

 **K water** 2019 Sustainability Report

*Providing a brighter,
happier, and more
prosperous future
with water*



About This Report

Having published its Sustainability Report annually since 2005, K-water presents its 15th Sustainability Report. The report transparently introduces the company's sustainable management activities which are aimed at the fulfillment of its mission "Providing a brighter, happier, and more prosperous future with water" and the achievements of these activities, along with K-water's unceasing efforts to be a global leader in the water industry by providing safe and clean water for all. The contents of this 2019 report were curated with a focus on the goals of K-water as a public enterprise of the people.

Reporting Standards

This report has been drafted in line with GRI (Global Reporting Initiative) Standards and ISO 26000, which are international sustainability reporting guidelines. More specifically, it complies with the core standards of the GRI Guidelines (100-400). This report features key issues derived from materiality tests in connection with the management strategy of the Corporation and management approach (MA) on key issues.

Reporting Period and Scope

This report centers on the sustainable management activities of K-water's headquarters [(1 vice president, 4 divisions, 6 head offices, 30 departments (including departments, institutes, centers, and offices)] and local business sites [3 divisions, 8 head offices (including institutes), 11 departments, 67 branches] and includes some of the activities of the first half of 2019 that are considered important. Quantitative performances include data from the last three years (2016 ~ 2018) or more to identify trends and changes. As overseas businesses (11 projects in 9 countries as of June 2018) are carried out on a project basis, only their management performances have been included in this report. The achievements of subsidiaries and affiliates are not covered in this report as well as performances related to the company's training and supporting systems, while those related to partner companies within the corporate supply chain are presented in this report. Financial performances have been filed based on consolidated data (K-IFRS) since 2011.

Report Assurance

For the enhancement of accuracy and reliability, the report has been verified by an independent external agency. This third-party verification agency has certified that this report complies with the core standards of the GRI Guidelines.

Alterations

In June 2018, K-water became under the auspices of the Ministry of Environment. Although this was a major change, no alterations have been made in relation to the sizes, structure, basic year or ownership structure presented in this report during the reporting period. Some changes with regard to data calculations and content descriptions are noted separately in the footnotes. K-water publicizes its Sustainability Management and Annual Report through the disclosure of its business management on its website. The Sustainability Report is issued both in Korean and English. It can be downloaded in PDF format via its website. For more information or inquiries, please find below our contact information.


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Since its founding in 1967, K-water has grown into Korea's representative public water management company while striving to improve national economic development and the nation's water welfare. According to the 2018 National Water Management Unification Policy for the innovation of droughts and water management system, K-water is re-establishing its vision as 'A partner for providing healthy water circulation services for all,' which includes public value, environmental value and innovation value and is reborn as a specialized water organization that the times and people demand.

As a result, focusing on services for the people, away from the existing development-oriented business structure, K-water is reinforcing its sustainability management activities in four areas: water safety, water sharing, water convergence, and water innovation. K-water's employees are working hard in unison to reflect the needs and opinions of stakeholders, including customers and achieve tangible results with which the people can be satisfied. K-water promises to provide the following four services :

First, we will provide 'water safety' services that keep people safe from all water hazards.

We will strengthen water security to reduce the risks of flood and droughts in vulnerable areas and strengthen disaster prevention support with safe and clean river basin-based water management. In addition, we will expand the scope of water management to include not only the main streams but also to the tributaries to enhance our ability to respond to water disasters. We will also take the lead in improving the water quality of rivers and restoring their ecological health, which have been relatively neglected. Based on the above, K-water will build a sustainable water circulation system with integrated water management that encompasses water quantity, quality, and ecosystem and promote the harmonious development of humankind and nature.

Second, we will lead the way by providing 'water-sharing' services which will bridge the water service gaps.

We will secure water supply stability by developing alternative water resources and expand investment in water-vulnerable facilities. Instead of focusing on the construction of large dams, we will carry out activities to enhance the linkage of facilities and discover alternative water sources to secure the necessary amount of water, while solving national distrust of tap water with smart water management. In addition, we will endeavor to resolve the imbalance in local waterworks charges step by step so that everyone can receive clean water without shortage at a fair price.

Third, we will provide 'water convergence' services that create new values for water through the convergence of water, energy, and urban technologies.

We will mitigate the effects of climate change and resolve fine dust by developing alternative eco-friendly water energy sources such as floating photovoltaic and hydrothermal systems and take the lead in solving urban water problems by applying advanced technologies and know-how accumulated through the creation of water circulation cities such as Busan EDC National Test-bed. By sharing these technologies with the private sector, developing and supporting small and medium venture companies, we will actively foster innovative growth in the water sector through job creation and enhancement of domestic water industry competitiveness.

Fourth, we will provide 'water innovation' services for realizing transparent management and social value.

We will innovate functions and organizations centered on publicity to create a foundation for smart water management by securing core technologies and strive to expand communication and participation with stakeholders.

Dear stakeholders,

Even at this moment, K-water considers all of our stakeholders as our top priority and continues endless challenges and innovation activities. Thanks to your generous trust and interest, K-water has grown into a global water company in the last half century. In return for your trust and support, K-water will be the cornerstone for establishing national water safety and national water welfare by successfully performing the unification of water management. We look forward to your continuous support and interest.

November 2019
K-water CEO

Hak-soo LEE

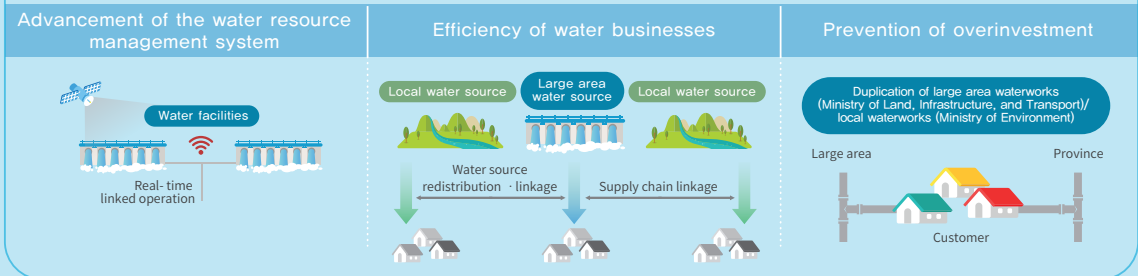
Making
new changes
for a happier Korea with you



2018 K-water Sustainability Highlights

The unification of water management the people can be influenced greatly by the outcome.

- Water management unification will have a national economic effect of KRW 16 trillion over the next 24 years
- Advanced operation of water resource facilities prevents disasters and reduces redundant investment



Implementation of 'Safety Korea'

- Selected as 'Best Institution' for safety management on 3 separate government evaluations (Ministry of Public Administration and Security, Ministry of Land, Infrastructure, and Transport)
- Disaster Management Assessment (Best Institution), Infrastructure Safety Assessment (Grade A), Safety Level Assessment (Excellent)

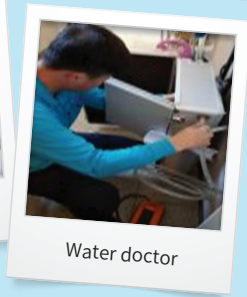
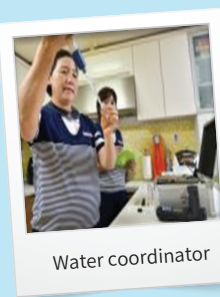
100% completion rate on the regularization of non-regular jobs

- Became the first public enterprise to guarantee non-regular workers' job security in 1st group public corporations sector.
- Expanded regularization of people vulnerable to poverty (seniors aged 60 or older, employees for entrusted projects)



Water industry platform for cooperative development

- 2018 Minister's Award (Ministry of SMEs and Startups) for achieving win-win growth in the water sector.
- Expanded the sales of enterprises selected to participate in the support program by 45% (86.1 billion won in 2017 → 125 billion in 2018)



Creation of water-related jobs

- A total 5,365 Job creation was made in 2018 by K-water job project.
※ A total of 9,254 jobs were created, including employment inducement in private industry sector(6,552 last year, 41.2% ↑)
- A record 370 new recruits were hired in 2018 (7.5% compared to fixed number of employees)

To promote the people's participation in management and cooperation for mutual prosperity

- Minister's award (Ministry of Environment), Prime Minister Award in recognition of government innovation by expanding public participation management
- Purchase rate of SMEs (construction and goods) increased by 104.3% from the previous year

Revitalization of local economies and resolution of local issues

- Support for the growth of social enterprises in local areas by collaborating with specialized organizations based on corporate capacity
※ Establishment of a social enterprise support model and derivation of achievements (Employees of enterprises selected to participate in the support program ↑ 2.5x, advancement into overseas markets - 3 countries)
- Generation of 1.5 billion won / year for local residents' income by activating local economies such as areas nearby to dams



< Local Business >



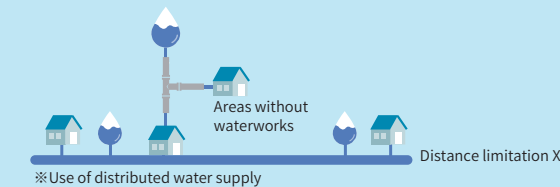
< Electricity Generation Association >



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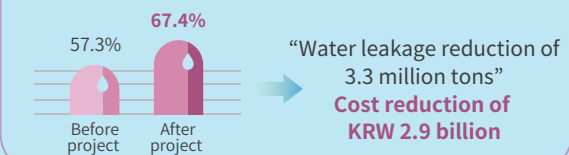
Water services that are fair to everyone, water welfare for the socially vulnerable

- Presented with "Grand Prize from Environment Minister" for government innovation and "Prime Minister Award" for social safety net service.
- Providing water to areas with populations less than 10,000 residents who previously had no direct access to the water supply network



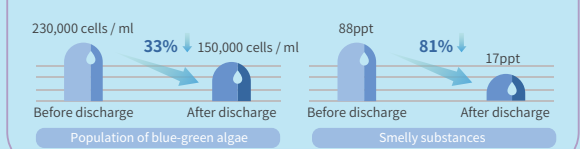
Endorsement of K-water's tap water management standard as an internationally recognized standard (UNESCO)

- Recognition of global competitiveness of Korea's water management through UN Organization Cooperation
※ Concluded the agreement of K-water-UNESCO international tap water certification system ('18.7)
- Evaluated as the best water service provider by achieving the highest flow rate improvement ever in Korea (Ministry of Environment)



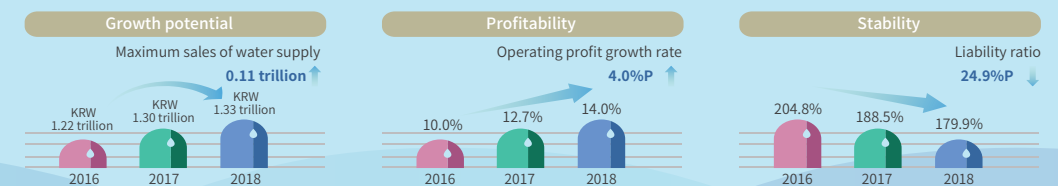
Recovery of aquatic ecosystem by improving the water environment

- Increased self-purification coefficient and expanded ecosystem diversity through active opening of weirs
- Mitigating abnormal water-related issues such as green algae to improve water quality by realizing integrated water quantity-water quality management by discharging 83 million^m of water



Realization of best company role-model based on excellent financial performance and organizational culture.

- Selected as an excellent Family-Friendly Enterprise certified by the Ministry of Gender Equality and Family for 10 consecutive years
- Selected as a "Best Asian Company to Work For" for 2 consecutive years by GPTW
- Improved performances in all areas of finance such as achievement of the highest rating of Private Valuation Rate (2.229%) in Korea and Debt-to-Equity Ratio improvement of 24.9%



Looking back on the 1st year of water management unification

134 local governments
No flood damages

Prevention of water disasters

- Establishment of region and people-centered drought response system

Water industry

- Activation of smart water management technologies for overseas export

52 companies
SMEs that advanced abroad with K-water's support

48 companies
The number of venture companies that improved performance through K-water's fostering program (in 2018)

Improvement of water

- Integration of water management for the improvement of upstream water environments
- Development of new eco-friendly water treatment technology
- Introduction of a new livestock manure treatment model

81%
Reduction of Taste and odor compounds in the Han River

33%
Reduction of algae in the Nakdong River

Launched the Smart Water City test-bed (Busan EDC, 2018)

Waterfront spaces

- Creation of a futuristic water circulation city

1.39 million people
Prevention of water service gaps

100,000 tons, **4** plants

Securing multiple water sources through the operation of seawater desalination plants in Western Chungnam Province

Securement of water quantity

- Activation of water recycling
- Elimination of water service gaps in all region, including isolated and sparsely population areas

Energy

- Expanding the application of eco-friendly hydrothermal energy

2,271 GWh/year

Clean energy produced annually by K-water (2018)

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- 016 Vision and Strategy
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Add

Making the world flow,
K-water









Overview

K-water, as Korea's representative public water company, provides water stably through the comprehensive development and efficient management of national water resources, improves water quality, provides high-quality water services without discrimination to all people, and protects people from disasters such as floods and droughts to realize its mission of 'providing a brighter, happier, and more prosperous future with water'.

Overview of Institution

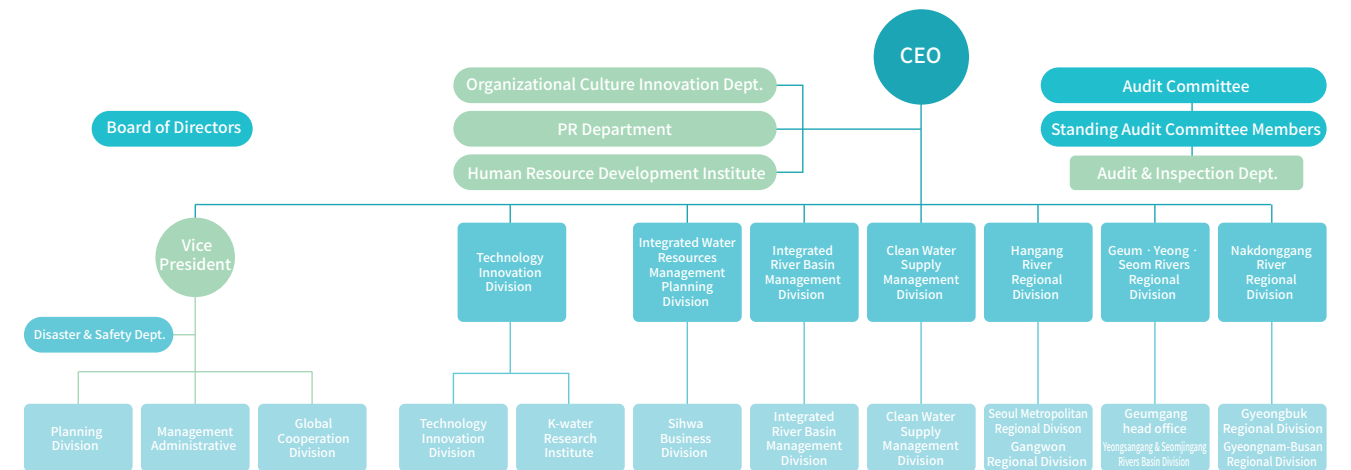
Institution name	Foundation date	Purpose of establishment	Institution type	Location of headquarters
 The Korea Water Resources Corporation (K-water) www.kwater.or.kr	 November 16, 1967	 To contribute to the enhancement of citizens' livelihoods and public welfare by ensuring the stable supply of water and improving water quality through the comprehensive development and management of water resources. (The Korea Water Resources Corporation Act Article 1)	 Quasi-market-type public corporation	 200, Sintanja-ro, Daedeokgu, Daejeon (34350)

Overview

 No. of Employees 6,092	 Organization <small>(Headquarters) 1 vice president, 4 divisions, 6 head offices, 30 departments (including departments, institutes, centers, and offices) (Local business sites) 3 divisions, 8 head offices (including institutes), 11 departments, 67 branches (offices)</small>	 Assets KRW 21.7968 trillion	 Sales KRW 3.3916 trillion	 Liability rate 179.9%	 Credit rating In Korea:: AAA, Abroad:: Moody's Aa2 (stable), S&P AA(stable)	 Shareholder composition Korean Government 92.83%, Korea Development Bank 7.09%, Local governments, etc. 0.08%
 Subsidiaries	Domestic <ul style="list-style-type: none"> Waterway+ (share ratio: 100%) P-Waters (share ratio: 2%) Korea Construction Management (share ratio: 18.9%) Korea Overseas Infrastructure & Urban Development Corporation (share ratio: 11.01%) K-water Operation and Management (share ratio: 100%) 	Abroad <ul style="list-style-type: none"> KDS Hydro PTE. Ltd. (share ratio 80%, Pakistan) Patrind O&M Limited (share ratio 100%, Pakistan) JSC Nenskra Hydro (share ratio 93%, Georgia) Angat Hydropower Corporation (share ratio 40%, Philippines) 	<ul style="list-style-type: none"> Tina Hydropower Limited (share ratio 80%, Solomon Islands) PT. Hasang Operation and Maintenance (share ratio 95%, Indonesia) Luzon Clean Water Development Co. (share ratio 3%, Philippines) 			

Organizational Structure

K-water has reorganized its corporate structure to preemptively prepare for the future and promote national affairs in a rapidly changing business environment. In order to provide water services that create social value, we expanded and reorganized the functions and organization of the Creating Shared Value Team, Job Creation & Promotion Team, and Water Industry Platform Center. In addition, we have established a communication channel to listen to the opinions of customers and directly participate in business and service improvements, thus laying the systematic foundation for creating social values such as job creation, shared growth, and social contributions.



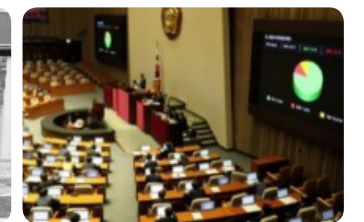
Construction of Soyanggang, Andong and Daecheong Dams



Construction of large area industrial water supply systems in the metropolitan areas of Ilsan and Ulsan, etc.



Entrusted with local waterworks management



K-water is under the auspices of the Ministry of Environment due to the unification of water management in Korea (2018)

Mission of the times	Establishment of the foundation for national economic development	Improvement of national welfare and livelihoods	Creation of the sustainable water circulation system	
Brief history	1967. 11. Foundation of the Korea Water Resources Development Corporation 1973. 10. Construction of Soyanggang, multipurpose dam 11. Launched the Changwon National Industrial Complex Development Project 1981. 05. Acquisition of Metropolitan 1st and 2nd stage large-area waterworks (Seoul) 1992. 11. Construction of water supply facilities in Ilsan Newtown 1996. ISO 9001 Certification (Quality Management System)	2002. ISO 14001 Certification (Environmental Management System) 2003. 05. Recognized as an international accredited testing institution by KS Q ISO / IEC 17025 for the first time among domestic water service providers 2006. 01 Proclamation of 6 Sigma Management 2008. 11. Grand Prize at the National Ordering Office VE Competition hosted by Ministry of Land, Transport and Maritime Affairs (large-area waterworks) 2009. 11. The first public corporation in Korea to receive ISO 27001 certification 2010. 06. KOSHA18001 Certification (Construction Industry Safety and Health Management System) 2011. 08. Commenced with the commercial development of Sihwa Tidal Power Plant, the largest of its kind in the world	2015. 04. Established Asia Water Council (AWC), co-hosted the 7th World Water Forum 06. National Sustainability Management Award in Social Contribution 2016. 09. 2016 Minister's Commendation at the 2016 National Sharing Awards 10. Minister's Commendation in recognition of contribution to the development of mensuration and measurement 2016. 11. Declaration of 50th Anniversary New Management Policy 2016 Asian-Pacific Stevie Award (in Local Community PR and Public Service and Communication Innovation)	2017. 04. 2017 Public Agency Innovation Example Contest Grand Award 10. Asian MAKE Award for the 10th consecutive year 11. Global MAKE Award for the 5th consecutive year (Hall of Fame) Commencement of commercial power generation at the Patrind Hydropower Plant (Pakistan) 2018. 01. Recognized as an Excellent Family-friendly Institution for the 10th consecutive year 05. Selected as a big data center 06. Moved to the Ministry of Environment in accordance with the amendments to the Government Organization Act 11. Award from Minister of Strategy and Finance for Social Responsibility Obtained order of Solomon Tina Hydropower Project

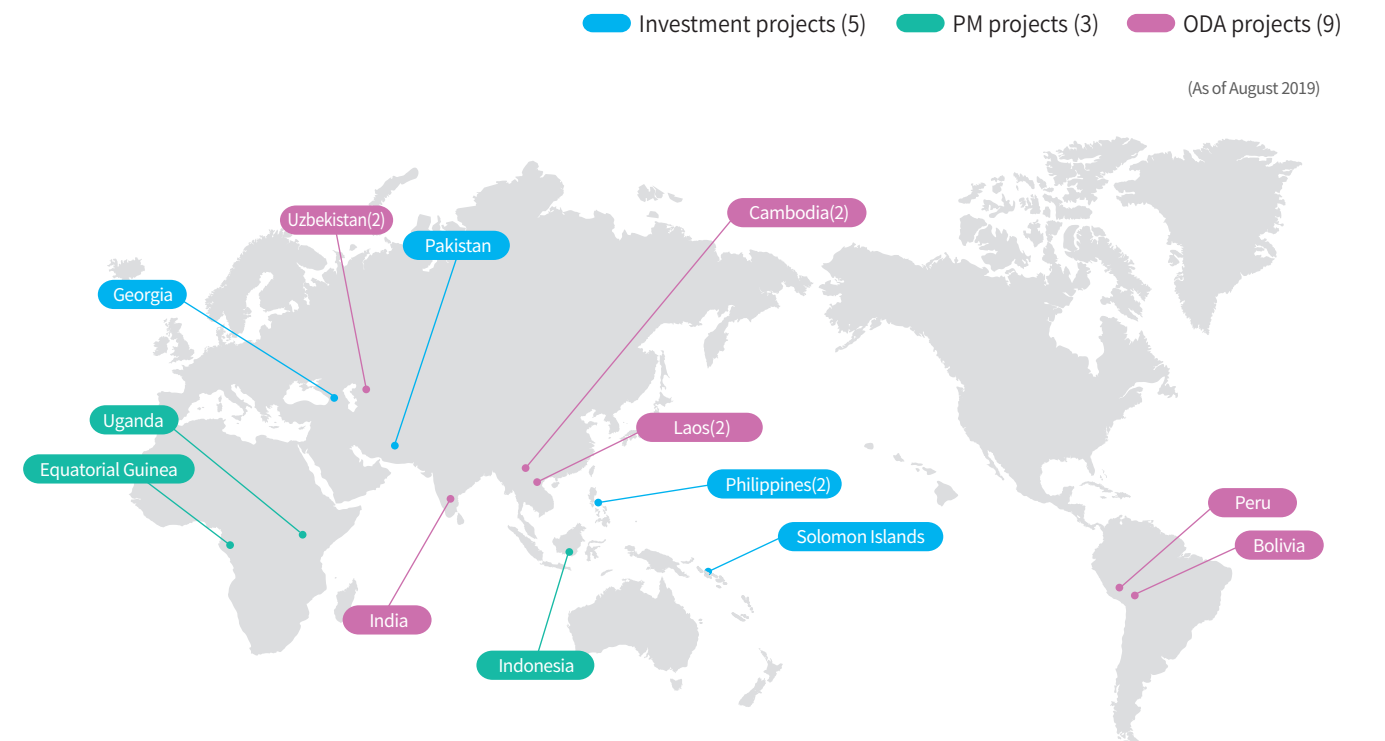
Integrated water management facilities

Based on its 50 years of water management experience, K-water is actively supporting the water management unification policy by suggesting ways to achieve national water management innovation, leading the way for the creation of a consensus among stakeholders, and establishing a foundation for the implementation of water management unification. K-water has also created a foundation for integrated water management tailored to each river by taking their unique characteristics into account and establishing a rapid decision-making structure centered on each river basin, to achieve optimal water management suited to and implemented by each regional office.



Overseas projects

Starting with Shanxi Province Bunha River Basin Research Project in 1994, K-water has been advancing into overseas markets, and has completed 78 projects in 30 countries by seeking to strengthen its business capabilities and diversify its business areas. Currently, we are conducting five investment projects and 12 technology service projects in 13 countries, including the construction and operation of the Patrind hydroelectric power plant in Pakistan.



K-water Headquarters



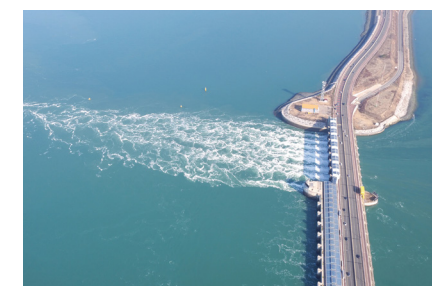
Soyang River Multi-purpose Dam



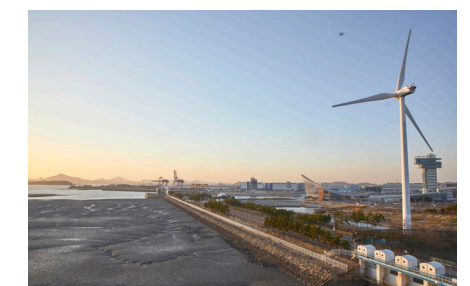
Seongnam Water Purification Plant



Daesan Industrial Water Center RO Facility



Sihwa Tidal Power Plant



Gyeongin Ara Waterway

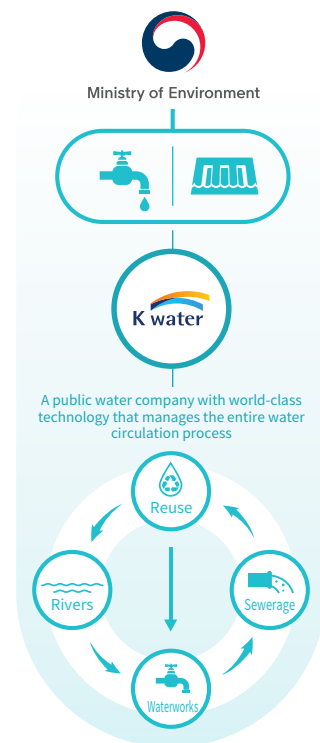
Vision and Strategy

K-water has re-established its vision of ‘a partner for healthy water circulation that benefits all’ to reflect public value, environmental value, and innovation value and is responding to the unification of national water management and the rapidly changing business environment in 24 years. We have shifted our business structure from a supply-oriented business structure, such as water resources and infrastructure development, to water a service-oriented business structure that identifies and delivers the needs of the people. In addition, based on the core values of internal stability, innovation, and trust, we will establish a foundation for sustainable growth with all people through K-water’s five management principles which are publicity, equity, safety, environment, and democracy.

