MA

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K-water

50 Years with Water, Another 50 Years Together to the Future

K water 2017 Sustainability Report

About This Report

K-water has published the sustainability report annually since 2005 in order to share the vision, activities and results of such sustainable management with stakeholders, making this the thirteenth (annual) report. With K-water's vision of 'A Future Driven by Water Sharing Happiness through Water', this report discloses K-water's sustainability management activities and our results, and our endeavor to become a Global Water Professional. The 2017 Report is mainly composed of four strategies that K-water strives to achieve.

✔ Reporting Standard

This report has been drafted in line with the GRI (Global Reporting Initiative) Standard and ISO 26000 which are the international standards for publishing sustainability reports, and complied with the core of the GRI standard guideline. This report features key issues derived from materiality tests and includes MA (Management Approach) on key issues.

✔ Reporting Period and Boundaries

This report is based on the 2016 calendar year. For the quantitative performance and, in terms of the additional performance, this report focuses on the sustainable management activities of the Head Office (3 Divisions, 2 Headquarters and 29 Offices) and Field Offices (3 Regional Headquarters, 1 Business Headquarters, 4 Regional Offices and 74 teams). In case of overseas projects (15 projects in 12 countries as of November 2017), only business performances were included in this report as they were operated not by business operators but by the project unit. This report does not cover subsidiaries and affiliates. Some data, such as results of education and support, included the content of partners in our supply chain. Financial performances have been filed based on consolidated data (K-IFRS) since 2011.

✔ Report Assurance

In order to enhance the accuracy and reliability of its content, this report was verified by Korea Management Registrations & Assessments Inc. The third-party assurance institution has confirmed that this report complied with the Core of the GRI Standard Guideline.

✔ Additional Information on the Report

There were not any significant changes in terms of scale, structure of the organization, base year, and/or ownership structure vis-a-vis the previous year. However, some data contained in the report were recalculated due to changes in criteria of calculation and application. K-water discloses its sustainable management activities and this report through the management disclosure on its website. The sustainability report is issued both in Korean and English. It can be downloaded in PDF format via our website. For more information, please contact the following.

K water

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50 Years with Water,
Another 50 Years Together to the Future

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50 Years with Water,
Another 50 Years Together to the Future

K-water 50 year History

1960s

Gaining a foothold for higher growth

- Established Korea Water Resources Development Corporation in 1967
- Carried out the 10-year plan for the water resources development
- Carried out the survey project of the Four-River Basin
- Started construction of Soyanggang River multi-purpose dam

1970s

Leading high growth despite the global recession

- Founded the Industrial Site Development Corporation in 1974
- Constructed Soyanggang River and Andong multi-purpose dams
- Created industrial complexes in Yeocheon, Changwon, Onsan, and Gumi
- Started operating the industrial water supply facilities of seven districts including Pohang, Yeocheon, Geoje, etc.

1980s

Nourishing the economy with abundant use of water

- Established Korea Water Resources Corporation in 1988
- Constructed Daecheon, Chungju, and Hapcheon multi-purpose dams, and Nakdonggang River Estuary Bank
- Started operating facilities of metropolitan water supply system, industrial waterworks of Onsan and Gwangyang, Multi-Regional water supply system of Gumi, etc.

1990s

In the midst of the economic prosperity, considering quality of life

- Constructed multi-purpose dams of Juam, Imha and Buan
- Constructed the industrial water supply systems of Gumi and Gwangyang, and multi-regional water supply system of Ilsan Newtown
- Conducted a water quality improvement project for Sihwa Lake and created the Reed Marsh Park of Sihwa Lake

2000s

The Blue Gold Age – Starting to enter the global water market

- Advanced the consignment project of Nonsan City local waterworks
- Completed the multi-purpose dams of Hoengseong, Yongdam and Jangheung
- Made a full-scale entry into overseas markets, including management of waterworks operation in Equatorial Guinea, technical support of the hydro power plant in India etc.

2010s

The Age of the Fourth Industrial Revolution – Leading the way with scientific water management

- Completed the Four Major Rivers Project and Sihwa Lake tidal power station, and opened up the Gyeongin Ara Waterway
- Implemented the Paju Smart Water City Pilot Project
- Advanced the hydro power generation projects in Pakistan and Georgia, and the waterworks project in the Philippines
- Held the 7th World Water Forum and established Asia Water Council(AWC)
- Implemented the Regional Headquarters System for realizing integrated water resource management (IWRM)

Members' activities

1971 Association of Great Dams
1974 Korean Society of Civil Engineers
1976 Korea Electric Association, International Contractors Association of Korea
1993 Korea Water Resources Association
1995 Environmental Impact Assessment Association
1996 Korean Association of Academic Societies, Korean Institute of Landscape Architecture
1997 Korea Electric Engineers Association
1999 Korea Disaster Prevention Association
2001 Korea New & Renewable Energy Association
2002 Korea Water and Waste Water Works Association
2003 Korean Society on Water Environment
2005 Korea Engineering & Consulting Association
2006 Ethical Management Forum, River Association, Korea Society for Environmental Analysis
2007 Korea Society of Environmental Restoration Technology, American Water Works Association, International Water Association, UN Global Compact
2008 Korean Society of Environmental Engineers, Membrane Society of Korea, Korean Society of Environment and Ecology
2010 Korean National Committee on Irrigation and Drainage, Korean Society for Fluid Machinery
2011 Society of Air-conditioning Refrigerating Engineers of Korea
2012 Korea Environmental Policy and Administration Society
2013 Architectural Institute of Korea
2014 Korea Society of Mechanical Engineers, Korean Society of Climate Change Research, Korea Photovoltaic Industry Association, Korea Society Quality Management, International Hydropower Association, The Korean Association for Conflict Studies
2015 Korean Society of Ecology and Infrastructure, Korea Society of Hazard Mitigation
2016 Asia Water Council (AWC), International Water Resource Association (IWRA)

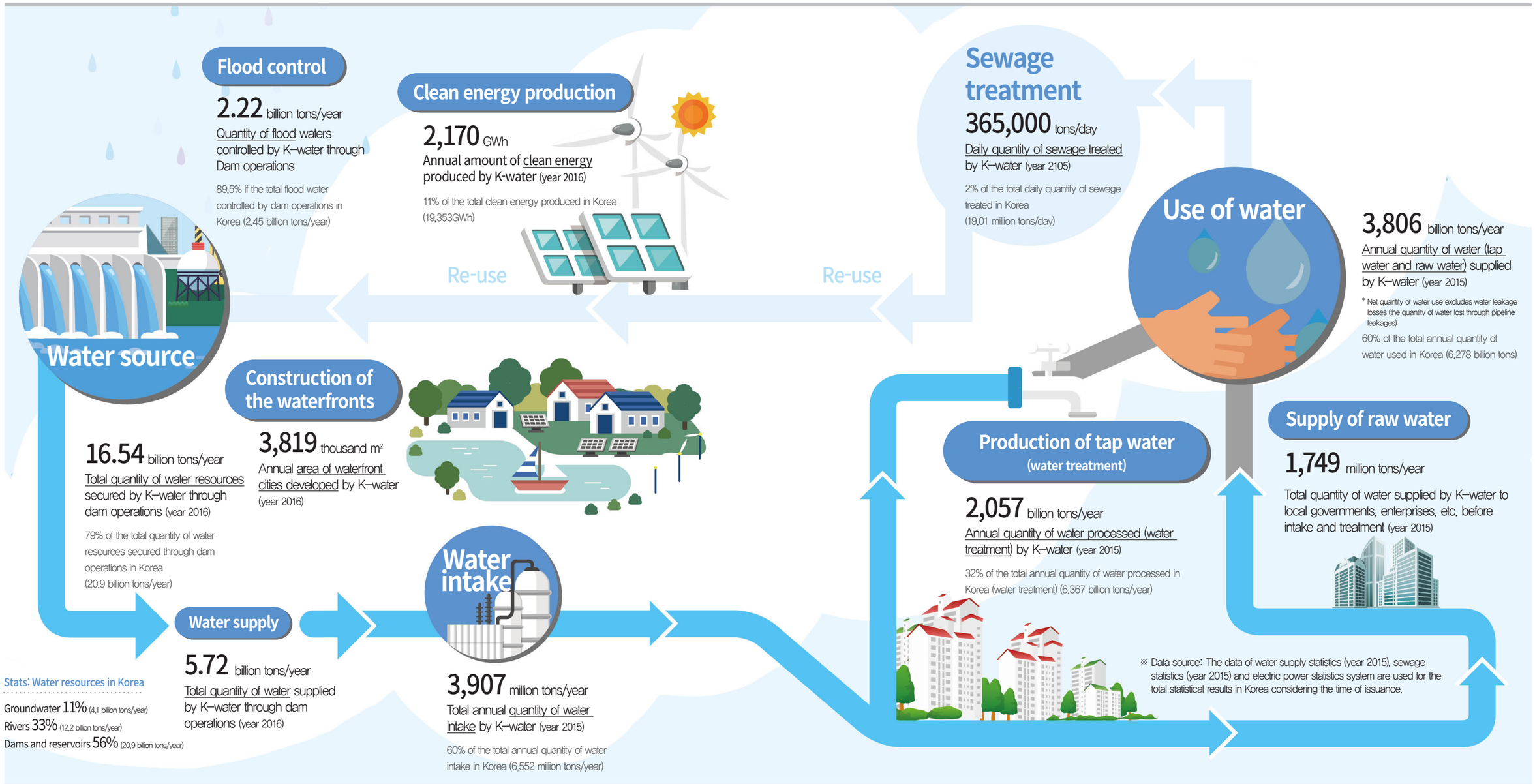
Awards

Apr. 2008 Grand Prize of Korea Digital Management Innovation Awards (Awarded by Ministry of Knowledge Economy and Maeil Business Newspaper)
Oct. 2008 Grand Prize of Korea Social Contribution Awards (Korea Journalist Forum), Sustainable Management 'Award of Highest Excellence' (Ministry of Knowledge Economy and Korea Chamber of Commerce and Industry), Grand Prize of Korea Eco-friendly Company Awards (Ministry of Environment), Selected as Most Admired Asian Knowledge Enterprise (UK Teleos)
Jan. 2009 Grand Prize of the Sustainable Creativity Management Awards in Environmental Management (Ministry of Knowledge Economy and UN Global Compact)
Oct. 2009 Received Commendation as an Excellent Enterprise in Low Carbon Green Growth (Green Growth Association and Ministry of Environment), New Regeneration Energy Awards 'Prime Minister Commendation' (Ministry of Knowledge Economy), Selected as Most Admired Asian Knowledge Enterprise (UK Teleos)
Dec. 2010 Grand Prize of National Green Technology Awards (Ministry of Knowledge Economy and Ministry of Education)
Jun. 2011 Special Prize in Green Management of Korea Green Management Awards (Ministry of Knowledge Economy and Ministry of Environment), Eco-technology Awards in the Eco-Star Pipeline Network Field (Ministry of Environment)
Jan. 2012 The First Public Enterprise Awarded as the 'Smart Work Superior Institute' (Ministry of Public Administration and Security)
Feb. 2012 The Most Admired Company in Korea (KMAC)
Jun. 2012 Grand Prize of Environmental Impact Management Awards (Ministry of Environment), Received Commendation as the Excellent Institution in the Global Social Contribution (Ministry of Health and Welfare), Selected as the Excellent Enterprise with an Outstanding Performance in 'Labor and Management Relations' (Ministry of Employment and Labor)
Jul. 2012 Korea Digital Innovation Award 'Public Sector Grand Prize' (Ministry of Knowledge Economy)
Sep. 2012 Excellent Enterprise with an Outstanding Performance in Purchasing Goods from SMEs (Small and Medium Business Administration of Korea)
Oct. 2012 Family-friendly Enterprise (Ministry of Gender Equality and Family),Top 100 Enterprise Selected as 'Great Workplace' (GWP Korea), Selected as Most Admired Asian Knowledge Enterprise (UK Teleos)
Nov. 2012 Received the Innovation Management Prize of the Sustainable Management Awards (Ministry of Knowledge Economy)
Dec. 2012 Received Grand Prize in the Public Enterprise Management Awards (Sisa Journal)
Jul. 2013 Received Grand Prize in the Korean Digital Green Management Innovation Award (Ministry of Science, ICT and Future Planning)
Oct. 2013 Korea Green Architecture Competition 'Award of Excellence' (Presidential Commissions on Architecture Policy), 'Commendation for Service' in Renewable Energy Supply Obligation System (Ministry of Trade, Industry and Energy)
Nov. 2013 Received Minister's Commendation in the Natural Environment Awards (Ministry of Environment), Selected as Most Admired Asian Knowledge Enterprise (UK Teleos)
Dec. 2013 Global Most Admired Knowledge Enterprise (UK Teleos)
Feb. 2014 The Most Admired Company in Korea (KMAC)
Jun. 2014 Selected as the Most Excellent Institution in the Assessment of Operation and Management of the Waterworks Business (Ministry of Environment)
Aug. 2014 Korean Digital Management Innovation Award in the CEO Sector (Ministry of Science, ICT and Future Planning), Received Certification of the Global Carbon Trust Standard (UK Carbon Trust)
Sep. 2014 Received the Global Project Innovation Award (IWA)
Oct. 2014 Selected as Most Admired Asian Knowledge Enterprise (UK Teleos)
Nov. 2014 GWP Grand Prize (GWP Korea), Korea Quality Management Enterprise Presidential Citation (Ministry of Trade Industry & Energy), Outstanding Agency in Anti-Disaster Drilling Assessment (National Emergency Management Agency), Advanced Public Enterprise in Shared Growth Prime Minister Award (Ministry of Public Administration and Security)
Dec. 2014 Received the Sustainability Science Award in the Environmental Sector (the Society of Sustainability Science), Korea Volunteer Work Grand Prize (Ministry of Public Administration and Security), Global Most Admired Knowledge Enterprise (UK Teleos)
Jun. 2015 Received Minister's Commendation in Social Contribution Sector of the National Sustainability Management Awards (Ministry of Health and Welfare)
Nov. 2015 Received Governmental Commendation from the Minister as the Most Admired Company in Korea (Ministry of Trade, Industry & Energy)
Dec. 2015 Received Minister's Commendation in Supporting Youth Out of School (Gender Equality and Family Minister) Received Minister's Commendation in the Public Institution Sector of Korean Educational Donation Awards (Ministry of Education), Selected as Most Admired Asian Knowledge Enterprise (UK Teleos)
May 2016 Received Minister's Commendation in Selection of Excellent Institutions at the Unification Expo (Ministry of Unification)
Sep. 2016 Received Minister's Commendation in the 2016 National Sharing Awards (Ministry of Health and Welfare)
Oct. 2016 Received Minister's Commendation in the 2016 National Sharing Awards (Ministry of Health and Welfare), Minister's Citation for Merit of Mensuration and Measurement(Ministry of Trade, Industry & Energy
Nov. 2016 Won Double Awards in the Web Awards Korea (Ministry of Science, ICT and Future Planning), Received the 2016 Asian-Pacific Stevie Award (in the Innovation Sector of Public Relation with Local Communities and Public Service Communication)
Dec. 2016 Selected as Most Admired Asian Knowledge Enterprise (UK Teleos)

Creating Sustainable Value

Major Performance of K-water

K–water endlessly strives for continuous value creation throughout the water cycle ranging from water resources to water taps.



CEO's Message

Dear stakeholders,
I would like to thank you for your encouragement and interest in K-water! I am glad to have the opportunity to present you with our thirteenth Sustainability Report.

Over the past 50 years, as the only water-specialized public enterprise in Korea, K-water has been protecting people's lives and property from water disasters and taking the lead in the sustained growth of the country. We have improved people's quality of life by efficiently developing and managing the national water resources. Recently, K-water's business environment has changed drastically. Due to climate change, water disasters are occurring more frequently, such as droughts and floods, all over the world, and the global water problems including water shortages and water pollution are getting more serious as the days go by. On the other hand, as the conditions of water management like population growth and industrialization deteriorate, water-related industries throughout the world are growing continuously. While both crises and opportunities coexist, K-water has been striving to promote sustainable growth as a global leader beyond Korea by taking full advantage of the prospective opportunities and overcoming the crises prudently.

In this report, the 13th Sustainability Report published by K-water, we would like to detail our endeavors and performances focused on "the four strategies for sustainable management" as the main pillars for addressing management issues in which our customers have interest.

First:
Water Circle, establishing the optimal water circulation system that will benefit the world
K-water, as the only water-specialized public enterprise in Korea, would like to see the existing water management paradigm classified into the supply and management of water quantity, quality, and ecology from an integrated viewpoint to which 'Water Circle' has been added, thereby realizing the sustainable use of water. K-water will realize water security and protect people and property from water disasters such as floods, droughts, etc., by responding to climate change through integrated water resources management. As well, we will create a new paradigm by providing efficient services that minimize the use of energy and resources while supplying healthy water.

Second:
Water Value, creating added value for people through the creative use of water
Due to the effects of global warming, inland waterfront spaces have become highly utilized and the demand for renewable energy is increasing. K-water would like to contribute to the creation of added value for the people by re-creating waterfront spaces as new spaces for life including dwellings, nature and culture, and by actively developing renewable energy, such as photovoltaic power generation on the surface of water, hydrothermal energy, and tidal power generation.

Third:
Water Platform, leading the global water industry
K-water is planning the operation of a water industry platform center and knowledge-based overseas expansion in order to be able to provide the world with comprehensive water services covering overall water circulation. It will be based on K-water's professional competence in water management, high reliability and global network accumulated over the past half century.

Fourth:
Water Trust, realizing a public enterprise based on trust
K-water is carrying out its corporate social responsibility based on financial soundness strengthened by ensuring the highest level of integrity in the public sector, and managing business efficiently. K-water is also expanding high-quality jobs by recruiting new employees and sharing jobs, and creating new jobs in the private sector by promoting the water industry. It is also creating an upright and ethical organizational culture, thereby striving to be continuously respected as a public enterprise trusted by the people.

I welcome your continued support for K-water, a company practicing sustainable management through the realization of "A Future Driven by Water Sharing Happiness through Water"
Thank you!

November 2017

Lee Hak-su
President & CEO of K-water

K-water's 2016 Sustainability Highlights

GWP 2016

Establishment of 'Global Water Professional,' the future vision for K-water's next 50 years

- Setting phased goals for accomplishing a future vision for the next 50 years

- Reorganizing the company's mission and core values
- Integrating, converging and reorganizing the company's projects → Water Circle, Water Value, Water Platform

Overall reorganization of the structural system

- Reorganizing focused on the Site → Regional Headquarters system, Head Office → Process
  Sites : 3 Regional Headquarters (Hangang River/Geumgang/Yeongsangang/Seomjingang Rivers/Nakdonggang River)
  Head Office : 3 Divisions and 2 Headquarters* (Management/Project Management/Project Plan/Waterfront*/Overseas*)
- Decentralizing the Head Office, and reinforcing responsible management centered on regions

Achieving the S Grade in the customer satisfaction measurement of publics enterprises

- Achieving the S Grade in the customer satisfaction measurement of public enterprises
- Reinforcing the customer-oriented quality management system
  - KS certification of the Customer Call Center → Raising the service quality and securing people's trust
  - Improvement of K-CRM System → Responding to civil complaints in a timely manner

Implementing social responsibility that reflects the features of ethical business

- Enhancing economic vitality by establishing K-water's unique platform for the water industry
  - Succeeding in the localization of hydroelectric facilities with the collaboration of industry-university-laboratory*
    *Design (university) → performance test (K-water) → manufacturing (SMEs)
- Resolving the gap of water-use by expanding the number of welfare projects
  - Improving the water environment, such as replacement of water supply facilities for the vulnerable social groups through the 'Water Project Full of Happiness' (cumulatively 323 facilities, benefiting 8,594 people)
  - Resolving water scarcity issues in farming and fishing communities, military camps and urban areas through operation of seawater desalination
  - Supporting water rate rebates for low-income groups with 'the water voucher' (KRW2 million to 1,070 households)

Reinforcing corporate partnership with SMEs

Expansion of the corporate partnership budget

Turnover of products developed with an option to purchase

- Expanding the budget for corporate partnership year on year
- Creating the public-private R&D fund of KW6 billion (KRW3 billion by K-water and KRW3 billion by the Korean Government)
- Supporting SMEs' overseas expansion, and development of new products with an option to purchase
- Expanding the one-stop performance sharing system and fostering hidden champions
  - Technology development of SMEs products (turnover of KRW51.4 billion), support of the performance verification (Saving KRW1.3 billion of the technology development cost), Water plus loan (supporting KRW65.4 billion), and vitalization of public purchases (purchasing KRW826.6 billion of SMEs' products)
- Providing K-water certification brand and advancing overseas markets together with SMEs
  - Supporting overseas entry including overseas exhibition, technology roadshows, etc., thereby creating SMEs' exports of KRW4.8 billion.
- Engaging in the water industry cluster, and leading the SMEs fostering policy
  - Engaging in the Technology Development Council of the water industry (attended by 13 institutions including the Ministry of Environment, special cities/metropolitan cities)

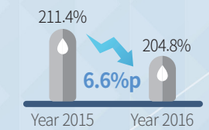
Export Certification Brand

K-ACE K-water ACcredited Excellent product

The excellent product has been certified by the government of Republic of Korea as part of a benefit sharing project, based on superior quality testing conducted at K-water's field test-beds

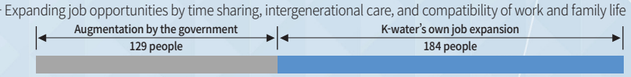
Securing financial structure soundness

- Reducing KRW1.69 trillion debt year-on-year (the largest in K-water's history)
- Re-establishing a high-intensity debt reduction plan by raising the debt reduction goal of KRW2.1 trillion by the year 2020



Creating jobs / contributing to the compatibility of work and family life

- Employing the largest number of recruits since the establishment of K-water (313 people being 7% of the total number of employees)
  - Expanding job opportunities by time sharing, intergenerational care, and compatibility of work and family life



  - Using the labor costs saved by the salary peak system for new recruitment → Sharing jobs among generations (61 people)
  - Expanding jobs by applying the rule of 6-hour working a day → Sharing jobs by a flexible work schedule (13 people)
  - Increasing the duration of parental leaves by strengthening the compatibility of work and family life → Filling the vacancy with temporary lay-offs and retired employees (110 people)
- Being certified as a family-friendly enterprise for 8 consecutive years, and Selected as one of the 100 Best Workplaces for five consecutive years (as of November 2017)
  - Engaging in the campaign for compatibility of work and family life uniquely among the public enterprises and enacting Business Standard
  - Total number of paternity leaves in 2016: Sixteen persons (1.8% of the total male employees), which is almost twice of the national average (8.5%)

Expanding the development of clean energy and exporting it to overseas markets

- Establishing and spreading the business model for all-out development of the photovoltaic power generation on the surface of water (40MW at Hapcheon Dam, etc.)
- Achieving export of K-water type model(SOLATUS) (Wananuma of Japan)
- Establishing the institutional basis for vitalizing water energy, such as foundation of the Water Energy Council
- Expanding the development of renewable energy sources like the floating photovoltaic energy generation system (2.8MW), small hydro power (6.17MW)
- Expanding sales of Renewable Energy Certificates and Certified Emission Reduction (REC · CER) (creating revenue of KRW47.5 billion)

Wananuma of Japan Water solar

Adjusting the future business portfolio / Innovation recognized by the people

- Adjusting the preemptive business functions based on the expectation of changes in the megatrends of future water management and collection of stakeholders' opinions
- Responding strategically through gap analyses between the future and present business
  - Deciding on multi-purpose hydroelectric dams for the reduction of non-core businesses and efficiency of water management
  - Concentrating efforts on future growth potential businesses: developing alternative water resources, developing water energy and establishing the Water Industry Platform
- Innovating services recognized by the people
  - Reducing the water rate for disaster areas, setting up an integrated flood control system, implementing real-time forecasts and alerts of drought, setting up portals, etc.

Creating an international cooperative base

- Founding the Asia Water Council(AWC) (March 2016) and hosting the Asia International Water Week(AIWW) (September 2017)
  - K-water's CEO is the current (sitting) President of AWC - Developing the Asia Water High-Level Round Table (AWHoT) into an international association
  - Establishing a basis for overseas expansion, and discovering and promoting private-public partnership projects (Smart water management project for Denpasa City, Indonesia)
- Attracting water-related international institutes (UNESCO International Center for Water Security and Sustainable Management)
- Holding the first Asia International Water Week(AIWW)
  - Attended by 15,500 people from 70 countries including Indonesia, Thailand, Cambodia, etc., and discussing solutions for Asian water issues including agreement of the Asia to World Declaration and enhancing the global phase of K-water and AWC

AWC General Assembly

Global Water Professional K-water

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Corporate Overview

K-water, as the only water-specialized public enterprise in Korea, aims at creating the "A Future Driven by Water Sharing Happiness through Water" by protecting people from disasters like floods through the efficient management of national water resources and by ensuring no region fails to receive the water benefits of a clean water supply.

General information (as of June 30, 2017)

Name of company

K water

Korea Water Resources Corporation
K-water

Date of establishment

November 16, 1967

Purpose of establishment

Contributing to improvement in the quality of life for all and promoting the public welfare by facilitating the supply of water needed for living purposes and improving the water quality through comprehensive development and management of water resources
(Article 1 of Korea Water Resources Corporation Act)

Type of organization

Quasi-market-type public enterprise

Location of HQ

200 Sintanjin-ro, Daedeok-gu, Daejeon Metropolitan City, Korea
(Postcode 34350)

Number of employees

4,687 people
(7 executives, 3,841 regular employees, 192 professional employees, 481 operating employees, and 166 specific employees)

Organization

HQ 3 Divisions, 2 Headquarters and 29 Offices
Site 3 Regional Headquarters, 2 Business Headquarters, and 74 Teams
Overseas 15 projects in 12 countries

Assets

KRW20.2994 trillion

Turnover

KRW3.6181 trillion

Debt

KRW13.6388 trillion

Credit rating

Domestic: AAA
International
- Moody's: Aa3 (stable)
- S&P: AA

Composition of shareholders

Korean Government: 92.1%
Korea Development Bank: 7.8%
Local government: 0.1%

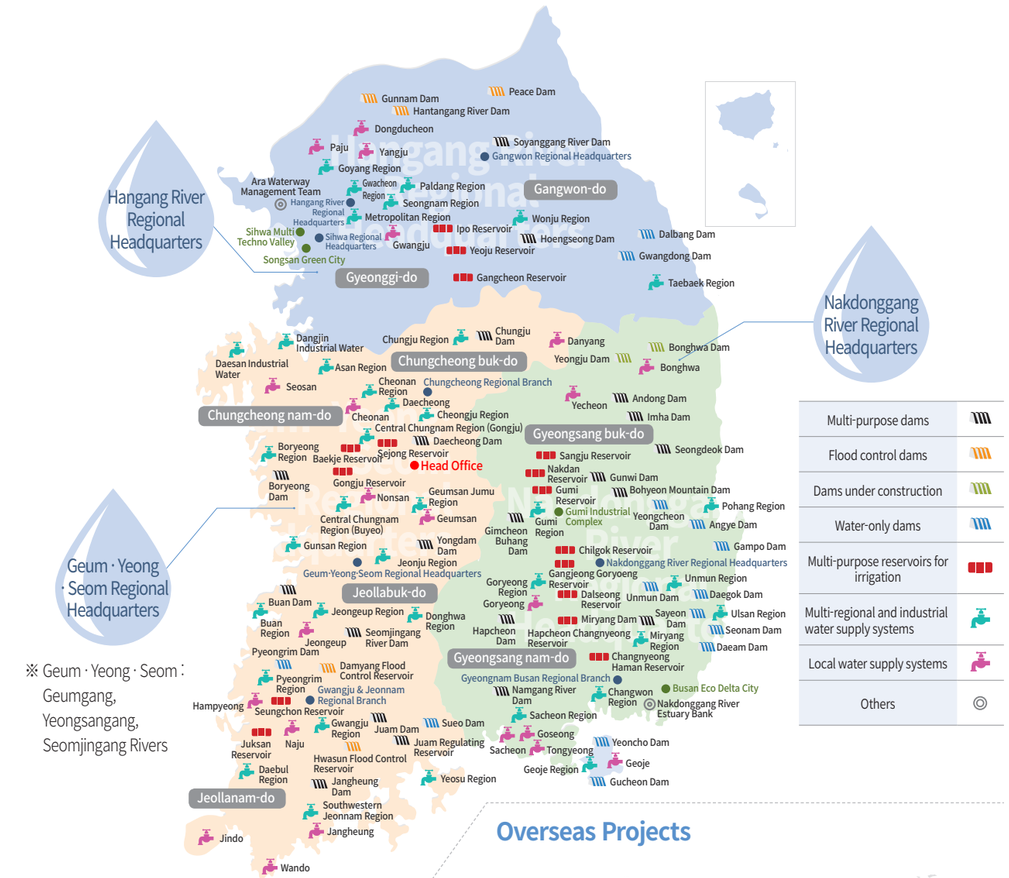
Subsidiaries of K-water

Domestic | Foreign

- Waterway Plus, Ltd. (shares: 100%)
- P Waters (shares: 2.0%)
- Korea Construction Management Corporation (shares: 18.9%)
- Angat Hydropower Co. (shares: 40.0% in the Philippines)
- KDS Hydro PTE. Ltd. (shares: 80.0% in Pakistan)
- K-water Thailand Co. Ltd. (shares: 99.9% in Thailand)
- KWPP Holdings Co. (shares: 38.5% in the Philippines)
- Star Hydro Power Ltd. (shares: 100.0% in Pakistan)
- JSC Nenskra Hydro (shares: 100% in Georgia)

※ Assets, turnover and debt: as of December 31, 2016

Integrated water resource management facilities in Korea



Overseas Projects

PM projects*: Project Management ODA Projects**: Official Development Assistance

Vision and Strategy

Having comprehensively developed and managed the water resources of Korea since its establishment in 1967, K-water, in celebration of its 50th anniversary, plans to advance as a global water-specialized enterprise over the next 50 years through the realization of integrated regional water management, establishment of water industry platforms and innovation across the entire water sector.

K-water's 50-year vision

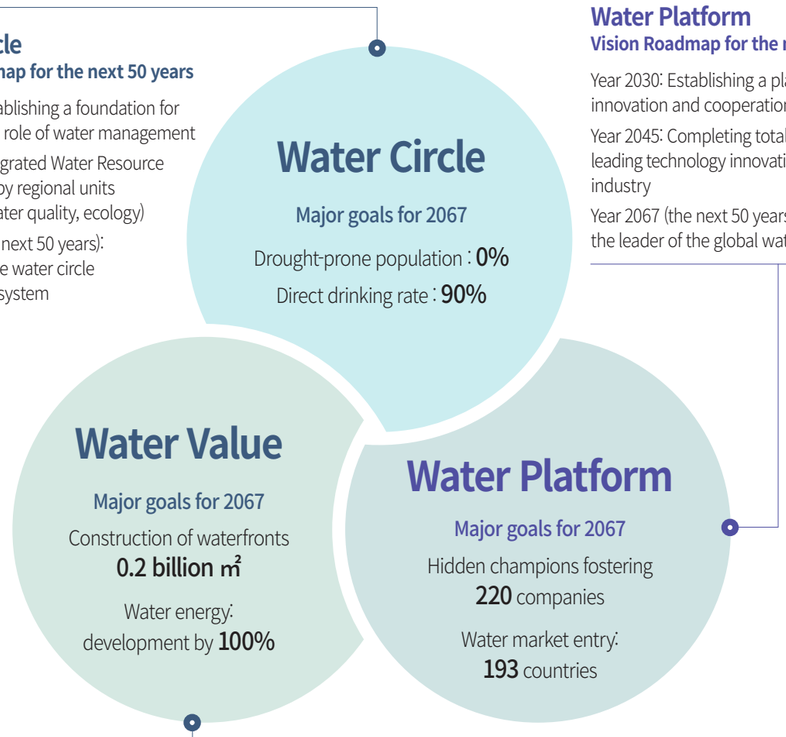
K–water will fulfill its social responsibility by establishing and implementing business strategies meeting the purpose of its establishment and by leading government policy, and is strengthening the sustainable growth base by discovering new growth engines through innovation in preparation for the future.

