

2nd Dushanbe Water Action Decade Conference

Integrated Water Resources Management (IWRM) Of KOREA







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Integrated Water Resources Management (IWRM) of KOREA

I. Water Management Environment



Hydrometeorologically & Topographically Unfavorable Water Management Environment of Korea

• High level of spatiotemporal precipitation variations, precipitation concentrated in the flood season (June to September), etc.



Water Management Environment





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No. of Dams & Reservoirs in Korea to Respond to Flood & Drought Damage: 18,000

No. of dams & reservoirs managed by K-water: 54 (incl. 20 (multipurpose) + 14 (water supply) + 3 (flood control) + 16 (weir) + Nakdong R. Estuary Barrage) \rightarrow 0.3% of the dams cover 60% and 95% of water supply and flood control, respectively.



Water Management Environment

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No. of dams & reservoirs : 17,506 댐 다기능보 Multipurpose dam 20 Water supply dam 54 나구득, 담수 Hydropower dam 12 다목적담 209억㎡/년 (14%) Irrigation water supply dam 17,401 농업용저수지 (20%) Flood control dam 3 16 Multifunctional weir

| | ltem | Water supply | Flood control capacity |
|--|----------------|----------------------|----------------------------|
| | Nationwide | 20.9 billion m³/year | 5.6 billion m [*] |
| | MOE* (K-water) | 12.4 billion m³/year | 5.3 billion m [*] |
| | Percentage | 60% | 95% |

* MOE: Ministry of Environment of the Republic of Korea (ROK)



water

Water Management Environment

Need for Integrated Water Resources Management (IWRM) Climate Change Response / Industrial- & Urbanization-Endangered Water Security / Energy Security

• Smart IWRM system to ensure the interlinked management of water quality, water quantity, energy and city



Integrated Water Resources Management (IWRM) of KOREA

I. Integrated Water Resources Management (IWRM)

01 Policy Evolution for IWRM02 ICT-Based Data Integration

01 Policy Evolution for IWRM

water

Policy Evolution for IWRM

The era of IWRM begins with Integration of Water Management, and Integration of River Management completed the reorganization of water management system. 2010's ~ 2000's **IWRM Watershed** Integrated Water 80's ~ 90's 60's ~ 70's **Resources Management** Management Water Resource Water Quality **Development** Management Water Safety Policy **River Environment Policy Ecofriendly River Management Policy River policy** Consideration of eco-friendly National comprehensive river environment project ★ Amendment of law to transfer river affairs focused on flood safety environment for river to the Ministry of Environment('20.12)





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Smart Water Management (SWM)

- A new water management paradigm in which ICT-based smart devices, smart solutions, and smart services ٠ are applied to conventional water management practices
- A water management system to secure water safety and efficiency by combining water management knowhow with various devices and ICTs



02 ICT-Based Data Integration ICT-Based Data Integration

Real-time water resource information system (RHDAPS)



Generation integrated operation system (GIOS)



Establishment of integrated water management center



Web-DB based portal system customized for users that creates and provides high quality hydrological data

- · Real-time collection · creation and storage · processing of hydrological data
- · Expression of hydrological information, providing real-time video
- · Smartphone-based dam operation information service

that provides real-time remote supervision/control of water power, transmission transformation facilities as well as the current status and statistical data of power generation operation

- · Real-time supervision and control of power generation,
- transmission · transformation facilities
- · Management of alarm history and SMS delivery by grade
- Management of failure history by facility

Establishment of a control tower for monitoring of disaster situations and quick decision-making

- Installation of a video wall (big board) for monitoring

 management of situations and decision-making
- · Displaying various types of video signals in desired sizes on the screen
- · Application of the latest LED projector
- Establishment of optimal sound facility within the control room through sound simulation
- Composed of control room, showroom, meeting room, office, server room

${\rm I\!I}$. Climate Change Response Efforts

01 Responding to Climate Change

02 International Environment Cooperation Center(IECC)

01 Responding to Climate Change

K water







Trend of responding to global climate change

- Declaration for emergency and Urging climate action against global climate crisis
 - Making carbon neutrality 2050 for global agenda, active involvement of USA and etc.
- International economic order change due to strengthening global environment regulating
 - Introduce carbon border tax in EU and USA, and spread the campaign to join RE100

• Grow environment friendly market and expand the green investment

Paris, France



Korea's responding to climate change

- Strengthened political trend on climate crisis since declaration of carbon neutrality policy 2050
 - Provide a carbon neutrality scenario
 (June 2021 and establish implementation strategy)
- Regulated to drive carbon neutrality on 2050 as the first task of the government
 - Introduce the climate impact assessment and perform the carbon recognition budgeting system
- Korean parliament adopted 'the resolution for urging emergent responding against climate crisis(Sep. 2020)

01 Responding to Climate Change

Responding to Climate Change

Net-Zero Water Treatment Plant (WTP)

- Wide-area WTP with functions to reduce greenhouse gas (GHG) emissions (generated in the process of treating & producing piped water) to "0"
- Improvement of carbon neutrality (net-zero) and energy self-reliance by expanding the use of renewable energy and ensuring the saving of energy



Responding to Climate Change

Floating Photovoltaic (PV) System

- A convergence system to combine renewable (solar) energy with marine technologies (shipbuilding + mooring)
- An eco-friendly power generation system with solar modules installed on the water surface of dams and reservoirs
- * Improve environmental safety by continuously monitoring environmental changes (in water quality, aquatic ecosystem, etc.) near the system



Renewable Energy Cluster

- Construct a renewable energy cluster along Lake Sihwa to produce renewable energy from solar PV power, hydrogen, and latent green energy, along with a tidal power plant (equipped with a combination of AI and digital twin)
- Achieve carbon neutrality and water quality improvement

Sihwa Renewable Energy Cluster : overview

Constructed around the Siwha lake, leading nation's carbon neutral strategy



02 International Environmental Cooperation Center

water

International Environmental Cooperation Center

IECC International Environmental Cooperation Center

A special agency of international cooperation in environment field, a platform expanding the cooperation among countries and driving international development cooperation such as exploring and performing ODA project to accomplish the international reduction target

• Objective of Establishment

Take a lead in Green Recovery for responding to global climate change and win-win

Main Projects

Survey, study and establish roadmap related to green new deal and carbon neutrality project ODA

Plan and explore project type ODA and international reduction project, and check and supervise entire processes of the project

> green new deal ODA project into 3 models of ①Reduction type ②Adaptation type ③Efficiency type

1 Reduction type model

Project model based on increasing new renewable energy production amount, power generation facility modernization and efficiency in tap water supply operation

Expand new renewable energy



2 Adaptation type model

Develop the political project model for the people of developing country to acquire the safety and quality of live vulnerable to global climate change

Basin consolidated water management and low carbon tap water supply



3 Effectuation model

Support the green conversion in developing country through water-=energy-water front city linking type nexus ODA project model development

Knowledge and experience sharing project and nexus convergence project and etc.







Galaxy S22+



Samsung Smart Phones

Interconnection Cooperation Integration



Son, Heung-min

BTS



hydropower systems, floating PV systems, hydrothermal systems, etc.



Globally Sustainable Development,

Which is what we will create together with cooperation and solidarity through the SDG-PSS program.

Thank you.