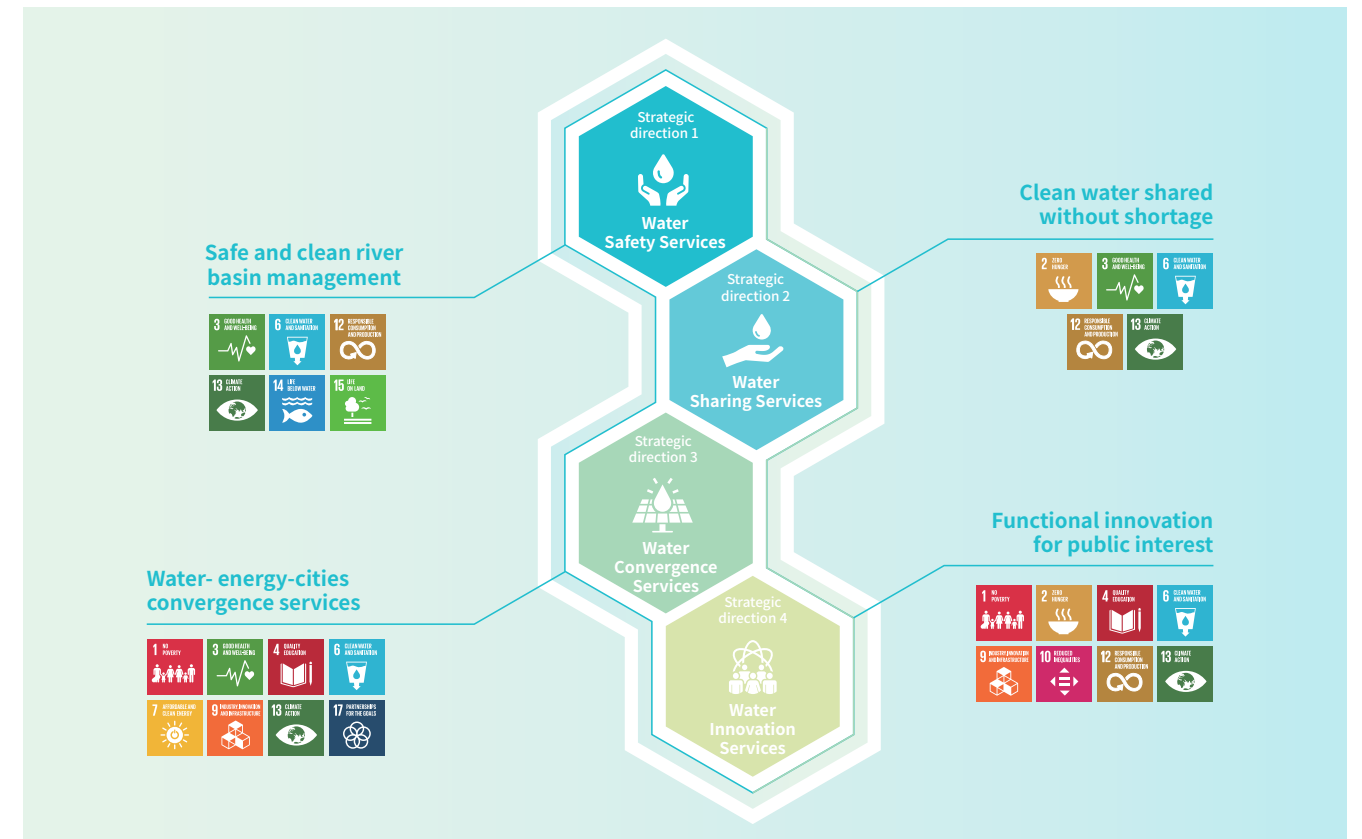
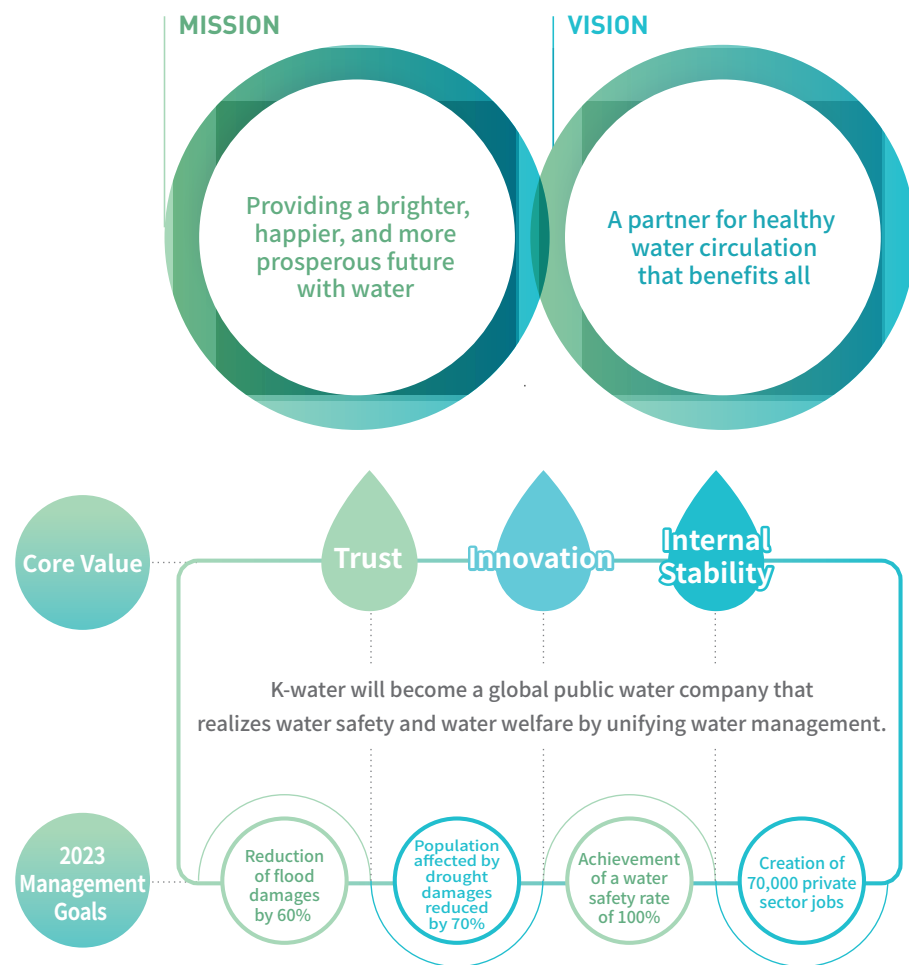
Management strategy

What does “water management unification” mean?

The water management system of Korea, which was diversified among various departments such as the Ministry of Environment for water quality and the Ministry of Land, Infrastructure and Transport for water quantity, was integrated into one unified system under one ministry for the purpose of achieving sustainable development.



As the 3rd Water Management Act was enacted and amended in 2018, many changes were made, such as the competent department moving to the Ministry of Environment and the emphasis on water quality and ecology. As a result, K-water has devised a strategy to restore the ecology of rivers and to resolve the imbalance in water supply and social inequality. In addition, we have established a strategic water management system to secure efficiency and take the lead in the water industry by utilizing cutting-edge innovations.



Sharing new strategies and core values

In order to share the strategies, vision and core values newly established according to the unification of water management policy with internal and external stakeholders, K-water has derived stakeholders related to management activities and established a shared strategy considering the issues and characteristics of each stakeholder. We share our management strategies by classifying stakeholders based on their awareness of K-water and the possibility for potential conflicts.

Shared strategies according to the types of internal and external stakeholders

Stakeholder type	Stakeholder characteristics	Stakeholder	Interest issue	Shared strategy	
Internal	Sponsor type	Employees, Labor Unions	Awareness (High)	Sustainable development of organizations, Self-realization, Working conditions	Encouraging active participation in management activities
			Conflict (Low)		
External	Cooperation type	Government (Central, Local), National Assembly, Experts, Related Agencies	Awareness (High)	National consistency, political interests	Building trust and maintaining cooperative relationships through understanding and persuasion
			Conflict (Low)		
External	Persuasion type	Community, NGO, Press	Awareness (High)	Environmental issues, justification for budgeting support activities, news value	Prevention of conflicts by sharing information and actively responding to issues
			Conflict (Low)		
External	Relation type	Customers, Citizens, Local Governments	Awareness (High)	Service quality, environment and economic interests	Forming friendly relations by improving services and creating shared values
			Conflict (Low)		

※ (High) ↔ (Low)

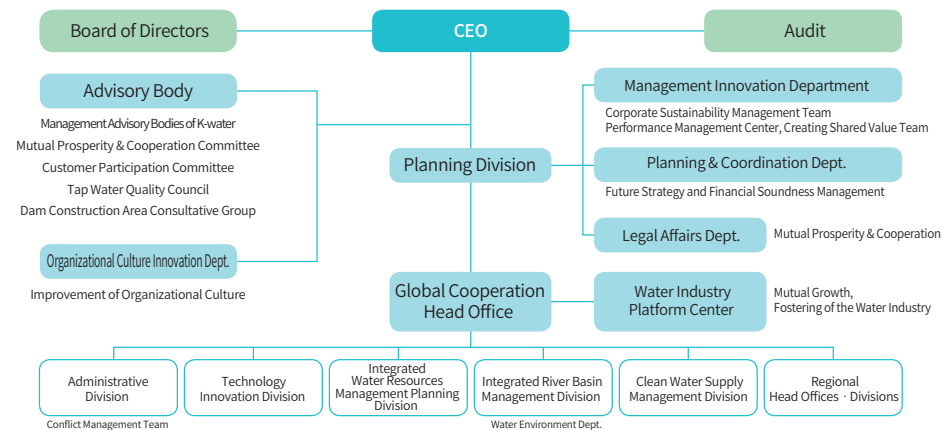
Sustainable Management Promotion System

Being fully aware of the mission given by the times and the people, K-water is pursuing sustainable management by establishing a new direction as a specialized water organization. In order to balance publicity and profitability, we newly reflect the three values of public interest, environment, and innovation in our strategic system, and are trying to achieve clear results by setting 28 key sustainable management performance indicators to provide water safety services, water sharing services, water convergence services, water innovation services, and water innovation services for the people.

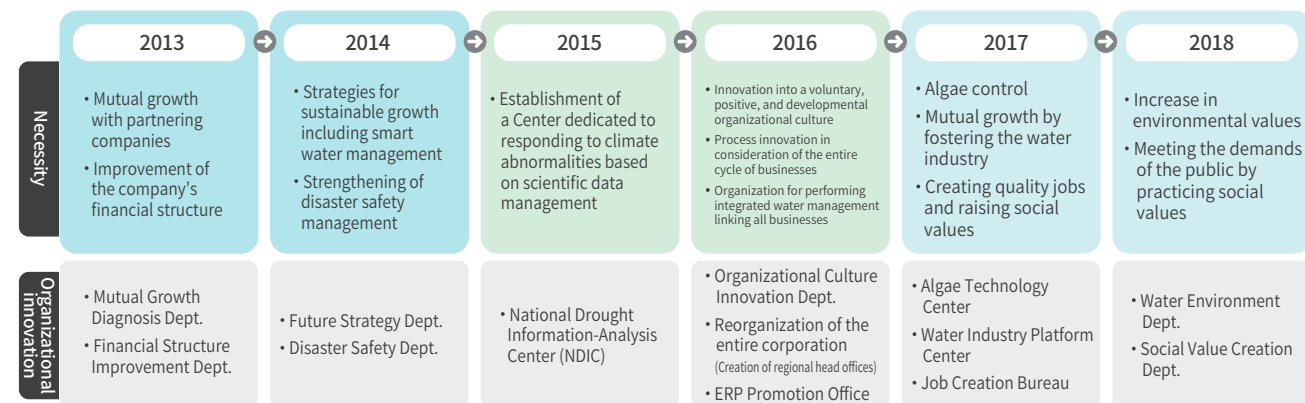
Sustainable management promotion system

K-water's sustainable management is implemented as a company-wide mission for the systematic implementation of K-SDGs. With the Management Innovation Department as a base, the main headquarters and each regional headquarters are centered to promote business organically from an economic, social and environmental perspective. In addition to working with these internal departments dedicated to sustainable management, it has listened to diverse opinions of stakeholders and operated advisory committees and councils to cooperate with them and pursue sustainable management.

Organizations promoting sustainable management



Organizational changes for sustainable management



K-water Key Performance Indicators of Sustainable Management

4 Major Services	Key Performance Indicator (KPI)	2016	2017	2018	Fulfillment Level	2019
			Performance	Performance		Goals
Water safety services	Supplied dam water (100 million m ³)	57.2	58.24	58.8	●	98.38
	Supplied tap water (100 million m ³)	38.85	39.97	40.75	●	
	Water innovation services	147	109	134	●	116
	Dam safety grade achievement rate (%)	84.2	86.2	86.7	●	90.0
	Dam/ river water quality management goal achievement rate (%)	54.6	42.6	49.0	●	56.9
	Risk management efforts (points)	96.48	96.5	97.0	●	Changes in the Indices
Water sharing services	Global water quality standard compliance rate (%)	99.9	99.99	99.98	●	100.0
	Tap water quality safety rate (%)	-	100	100	●	100
	Local waterworks flow rate (%)	83.9	84.3	84.3	●	82.0
	Smart water management expansion (cumulative cases)	-	5	9	●	13
	Sewage reuse (1 million m ³ /year)	-	42	42	●	42
Water convergence services	Greenhouse gas reduction converted into renewable energy generation (1,000 t CO ₂ eq.)	1,012	988	1,569	●	1,133
	Distributed waterfront project sales (1 million won)	9,831	8,084	8,772	●	9,242
	SMEs that benefited from K-water's mutual overseas market advancement program (no. of companies)	11	33	52	●	279
	Enterprises newly selected for the support program to foster the Korean water industry (# of companies)	-	-	192	●	
	Sales of products developed with SME technologie (KRW 100 million)	514	861	1250	●	330
Water innovation services	Environmental performance index (points)	153	151	158	●	155
	Green product purchase rate(%)	81.3	80.8	84.3	●	80.0
	Sales (KRW trillion)	3.6	3.4	3.4	●	4.6
	Liability rate (%)	204.8	188.5	179.9	●	175.4
	Job creation (persons)	5,874	6,886	9,624	●	11,706
	Social contribution index (points)	92.6	93.4	87.0	●	90.0
	Human resource cultivation index (%)	43.6	44.3	45.0	●	45
	Customer satisfaction (grade)	Grade S	Grade S	Grade A	●	Grade A
	Trust-based management index (points)	77	74	74	●	75
	Integrity level (grade)	Unsatisfactory	Moderate	Unsatisfactory	●	Very good
	Industrial accident rate (%)	0.25	0.17	0.23	●	0.00
	Information and security management level (points)	80.22	87.12	74.33	●	75.00

1) Dam/river water quality management goal achievement rate (%): The 2016-2017 rates were calculated as the achievement rates of dam water chlorophyll a control goals (Ia). Since 2018, the rate refers to the fulfillment rate of dam (TOC, T-P) and river (BOD, T-P) water quality management goals (Ia).
 2) Tap water quality safety rate (%): A newly included index calculated by dividing the number of non-detection of five algal toxins by the number of measurements (in 38 large-area water purification plants) * Five algal toxins (Microcystin-LR, Microcystin-RR, Microcystin-YR, Anatoxin, Nodularin)
 3) Environmental performance index (points): The indexed value of the degree of environmental performance improvement compared to the base year

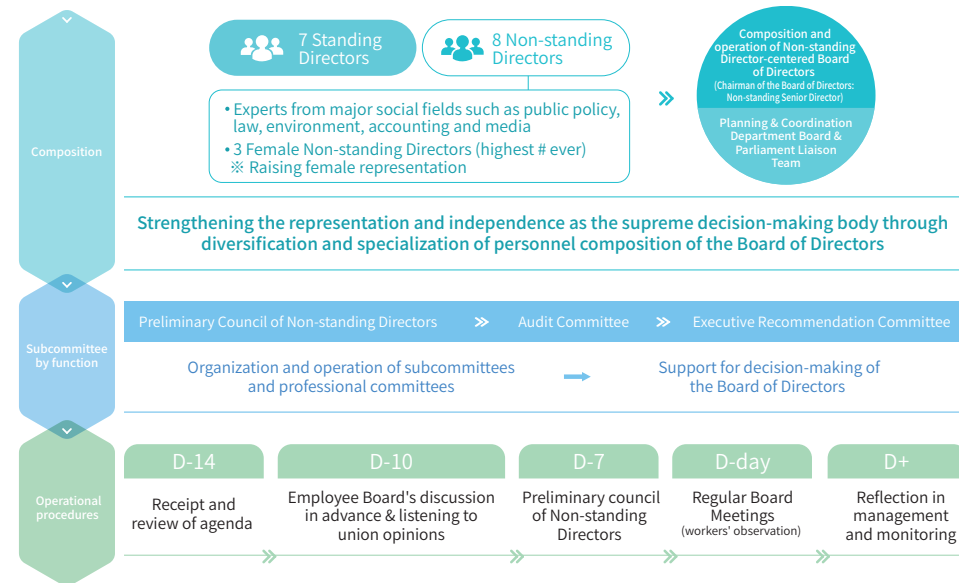
Governance and Responsible Management

K-water's management maintains a sound governing structure by ensuring that its performances are evaluated through rigorous processes. The CEO concludes a management contract with the Minister of Environment, which is the competent department and is evaluated according to the Ministry of Strategy and Finance's Government Management Performance Evaluation Manual, and the incentives are differentially applied according to the results. The standing directors set goals for the government evaluation indicators and the unique work indicators and enter into management agreements with the CEO for the annual evaluation.

Composition of the Board of Directors and Operation System

The Board of Directors is the supreme decision-making body that deliberates and resolves K-water's major issues. It consists of 15 members, 7 of whom are standing directors and the other 8 are Non-standing Directors. We hold regular board meetings once a month and hold temporary board meetings from time to time to review and address major issues. In addition, in order to transparently select Directors, we form an Executive Recommendation Committee in accordance with 'Article 25 of the Act on the Operation of Public Institutions' to select directors with diversity and expertise. Candidates who are openly recruited are selected through document screening and in-depth interviews to ensure fairness of procedures.

Composition of the Board of Directors and Operation System



348th Board of Directors (18. 24. 18)



355th Board of Directors (18. 12. 26.)

BOD Operation Status

Classification	2016	2017	2018	Compared to the previous year
No. of the BOD meetings (number)	18	15	16	6.7% ▲
No. of agenda items	42	47	53	12.8% ▲
Resolved agenda (case)	27	30	32	6.7% ▲
Report agenda (case)	14	9	12	33.33% ▲
Special reporting agenda (case)	1	8	9	12.5% ▲
Preliminary review rate (%)	85.3%(29/34 cases)	97.1%(33/34 cases)	100%(48/48 cases)	2.9%p ▲
Original bill resolution rate (%)	92.6%(25/27 cases)	96.7%(29/30 cases)	100%(32/32 cases)	3.3%p ▲
Non-standing Directors' management suggestions (case)	65	68	76	11.8% ▲
BOD attendance rate (%)	93.9%	90.2%	92.4%	2.2%p ▲
Non-standing Director attendance rate (%)	95.8%	87.5%	90.4%	2.9%p ▲

* Prior deliberation rate: Written resolution agendas excluded, preliminary review of special reporting issues from 2018.
 * From the 2019 Sustainability Report, the number of special reporting cases are included in the number of agenda items.

Transparency and Diversity of BOD

For transparent and objective decision-making, K-water requires Directors who have a stake in a specific issue not to participate in the agenda. The contents and results of BOD meetings are frequently published in 'Alio', a public institution management information disclosure system. In addition, to ensure diversity and balance of BOD, we place no special restrictions on recruitment and do not discriminate on gender, religion, race, or nationality. Especially in 2018, we appointed a record number of female Directors (3 out of 15 Directors) to secure diversity and secured the expertise of the Board of Directors by appointing Non-standing Directors with a wealth of knowledge and experience in various fields such as law, economics, media, and academics.

Composition of the Board of Directors (Standing Directors)

Name	Position	Career
Hak-soo LEE	CEO	· Vice-President, K-water · Head of Urban Environmental Business HQ, K-water · Head of Audit Dept., K-water
Jeong-hyeon PARK	Standing Audit Committee member	· Chief of Public Affairs, Office of the Prime Minister · Editor-in-Chief, the Seoul Shinmun (newspaper) · Head of Management Planning Dept., the Seoul Shinmun (newspaper)
Su-dong GWAK	Vice President (Also serves as Director of the Nakdonggang River Regional Head office)	· Director of the Nakdonggang River Regional Head office, K-water · Head of Planning & Coordination Dept., K-water · Chief Secretary, K-water
Bong-jae KIM	Water Management Planning Director (Also serves as Director of the Geumyeongseom Rivers Regional Head office)	· Head of Dam Area Management Dept., K-water · Head of Waterfront Business Dept., K-water · Head of Bohyeonsan Dam Construction Office, K-water
Seong-ho LIM	Director of the Hangang River Regional Head office	· Head of Gyeongin Ara Waterway HQ, K-water · Head of Songsan Construction Office, K-water · Head of Ara Waterway Business Dept., K-water

Composition of the Board of Directors (Non-standing Directors)

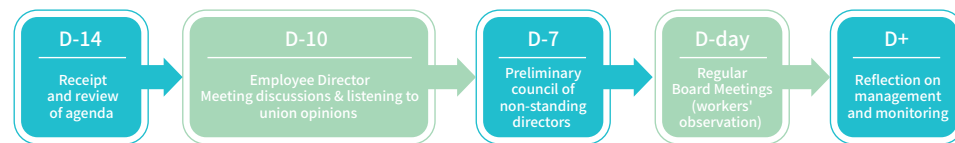
Name	Position	Career
 Gwan-min PARK	Non-standing Director * Chairman	· President, Korea Drone Association · Former Director of Green City, Korea Land & Housing Corporation
 Hae-jong LIM	Non-standing Director	· Chairman, Democratic Party of Korea Jeungpyeong, Jincheon, Goesan & Eumseong Committee · Former Auditor, Korea Development Bank
 Nam-sun JEONG	Non-standing Director	· Vice Director, Environment Law Center
 Sang-su JEONG	Non-standing Director	· CEO, Geumnan Welfare Foundation · Director, Daejeon YMCA
 Jeong-su KIM	Non-standing Director	· Standing Representative, Gwangju Human Rights Peace Foundation · Director, Sophia School
 Seon-yeong YU	Non-standing Director	· Prof. of Journalism & Broadcasting, Sungkonghoe Univ. · Former President, Korean Association For Communication And Information Studies
 Hyeon-mi JI	Non-standing Director	· Associate Prof. of Accounting and Tax Affairs, Keimyung Univ. · Former Senior Investigator, Financial Supervisory Service
 Dong-jin CHOI	Non-standing Director	· CEO, National Institute of Land and Environment · Director, Institute for Climate Change Action

(As of August 2019)



Employee Director Meeting discussions

In addition, K-water is operating the 「K-water Stakeholder Participatory Decision Making Model」 to lead the government's 「Public Institution Governance Improvement」 policy. In December 2018, we introduced the 'Employee-Director Meeting Observation System' for the first time in a Korean public corporation to expand employees' management participation and is improving management transparency by strengthening internal management checks. In addition, we conduct 'Employee Director Meeting discussions' on the agenda presented to the Board of Directors to reflect employee-directors' creative and diverse opinions on management and to strengthen communication between management and employees.



In order to reinforce the role of the Board of Directors in line with the management environment, we set annual operation goals. The performance of BOD operation is evaluated by the evaluation team through management evaluation indicators, and operational improvement activities are continuously conducted based on the feedback.

Goals of BOD Operation in 2019

Goal	To ensure optimal decision making and enhance publicity by securing the expertise and independence of BOD members		
Tasks	Operation of the Participatory Decision Making Model	Support for Optimal Decision Making	Efforts to Revitalize the Board of Directors
	<ul style="list-style-type: none"> Regularization of employee director meetings Operation of Worker Observation System Preparation for Employee-Director System 	<ul style="list-style-type: none"> Strengthening of preliminary deliberation functions Strengthening of field management Providing more information on management issues 	<ul style="list-style-type: none"> Strengthening of outside communication Strategy promotion Expansion of institutional exchange

Evaluation and feedback on BOD operation performance

Integrity and Ethical Management

In 2019, K-water reestablished an ethical management system based on human rights and practiced ethical management to ensure safe and clean water supply through transparent work processing, communication, and cooperation. In addition, we strengthened the anti-corruption system to prevent corruption in advance and realized transparent management through an internal checking system such as internal audits and external monitoring. In the future, we will internally establish a commitment to ethical management to become a respected company that meets the standards of the people, and will do our best to contribute to the spread of ethical culture throughout the water industry.

K-water Sound and Ethical Management System

Based on a strong will to fight corruption, the government is making efforts to spread ethical management of public institutions by establishing a five-year anti-corruption master plan. In line with this, with ethical management as a top priority, K-water set a Integrity and ethical company trusted by the people and empathized by its members' as its Integrity vision. By strengthening our Integrity ecosystem, zero corruption and spreading the Integrity and ethical culture as major tasks, we are promoting ethical management.