Water Circle
Vision Roadmap for the next 50 years

Year 2030: Establishing a foundation for expanding the role of water management

Year 2045: Integrated Water Resource Management by regional units (Quantities, water quality, ecology)

Year 2067 (the next 50 years): Completing the water circle management system



Water Platform
Vision Roadmap for the next 50 years

Year 2030: Establishing a platform for innovation and cooperation

Year 2045: Completing total solutions and leading technology innovation of the water industry

Year 2067 (the next 50 years): Becoming the leader of the global water platform

Water Value
Vision Roadmap for the next 50 years

Year 2030: Expanding the waterfront development and water energy businesses

Year 2045: Re-creating waterfront spaces with culture

Year 2067 (the next 50 years): Maximizing the value of waterfronts and water energy

Establishing a medium and long-term management strategy

K–water has declared its future vision by establishing a new future direction towards its centennial anniversary in 2067. By using technology innovation to mitigate the changing circumstances caused by climate change, K–water can realize sustainable water management and seize new opportunities for future growth by systematically predicting and analyzing water related conditions for the next 50 years.

In order to derive a new value system for achieving the new vision and create future growth engines through convergence, integration, and by strengthening connectivity, K–water has derived the management goals for 2026 and has set up 19 strategic tasks and 73 goal indicators. In order to enhance its role based on the recent national consensus on the importance of water management and lead the global water market based on "internal stability, innovation and trust," K–water is seeking to become a global water enterprise by establishing the medium (2017~2027) and long–term business strategies (2017–2067).

Purpose of establishment	Developing water resources	Supplying water	Improving water quality	Promoting public welfare
Mission	A Future Driven by Water Sharing Happiness through Water			
Vision	Global Water Professional			
Shared vision	Core values: Internal stability, Innovation, Trust		New management policy: Realization of the water circulation system; Creation of the new growth value; Pragmatic innovation management	
Managerial goals (year 2026)	Water Circle: Securement of water resources 18.66 billion tons; Direct drinking rate of tap water 30%	Water Value: Waterfront construction area 100 million ㎡; Water energy development 4,134W	Water Platform: Overseas turnover KRW302.8 billion; Support of overseas expansion 61 companies	Water Trust(TAP): Turnover KRW7,100 billion; Debt ratio 98%
Strategic goals (4 items)	Establishing the optimal water circulation system	Creating the added value of water	Leading the global water industry	Realization of being a trusted public enterprise
Strategic tasks (19 items)	Six items including the establishment of integrated water management base etc.	Five items including development of global waterfront cities etc.	Five items including enhancement of internal stability of the overseas projects	Three items including the open innovation engaged by the customers
Goal indicators (73 items)	27 items including the rationalization of hydroelectric dam management	20 items including construction of world-wide waterfront cities	17 items including fostering of hidden champions	Nine items including the expansion of management services that engage the customers

※ TAP: Together, Autonomous and Performance which is K-water's execution strategy

Corporate Governance and Responsible Management

In accordance with the "Korea Water Resources Corporation Act," the capital investment in K-water is limited to the Korean government, local government or Korea Development Bank, and the Korean government is required to invest 50% or more of the total capital. As of December 31, 2016, the investors are composed of the Korean government at 92.1%, Korea Development Bank at 7.8% and local governments at 0.1%. In addition, K-water's Board of Directors is composed of members who are professionals in each field, and it forges sound corporate governance through the establishment of a fair decision-making system.

Composition and operating system of the Board of Directors

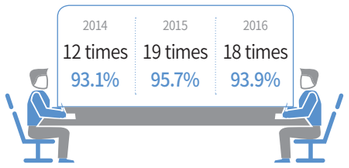
The Board of Directors, K–water's highest decision–making body, deliberates and resolves significant managerial issues including the management goals in consideration of public interest, economic feasibility, social responsibility and the environment. It also checks and supports the management group simultaneously. K–water's Board of Directors, 15 members in total, is comprised of seven executive directors and eight non–executive directors, and the chair is conducted by the senior non–executive director, thereby contributing to improvement of corporate governance of the public enterprise and rational checks of the management group. We elect a specialized non–executive directors to resolve management issues, such as the improvement of financial soundness, development of waterfront areas, etc. We constituted the Board of Directors, the Executive Recommendation Committee and the Audit Committee so that non–executive directors can form more than half of the total members of each organization to ensure the independence of non–executive directors and reinforce their role of checking.

Members of the Board (As of September 2017)

Executives	Name	Position
Executive directors	Lee, Hak Su	President & CEO
	Park, Jeong Hyeon	Auditor General
	Kim, Seon Yeong	Senior Executive Vice President
	Kwak, Soo Dong	Chief Administration Officer
	Kim, Bong Jae	Chief Business Management Officer
	Park, Byeong Don	Chief Business Planning Officer
	Lim, Seong Ho	Chief Management Officer of Hangang River Region
Non-executive directors	Park, Seung Ki	(Former) Chairman of Hyundai Steel & C. Ltd.
	Kim, Won Tae	Professor of the Graduate School of Public Policy, Hanyang University
	Lee, Won Suk	Steering Committee member of the Action Association for the Happy Smart Movement
	Kim, Keun Sik	(Former) Chief of the Marketing Headquarters of News Bureaus cum Head of the Gyeongin Center of CBS
	Choi, Yun Ho	(Former) Executive Director of ROTC State Forum
	Cho, Young Jae	CEO of DEJIN E&D
	Park, Woo Ho	(Former) CEO of Seyoung Accounting Corporation
	Cho, Hong Sik	Dean of the College of Law cum dean of School of Law of Seoul National University

In 2016, regular Board Meetings were held a total of 18 times, and the attendance rate of the members was 93.9%. In the Board of Directors meetings, 104 significant business progress issues were reported and 65 management suggestions were presented. In addition, the management suggestions of the Board of Directors were totally reflected, thereby contributing to K–water's improvement of management.

Operation status of the Board of Directors (Number of meetings / attendance rate)



Remuneration policy for the directors and auditor

The executive directors and auditor general receive their performance annual salary differentially depending on the result of the Government's evaluation, and the contents of the evaluation are composed of both quantitative and non–quantitative performances including the result of performance and efforts. In 2016, about KRW223 million was paid to the CEO as his remuneration, KRW170 million was paid to the Auditor General, and the average remuneration of the executive directors was KRW163 million. Allowance for the non–executive directors is paid differentially based on the record of their attendance at the Board of Director Meetings and the maximum payable amount is KRW30 million.

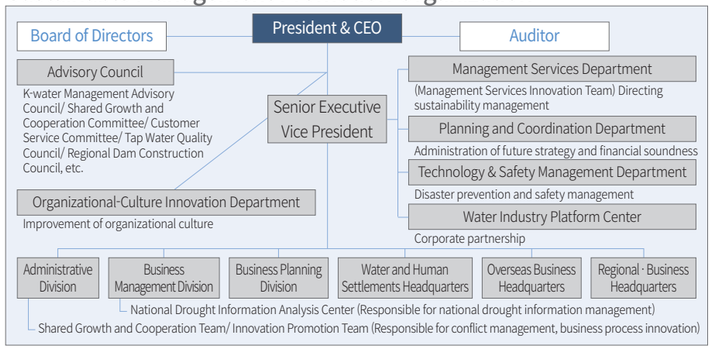
Promotion system for sustainability management

KoBEX SM
The highest grade for 5 consecutive years

SDGBI
Selected as an excellent group

K–water has set up and manages key performance indicators of 15 fields for the sustainable management and the systematic execution of SDGs. Through such efforts, K–water's sustainability management has received the highest grade for five consecutive years in the KoBEX SM (Korea Business Index – Sustainability Management) measured by the Korean government, thereby attaining its excellence. In addition, K–water was selected as part of the excellent group in the Sustainable Development Goals Business Index (SDGBI) (in November 2017) announced by the Korean Association for supporting the United Nations SDGS which is the Special Advisory Body of the United Nations Economic and Social Council. K–water's sustainability management is carried forward as a company–wide mission, and with the Management Service Department led by the Senior Executive Vice President as the mainstay, each of the Divisions and Regional Headquarters plays a central role for carrying forward projects organizationally from economic, social and environmental point of views.

Sustainable Management Promotion Organization



Organizational innovation for sustainable management

K–water annually strengthens the main functions to promote sustainable management within the organization in consideration of changes to management. By operating committees and councils, etc., continuously in order to listen to stakeholders' various opinions and cooperate with them along with the dedicated internal organization for sustainable management, we are planning to successfully perform sustainable management.

Year	2013	2014	2015	2016	2017
Requirements	· Corporate partnerships with our partners · Improvement of financial structure	· Sustainable growth strategy like smart water management, etc. · Reinforcement of disaster and safety management	· The basis for scientific water management in response to abnormal climate	· Innovation of autonomous, positive, and dynamic organizational culture · Innovation of the entire business cycle in consideration of sustainable management · Reorganization of each business in order to achieve Integrated Water Resources Management	· Control of algal blooms · Corporate partnership through developing the water industry · Implement projects that create social value
Organizational innovation	Corporate Partnership and Diagnosis Team Financial Structure Improvement Team	Future Strategy Department Disaster and Safety Management Department	National Drought Information Analysis Center	Organizational Culture Innovation Department Company-wide reorganization (formation of Regional Headquarters) ERP Promotion Team	Algal Blooms Technology Center Water Industry Platform Center Executive Office for Jobs

Key Performance Indicators of medium- and long-term sustainable management

K–water manages the key performance indicators of sustainable management in accordance with the rapidly changing environment. In order to respond to the external environmental changes including climate change, water management trends, reinforcement of corporate social responsibility, etc., and improve the performance of sustainable management, K–water has improved management efficiency by amending the key performance indicators in accordance with the New Management Strategy and has improved them in order to create social value in relation to its business.

Direction of the Sustainable Management Strategy	Key Performance Indicators	2015	2016			2017
		Performance	Goal	Performance	Achievement rate	Goal
Establishing the Optimal Water Circulation System Water Circle	Quantities of Dam Water Supply (100 million m^3)	56.9	57.8	57.2	99%	59.1
	Quantities of Secured Water Resources (100 million m^3)	160.9	165.4	165.4	100%	182.9
	Introduction Rate of the Integrated Flood Management (%)	9	18	18	100%	28
	Water Safety Index (WSI)	0.851	0.876	0.884	101%	0.9
	Global Water Quality Standard Achievement Rate (%)	99.7	99.9	99.9	100%	100.0
	Securement Rate of Dam Safety Rating (%)	78.6	84.2	84.2	100%	86.2
	Water Flow Rate in Pipelines of Local Waterworks (%)	82.9	83.3	83.9	101%	83.3
Creating the Added Value of Water Water Value	Water Energy Development Rate (%)	-	1	1	100%	5
	Improvement of Hydropower Generation Efficiency (GWh)	909	1,516	1,324	87%	1,355
	Renewable Energy Supply Rate (%)	5.1	5.2	5.3	102%	5.3
	Waterfront Plot Sales	10,339	16,815	9,831	59%	8,825
	Number of Waterfront Visitors (people)	10,716	11,252	11,756	104%	11.814
Leading the Global Water Business Water Platform	SMEs Jointly Advancing to Overseas (number)	-	2	2	100%	2
	Sales of SMEs' Products of Technology Development (KRW 100 million)	381	442	514	116%	524
	Turnover of Overseas Business (KRW 100 million)	1,319	1,578	1,769	112%	2,057
Realizing the Trusted Public Enterprise Water Trust	Consensus Rate of Vision and Strategy (points)	97.1	97.6	97.7	100%	98.0
	Turnover (KRW1,000 billion)	3.7	3.7	3.6	98%	3.7
	Debt Ratio (%)	211.4	212.6	204.8	104%	206.3
	Business Profit Rate (%)	9.3	9.9	10.1	102%	12.5
	Cost Reduction Rate (%)	17.1	12.0	14.7	123%	12.4
	Scale of work Creation (people)	30,712	32,712	32,062	98%	34,712
	Social Contribution Activity Index (points)	92.7	92.5	92.6	100%	92.5
	Talent Fostering Rate (%)	42.5	43	43.6	101%	44
	Customer Satisfaction Rate (grade)	A	A	S	100%	A
	Trust Management Index (point)	68	72	77	107%	78
	Evaluation of Information Security Management Status	78.64	79.46	80.22	101%	80.46
	Diagnosis of Personal Information Management Level	97.14	97.0	98.04	101%	97.0
	Degree of Effort for Risk Management	95.29	95.8	96.48	101%	96.3
	Accident Rate of the Construction Work	0.52	0.47	0.46	102%	0.41

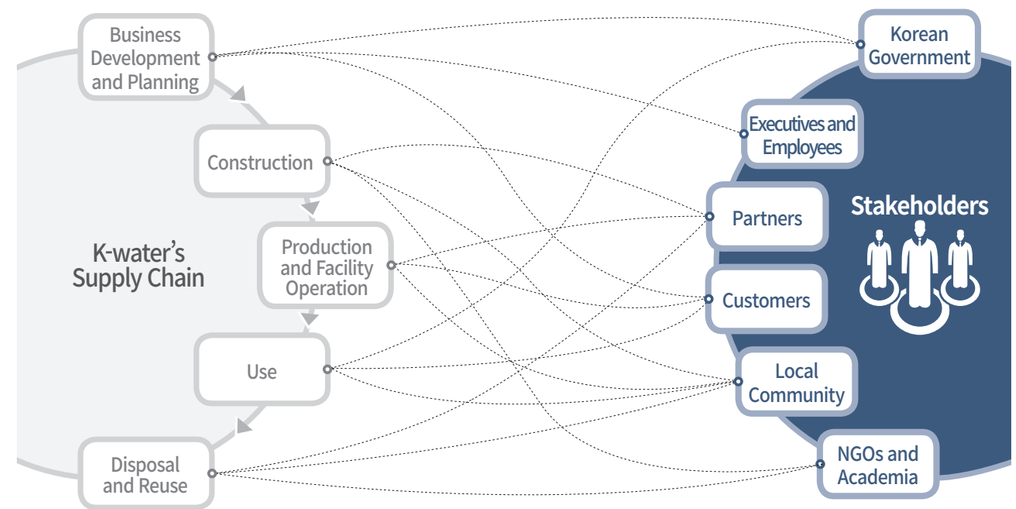
Sustainable Management along with the Stakeholders

For efficient communication with diversified stakeholders, K-water prevents conflicts in advance and ensures transparency and trust through the communication channels fit for each characteristic.

Composition of stakeholders

K–water's stakeholders are directly the customers who are provided with K–water's services, and indirectly the Korean government and local governments influencing K–waters business promotion, the local communities carrying forward the projects, policy customers like academia, and civil societies, etc. This influences the direction of K–water's business projects, the partners engaging in the whole business process, and the executives and employees who conduct the business directly.

Major stakeholders of K-water's supply chain



※ The connecting lines indicate which stakeholder gives and receives influence in each stage of the supply chain

Korean Government
Governmental agencies related to projects

Customers
Domestic local governments (consumers of multi-regional waterworks, consignment of local water and sewage)
Residents who are supplied with tap water, Korea Electric Power Corp., buyers of waterfront plots
Overseas local government, residents, development banks, etc.

Executives and Employees
Domestic and overseas executives and employees, and labor union

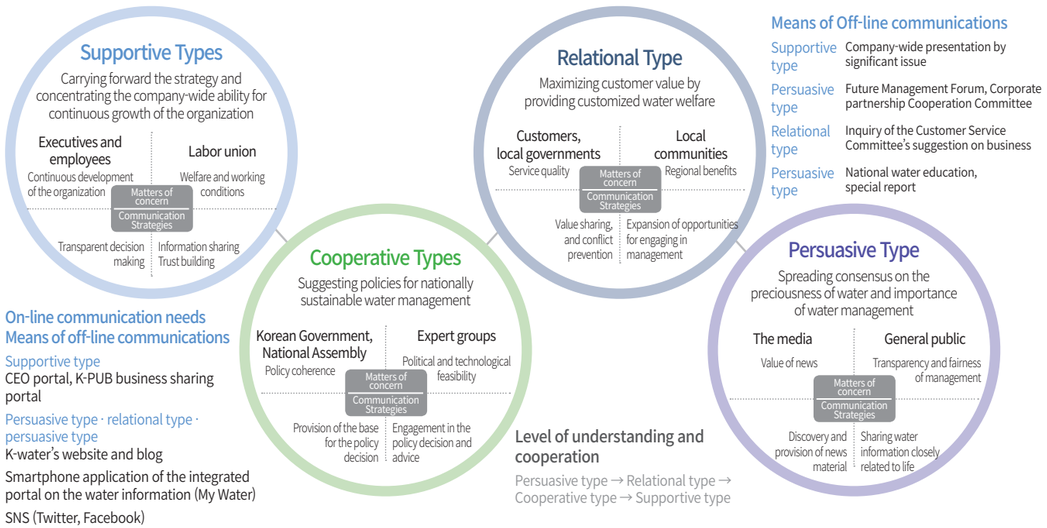
Local Communities
Construction areas, business areas, other local residents, etc.

Partners
Companies in the field/area of raw material production, facilities, maintenance, construction, etc.

NGOs and Academia
Academia, associations, civic organizations, etc.

Communication strategies with K-water's major stakeholders

In order to execute the communication strategies depending on the stakeholders' characteristics and concerns, K–water classifies stakeholders on the basis of the degree of understanding and cooperation on water management. By classifying stakeholders, we can greatly enhance the likelihood of reaching a consensus on our vision and strategies with both domestic and foreign stakeholders by operating shared channels and programs in consideration of their unique characteristics.



Results of executing the communication strategies with stakeholders

In order to preemptively resolve conflict factors that could occur when carrying out projects through stakeholders' engagement and minimize people's inconveniences, K–water is striving to engage stakeholders in the whole process of management either directly or indirectly through effective communication strategies considering the characteristics of each stakeholder.

Measuring indicators		2014	2015	2016
Internal performance	Consensus of vision · strategy	95.5 points	97.1 points	97.7 points
	Trust management index	56 points	68 points	77 points

Measuring indicators		2014	2015	2016
External performance	Customer satisfaction	96.2 points	94.7 points	95.9 points
	Number of the positive reports	3,039 items	3,994 items	2,921 items

※ Criteria of the number of positive reports: K-water's own investigation

In order to listen to opinions from various stakeholders of all social strata including critical opinions and communicate with them, K–water operates regular and standing consultative groups and committees which civic groups, experts, academia and government engage in. Especially, the Win–Win Cooperation Committee, in which civic environmental groups like the Korean Federation for Environmental Group, water management experts and conflict management experts engage and discuss the management issues of K–water, was established in 2014 and has implemented 23 conferences as of October 2017, not including temporary committees and subcommittees. In addition, as the need was raised for the basin management of the overall water circle, for establishment of the governance following the reorganization by the basin unit and realization of the Integrated Water Resources Management (IWRM) by the basin unit, K–water is operating the Win–Win Cooperation Committee respectively in three regional headquarters. Through this, K–water improves the ability to resolve current issues and enhances the role of the regional headquarters by the conjunctive operation of the Central Win–Win Cooperation Committee and the Regional Win–Win Cooperation Committee.

K-water's Efforts to Achieve the SDGs

K-water plans to lead sustainable development in the water-related field by carrying forward the sustainable management policy and activities and also contribute to the sustainability of Korea and, by extension, the international community. The United Nations has declared the Sustainability Development Goals (SDGs) which the whole world ought to accomplish by 2030 for the sustainable development of the international community. SDGs are comprised of 169 detailed targets in 17 goals for resolving the universal problems of humankind (poverty, diseases, education, female, children, etc.), global environmental problems (climate change, energy, environmental pollution, water, biodiversity, etc.), and economic and social problems (technology, dwelling, labor, employment, production, consumption, social structure, etc.).
Especially, water-related issues has emerged as the key challenge for the future preparation to the point that water is related to 11 out of 17 goals, and as such, K-water's role as a government enterprise is increasing in importance. K-water has engaged in the SDGs Supporting CEO Statement conducted by UN Global Compact Network Korea and declared its willingness to implement (in September 2017, referring to page 96 of Appendix), and now plans to become a water-specialized public enterprise of Korea, a global water management powerhouse, by realizing the global Sustainable Development Goals (SDGs) through the dissemination of know-how on integrated water management, development of water energy, creation of waterfront spaces, etc., and by enhancing and sharing the value of water with the world and toward the future.

Implementation of a new management strategy and sustainable development goals (SDGs)

Water circle (Life-protecting water)

K–water is conducting integrated basin water management for the overall water circulation process in which the runoff flowing into basins and rivers is efficiently used and managed through the ICT technology. In this way, K–water plans to achieve its sustainable development goals ensuring the sanitation of water and responding to climate change.

Definition	Integrating management of the previously distributed water management components (facility, information, water quantities, water quality, etc.) based on communication with water management related stakeholders and advanced technology for managing water optimally.
Goal	Fairness, durability and efficiency of water management

Stabilizing water supply

Leading the innovation of national water management p.31~32

Diversifying water sources and customizing development p.32

Enhancing efficiency of existing water resources p.32, 36

Clean water and sanitation

Preventing water disasters

Reinforcing the safety of prevention-focused dams p.31

Enhancing the responsiveness to algal blooms in dam and reservoir waters p.44

Responding to disasters in collaboration with other institutions p.41~44

Climate action

Enhancing water balance

Reinforcing customized regional support projects p.32

Providing integrated water information centered on people p.31, 35

Using water resources facilities diversely p.40

Clean water and sanitation; Reduced inequalities

Water Value (Value-creating water)

K–water is carrying forward the development projects of waterfront cities, water–friendly cities and national industrial complexes as part of K–water's waterfront development business and leading the domestic renewable energy business as part of K–water's clean energy development business. Through this, K–water is making significant contributions to achieve the sustainable development goals (SDGs) by providing sustainable cities, dwelling environments and producing affordable and clean energy.

Definition	Developing clean energy, developing waterfront cities and spaces using water-related spaces and facilities
Goal	Contributing to public welfare promotion through the creation of new values added to water

Waterfront projects

Developing waterfront cities (Sihwa Multi Techno Valley, Songsan Green City) p.48

Developing water-friendly cities (Busan Eco Delta City, Buyeo Gyuam District, Naju Noan District) p.49

Developing the national industrial complex (Gumi Expansion Complex, Gumi Hitech Valley) p.48

Sustainable cities and communities; Life below water

Clean energy projects

K-water operates 9 large hydro power generation plants, 35 small hydro power generation plants, one tidal power generation plants, 3 wind power generation plants, 24 photovoltaic power generation plants, and 16 hydro power generation plants, reservoirs of the Four Major Rivers p.47

Affordable and clean energy

Water platform (Economy-vitalizing water)

K–water will contribute to the achievement of the sustainable development goals (SDGs) by activating global partnerships among countries through support activities for overseas projects and SMEs, and vitalizing the economy and providing high quality job opportunities.

Definition	Realizing national water welfare through overseas expansion of the water industry, such as dam, waterworks, energy, etc., and securing competitiveness in the water industry
Goal	Fostering the hidden champions in the water industry and expanding advancement to the global water markets

Overseas projects

Dedicating the organization to overseas projects p.54

Conducting 15 projects in 12 countries p.15, 54~55

[Investment] Pakistan, The Philippines, Georgia [PM] Equatorial Guinea, Indonesia, Chile [ODA] Solomon Islands, Cambodia, Africa, Bangladesh, Thailand

Partnerships for the goals

Developing the water industry

Establishing the Water Industry Platform Center p.51~53

Supporting one-stop customized service to SMEs p.51~53

Government departments, public institutions, research institutes and financial institutions supporting SMEs

Economic growth and works of high quality

Corporate partnership / fair trading

Program of corporate partnership growth support p.51~53

[Multilateral performance sharing system] Leading proliferation of performance to the secondary partner

Settling the culture of fair trade p.53

[Keeper of subcontractor] Eradicating unfair trade

Economic growth and works of high quality

Water Trust (Trustworthy water)

K–water is striving to become a fully trusted sustainable public enterprise through social contribution activities (efforts) and ethical management. Through this, K–water will contribute to the sustainable development goals (SDGs) for reducing inequality, providing sustainable services of high quality, accelerating inclusive and sustainable industrialization, and encouraging innovation.

Definition	Realizing a public enterprise that is trusted by implementing social responsibility activities and ethical management on the global level
Goal	Reinforcing the public's trust through social contribution, creation of jobs, realization of autonomous financial structure, and ethical management, etc.

Social contributions

Filling water with win-win p.61

Sharing clean water, developing a clean water environment, contributing to the global society

Filling water with love p.61

Medical service for sharing love

Filling water with hope p.62

Mentoring hope for happy water, donating water, and providing education programs

Quality education; Reduced inequalities

Creation of jobs

Changing temporary positions to permanent positions p.63

Creating jobs for youth p.63

Creating jobs in private sector p.64

SMEs support system, technology transfer

Creating jobs for vulnerable groups p.64

Conducting public services for the socially vulnerable groups around dams

Economic growth and high quality jobs/employment

Organization management

Ethical management (establishment of marketing organization)) p.67

Separation of Ethics Committee, Audit Office, person in charge of each Department, and Ethical Leaders

Striving to enhance the integrity of leaders/employees (Enforcement of the ethical management) p.67~68

Pledge of practicing integrity and ethics, installment of the integrity communications box, external cooperation for integrity and ethics

K-water risk management (system advancement) p.71~73

Establishment of special safety measures

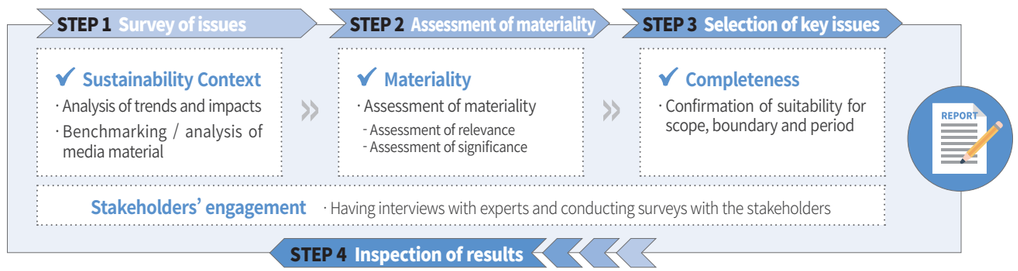
Sustainable cities and communities

K-water's Key Issues for Sustainable Management

K-water is pursuing sustainable development by reflecting a wide range of issues such as issues of economic, social and environmental aspects throughout the operation of the organization (we have a research institute, education institute, etc.). In order to select issues more significant to the stakeholders and manage and report them transparently, K-water has selected the key issues for sustainable management in accordance with the materiality assessment method recommended by GRI Standard and ISO 26000 (Social responsibility).

Materiality assessment process

In order to derive significant issues for sustainable management, K–water has implemented the internal and external environmental analysis and materiality assessment based on the context of sustainability, the principles of materiality and completeness, and the engagement of the stakeholders.



[Step 1] Identifying sustainable management issues through the internal and external environmental analysis

Through the report on the medium and long–term management strategy, improvement of the business process and analysis of the competitiveness, the contents of press reports, the issue analysis of peer industry and global excellent companies, etc., K–water has selected 24 issues for the external environment (trends) and 38 issues corresponding to the ripple effects (impact) in relation to sustainable management.

[Step 2] Assessment of the relevance and materiality of issues through a survey among stakeholders

K–water has evaluated the relevance and materiality of 62 issues selected on the basis of the International Standards for Sustainability Management (ISO 26000) and the Guidelines of the International Sustainability Management Report (GRI Standard), and has prioritized such issues. K–water has evaluated the materiality of issues in relation to the size of gap between the Concerns of the stakeholders (society) and K–water's Performance by excluding issues of low relevance through the relevance assessment and by investigating them through the internal and external stakeholder survey.

[Step 3] Selection of significant issues

Based on the gap to which K–water's performance is insufficient vis–a–vis the stakeholders' concerns, K–water has reclassified 20 issues regarded as significant by both internal and external stakeholders into the "Four Sustainable Strategies" of this reports. More (detailed) information can be found on page 27.

4 Strategies for Sustainable Management

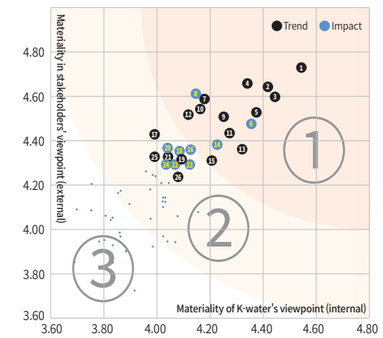
K–water has reported in detail on the activities, results and future plans related to the sustainable management strategy with priority given to the significant issues derived through the materiality assessment.

