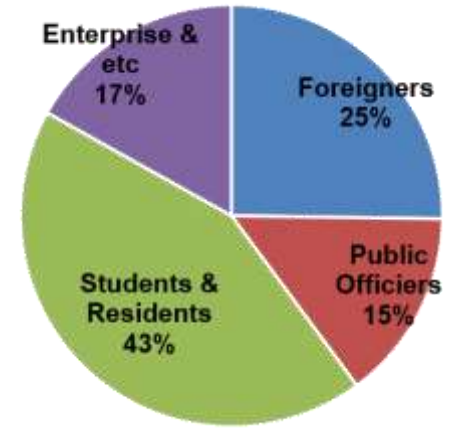


Water Management Center

2. Smart Water Management of K-water

Visitors

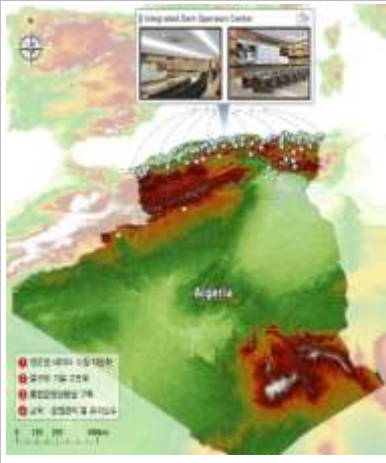



- **(Number of visitor)** More than 3,000 people visit annually
- **(Major celebrities)**
 - 2016 : Delegation of ADB, Nepal, Iran, Thailand
 - 2015 : CEO of IIC, Minister of Brazil, Minister of Mongolia, President nominator of Malawi
 - 2014 : Minister of Uganda, Minister of China, World bank WGP
 - 2013 : Vice chairman of Congress of Hungary, Ambassador of Pakistan
Chairman of Congress of Thailand



2. Water Management of K-water

Perform Overseas Project by Using Water Management Technology

- (Completed) 67 projects in 24 countries
- (Ongoing & Under Discussion) 18 projects in 24 countries

	Algeria (Integrated Dam Operation)	Peru (Integrated Water Resources Operation System)	Indonesia (Integrated Water Resources Operation System)	Philippines (Angat Hydroelectric plant)
Period	2017-2022(6yr)	2016-2020(5yr)	2017-2021(5yr)	2014-2039(25yr)
Expenses	320 Million USD	0.6 Million USD (Detail Design)	Under negotiation	500 Million USD
Contents	- Auto data gathering - Water management Technology	- Integrated Water Control Center - S/W and H/W for IWRM	- Integrated Water Control center - S/W and H/W for IWRM	- Hydropower plant O&M(218MW)
Pictures				



Thank You