Integrity and Ethical Management System



K-water's integrity and ethical practice tasks

Recognizing that Integrity and ethical management is a very important management activity to earn stakeholder trust, we select and promote integrity and ethical tasks every year for communication and cooperation with various stakeholders. In particular, in order to secure the execution ability of the project, we established the CEO-led 'Special Integrity Countermeasures Headquarters' as a control tower, and includes the relevant departments in the division for regular performance and performance checks. In 2018 and 2019, we made various efforts to reorganize our promotion system and secure all employees' empathy for strengthening our integrity and ethics.

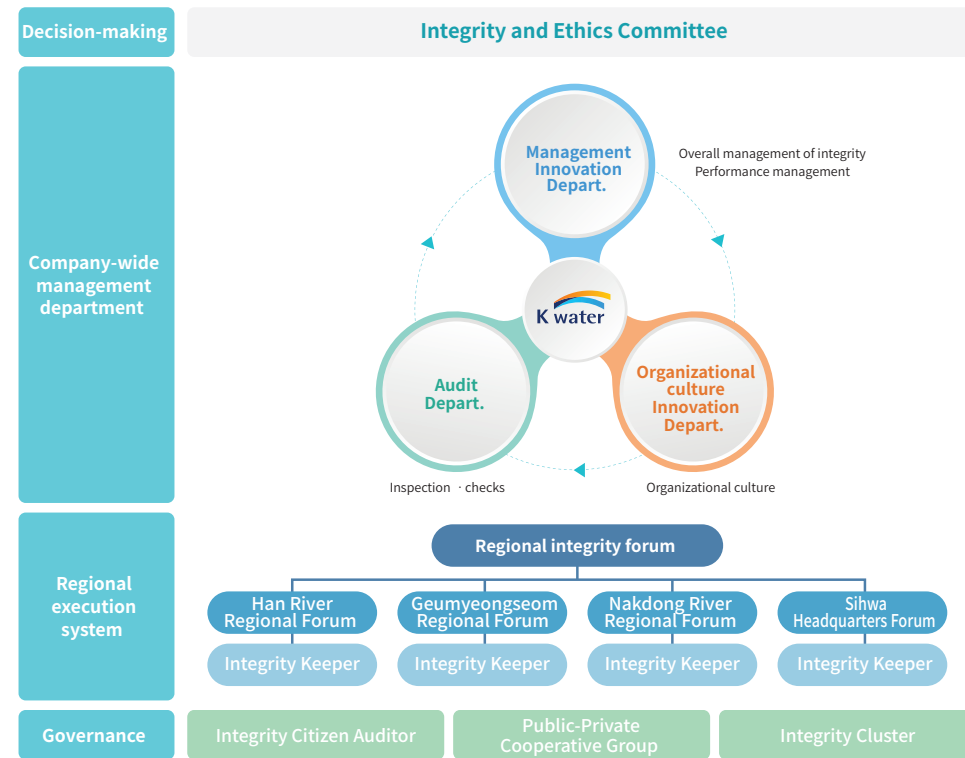
Progress of major integrity and ethical tasks

Classification	Existing (Before 2017)	Improvements (2018 ~ 2019)
Strengthening of the integrity ecosystem Upgrading integrity and ethical system	<ul style="list-style-type: none"> Decision-making at the Integrity and Ethics Committee Headquarters-site integrity and ethical system 	<ul style="list-style-type: none"> Expansion of decision-making body + establishment of executive body Establishment of organic system between headquarters-region-site
Zero corruption Strengthen executive integrity leadership	<ul style="list-style-type: none"> Signing a job integrity contract for executives and above Evaluation of integrity of high-level employees and reflection in individual evaluation 	<ul style="list-style-type: none"> Signing a job integrity contract for heads of division and above Expansion of implementation targets and share of evaluation reflection
Spread of integrity and ethical culture Strengthening education and governance	<ul style="list-style-type: none"> Each department conducts its own integrity and ethical education Operation of integrity cluster by region 	<ul style="list-style-type: none"> Establishment of Clean Master Communication Training for all departments Launching of Public Enterprise Integrity Society Council

Integrity and ethical management organizational structure

In order to implement integrity and ethical management, K-water is systematically operating the Management Innovation Dept., the Audit Dept., the Ethics Practice Manager and the Integrity Keeper for each department around the Integrity and Ethics Committee, the supreme decision-making body.

Integrity and ethical management organizational structure



Operation of various communication channels to prevent corruption

K-water is carrying out various preventive activities to meet the people's expectations for eliminating corruption. In order to activate internal reporting, we established a standing audit hot-line, a confidential internal reporting help-line, a request registration system, and a security attorney. Each department appoints integrity keepers for integrity education, corruption counseling and reporting.

A variety of reporting channels to prevent corruption

K-water Reporting Center	Outsourcing Reporting Center
<ul style="list-style-type: none"> Irrationality · abuses of authority reporting - 「Report」 menu at the bottom of the website or 「Customer Center → Customer Square → Report → Report Irrationality · abuses of authority」 Security Report Attorney - To ensure your anonymity, the Security Report Attorney reports on your behalf - Email : amie42@hanmail.net 	<ul style="list-style-type: none"> Report of Internal Corruption for Public Interest(Website) Customer Center → Customer Square → Report → Report of Internal Corruption for Public Interest K-WHISTLE APP Play Store → Search for 'K-Water K-Whistle' → Install

Education and Consensus for Practice of Integrity and Ethics

In order to spread the culture of integrity and ethics, we conduct a variety of upright and ethical education and participation programs for employees, as well as various measurement such as self-measurement of external integrity, integrity survey of high-ranking positions, survey of all employees and human rights impact assessment.

Programs for strengthening the culture of integrity and ethics

Classification	Highlights
Announcement of CEO's pledge	Emphasis on the importance of upright and ethical decision making at official events, various meetings and meetings, including the inaugural address (2016.9), New year's address (2018.1), and management issue meetings, etc.
Customized integrity education	Mandatory management of integrity education such as new employees, promotion education, and executive leadership training
Code of conduct practice manual	Practical information for easy use by practitioners, including the importance of integrity and ethics, Q&A, sharing of violations, and related regulations
Clean Master communication training and abuses of authority prohibition guideline	Clean Master (In-house integrity instructor) tour training (2017) Distribution of abuses of authority prohibition guideline (2019), etc.



2018 UNGC Korea Association Fair Player Club Activities



Clean Master Tour Training



Declaration of Human Rights Management for All Employees



1st Meeting of Special Integrity Measures Task Force (TF)

Strengthening transparency through fundamental innovation of the Records Management System

In January 2018, K-water organized its Records Management TF, headed by the CEO, after the press released a report about the destruction of records during office relocation and maintenance. The TF was established to innovate the entire records management process and transform the perception of all employees.

1 Organization · System Innovation	2 Process Innovation	3 Shift of Employees Awareness
<ul style="list-style-type: none"> Establishment of A Records Management Center Establishment of a Records Management and Memo Reporting System 	<ul style="list-style-type: none"> Permanent preservation of four major rivers related documents Transfer of important records (996 volumes in 4 departments) Establishment of an Evaluation Council (Eradication of Unauthorized Disposal) 	<ul style="list-style-type: none"> Compulsory education for employees (1,152) Consulting for 43 departments Making new internal evaluation standard about record management system

* Evaluation Council : Council that evaluates whether we can destruct the record

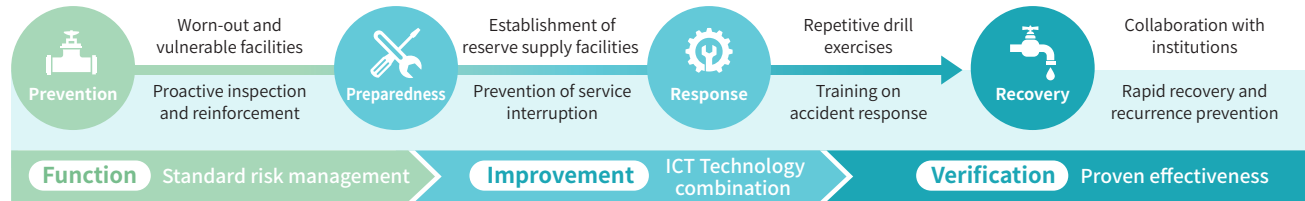
Risk Management

Through a great transformation of its management paradigm, K-water has changed its focus from facility efficiency management to pursue safety management that focuses on the value of all people. In 2007, we developed the K-water Risk Management (KRM) system to reflect internal and external environmental changes and continuously improve the safety management master plan until 2019. As a public corporation that operates and manages national infrastructure, we will take responsibility for the safety of all people by implementing substantial safety management activities.

Establishment of company-wide Safety Management and Disaster Response System

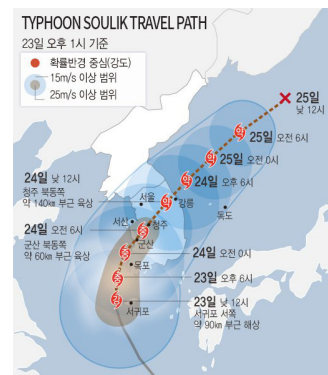
As the uncertainty of natural disasters such as floods and droughts caused by climate change increases, we inspect and reinforce the facilities that are vulnerable to extreme weather such as multi-purpose dams, water supply dams, water purification plants, and pipelines. In addition to the double-tracking of pipelines and emergency linkage pipelines, dualization of power supply and establishment and revision of the accident type manual, and self-disaster preparedness training, we conducted substantial safety management activities through joint training of related organizations. In addition, we are striving to ensure public safety from all water-related risks by analyzing the causes of accidents and sharing measures to prevent recurrences in order to protect the lives and ensure the safety of all people as well as to create a safe working environment for outsourced workers.

Safety Management and Disaster Response System



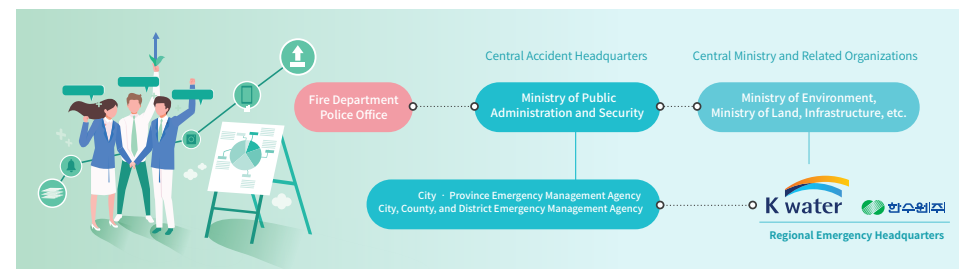
Disaster management that is naturally occurring

Typhoon Soulik Travel Path



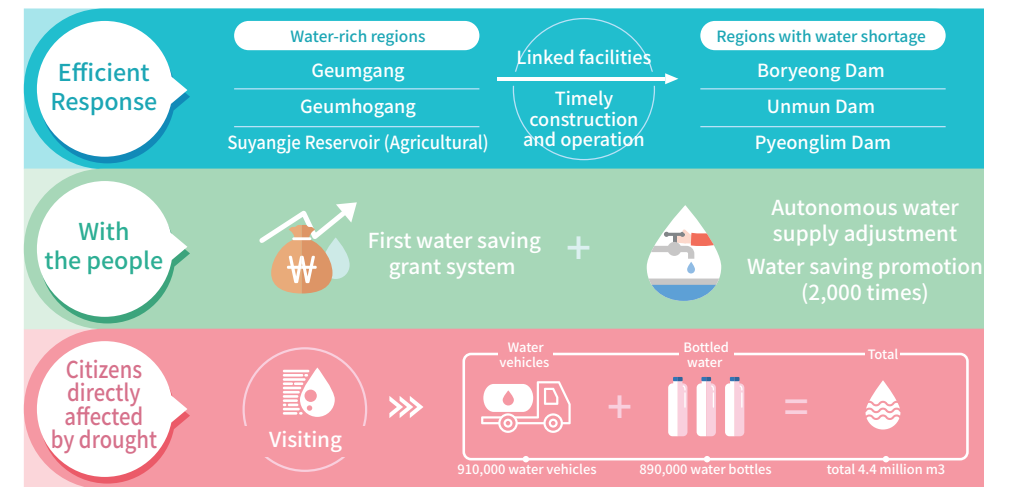
K-water established a working manual on risk management regarding damages from storms and flooding and to prepare for typhoons that make landfall and localized heavy rain through the joint and self K-water Flood Solution (KFS). A complete enumeration survey was conducted on 2,869 upstream and downstream facilities, and the flood management system was upgraded to improve the estimation of rainfall in border areas. We also advanced our flood analysis capabilities through the introduction of a drone-based video surveillance system and secured flood control capacity through preliminary dam level control around dams with higher water levels than in previous years. Although Typhoon Soulik reached landfall on the Korean Peninsula, the first time in six years, we determined the optimal discharge amount and discharge time through occasional rainfall prediction and real-time measurements of hydrologic data, which resulted in no damages to the dams downstream.

Collaboration System with Related Organizations



K-water Integrated Drought Management

Having experienced a long-term drought lasting five years, Korea finally overcame the drought in 2018 by implementing integrated drought management. We established an integrated drought management system which includes information integration of regional and national services as well as forecasting information services suitable for each region through regional customized consulting. As an effective measure, K-water quickly built the Unmun Dam Emergency Supply Facility in only 4 months to prevent limited water supply to 13 local governments in Daegu and Gyeongsangbuk-do. In addition, we established preemptive and systematic response capabilities to avoid drought prolongation through the regulation of dam water supply.



Disaster management in facility accident field

As anxiety spreads across Korea as people fear it is no longer an earthquake-safe country, the Korean government is preparing for disasters by strengthening dam safety management. We conducted safety inspections on K-water's 290 facilities through joint inspections with earthquake-related experts. As a result, there were no damages in 2018, and despite the trend of aging dams in Korea, we have been able to reduce the public's anxiety by preemptively evaluating and improving the performances of facilities. We also strengthened the seismic design standards from 6.3 to 6.7, introduced performance evaluations for 142 facilities, and carried out dam safety reinforcement projects for 29 dams to improve their facilities. In addition, we are promoting 22 modernization projects for aging 8 dams that are over 50 years old. We have actively introduced new technologies such as dam leakage exploration technology development and rapid inspection using drones. In the area of drinking water supply, we have achieved global water quality standards and reduced pipeline accident rates by strengthening various safety systems. We identified that old pipelines were the biggest cause of accidents and we have taken action to improve 273km of old pipelines since 2015. In 2018, 26 km of old pipelines were replaced. Based on the lessons learned from the suspension of water supply to 500,000 people in Gumi that lasted for 5 days in 2011, we expanded the dualization of pipelines and emergency linkage networks. We also introduced a "weekend pipeline patrol team" and developed pipeline diagnostic technology and exploration robots to predict and monitor risks in advance. In order to strengthen the proactive response of water quality of water intake stations, we investigated the upstream contaminant inflow route and strengthened the turbidity standards from 0.5 to 0.1 NTU to achieve global water quality standards.

* NTU (Nephelometric-Turbidity-Unit)
A result value of measuring turbidity using a nephelometry, indicating the turbidity of water



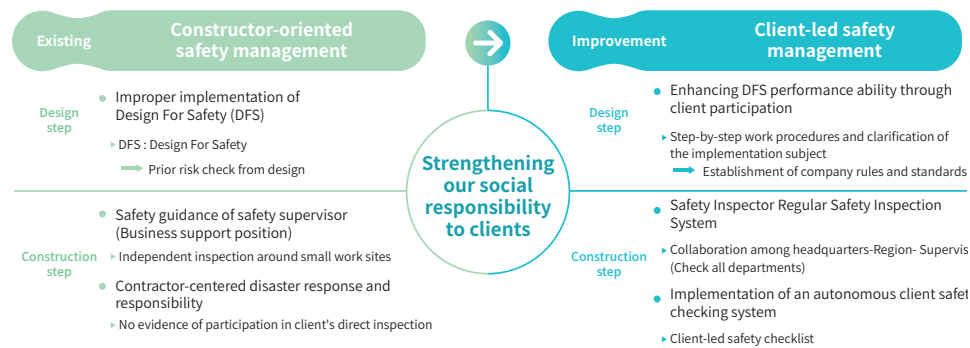
Old pipeline improvement work

Development of a pipeline diagnosis exploration robot

Settlement of a safe workplace for outsourced workers and construction workers

K-water strives to create a safe working environment for outsourced workers and construction workers as well as employees. We are conducting joint safety and health activities with our partners, such as joint safety and health councils, tour inspections, and working environment evaluations, and signed MOUs with industrial safety-related organizations to utilize their professional know-how and reinforce their capabilities. In addition, we strengthened the safety of the old dam additional facilities such as protection fences, rockfall prevention nets, and inspection roads, and renovated worn-out water business sites, including 59 water purification plants. We provide comprehensive health and welfare services to K-water's employees as well as employees at partnering companies to manage all stages of prevention, check-up, and prescription and are working on physical and psychological management by expanding the Employee Assistance Program (EAP). In addition, we established a customized disaster and accident prevention process using the 4th industry's information and communications technology (ICT) to actively introduce IoT-based safety management and technologies, such as enclosed space harmful object sensors, dangerous obstacle recognition sensors, branch-head office server technology, and a safety response information system.

K-water Standard Safety Management System



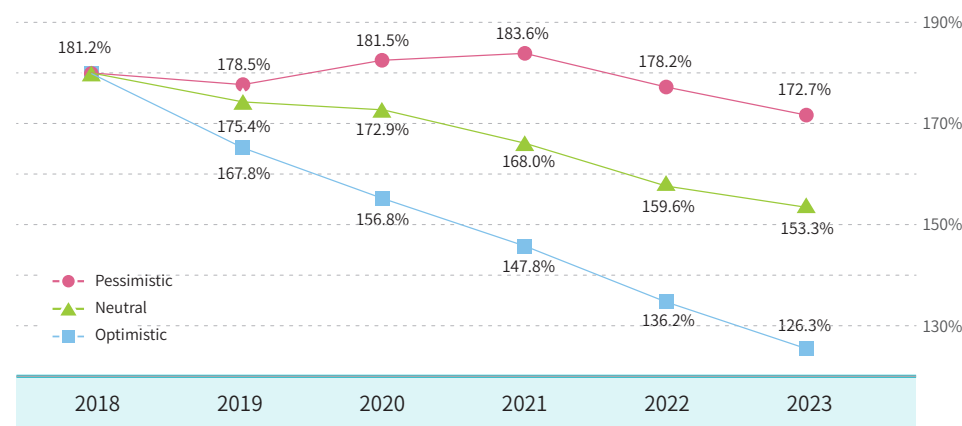
Realization of financial soundness centered on publicity

Establishing a sustainable financial plan, K-water is striving for financial soundness for social and financial growth as a public corporation. In particular, we decreased 24.9% of the liability rate in 3 years through the innovation of the financial risk management system, restoring the average level of public enterprises. Through scenario analyses, we set rational financial goals and set a liability rate scenario by analyzing an additional driver through the procurement of interest rates in consideration of the volatility of financial markets in addition to the four factors of water rate, energy production, real estate economy, and financial support. As well, we are operating a financial risk early warning system based on segmented accounting.

Financial Risk Management Operating System



Liability rate scenario



Stakeholder Communication

K-water 's Stakeholders can be classified into executives and employees, including customers, NGOs, local communities, governments, suppliers, and unions, and we are operating various management participation systems so that these various stakeholders can directly or indirectly participate in management or provide opinions. In 2018, we revised the management regulations and mandated public participation in the overall management decision-making process for the first time as a public corporation. In addition, we are operating Public Communication Platforms (Danbi Talk Talk, etc.), Smart 1st Street and a National Happiness Design Group for service innovation, an open committee for cooperative management, and a Citizen Participation Innovation Group.

Composition of Stakeholders

K-water strives to listen to stakeholders' opinions through various communication channels. Through communication with stakeholders, we include messages from major stakeholders in our sustainable management activities, and conduct annual stakeholder surveys to identify the issues and priorities of stakeholders.

K-water's Major Stakeholders

Goal	Enhancement of National water welfare through the implementation of integrated water management			
Strategic direction	Water safety services	Water sharing services	Water convergence services	Water innovation services
Provided values	<ul style="list-style-type: none"> Achieving integrated water management Ensuring water safety 	<ul style="list-style-type: none"> Intelligent, efficient water services 	<ul style="list-style-type: none"> Pollution-free water energy Recovering the natural water circulation cycle in urban areas 	<ul style="list-style-type: none"> Fostering growth in the water industry and creating jobs

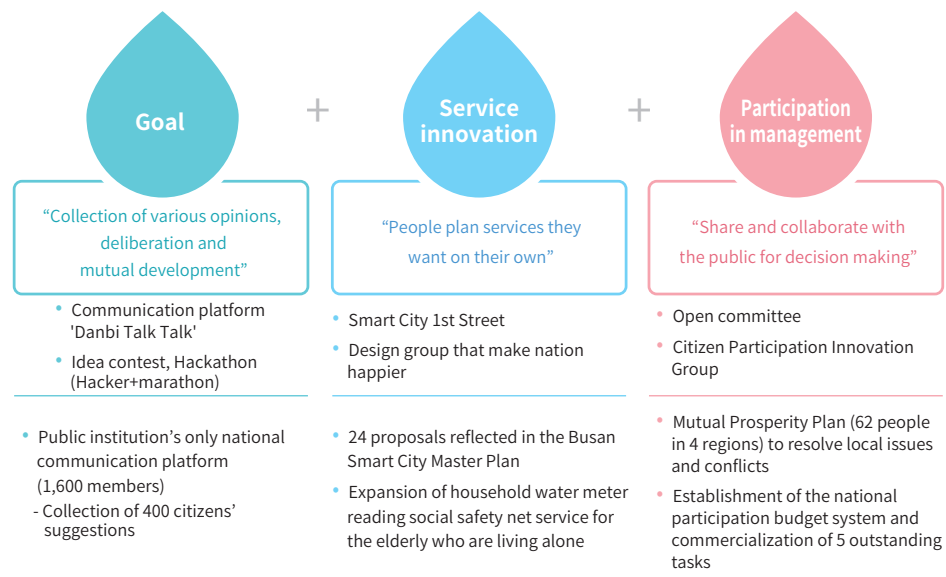
Classification	Main interests	Communication performances	Communication channels
Sponsor type	<ul style="list-style-type: none"> Employees: Water management unification, Organizational culture improvement Labor union: Introduction of worker director system, Organizational culture improvement 	<ul style="list-style-type: none"> Quick sharing of information Operation of a dedicated organization Labor-management council meetings (4 times) and joint program operation 	<ul style="list-style-type: none"> CEO messages, management meetings, education, employee director meetings, etc. Labor-management council, a joint TFT
Cooperation type	<ul style="list-style-type: none"> Government and the National Assembly, experts: Implementation of government projects Relevant institutions, partnering companies: National service enhancement, Fostering of the water industry 	<ul style="list-style-type: none"> Activation of policy proposals Implementation of leading policy Seeking substantial cooperation Need for identification, practical support 	<ul style="list-style-type: none"> Policy conferences, interviews, etc. Business meetings, MOUs, etc. Conferences, platform centers, etc.
Relation type	<ul style="list-style-type: none"> Customers, citizens: Water service improvement Local government and communities: Local water issues 	<ul style="list-style-type: none"> Meetings with customers (3 times) pre-release (317 items) Direct communication and joint decision making on key policies 	<ul style="list-style-type: none"> Website and SNS, Danbi Talk Talk, supporters, meetings with customers, national forums, etc. Mutual Prosperity and Cooperation Committee, interviews, meetings with residents, etc.
Persuasion type	<ul style="list-style-type: none"> Civic groups: Opening of the weirs of the four major rivers, Ecosystem restoration The press: Water management issues 	<ul style="list-style-type: none"> Operation of private advisory groups Participation in key policy decisions Providing accurate information 	<ul style="list-style-type: none"> Mutual Prosperity and Cooperation Committee, forums, advisory groups Contributions, special reports, press conferences

* 1) worker director system : Introduction of system that a member of a labor union can join the board of directors
 * 2) Mutual Prosperity and Cooperation Committee : Committee for mutual prosperity and cooperation between K-water and community

Management activities that reflect stakeholders' opinions

In order to effectively communicate with stakeholders, K-water has classified and analyzed stakeholders according to their roles such as value production and operated channels of communication suited to each stakeholder group by selecting issues of interest for them. This enabled K-water to establish a foundation for the implementation of water management unification through the participation of all employees in discussions on integrated water management. By actively reflecting the major opinions in management, we are using them as the basis for K-water's sustainable growth.