Issues reflected in this report

- K-water's mid-term management goals and strategies
- Reflecting the media analysis result
- Reflecting the data analysis result of water-related companies
- Reflecting stakeholders' opinions

Materiality Assessment

① Issues to actively make public in the sustainability report
② Issues to make public using website etc. (making public the relevant information briefly in the report)
③ Issues unnecessary to make public



Issues

1. Increased demand for more transparent and ethical management of enterprises
2. Climate change
3. Increased demand for safety of products and services (water quality)
4. Prevention of pollution (air, water and soil)
5. Reinforcement of the importance of HR development
6. Use of water
7. Acceleration of technological development
8. Anti-corruption
9. Increased demand for fair trading
10. Depletion of natural resources (water resources, mineral resources and fossil fuels)
11. Strengthened environmental laws and regulations
12. Intensified competition (technology development, patents, overseas expansion etc.)
13. Increase of the variability and strength of customer demand
14. Saving energy (renewable power generation including hydropower)
15. Increase of customers valuing health, environment and society
16. Compliance with environmental laws and regulations
17. Increase of importance of corporate partnership with affiliates
18. Customer satisfaction on products and services
19. Increase of interest in corporate governance (responsible management)
20. Social contribution to local communities

K-water's key issues

Sustainable management strategies	Significant issues	Stakeholders	International Sustainable Management Indicators (GRI Standard)		Aspect boundary		Page
			Classification	Aspect	Internal	External	
K-water	Increase of interest in corporate governance (responsible management)	NGO	General	Governance	○		18
Sustainable Management Strategy I Water Circle	Customer satisfaction on products and services	NGO	Society	Consumers' safety and health	○		22,36, 79
	Increase of demand for safety of products and services (water quality)	Local government	Society	Consumers' safety and health		○	31~36
	Increase of the diverse and strengthened customers' demands	Local government					
	Strengthened environmental laws and regulations	NGO	Environment	Compliance with environmental law and regulation	○		34,37~39
	Compliance with environmental laws and regulations	Korean Government	Environment				
	Use of water	Local government	Environment	Water	○		33~36, 85
	Climate change	NGO	Environment	Emissions, Effluent and waste	○		38~39, 85~86
	Prevention of pollution (air, water and soil)	NGO	Environment				40,85~87
Sustainable Management Strategy II Water Value	Depletion of natural resources (water resources, mineral resources and fossil fuels)	NGO	Environment	Water, biodiversity		○	40, 88
	Saving energy (renewable power generation including hydro power)	Partner	Environment	Energy	○		46~47
	Increase of customers valuing health, environment and society	NGO	Society	Consumers' safety and health		○	48~49
Sustainable Management Strategy III Water Platform	Acceleration of technological development	Local government	Society	Consumers' safety and health		○	51~53
	Increase of demand for fair trading	Partner	Economy	Anti-competition behavior		○	53
	Increase of importance of corporate partnership with affiliates	Partner	Society	Social appraisal of suppliers		○	51~52
	Intensified competition (technology development, patents, overseas expansion etc.)	Local government	Society	Anti-competition behavior	○		51~55
Sustainable Management Strategy IV Water Trust	Social contribution to local communities	NGO	Society	Local communities		○	56~62, 80
	Increase of demand for more transparent and ethical management of the enterprise	NGO	Society	Anti-corruption	○		67~68
	Anti-corruption	Customer					
	Reinforcement of importance of HR development	NGO	Society	Employment	○		60, 81~82

K-water

A Future Driven by Water

Sharing Happiness through Water

Water Circle

· Water Circle Management Approaches (MA) and Implementation of SDGs 30
· K-water's Sustainable Water Use 31
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Water Value

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· Water Industry Promotion along with Hidden Champions 51
· Invigorating the Korean economy through K-water's Overseas Projects 54
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· Happiness Sharing with Water - K-water's Water-related Welfare Projects 59
· Creating jobs through cooperation with K-water 63
· Creation of Advanced Organizational Culture 65
· Integrity-based Ethical Management for Ensuring People's Trust 67
· Improvement of Financial Soundness 69
· Enhancement of Cyber Security and Disaster Management 71

Sustainable management strategy I

Water Circle

K-water is striving to provide a healthy water supply service that can be trusted whenever and wherever through the scientific and strict management grafted onto the ICT technology we developed based on our know-how accumulated over 50 years. In addition, K-water is concentrating its ability on realizing water security to protect people and properties from disasters such as floods and earthquakes, and for increasing the stability of water services to preemptively mitigate the effects of abnormal climate and natural disasters.

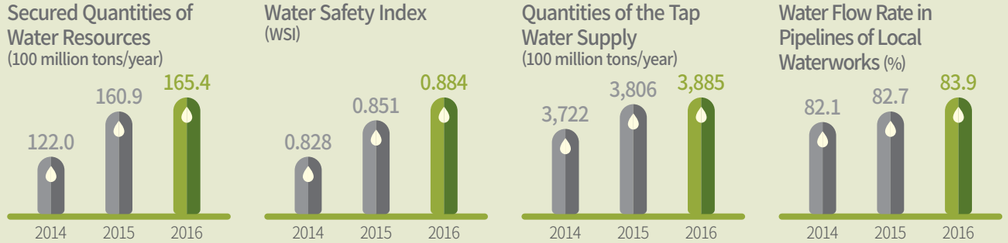
Key activities for K-water's sustainable management >

- Actively responding to water disasters through a conjunctive operation plan for dams, reservoirs and waterworks dams, reservoirs and waterworks and establishing a constant high–quality tap water supply system
- Setting the base of integrated water resources management (IWRM) by unifying the management of the hydroelectric dams and introducing the Regional Headquarters System
- Advancing water management technology through active implementation of the water quantity and water quality measures and scientific water–quality forecasting
- Improving national water welfare through stable water supply and expansion of the water supply system (network) in areas (regions are too big in this context) where water is not supplied

Future plans for K-water's sustainable management >

- Recovering a sound water circulation system through the realization of integrated water management connecting water quantity and water quality
- Realizing efficient water management through the reinforcement of integrated operations among existing facilities and promotion of water resource diversification
- Reinforcing water security through prevention–focused disaster management
- Assuring human rights to water and welfare through stable water supply during disasters and elimination of regional water service gaps

Results of Water Circle



※ Water Safety Index(WSI): Degree of Risk depending depending on the of factors hazardous to water safety (the closer to 1, the safer), which is one of K-water's significant issues of sustainable management and contribution to SDGs

K-water's significant issues of sustainable management and contribution to SDGs

K–water plans to establish an optimal water circulation system for sustainable use of water. K–water will change the traditional water supply system focused on wide areas to local water and sewage, and integrate the function of water management from a diversified one into one centered on regions. In relation to this, K–water is contributing to the global sustainable development goals (SDGs) by selecting the significant issues of sustainable management related to the Water Circle, which is a significant strategic task and by managing them systematically.

Customers' safety and health	Compliance with environmental laws and regulations	Water	Dispos l of waste water and waste
Increase of demand for stability of products and services (water quality) Increase of the variability and strength of customer demand	Strengthen environmental regulations Compliance with environmental laws and regulations	Use of water	Climate change Prevention of pollution (air, water and soil)

SDGs

K-water's Sustainable Water Use

Integrated Water Resources Management (IWRM)

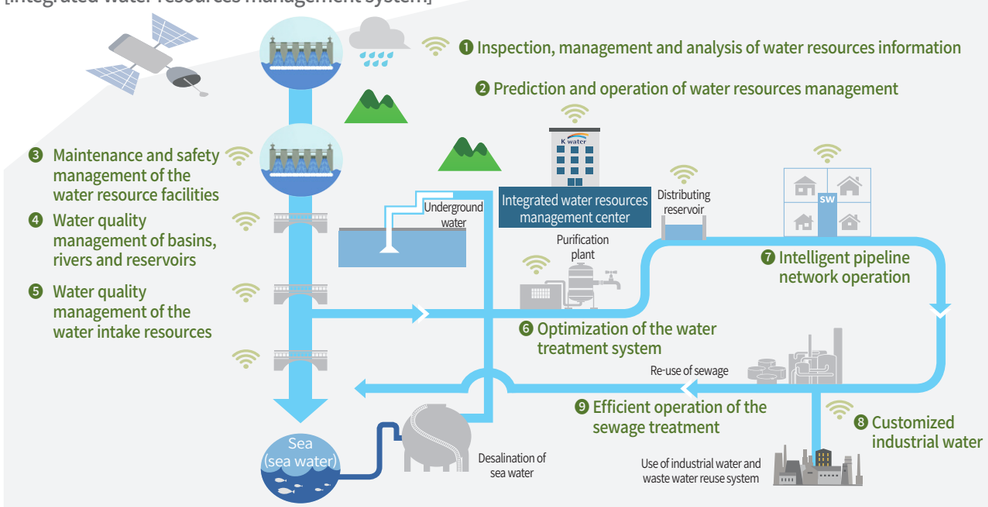
This means that for the optimal management of water, we manage water quantity, water quality, ecology, the environment, etc., which were managed individually in an integrated and scientific way in consideration of all the factors influencing water management in the region.

[Performance indicators related to Integrated water resources management]

Stability of water supply	Performance of 2015	Performance of 2016
Secured quantity of water resources (water storage capacity)	16.09 billion m³	16.54 billion m³
Supplied quantity of dam water (Annual supply quantity)	5.69 billion m³	5.72 billion m³
Unification of hydroelectric dam operations (Unit: non-mensuration)	Integrating operations in real-time for overcoming drought	Confirming the unification of hydroelectric dam operations (management)

Prevention of water disaster	Performance of 2015	Performance of 2016
Performance rate of the dam operation goal (protecting against drought·floods)	136%	118%
Securement rate of the dam safety rating	78.6%	84.2%
Korean eutrophication index	32.9%	33.8%
Disaster prevention support for local governments	Preparing for the support base (27 local governments)	Carrying forward as a national project (31 local governments)

[Integrated water resources management system]



※ Korean eutrophication index: Comprehensive evaluation index of the impact by water quality item (TSIKO x reservoir capacity)
※ Goal achievement rate of the dam operation: the goal achievement of dam reserving rate and flood control rate to cope with droughts and floods

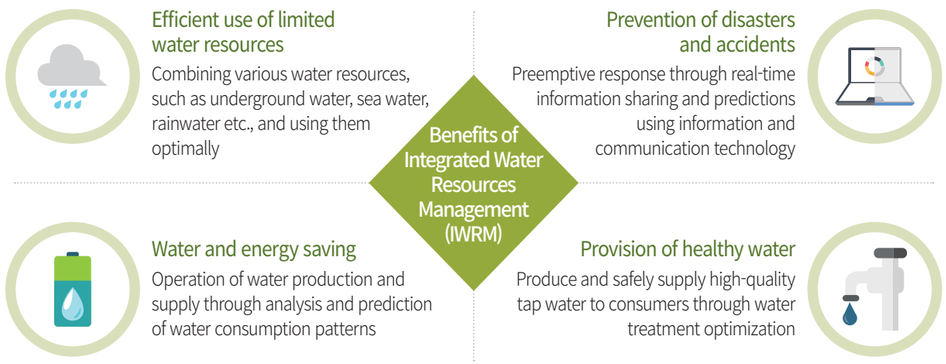
Stakeholder interview

Mr. Kim, Jeong Hoon, the Office Representative of the Korean Association of Supporting SDGs for the United Nations

Ninety–eight percent of the water existing on Earth is seawater and the ratio of fresh water is only 2%. All the citizens of the world including the people of Korea depend on this mere 2% of fresh water, and K–water is an important institution managing fresh water which is a precious resource. Especially, for K–water's further development and advanced water resources management, I think that the "Global partnership," which is Goal 17 of the SDGs, will become more important. I hope K–water will implement the campaign actively through the partnership, declaring that water is not given freely but should be managed as a resource for the environment of the Earth.

K-water's total water solution based on the convergence of dam operations

Integrated water resources management (IWRM) focuses on regions from the viewpoint of total rivers that go beyond administrative districts. When hydroelectric dam operations are integrated, it is expected that nationwide infrastructure for the efficient use of water resources will be arranged, and the maximum flood control capacity of 240 million m^3 and the annual water supply of 880 million m^3 will be secured without the need to construct new dams. In addition, K–water has realized the optimized organization for the integrated water management by reorganizing the existing nine district headquarters into three Regional Headquarters through the introduction of the Regional Headquarters by water system and eliminated partitions between departments for facilitating smooth communications, thereby planning to provide the nation with an optimal total water solution.



Stable water supply through the development and diversification of water resources through the Win-Win Committee

K–water is striving to solve water–related problems by establishing the Water Win–Win Committee together with local governments, related institutions and NGOs. K–water is also drawing up an improvement plan through communication, such as the agreement reached to establish comprehensive regional–customized measures to mitigate the effects of chronic droughts in the Gangwon District.

Expert forum for the integrated water management of Geumgang River basin

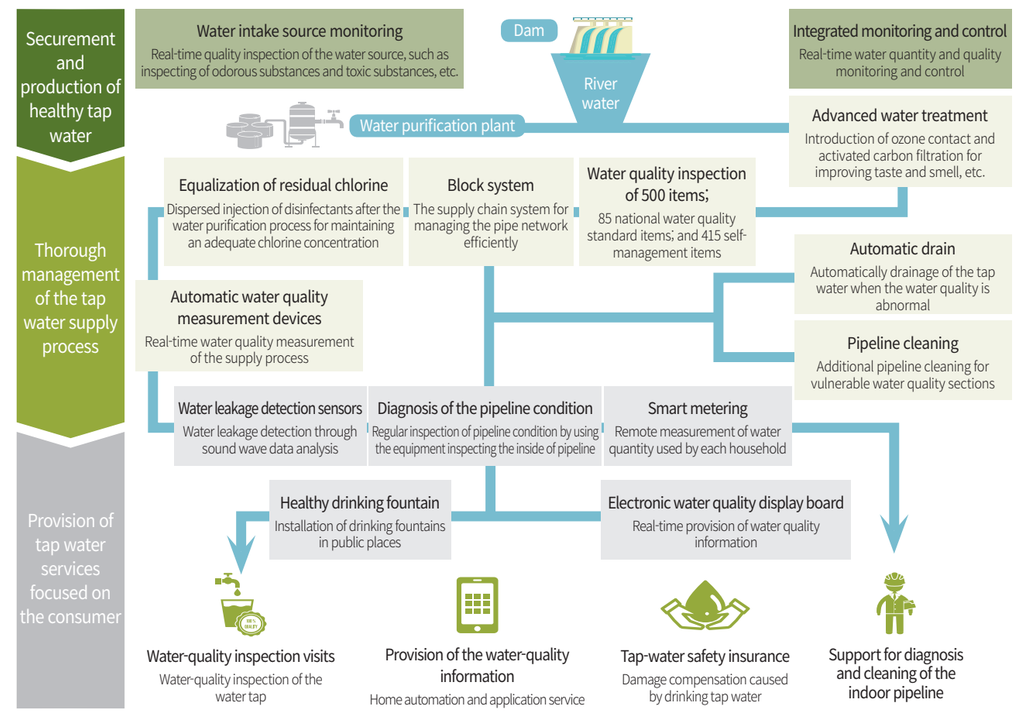
The 21st regular general meeting and workshop of the Win-Win Cooperation Committee

Healthy water supply project

The drinking rate of tap water in Korea is only 5% on average despite its world–class quality due to vague anxieties about the tap water and distrust on the condition of water pipelines and storage tanks, smell of disinfectants etc., and the low drinking rate causes social costs of about KRW 200 billion annually.

The healthy water supply project focuses on the realization of water welfare services, expansion of the safe water supply and securement of competitiveness in the water industry, and K–water is striving to realize water welfare services that are available to the entire nation by supplying tap water that is healthy for the human body.

K-water's Healthy tap water supply system



Stakeholder interview

Mr. **Han Seob Cho** Deputy Director, Waterworks and Sewage Department of the Environmental Protection Bureau, Sejong Metropolitan Autonomous City

Due to the business characteristics of water resources management, it is necessary for K–water to meet the expectations of the people by providing more accurate information on water resources services. Especially, as a public enterprise that provides water services, K–water needs to enable residents to use the water services with confidence by supplying water services for wide–areas through the establishment of a stable disaster management system. K–water sufficiently guarantees people's right to know by sharing comprehensive information on water management. In addition, I look forward to K–water's social responsibility as a public institution, such as providing donations and sharing culture, corporate partnership with affiliates, anti–corruption, and transparent management, etc.

SWC (Smart Water City) project

SWC (Smart Water City) means a city of water equipped with a supply system of healthy water that consumers can drink with confidence by managing the water quantity and quality scientifically and providing information on the tap water supply through the grafting of ICT onto the whole process of supply, ranging from water sources to the tap water. K–water is providing the nation with safe water services by utilizing its excellent technologies including, but not limited to, equalization of residual chlorine, automated crane facilities, real–time water–quality measurements and water information provision throughout the whole supply process, pipe cleaning, operation of the advanced non–wastewater exploration equipment, smart metering, remote water leak monitoring system and the management system of the pipeline network operation. The first SWC pilot project started in 2014 with Paju City and has been expanded in phases as citizens became more receptive to point now in which K–water is supplying water to the whole city as of 2016. With this project, the water quality and processing of the relevant area have been improved drastically and the direct drinking rate of tap water has increased from 1% to 36.3%. In addition, with the increase in customer satisfaction from 80.7% to 93.8%, the project has been evaluated as a successful promotion, and the government is preparing for nationwide expansion. At present, both Songsan Green City and Busan Eco Delta City have applied the Smart Water City system from the new construction phase, and in 2017, K–water commenced with the Sejong City Project which is the first national project.

Pilot project

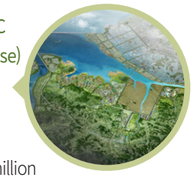
Paju City (completed)

- Providing service (2014~)
- Served population: 0.406 million

New project (applying SWC from the construction phase)

Songsan Green City

- Started construction (Mar. 2016)
- Served population: 0.15 million (2030)



First national project

Sejong City

- Started project (2017~2020)
- Served population: 0.24 million (2020)

New project (applying SWC from the construction phase)

Busan Eco Delta City

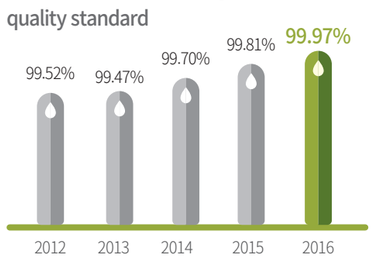
- Completion of implementation design (Dec. 2016)
- Population served : 75,000 (2022)

Production of world-class tap water through global water-quality standardized operations

In order to secure global–level competitiveness for tap water, K–water introduced and has been using the global water quality standard system since 2012. The global water quality standard is K–water's own tap water quality standard made by applying the strictest standards among the water–quality standards for drinking water among WHO (World Health Organization), Korea and five countries representing the OECD. At present, we are striving to improve the achievement rate by assessing and reviewing annually the results of operation of the water purification plants (wide–area and local consignments) operated by K–water. As a result of continuous endeavors for improvement of the achievement rate, such as optimizing the water treatment process and improving vulnerable water treatment facilities, K–water is producing world–class tap water, as shown by the achievement rate of 99.97% in 2016.

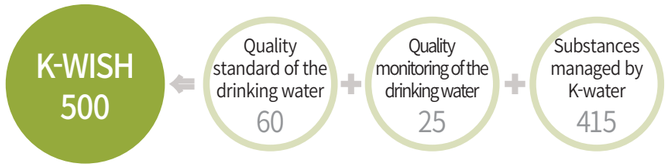
Advanced treatment process (Gumi)

Achievement rate of the global water quality standard



Operation of K-WISH 500, K-water's quality management system for drinking water

In order to advance the quality management system for drinking water in response to the rapidly changing domestic and overseas water quality management trends smoothly and preemptively, K–water has launched and is operating "K–WISH 500," which is the new quality management system for drinking water. K–WISH 500 is a global leading quality management system that manages potential hazardous factors from water sources to water taps, with the aim of having everyone drink healthy water with confidence by securing the safety of the tap water from various harmful trace substances and microbes etc.



K-WISH 500 Launching

Category		Total	Once/month	4 times/year	Twice/year	Once/year	
Legal items	Quality standard of the drinking water	60	60	-	-	-	Water quality inspection office of Head Office
	Quality monitoring of the drinking water	25	2	10	-	13	
Self-management items		215	-	-	215	-	Water quality research center
Total		300	62	10	215	13	

My Water portal site provides customized water information

K–water is striving to provide useful information on water using the ICT–based water information technology. K–water also endeavors to provide customized information on water resources, water and sewage, and underground water reflecting the user characteristics of various classes through 163 detailed contents by transparently disclosing information and beyond just the supplier–oriented fragmented information. In addition, by providing mobile services from 2016, K–water has been helping the customers select and easily use the information useful in real life, thereby increasing the daily average number of connections from 570 in January to 4,520 in December, 2016. As a result, My Water portal site was selected as the best practice for innovation in public institutions, and won the grand prize of the Electronic Government Awards from the Ministry of Government Administration and Home Affairs.

Customized water information site

My Water

Providing mobile services

'My Water' application
m.water.or.kr

Expanding location-based services

Additional services such as information on drought, tidal currents, dams, and well sites etc.

Enhancing the customized contents

| People |
Quality of drinking water, forecast and alarm of drought

| Enterprises |
New technology product, corporate partnership

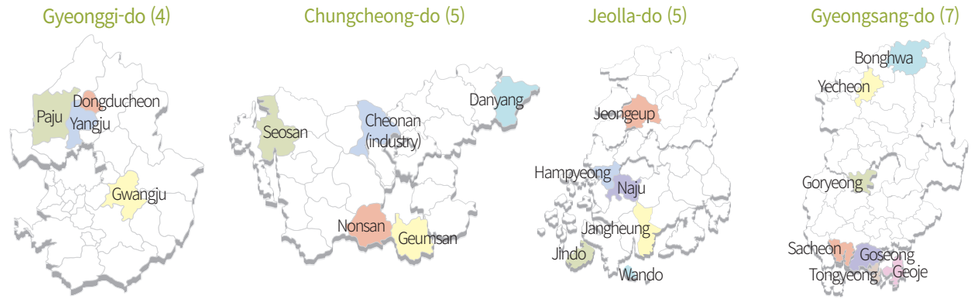
|Academia|
Real-time information, cutting-edge technologies

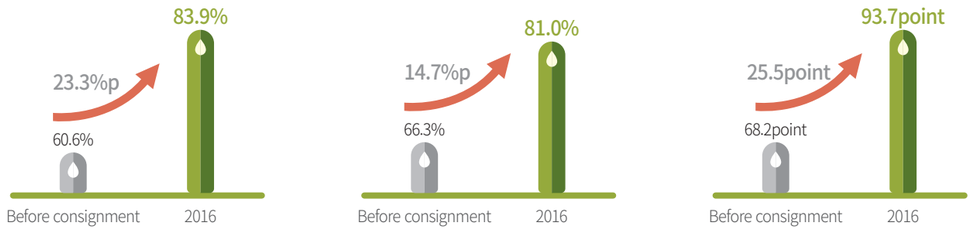
|Government|
Latest water news, issue reportv

Improvement of the flow rate for local waterworks

As 31% of Korea's water pipes (58,000 km) are deteriorating since they are more than 20 years, 690 million m³ of water, equivalent to the national water supply of 48 days, is lost through leakages every year, causing losses of KRW605.9 billion. In order to prevent such losses and use the water resources efficiently, K–water has established a pipeline network management system and intensively improved the deteriorated facilities while having been consigned to operate the local waterworks of 22 local governments since 2004, thereby improving the flow rate by 23.3% point from 60.6% before consignment to 83.9% and recording a customer satisfaction rate of 81.0%, improved by 14.7% compared with the record before consignment.

[Consigned operation status of local government waterworks]





※ Scientization rate: the indicator scored by evaluating the level of the automated facility (50%) and the level of operation (50%) of the water purification facilities

In addition, K–water implemented urgent water leak reduction projects for four local governments including Hongseong–gun, etc. as permanent measures in light of the worst drought in 43 years that occurred in Chungcheongnam–do. K–water improved the flow rate by 16.8 point through short–term intensive deployment of 68 experts, establishment of 45 leak monitoring systems, decompression of 36 high water pressure districts, 1,165 items of leak exploration and restoration using the remote leak monitoring technology, and preferential replacement of 44.8 km of pipelines vulnerable to leakage, of which the quantity of the reduced leak was equivalent to the daily use volume of Taean–gun, that is, 21,000 m³ per day. And then, with operation of the Boryeong Waterway connecting Geumgang River to Boryeongho Lake, eight cities and counties in the West Chungnam Region that receive raw water from Boryeongho Lake dam were relieved from drought.

The Water Flow Ceremony of Boryeong Dam Waterway

K-water's Environmental & Green Management

The influence of climate change including the occurrence of severe floods and droughts, etc., is a global issue, and water management is the key challenge of future preparations — to the extent that the water management field is responsible for more than 90% of the measures to adapt to climate change. We are carrying forward the management activities in consideration of the environmental influence of the whole supply chain as well as that caused by K-water. As the only water-specialized public enterprise, K-water is striving to implement environmental management sustainably for the whole process of business.

Summary of K-water's environmental management

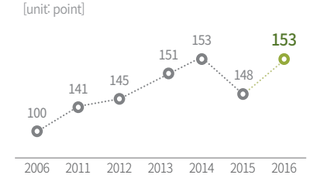
Execution system
Operation of quality, environmental and green management system conforming to global standards

- Acquired certification of International Standard(ISO) on the quality, environmental and green management (ISO 9001(quality management) / ISO 14001 (environmental management) / KSI 7001(green management)
- Every department is investigated by both internal and external experts on the implementation status of quality, environmental and green management (quality of customer service, environmental and safety management etc.) and executes improvement activities.

Performance index
Environmental performance evaluation (EPE)

- The index measuring the results of environmental management comprehensively and quantitatively in all management sectors
- Meaning the degree of comparative improvement of the environmental performance compared to the base year (year 2006)
- Having been measured since 2007, and establishing Korea's first computerized environmental performance evaluation system and obtaining a patent
- 153 points of 2016 EPE index meaning that the environmental performance has been improved by 53% compared to the base year (year 2006)

EPE (Environmental Performance Evaluation)
[unit: point]



Support base
Training internal experts on quality, environment and green management

- Selected internal staffs and provided training opportunities for the certification auditor of ISO quality and environmental management since 2007
- As of October 2017, fostering 169 certification auditors of ISO quality and environmental management
- Understanding substantially the quality and environmental management conforming to the international standard in all of K-water's business places through internal experts.

Implementation strategy for environmental management

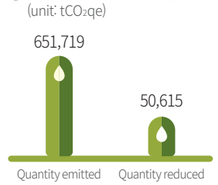
K-water's supply chain and environmental management

	Environmental management	Environmental performance
Supply	- Purchase of green products (Refer to graph❶) - Water quality management of the water sources	- Promoting the production of resource circulation goods (recycled) and products (Refer to graph❶) - Attracting companies to produce eco-friendly products - Improving the local environment of water sources
Project development and planning Construction Production and facility operation	- Eco-friendly construction - Reduction and recycling of construction wastes - Environmental education to partners - Minimization of energy, resources, and labor input through improvement of facility and process - Minimization and recycling of the residual precipitate (sludge) after water and sewage treatment - After water and sewage treatment, effluent is discharged and results in water quality that is higher than the legal standard.	- Saving energy costs and resources (Refer to graph❷) - Reducing GHG emissions (Refer to graph❸) - Reducing the treatment cost of sludge and construction wastes (Refer to graph❼) - Preserving and improving the local environment including the discharging area of effluent (Refer to graph❻)
Use Disposal and recycle	- Tap water healthy to the human body - Use of lightweight packaging materials - Promoting water recycling by reducing fees to the users of the treated water supply (Refer to graph❹) - Collecting and treating garbage floating on dam reservoirs and rivers after rainfall events (Refer to graph❺)	- Preventing the pollution of groundwater, etc., by expanding tap water use - Reducing social costs for the treatment of wastes - Preserving the local environment

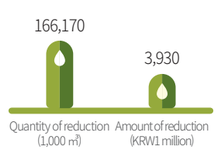
❶ Record of green purchases in 2016 (unit: KRW100 million)

❷ Energy use and saving in 2016

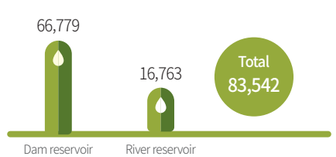
❸ Emissions of GHG in 2016 (unit: tCO_2qe)



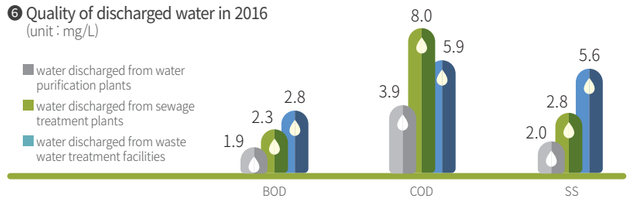
❹ Fee reduction to the users of treated water supply



❺ Treatment of garbage floating on dam reservoirs and rivers (unit : m³)



❻ Quality of discharged water in 2016 (unit : mg/L)



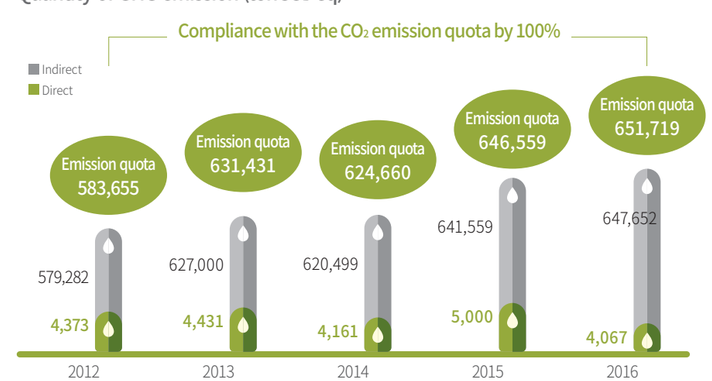
❼ Generation of water sludge, sewage sludge and construction wastes, and the recycling rate

K-water's efforts to respond to climate change

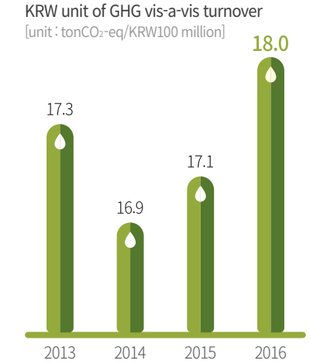
Based on the objective management system of the national GHG, K–water has been designated as a public company that is responsible for implementing the system in order to reduce emissions. K–water's GHG emission in 2016 (651,719 tCO2eq) was similar to that of the previous year, and K–water has complied with the CO2 emission quota allotted by the Ministry of Environment for five consecutive years. Most of the GHG emitted by K–water is indirect GHG generated when operating pumps needed for supplying the tap water, and emission of the biogenic GHG was not measured. The KRW unit of GHG compared with turnover was 18.0 tCO2eq / KRW100 million, which reflects the quantity of GHG generated to achieve a turnover of KRW100 million. In addition, K–water started the Clean Development Mechanism (CDM) project for the first time among Korean public enterprises from May 2005 and has registered 12 projects to UNFCCC (United Nations Framework Convention on Climate Change) and was recognized for its GHG reduction efforts which totaled 530,000 tons.

Category	Target	Date of UN Registration	Q'ty of annual power generation (MWh/year)	Q'ty of CO_2 reduction (CO_2 /y)
Total	-	-	830,176	532,332
Sihwa tidal power	Sihwa tidal power	Jun. 2006	507,629	315,440
Small hydro power 1	Andong, Jangheung, Seongnam 1	Oct. 2006	15,473	8,103
Small hydro power 2	Daecheong, Juam, Dalbang, Seongnam 2	Feb. 2007	13,944	8,331
Sihwa wind power	Sihwa wind power	Nov. 2007	6,293	4,013
Small hydro power 3	Gosan, Pangyo	Nov. 2009	5,557	2,987
Small hydro power 4	Seongdeok, Gimcheon Buhang	Oct. 2010	4,963	2,759
Small hydro power 5	Angye, Hoengseong 2	Apr. 2012	4,603	3,100
Improvement of water efficiency	Paldang 3 water intake station	Aug. 2012	-	7,044
Hydro power 6	Ipo, Yeoju, Gangcheon	Oct. 2012	76,406	50,772
Hydro power 7	Sejong, Gongju, Baekje, Sangju	Sep. 2012	57,541	38,237
Hydro power 8	Nakdan, Gumi, Chilgok, Gangjeong Goryeong	Sep. 2012	58,170	38,654
Hydro power 9	Dalseong, Hapcheon Changnyeong, Changnyeong Haman, Seungchon, Juksan	Sep. 2012	79,597	52,892

Quantity of GHG emission ($tonCO_2$-eq)



KRW unit of GHG vis-a-vis turnover (unit : $tonCO_2$-eq/KRW100 million)



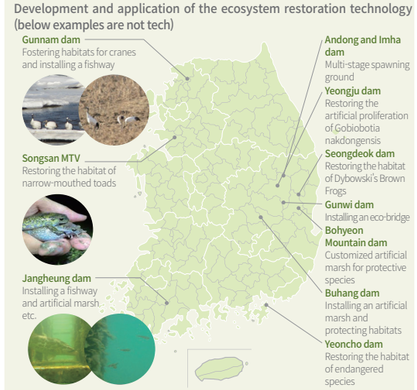
Ecosystem-centered Water Resource Planning and Eco-friendly Value Enhancement

In spite of the excellent functions of dams, such as flood control, water supply etc., their negative image regarding environmental regulations and environmental changes has been magnified considerably. K-water is thus striving for the ecological conservative management of water resources by objectively evaluating and improving the environmental value of dams ranging from planning to operation.

Improving ecological value through the installation of ecological restoration facilities and implementing post-environmental impact assessments

In order to minimize environmental influences following the development of water resources, such as the atmosphere, water quality, etc., and lessen the impact on the natural ecosystem, K–water prepares for and implements environmental impact reduction plans including, but not limited to, artificial marshes, alternative habitats, wildlife crossings, and ecological restoration facilities, etc. (Refer to page 98 of the Appendix for the status of the ecological restoration facilities.) Post–environmental impact assessments systematically investigate the environmental impacts following the implementation of projects, and K–water has met the environmental standards in all areas in which projects have been implemented. (Refer to page 97 of Appendix for inspection results)

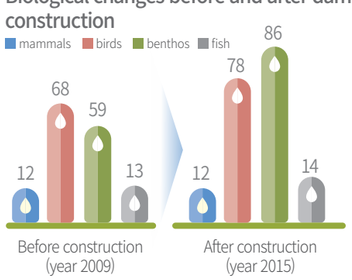
Development and application of the ecosystem restoration technology (below examples are not tech)



[Best practice selected by the Ministry of Environment] The ecosystem preservation facility of Bohyeonsan Mountain Dam

In case of Bohyeonsan Mountain Dam, it was possible to secure the diversity of habitats and use the dam as a specified ecological base by fostering a customized artificial marsh that protects species, and it was investigated that species have increased after construction (year 2015) compared with before the construction (year 2009). As a result, K–water received the bronze prize in the 2016 Best Practice of the Ministry of Environment and Korean Society of Ecology and Infrastructure Engineering.

Biological changes before and after dam construction



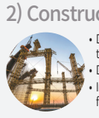
Inhabited animals and plants after the dam construction

Management procedure of the overall water resources development process

1) Planning stage

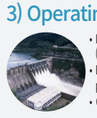
- Studying the quantification of ecological value
- Studying the ecological system service
- Studying the eco-friendly dam use
- Studying the environmental ecology flow

2) Constructing stage



- Developing and applying the ecosystem restoration technology
- Developing the guidelines on installation of facilities
- Installing and monitoring the ecosystem preservation facility (fostering eco-corridor, habitats etc.)

3) Operating stage



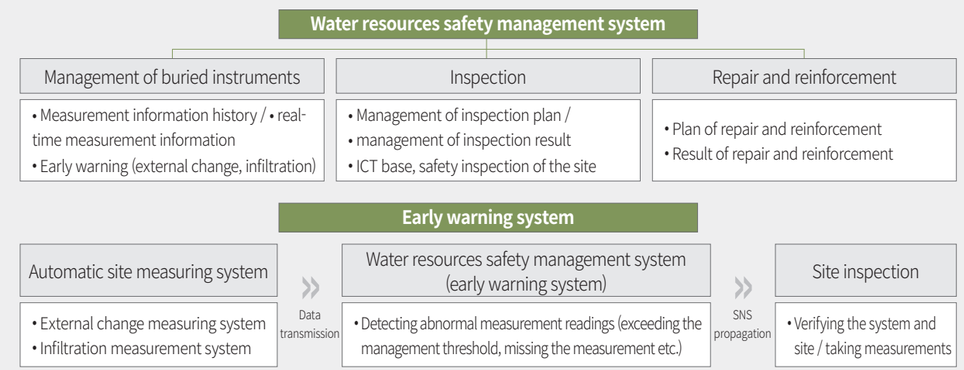
- Implementing the endangered species restoration project (Gobiobotia nakdongensis, narrow-mouthed toad, fireflies etc.)
- Establishing an operation standard of the ecosystem preservation facility
- Conducting the ecosystem monitoring periodically

Protection of People from Water Disasters

Operating the water resources safety management system

K–water has established the water resources safety management system in order to support facility management work efficiently by systematically integrating facility related information in real–time. Various information include measurement instrument data for multi–purpose dams, water dams and multi–functional reservoirs under K–water's management, as well as plans and results of inspections, and historical data of maintenance works, etc.. In addition, K–water is striving to improve the safety of water resources facilities in preparation for various disasters like floods and droughts. By organizing the data in the integrated information system, water resources decision–making capabilities have been greatly enhanced.

Chart of the safety management system of water resources

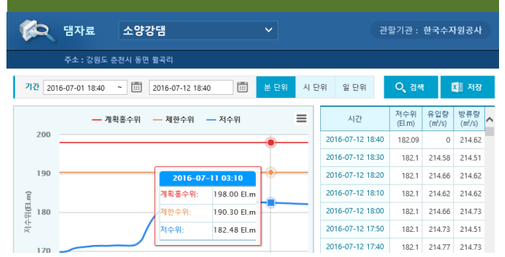


Water disaster management using the real-time system

K–water is operating the Hydrological Data Information Management System (HDIMS) in real–time so as to check for any abnormalities of relevant observation tools and related facilities through constant monitoring of hydrological data update in one minute intervals at observation stations of multi–purpose dams, water dams, multi–functional reservoirs, and flood control reservoirs. In consideration of long–term weather forecasts, K–water has introduced the daily quantitative long–term rainfall forecasting system by developing the General Circulation Model (GCM) and the long–term rainfall downscaling technique by basin in order to enhance the irrigation response capabilities in terms of water management. Through this, K–water has helped with the establishment of the monthly reservoir operation plan for stable water supply and set up a preemptive response base in preparation for disasters, such as droughts, floods, and water quality, etc.

Screen of the quality management system for the national hydrological data

Screen of dam operation data monitoring



Zero disaster related damages! Reinforcement of the flood response system

Although 98.7% of river flood damages occur in the tributary streams under the control of local governments, it is difficult for the local governments to manage floods on their own due to the lack of experts, technical skills, and budget, etc. Against this background, K–water is reinforcing the flood response system and promoting public safety by co–developing the integrated flood information system through cooperation. As a result, K–water has achieved zero disaster damage areas for three consecutive years and, recognized for its merit, received 'the Excellence Award' of Korea Safety Training from the Ministry of Public Safety and Security.

Disaster-damaged area for three consecutive years

Zero

Korea Safety Training of Ministry of Public Safety and Security

Excellence Award

Integration and linkage of flood information and co-development of the advanced system

K-water
- Suggestion of customized projects
- System developing and establishment
- Maintenance and education

Local government
- Suggestion of local government needs
- System operation
- Funding (KRW18.2 billion)

Ministry of Land, Infrastructure and Transport · Korea Meteorological Administration · Agriculture and Industry
- Provision of and joint use of flood information

SMEs*
- Manufacturing and supplying facilities (KRW 7 billion to 9 companies)

Existing
- Insufficient flood information sharing with the relevant institutions
- Lack of a flood monitoring system
- Lack of a flood prediction system and situational response criteria
- Manipulating the irrigation facilities like drainage gates on the spot

Improving
- Integration and linkage of information among relevant institutions in a basin
- Establishment of an integrated monitoring system for upstream and downstream status
- Establishment of a flood analysis model that reflects the characteristics of local governments' rivers and provision of action plan by river level
- Establishment of a remote-control system for manipulating in the situation room

*SMEs : economics small and medium-sized enterprises

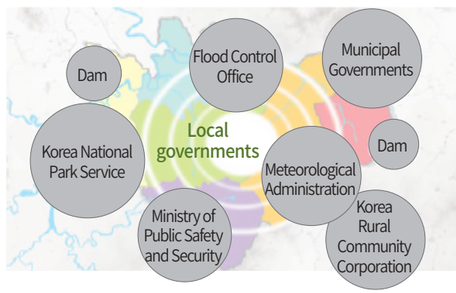
Contract status of local government systems established

Category	~ 2014	2015	2016
New contracts (cumulative)	5	20	30
Area ratio (cumulative)	3%	18%	21%

※ Area ratio: the ratio of the total contracted area of local governments compared to the total area of the national territory

K-water's integrated flood disaster management system

Cooperative system in response to floods



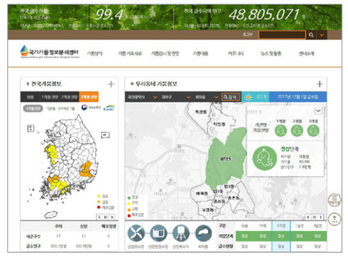
K-water's efforts to minimize drought damages

K–water has implemented a drought forecasting and warning system to provide drought information to stakeholders and the general public in order to improve public awareness on the seriousness of drought situations and to take preemptive measures rather than restoration–focused practices.

K–water has shifted the paradigm of drought management from 'ex post measure' to 'preemptive protection,' and its role to prevent national disasters has been expanded from dams to local governments throughout the country.

Although a severe drought occurred in which water quantity inflowing to dams (30.27 m^3) dropped sharply by 42.3% as lack of precipitation continued for three consecutive years from 2014 to 2016 (normal year average: 81% and 3,081.4mm), K–water recovered from the long–term drought by way of multiple efforts to secure water (3.19 billion m^3, equivalent to five months of nationwide use), and secured 105% total volume of water in the multi–purpose dams in relation to the previous year. In addition, as a cautionary step of drought was issued in Gangneung City due to prior cognition through drought forecasting and warning, 1.6 million tons of water was secured in advanced and, as a result drought damages in Gangneung City were prevented without restrictive water rationing. (Otherwise, 177,000 people might have suffered from restrictive water rationing.)

Drought information portal



Drought management system

Reinforcement of prevention

Establishment of foundation
Established the drought center in K-water (Nov. 2011), promoting the relevant legalization etc.

Analyses of droughts
Drought judgment criteria and a forecast analysis system of 471 water sources nationwide, including dams, rivers were established.

Drought forecasting and warning
Implemented national drought forecasting and warning for the first time (Mar. 2016)
Established the drought information portal to provide people with drought information (Sep. 2017)

Improvement of criteria

Improvement of the drought response procedure
Setting the Standard Operation Procedure (SOP) for drought response

Improvement of the water adjustment criterion
Operating the one-step-faster drought response system by increasing the water supply reduction criteria (the volume of water stored in dam)

Improvement of water supply method
Expanding in full measure the dam supply method of reserving water when the stream flow is abundant

Operation of a demand-adjusting system for autonomous water saving of the wide-area waterworks
Applying the subsidy (or penalty) differentially depending on the achievement rate of reduction goals through inducement of customers' autonomous water saving

Cooperation with institutions

Preparation of the drought response system

K-water
(Collecting water information → analyzing drought nationwide → providing drought information)
↓
Government · local governments · people
(prior cognition · response)

※ Establishment of the national action plan and the national response system depending on the drought stage

Drought response

Drought forecasting and warning
Issuing the drought stage and providing prospective information to eight cities and counties in Chungcheongnam-do (the area where water is supplied from Boryeong dam)

Water reserves
Securing 2.38 billion m^3 by reducing supply of the stream maintenance water and agricultural water

Linkage operation
Securing 810 million m^3 by linking multi-purpose dams, hydroelectric dams and reservoirs, and use of Boryeong dam's waterway

Reduction of algal blooms through the management of pollutants and expansion of water flow and facilities

K–water has set up and implemented the Algal Bloom Response Action Plan since 2014 for managing and responding to algal bloom issues proactively, preemptively and systematically. K–water has set up a constant response system by establishing the Algal Bloom Technology Center as the central command for responding to algal blooms and water environment in 2017 and strengthened inspection personnel monitoring areas in which algal bloom are generating, thereby striving to respond immediately once an algal bloom occurs.

By developing the reservoir pulse discharge technique* jointly with relevant institutions in 2014, K–water tested the pulse–type discharge as a pilot project in the section of Gangjeong Goryeong reservoir and Changnyeong Haman reservoir from June to September, 2015, and implemented the second–year pilot project by expanding the scope of operation in 2016 to 115 million m^3 covering three water systems with 10 reservoirs and dams in total.

* Pulse-type discharge: This is the technique suggested in Australia for reducing algal blooms, which suppresses growth of the blue-green algae by mixing the upper and lower layers of the stream and destroying the sediment through increase of the flux (flow rate) of the stream using an artificial and repetitive method.

Existing

- Lack of algal bloom reduction facilities in the areas where algal blooms are constantly generating
- Analyzing the effects by facility and applying technology (Absence of the synergy effect by technological convergence

Improvement

- Expansion of performance-proven reduction facilities and extending the installation range
  *Eliminating vessels(2↑), water flow diffuser(25↑), surface aerator(43↑)
- Developing multi-type algal bloom reduction facilities (2016), and introducing (2017)

Opening of the Algal Bloom Technology Center

Algal bloom reduction technology competition

2017 Nationwide Safety and Security Diagnosis in coordination with relevant institutions

K–water has diagnosed a total of 428 facilities under its control along with the Ministry of Land, Infrastructure and Transport, Ministry of Public Safety and Security, and private experts, etc. In the Nationwide Safety and Security Diagnosis, K–water has conducted an intensive inspection of vulnerability factors and risk factors to the facilities under its control, such as main water resource facilities such as dams and water purification plants, and construction sites which are close to residential areas and can lead to major disasters in case of accidents, as well as water culture halls and observatories which attract many visitors.

K–water proceeded with diagnostic tests in order to minimize damages to facilities by checking any abnormalities in the main body of dams using measuring instruments installed in the dams and measuring the concrete strength of the structures using non–destructive testing equipment. K–water corrects any identified risk factors immediately on the spot and, in case of significant faults, reinforces the relevant facilities by executing precision safety diagnoses, not to mention restriction of use, thereby ensuring the optimal state of facilities.

Sustainable management strategy Ⅱ

Water Value

K-water takes the lead in creating waterfront value where the ecological environment and leisure culture coexist. Sustainable waterfront spaces are being developed to enhance public value through the specialized strategy of waterfront spaces that reflect people's needs, such as leisure, relaxation, safety, and ICT-based convenience. In addition, K-water is creating revenue and new growth engines by strengthening the foundation for water energy development and expanding the business area using its own capabilities.

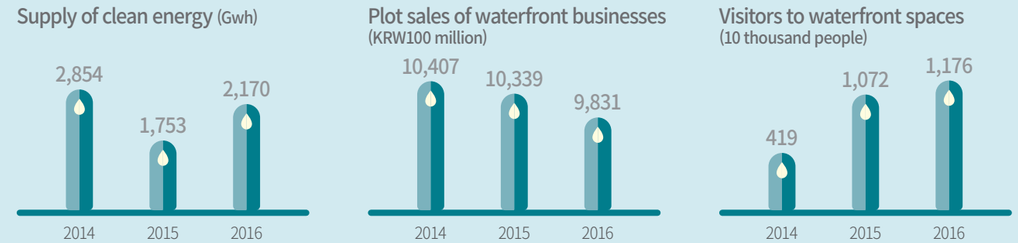
Key activities for K-water's sustainable management >

- Leading the nation as an energy distribution hub through the development of hydroelectric power, Sihwa tidal power generation, and photovoltaic power generation on the water, as the No. 1 renewable energy provider in Korea
- Establishing an activation base for eco–friendly water energy
- Fostering advanced waterfront cities on the international level
- Fostering waterfront zone protection initiatives to prevent reckless development of waterfront zones

Future plans for K-water's sustainable management >

- Leading the shift toward an eco–friendly energy paradigm through the expansion of water energy development
- Fostering high–quality waterfront and water–friendly spaces considering the entire water cycle process and ecosystem restoration

Performance of Water Value



Significant issues that hinder K-water's efforts to achieve sustainable management and contribute to the SDGs

K–water plans to create added value for all people through creative water uses including, but not limited to, the development of water energy, construction of energy self–reliance cities, re–creation of urban waterfront spaces, and restoration of water ecosystem thriving with culture. In relation to this, the increasing number of consumers who are emphasizing health, eco–friendliness and prosocial behavior, energy use, depletion of the natural resources, and so forth, have been derived as the sustainable management issues related to Water Value which is a significant strategic task. K–water manages such significant issues systematically for contributing to the sustainable development goals (SDGs).

Consumers' safety and health	Energy	Biodiversity
Increase in consumers who are emphasizing health, eco-friendliness and pro-social behavior	Reduction of energy use (Producing renewable energy such as hydroelectric power)	Depletion of natural resources (water resources, mineral resources, fossil fuels)
SDGs		

Full Use of Water Energy

Medium and long-term roadmap for energy projects

K–water plans to recreate the value of water resources facilities and create the utility value of the relevant facilities through the development of clean energy using the facilities of dams and waterworks, etc. K–water is carrying forward the medium and long–term roadmap of "2025 Advance to Global Leader" for meeting the Government's policy of fostering the new energy industry and expanding renewable energy, and for transforming the energy business into a future growth engine.

2016 2017 2018 2019 2020 2021 2022 2023 2024 2025

Establishing market leading capabilities
- Diversifying business methods and development of energy sources
- Establishing customized maintenance criteria
- Fostering a foundation for localization and diagnostic institutions

Performing market leading functions
- Spreading engagement and win-win type business models
- Advancing the maintenance criteria
- Securing the ability of localization and diagnostic institutions

Progressing to be a global leader
- Exporting Korean business models to overseas markets
- Leading the way for global standardization of maintenance
- Exporting localization and diagnostic models to overseas markets

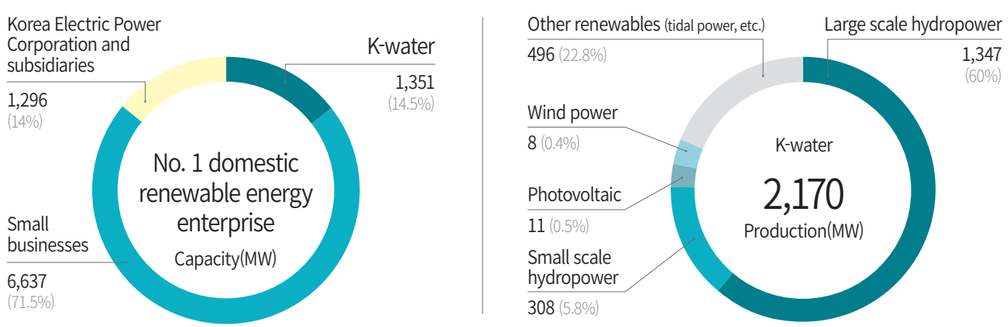
Suggesting the vision of K-water's energy business that will lead the future

K-water will lead the way for growth for the next 50 years | Leading the national policy of water energy | Expansion of domestic and overseas water energy businesses | Leading the way by implementing GHG reduction initiatives

Clean energy business

Starting with the commencement of hydroelectric power generation of Soyanggang River dam in 1973, Sihwa Lake tidal power generation in 2011, and small scale hydroelectric power plants that were constructed as part of the Four Major Rivers Project in 2012, K–water operates facilities with an annual generating capacity of 1,351 MW, which is 14.5% of the total domestic renewable energy facility capacity (9,284MW as of the end of 2016). In particular, K–water operates 60% (1,079MW) of the domestic hydroelectric power facilities (1,785 MW). In 2016, K–water strived to vitalize the water energy business by proclaiming its water–energy vision and deriving and carrying forward the execution of 28 tasks. With a total output of 2,170GWh in 2016, K–water produced electricity equivalent to 11% of the total renewable energy output in Korea (19,353 GWH).

Korea's renewable energy output and composition ratio



Stabilizing the national electric power by supplying 2,170GWh of renewable energy in 2016

※ Data source: KPX Electric Power Statistics Information System (as of the end of 2016)

K-water's new business model for developing renewable energy

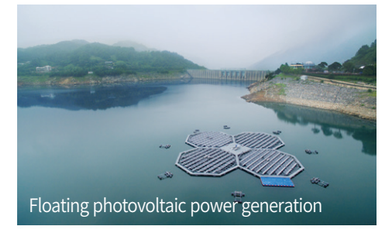
K–water leads the national energy policy by introducing new business models through the development of renewable energy sources including small hydroelectric power plants, wind power, and thermal energy in order to reduce carbon dioxide emissions which has a major impact on global warming. Especially, with Sihwa Lake as a demonstrative case, K–water established Korea's largest renewable energy complex of 315MW and ocean energy tourism attraction mixed with the existing tidal power generation and wind power by creating new energy sources including land based photovoltaic power generation (7MW), floating photovoltaic power generation (20MW), and marine based wind power (30MW), etc. as well as the construction of a tourism center to showcase Korea's renowned renewable energy technologies.

Construction of the tourism center to showcase new energy sources and renewable energy technologies
(with Sihwa Lake as a demonstrative case in 2021)

Land based photovoltaic power generation generation 7MW

Floating photovoltaic power generation 20MW

Marine based wind power generation 30MW


Floating photovoltaic power generation

Wind power

Floating photovoltaic power generation

Tidal power

Operation and development status of clean energy power generation facilities

Hydro	Large scale hydro	9 plants including Soyanggang River dam 1,000.6MW	3 plants including Chungju, Daecheong and Danyang reservoir (continuing) 3 plants including Miryang, Yongdam and Imha (new)	11.5MW
	Small scale hydro	51 plants including Andong small scale hydropower plant 78.8MW		
Tidal power		Sihwa tidal power (the largest in the world) 254.0MW		
Wind power		3 plants including Sihwa Bangameori, Gyeongin Port, and Gampo dam 8.0MW		
Photovoltaic		24 plants including Bonpo photovoltaic 10.2MW	Marine in Hapcheon dam Marine in Chungju dam Sihwa Bangameori	63.0MW
Hydrothermal energy		14 plants including Hagya water purification plant 3,673RT		
Total		1,351.6MW		

※ In case of hydrothermal energy, the total cooling and heating (RT) capacity of facilities are calculated separately.

Creation of Eco-friendly Water Cities with Blossoming Culture

Creation of waterfront space through communications

K–water is pursuing the creation of waterfront cities where water, nature and culture are converged by grafting water–related technology upon waterfront spaces, such as dams, rivers, lakes, and areas near the sea throughout the country. K–water identifies people's needs by operating various communication channels with experts and governments, and based on this, is making leisure and culture spaces where people and nature coexist by developing eco–friendly complex cities, such as Sihwa Multi Techno Valley (MTV) Songsan Green City, Busan Eco Delta City etc., and creating various eco–friendly waterfront spaces including comprehensive river maintenance projects, Ara waterway, and Sihwa Lake, etc.

Creation of waterfront cities

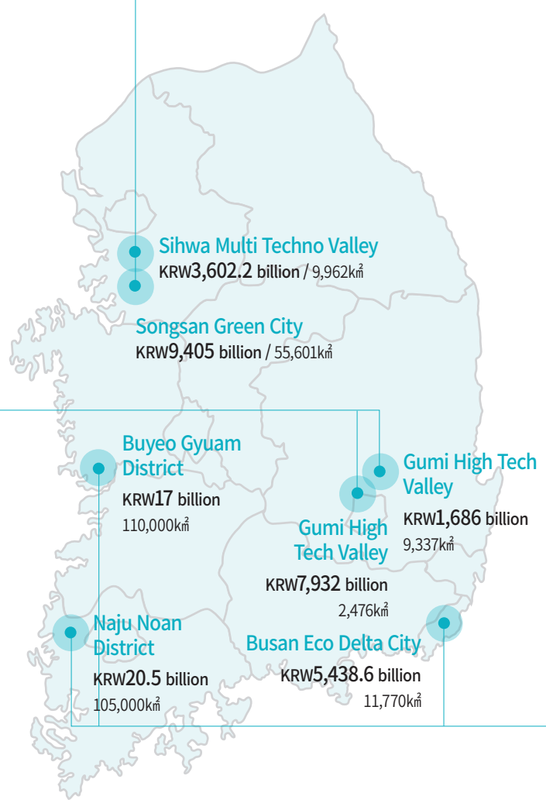
Creative eco–friendly waterfront cities incorporating nature and urbanization
K–water constructs eco–friendly cities by redeveloping waterfront spaces, thereby contributing to the vitalization of regional economies and promoting specialized development by region.

Sihwa Multi Techno Valley

- **Project expense** : KRW3,602.2 billion
- **Project period** : year 2002~2020
- **Attracted industry** : eco-friendly advanced venture business, logistics, distribution, support facilities
- **Project area** : 9,962㎢

Songsan Green City

- **Project expense** : KRW9,405 billion
- **Project period** : year 2007~2022
- **Population plan** : 60,000 households for 150,000 people (population density: 40 people/ha)
- **Project area** : 55,601㎢



Creation of national industrial complexes

Gumi Expansion Industrial Complex

- **Project expense** : KRW7,932 billion
- **Project period** : year 2008~2018
- **Attracted industry** : R&D, industrial cluster, residence culture, education etc.
- **Project area** : 2,476㎢

Gumi High Tech Valley

- **Project expense** : KRW1,686.8 billion
- **Project period** : year 2009~2020
- **Attracted industry** : Advanced industry, such as electronic information, computer, semiconductor etc.
- **Project area** : 9,337㎢

Creating waterfront value where nature, leisure, and culture coexist

K–water is striving to create value through new water–friendly culture by providing various contents, such as education, leisure, culture, and tourism. etc., through the utilization of waterfront resources including dams, lakes, Ara waterway, and Sihwa Lake, etc. In addition, K–water is making great efforts to resolve cultural gaps between regions and expand people's opportunities to enjoy culture through various activities such as festivals and shows, exhibitions and cultural pavilions using the waterfront spaces such as dams and rivers. Through such efforts, the number of visitors to waterfront spaces have been steadily increasing from 10,716,000 in 2015 to 11,756,000 in 2016.

Status of water-friendly culture vitalization contents

Sihwa Narae Ara waterway →

Sihwa Narae Marine Festival
Enhancing the value of Sihwa Lake by providing various water leisure activities such as the yacht academy, Ueumdo Island, eco-tracking and operation of an ecology program

Ara Culture Festival
Rising as a representative regional festival with 18 cultural experience programs including a dragon boat competition and Ara yacht competition, etc.

Dams / lakes →

Eco-tourism
Enhancing the value of ecosystem services and creating tourism attractions through the implementation of Daecheong Lake ecotourism utilizing the ecological, historical and cultural resources of the waterfront space

Social contribution-type education
Conducting outdoor education programs such as hope mentoring, leisure experiences, and communications training to the youth of multicultural families and marginalized classes

Rivers / streams →

Territory schools
Boosting the use of cultural centers by conducting the youth territory school in collaboration with the Ministry of Land, Infrastructure and Transport and LH as well as reinforcing support to areas near dams (about 500 people in 9 areas)

Culture and art performances
Operating support programs for cultural performances and art exhibitions to marginalized areas (about 6,000 people in 13 locations including Andong dam, etc.)

Construction of waterfront cities

Busan Eco Delta Cityy

- **Project expense** : KRW5,438.6 billion
- **Project period** : year 2012~2018
- **Attracted industry** : R&D, industrial cluster, residence culture, education etc.
- **Project area** : 11,770㎢

Naju Noan District

- **Project expense** : KRW20.5 billion
- **Project period** : year 2012~2018
- **Main introduction function** : Countryside residential complex, Namdo culture experience complex, neighborhood living facilities, etc.
- **Project area** : 105,000㎢

Buyeo Gyuam District

- **Project expense** : KRW17.0 billion
- **Project period** : year 2012~2018
- **Main introduction function**: Education and training facilities, water leisure sports facilities, family pension, bike del etc.
- **Project area** : 110,000㎢

Sustainable management strategy Ⅲ

Water Platform

K-water, as the only water industry-related national public enterprise representing Korea, plans to lead the global water industry by inducing the creation of new water industry platform and enhancement of its export competitiveness. Thus, K-water is striving to be a technological innovation leader in water management by incorporating fourth industrial revolution technology such as IoT and AI, etc., and expand its overseas business by establishing a water industry platform along with hidden champions in the industry.

Key activities for K-water's sustainable management >

- Securing future technology through the establishment of a technological innovation roadmap
- Preparing infrastructure to foster the water information hub, including the establishment of the National Drought Information Analysis Center
- Fostering hidden champions through a performance sharing system, Water+ loan, establishment of the integrated water industry platform
- Exploring new markets through the vitalization of overseas projects
- Expansion of its global network by leading the operation of the Asia Water Council, etc.

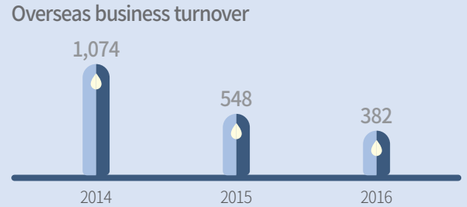
Future plans for K-water's sustainable management >

- Advancing the water industry by grafting the technology of the fourth industrial industry
- Preparing for open innovation based on the integration, opening, and sharing of big data on water information
- Vitalizing overseas projects, supporting SMEs for securing market opportunities through the expansion of the global network, and reinforcing the global competitiveness of the water industry

Performance of the Water Platform

Creation of private workplaces

Overseas business turnover



Significant issues K-water faces in achieving sustainable management and SDG contributions

As a leading player in the global water industry, K–water plans to provide water services of abundance and prosperity all over the world by innovating and fostering the water industry with open innovation and realizing water unification of the Korea Peninsula. In this regards, the acceleration of technological development, increase of demand for fair trade, increase in the significance of corporate partnerships with affiliates, etc. have been derived as the significant issues of the sustainable management related to the Water Platform which is a significant strategic task. K–water manages such significant issues systematically for contributing to the sustainable development goals (SDGs).

Safety and health of consumers	Anti-competitive behavior	Social evaluation of suppliers	Anti-competitive behavior
Acceleration of the technological development	Increase in the demand for fair trade	Increase in the significance of corporate partnership with affiliates	Intensifying competition (technological development, patents, overseas expansion, etc.)

SDGs

Water Industry Promotion along with Hidden Champions

Growth of the global water industry

According to Global Water Intelligence (GWI), a global water industry research institute, the water–related industry is worth KRW800 trillion worldwide (as of 2016), and the market itself is in a trend of continuous growth of 3.7% annually. As the water management conditions deteriorate due to population growth, industrialization and rapid climate change, global water–related industries are continuously developing. According to a GWI report, the global water market will expand to US$834.1 billion (about KRW1,000 trillion) in 2020, and in line with this trend, K–water plans to expand its scope of business to the global market by establishing its unique water industry export model based on the development of core technology and vitalization of the local market.