K-water Communication Platform



Performance of Stakeholder Communication by Major Project

Major project	Performance	Major stakeholders
Integrated water management task policy	<ul style="list-style-type: none"> • Integrated water management tasks proposed by K-water are mostly reflected in the government's water management unification task → Ministry of Environment's First Step Task (67%) 	Government, National Assembly, Experts
Integrated operation of large area- province	<ul style="list-style-type: none"> • Promotion of integrated waterworks pilot project ('18.6.-) and integrated waterworks plan for Chungnam-do * 1.66 trillion won can be saved annually due to the integration of large area-province (0.7 trillion for facility duplication, 0.96 trillion for operating expenses) 	Local governments, local residents
Water environment improvement	<ul style="list-style-type: none"> • First watershed management pilot project beyond the legal limits of water surface management (Bohyeonsan Dam, KRW 24 billion) • Establishment of an integrated management model* of upstream of rivers (73% of rivers), which is a small vein of a river (Bocheongcheon) * Integration of restoration of ditches + Reduction of nonpoint pollution + Securement of ecological flow + Tributary disaster prevention 	NGOs, press, local residents
Expansion of water welfare	<ul style="list-style-type: none"> • Expansion of direct water supply of large-area waterworks to areas with limited access to water (farming and fishing village) (water supply to areas with 10,000 people or less) • Implementation of groundwater reservoir projects for remote islands (Anma, Daeijak) (Resolved drinking water shortages for 477 people a year) 	Customers, citizens, and community
Expansion of smart water management	<ul style="list-style-type: none"> • Sejong City (first national project), expanded high quality tap water services to local waterworks entrusted by the local government (4 local governments, 9 in 2017 → 13 in 2018) • Busan Eco-Delta City selected as a National Smart City Test-bed ('18.1.) 	Local government, Central government, related institutions
Water energy development	<ul style="list-style-type: none"> • Profit sharing of a floating photovoltaic project implemented as a model for overcoming regional opposition (Hapcheon, Yongdam 60MW) 	Community, Employees, Partner Companies
Creation of a water circulation city	<ul style="list-style-type: none"> • Andong was selected as a test-bed for the water circulation city project by the Ministry of Environment based on K-water's experience in creating its own water circulation city (Songsan GC, Busan EDC) 	Local government, community

Social Value Committee

In order to gather opinions from various fields related to social value and secure expertise for action plans, K-water organizes and operates the “Social Value Committee,” an open advisory body. It consists of 14 private experts such as water management experts, academia, entrepreneurs, and socio-economic organizations, whom have knowledge and experience in social values. Launched in April 2018, a total of 9 meetings were held as of October 2019.

Major subdivisions of the Social Value Committee

Subdivision	Key topics
Human rights · Safety environment	<ul style="list-style-type: none"> • Realization of human rights to water without discrimination • Sustainable conservation of the environment • Implementation of system to protect people from disasters and accidents
Jobs · Mutual prosperity	<ul style="list-style-type: none"> • Job creation (Youth, private sector) • Support for SMEs, mutual prosperity and improvement of public services • Revitalization of local economies



Social Value Committee

Operation of stakeholder engagement governance

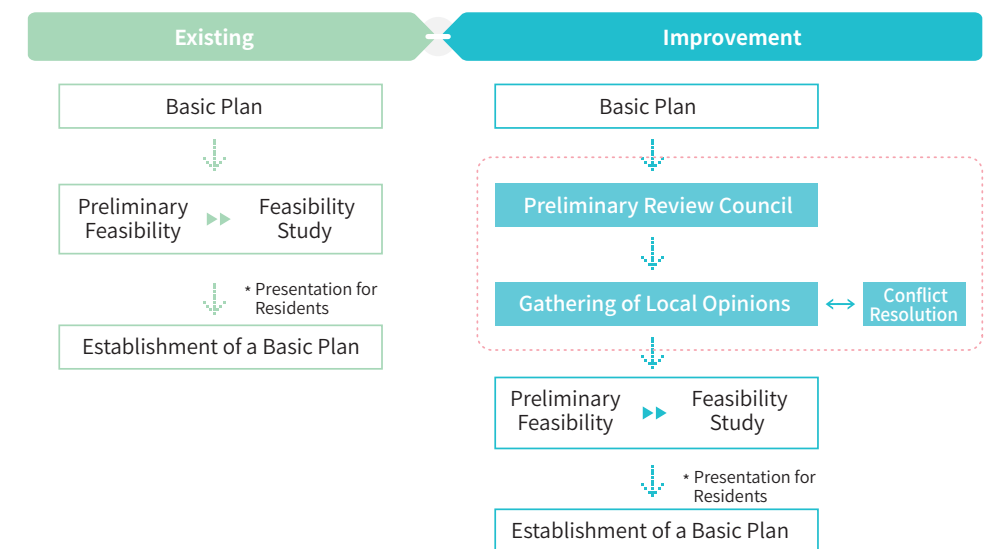
Recognizing the need for ‘governance’ to build a consensus through the communication and cooperation with stakeholders in the successful implementation of policies before the unification of water management, K-water identifies and collects current issues by company, region and area and reflects them in the policy through the operation of 50 various governance groups including the Mutual Prosperity & Cooperation Committee and the Water Environment Monitoring Group. In particular, the Mutual Prosperity & Cooperation Committee is an organization that consults on mutual prosperity measures such as water management policy, operation, and conflict management. The committee also includes experts who have negative opinions about K-water projects to ensure balance and fairness of opinion gathering.



Special Meeting of the Mutual Prosperity & Cooperation Committee (Site visit to Peace Dam)



Joint Meeting of the Mutual Prosperity & Cooperation Committee (group)



Key Issues for Sustainable Management

K-water conducts materiality tests and reports on the priorities in order to effectively reflect various issues of the business environment and stakeholders that affect sustainable management. We reviewed GRI Standards and the 10 principles of UNGC, which are international guidelines on internal issues and sustainable management, and formed a pool of issues related to K-water's sustainable management through media analyses.

Materiality Testing Process

STEP 1 | Establishment of a pool of issues

In order to identify K-water's sustainable management topics, we conducted various internal and external environmental analyses. In addition to an in-depth media analysis, we derived 280 issues that are important to K-water through related company analyses, Trend & Impact analyses, government national project analyses, and management issue analyses.

Review of identified issues

- Internal project strategy and performance
- Sustainable Management Guidelines (GRI Standards, UNGC, ISO 26000, SDGs, etc.)
- Trend & Impact analysis
- Media analysis

STEP 2 | Selection of issues

Based on a total of 280 issues, we selected 32 key issues through the combination of similar and elimination of duplicating issues.

Analysis of identified issues

- Categorization of the issues

Elimination of low impact issues

- Omission of report topics that are deemed to have low impacts based on risk and impact

STEP 3 | Materiality test

We conducted a survey for key stakeholder groups, and a total of 453 people participated in the priority selection process. The priorities of the key issues were selected through the review of the importance from the perspective of stakeholders and the importance from the perspective of K-water's business, and strengthening the importance of securing human resources, increase in requirements of transparency and ethical management, and increase in requirements of water management safety were ranked at the top.

Criteria for evaluating key issues

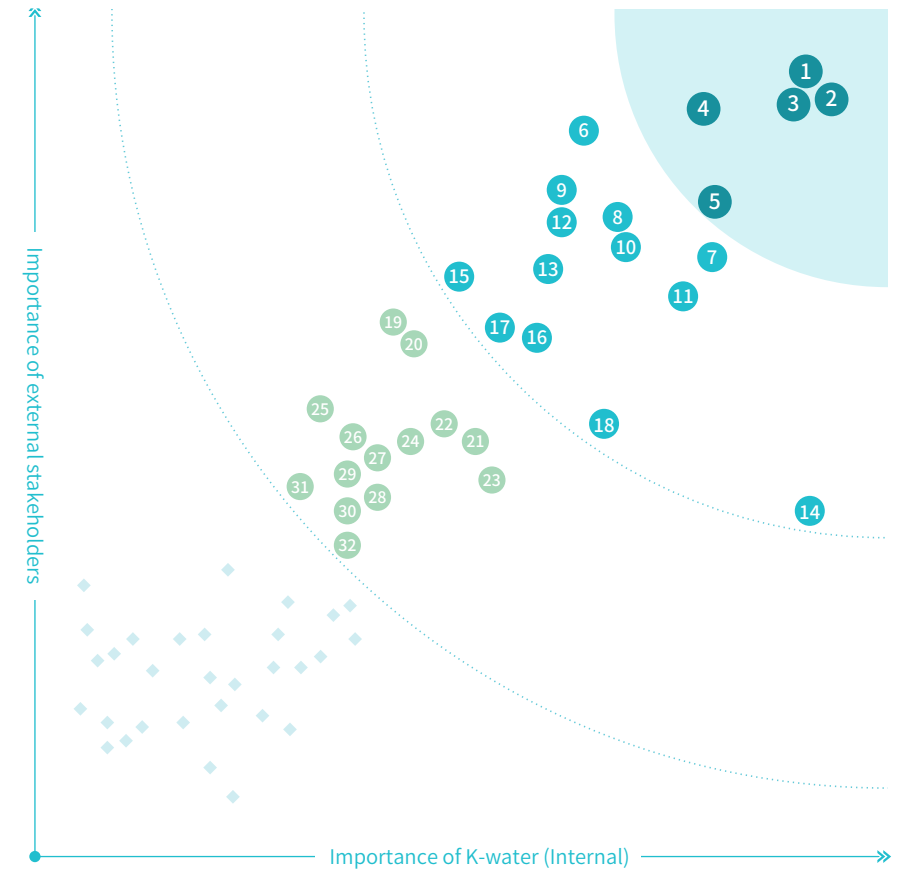
- A survey for internal and external stakeholders
- Interviews with internal and external stakeholders
- Analysis of stakeholder interests and business impacts

STEP 4 | Third Party Verification

In order to secure the objectivity and transparency of the materiality testing process, we conducted third party verification of the processes and topics. In the process of forming a pool of issues and evaluating priorities, we separately checked whether external stakeholders' opinions were fully reflected in the value chain

Third Party Verification

- Verification of the materiality testing process
- Verification of material topic-centered reporting



No.	Key Issues	Stakeholders	Sustainable management indicators		Impact		Page
			Classification	Issues	Internal	External	
1	Job creation and securement of human resources	Employees	Society	Employees / Indirect economy	●		
2	Increase in requirements of transparency and ethical management from enterprise	Employees	General	Transparent management / Anti-corruption	●		
3	Increase in the requirements for water management safety	Government, NGO	Environment	Water resources		●	
4	Environmental pollution prevention (air, water quality, soil pollution)	NGO, Local governments	Environment	Environmental pollution		●	
5	Climatic change	NGO, Local governments	Environment	Climatic change		●	
6	Depletion of natural resources (water resources, mineral resources, fossil fuel)	NGO, Local governments	Environment	Resource depletion		●	
7	Increase in requirements for fair trade	Partner companies	Society	Fair trade		●	
8	Increase in consumers who value health, eco-friendliness, and are pro-society	Customers (people)	General	Consumer rights		●	
9	Development of core technology for water management	Government, employees	Economy	Technological advancement		●	
10	Increase in diverse and advanced customer demands	Customers (people)	Society	Consumer rights		●	
11	Reinforcement of environmental regulations	NGO, Local governments	Environment	Environmental pollution	●		
12	Intensifying competition (technological development, patents, overseas expansion, etc.)	Government, employees	Economy	Economic performance	●		
13	Water use	NGO, Local governments	Environment	Water resources	●		
14	Increase in requirements of employee welfare and rights (Work-life balance)	Employees	Society	Employees	●		
15	Increasing interest in governance (responsible management)	Employees	General	Governance	●		
16	Increase in requirements of fair competition	Customers (people)	Society	Fair trade		●	

No.	Key Issues	Stakeholders	Sustainable management indicators		Impact		Page
			Classification	Issues	Internal	External	
17	Reduction of energy use (production of renewable energy such as hydropower)	Government, NGO	Environment	Energy		●	
18	Expansion of partnering company CSR (Environment, Safety, Labor, Human Rights, etc.)	Partner companies	Society	Mutual prosperity		●	
19	Increased importance on mutual growth with partners	Partner companies	Society	Mutual prosperity		●	
20	Increase in the requirements of customer information security	Customers (people)	Society	Information protection		●	
21	Customer satisfaction to products and services	Customers (people)	Society	Consumer rights		●	
22	Compliance with environmental laws and regulations	NGO, Local governments	Environment	Environmental pollution	●		
23	Anti-corruption	Employees	General	Anti-corruption	●		
24	Clients' health and safety	Customers (people)	Society	Health and safety		●	
25	Discharge of wastewater and waste	NGO, Local governments	Environment	Environmental pollution	●		
26	Easy access to company information (Internet, SMS)	Customers (people)	General	Transparent management		●	
27	Social contribution to local communities	Customers (people)	Society	Community		●	
28	Compliance with social sector laws	Employees	Society	Anti-corruption	●		
29	Increased youth unemployment and non-regular workers	Customers (people)	Society	Employees / Indirect economy		●	
30	Population trend (aging, low fertility, etc.)	Customers (people)	Society	Community		●	
31	Indirect economic effects through water resources development and supply	Government, people	Economy	Indirect economy	●		
32	Economic performance (creation and distribution of economic value)	Employees	Economy	Economic performance	●		

036 Management Approach (MA)

038 Water Safety Services

048 Water Sharing Services

055 Water Convergence Services

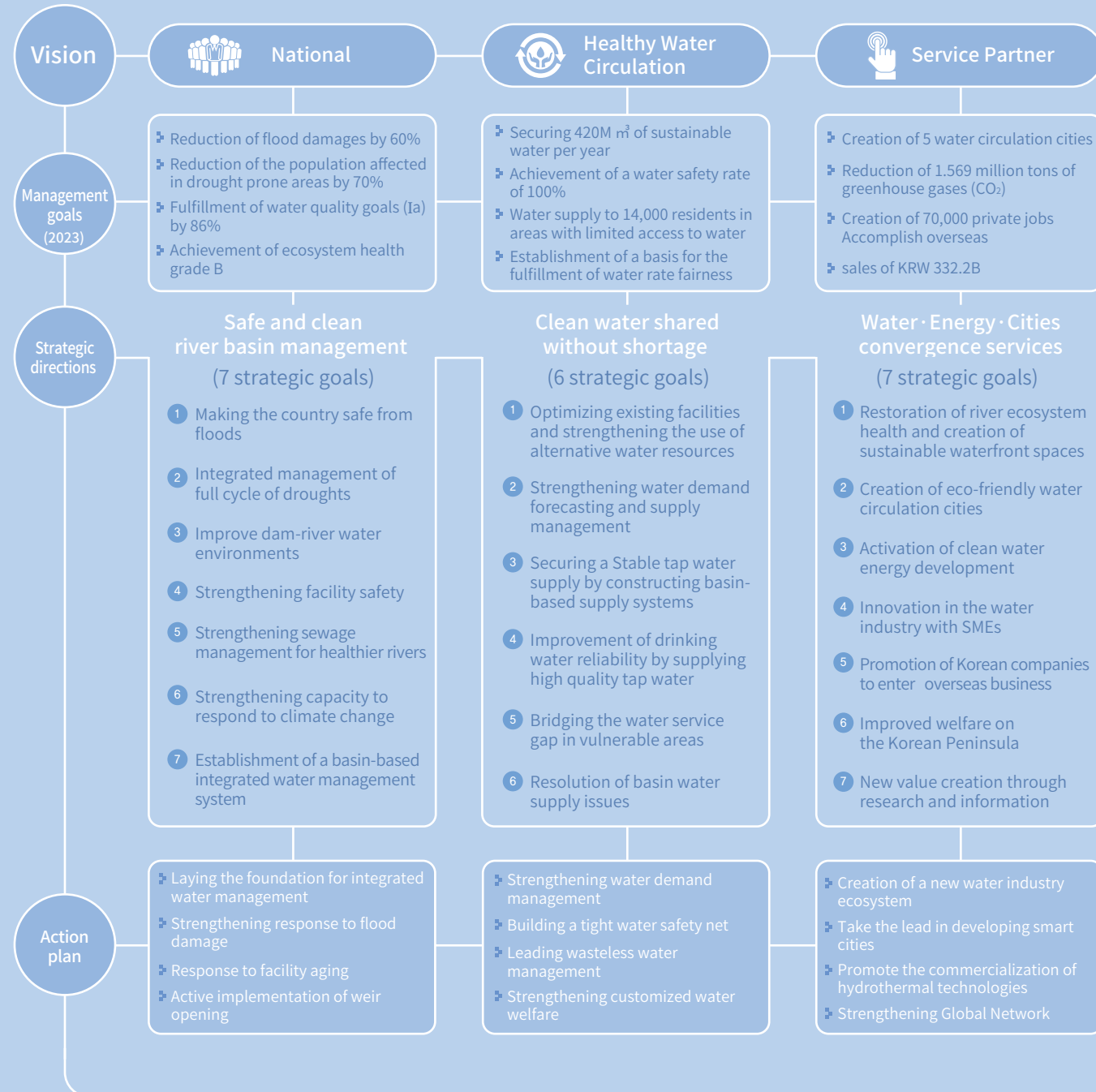
 Multiply

Water Welfare
for All People

Management Approach (MA)

K-water implemented the unification of water management for the first time in 24 years. K-water, which celebrates its first year of national integrated water management has been expanding integrated water management by taking into consideration water quantity, water quality, and ecology. In addition, we are to actively promoting facility stabilization projects to prevent water disasters such as flooding and drought in vulnerable areas that could severely impact local governments and residents in those areas.

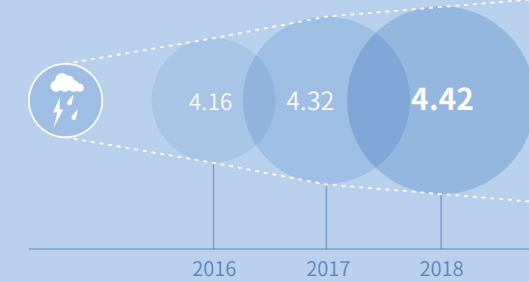
Project Promotion Strategies and Future Plans for the Unification of Water Management



Major project performances

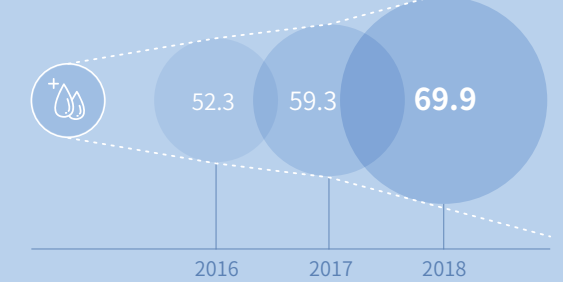
Flood control capacity achievement rate

(Unit: m/s/million m³)



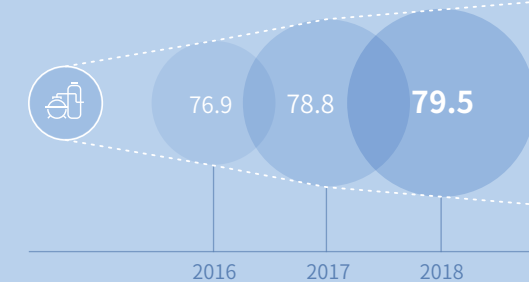
Reserve rate secured for potential droughts

(Unit: %)



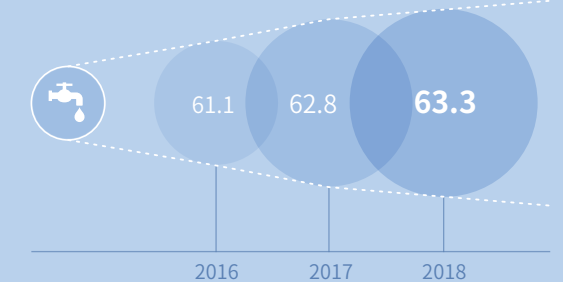
Utilization of water facilities

(Unit: %)



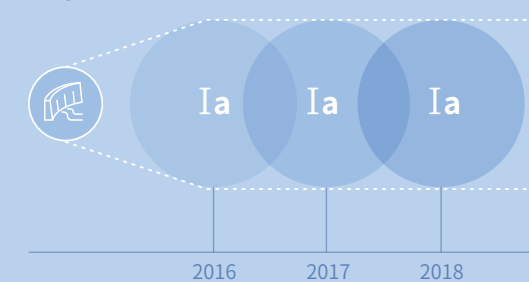
Utilization of water supply facilities

(Unit: %)



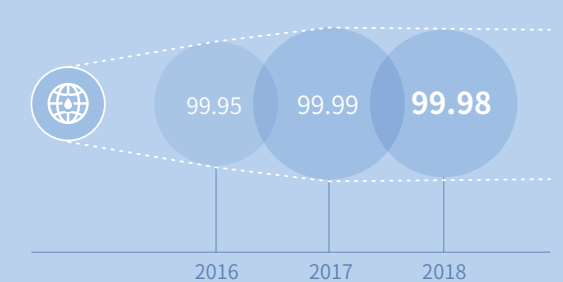
Dam-reservoir algal concentrations (Chl-a) grade

(Unit: grade)



Global water quality standard achievement rate

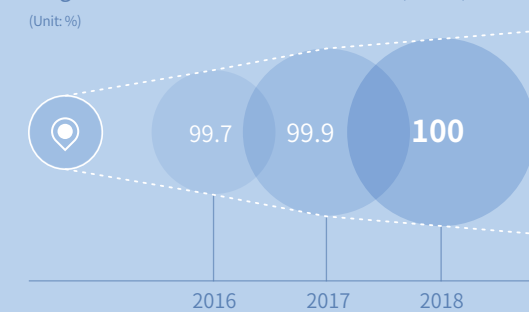
(Unit: %)



Large-area waterworks flow rate

(Unit: %)

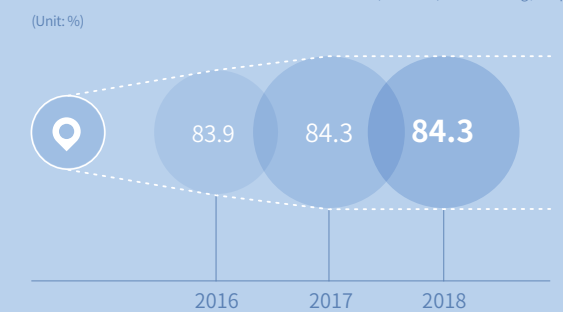
* (Flow rate) Meter reading / output



Local waterworks flow rate

(Unit: %)

* (Flow rate) Meter reading / output

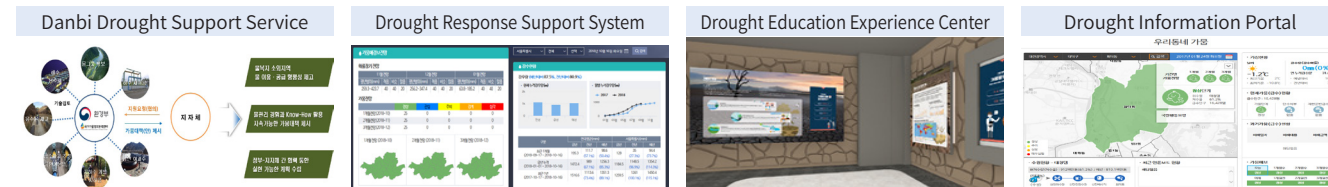


Water Safety Services

Establishing a basin-based integrated water quality-water quantity management system according to the unification of water management, K-water strives to ensure the safety of the people from water disasters such as floods, droughts and water pollution. In particular, we will reinforce the role and responsibility of water quality and water ecosystem management through the unification of water management as a specialized water management institution, and actively develop and introduce the latest technology for responsiveness to climate change to provide healthy and clean water.

Strengthening the prevention of and response to drought damage through local customization and citizen participation

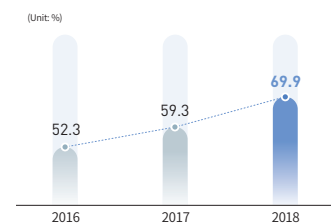
Supporting the establishment of customized drought countermeasures for drought-prone areas based on big data analysis to minimize the drought damage of local governments ('Danbi' service), K-water has established and distributes a 'drought response support system' so that local government personnel can monitor drought conditions in the region and make quick decisions. We are also working hard to prevent national drought damage and strengthen our ability to respond while operating a 'national drought information portal' that provides localized drought information to implement a drought response system that allows the citizens to experience and participate. As well, the Drought Education Experience Center in K-water provides the public with the opportunity to recognize and experience the seriousness of drought.



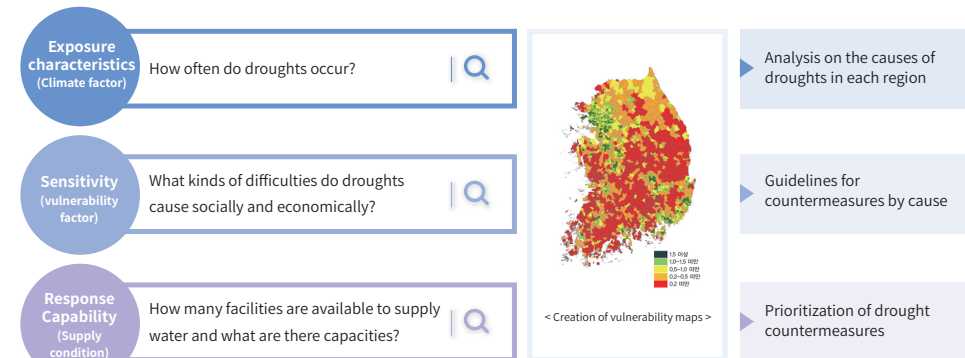
Integrated management on the full cycle of droughts

K-water develops and provides transparent drought information services so that the people can have access to the integrating drought information system which provides stakeholders with relevant information that can be used to enhance response capabilities even in abnormal weather. We have also strived to establish a national drought decision support system that provides regional drought characteristics and vulnerability evaluations. We have also integrated drought information produced and provided by other institutions and sectors (weather, agriculture, biotechnology). Through these efforts, we have established a drought information production system the people can experience, evaluate local vulnerabilities and strengthen the support system for establishing drought countermeasures. In 2018, we established a guideline for evaluating drought vulnerability and establishing vulnerability maps. Based on the guideline, we built vulnerability maps in stages to supplement drought vulnerability maps by periodically evaluating drought exposure, sensitivity, and adaptability that vary from region to region. In particular, in order to enhance our ability to respond to extreme droughts, we will build a water supply and demand system based on performance data and improve drought forecasting and evaluation techniques to respond to droughts.