Promotion of corporate partnerships

Reflecting the CEO's strong commitment to this goal, K–water has expressed the importance of corporate partnerships as its core policy in the vision proclamation ceremony of the next 50 years, and has set up the vision, goal and tasks in order to create a cooperative water industry ecosystem. We have compiled a pamphlet and promotional video introducing K–water's support system, and announced internally and externally K–water's willingness to enter into corporate partners. In addition, using various communication channels, such as conferences with corporate partnership, technological development council for the water industry, advisory committees of large, medium and small enterprises, etc., and all the executives and employees including the CEO listen to the opinions for supporting SMEs. K–water is striving to foster small and medium venture enterprises of the water industry and create new opportunities by establishing cooperative networks with government agencies, international organizations and NGOs, etc.

Vision	Creation of the cooperative water industry ecosystem			
Goal	Achievement as an excellent company in corporate partnerships by establishing a sustainable management system			
Strategic tasks	Expansion of public purchases and securement of a consensus	Vitalization of technological development and expansion of the water market	Win-win cooperation in construction works	Commercialization of technology transfer and enhancement of technical competence

Pamphlet on the SMEs support system	Production of a PR video	Corporate partnership contest

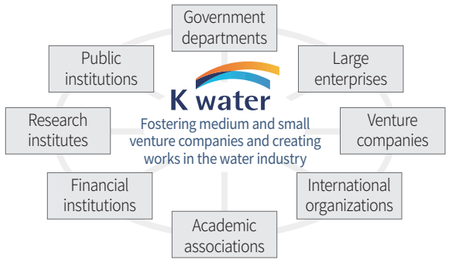
Stakeholder's interview

Mr. Oh, Gwang Seok, representative of Usol Co., Ltd.

In my opinion, for further development in the future, K–water should pursue the happiness of society as a whole, strive to manage water resources while valuing sustainable management which is a topic of the global community. I think K–water needs to gain the trust of various stakeholders through the promotion of corporate partnerships, activities for local communities, and expansion of culture sharing efforts. By satisfying external stakeholders as well as internal executives and employees, K–water will be reborn as a leading sustainable management institution.

The promotion system of the water industry platform

K–water recognizes the importance of fostering the water industry as a significant business and, in that context, has established the Water Industry Platform Center, which will take on the role of a control tower by integrating the creative innovation of relevant organizations and promoting rapid execution. As the water–related industries are expected to grow continuously throughout the world, K–water plans to be a water–industry technological innovation leader of the new normal era represented by climate change and the fourth industrial revolution through the Water Industry Platform Center. The water industry platform will integrate services to foster water–related SME growth by sharing and opening K–water's knowledge, technology, infrastructure and network to secure new opportunities and export the competitive technologies of the domestic water industry. We plan to improve conveniences and efficiency for SMEs by integrating network information through the Water Industry Platform Center. To this end, online services (K–water Online Priming Center) and telephone services (key number 1666–0209) are available for improving users' conveniences. (www.kwater.or.kr/mjmool)



How to use the services of K-water's Priming (majungmool) Center

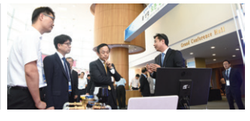
※ Phone services: Providing a customized support system for SMEs seeking information both online and offline (key number: 1666-0209)

Corporate partnership platform

Sharing values through the water industry platform and enhancement of the services minded by all executives and employees	Opening of a 'One-stop Comprehensive Consultation Counter for SMEs' at the Main and Regional Headquarters	Turnover of KRW51.4 billion through the development of hidden champions' technology products	Received a Presidential citation for commercialization and purchase expansion of SMEs' excellent technologies

Innovation technology platform

Opening K-water's technology, knowledge and facilities and expanding open innovation	Vitalizing the national and regional water industry cluster and enhancing K-water's role	Enhancing SMEs' technical competitiveness through gratuitous conveyance of the intellectual property rights * Selecting 52 items of gratuitously conveyed technologies in 2016, 6 items were conveyed to 9 companies



Venture start-up platform

Establishing K-water's water industry venture and medium and long-term roadmap strategy	Preparing for the establishment of a water industry technology venture and comprehensive support program	Promoting growth in the domestic water industry and creating high-quality technologies

Export platform

Studying overseas markets in depth and establishing an export platform that can be customized by country	Taking the initiative to secure and enter new water industry markets using K-water's global network	Providing K-ACE export certification branding for SMEs to improve awareness in overseas markets	Concluded a Memorandum of Understanding (MOU) with the Vietnamese Governmental water resources management institution (NAWAPI*)

* NAWAPI: National Center for Water Resources Planning and Investigation

Supporting R&D in the water industry

In order establish a systematic basis for the vitalization of the water industry through R&D and commercialization of demonstrative technologies, K–water Convergence Research Center is implementing a support plan for domestic water companies to provide them with direct experience and foster mutually beneficial growth. Especially, K–water plans to reinforce SMEs' competitiveness through the customized R&D of enterprise demands, sharing of K–water's water infrastructure, and enhancement of domestic and foreign R&D cooperation, etc.

Establishment plan for R&D of the water industry platform

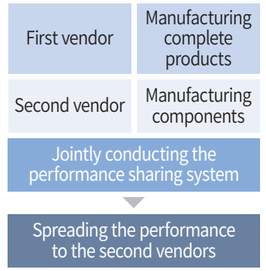
Vitalizing the multilateral performance sharing system

K–water is operating various corporate partnership programs by supporting the discovery, practical use and commercialization of SMEs' excellent technologies. Especially in 2016, K–water expanded the multilateral performance sharing system in order to spread the performance to the second vendors who are manufacturing water–related equipment. In addition, K–water has expanded the support business cost to SMEs, relaxed entry regulations and reduced the necessary period for contract conclusion by improving the enforcement criteria of the Performance Sharing System.

Improvement of the enforcement criteria of the Performance Sharing System

Category	Existing	Improved
Support business cost	Supporting only the cost of equipment	Equipment + installation cost
Necessary period for contract conclusion	Up to 12 months	3 months

Overview of the multilateral performance sharing system



Establishment of a fair trade culture through the discovery and improvement of unfair factors

K–water actively uses a subcontract keeper to block any overdue construction expenses at the source, and has newly arranged and is using the Fair–trade Pledge* recommending direct payment of the subcontract price for eliminating unfair practices caused by the vertical structure of the construction business. In addition, through the reinforcement of onsite inspections and vitalization of communications, K–water is striving to eradicate unfair trade practices by analyzing and improving any irrational factors. Accordingly, K–water has uncovered and corrected 121 items of unfair trades, such as illegal subcontracts, failing to use the standard contract etc., and discovered and improved 74 tasks including appropriate reflection of temporary structures and realization of safety management, etc.

Results of unfair trade eradication

Category	Year 2015	Year 2016	Results
Construction applied to subcontract keepers	KRW168.8 billion	KRW528.5 billion	Increased by KRW359.7 billion y-o-y (213% ↑)
Direct payment of subcontract price	KRW16.5 billion	KRW39.8 billion	Increased by KRW23.3 billion y-o-y (141% ↑)

* (Fair-trade Pledge): attaching the documents pledging the prevention of overdue payments and vitalization of direct payments in the subcontracted etc. as the contract document.

Invigorating the Korean economy through K-water's Overseas Projects

Establishing an organization dedicated to overseas business

K–water is pursuing overseas business opportunities with a total of 102 employees who are working at the main headquarters, with five teams, eight project groups and three SPCs. Starting with the research of Fenhe Basin, China in 1994 (gratuitous assistance), K–water has carried forward 85 projects worth KRW2,515.8 billion in 24 countries (K–water's investment: about KRW530 billion). Of the five teams, the Overseas Planning Team is in charge of construction and operational management of businesses that are in progress, while the Overseas Business Team and Overseas Technology Team conduct the development business, such as discovery of new projects, order negotiation, technology support, etc., thereby expanding their expertise. K–water plans to expand regional overseas subsidiaries up to 30 entities by 2025 based on the hydroelectric projects in Pakistan and Georgia, waterworks in the Philippines, etc., and is arranging the foundation to advance into projects in North Korea in preparation for the coming unification era.

Significant results of overseas business

Patrind Hydropower Project

In spite of construction delays due to changes to the grit chamber caused by poor quality of rocks and delay of transmission line construction by the government of Pakistan, K–water finished the completion test of the Patrind Hydropower Generation Project, which is K–water's first overseas investment project, in November 2017 and started commercial generation.

In case of the Angat Dam Project in the Philippines, K–water was empowered to operate the dam by the strategic negotiation with the government of the Philippines and, as a result, made a generation profit of KRW30.1 billion thanks to the application of scientific operations management. Also, when proceeding with the Bolakan Waterworks Project, K–water minimized its equity portion in the equity investment method and converted the business model into the technical advisory agreement for technology export which is K–water's strength and carried forward the project, thereby reducing the legal and economic investment risks and securing the target return rate of 11%.

Securing future growth engines through foreign expansion of new growth industries

K–water is entering new business areas of by focusing on information and communication technologies to create added value. K–water has adjusted its priorities from overseas expansion focused on a single project to total solution systems, such as smart water management based on information and communication. In addition, K–water, Doosan and SK jointly entered a seawater desalination project in the Red Sea (Dead Sea) in Jordan, and passed the pre–qualification, and are proceeding with 'Korea–UAE International Joint Research for securing the world–best level of seawater desalination technology.

Change in overseas business priorities

From the past <operation + construction> type, separating operation and construction now, and adding IWRM* and SWM**

*IWRM: Integrated water resource management
**SWM: Smart water management which refers to K-water's intelligent water management system

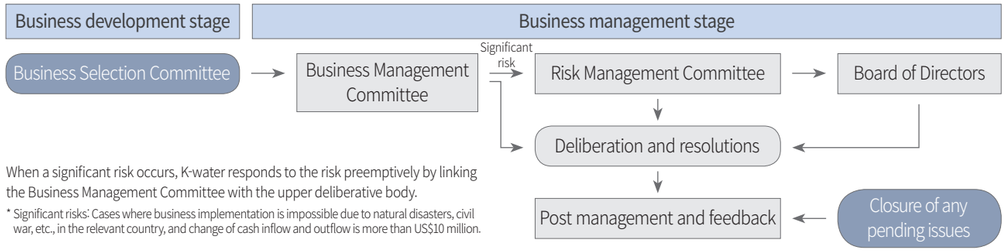
Laying the foundation to advance needed projects in North Korea during the unification era

For the development of the water industry for the entire Korean Peninsula after unification, K–water is looking to establish a plan that utilizes water and electric power simultaneously by changing some deteriorated dams into multipurpose dams as well as the linked business for co–managing the rivers shared by both South and North Korea. As well, K–water is strengthening international cooperation with neighboring countries in Northeast Asia including China and Russia.

Efforts made to secure the overseas business opportunities

K–water has diversified its business model through ties with global institutions, such as international organizations, Multilateral Development Banks (MDBs), etc., and expands the establishment of overseas subsidiaries centered on Southeast Asia and spreads them into emerging countries. Especially, K–water vitalized smart water management as a new business area based on the strength of Korean information and communication technology accumulated over the past 50 years, thereby setting it as its new growth business. In addition, in order to prepare against risk factors that can occur in its overseas business, K–water has greatly enhanced the safety and stability of projects by operating the Risk Management Committee.

[Risk Management System by stage of overseas business]



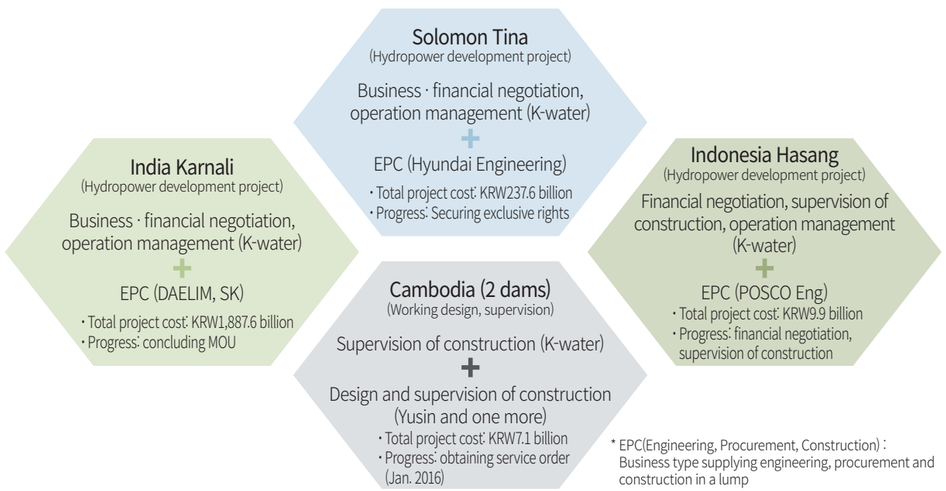
When a significant risk occurs, K-water responds to the risk preemptively by linking the Business Management Committee with the upper deliberative body.

* Significant risks: Cases where business implementation is impossible due to natural disasters, civil war, etc., in the relevant country, and change of cash inflow and outflow is more than US$10 million.

Realization of joint expansion to overseas markets thorough collaboration with private and public enterprises

For overseas expansion, K–water has realized joint expansion by converging its funding and operation and management capabilities with the excellent design and construction technology of private companies. K–water has led the overseas expansion of the Korean water industry under a scheme where basic investigation are being jointly conducted. Typically, negotiations and financing are executed by K–water, while construction is done by private enterprises with K–water in charge of operations management.

[Status of joint overseas expansion in collaboration with private and public enterprises]



* EPC(Engineering, Procurement, Construction) : Business type supplying engineering, procurement and construction in a lump

Enhancement of Leadership and Competencies for Solving Global Water Issues

Collaboration with UNESCO to establish I-WSSM (International Center for Water Security and Sustainable Management)

Opening Ceremony of the International Center for Water Security and Sustainable Management (I-WSSM)

K–water has established I–WSSM (International Center for Water Security and Sustainable Management) in collaboration with UNESCO and the Ministry of Land, Infrastructure and Transport and Ministry of Foreign Affairs. I–WSSM is the international research and education center of water security and sustainable water management to which the hubs of research, education and information are converged, and it is an organization supporting a water security strategy that can realize sustainable growth for developing countries through the functions of convergence research on integrated problem–solving, site–oriented education and global networking. This was the first time to establish of a renowned water–related international organization center in Korea, and as such, K–water is expecting to lead the agenda of water industry and set up a foundation for solving the international water problem and boosting overseas business.

[Mission and vision of UNESCO I-WSSM]

About 'UNESCO I-WSSM'

International Center for Water Security and Sustainable Management

UNESCO

Attraction of UNESCO I-WSSM

MISSION	Support water security strategies for sustainable development against climate change
VISION	Equal and safe water use and better quality of human life
Strategic Direction	Interdisciplinary convergence research based on integrated problem-solving / Field-oriented education / Information platform for water security

Establishing a world-leading network

The third Board of Directors Meeting of the Asia Water Committee (AWC)

K–water continues to expand its business scope by entering the global water market and cooperating with renowned international organizations. In particular, K–water successfully hosted the 7th World Water Forum (7th WWF) in 2017 and is playing a leading role as a global water–specialized enterprise by establishing a global network through the exchange of technology and workforce and securing base partnerships in the Asian region with the World Water Council. In addition, K–water is performing a pivotal role in solving the water problems of the Asian region by developing AWHOT (Asian Water High–Level Round Table). Based on the consensus of AWHOT participants who met during the 7th WWF, the establishment of the Asia Water Council (AWC) was agreed upon and is being chaired by K–water. AWC is a high–level platform for discussing and seeking solutions to water issues in Asian region.

AWC ASIA WATER COUNCIL

About 'AWC (Asia Water Council)'

- The international water organization for cooperation in discussing and solving water problems of Asia
- Membership includes over 120 institutions from 26 countries, including Indonesia, China etc.,

Holding Asia International Water Week (AIWW)

Opening Ceremony of the Asia International Water Week (AIWW)

The Asia Water Council (AWC), which was established in March 2016 in order to look for and apply practical solutions to water problems in Asia, agreed to hold the Asia International Water Week (AIWW) every three years as a forum for disseminating performances and overseas expansion of the water industry. The 1st AIWW was held in September 2017 in Gyeongju under the theme of 'Asian Solution for Water'. Approximately 15,000 participants from Korean and foreign governments, international organizations, academia, and NGOs, etc. engaged in various events, such as the agreement of declaration, topic presentations, water project forum, and special sessions. As a result, AIWW greatly enhanced the global status of K–water and AWC.

AIWW (Asia International Water Week)	
	Date 20 (Wed) ~ 23 (Sat), September, 2017 **Place** Gyeongju HICO
	Participants 15,500 people from 70 countries including Indonesia, Thailand, and Cambodia etc.
	Main programs Opening and closing ceremonies, EXPO, Declaration Statement (Asia to World), Water Issues (25 sessions), Water Project Forum (MDBs, by country), AIWW Special Sessions (Algal Bloom, Water Industry platform, Asia Water Challenge, Korea-ASEAN, ADB), 5th AWC Board of Directors Meeting, and 2nd General Assembly, etc.

Representatives from about 50 countries and water–related institutions participated in "the high–level declaration session (Asia to World Statement)" and selected the declaration that can implement solutions to Asian water problems. Approximately 2,000 water experts discussed cases and solutions of five water–related main themes which were water and climate change, drinking water and sanitation, sustainable water resource management, water–energy–food (WEF) nexus, and water ecosystem and waterfront and 25 detailed topics. About 300 people attended the Water Project Forum which promoted the sharing of project order planning of six major Asian countries and Multilateral Development Banks and 1:1 meetings were held with enterprises. As a result, domestic water companies were provided with opportunities for overseas expansion.

The successful hosting of the Asia International Water Week (AIWW) paved the way for Korea as well as K–water to establish a solid foothold in the global water market and, based on this performance, K–water is expected to play a leading role in the growth of the water industry and achievement of the sustainable development goals (SDGs) by strengthening civil–government–academic cooperation using a global platform and continuously developing its technological prowess.

▲ Closing ceremony of AIWW
◀ Special session of AIWW

Water Trust

K-water is striving to be realized as a trusted public enterprise. K-water is striving to create opportunities for overcoming low growth and reducing unemployment, set up a clean organizational culture and secure financial soundness in the era where low growth has become the new norm.

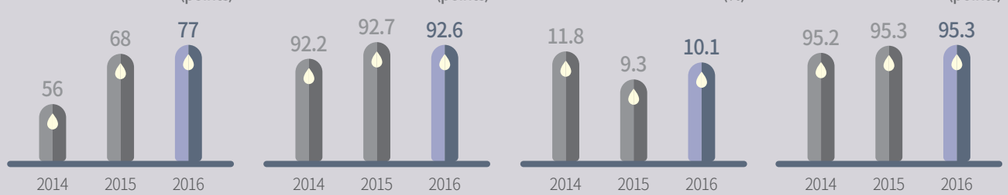
Key activities for K-water's sustainable management

- Setting up an efficient organizational culture, such as the establishment of the Organization Culture Innovation Office
- Fostering global human resources through the expansion of exchanges with international organizations (WB, OECD, etc.)
- Exceeding the debt reduction plan focused on high–intensity self–help efforts and improving careless management

Future plans for K-water's sustainable management

- Expanding the quality jobs through new employment, job sharing, and conversion to permanent positions, etc.
- Creating opportunities for private enterprises through the cultivation of the water industry
- Securing the highest–level of integrity among public enterprises
- Establishing a performance–focused organizational culture by realizing the Great Work Place based on the trust among members
- Reinforcing financial soundness by high–intensity self–help efforts and efficient business management

Performance of Water Trust



Significant issues K-water faces for sustainable management and contribution to SDGs

K–water plans to be realized as a trusted public enterprise through the creation of new employment opportunities, implementation of social responsibility, realization of global–level transparent and ethical management, preemptive risk management, and fostering of convergence–type human resources who will lead the future. In this context, contributions to local communities, anti–corruption, increasing in the demand for transparent and ethical management and reinforcing the importance of securing human resources were derived as significant issues of sustainable management related to Water Trust. K–water is contributing to the sustainable development goals (SDGs) by managing such significant issues systematically.

Local communities	Anti-corruption	Employment
Contributions to local communities	Increasing the demand for transparent and ethical management	Reinforcing the importance of securing human resources

SDGs

Happiness Sharing with Water – K-water's Welfare Projects

K-water is striving to realize a warm, sharing, and happy society using its professionalism in water management to open the future and share happiness with water through contributions nationally and to local communities.

K-water's social contributions are creating the social value

For the sustainable development of the enterprise and society, K–water is pursuing social contribution activities by establishing a unique vision, three core values and promotional direction of the social contribution activities. K–water is concentrating its resources and capabilities so that the beneficiaries can receive actual benefits through differentiated activities making the most of the characteristics of its business.

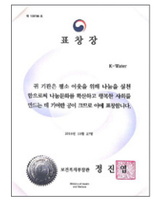
[K-water's social contribution system]

| **Vision** | Warm sharing, happy society | **Slogan** | Flowing into happiness | **Brand** | Happy water |

Promotional theme of the core value	Value creation **Win-win with water** Creating the sharing value of water Improving deteriorated water environments of the vulnerable class, sharing clean water, making the healthy water environment, and contributing to the global community	Engagement **Water full of love** Supporting the local communities Caring for local residents, sharing love by providing medical services, conducting filial piety sharing services, increasing income of the regions around dams, and providing water culture spaces	Consensus **Water full of hope** Realizing future hopes Mentoring hope for the happy water, providing water education, and supporting future generations
Activity resource	Water love sharing fund (sharing 1% of the salary of the executives and employees) + matching grant (K-waters contribution) etc.	Promoting organization	K-water's Water Love Sharers

Water Love Sharers are taking action

Water Love Sharers, which is a volunteer group composed of K–water's executives and employees, have been continuously carrying out various volunteer activities, such as protecting the environment, supporting disaster relief efforts, and helping marginalized neighbors, etc., since its foundation in July 2004. Financial resources are provided by the Water Love Sharing Fund, which the executives and employees raise every month with certain amounts taken out of their salaries and the Matching Grant contributed by the enterprise. In particular, K–water is continuously developing the campaign of sharing 1% of employees' salaries, which was implemented for the first time among public enterprises. In 2016, Water Love Sharers developed activities totaling 58,000 hours through 113 voluntary groups across the country and their activities have been developed taking into consideration regional characteristics and responding to social issues actively, such as the water voucher supporting initiative which covers water bills for lower–income groups, and social adaptation of uneducated youth. Thus, in 2016, Water Love Sharers received the citation from Minister of Health and Welfare in the National Sharing Awards.



National Sharing Awards Citation (2016)

Happiness sharing with water
K-water
Water Love Sharers

Helping disadvantaged neighbors	Various activities, such as delivering side dishes, providing company, etc. for vulnerable classes including single elderly persons, persons with disabilities, households led by children, etc.	Environmental protection campaign, purification of rivers and streams, activities for fostering clean environment, such as a tree planting event	Environmental protection activities
Supporting disaster relief	Prompt action, such as disaster recovery, support of relief goods for disaster areas affected by floods and drought, etc.	Local community-based activities, such as technical service activities for farming areas, quality inspection of the drinking water, and support of residential unity events etc.	Contributing to local communities

Supporting disaster relief

Supporting disaster relief

Providing clean water

Overseas technical support

Win-win with water

K–water has been implementing the Water Full of Happiness Project to improve deteriorating water–use environments and residential environments of the vulnerable classes since October 2013, and is developing projects such as the improvement of the drinking water facilities like installation of membrane filtration facilities for elementary and middle schools in the regions where water services are not provided. K–water also operates seawater desalination facilities in the insular areas that are suffering from severe lack of drinking water, support of emergency drinking water to disaster areas, protection of river ecosystems, and making clean rivers and streams. Moreover, by raising the professionalism of its business, K–water has been developing drinking water facilities in regions suffering from lack of water, such as Cambodia, Mongolia, and Laos, and carrying out life support projects every year since 2006. Moreover, in 2016, K–water carried out customized voluntary services, such as the development of drinking water facilities, provision of medical and educational services, renovation of public facilities, etc., in Mongolia in collaboration with the residents for achieving sustainable development

Water Full of Happiness Project
Improvement of water environment: 51 sites
Number of users: 2,341

Sharing clean water
Support of drinking water facilities: 27 sites
Seawater desalination facilities: 8 sites

Making healthy water environments
Environmental protection activities: 102 times
Release of native fish: 320 thousand fish

Global social contribution
Mongolia:
2 times
dispatching 60 volunteers

Water full of love

K–water is developing life cycle–customized social contributions reflecting the needs of the residents dwelling in the business area. With 113 Water Love Sharers, volunteer groups are composed of executives and employees. K–water carries out various activities to care for local residents, such as making kimchi for the winter, briquette sharing, and water vouchers, etc., for the underprivileged neighbors including single elderly persons and children of vulnerable classes, etc. Since 2009, K–water has been implementing love–sharing medical services in collaboration with professional medical organizations for improving the health of residents in the regions around dams where the medical condition is poor. In addition, starting with Hapcheon dam, K–water contributes by providing sustainable incomes and job creation for the residents, such as operation of eight Filial Piety–sharing Welfare Centers, housework and nursing services, operation of the child welfare center, construction of solar photovoltaic power stations, etc., and show compassions to neighbors in need.

Lovely sharing by making kimchi (gimjang)

Caring Activities for local residents
Number of people engaged: 4,232
Hours of activities: 58,432

Love-sharing medical services
Number of patients treated: 5,952
Times of activities: 30

Operating filial piety-sharing welfare centers
Operating 8 centers
Number of users: 645,127

Increasing income in the regions around dams
Created 4,191 jobs and income of KRW500 million

Providing water culture spaces
Operating 15 water culture center
Number of users: 1,127

Water full of hope

K–water contributes to recognition of the importance of water and cultivation of future human resources by operating Happy Water Hope Mentoring, which is a multi–mentoring regional program between high school and university students and K–water's employees, and carrying out creative and interesting water education with Water Dream Camp, which is an education–donating program.

Recognized for this performance, K–water received the citation from the Minister of Health and Welfare in the mentoring field at the 2016 National Sharing Awards and won a meritorious commendation from Ministry of Education for vitalizing the free semester system in 2017. In addition, in order to eliminate the disparity of education between urban and rural areas, K–water is supporting various educational services, such as the operation of differentiated education programs and support of educational equipment to schools located around dams.

Happy Water Hope Mentoring
Number of people engaged: 98
Degree of satisfaction: 94%

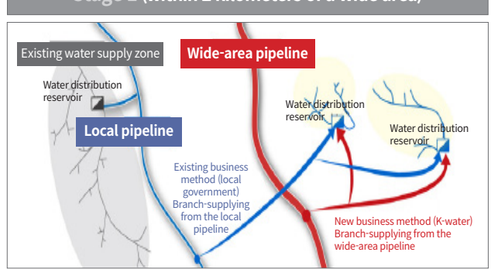
Donation of water education
Number of people engaged-Water dream camp: 14,223
Outdoor camp: 397
Youth regional schools: 320

Support for future generations
Education by native speakers: 6,569
Support of characterization class: 50 schools

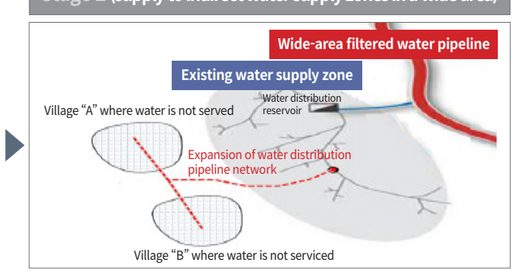
Eliminating water service dead zones through the diversification of water resources

K–water is striving to eliminate water service dead zones where tap water is not supplied. Moreover, K–water has developed the water–welfare cooperation model between wide and local areas in order to solve inconveniences using the wide waterworks in farming and fishing communities where the water distribution rate is comparatively low. In addition, K–water improved the water supply infrastructure and technical support to military bases located in mountainous areas depending on underground water or valley water, thereby solving inconveniences, such as water quality issues.

Stage 1 (within 2 kilometers of a wide area)



Stage 2 (supply to indirect water supply zones in a wide area)



Creating jobs through cooperation with K-water

Creating jobs that satisfies people's levels

K–water has set the regulation to recruit full–time employees for permanent and full–time job positions in order to enhance the quality of public works and realize strong social values. For employment stability, K–water is continuously promoting short–term workers who mainly manage local waterworks into unlimited contract workers with full–time positions. This is a reflection of K–water's policy of using external consultation and internal experts. Especially, K–water has completed employment pattern and job analyses in order to realize the principle of 'the equal remuneration for work of equal value' and set up the conversion criteria across a full spectrum of discussions by forming a council of labor–management and experts.

[K-water's job promotion strategy]

Goal	Creation and enhancement of high-quality jobs, enhancing the quality of employment, and reducing the gap
3 key tasks	Conversion of temporary positions to regular positions + Creation of employment opportunities for youth + Creation of private works
CEO-leading	Operating "Good works creation TF" with the CEO as the leader - having twenty members including executives and operating the permanent executive office

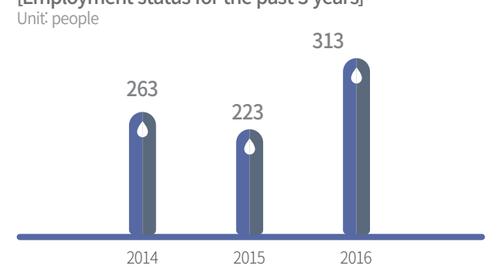
Power of youth in Korea, creation of jobs for the youth

K–water reinforces youth employment through youth intern opportunities that are linked to recruitment, consolidates its position as the water–specialized public enterprise by employing professional talents possessing various career bases, and fosters the culture of balancing work and life and responds to various employment demands spanning the life cycle, such as infant care, study opportunities, and employing women who are reentering the work force after a career break.

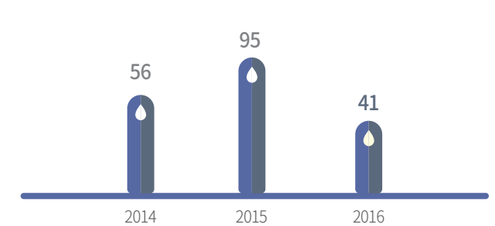
[Recruitment system of fair opportunity and consideration for minorities]

Affirmative action	Recruiting only based on the job competency by conducting interviews after applying affirmative action to all the personal information, such as name, age, sex, and educational background etc. - Prohibiting the unnecessary collection of personal information (educational background etc.) from the stage of receiving any documents
Local talents	Employing about 50% of new recruits with local talents annually by operating autonomously "the recruiting system aiming at hiring talents from non-metropolitan areas by 40%"
Female talents	Continuously expanding the recruitment of female talents by operating "the recruiting system aimed at increasing female employment by 30%"

[Employment status for the past 3 years]
Unit: people



[Record of conversion into the unlimited contract]
Unit: people



Creating opportunities for private enterprises

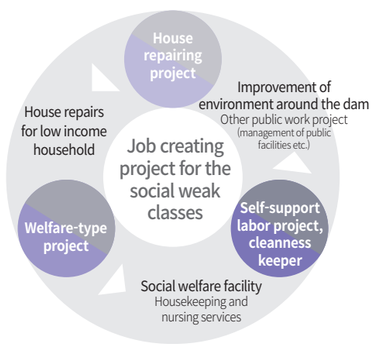
K–water has created 2,859 works from 2013 to 2016 through the existing SMEs support system and technology transfer. Moreover, K–water plans to foster the water industry and create new works by establishing an open platform and entirely opening K–water's knowledge and facilities to private companies. In addition, K–water will create a total of 15,000 works for the next five years by expanding investment in renewable energy and in the safety field. By concentrating on the water–related energy development for the successful accomplishment of the Government's renewable energy 2020 policy*, K–water plans to contribute to work creation by expanding the application of floating photovoltaic energy systems (3.7GW) using the water surface of dam reservoirs and hydro thermal energy (1.4GW) using raw water in wide–areas while preemptively carrying forward the mission for 'Safe Korea' by reinforcing the safety of dams in response to earthquakes and other disasters.