Reserve rate secured for potential droughts

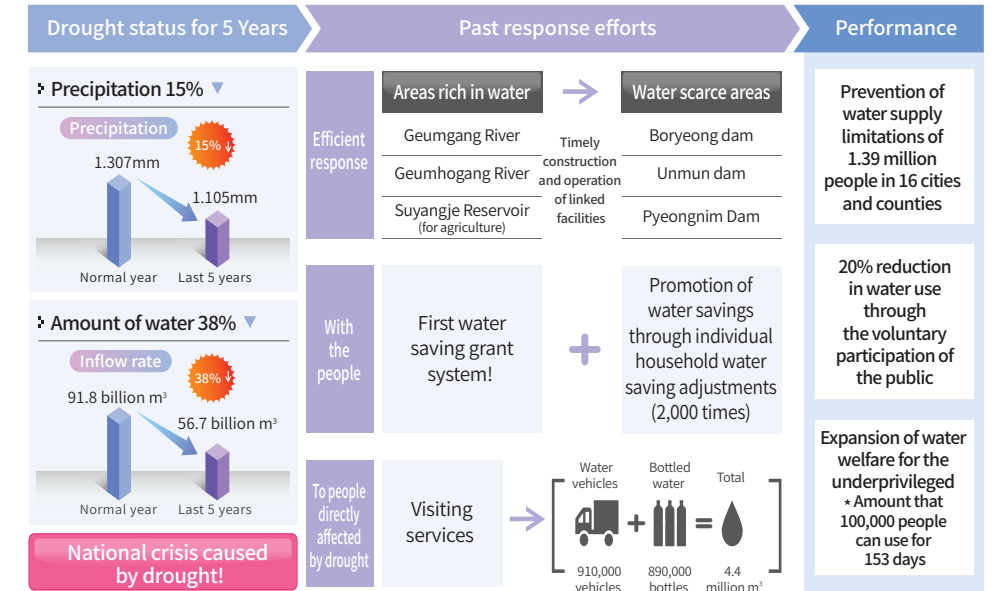


Drought vulnerability map



Overcoming long-term droughts

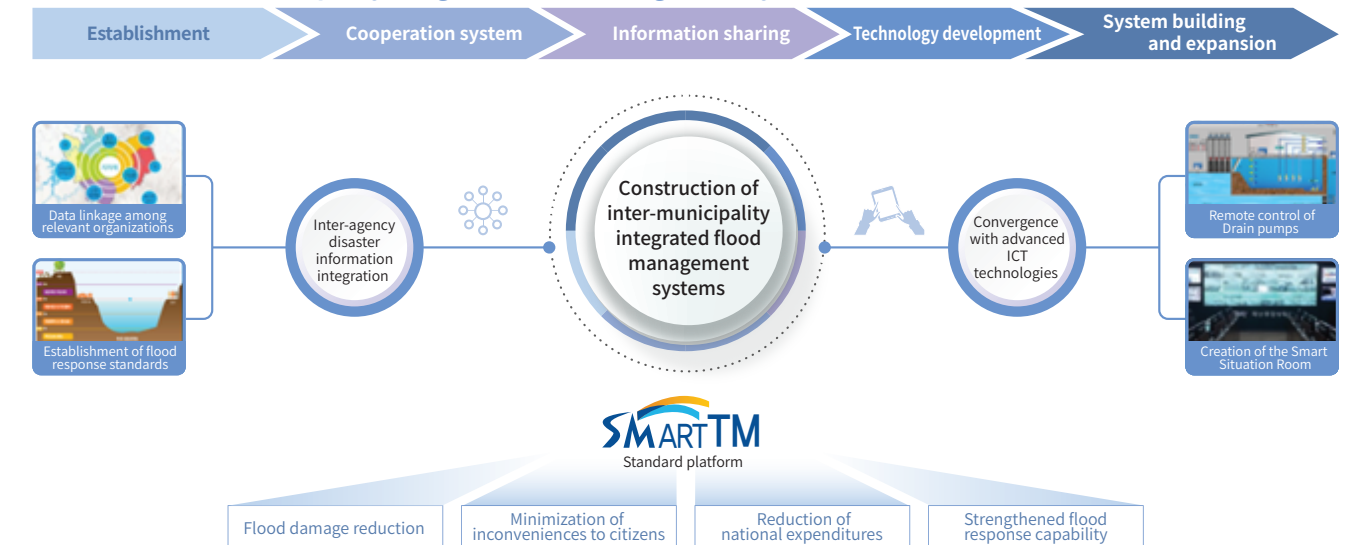
Based on these efforts, we were able to completely overcome the worst ever five-year long-term drought, while also practicing water saving with the public by expanding education and information services such as customized education for each local government, the opening of drought portals and experience-type information, and setting up drought experience centers. By doing so, we were able to reduce water usage despite record-breaking heat waves.



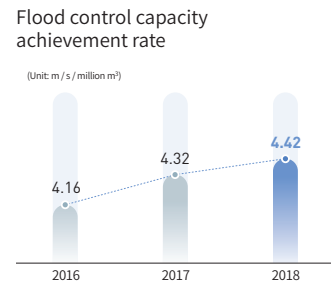
Operation of the 'Integrated Flood Management System' to Prevent Floods in Small and Medium Rivers

Prevention of floods in small and medium rivers is important, as 87% of natural disasters are caused by typhoons and heavy rains among which 98.7% occur in local small and medium rivers. In order to prevent damages in and around small and medium rivers managed by local governments based on various water management experiences and technologies accumulated over 50 years, K-water applied the 'Integrated Flood Management System' developed in collaboration with the Ministry of Environment (Flood Control Office), Rural Community Corporation and Korea Meteorological Administration, etc. As a result, we are strengthening our cooperative network with local governments to minimize casualties and damages by expanding and building preventive and advanced disaster prevention systems. These systems have minimized flood disasters in 22 local governments based on enhanced flood response capabilities.

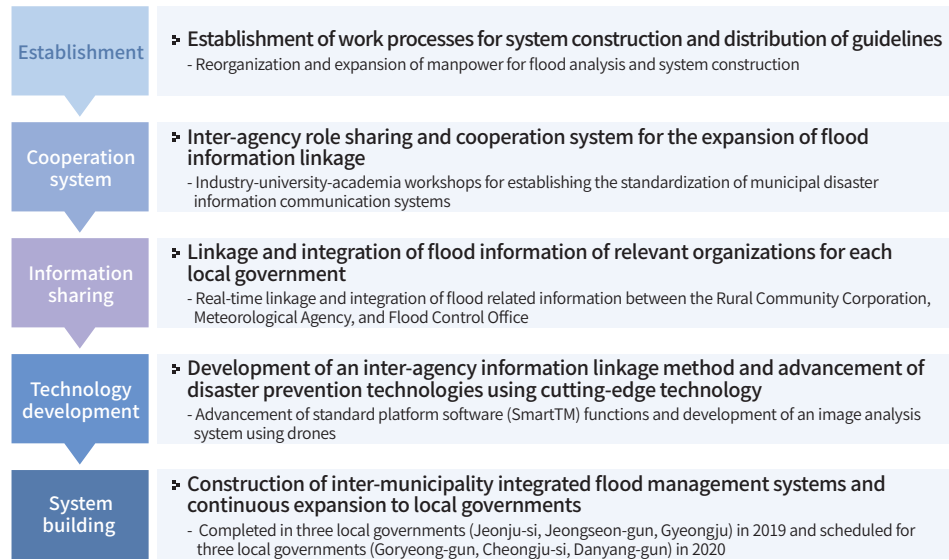
Overview of inter-municipality integrated flood management systems



*SmartTM: K-water's disaster management software that provides information collection, storage, presentation, remote monitoring and control functions, and integrates communication systems with different systems or devices.



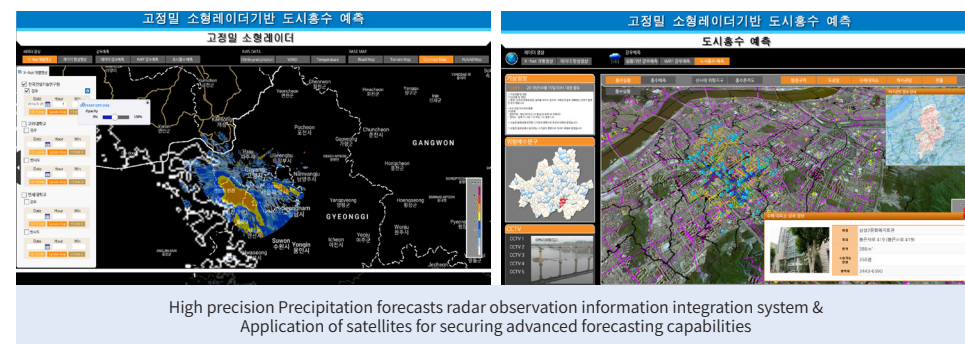
Integrated Flood Management System Construction Process



Ensuring Korea is a flood-safe country

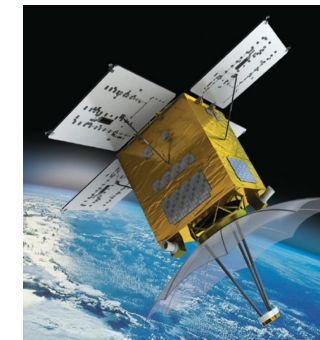
K-water has established a system for rainfall forecasting, flood analysis, and flood response using advanced technology as well as an advanced preemptive flood response system by upgrading the entire flood preparation and response processes. In preparation for climate change in the global village, we will realize a safe and secure society where the Korean people are safe from floods. In particular, we are supporting the enhancement of municipal flood management capabilities by carrying out the 'Development and Commercialization of Urban Local Flood Forecasting Response System', an R&D project of the Ministry of Environment as well as building a smart urban flood forecasting warning system. In the future, we are planning to expand the pilot project operating in Seoul to other local governments by selecting high-precision rainfall observation points, expanding radar installation and developing operating technology. In addition, we established an integrated urban flood observation strategy to improve the accuracy of flood forecasts, developed local flood observation systems and flood forecasting technologies customized to the region, and developed high-precision hydro radar-based rainfall forecasting technologies to provide customized smart urban flood management centered on citizens and local governments.

Application of satellites for securing advanced forecasting capabilities



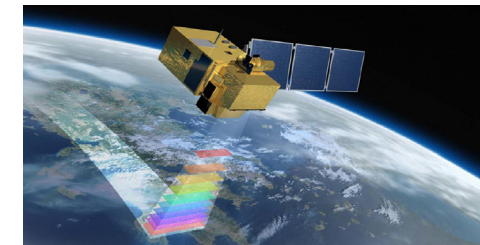
By establishing the 'Research Center for Water Satellite Utilization', the K-water Research Institute aims to secure satellite-based water disaster response technology and upgrade it as a national institution when the satellite is launched. In 2021, we will develop core technologies for water resources and water disaster management using satellites, accumulate global technologies for water-related satellite development projects, and discover subsequent satellite projects with the purpose of satellite production and launch in 2025.

Characteristics of the water satellite's operation



* Acquiring image data of the entire Korean peninsula 2 times / day and creating and providing water disaster-related thematic maps

Overview of water satellite	
Payload type	C-band SAR (Image radar)
Channel	5.4 GHz
Observation width	120 Km or more
Resolution	10m x 10m or less
Weight	150 kg or less
Volume	Ant. Ø : 3m x 1.2m
Operating altitude	562 km
Re-visit cycle	2 times / day (Observation of the entire Korean Peninsula)
Operation period	More than 4 years



③ Sentinel2 Satellite (European Aerospace Agency)

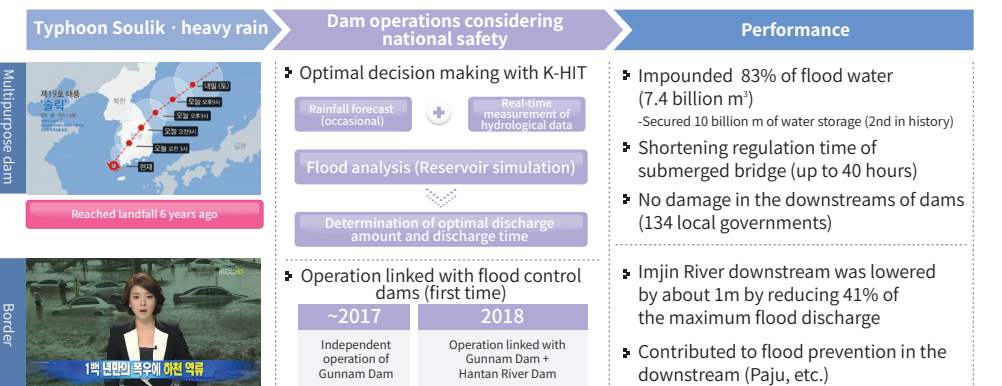


④ Han River Satellite Image Green Algae Analysis Case (September 2017)



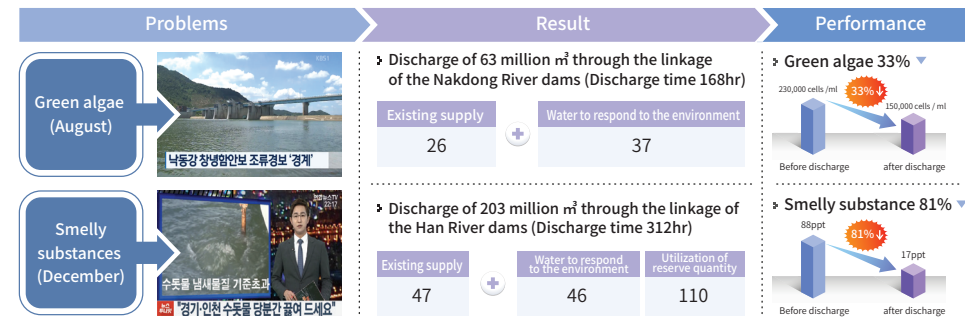
An integrated water management operation system that consists of 7 systems in 5 fields that combine K-water's water management experience and the latest ICT technology

In addition, we are conducting a preliminary study to introduce the flood control capacity system, which is a system to prevent damage in or around small and medium-sized rivers, such as the equal distribution of floods, flood volume allocation by small basin, and various alternatives. In the preliminary research, we are establishing various flood protection alternatives by establishing natural rivers, securing permeable areas, and installing reservoirs that can be applied within the current system, such as the integration of national plans, stabilization of laws, and application of pilot basins. As a result, despite the heavy rainfall of 'Soulik', a typhoon that reached landfall six years ago, optimal dam operations protected 134 local governments from flood damages by improving the flood management system and implementing dam level controls preemptively before the typhoon reached land.



Creation of Dam-Stream Water Environment Improvement Effect

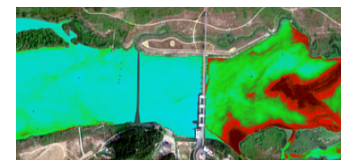
As environmental values have become an important part of the water management policy decision process, K-water has improved its water management system by focusing on the improvement of the water environment, including water quality and ecology. We improved the standards for securing water to respond to the environments of 10 dams in 2018 to supply water as needed. In total, 154 millionm³ of water was secured, the largest amount since 2014, when the policy to secure water was first introduced to respond to the environment. The timely discharge of water to respond to the environment has alleviated abnormal water quality phenomena, including a 33% reduction in the green algae in the Nakdong River and an 11-day reduction in the number of the day when odor are caused in Paldang Dam.



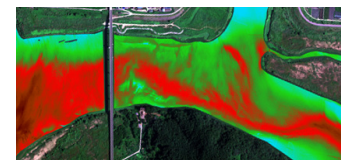
Self-development water quality forecasting system

K-water manages the entire water quality management cycle of dams and rivers by establishing a 'surveillance - forecasting - prevention - action - research' response system. We conduct scientific monitoring using cutting-edge technology such as water quality surveys, real-time CCTV, unmanned aircrafts, and satellites, and develop Korea's only self-development water quality forecasting system (SURIAN) for preventive water quality and green algae management.

Unmanned Aircraft Green Algae Monitoring Case

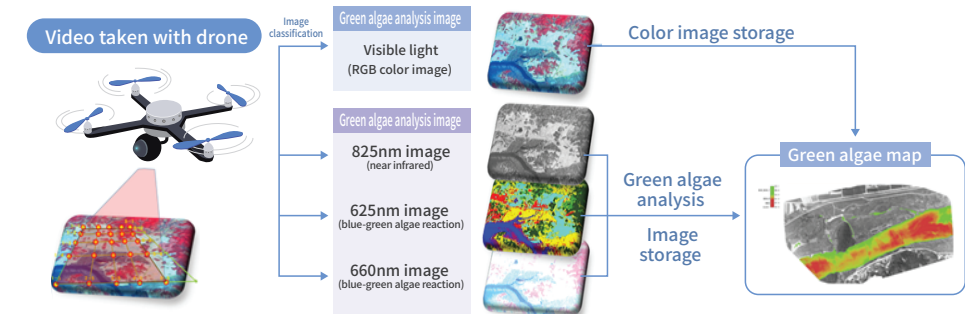


Baekje Weir (August 8, 2018)



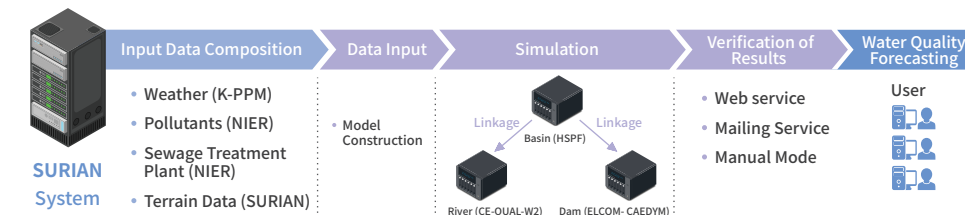
Yulji Bridge in the upstream of the Nakdong River Hapcheon Changnyeong Weir (August 1, 2018)

Overview of unmanned aircraft (drone) green algae monitoring technology



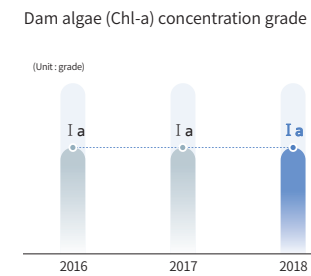
Fast and accurate forecasting of water flow and water quality is essential for safe water management. With the K-HIT package (2012), an intelligent integrated basin water management decision-making support tool that integrates weather forecasting, hydrological observations, flood analysis, water supply, and power generation, K-water develops and operates SURIAN (SUpercom based River Analysis Network) (2013), a 3D water quality forecasting model based on supercomputing linking weather-basin-dam-river. Based on this forecasting technology, we have been conducting daily water quality forecasts (6 items: algae, water temperature, biochemical oxygen demand, total nitrogen, total phosphorus, suspended solids) for 27 dam reservoirs and rivers nationwide since February 2014. Since March 2015, K-water's website has been providing algae forecasts for eight major dams. We also forecast weekly and monthly green algae and provide information to related organizations and the public in real-time.

Integrated Water Quality Forecasting System



Green algae reduction activities

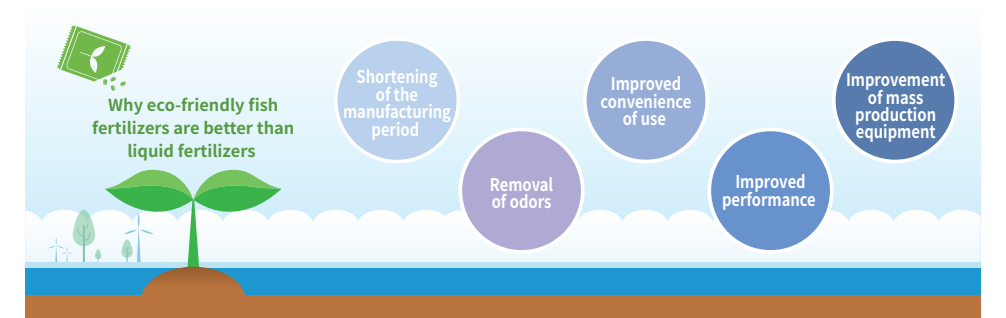
K-water makes every effort to reduce green algae before and after the occurrence by checking and taking measures of major pollutants in advance that cause green algae and directly removing them using removal technologies such as water circulation devices and algae removal vessels. In order to preemptively respond to green algae, we established a real-time monitoring system by installing a real-time analysis device for algae odorous substances in major water systems (Paldang (Hangang), Cheongju (Daecheong Dam), and Gumi (Nakdonggang)). In addition, we are operating the algae odor forecasting system in the Bukhan River basin system (Cheongpyeong, Uiam, Paldang Dam), and expanding it to the Nakdong River basin system. By participating in the "Inter-ministry Green Algae Research Council" with the Ministry of Environment and the National Institute of Environmental Research, etc., we are developing highly efficient green algae removal and suppression technologies in dam reservoirs and rivers. In the waters where green algae have occurred, we have increased the discharge through dam-weir linkage operation and removed the algae in an eco-friendly way by collecting them with mobile algae removal vessels (Daecheong Dam So-ok cheon) without having to settle the algae.



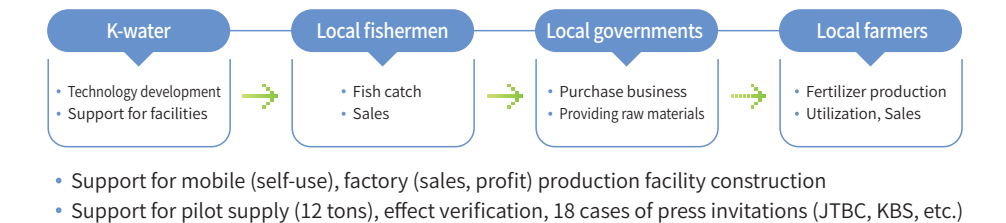
Development of eco-friendly fertilizer to protect aquatic ecosystems

In order to effectively remove harmful fish species that threaten aquatic ecosystems and cause damage to residents, K-water has developed Korea's first technology to reproduce harmful fish species with eco-friendly fish fertilizers after joint research with local universities and SMEs for three years from 2016. This is a core source technology that can be applied to all dams, rivers, and lakes across the country. It is not only able to protect the aquatic ecosystem through the 'recycling of ecological disturbance species' but also to increase income and create jobs by 'discovering new projects in the aquatic sector'.

Advantages of eco-friendly fish fertilizer



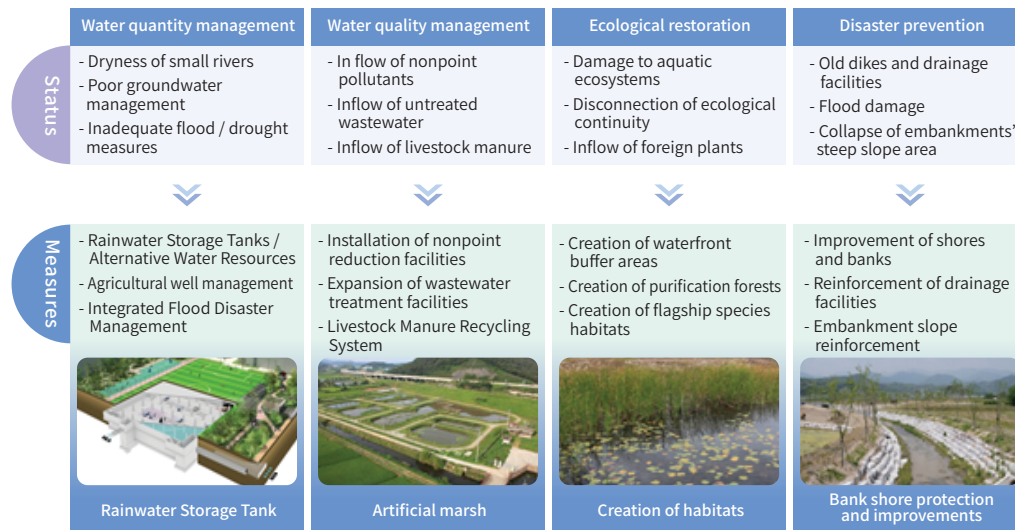
Eco-Fertilizer Production Procedure



Creation of a healthy water environment

K-water promotes ecosystem conservation measures such as young fish releases, eradication of ecosystem disturbance species, using them as resources, and creation of fish spawning areas to restore the health of aquatic ecosystems in dams. In addition, we establish a comprehensive basin plan to reduce pollutants from the upstream of dams to improve the fundamental water quality and ecosystem and strive to secure healthy water to maintain a sustainable ecosystem by carrying out projects such as eco-filtering and integrated upstream water recovery, which are eco-friendly water quality improvement technologies.

Upstream water improvement application technology

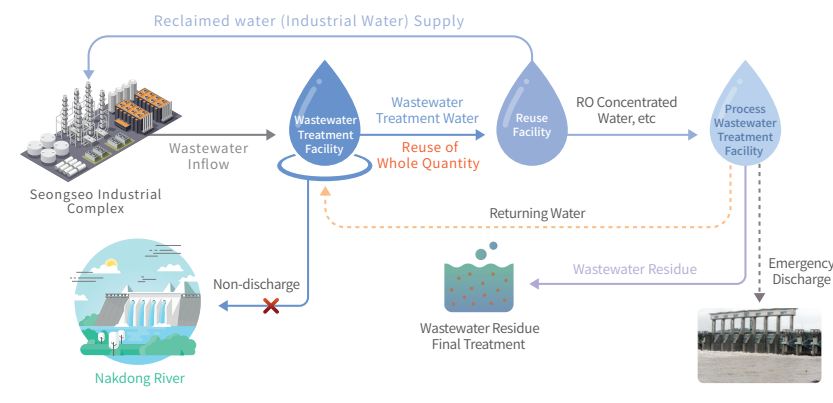


In addition, we will contribute to the improvement of water quality and secure safe water sources by blocking the inflow of pollutants from industrial wastewater into the water system by participating in projects to recycle wastewater from public wastewater treatment facilities as industrial water.

Seongseo Industrial Complex Wastewater Treatment Water (whole quantity) Reuse Project

- Service name :** Feasibility study and establishment of the basic plan for reuse of treated wastewater water (whole quantity) from the public wastewater treatment facility in Seongseo Industrial Complex
- Period / scale**
- 22 months, 2 billion won (1.4 billion won of national expenses, 600 million won of local expenses)
- Contents**
- Feasibility study by discovering industrial water clients and operating pilot plants
- Establishment of basic plans such as facility planning and project cost calculation of wastewater treatment water reuse facilities

Wastewater Treatment Water (whole quantity) Reuse Project (draft)



Enhancement of sewage management for healthy rivers and activation of reuse

K-water aims to contribute to restoring the health of the water cycle while fulfilling public responsibility by improving the quality of rivers through the integrated management of sewage in dam basins and repair of old facilities. In addition, we are securing sustainable alternative water resources and establishing a sound water circulation system by activating water reuse.

Establishment of the basic plan for water reuse (2021 ~ 2030)

- **Related law :** Act on the Promotion and Support of Water Reuse
- **Contents :** The governments' most significant plan related to water reuse such as rainwater use, reclaimed water, treated sewage and wastewater water to secure sustainable water resources
- **Organizer / Cycle :** Ministry of Environment / 10 years
- **Period / Amount :** August 2019 ~ November 2020 (16 months) / KRW 1,500 million

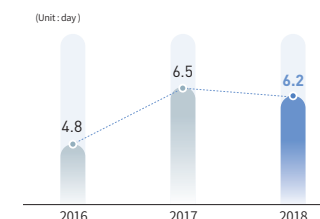
Strengthening the safety of facilities

K-water strives to establish a preventive safety management system against disasters such as earthquakes or facility failures. We prevent facility accidents by securing facility safety and advancing safety management technologies. To this end, we have developed job training programs for dam facility management, revised relevant manuals, and preemptively respond to increasing dam safety threats such as aging infrastructure and earthquakes, by establishing appropriate manpower and budget standards for dam operation and maintenance.

Modernization Project for Obsolete Hydraulic Equipment

- **Contents :** To enhance the capacity and efficiency of obsolete hydropower facilities (water turbine power generation facilities, outdoor substation facilities) with the useful life of 40 years and secure operational stability.
- **Target :** 10 hydroelectric power 22 units 979.7MW
- **Period / Project cost :** 2013-2030 / 641.2 billion won
- **Status :** 2 locations completed (Andong, Hapcheon 2), 3 locations in operation (Namgang, Daechong, Hapcheon 1) 4 places scheduled (Soyanggang, Chungju, Juam, Imha Dam)

Failure of power generation facilities (days)

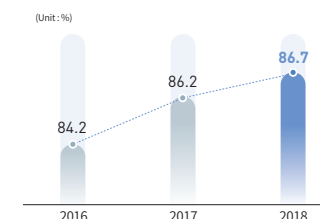


In the future, we are to establish a cultivation and training system for identifying professionals by developing customized career paths and educational programs for each field. In addition, we are upgrading our diagnostic technology using AI and expanding the certification of diagnostic equipment and techniques, as well as strengthening our technological capabilities through technology sharing and joint development with SMEs.

Measures to strengthen water infrastructure diagnosis technology capabilities

- **(Technical support)** 119 Technical Support System to solve local government water supply issues
- **(System improvement)** Amendment of the Waterworks Law to conduct integrated diagnosis of water facilities (water purification plant pipeline)
- **(Overseas market)** TA project expansion, technical support for new projects, linking hydropower facility diagnoses with agencies such as KOICA

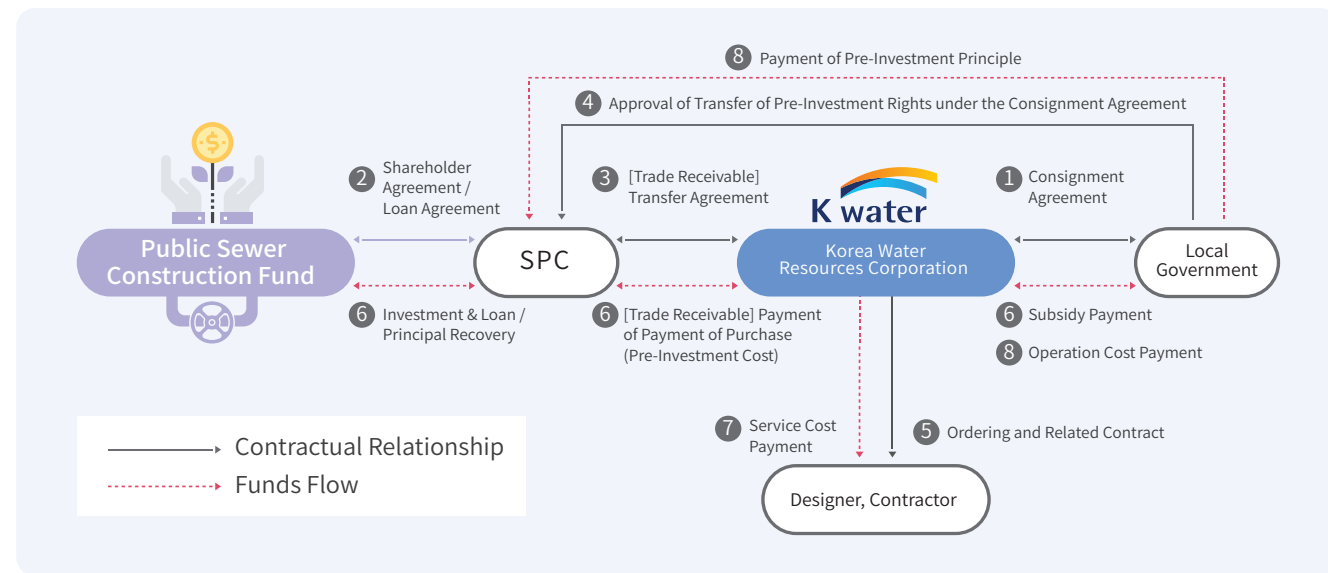
Dam safety grade achievement rate



In preparation for climate change, K-water is creating a land that is resistant to disasters by strengthening its response to water disasters and enhancing the stability of water resources facilities. We are to improve water management efficiency and disaster response capabilities by organically integrating diversified water quality, water quality, ecology, and disaster response functions. Through such sustainable water management, we are striving to make changes in the water environment that people can feel.

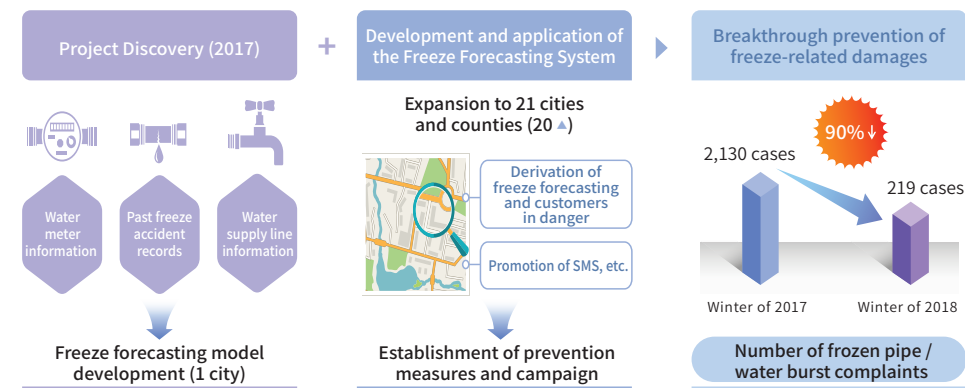
Although odor complaints are increasing due to the rapid degradation of sewage facilities of local governments, we are committed to improving their facilities and resolve local needs through the K-water Water Industry Fund for local governments that are suffering from financial problems. In addition, we work with private companies to establish an integrated small sewage operating system in the upstream of dams and contribute to water quality improvement.

K-water Water Industry Fund



Data-based proactive water management

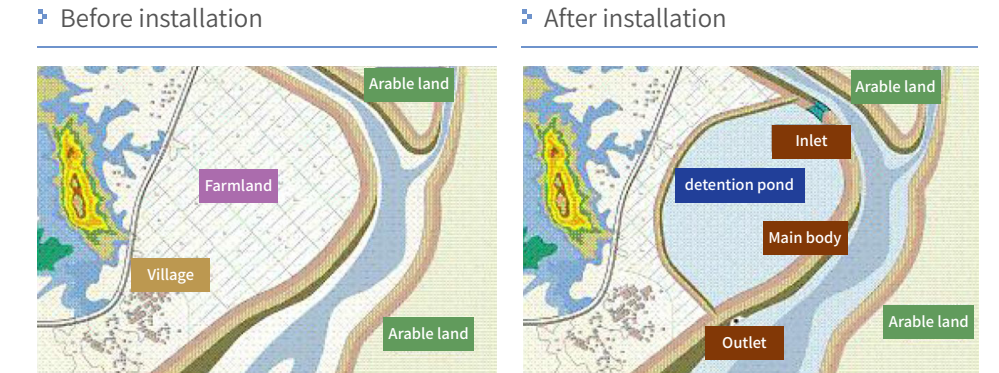
K-water strives to maximize its technological performance by establishing a virtuous cycle of integrated lifecycle management (planning, selection, development, and management) in the technology field, and to develop and introduce technologies for preemptive prevention. In this process, we have secured 82 core technologies that the public can experience, including the removal of algal toxins in water purification plants and the application of hydrothermal energy. In addition, as it was necessary to create an environment to expand the analysis, utilization, and sharing of big data, we established a big data platform (K-big) and developed an error detection algorithm. Thus, The Ministry of science and ICT selected K-water as an official "Big Data Center" and received the Excellent Data Quality Award for the improvement of data quality. The commercialization of the Freeze Forecasting System was used to reduce the number of freeze complaints by 90%, thereby improving public services.



Introduction of decentralized water management facilities

K-water is promoting the introduction of eco-friendly small and medium-sized multi-purpose water detention ponds, which are decentralized water management facilities that can respond to various water disaster situations. The World Committee for Dams (WCD) has presented a multipurpose water detention pond as a water bowl against climate change. In addition to droughts and floods, the WCD has adopted a low-impact development standard to cope with both environmental and climate changes.

Conceptual diagram of water detention ponds



Establishment of a basin-based integrated water management system

By Integrating water management plans and establishing basin water management plans in line with the reform of the national water management system, K-water is operating governance and legal and system improvements to settle basin-based integrated water management. We are securing competitiveness from the water management planning stage by diagnosing the current level of water circulation systems such as water quantity, water quality and water ecology, and preparing the improvement direction in advance.

Water disaster prevention

- Timely operation of Munmun Dam Emergency Water Supply Facilities prevents limited water supply to 4 cities and counties (880,000 people) including Daegu
- Promotion of integrated flood management support for local governments (36 locations)

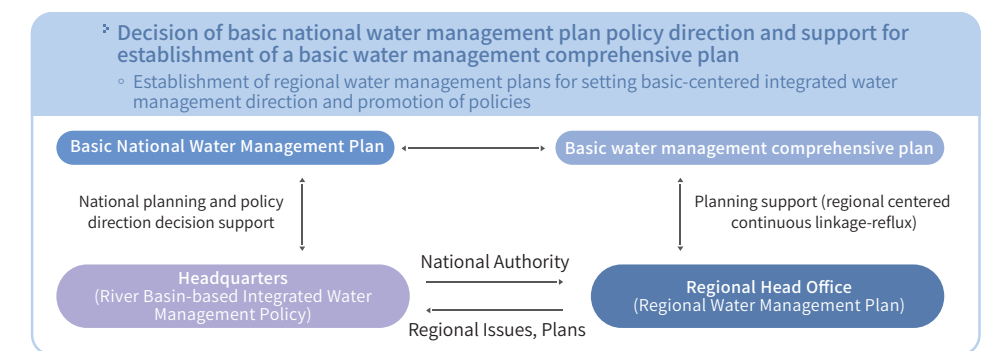
Strengthening of water rights

- Direct supply of water to farming and fishing villages that have no waterworks (Solving water problems for 100,000 people)
- Resolved salt damage complaints and solved water shortages at Yeosu National Industrial Complex by discharging impounded water from Seomjin River Dam (65 million m³ / year)

Settlement of water disputes

- Establishment of a foundation for resolving conflicts by activating basin governance and reestablishing relations with NGOs (Companion)
- Proposed measures through the establishment of local water resources management plans (Gangwon, Gyeongbuk)

Direction of the National and Basin Water Management Policy and Plan Support System



We are to realize the residents' water autonomy by activating the Basin Water Management Committee and Regional Mutual Prosperity Committee, which are communication channels between small and medium-sized regions and community governance and support the operation of the Water Management Committee by establishing a plan to form the National · Basin Water Management Committee and presenting policy directions, such as operating system guidelines, etc. Through this, we are to support the settlement of basin integrated water management by providing preemptive solutions for local water problems. In addition, we will reduce the waste of budgets through the unification of water management and lay the foundation for efficient water management through the coordination of overlapping projects.

Water Sharing Services

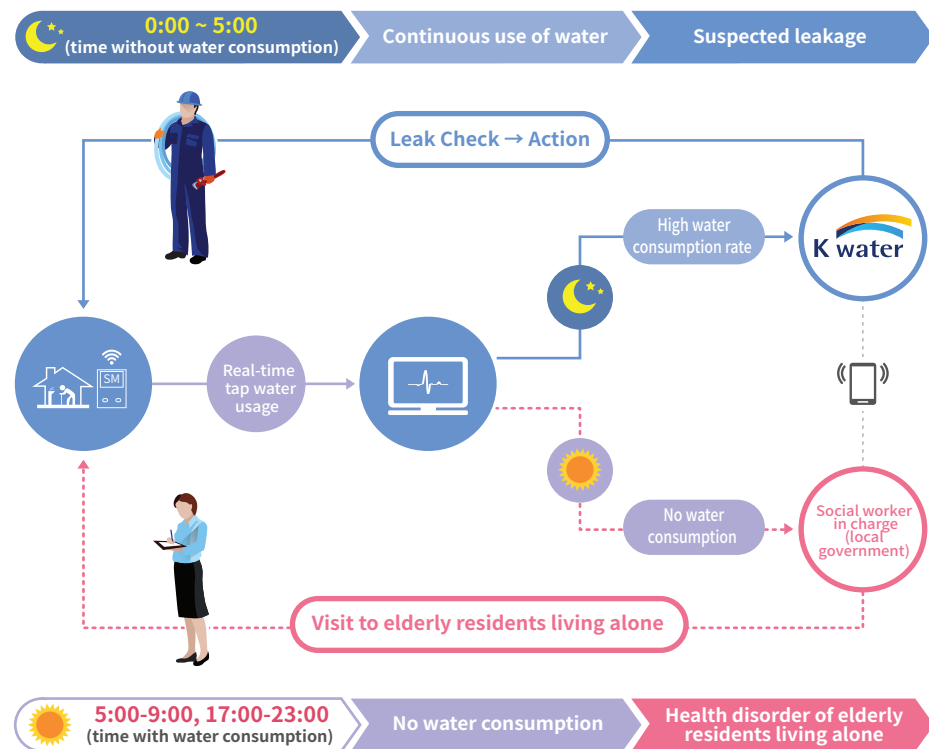
As it is necessary to secure a sustainable water quantity by utilizing existing water resources facilities without developing large-scale dams, reusing water, and strengthening demand management, K-water has switched its divided large area-local waterworks into a basin-based integrated supply system. In addition, in order to improve the stability and efficiency of water supply, we are improving the equity of 'water quantity, water quality, and rates in areas with limited access to water, and fulfilling our social responsibility and public role of as a public enterprise. In the future, we will provide high-quality tap water as well as tap water services that all people can trust by resolving clean water conflicts between the regions.

Establishment of a social safety net including smart meter reading

K-water has built a 'social safety net service' for vulnerable groups such as the elderly living alone by combining water services and innovative technology. Local waterworks business sites commissioned by K-water are mostly located in rural areas with a large number of elderly residents, and we strive to protect the socially disadvantaged including the elderly by building a compact welfare safety net using a public service called 'water meter reading'. In particular, by building a service that uses IoT technologies such as smart meter reading and big data to monitor the water usage patterns of the elderly living alone and identifies the use of water at a certain time to determine potential crisis situations, we received recognition for our achievements. For example, K-water was awarded the Ministry of Environment's Best Practice Case for Government Innovation (October 2018), the Prime Minister's Award for Best Practice Competition of the Government (December 2018), and the Ministry of Public Administration and Security's National Participation Innovation Task (February 2019).

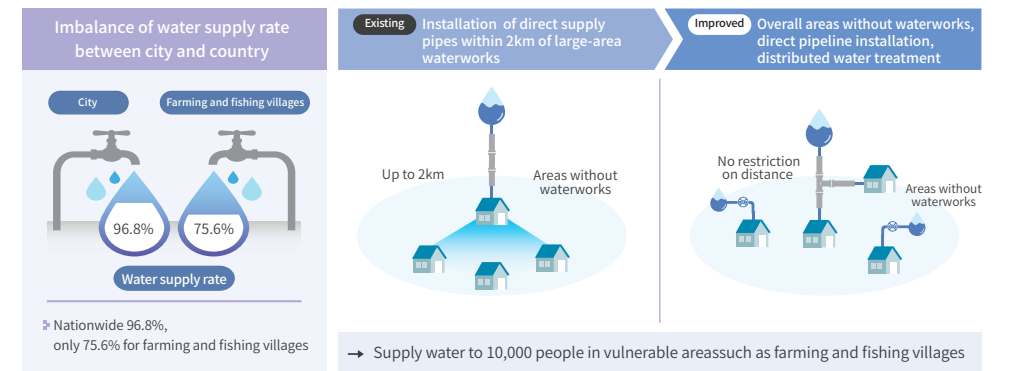
Establishment of social safety net through smart meter reading

- Pilot Project (2017)**
 - Alert service for the elderly living alone through IOT-based remote meter reading
 - 337 SMS (28 households in Goryeong-gun)
- Expansion (2018)**
 - Expansion of services + new services (114 households in 3 counties)
 - A new service for meter readers to find vulnerable groups directly
- Advancement (2019 ~)**
 - Combined service (Enhancement of welfare for the elderly + tap water reliability)
 - 1,000 households in all entrusted local governments

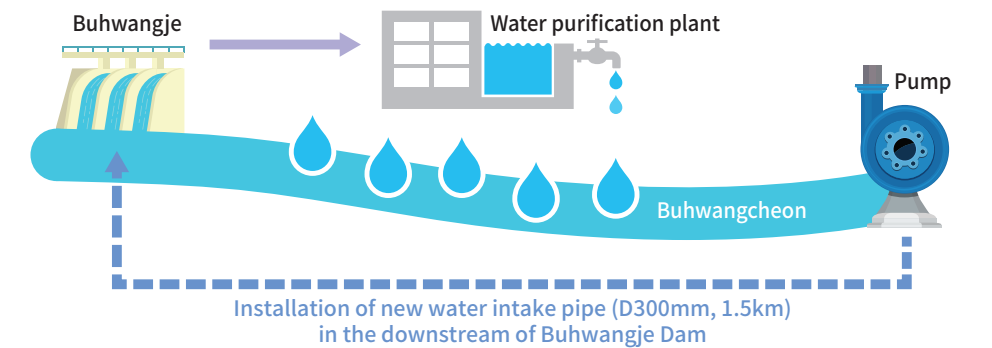


Supply water to remote farming and fishing villages that are without water supply services

K-water is promoting a project that directly supplies its large-area waterworks to farming and fishing villagers who typically relied on groundwater or spring water and suffered from water shortages and water pollution. In particular, K-water shared 50% of the cost of local governments to alleviate their financial burden and enhanced the water rights for 10,000 residents in local governments by promptly supplying tap water from large-area waterworks tap water to areas without waterworks in Sejong City. We also resolved the water supply problem without developing a new water source by installing water intake pipes to transfer the downstream river water when it rains to the island villagers who are suffering from water shortage due to limited water supply reserves of water supply sources.



Securing water supply sources by using downstream river water of island areas

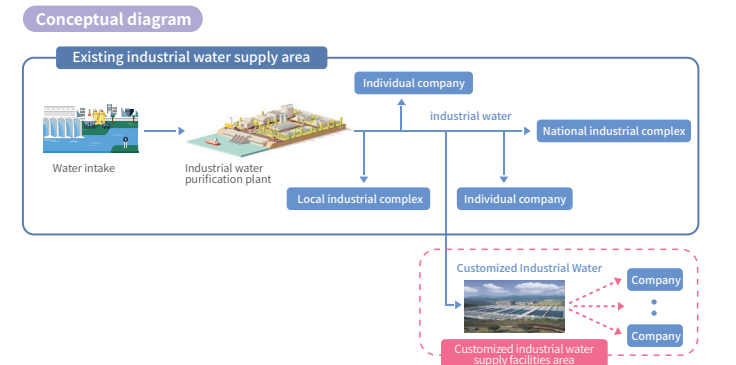


Optimizing Existing Facilities and Strengthening the Use of Alternative Water Resources

K-water effectively responds to water disasters and secures water by strengthening the linkage between existing dams. By devising measures and plans to evaluate the water supply stability of existing dams, we have established technical support and cooperation systems with related organizations to strengthen and operate water management functions such as responses to floods and droughts in multipurpose dams. In addition, to secure additional water to meet the demand for industrial water according to the expansion of new industrial complexes and individual companies, we will develop large-scale seawater desalination plants and advanced technologies required for the installation, operation, and management of localized customized sewage reuse supply models.

Customized and Integrated Industrial Water Supply Project

Definition	A project method for producing and supplying industrial water according to the specific water quality required by a company or industrial complexes and for recovering the investment costs in return for the fee for use
Effect	Improving industrial infrastructure and enhancing investment efficiency by realizing economies of scale through the integration of customized water treatment services for companies, reducing corporate burden and strengthening national competitiveness
Case	Integrated Industrial Water Supply Project Customized for Daesan Seaside Industrial Area

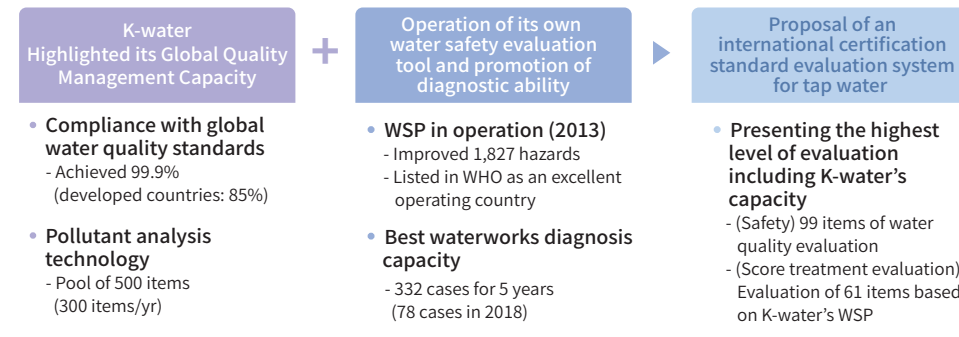


Production of healthy and safe tap water

We are operating a water safety management technique and a water treatment process diagnosis program to reinforce our healthy tap water production system that everyone can trust and are also striving to introduce future water supply systems by constructing water purification facilities near consumers using new concept vertical water treatment technology. We have also developed and applied on our own according to the domestic situation to proactively diagnose the risk factors that may threaten the safety of tap water from water supply source to faucet by using the Global Water Safety Plan (WSP). In addition, we introduced a vertical water treatment and distributed water supply system for water purification facilities and secure emergency water in the vicinity of consumers with a new vertical water treatment design technology with a compact vertical structure.

Also recognized for K-water's safe tap water management capacity, we completed the agreement with UNESCO in July 2018 to take a leading role in the evaluation of water treatment facilities as an advisor for UNESCO's internationally recognized tap water certification system. After the pilot application from 2019 to 2020, the tap water international certification system will expand its certification to major tourist cities and the world. This will spread K-water's professional water management technology to the world and contribute to resolving vague anxiety about tap water and improving reliability.

K-water's Safe Water Management Capacity



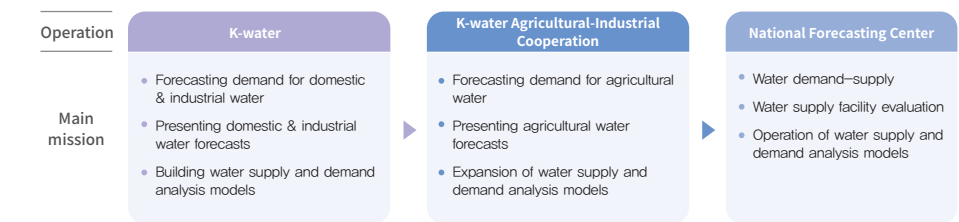
Strengthening water demand forecasting and supply management

Types of waterworks

Classification	Contents
Waterworks	Refers to all facilities that supply raw water or purified water using pipelines, etc.
General waterworks	Large-area waterworks General waterworks that supply raw water or treated water to two or more local governments
	Local waterworks General waterworks that supply raw water (treated water) to the jurisdiction or local governments nearby
	Village waterworks Waterworks with a daily supply of 20m ³ - 500m ³ to the water supply population of 100 - 2,500 people

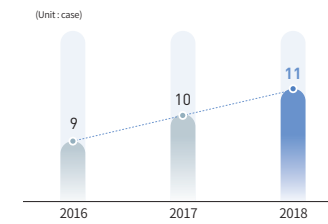
K-water supports the integrated management of water supply and demand forecasting at the national level in order to establish a plan for sustaining participation in local water supply modernization projects and performance. In particular, by establishing rainwater usage facility installation standards and support systems such rainwater storage tank, we have established a plan to supply flow rate of rivers at locations where it is difficult to secure ecological flow rates.