Development of renewable energy	Expansion of floating photovoltaic power systems (3.7GW) and hydro thermal energy (1.4GW) * accomplishment of the Government's renewable energy 3020 policy	2,276people
Earthquake preparedness	Improving the structure of water intake towers and reinforcing the dam slope etc. in preparation for earthquakes * more than 37% of 35 dams managed by K-water are older than 30 years (17 dams)	288people
Stability of the water supply facility	Improving deteriorated water pipelines and carrying forward double lines of pipelines * 9% out of 5,300km of wide-area waterworks are older than 30 years	12,019people
Stability of water supply	Dualizing the water intake station of Paldang dam to improve the drinking water safety of 13 million people * Risk of large-scale water cut-off as 27 cities and counties in the metropolitan area depend on Paldang dam	449people

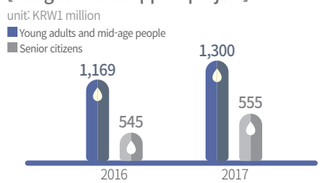
* Renewable energy 3020 policy: supplying 20% of the total energy with the renewable energy by 2030

Creating works for low income residents

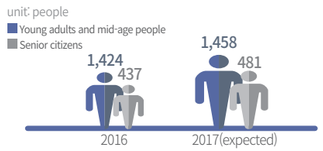
K–water is making efforts to enhance the quality of life by providing housekeeping, nursing, and various public services for vulnerable residents residing around dams. In addition, K–water enhances the vitalization of the organization and meets the Government's work sharing policy by creating new employment opportunities through job sharing and recruiting human resources.



[Budget of the support project]



[Annual creation of works (estimated)]



Stakeholder's interview

Mr. Cho, Yeong Cheol Professor of the Environmental Engineering Department, Chungbuk National University

It is high time to be concerned with the inclusive growth of our society while anticipating massive social and economic changes which the fourth industrial revolution will bring. As a water resources–specialized public enterprise representing Korea, K–water will play its role for this inclusive growth, such as support to partners, investment in technology–based ventures, support for the creation of youth works etc., in order to fairly allocate opportunities and profit distribution. Especially, my hope is that K–water becomes an organization concerned with fulfilling its social responsibility by expanding work–focused investment.

Creation of Advanced Organizational Culture

Fostering the healthy organizational culture of respect and trust

K–water is systematically setting up its unique innovation model, while having newly established its commitment to foster organizational culture with direct innovative leadership from the CEO. Especially, K–water has concentrated on fostering an empowering workplace environment which involves members' immersion and creation by setting up a culture of efficient work through the systemization of the Work Smart activities, thus improving the over–time working culture which was prevalent, and actively using the family–friendly system. Based on these efforts, K–water has been certified as a family–friendly enterprise for 8 consecutive years and selected as Top 100 Enterprise selected as Great Workplace for 5 consecutive years. (as of November 2017)

Great workplace to work at

CEO's volition
- Establishing a new unit dedicated to the organizational culture activities directly under CEO's control
- Setting up the work criteria for work and life balance for the first time among public enterprises
- Formulating the unique organizational culture innovation model (5 Smart)

Flexible work environment
- Operating the customized flexible work system of the highest level among public enterprises
  * 40% of total employees (1,892 people) are using the flexible work system
- Expansion of 'Family Day' (Wed, Fri) and operating a PC Office system

Members' engagement
- Carrying on 'the Why Campaign' for sharing the meaning and purpose of work between leaders and members
- Conducting 'Dignity of the Workplace' a customized campaign based on the employee questionnaire

Family-friendly system
- Newly setting up the pregnancy leave, linking childbirth with maternity leave and supplementing the substitute workers, supporting infertility and subfertility etc.
  * laid-off male employees are more than twice the national average (16 people)

Continuous efforts to increase work efficiency and create a healthy workplace: harmonizing work and family

Faced with rapidly changing circumstances, such as climate change and the fourth industrial revolution, K–water is working to create a healthy workplace where members work efficiently, and work and family are harmonized by recognizing the organizational culture as the core factor for corporate growth and development. Especially, K–water is carrying forward the systematic activities by recognizing issues of low fertility and aging as top priorities for national development and setting up its unique innovation model (5 Smart).

[K-water's 5 Smart Model]

Internal Respecting and trusting K-water

- People Smart: Establishing self-esteem
- Team Smart: Establishing mission-based organizational competency
- Life Smart: Realizing the happiness of individual/workplace
- Work Smart: Working efficiently

+

External K-water brand recognition by customers

- Brand Smart: Customer competitiveness
  - Customers' recognition of K-water's mission and cultural strength
  - Recognizing K-water's own differentiated brand

The model for enhancing the external competitiveness (Brand Smart) and achieving the continuous growth through the internal business innovation (4 Smart)

Contributing to the accomplishment of K-water's vision and performance creation

Human rights management

K–water manages its activities with a sense of responsibility for protecting the human rights of all the stakeholders involved in the management activities as well as the executives and employees for the sustainable management of the institution. To this end, K–water is rigorously pursuing leading human rights management by applying both domestic and foreign criteria, such as the United Nations Universal Declaration of Human Rights and the Human Rights Management Guideline of the National Human Rights Commission of Korea, etc. In 2016, K–water expressed its commitment to practice human rights management both internally and externally, such as publishing and distributing 'the Declaration of Human Rights Management' for spreading the value of human rights management, and exerting continuous endeavors for the creation of a safe and sanitary work environment. For example, K–water is operating an advanced safety and health management system (KOSHA18001: Korea Occupational Safety and Health Agency) every year. Moreover, K–water works toward the prevention of industrial accidents through the expansion of the no hazard campaign in the workplace, the implementation of K–water Safety Patrol system, special education for disaster safety targeting department heads and supervisors, implementation of industrial safety and health education to all the departments, and finally, the implementation of the K–water Safety Check Day, etc.

Fostering global human resources and carrying out open employment

K–water has offered a graduate school course on global water resources policy with the aim of fostering professional human resources who will be better prepared for the future, thereby cultivating global human resources equipped to become leaders in key areas of the future growth engine. In addition, K–water has created new jobs with timely recruitment of human resources through job sharing by implementing the analysis of employment situations and the complementation plan.

[Graduate school program on global water resources policy]

Fostering experts

- Operating regularly a master's course that provides convergent education between water-related policy and technological areas
  - * Carrying forward a contract agreement with KDI (opening in 2017)
- Fostering global experts by conducting all the classes in English

Expected results

Fostering customized core talents specialized in K-water's business and supporting overseas business expansion

[Expansion of employment based on social-equity]

Women — Recruited 89 people (2 times↑)
Setting up the hiring goal (30% of the total recruitment)
44people — 2015 — 2016

Persons with disability — Recruited 6 people (1.2 times↑)
Preferentially treating points added, and relaxing language qualifications
5people — 2015 — 2016

Local talents — Recruited 160 people (1.3 times↑)
Setting up the hiring goal (40% of the total recruitment)
122people — 2015 — 2016

People of national merit — Keeping employment of 505 people (28 people (6%) ↑)
Aiming for 9% of the total employees (the highest among public enterprises)
477people — 2015 — 2016

High school graduates — Recruited 63 people (1.2 times↑)
Operating limited open recruitment and a high school graduate internship program
55people — 2015 — 2016

Senior citizens — Recruited 3 people (stable shiftwork, utilizing knowhow)
Newly establishing the human resources bank for retirees
Newly implemented — 2015 — 2016

Stakeholder's interview

Mr. **Kim Hyeon Jin,** Chairman of the 13th K-water Junior Board

As a representative Korean public enterprise managing water resources, K–water has great economic, social and environmental impacts on Korean society, and has a greater responsibility to our society. In this context, I believe it is K–water's essential role for securing the growth engine for creating working conditions under which both executives and employees may realize optimum job satisfaction. In addition, business ethics has become a top priority as well as the social responsibility of the enterprise. It is important that K–water, as the only water–specialized institution in Korea, should gain public confidence by continuously and consistently maintaining ethical decision making, transparency, integrity, and fairness in mind while conducting business. K–water should strive to collaborate with customers, partners, and local governments, etc. in order for all people in Korea to share happiness and open the future with water.

Integrity-based Ethical Management for Ensuring People's Trust

Strategies for carrying forward K-water's integrity-based ethical management

Business ethics issues, such as human rights, labor, environment, anti–corruption etc., are being magnified as major issues of corporate management and, in that context, the importance of strategic communications and cooperation with various stakeholders is increasing. In order to decrease the number of items compared with those of the previous year in the result of the 2016 integrity evaluation, enhance the ethical management, and reinforce implementation of the social responsibility through business, K–water has selected and is conducting ethical practice tasks including the implementation of global–level social responsibility, internal and external expansion of its own management disclosure, expansion of domestic and foreign ethical networks, and securement of corporate partnerships with stakeholders.

[Strategies to carry the ethical management program forward]

Goal	Securing the friendly consensus and trust from various stakeholders			
	Customers	General society	Executives and employees	Environment
Execution tasks	• Satisfying customers by providing the best services and protecting their rights and interests • Management for customers' happiness, compensation and supply of healthy tap water, etc.	• Vitalizing transparency of management and social contributions as a public enterprise • Government 3.0, extending the sharing culture and corporate partnerships, etc.	• Fair human resources policies and compensation based on respect among members • Improvement of reckless management, labor-management relations and integrity-based ethical education, etc.	• Carrying forward eco-friendly policy and business for the sustainable management of the enterprise • NGO exchange, environmental management and development of renewable energy, etc.
	Base of the ethical management	code of ethics, executing organization, monitoring system,consensus		
Ethics vision	Sustainable enterprise with ethical management practices that are as transparent as water			

Implementation system for integrity-based ethical management

With the Integrity and Ethics Committee, which is the highest decision–making organization for carrying forward our program for ethical management, K–water is operating a dedicated team for the improvement of integrity and ethics, and regional integrity forum for autonomous and practical integrity activities for the sake of company–wide system improvements.

Implementation system of the integrity-based ethical management

Fulfillment pledge for enhancing integrity and ethics by labor-management

In order to resolve the joint efforts by labor and management for the realization of an integral and transparent organizational culture, all executives and employees, including the CEO, the standing auditor, as well as the head of the labor union have pledged a strong commitment to the fulfillment of integrity and ethics. This includes the 'realization of integral and transparent organizational culture,' 'no offer and/or receipt of money, treat, and/or expediency,' business performance excluding internally and/or externally unlawful requests, 'reinforcement of punishment for corruption,' and 'enhancement of employees' quality of life.'

[Result of the integrity evaluation]

Category	year 2015	year 2016	year 2017
Comprehensive integrity	7.96	7.36	8.02
Grade	3	4	3

Various efforts for the integrity-based ethical management

Operating the on- and offline report system

For the realization of an integrity based organizational culture, K–water is operating various watch and report systems, e.g. operating the on– and offline secret report center in order to eradicate misconduct, such as unlawful requests, receipt and/or offering money, and unfair work instructions, etc. In addition, in order to expand the collection of external customers' opinions and internal employees' communications channel, K–water has installed integrity communications boxes in every department (11 boxes can be found in the Head Office and 87 boxes are located in regional offices), and constantly places blank stamped addressed envelopes in order not to have the identity of the notifying person exposed, thereby improving the existing offline report system.

Report system

Offline **Integrity communications box (blank stamped addressed envelopes)**

Online **Help-line(Internet)** K-water's website → report center → whistleblowers

K whistle (smart phone application) Google Playstore → Browsing and installing 'K-water K whistle'

Integrity communications box

Reinforcing external cooperation of the integrity and ethics program

K–water has reinforced the external cooperation for the integrity and ethics program. K–water is implementing an anti–corruption competency diagnosis and system improvement through the monitoring and consulting of areas vulnerable to corruption conducted by external experts. In addition, K–water has organized and is operating an integrity cluster among the related institutions in Daejeon and the integrity consultative body under the control of the Ministry of Land, Infrastructure and Transport.

Integrity cluster activities

Integrity consultative body activities

Operating a dedicated team for the improvement of integrity and ethics

K–water is operating a dedicated team for the improvement of integrity and ethics in order to implement main policies decided by the Integrity and Ethics Committee. This dedicated team is headed by the Chief of the Business Administration Office and is composed of three subcommittees including the External Integrity Subcommittee, Internal Integrity Subcommittee and Policy and Customer Evaluation Subcommittee, and Regional Subcommittee for execution on site, and the Anti–corruption Policy Evaluation Subcommittee, and is proceeding with the projects, such as integrity improvements by measuring field and system improvements and management of improvements in vulnerable areas.

Reinforcing the integrity and ethics through education and communication

K–water is continuously meeting with and monitoring construction workers and contract workers, inspectors of the waterworks etc. who are vulnerable to corruption, and is carrying forward various integrity communication activities, such as integrity education for high level executives targeting the CEO and executives, integrity communications education by the *Clean Masters who visit all the departments, etc. In addition, K–water encourages employees' to participate in voluntary integrity activities such as the in–house innovation contest for integrity improvement and reflecting the results in the system improvement, and discovering excellent cases and rewarding excellent departments and employees through the integrity competitive exhibition, etc.

Integrity education for high level executives

Integrity communication education by Clean Masters

* Clean master : integrity communications experts in K–water

Improvement of Financial Soundness

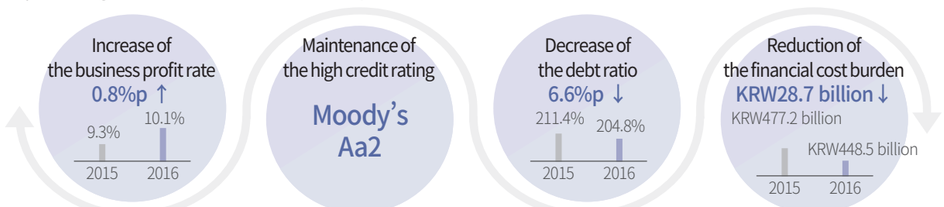
K-water has established performance goals for reinforcing the soundness of the financial structure and is implementing the tasks for promotion in order to achieve sustainable management as a public enterprise.

Reinforcement of the ability to implement medium and long-term financial planning	Enhancement of the soundness of the financial structure	Efficient use of assets held	Rational planning and management of the budget
Reinforcement of link between strategy and finance Reflecting the share of liability regarding 4 major rivers in the financial goal and segmenting the business plan **Establishment of rational financial goals** Securing validity of the goals set this year through scenario analyses **Feedback on financial planning** Expanding the investment volume by reflecting the strategic tasks needed for achievement of the future vision	**Response to financial risks** Maintaining financial soundness by systematically responding to risks (sales, investment) **Liquidity management** Maintaining the top-level credit rating and securing the stable solvency **Link of the debt repayment plan** Cash-based money management through expansion of sales and government investment	**IImprovement of asset utilization** Contributing to sales increase by improving the utilization of assets held. **Strategic management of financial assets** Overcoming the low-interest market environment by managing the strategic financial assets	**Rational allocation of resources** Drawing up a budget and investing rationally, and reinforcing the internal control of decision making **Efficient savings of budget** Striving for company-wide cost reduction and improving transparency of budget execution **Advancement of the budget reflux system** Systematic evaluation of budget performance Advancement of the reflux

Goal of indicators Preparing for the foundation of the independent financial structure for stable realization of the public interest value

Improvement of the financial structure

K–water worked to improve the financial structure in 2016. As a result, the business profit rate increased, and K–water was able to maintain the high credit rating provided by the credit evaluation agency. In addition, K–water decreased the debt ratio, thereby reducing the burden to the financial cost.



Reinforcing soundness of the financial structure

K–water is striving to improve soundness of the financial structure by setting up 4 promotional directions of enhancement which are investment efficiency, improvement of profitability by increasing sales, implementation of a debt reduction plan, and capital expansion.

Investment efficiency

K–water has improved the efficient use of the investment resources in stages. Firstly, we reduced unnecessary projects at the decision–making stage of engagement, and reinforced investment assessments for risk reduction. In addition, we amended the discount rate of each business by reflecting changes of the business environment, and improved the system of the decision–making stage of engagement by preparing for the standard guideline of the financial analysis by business. Secondly, we reinforced the management of business expenses linked to the medium and long–term financial plan in the stage of business management, enhanced the review procedure of the adjustment evaluation like site verification, etc., and distributed the management manual to the business departments.

Increase of sales

In order to raise reinvestment resources for deteriorated facilities, K–water has set up the sales increase plan by rationalizing the water bills and expanding the supply.

Category	Before rationalization	After rationalization	Rate of increase	▶	Expected effects
Water bills	KRW308.8/㎥	KRW326.6/㎥	4.8%		KRW62.4 billion / annual increase of turnover

Implementation of the debt reduction plan

K–water exceeded the goal for four consecutive years after setting up the debt reduction plan, and has established a stable fund management plan by creating the medium and long–term directivities for future management directions.

Category	Year 2014			Year 2015			Year 2016		
	Goal	Result	Rate	Goal	Result	Rate	Goal	Result	Rate
Amount (KRW100 million)	8,065	9,970	124%	5,599	8,132	145%	7,316	10,690	146%

Directions of medium and long-term debt management

Directions of medium and long-term debt management	Implementation of fianacial plan with maintaining a stable cash flow without additional borrowing and carrying out investment projects with the national treasury
Key promotional tasks	**Creation of stable cashflow** Enhancement of profits by increasing water sales and land plot sales / cost reduction through the implementation of a continuous debt reduction plan
	Execution of efficient investment considering financial competencies Implementation of investment without interruption for stable water supply / concentration of investment for repaying four major rivers project debt
	Reflection of the proper national treasury considering financial conditions Active use of the business method utilizing the external financial resources / Reflecting the stabilization project of water welfare and waterworks on the national treasury.

Capital expansion

K–water has secured the largest governmental investment ever by reinforcing external negotiations with the Government and National Assembly, etc. As a result, K–water's capital increased vis–a–vis from the previous year by securing KRW 496.4 billion, which is an increase of KRW 317.2 billion compared with the amount secured last year.

Category	Total	Four major rivers	Ara waterway	Waterworks
Amount (KRW100 million)	4,964	3,400	670	894

Directions for responding to the future

K–water plans for financially sustainable management by setting up the financial plan based on future scenarios along with improvement of the current financial structure and reflecting such financial plans in the medium and long–term management goal through the medium and long–term financial plan on a rolling basis.

Key financial indicators	Year 2017	Year 2021	Year 2026
Turnover (KRW100 million)	36,919	57,788	71,582
Operating profit rate (%)	13.6	12.6	17.0
Debt ratio (%)	205	167	98
Times interest earned ratio (times)	1.7	2.1	7.1

Enhancement of Cyber Security and Disaster Management

Company-wide risk management system

K–water's role is rising to the challenge of continuously supplying safe and healthy water as the incident of disasters become more frequent and complicated. In order to safely and stably supply water against risks, secure global competitiveness through reinforcement of crisis response competencies and implement successfully, with the Government's disaster management policy and K–water's management policy, we have introduced the company–wide risk management system in which all departments engage in and implement with the Technology Security Office as the main axis which responds to the aforementioned risks.

In 2016, K–water established the 'K–water Safety Management Master Plan' and thereafter, has established prevention–oriented safety management and reinforced competency responses to actual situations.

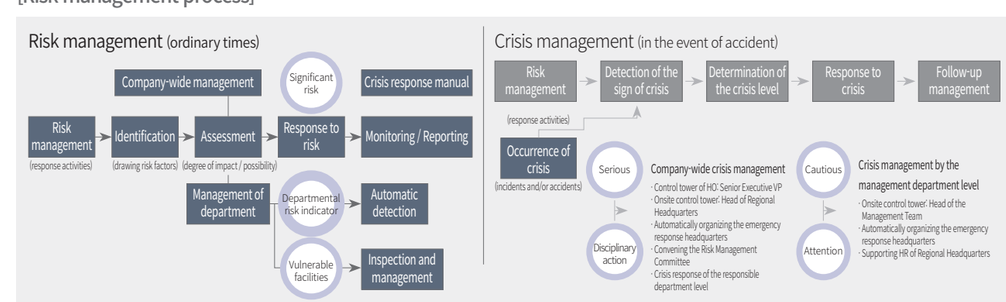
[Status of K-water's introduction of the risk management]

[K-water's master plan for safety management]

Existing		Direction of improvement	
Need for establishing a command system for disaster management	▶	Reinforcing the control tower function	• Unifying the disaster management and reinforcing the command system • Reinforcing the support and adjustment function of the disaster site
Safety management focused on ex post facto responses	▶	Establishing safety management focused on prevention	• Managing vulnerable factors intensively, and investigating and diagnosing safety blind spots • Establishing and expanding the company-wide safety culture
Vulnerable capabilities in response to increase of new disasters	▶	Enhancing the actual capabilities to respond to crises	• Reinforcing disaster response capabilities of on-site completion type • Reinforcing capabilities to respond to new disasters (cyber, drought, and terror)

K–water has established the emergency response system and the risk management process with immediate response capabilities under any circumstances. We have standardized the manuals by type and by department for securing the Business Continuity Management (BCM) in order to maintain the required function for water supply when disaster occurs, established the support system of emergency water supply among the water service providers (K–water and 91 local governments), and collaborated with other underground utility management institutions (Korea Gas Corporation) for joint management of facilities and response to accidents.

[Risk management process]



Company-wide risk management strategy

In order to reinforce the disaster and safety management system, K–water has established the company–wide risk management system by drawing up eight strategic tasks with achievement of the prevention–oriented safety management, enhancement of risk–response efficiencies, and improvement of risk management capabilities through feedback on the strategic directions, aiming at getting 95 points or higher in the degree of risk management effort which is a key performance index.

Reinforcement of the disaster and safety management system for realizing people's water welfare

Realizing people's safety by achieving prevention-oriented safety management
+
Reinforcing the actual response capabilities through advancement of the crisis response system

Achievements of prevention-oriented safety management

1. Reinforcing management of the risk factors (vulnerable facilities & departmental risk indicators)
2. Establishing a disaster management system with constantly updated manuals
3. Setting up and expanding the safety culture

Enhancement of risk- response efficiencies

1. Improving the risk response system
2. Enhancing HR capacities through education
3. Vitalizing the ICT-based disaster management system

Improvement of risk management capabilities through feedback

1. Reinforcing prevention of similar accidents
2. Improving the KRM system by collecting users' opinions

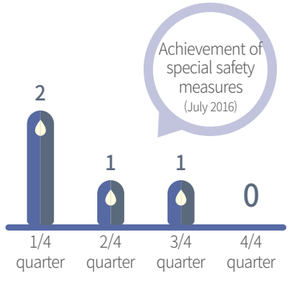
Striving to respond to unexpected and unfamiliar catastrophic disasters

K–water is striving to minimize damages and prevent them from spreading by faithfully implementing legal and social responsibility actions as the institution responsible for disaster management and responding to unexpected and unfamiliar catastrophic disasters promptly and flexibly.

Category	New disaster such as terror etc.	Earthquake in Gyeongju (5.8 scale)	Major typhoon 'Chaba'
Disaster situation	• Expected terrorist attacks to national facilities, such as dams, reservoirs, rivers, and water purification plants, etc.	• Threatening the stability of water resources facility as the largest-scale earthquake ever in Korea	• Occurrence of flooding that exceeded (200 years) the river plan (50-year frequency)
Response activities	• Preparing for emergency operation items for minimizing diffusion of hazardous substances • Managing the security of cyber terror through separation of the internet network	• Implementing the special safety inspection for 62 water resources facilities utilizing internal and external experts • Establishing comprehensive measures in response to earthquakes	• Dispatching contact persons to Ulsan-si and Ministry of Public Safety and Security (7~26, Oct. 2016) • Mobilizing human and material resources (about 500 people, bottled water, water pumps etc.)
Results	• Reinforcing the crisis response posture as a warning for terrorism through inspection of vulnerable facilities, modification of manuals, and mock exercises, etc. • Securing the stability of water resources facilities against earthquakes through testing and/or investigation of the detailed inspection level • Recovering the affected area early through prompt operation of the national disaster response system (Central Disaster Relief Center – Regional Disaster Relief Center – Regional Emergency Headquarters)		

Realization of construction sites that embody the principle of safety first and construction later

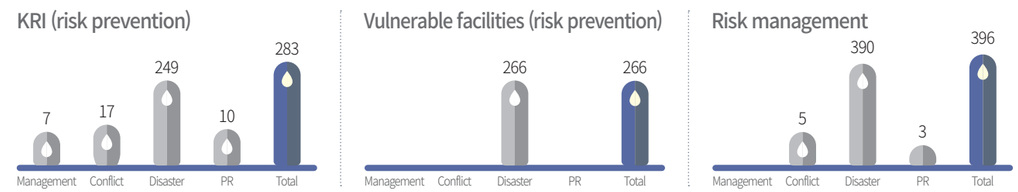
In order to reduce construction disasters, K–water is striving for strategic safety management, promotion and establishment of special safety measures for vulnerable areas. K–water has improved 154 risk factors of business places and construction sites, and introduced the work permit system for construction equipment and temporary facility construction. Work sites that are in enclosed places are analyzed for vulnerabilities to accidents and supervisors are obligated to be onsite when preparing for working in the enclosed space and doing initial works, and reinforced the responsibility of the ordering body, such as imposing sanctions on the supervising department etc., when significant disaster occurs.



In addition, K–water fosters the construction environment by placing the top priority on safety management through the introduction of safety patrols, reinforcing collaboration with the safety–specialized institutions, reinforcing manpower of the organizations dedicated to safety management, and simplifying the supervision procedure through communications with the constructor. As a result of such performances, the accident rate at construction work sites was 0.46% as of 2016, decreasing by 0.06% compared with 2015.

Main performances of risk management in 2016

K–water has actively responded to risk prevention while discovering and managing 283 items of the departmental risk indicator (KPI), and 266 items of vulnerable facilities in advance. Furthermore, with the occurrence of a total of 398 accidents mainly consisting of disasters in 2016, we implemented crisis responses, such as rapid propagation of the situation, and confirmed the effectiveness of K–water's crisis response system by achieving 94 points of appropriate reporting rate and 93 points of action complete rate within an hour. Based on this, K–water was selected as an excellent institution in the Situation Propagation Training, Safety Korea Training, and State–based Disaster Management Assessment (2 consecutive times).



Category		Assessment criteria	Performance rate (Number of assessed items)
Risk prevention	Appropriate management rate of KPI (%)	Number of appropriate management / total number	97%(274/283)
	Appropriate management rate of vulnerable facilities (%)	Number of appropriate management / total number	100%(266/266)
Crisis prevention	Appropriate reporting rate (%)	Number of reports within one hour / total number of occurrence	94%(374/398)
	Action complete rate (%)	Number of action complete / total number of occurrence	93%(371/398)

Realizing a cyber-safe K-water

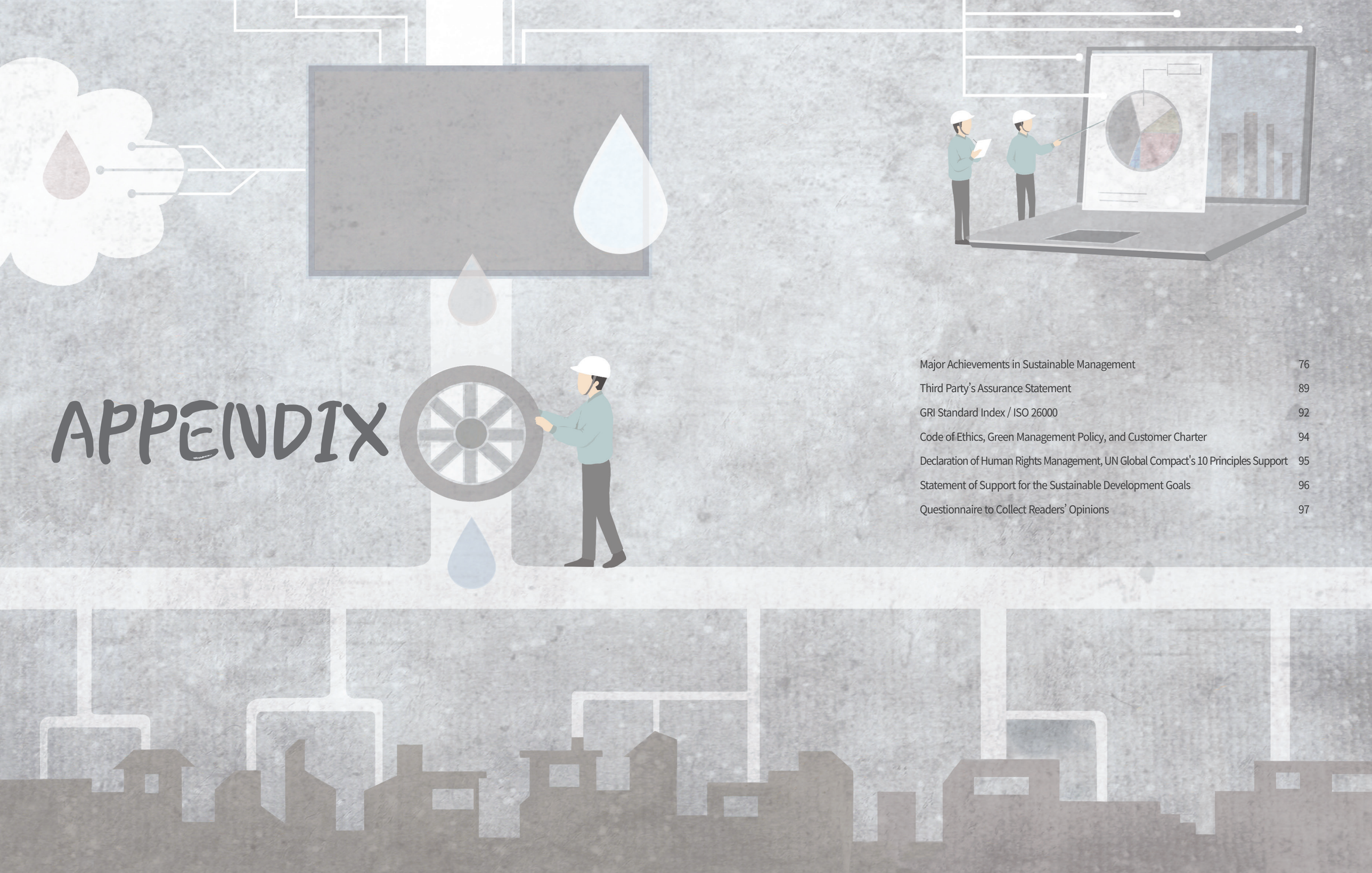
As demands for improvement of the security management system and as the enhancement of consciousness increases due to internal and external environmental changes to cyber security, K–water has established the security management system of the future by setting up the medium and long–term security reinforcement plan.