Establishment of an integrated management plan for forecasting national water demand and supply

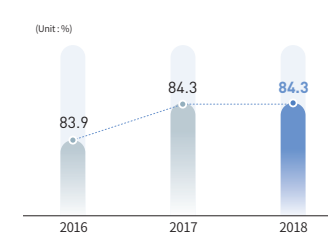


Stable tap water supply through the construction of a basin-based supply system

Local Waterworks Modernization Performance

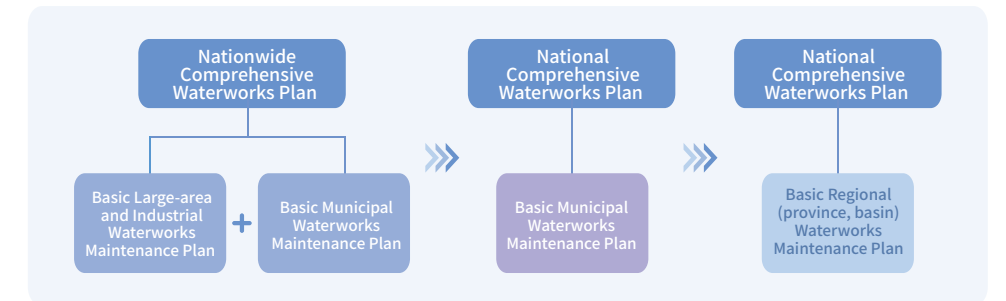


Local Water Supply Flow Rate



K-water proposed policy by reviewing the step-by-step integration of the water management system that was dualized in accordance with the unification of water management (June, 2018). In particular, by establishing a concrete plan for integrating the national water supply plan, which had been dualized into the Nationwide Comprehensive Waterworks Plan and large-area and basic industrial waterworks maintenance plan into National Comprehensive Waterworks Plan (tentatively named), we contributed to the establishment of a foundation for mid- to long-term large area-local waterworks linkages and integration. In the mid- to long term, we will establish a basin-based water supply system by linking and integrating waterworks to improve water supply facilities' operational efficiency and stable water supply by adjusting the water supply system and expanding emergency linkages between facilities. We are leading the restructuring of the basin-based waterworks projects by expanding sustainable water supply facilities for water-scarce areas and creating tangible large area-local integrated operation results. In the future, we will secure the stability and reliability of the water supply by making timely investments in aging water facilities.

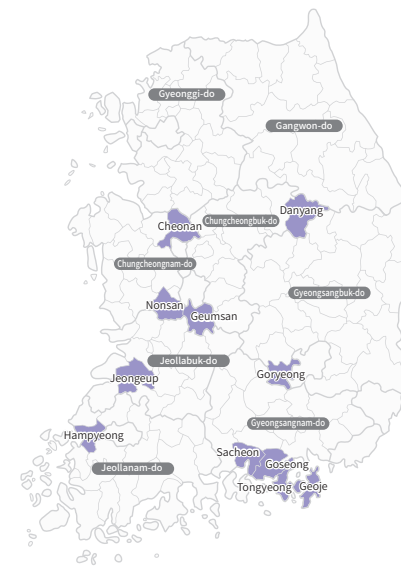
Integrated Water Plan Direction



Status of integrated large area-local management

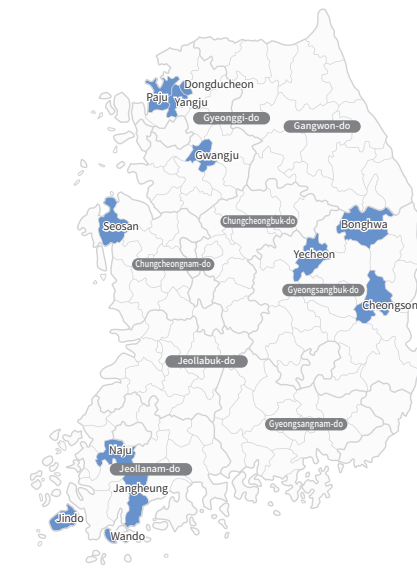
Large area-local integration (11)

- Nonsan, Geumsan, Jeongeup, Sacheon, Tongyeong, Goseong, Goryeong, Geoje, Cheonan, Danyang, Hampyeong



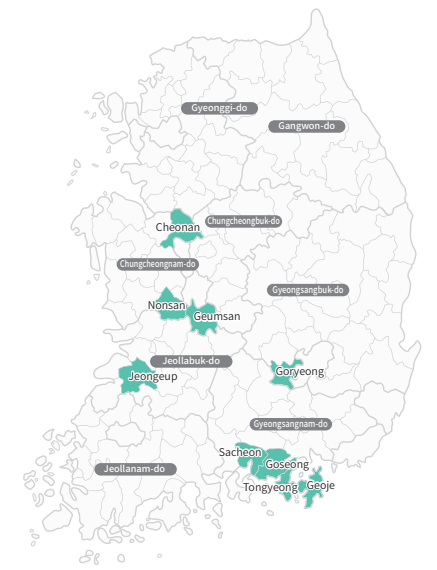
Local waterworks (12)

- Dongducheon, Yangju, Paju, Naju, Seosan, Wando, Jindo, Jangheung, Gwangju, Yecheon, Bonghwa, Cheongsong



Integrated system construction (9)

- Nonsan, Geumsan, Jeongeup, Sichuan, Tongyeong, Goseong, Goryeong, Geoje, Cheonan



Improvement of drinking water reliability by supplying high quality tap water

K-water is expanding its Smart Water Management (SWM) for safe drinking to the faucet. We have improved the reliability of drinking water by strengthening the management of trace amounts of hazardous substances and providing customer-oriented water quality management services.

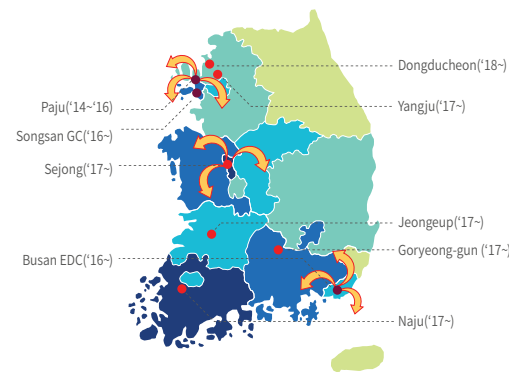
Introduction of K-water's Smart Water Management

- ▶ (Project Overview) 5 Projects, KRW 4.57 Billion (Operational Efficiency Project Cost)
- ▶ (Recipient Population) Smart Water Management Service for 540,000 people

Classification	Yangju (All Areas)	Dongducheon (All Areas)	Goryeong (All Areas)	Jeongeup (Jangmyeong 2,3)	Naju (Innovation City)
Period	'17-'19	'18-'20	'17-'19	'17	'18-'19
Project Cost (100 million won)	5.7	4.6	4.8	0.6	30.0

Water quantity management	Systematic supply management by installing devices such as leak sensor and smart meter
Water quality management	Rechlorination facility, automatic drain, pipe washing, supply process water quality monitoring system
Enhanced public awareness of water quality	Installation of public drinking water and water signboards

Expanded introduction of 21 local waterworks by 2021



12 Leakage monitoring sensor



13 Pipe washing

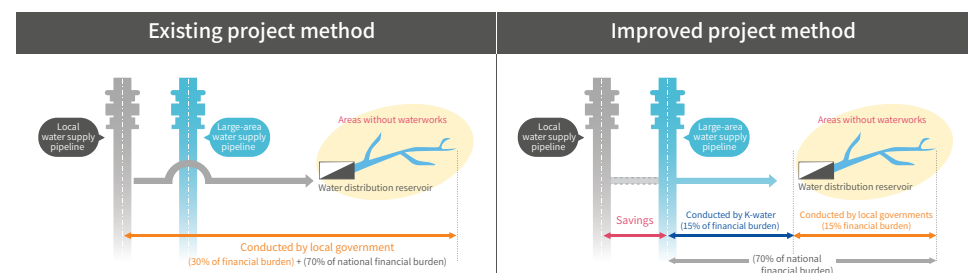


14 Drinking fountain

Bridging the gaps of water services in areas with limited access to water

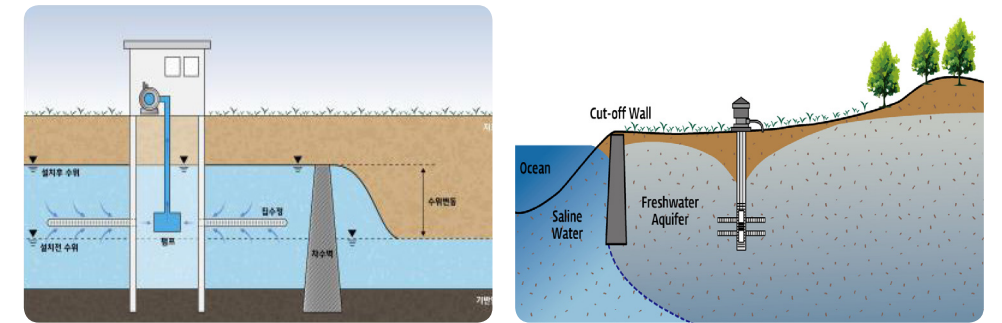
By relying on limited sources of water such as groundwater, farming and fishing villages and islands have difficulty in securing water, especially during short-term droughts, and are vulnerable to water quality problems due to unmanaged water sources unprofessional water quality management. It is the responsibility of local governments to support areas with limited access to water, but K-water is making various efforts to expedite water welfare for areas with limited access to water as a public water company. By carrying out the direct supply of large area waterworks direct supply (quarterly) to areas with limited access to water in farming and fishing villages where a large area water supply is more favorable than rural areas, we provided water benefits to 10,000 people in 16 local governments to date. We are consingning small desalination facilities (35 facilities in 8 local governments nationwide) and installing groundwater reservoirs to secure water in island areas. In 2018, we commenced with the construction of groundwater reservoirs in Daeijakdo and Anmado.

Conceptual Diagram of a Large-area Direct Water Supply (Quarterly) Project



Conceptual diagram of a groundwater reservoir

An environment-friendly water resource acquisition technology that secures additional groundwater resources by installing artificial cutoff walls in underground aquifers and storing groundwater



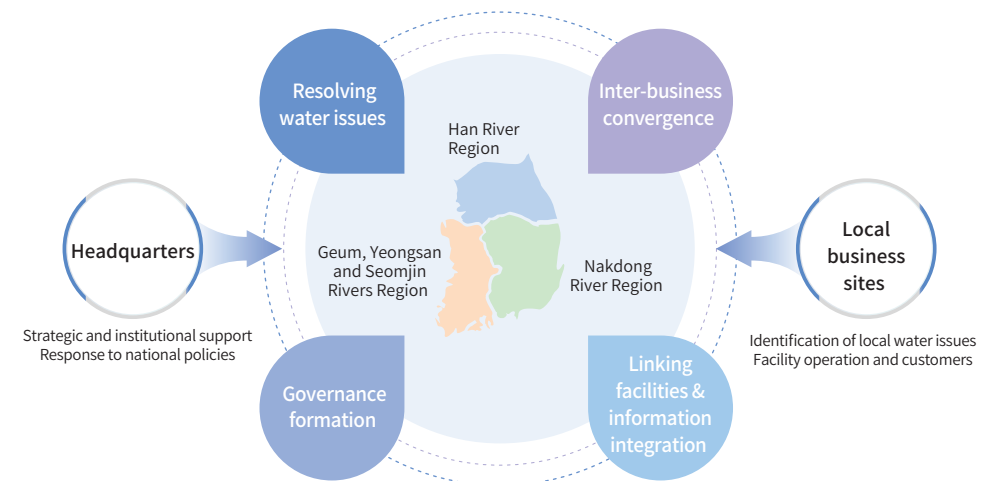
According to the unification of water management, we are making every effort to create the foundation to resolve areas with limited access to water in a rational and sustainable manner by establishing criteria for resolving areas that have no access to waterworks facilities and proposing policies in consideration of regional characteristics, including large-area and local waterworks.

Through research on integrated basin water management, we have resolved the anxiety of the public towards drinking water by various actions including the water quality improvement of the Nakdong River, and prepared measures in Western Chungnam and Gangwon-Youngdong areas where chronic drought persists. In order to improve the ecological environment at the mouth and to prevent salt damage by securing the flow of the Seomjin River, we will jointly conduct environmental impact surveys and investigate the causes of salt damage in the Seomjin River with related organizations to prepare fundamental improvement measures.

Based on ICT technologies, K-water is building a water operation system that collects operation data on all processes from water intake sources to the faucet and remotely monitors and controls in real-time. In addition, by analyzing the collected data, we realize a healthy water supply for each basin by continuously supplying water and deriving rational facility improvement plans through an intelligent pipeline operation system that enables water quantity, water quality, and energy management.

Region-based integrated water resources management

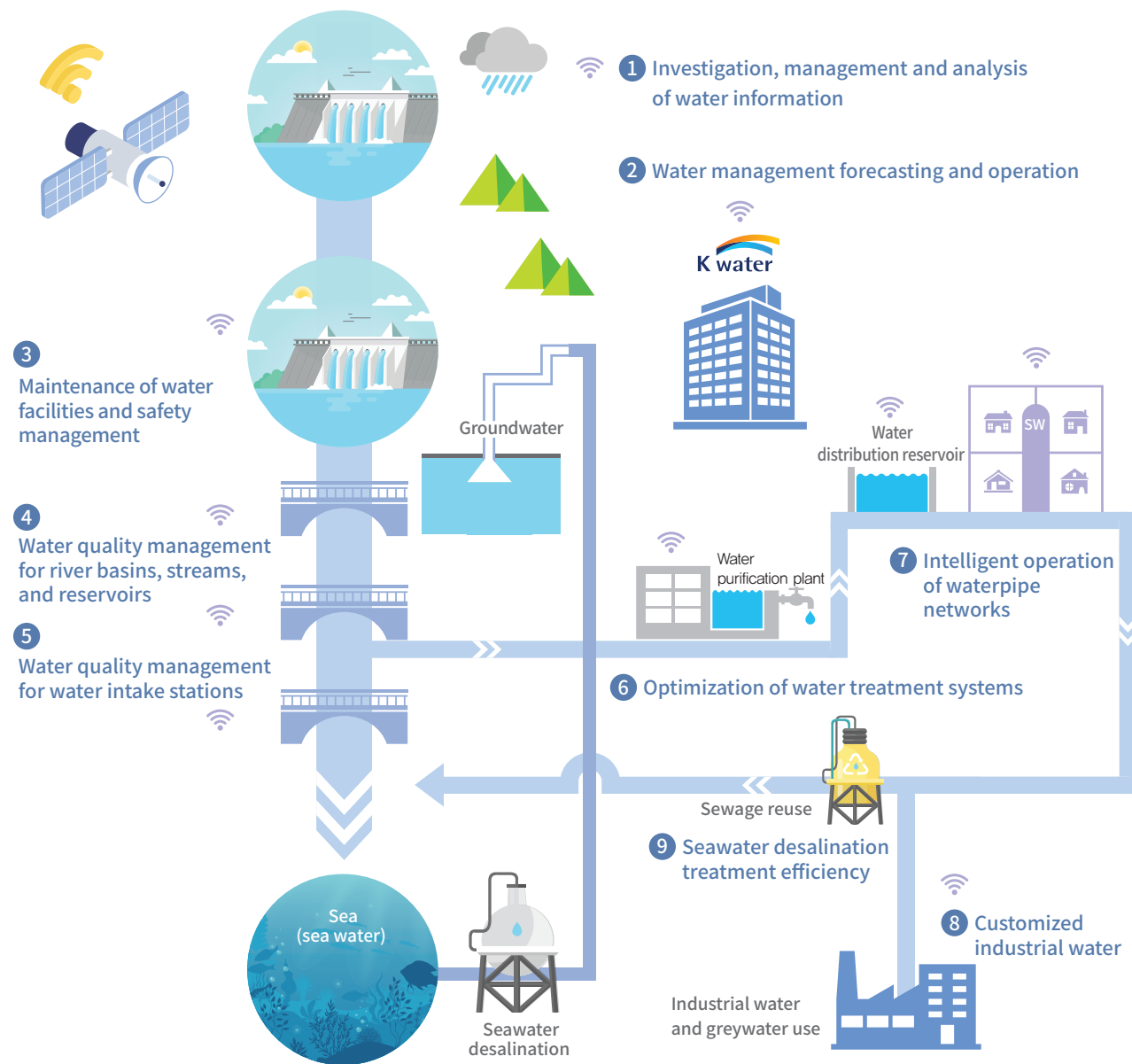
What is region-based integrated water resources management?
Managing water quantity, quality, ecology, and environment, which were previously managed individually, in an integrated and intelligent way by taking into account all factors affecting water management in a region



K-water's sustainable integrated water resources management (IWRM)

Integrated water resources management refers to the management of water quantity, quality, ecology, and environment, which were previously managed individually, in an integrated and intelligent way by taking into account of all the factors affecting water management in a region or basin. To create a healthy water environment and a cooperative water culture in Korea, K-water preemptively established a masterplan for integrated water resources management in 2014 and contributed to its inclusion in national policies. In addition, K-water is committed to the settlement and expansion of the integrated water resources management system through the formation of governance to eliminate conflicts over water issues between regions and river basin areas.

Integrated water resources management system



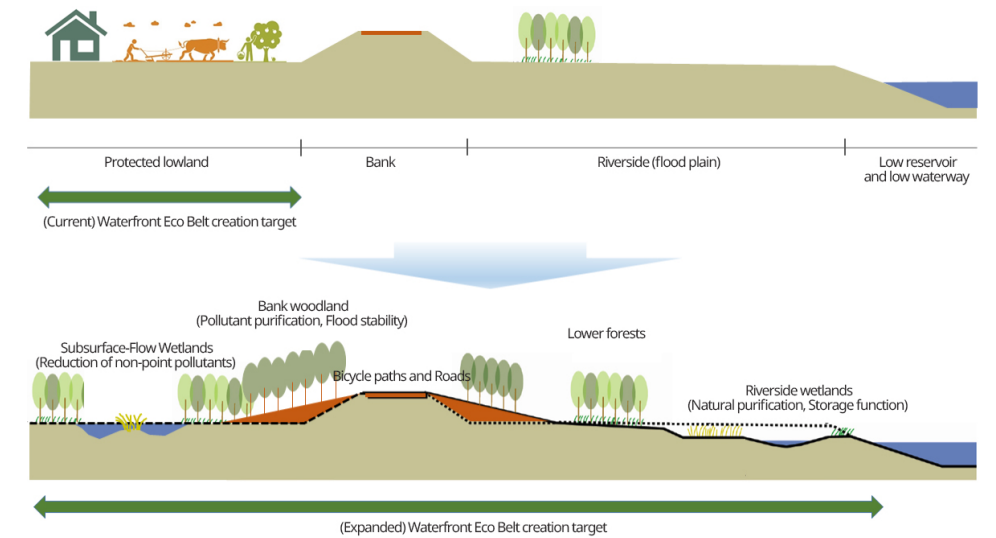
Water Convergence Services

In order to create new values for water through water-energy-city convergence services, K-water has shifted from a water-quantity oriented system to a dam and river management system considering aquatic ecosystem and is creating water-friendly cities with enhanced ecological value and water circulation. In addition, we strengthened support for small and medium-sized water companies to revitalize the domestic water industry and made systematic preparations for the integration of water management on the Korean peninsula as inter-Korean relations have improved.

Restoration of river ecosystem health and creation of sustainable waterfront spaces

We have derived a new waterfront eco belt standard that harmoniously improves the various functions of waterfront spaces such as dams and lakes, water utilization, control of rivers, water quality, and aquatic ecosystem health. In the long term, we will expand the waterfront eco belt standards to dams, rivers, and protected lowlands and improve its functions by improving laws and systems and developing technologies. We are also working with local communities to find sustainable eco-tourism programs that consider ecological values and capacities and to expand the services that people can feel.

Waterfront Eco Belt Standard Model



Efforts for Sustainable Ecotourism

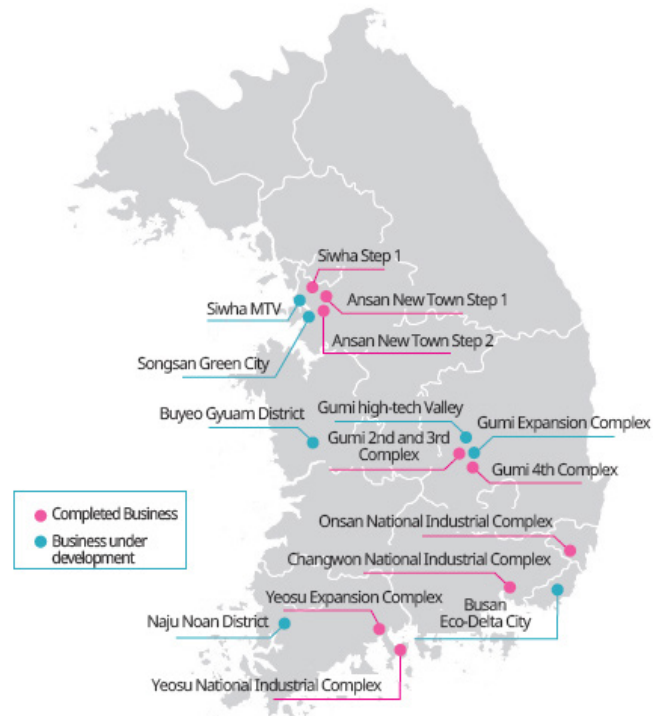
- Ecotourism: Nature-friendly tourism that allows tourists to experience the importance of the environment through the conservation and wise use of natural assets.
- K-water is developing participatory ecology expedition and experience programs for sustainable ecotourism utilizing ecological landscapes such as lakes, rivers, and estuaries.



Korea's Water Specialized City Model

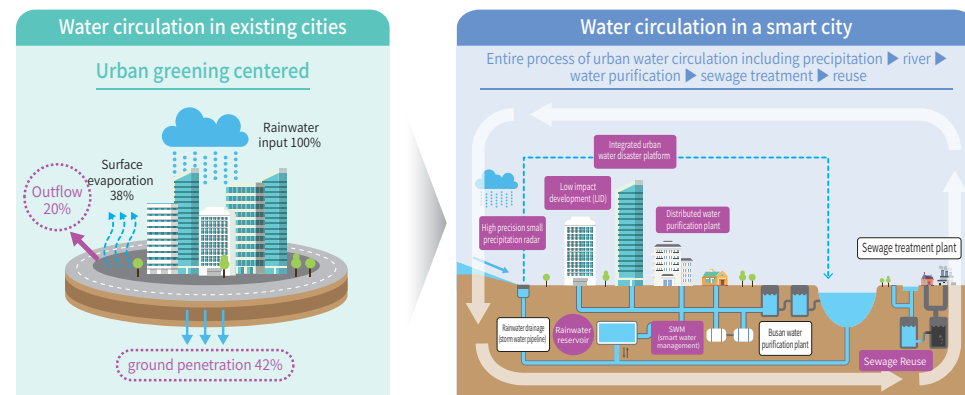
K-water is creating an eco-friendly city model that takes into account the water circulation, ecology, landscape such as LID, water reuse, and smart water management. Busan Eco-Delta Smart City, designated as a national smart city test-bed (January 2018), is building 'Korea's Water Specialized City Model' to cope with climate change by applying advanced smart water management technology and services to the entire water circulation process (precipitation -river-water purification-sewage-reuse) in the city.

Status of Waterfront Project Creation and Progress of Water-friendly Projects




Creation of Eco-friendly Water Circulation Cities

K-water has created a differentiated water-friendly city by improving water quality and recovering the natural water circulation cycle through eco-friendly eco-filtering and introducing smart water management technology. In particular, by applying advanced smart water management technology and services to the entire process of water circulation in the city (precipitation -river-water purification-sewage-reuse) of Busan EDC, which was selected as a national smart city test-bed, we are planning to create the world's only water-specialized smart city to cope with climate change and take part in planning the water circulation city led by the Ministry of Environment using urban development know-how. Through innovative technologies, we will create innovative growth and smart city success models by providing solutions to water management, living, safety, transportation, and energy issues in urban areas.



Progress of Water-friendly Projects

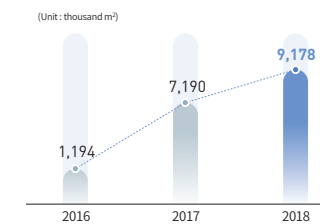
Busan Eco Delta City	
Area	11,770,000㎡(3.6 million pyeong)
Cost	KRW 6605 billion
Period	2012~2023(12 years)
Population, housing plan	Population (76,000 people) Houses (approximately 30,000 households)
Operator	Busan (responsible for licensing), K-water (85%), Busan Metropolitan Corporation (15%)



Bird's-eye view of Busan Eco Delta City

Buyeo Gyuaem District	Nagan Noan District		
Area	111,000 ㎡(3.3000 pyeong)	Area	105,000 ㎡(3.2000 pyeong)
Cost	KRW 24.9 billion	Cost	KRW 24.8 billion
Period	2012~2020 (9 years)	Period	2012~2020 (9 years)
Development direction	Leisure sports Experience-type Recreation Landscape Village	Development direction	Water-friendly- Ecological rural village
Operator	K-water(100%), Buyeo-gun	Operator	K-water(100%), Naju


Waterfront project area (sold in lots)



Activation of Clean Water Energy Development

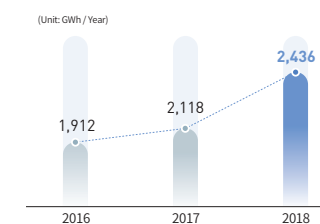
K-water is actively responding to the government's climate change and energy policy through the active development of alternative water sources considering the eco-friendliness and acceptability of residents. In order to secure the stability of water utilization, control of dams, and to consider the environmental performance and acceptability of residents, we are planning to develop 550MW of floating photovoltaic energy by 2023. We are improving the law and system regulations to promote the development of floating photovoltaic energy and continuously review ways to connect power systems for large-scale photovoltaic development.