Vision	Protection of K-water's major information resources with the world's best comprehensive water services		
Strategic goal	Systematic management of information resources	Operation of zero-defect information facilities	Reinforcement of security control
Key implementation tasks	Optimizing the operation of security policies • Establishing security management procedures by stage • Establishing a guideline for security management	Establishing the diagnosis system to detect vulnerabilities • Introducing the virtuous circle procedure by automating the history management of vulnerabilities	Advancing manpower and systems • Advancing the information protection system • Increasing the manpower dedicated to protecting information

K–water has further reinforced its responsibility for security by reinforcing the security management, such as enhancement of password settings and original prohibition of portable storage media, etc., and seeking sanctions to the service company when security accidents occur based on the enactment through the national initiative of the Legislation Office. In addition, K–water is continuously implementing education and training for enhancement of security consciousness and reinforcement of crisis response capabilities, such as combined implementation of both online and offline education and participation in cyber competitions, etc. In addition, K–water reinforces cyber security through the separation of the internet network and business networks (in 2016) and has established the prompt recovery system for minimizing damages when cyber terror occurs.

Established the emergency recovery system of the waterworks field	Commenced with the operation of the disaster recovery center of the water resources field
6 Headquarters and affiliated management teams ▶ Installing the recovery software to 176 servers, PCs etc.	Operating Warm Site* for distant location (Chungju) * Configuration and backup of additional resources

Main performances of 2016	
	• Earning 'Excellence' for three consecutive years in the protection of personal information (98.4 points) *average of public enterprises: 83.45 points • Enhancing the assessment score of actual conditions of information and security management conducted by the National Intelligence Service (78.46 points in 2015 → 80.22 points in 2016) • Attaining the Security Accident 'Zero,' such as malicious code infection etc. (no security accidents for 49 consecutive years)



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Major Achievements in Sustainable Management

Financial Performance

[Condensed financial statements] (in millions KRW)

Category		Year '12	Year '13	Year '14	Year '15	Year '16
Assets	Current assets	5,213,014	5,785,518	5,631,464	6,006,540	6,422,010
	Non-current assets	19,803,369	19,818,389	19,807,635	13,544,099	13,877,420
	Total	25,016,383	25,603,907	25,439,099	19,550,639	20,299,430
Liabilities	Current liabilities	2,722,666	3,358,548	2,161,443	2,795,626	3,154,565
	Non-current liabilities	11,055,255	10,639,904	11,299,992	10,477,544	10,484,290
	Total	13,777,921	13,998,452	13,461,435	13,273,170	13,638,855
Liabilities	Capital	6,815,621	6,898,731	7,016,965	7,196,145	7,692,548
	Others	4,411,461	4,697,176	4,945,222	-942,043	-1,064,523
	Equity attributable to owners of the parent company	11,227,082	11,595,907	11,962,187	6,254,102	6,628,025
	Non-controlling interest	11,380	9,548	15,477	23,367	32,550
	Total	11,238,462	11,605,455	11,977,664	6,277,469	6,660,575

※ Having applied the consolidation criteria in accordance with Korean International Financial Reporting Standards (K-IFRS) since 2011

[Condensed all-inclusive income statement] (in millions KRW) *Refer to the 'ALIO' disclosure of information in the website.

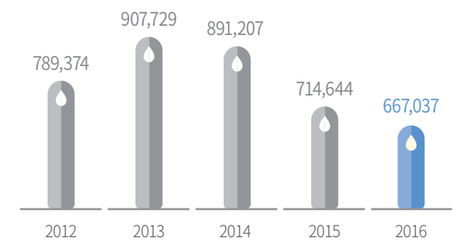
Category	Year '12	Year '13	Year '14	Year '15	Year '16
Revenue (turnover)	3,668,445	3,645,387	3,698,372	3,777,345	3,618,084
Cost of sails	3,117,070	2,989,350	3,178,494	3,288,664	3,105,616
Selling, general and administrative expenses	117,048	123,920	129,419	139,064	148,369
Operating profit	434,327	532,117	390,459	349,617	364,099
Other income	296,308	315,516	323,280	349,076	20,053
Other expenses	3,856	43,087	6,826	7,437	120,128
Other gain (loss)	-5,296	2,078	-13,221	-6,295,565	-143,011
Financial income	195,182	97,870	91,264	85,503	46,182
Financial costs	515,371	449,185	400,656	370,962	329,105
Profit(loss) from investments in associates	395	1,565	33,248	-8,058	-3,309
Net profit(loss) before income tax	401,689	456,874	417,548	-5,897,826	-165,219
Income tax expense (profit)	93,394	108,756	118,222	-102,186	-48,254
Net profit (loss)	308,295	348,118	299,326	-5,795,638	-116,965
Other comprehensive income	13,386	-9,901	18,874	-8,023	2,844
Total comprehensive income	321,681	338,217	318,200	-5,803,661	-114,121
Net profit attributable to owners of the parent company	308,247	346,443	298,554	-5,799,067	-120,913
Net profit attributable to non-controlling interest	48	1,675	772	3,429	3,948

※ Having applied the consolidation criteria in accordance with Korean International Financial Reporting Standards (K-IFRS) from 2011

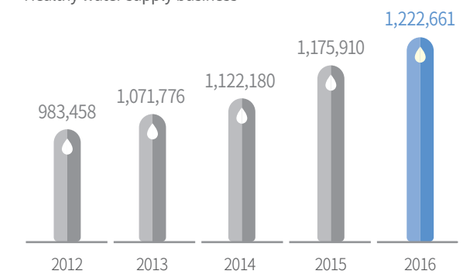
Continuous growth through innovation

[Turnover by business] (in millions KRW)

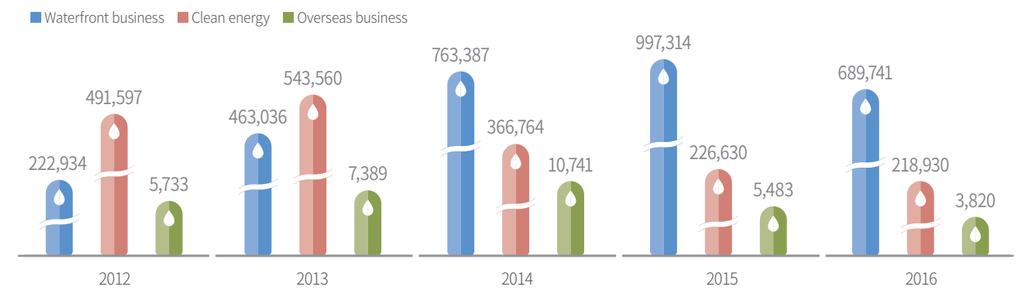
IWRM(Integrated Water Resources Management)



Healthy water supply business

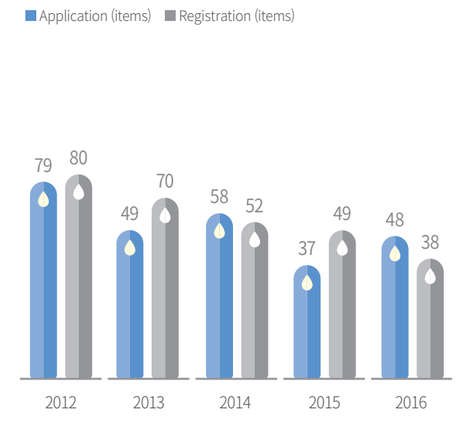


Related businesses

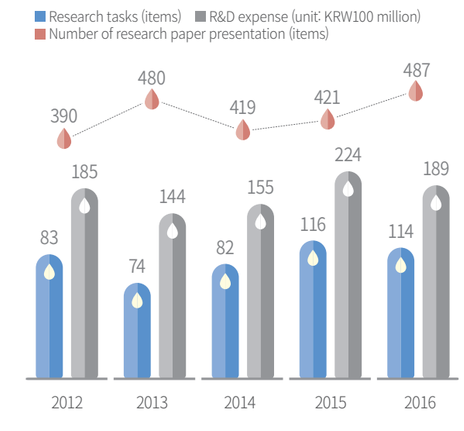


[Patents and research performances]

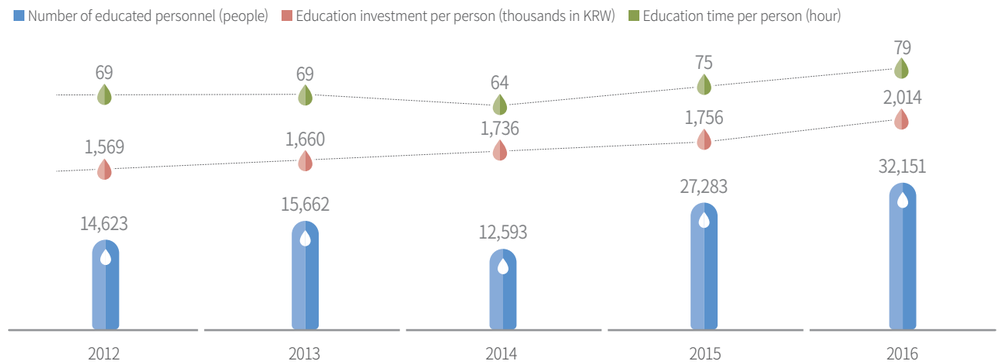
Patents



Researches

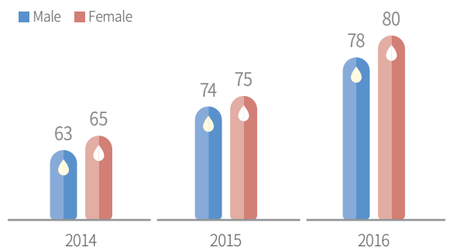


[Education status for executives and employees]

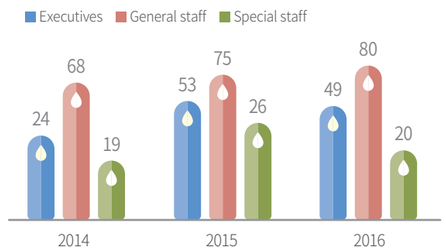


[Education time per person] (unit: hour)

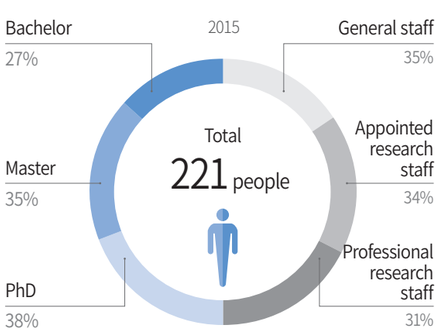
By gender

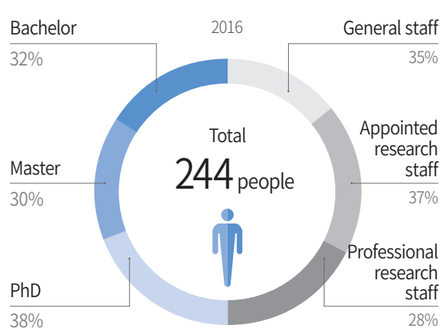


By employment type



[Securement of R&D experts]

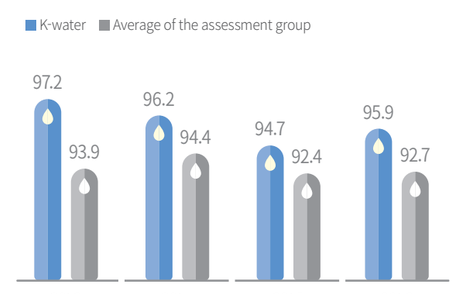




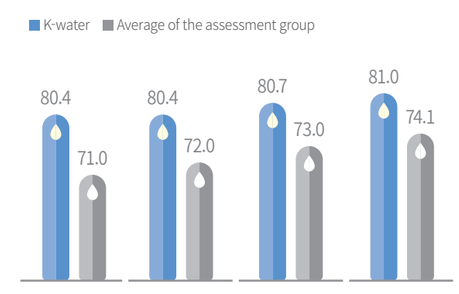
Social performance Customer impression beyond customer satisfaction

[Customer satisfaction] (unit: point)

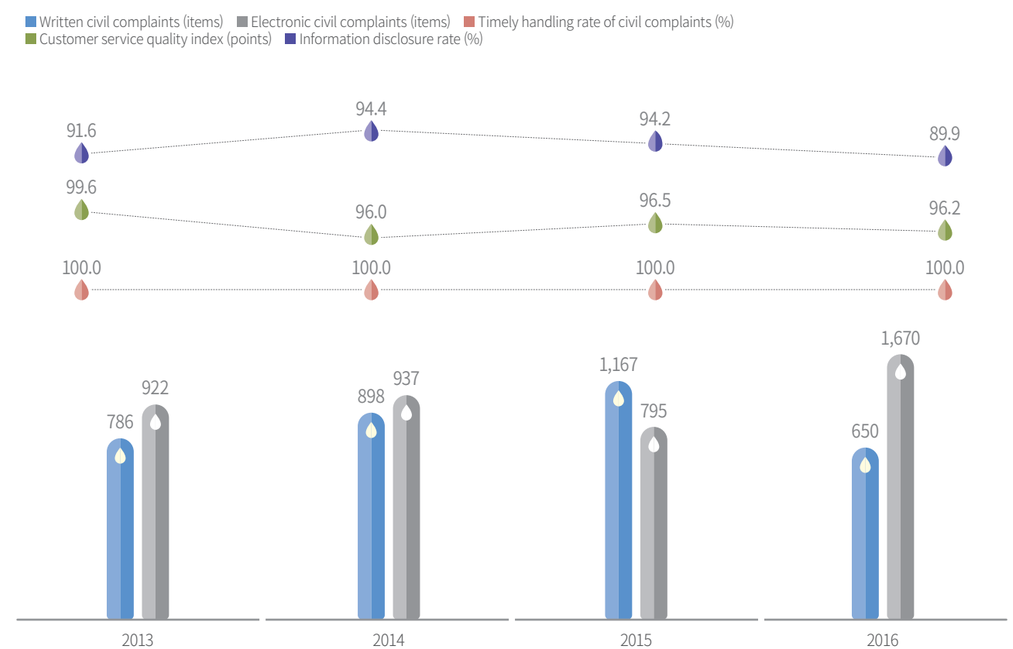
Customer satisfaction



Customer satisfaction of the local waterworks

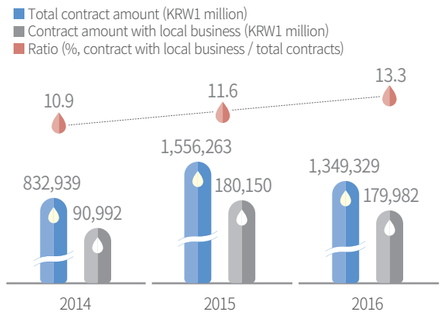


[Communications with customers]

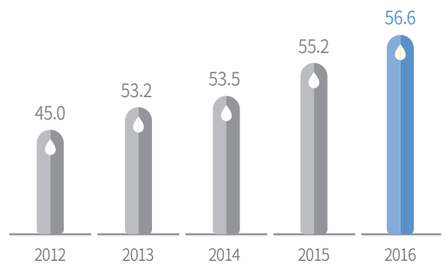


Horizontal partnership, and vertical growth

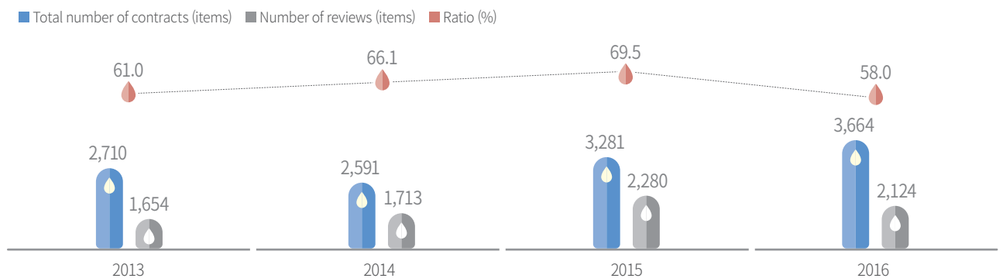
[Contract amount with local business]



[Purchase rate of SMEs' products] (unit: %)

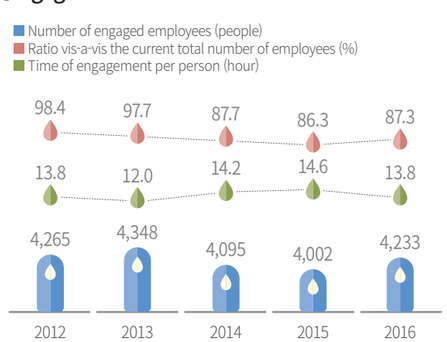


[Operational performance of the protecting socially vulnerable people and preferential system]

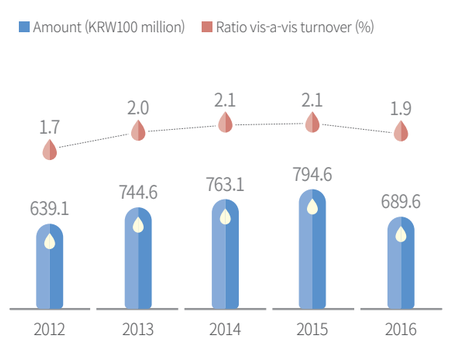


Support activities for local communities

[Engagement measurement of the social contribution]



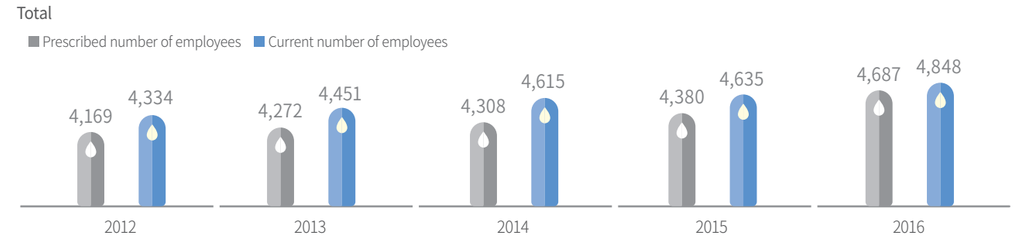
[Investment volume of the social contribution]

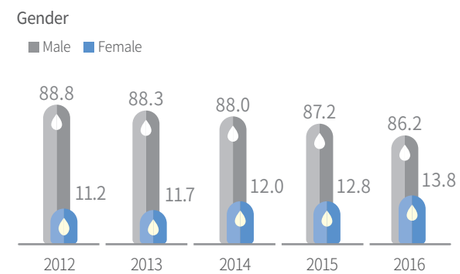


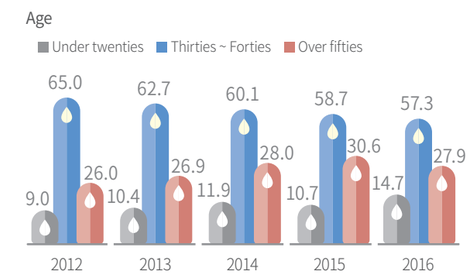
※ Number of employees engaged in social contribution activities: excluding employees who engage in fundraising campaigns but cannot engage physical activities like employees dispatched abroad from 2014

Workplace assured of fairness and diversity

[Composition of employees] (unit: people)







※ Current number of employees: total current number of full-time employees, including the employees of entrusted businesses, parental leaves and military service workers who are excluded in ALIO disclosure

[Composition of employees by employment type] (ratio: %)

Category				2014		2015		2016	
				Personnel (people)	Ratio (%)	Personnel (people)	Ratio (%)	Personnel (people)	Ratio (%)
Current number of employees	Executives	Total		7	100.0	7	100.0	7	100.0
		Age	Under 20s	0	-	0	-	0	-
			30~40s	0	-	0	-	0	-
			50s or older	7	100.0	7	100.0	7	100.0
		Gender	Male	7	100.0	7	100.0	7	100.0
			Female	0	-	0	-	0	-
	General	Total		4239	100.0	4336	100.0	4,517	100.0
		Age	Under 20s	547	12.9	496	11.4	714	15.8
			30~40s	2619	61.8	2609	60.2	2,670	59.1
			50s or older	1073	25.3	1231	28.4	1,133	25.1
		Gender	Male	3782	89.2	3838	89	3,936	87.1
			Female	457	10.8	498	11	581	12.9
	Special	Total		369	100.0	292	100.0	324	100.0
		Age	Under 20s	0	0.0	0	0.0	0	0.0
			30~40s	155	42.0	111	38.0	110	34.0
			50s or older	214	58.0	181	62.0	214	66.0
		Gender	Male	272	73.7	199	68.2	234	72.2
			Female	97	26.3	93	31.8	90	27.8

[Employment status of minority workforce]

Category		2012		2013		2014		2015		2016	
		Personnel (people)	Ratio (%)	Personnel (people)	Ratio (%)	Personnel (people)	Ratio (%)	Personnel (people)	Ratio (%)	Personnel (people)	Ratio (%)
Total number of new recruits		222		252		261		220.5		309.75	
Type	Women	40	18.0	47	18.7	42.25	16.2	41.75	18.9	87.25	28.2
	People with disability	2	0.9	4	1.6	7.5	2.9	4.75	2.2	5.0	1.6
	Local talents	128	57.7	161	63.9	175.5	67.2	119.75	54.3	157.25	50.8
	High school graduates	51	23.0	71	28.2	86	33.0	54.75	24.8	62.5	20.2

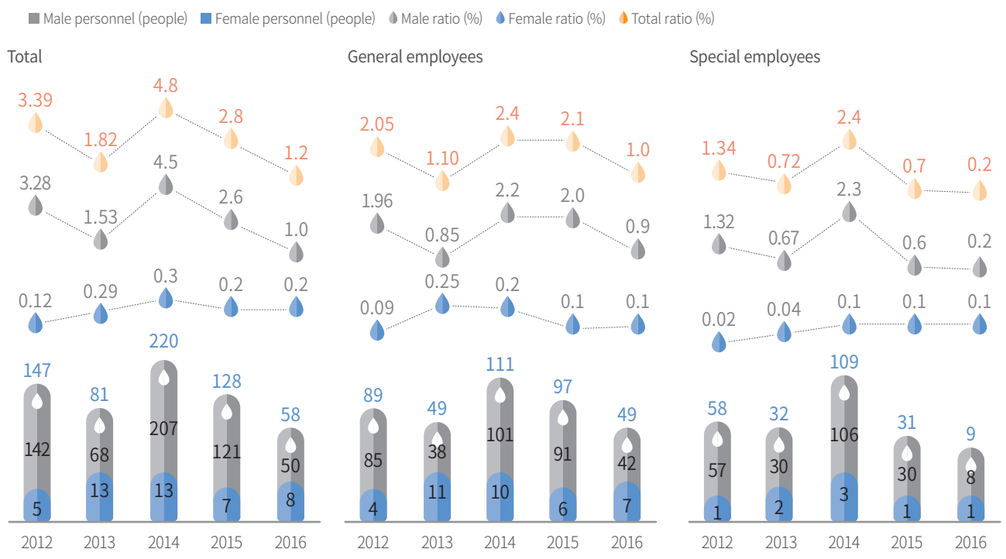
※ Ratio (%): the ratio versus total number of new recruits

[Status of non-regular employees]

Category		2012		2013		2014		2015		2016	
		Personnel (people)	Ratio (%)	Personnel (people)	Ratio (%)	Personnel (people)	Ratio (%)	Personnel (people)	Ratio (%)	Personnel (people)	Ratio (%)
Total number		364	7.8	414	8.5	403	8.1	359	7.2	361	6.92
Type	Short-term employees	293	6.3	340	7.0	322	6.5	323	6.5	343	6.58
	Part-time employees	71	1.5	74	1.5	66	1.3	21	0.4	18	0.3
	Other temporary employees	-	-	-	-	15	0.3	15	0.3	-	-

※ Ratio (%) = temporary employees / (temporary employees + non-fixed term contract employees + regular employees)

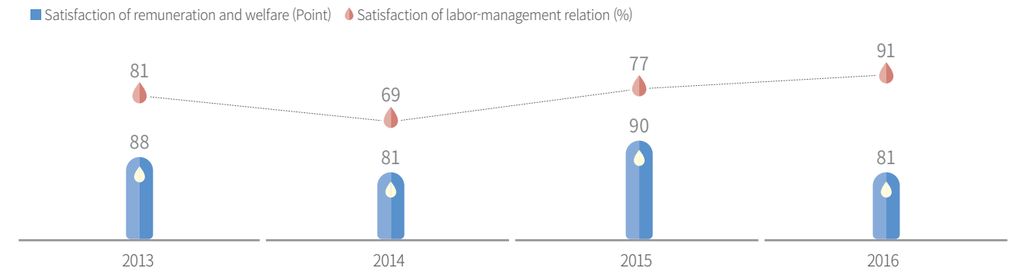
[Status of turnover]



※ Ratio (%): calculated based on the current number of employees

Pleasant workplace where work and family harmonize with each other

[Employee satisfaction]



[Creation of the corporate culture harmonizing work and family]

Expanding flexible work	- Expanding the Smart Work Center and telecommuting on alternating workdays and days off - Operating various types of flexible work through part-time work system and demand survey
Improving working practices	- Operating "Family Day" (every Wednesday) - Implementing shutdown of electricity and mandatory PC shutdown at 9 p.m. during weekdays, and PC shutdown on weekends - Carrying forward work effectiveness through improvement of working methods - Improving meeting practices
Responding to the childbirth promotion policy	- Operating maternity leave, prenotification system of parental leave, and parental leave - Operating a daycare center in the workplace (expanding the maximum number by converting idle facilities to childcare facilities)
Supporting the balance of work and life	- Implementing family-engaging education such as couple coaching, father school (parenting program) etc. - Continuously adding recreational facilities, such as expansion of support to recreation activities, departments and cultural performances, etc.

[Status of flexible work]

Category		2012	2013	2014	2015	2016
Part-time work	New (recruitment)	0	0	12	10	13
	Conversion	0	2	28	31	29
Flexible work	Staggered office hours	525	662	858	978	1,828
	Selection of business hours	0	0	0	0	0
	Compressed work schedule	3	3	3	5	14
	Discretionary work schedule	0	0	0	0	0
Telecommuting	Work from home	0	0	0	9	0
	Smart working	0	0	0	0	6

※ Ratio (%): calculated based on the current number of employees

[Safety of workplace]

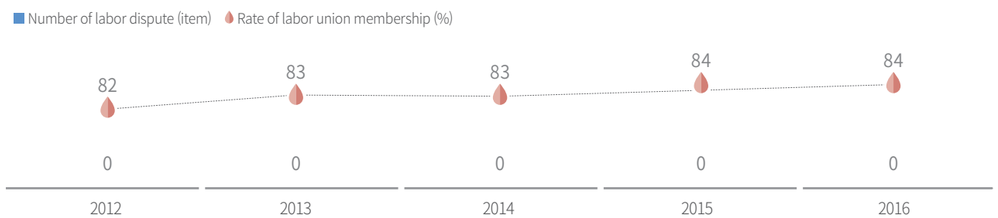
Category	2012	2013	2014	2015	2016
	Ratio (%)	Ratio (%)	Ratio (%)	Ratio (%)	Ratio (%)
Injuries	0.23	0.22	0.16	0.30	0.23
Occupational diseases	0.00	0.00	0.00	0.00	0
Industrial accident rate	0.22	0.08	0.06	0.25	0.23
Prevalence rate	7.1	7.0	6.7	8.7	8.8

※ Ratio (%): Ratio of personnel compared with the current number of employees

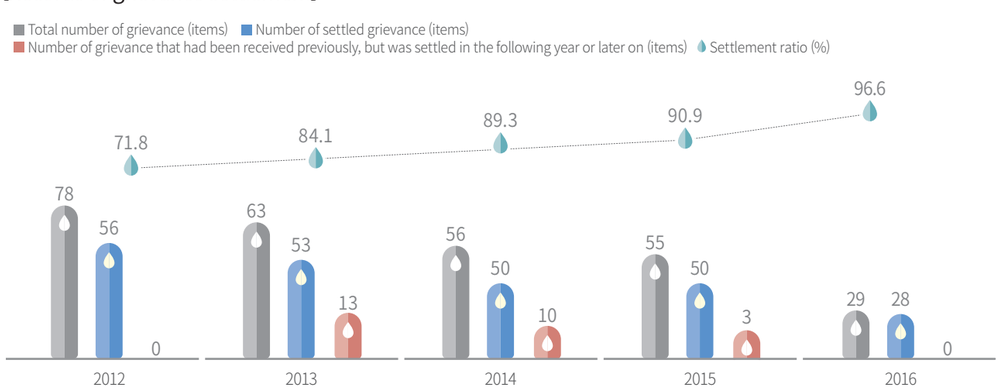
[Status of parental leave and reinstatement rate]

Category		2012	2013	2014	2015	2016
Total	Reinstatement rate (%)	100.0	100.0	100.0	100.0	100.0
	Retention rate (%)	80.8	97.3	100.0	100.0	100.0
Male	Reinstatement rate (%)	100.0	100.0	100.0	100.0	100.0
	Retention rate (%)	66.7	100.0	100.0	100.0	100.0
Female	Reinstatement rate (%)	100.0	100.0	100.0	100.0	100.0
	Retention rate (%)	85.0	96.8	100.0	100.0	100.0

[Labor-management relations]



[Records of grievance settlement]

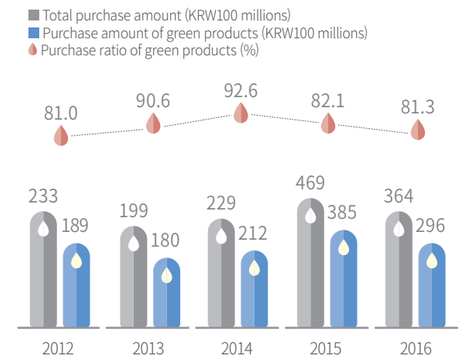


Environmental performance

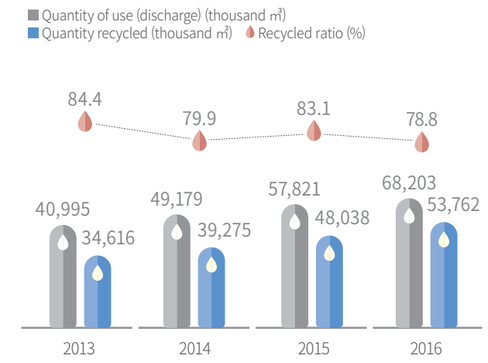
Expanding environmental considerations for the entire corporate supply chain

[Input]

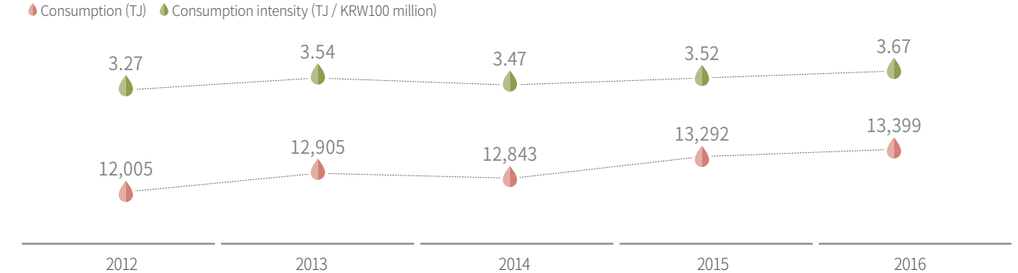
Purchase of green products



Water



Energy



[Output]

(unit : mg/L)

Category			2012	2013	2014	2015	2016	Quality standard of discharged water
Quality of discharged water	Water purification plant	BOD	2.1	2.0	1.7	1.4	1.9	10 or lower
		COD	4.1	3.3	3.4	4.5	3.9	20 or lower
		SS	3.2	2.4	1.6	2.0	2.0	10 or lower
	Sewage treatment plant	BOD	1.9	1.5	1.8	1.9	2.3	5 or lower
		COD	6.9	6.8	6.6	7.6	8.0	20 or lower
		SS	2.6	3.0	2.5	2.9	2.8	10 or lower
	Effluents treatment facility	BOD	7.0	6.0	6.3	6.8	5.9	10 or lower
		SS	6.8	5.4	6.0	6.2	5.6	10 or lower

※ the highest requirement standard by each facility according to the Water Quality and Water Ecosystem Conservation Act / Sewerage Act

Category		2012	2013	2014	2015	2016
Emissions of air pollutants	Fine dust (kg)	244	226	220	256	226
	SOx (kg)	1,678	1,628	1,443	1,671	1,559
	CO (kg)	3,533	4,568	4,223	5,565	3,050
	HC (kg)	896	1,197	1,106	1,470	766
	NOx (kg)	9,235	11,566	10,892	14,166	8,038

※ Operating the GHG reduction target from 2012, and including the early reduction on top of the reduction for the year in 2014

Category			2012	2013	2014	2015	2016
GHG	Discharge	Total (ton CO_2)**	583,655	631,431	624,660	646,559	651,719
		Direct (ton CO_2)	4,373	4,431	4,161	5,000	4,067
		Indirect (ton CO_2)	579,282	627,000	620,499	641,559	647,652
		Carbon cleanliness	15.91	17.32	16.89	17.12	18.01
	Reduction	Reduction target (ton CO_2)	15,729	65,694	60,551	29,133	53,531
		Expected discharge volume (ton CO_2)	662,114	634,126	649,132	647,899	679,933
		Discharge allowance volume (ton CO_2)	646,385	568,432	588,581	618,766	626,402
		Total reduction (ton CO_2)	69,154	79,702	60,551	29,133	50,615
		Reduction of the year (ton CO_2)	69,154	79,702	57,507	1,340	2,844
		Early reduction (ton CO_2)	0	0	3,044	27,793	47,771

※ Operating the GHG reduction target from 2012, and including the early reduction on top of the reduction for the year in 2014

Category			2012	2013	2014	2015	2016
Waste	Water purification plant	Generated water purification sludge (tons)	111,414	110,027	110,397	107,388	119,898
		Generated source unit compared to water supply (g/m³)	59.5	54.2	55.3	52.3	56.4
		Recycling rate (%)	100	100	100	100	100
		Raw material of cement	77.5	83.8	40	43	61
		Soil covering material, fill dirt material	3.6	12.4	57	50	39
		Green soil, pebble etc.	18.9	3.8	3.0	7.0	0.0
	Sewage treatment plant	Generated sewage sludge (tons)	42,876	39,565	42,083	37,894	37,856
		Recycling rate (%)	46	49	59	65	89
	Construction site	Total quantity generated in the construction site (tons)	471,366	496,260	520,149	4,230,643	814,978
		Waste concrete	272,580	255,578	258,881	4,143,304	139,839
		Waste ascon	114,453	121,827	218,061	17,376	71,479
		Wood waste	50,649	69,669	1,646	145	1,215
		Waste synthetic resin	2,709	1,314	183	525	236
		Mixed waste	30,975	47,873	41,377	69,292	602,218
		Recycling rate (%)	94.8	96.8	98.9	99.1	99.9
		Waste concrete	97.7	98.9	99.5	99.2	99.9
		Waste ascon	99.0	99.2	99.7	100.0	100.0
		Wood waste	100.0	100.0	100.0	100.0	100.0
		Waste synthetic resin	0.0	14.1	100.0	100.0	100.0
		Mixed waste	53.1	76.7	91.5	96.4	99.2

Efforts to preserve and improve the environment of local communities

[Inducement of water recycling by discounting water bill to the customers using the grey water supply]

Category	2012	2013	2014	2015	2016
Water quantity reduced by the customers using the grey water supply (thousand m³)	135,356	157,278	171,515	164,271	166,170
Amount discounted to the customers using the grey water supply (KRW1 million)	2,685	3,373	3,955	3,842	3,930

[Records of garbage treatment efforts for dams, reservoirs and rivers]

Name of dams	2012	2013	2014	2015	2016
Total (m³)	84,654	41,171	25,801	14,436	83,542
Dam reservoirs (m³)	72,203	34,797	18,756	9,160	66,779
River reservoirs (m³)	12,451	6,374	7,045	5,276	16,763

[Post-environmental impact investigation of the construction site (year 2016) _ water quality environment]

Category		Hantangang Dam	Gimcheon Buhang Dam	Seongdeok Dam	Yeongju Dam	Bohyeonsan Dam	Environmental standard
Water quality environment	BOD (㎎/ℓ)	1.3	2.3	2.4	1.1	1.4	3 or lower
	COD (㎎/ℓ)	2.7	4.3	3.8	3.4	3.6	5 or lower
Atmospheric environment	PM-10 (㎍)	38	53	-	35	39	100 or lower
	NO_2 (ppb)	8	12	-	9	7	60 or lower
Noise & vibration	Noise (dBA)	46	48	-	46	45	65 or lower
	Vibration (dBV)	18	25	-	21	27	65 or lower

※ Seongdeok Dam: the post-environmental impact investigation will be implemented when the dam is operated after construction has been completed. (atmospheric quality, noise and vibration not yet measured).

[Post-environmental impact investigation of the construction area _ flora and fauna of year 2016]

Category		Hantangang Dam	Gimcheon Buhang Dam	Seongdeok Dam	Yeongju Dam	Bohyeonsan Dam
Mammals	Total (species)	20	12	11	11	12
	Legally protected species (species)	2	2	2	2	2
	Legally protected species (detail)	Hantangang Dam: wildcat, flying squirrel / Gimcheon Buhang Dam, Seongdeok Dam, Yeongju Dam, Bohyeonsan Dam: otter, wildcat				
Fish	Total (species)	33	15	17	23	16
	Legally protected species (species)	5	0	0	0	0
	Legally protected species (detail)	Hantangang: common Korean bitterling, Cyprinid Fish, slender shiner, Gobiobotia macrocephala, Gobiobotia brevibarba				
Amphibians & reptiles	Total (species)	26	11	11	13	14
	Legally protected species (species)	3	0	0	0	0
	Legally protected species (detail)	Hantangang: big snake, freshwater tortoise, narrow-mouthed toad				
Birds	Total (species)	65	47	44	66	53
	Legally protected species (species)	6	3	1	9	6
	Legally protected species (detail)	Hantangang: mandarin duck, eagle, grey frog hawk, sparrow hawk, goshawk, kestrel Gimcheon Buhang Dam: mandarin duck, kestrel, hobby Seongdeok Dam: kestrel Yeongju Dam: mandarin duck, sparrow hawk, kestrel, hen harrier, grey frog hawk, black-headed stork, hobby, osprey, long-billed ringed plover Bohyeonsan Dam: mandarin duck, goshawk, kestrel, long-billed ringed plover, scops owl, sparrow hawk				

[Construction of regional eco-cultural space]

Category		2013	2014	2015	2016
Total	Alternative habitat (number of places)	45	52	54	54
	Fish spawning ground (number of places)	12	11	11	13
	Eco-corridor (number of places)	116	116	116	116
	Artificial marsh (number of places)	17	17	17	20
	Fishway (number of places)	4	4	4	5
Gunwi Dam	Alternative habitat (number of places)	6	6	6	6
	Fish spawning ground (number of places)	5	5	5	5
	Eco-corridor (number of places)	6	6	6	6
	Artificial marsh (number of places)	6	6	6	6
	Fishway (number of places)	0	0	0	0
Gunnam Dam	Alternative habitat (number of places)	8	8	8	8
	Fish spawning ground (number of places)	0	0	0	0
	Eco-corridor (number of places)	6	6	6	6
	Artificial marsh (number of places)	1	1	1	1
	Fishway (number of places)	1	1	1	1
Hantangang Dam	Alternative habitat (number of places)	0	0	0	0
	Fish spawning ground (number of places)	0	0	0	0
	Eco-corridor (number of places)	7	7	7	7
	Artificial marsh (number of places)	0	0	0	0
	Fishway (number of places)	0	0	0	0
Gimcheon Buhang Dam	Alternative habitat (number of places)	12	12	12	12
	Fish spawning ground (number of places)	2	3	3	3
	Eco-corridor (number of places)	46	46	46	46
	Artificial marsh (number of places)	4	4	4	4
	Fishway (number of places)	3	3	3	3
Seongdeok Dam	Alternative habitat (number of places)	15	22	24	24
	Fish spawning ground (number of places)	5	3	3	3
	Eco-corridor (number of places)	45	45	45	45
	Artificial marsh (number of places)	2	2	2	2
	Fishway (number of places)	0	0	0	0
Yeongju Dam	Alternative habitat (number of places)	0	0	0	0
	Fish spawning ground (number of places)	0	0	0	1
	Eco-corridor (number of places)	1	1	1	1
	Artificial marsh (number of places)	0	0	0	3
	Fishway (number of places)	0	0	0	1
Bohyeonsan Dam	Alternative habitat (number of places)	4	4	4	4
	Fish spawning ground (number of places)	0	0	0	1
	Eco-corridor (number of places)	5	5	5	5
	Artificial marsh (number of places)	4	4	4	4
	Fishway (number of places)	0	0	0	0

Third Party's Assurance Statement

To the Readers of K-water 2017 Sustainability Report:

Foreword

Korea Management Registrar Inc.(hereinafter "KMR") has been requested by of Korea Water Resources Corporation (hereinafter "K–water") to verify the contents of its 2017 Sustainability Report (hereinafter "the Report"). K–water is responsible for the collection and presentation of information included in the Report. KMR's responsibility is to carry out assurance engagement on specific data and information in the assurance scope stipulated below.

Scope and standard

K–water describes its efforts and achievements of the corporate social responsibility activities in the Report. KMR performed a Type 2, moderate level of assurance using AA1000AS (2008) as an assurance standard. KMR's assurance team(hereinafter "the team") evaluated the adherence to Principles of Inclusivity, Materiality and Responsiveness, and the reliability of the selected GRI Standard indices as below, where professional judgment of the team was exercised as materiality criteria.

- ✔ GRI Reporting Principles
- ✔ Universal Standards
- ✔ Topic Specific Standards
- ✔ Management approach of Topic Specific Standards
  - Anti-Corruption: 205-1, 205-2
  - Anti-competitive Behavior: 206-1
  - Water: 303-1, 303-2, 303-3
  - Biodiversity: 304-1, 304-2, 304-3, 304-4
  - Emissions: 305-1, 305-2, 305-3, 305-5, 305-6, 305-7
  - Effluents and Waste: 306-2, 306-3
  - Environmental Compliance: 307-1
  - Employment: 401-1, 401-2, 401-3
  - Local Communities: 413-1
  - Supplier Social Assessment: 414-1, 414-2
  - Customer Health and Safety: 416-1, 416-2

This Report excludes a data sand information of joint corporate, contractor etc. which is outside of the organization, i.e. K–water, among report boundaries.

Our approach

In order to verify the contents of the Report within an agreed scope of assurance in accordance with the assurance standard, the team has carried out an assurance engagement as follows:

- Reviewed overall report
- Reviewed materiality test process and methodology
- Reviewed sustainability management strategies and targets
- Reviewed stakeholder engagement activities
- Interviewed people in charge of preparing the Report

Our conclusion

Based on the results we have obtained from material reviews and interviews, we had several discussions with K–water on the revision of the Report. We reviewed the Report's final version in order to confirm that our recommendations for improvement and our revisions have been reflected. When reviewing the results of the assurance, the assurance team could not find any inappropriate contents in the Report to the compliance with the principles stipulated below. Nothing has come to our attention that causes us to believe that the data included in the verification scope are not presented appropriately.

Inclusivity

Inclusivity is the participation of stakeholders in developing and achieving an accountable and strategic response to sustainability

- K-water is developing and maintaining stakeholder communication channels in various forms and levels in order to make a commitment to be responsible for the stakeholders. The assurance team could not find any critical stakeholder K-water left out during this procedure.

Materiality

Materiality is determining the relevance and significance of an issue to an organization and its stakeholders. A material issue is an issue that will influence the decisions, actions, and performance of an organization or its stakeholders.

- K-water is determining the materiality of issues found out through stakeholder communication channels through its own materiality evaluation process, and the assurance team could not find any critical issues left out in this process.

Responsiveness

Responsiveness is an organization's response to stakeholder issues that affect its sustainability performance and is realized through decisions, actions, and performance, as well as communication with stakeholders.

- The assurance team could not find any evidence that K-water's counter measures to critical stakeholder issues were inappropriately recorded in the Report.

We could not find any evidence the Report was not prepared in accordance with the 'Core Option' of GRI Standard.

Recommendation for improvement

We hope the Report is actively used as a communication tool for stakeholders and we recommend the following for improvements.

Make connections of sustainability and business strategy:

Through this report, K-water transparently discloses stakeholder communication procedures and company promises in various management aspects. It is recommended that K-Water to link the four strategic objectives and business strategies in the future and utilize them as an opportunity to create value related to business strategy in the mid- to long-term by establishing the trust of stakeholders.

Improving and utilizing the report publishing process:

The main reason for publishing the report is to carry out management function of non-financial management threats faithfully and to link with management's business value creation process. In the future, we hope to improve the process of publishing reports so that organizations and members can better understand and understand sustainability, and to improve the utilization of reports after publishing them.

Our independence

With the exception of providing third party assurance services, KMR is not involved in any other K–water's business operations that are aimed at making profit in order to avoid any conflicts of interest and to maintain independence.

November, 20th, 2017

KMR

AA1000
Licensed Assurance Provider
000-129

E. J Hwang
Acting CEO Eun Ju Hwang

GRI Standard Index / ISO 26000

Significant issue	Topic		Disclosure	ISO 26000	Verification		
					Page	Omissions/ Comments	Assurance
General increase in interest of the governance (responsible management)	Organizational Profile	102-1	Name of the organization	6.3.10 / 6.4.1-6.4.2 / 6.4.3 / 6.4.4 / 6.4.5 / 6.8.5 / 7.8	14		✓
		102-2	Activities, brands, products, and services		14		✓
		102-3	Location of headquarters		14		✓
		102-4	Location of operations		15		✓
		102-5	Nature of ownership and legal form		14		✓
		102-6	Markets served		15		✓
		102-7	Scale of the organization		14		✓
		102-8	Information on employees and other workers		14		✓
		102-9	Organization's supply chain		21		✓
		102-10	Significant changes to the organization and its supply chain		10		✓
		102-11	Precautionary principle or approach		66~68		✓
		102-12	External initiatives		56~57		✓
		102-13	Membership of association		4~5		✓
	Strategy	102-14	Statement from senior decision-maker	4.7 / 6.2 / 7.4.2	8, 9, 96		✓
		102-15	Key impacts, risks, and opportunities		8, 9		✓
	Ethics and integrity	102-16	Values, Principles, standards, and norms of behavior	4.4 / 6.6.3	94, 95		✓
	Governance	102-18	Governance structure	6.2 / 7.4.3 / 7.7.5	18, 19		✓
	Stakeholder Engagement	102-40	List of stakeholder groups engaged by the organization	5.3	21		✓
		102-41	Collective bargaining agreements		65		✓
		102-42	Identifying and selecting stakeholders		21		✓
		102-43	Approach to stakeholder engagement		22		✓
		102-44	Key topics and concerns that have been raised through stakeholder engagement		27		✓
	Reporting practice	102-45	A list of all entities included in the organizations consolidated financial statements (subsidiary and joint venture)	5.2 / 7.3.2 / 7.3.3 / 7.3.4	14		✓
		102-46	Defining report content and topic boundaries		27		✓
		102-47	List of material topics		27		✓
		102-48	Restatements of information		About This Report		✓
		102-49	Changes in reporting		About This Report		✓
		102-50	Reporting period	7.5.3 / 7.6.2	About This Report		✓
		102-51	Date of most recent report		About This Report		✓
		102-52	Reporting cycle		About This Report		✓
		102-53	Contact point for questions regarding the report		About This Report		✓
		102-54	Claims of reporting in accordance with the GRI Standards		About This Report		✓
		102-55	GRI content index		92		✓
		102-56	External assurance		89~91		✓
Anti-corruption increase in requirements of transparency and ethical management from enterprise	Anti-corruption	103	Management approach	5.2 / 7.3.2 / 7.3.3 / 7.3.4	67, 68		✓
		205-1	Operations assessed for risks related to corruption	6.6.1-6.6.2 / 6.6.3	67, 68		✓
		205-2	Communication and training about anti-corruption policies and procedure		67, 68		✓
Increase in requirements of fair trade	Anti-competitive Behavior	103	Management approach	5.2 / 7.3.2 / 7.3.3 / 7.3.4	53		✓
		206-1	Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	6.6.1-6.6.2 / 6.6.5 / 6.6.7	53		✓

Significant issue	Topic		Disclosure	ISO 26000	Verification		
					Page	Omissions/ Comments	Assurance
Water use Depletion of natural resources (water, mineral resources, fossil fuels)	Water	103	Management approach	5.2 / 7.3.2 / 7.3.3 / 7.3.4	31~32		✓
		303-1	Water withdrawal by source	6.5.4	33		✓
		303-2	Water sources significantly affected by withdrawal of water		33		✓
		303-3	Water recycled and reused		85		✓
	Biodiversity	103	Management approach	5.2 / 7.3.2 / 7.3.3 / 7.3.4	40		✓
		304-1	Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	6.5.6	40		✓
		304-2	Significant impacts of activities, products, and services on biodiversity		40, 87		✓
		304-3	Habitats protected or restored		40, 88		✓
		304-4	IUCN Red List species and national conservation list species with habitats in areas affected by operations		40, 87		✓
Climate change Prevention of environmental pollution (pollution of atmosphere, water quality, and soil) Reduction of energy use (producing renewable energy, such as hydropower)	Emissions	103	Management approach	5.2 / 7.3.2 / 7.3.3 / 7.3.4	39		✓
		305-1	Direct (Scope 1) GHG emissions	6.5.5	39, 86		✓
		305-2	Energy indirect (Scope 2) GHG emissions		39, 86		✓
		305-3	Other indirect (Scope 3) GHG emissions		-	Not applicable	✓
		305-5	Reduction of GHG emissions		39, 86		✓
		305-6	Emissions of ozone-depleting substances (ODS)	6.5.3 / 6.5.5	-	Not applicable	✓
		305-7	Nitrogen oxides (NOX), sulfur oxides (SOX), and other significant air emissions	6.5.3	86		✓
	Effluents and Waste	103	Management approach	5.2 / 7.3.2 / 7.3.3 / 7.3.4	38		✓
		306-2	Waste by type and disposal method	6.5.3	38, 85		✓
		306-3	Significant spills of harmful substances		-	Not applicable	✓
Reinforcement of environmental regulation Compliance with laws and regulations of environmental area	Environmental Compliance	103	Management approach	5.2 / 7.3.2 / 7.3.3 / 7.3.4	37		✓
		307-1	Non-compliance with environmental laws and regulations	4.6	-	No violation	✓
Enhancement of importance in securement of human resources	Employment	103	Management approach	5.2 / 7.3.2 / 7.3.3 / 7.3.4	66		✓
		401-1	New employee hires and employee turnover	6.4.3	82		✓
		401-2	Benefits provided to full-time employees that are not provided to temporary or part-time employees	6.4.4 / 6.8.7	83		✓
		401-3	Parental leave	6.4.4	84		✓
Social contribution to local communities	Local Communities	103	Management approach	5.2 / 7.3.2 / 7.3.3 / 7.3.4	59~62		✓
		413-1	Operations with local community engagement, impact assessments, and development programs	6.3.9 / 6.5.1-6.5.2 / 6.5.3 / 6.8	59~62		✓
Increased importance of corporate partnership with partners	Supplier Social Assessment	103	Management approach	5.2 / 7.3.2 / 7.3.3 / 7.3.4	51~52		✓
		414-1	New suppliers that were screened using social criteria	6.3.3 / 6.3.4 / 6.3.5 / 6.6.6	-		✓
		414-2	Negative social impacts in the supply chain and actions taken		53		✓
Increased safety requirements of product and service (water quality) Acceleration of technological advancement Intensifying competition (technological development, patent, overseas expansion etc.) Diversified and enhanced increase of customers' requirement Increase of consumers thinking highly of health, green environment, and pro-social value Customer satisfaction to products and services	Customer Health and Safety	103	Management Approach	5.2 / 7.3.2 / 7.3.3 / 7.3.4	44		✓
		416-1	Assessment of the health and safety impacts of product and service categories	6.7.1-6.7.2 / 6.7.4 / 6.7.5 / 6.8.8	44		✓
		416-2	Incidents of non-compliance concerning the health and safety impacts of products and services	4.6 / 6.7.1-6.7.2 / 6.7.4 / 6.7.5 / 6.8.8	-	No violation	✓

Code of Ethics

K–water is the people's enterprise contributing to the quality of people's life and the national development by developing, managing, and preserving Korea's water resources in environmentally, economically, and socially sustainable way and by providing the best products and services.
With such pride and self–esteem, we pledge as follows in order to be reborn as a global water–specialized enterprise for 'the 21st century – the era of water.'

One, we accomplish our missions with creative thinking and challenging spirit, do our business in an honest and fair manner, and strive to realize transparent management.
One, we recognize that the global environment is a precious asset to be handed over to our descendants and the base of healthy and pleasant life, and practice environmental management.
One, we provide our customers with the best products and services and practice 'the Customer First' through customer satisfaction and management of new value creation.
One, as a member of local communities, we respect the tradition and culture of relevant communities and contribute to the development of local communities, thereby enriching the lives of residents.
One, we comply with moral and/or legal values, respect the market order of free competition, and pursue the realization of fair competition.
One, we respect individual personality without any discrimination, and value people's personality and creativity.
One, we develop the partnership between labor and management based on the trust and unity recognizing that both labor and management are one entity, thereby pursuing the common prosperity.

* Please refer to K–water's website (www.kwater.or.kr) for details about the Code of Ethics and the Employee Code of Conduct.

Green Management Policy

We fully realize that it is high time for all–out efforts for the promotion of sustainable development harmonized with the environment for the sake of a pleasant and livable environment. We, as the public enterprise dealing with water which is the source of life, declare the Green Management Policy, mustering the will of all the executives and employees, in order to emerge as an eco–friendly enterprise trusted and loved by the people by developing and managing the water resources in an eco–friendly way.

Firstly, all of us take the initiative in preserving clean water and air, and the livable natural environment.
One, we strive to make all of our activities harmonize with the environmental preservation by predicting the environmental impact caused by the development and management of water resources, and continuously carrying forward preservation of the natural ecosystem, prevention of pollution, and improvement of environment.
One, we establish a sound consumer culture of saving and recycling resources and energy, and always endeavor seriously not to destroy the environment due to indifference.
One, in setting up plans related to the environment, we enhance the reliability of K–water and the transparency of the business by collecting extensive opinions from all walks of life and disclosing information and data.
One, we embrace the responsibility and obligation to prevent environmental pollution at the source, exert every effort to solve the problem should environmental pollution occur due to corporate activities, and always keep in mind that such implementation is the fundamental aspect of responsible business ethics.
One, we conduct environmental education continuously and strive for the research and development for environmental preservation and improvement so that our activities for the environment may become the ethical standard.

All of K–water's executives and employees shall do their best to ensure people can enjoy prosperity with posterity in a pleasant environment by putting this declaration into practice.

Customer Charter Statement

K–water hereby undertakes to make every possible effort for realizing the customer–friendly and customer–oriented management based on the business philosophy that "Customers' value is our value."

One, we will supply stability of the highest quality of water and land which the customers can trust.

One, we will provide the information and services necessary for guaranteeing customers' safety and property rights one step ahead of the customers' request.

One, we will gather customers' opinions by always listening to their recommendations and suggestions and use those opinions to improve customer services.

One, we will perform our job without discrimination to any customer, and ensure the best interest for our customers by pursuing the most efficient management.

In order to realize the above goals, we hereby pledge that we will always set up the highest level of service implementation standards which K–water can provide from our customers' viewpoint, and will implement this standard.

Declaration of Human Rights Management

In order to realize the "A Future Driven by Water Sharing Happiness through Water", we will actively practice ethics management emphasizing on and protecting human dignity and values in all of our business activities, and pursue sustainable development. For this, we support and resolve to practice human rights management as follows as the criteria of behavior and value judgment which all the executives and employees should abide by.

One, we respect and support international standards and norms for the protection and promotion of human rights, including the UN's Universal Declaration of Human Rights.
One, we institutionalize human rights management and actively eradicate human rights violations.
One, we do not discriminate on the basis of races, religions, disability, gender, places of birth, or political opinions among others.
One, we guarantee the freedom of association and collective bargaining.
One, we do not use any form of forced labor in employment and do not allow child labor.
One, we provide a safe and hygienic working environment.
One, we support all our partners' implementation of human rights management.
One, we respect and protect the human rights of local residents in areas in which we do business.
One, we establish and maintain an environmental management system to prevent environmental problems.
One, we provide safe and transparent water services to consumers and protect customer values, such as personal information etc., collected during our business activities.

We will take a responsible attitude to protect and respect the human rights of all stakeholders involved in our management activities and pledge to do our best to establish and spread human rights management.

UN Global Compact's 10 Principles Support

The UN Global Compact's Ten Principles are derived from the following international agreements.

THE GLOBAL COMPACT
WE SUPPORT

- The Universal Declaration of Human Rights
- The International Labor Organization(ILO)'s 'Declaration on Fundamental Principles and Rights at Work'
- The Rio Declaration on Environment and Development
- The United Nations Convention Against Corruption

The UN Global Compact asks companies to embrace, support and enact, within their sphere of influence, a set of core values in the four areas of human rights, labor, the environment and anti–corruption.

Human Rights

Principle 1: Businesses should support and respect the protection of internationally proclaimed human rights, and;
Principle 2: make sure that they are not complicit in human rights abuses.

Labor

Principle 3: Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;
Principle 4: the elimination of all forms of forced and compulsory labor;
Principle 5: the effective abolition of child labor; and
Principle 6: the elimination of discrimination in respect of employment and occupation.

Environment

Principle 7: Businesses should support a precautionary approach to environmental challenges;
Principle 8: undertake initiatives to promote greater environmental responsibility; and
Principle 9: encourage the development and diffusion of environmentally friendly technologies.

Anti–Corruption

Principle 10: Businesses should work against corruption in all its forms, including extortion and bribery.

K–water complies with and practices the ten principles of UN Global Compact.

Statement of Support for the Sustainable Development Goals

SUSTAINABLE DEVELOPMENT GOALS

Global Compact Network Korea

CEO Statement of Support for the Sustainable Development Goals

K water

K-water, as the only public enterprise for water services in Korea, has contributed to the economic development and water welfare of Korea by providing clean and healthy water stably using scientific water management technologies and experience accumulated over 50 years in water infrastructure and management.

Especially, K-water has made diverse efforts to achieve the water-related SDGs established by the UN. To bridge the gap of water supply among regions, K-water is implementing improvements and expanding existing facilities. Furthermore, K-water is doing its best to secure stable water resources and manage water quality to achieve water sustainability. In addition, K-water is actively involved in new & renewable energy businesses relevant to water including floating photovoltaic systems and hydrothermal energy as an effort to respond to climate change.

K-water strengthened its water management and disaster response capabilities by establishing Integrated Water Resources Management (IWRM) and by introducing Smart Water Management (SWM) based on 4th industrial revolution technologies. Moreover, K-water is making efforts to apply Low Impact Development (LID) technology aimed at reinforcing the water circulation system for waterfront areas currently under development.

Also, with a keen interest to solve global water problems, K-water has proceeded with cooperative projects with global water-related associations and international organizations such as WWC, World Bank, ADB, and UNESCO. K-water has also been very active in establishing relevant governance and took the initiate to help establish Asia Water Council (AWC). As the chair nation of AWC, K-water is hoping to solve water problems in Asia by drawing active participation and support from Asian nations.

K-water is committed to achieving the United Nation's SDGs and gives its wholehearted support. K-water will endeavor to find various ways to improve the value and accessibility of water for all humanity.

[SDG 6, 7, 9, 11, 13, 17]

11 September 2017

Hak-Soo LEE
K-water CEO & President of Asia Water Council

Questionnaire to Collect Readers' Opinions

We welcome your valuable opinions.
With a view to publishing a better sustainability report in the future, K-water wants to hear the opinions of various stakeholders including our readers about the 2017 Sustainability Report. Please complete the following and send it to the address listed on the bottom of this questionnaire by mail or fax.

1. Which groups do you belong to?
   - ◻ Customers ◻ Employee ◻ Government ◻ Local residents ◻ Partners ◻ NGOs and Civic Groups
   - ◻ Specialized organizations ◻ Others( )
2. How did you find this sustainability report?
   - ◻ K-water's website ◻ Media such as newspapers ◻ Web surfing ◻ K-water's employees ◻ Seminars/lectures ◻ Others( )
3. For what purpose do you use this report? (Multiple responses are possible.)
   - ◻ To get information about K-water ◻ To understand K-water's sustainability management activities
   - ◻ To compare and analyze the characteristics of the industry to which K-water belongs ◻ For research and education
   - ◻ Others( )
4. Which section was most interesting to you in this report? (Multiple answers are possible.)
   - ◻ Global water Professional K-water ◻ Water Circle
   - ◻ Water Value ◻ Water Platform
   - ◻ Water Trust ◻ Appendix
5. Which pledge requires more information to be supplemented? (Multiple answers are possible)
   - ◻ Global water Professional K-water ◻ Water Circle
   - ◻ Water Value ◻ Water Platform
   - ◻ Water Trust ◻ Appendix
6. Was this report helpful for you to have a better picture of K-water's sustainable management activities?
   - ◻ Very ◻ A little ◻ Neutral ◻ Not ◻ Not at all
7. How satisfied are you with this report?

• Understanding of information	◻ Very Satisfied	◻ Satisfied	◻ Normal	◻ Unsatisfied	◻ Very Dissatisfied
• Accuracy of information	◻ Very Satisfied	◻ Satisfied	◻ Normal	◻ Unsatisfied	◻ Very Dissatisfied
• Quantity of information	◻ Very Satisfied	◻ Satisfied	◻ Normal	◻ Unsatisfied	◻ Very Dissatisfied
• Design	◻ Very Satisfied	◻ Satisfied	◻ Normal	◻ Unsatisfied	◻ Very Dissatisfied

8. Feel free to write your opinions about the overall configuration and contents of the report.

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K-water 2017 Sustainability Report

50 Years with Water, Another 50 Years Together to the Future

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