Hapcheon Dam Floating Photovoltaic Energy System Floating Photovoltaic Energy Development Plan



Schedule	Total	2019	2020	2021	2022	2023
Development capacity (MW)	550	145	132	129	121	23
Development scale (100 million won)	13,750	3,625	3,300	3,225	3,025	575

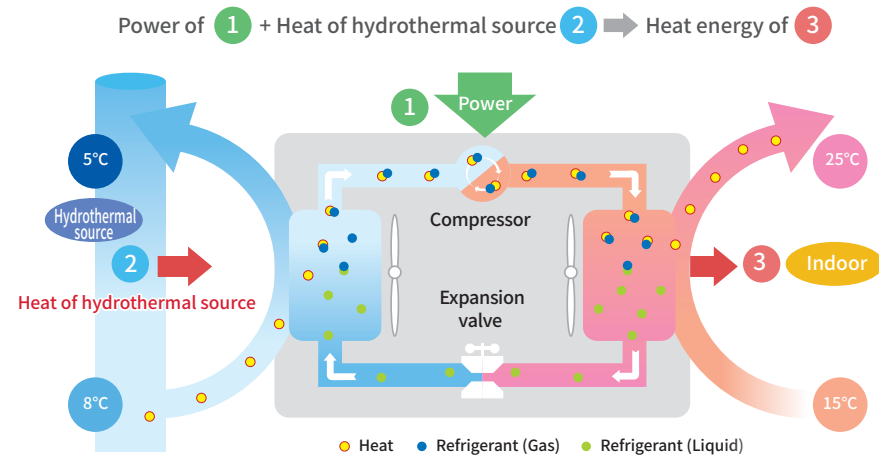
Renewable Energy Production



In addition, we plan to generate 34 kWh of land-based photovoltaic energy and small-scale hydropower by 2023 using surplus resources such as idle sites including water intake and purification facilities and flood plains in connection with the policy of the Ministry of Environment. We are developing land photovoltaic energy using idle sites in the upstream of dams, flood control sites, reservoirs, flood control dams. As well, we are promoting small-scale hydropower development using surplus energy from running water resources and water facilities in operation.

In addition, K-water is striving to activate hydrothermal energy using the temperature difference of water, which is lower than the atmospheric temperature in the summer and higher in the winter, as an eco-friendly energy source utilizing the potential value of water. Large-area waterworks have introduced hydrothermal energy to support air conditioning systems while Lotte World Tower (3,000RT) and K-water's own buildings have introduced heating systems. In the future, we plan to expand the supply of hydrothermal energy to Gangwon-do Cluster, Busan Smart City, and large buildings in metropolitan areas.

Principle of a Hydrothermal Energy Heat Pump

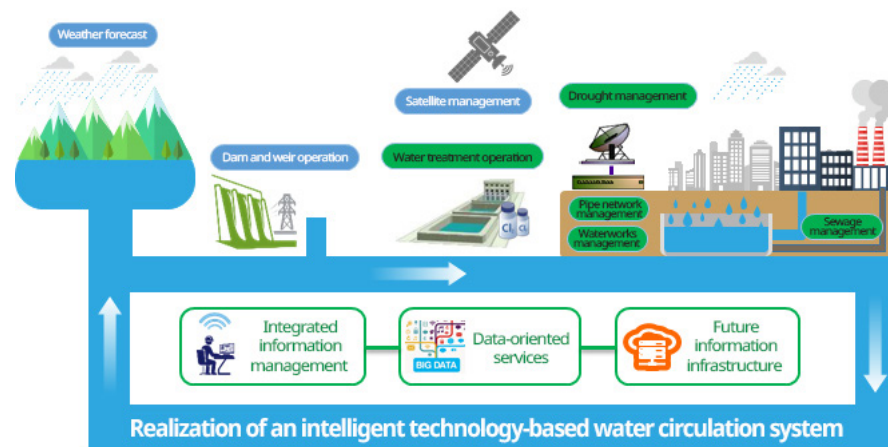


TIP : What is hydrothermal energy unit RT? RT is hydrothermal energy unit. It is freezing capacity to make 1 ton of 0 °C water into 0 °C ice for 24 hours (1RT = 3.5kW)

Establishment of a Foundation for Smart Water Management

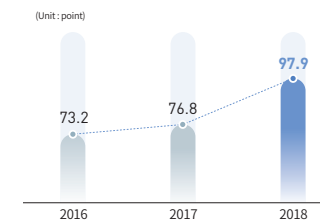
K-water has strengthened its technological capabilities for the entire process of informatization by operating core areas and water management infrastructure and securing technology on its own. We have established a foundation for the use of big data for water management and strengthened our services to support efficient integrated water resources management decision-making. In addition, we improved the way we work by improving the availability and accessibility of information resources through the advancement of the in-house cloud environment and improvement of the utilization system. In addition, we are laying the groundwork for the application of the 4th industrial revolution technologies, such as ICBAM and drones, by strengthening development standards, advancing network technologies, and responding to evolving hacking threats by strengthening security management technologies and operating systems.

Applications of smart water management technology



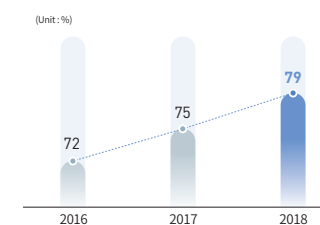
Innovation of the water technology management system to lead the 4th industrial revolution

R&D Performance Index



* R&D performance index: A performance index calculated by indexing management resources, intellectual property rights, and academic activities.

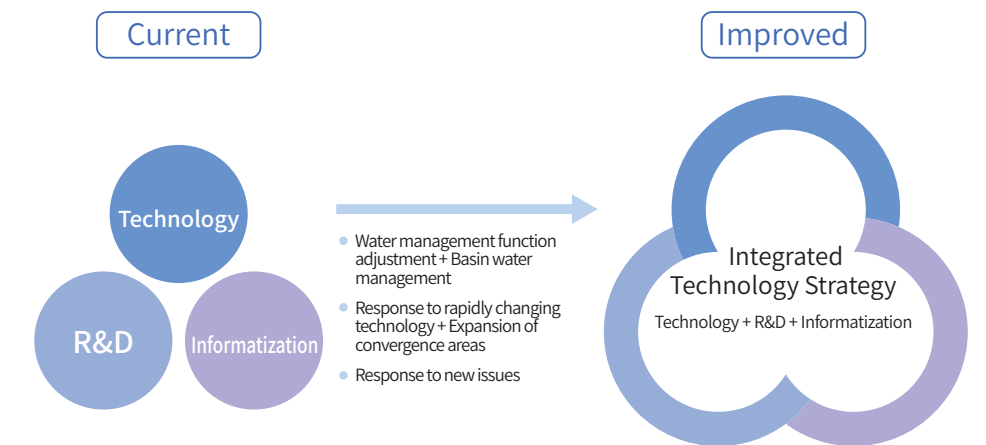
Future Technology Achievement Rate



*Future technology achievement rate: Achievement rate compared to the goal of developing 1,447 technologies by 2025 (med- to long-term management goal)

K-water unified its technology, R&D, and informatization strategies by establishing mid- and long-term integrated technology strategies to expand future technology capabilities. The innovation of the water technology management system has made it possible to set the direction of technology development for rapid response to environmental changes such as function adjustment of water management affiliated institutions, basin water management, and rapid technological change cycles. We are also responding to various water-related issues by complementing and strengthening the functions of the continuously integrated technology strategy.

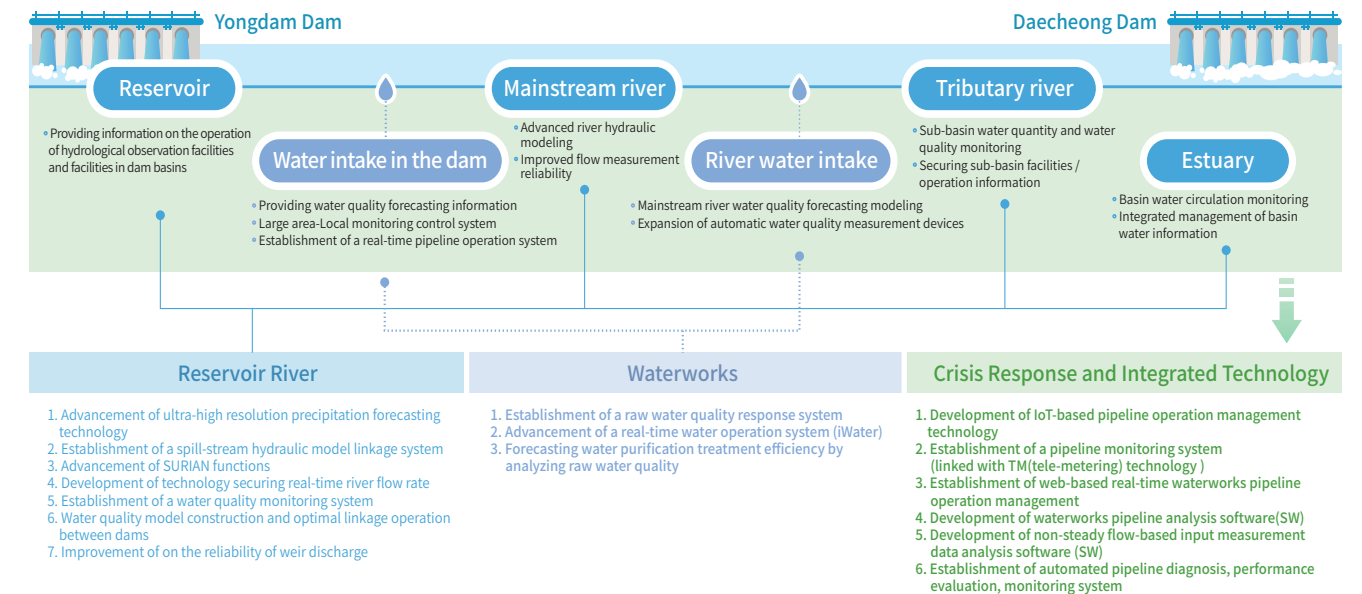
Establishment of Mid- / Long-term Integrated Technology Strategies



Securing core technologies to foster future new industries

K-water has secured core water management technologies for future water management by obtaining smart water management technology that combines technology that people can feel which is consistent with the unification of water management and 4th industrial revolution intelligence technologies. We have developed unique technologies optimized for integrated water resources management by replacing foreign original software used in the water sector and are building an integrated water information system linking the development of water resources and waterworks element technologies from dam reservoirs to estuaries.

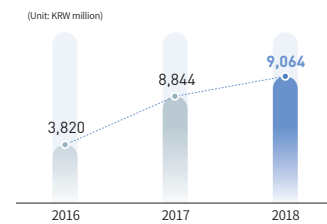
Construction of the integrated water information system between Yongdam Dam and Daechong Dam



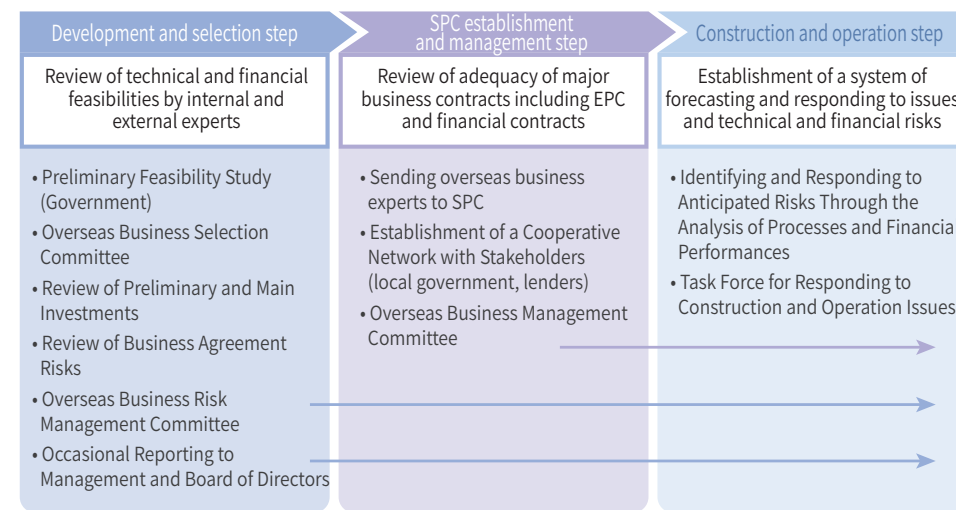
Leaping forward to become a leading global water company

K-water is striving to diversify its business methods and obtain high value-added businesses through the innovation of our overseas businesses. We have stabilized our business and improved profitability by strengthening internal and external capabilities to reduce risks. In particular, in order to thoroughly manage the risks of overseas investment projects, we are forecasting and responding to risks at each step of the business process through the Project Selection Committee, Project Management Committee, and Risk Management Committee, and internal and external experts in fields such as finance, technology, and law. In addition, we are making stable investment projects by partnering with domestic and foreign companies to complement careers and technical qualifications at the level of MDBs(Multilateral Development Banks) and participate in bidding projects based on K-water's core competencies (SWM, IWRM, etc.).

Overseas business sales



K-water risk management system for each step in an overseas investment project



※ Securing overseas business risk management capabilities

- Professional manpower** Cultivation of overseas business experts and recruitment of external talents through in-house, external technologies, and financial training
- Work standard** Setting and upgrading performance standards (selection criteria, standard yield, etc.) for each type of overseas business

Strengthening of leadership and competencies to solve global water problems

Since the successful hosting of the 7th World Water Forum (WWF), the Asia Water Council (AWC), established under the leadership of K-water and the Korean government, has grown into a platform for solving water issues in Asia. The President's role (K-water CEO) and the Secretariat are led by K-water, holding regular board meetings (twice a year) and participating in international conferences with member organizations to pursue human and technological exchanges. In this way, K-water is playing a pivotal role in solving water-related problems in Asia.

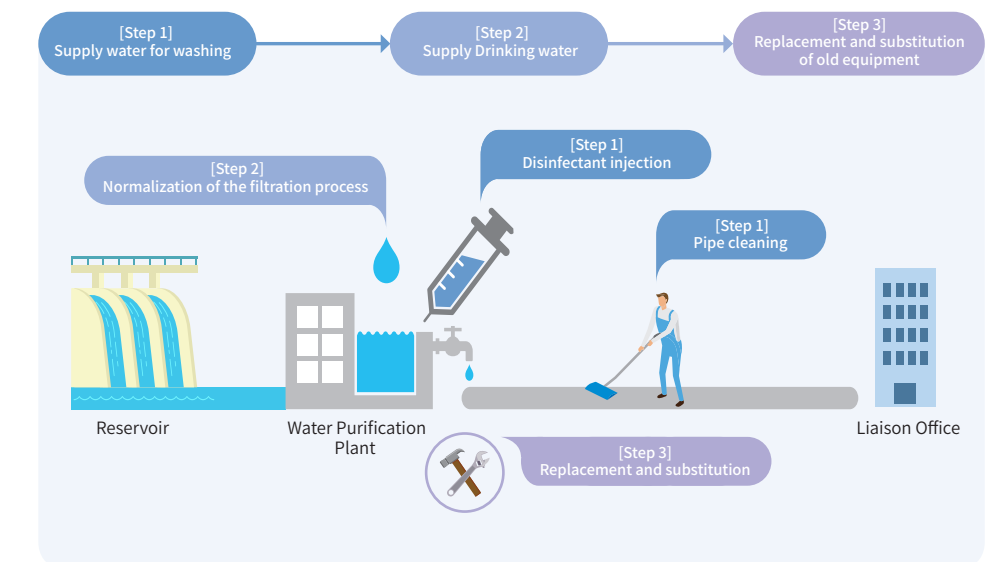


1 The 2nd AIWW Kick-off Meeting 2 Conclusion of an MOA between Indonesia and AWC 3 Advancement into the Singapore water market based on SWM

Improvement of water welfare on the Korean Peninsula

As the inter-Korean relations continue to improve, we are systematically preparing to realize integrated water resources management on the Korean peninsula, to establish cooperative projects for water welfare improvement, and to lay the foundation for implementing projects. We found solutions to North Korea's water problems through a comprehensive approach including basin-stream and water quantity-water quality and established a transboundary cooperation system that could be implemented as a priority project. To this end, we have established a permanent consultation organization for peaceful joint utilization of inter-Korean shared-rivers, and are promoting joint basin investigations and flood forecast warning systems.

Normalization of Gaeseong Water Purification Plant and Drainage Station Operation through the Inter-Korean Liaison Office



Creation of new values for investigation and information

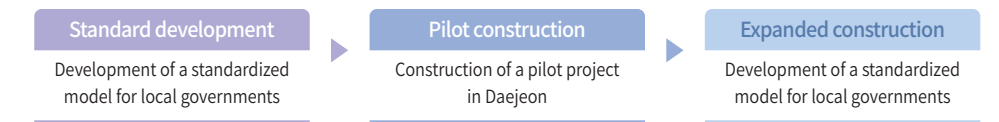
K-water has established an integrated water quality-quantity investigation and information sharing system to realize environmentally-friendly integrated water resources management, and is creating new water information value creation and utilization conditions. We have also adjusted the water quantity and water quality observation network to utilize observational data linkages, expanded the points to conduct scientific basin management, developed a survey platform, and applied the latest analytical methods to implement the measurement system for the entire process of water circulation. In addition, we are building and operating an integrated groundwater information system (www.gims.go.kr) by transferring the groundwater information system to a national groundwater information system.



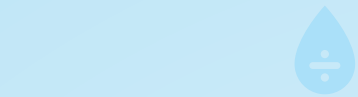
1 Integrated Groundwater Information System (www.gims.go.kr)

Groundwater Information System

Groundwater Information System	
Grounds for promotion	Article 5 (2) of Groundwater Law (Informatization of Groundwater Conservation and Management)
Support contents	Construction of an integrated DB and information management system linked with observation networks and introduced and applied to infrastructure
Support target	12 cities and counties without the system, 35 cities and counties among areas where groundwater use charges are imposed
Plans	Sequential expansion to other local governments after the development of a standardized model and construction of a pilot project in Daejeon



- 064 Management Approach (MA)
- 066 Citizen Participation Management
- 070 Improvement of peoples' lives
- 075 Environmental Management
- 078 K-water and SMEs
- 081 The Role of Priming Water for Community



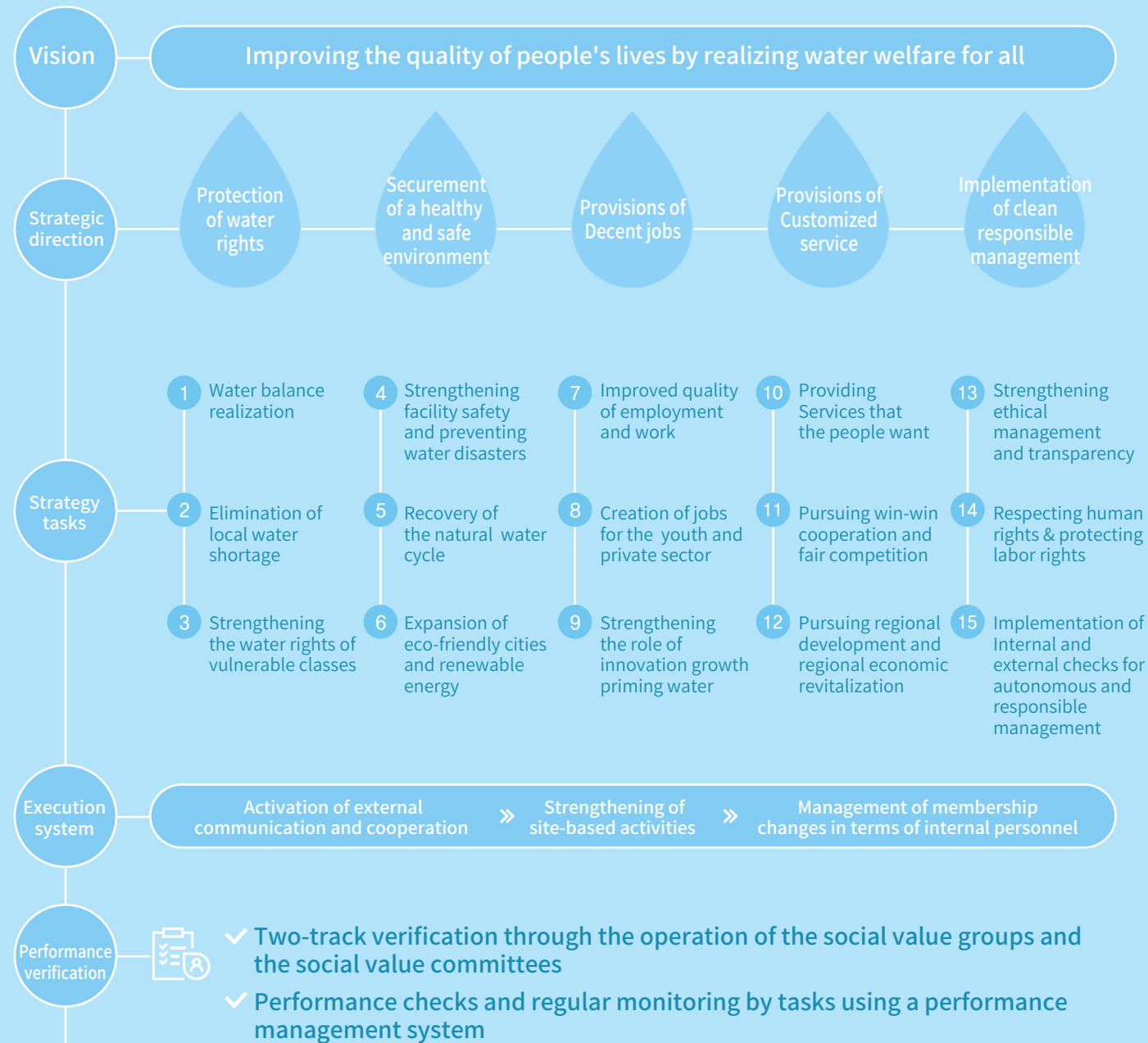
Divide

*Making a Happier
Korea Together*

Management Approach (MA)

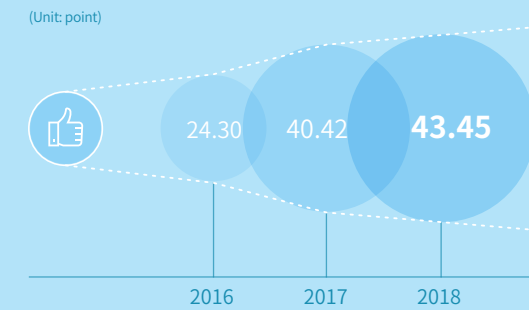
Under the slogan, "Making a Happier Korea with Water", K-water is doing its best to realize social value. To this end, K-water increased its work force and expanded its integrated water resources management system to realize water welfare for all people. In addition, we are doing our best to spread social value by establishing a communication channel for all people that enables them to express themselves and directly participate in projects and service improvements.

Sustainable Strategies and Future Plans for Social Value Realization

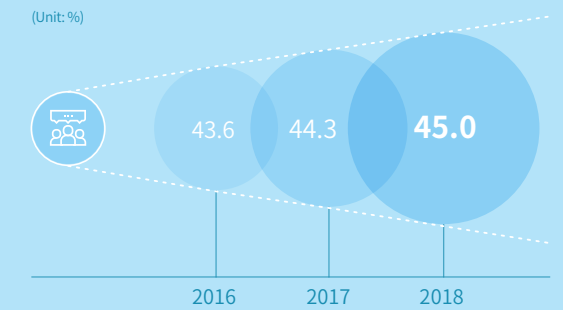


Key Achievements of Social Value Realization

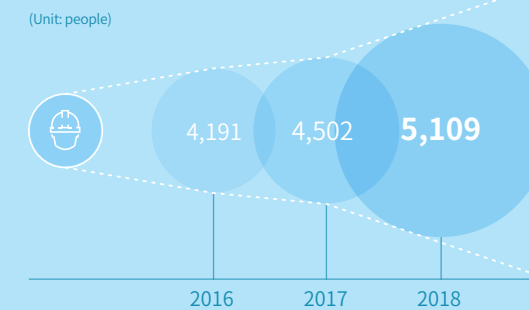
Customer (Complaints) Business Process Satisfaction (Unit: point)



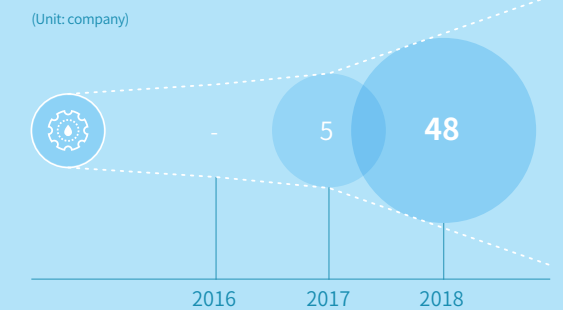
Human Resources Cultivation Index (Unit: %)



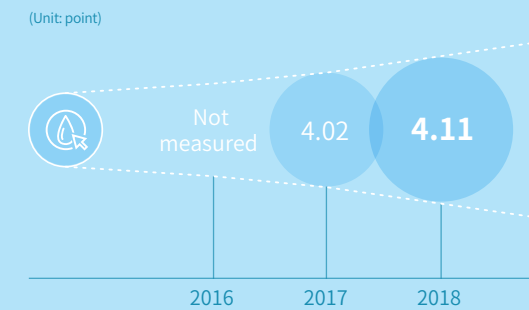
Job creation Around Dams (Unit: people)



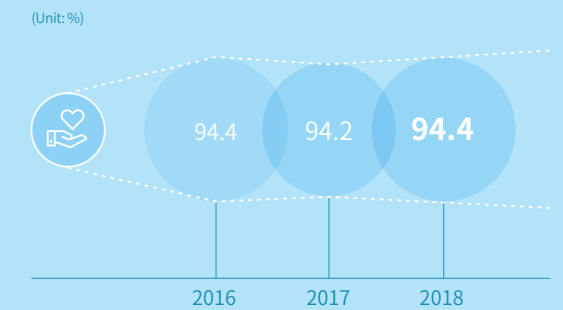
Number of Water Industry Startups (Unit: company)



Water Information(My Water) Satisfaction (Unit: point)



Social Contribution Program Satisfaction (Unit: %)



Citizen Participation Management

K-water tries to spread social values for the people by listening to their opinions and expanding participation and communication channels for them to directly participate in projects and service improvement. In 2018, we increased the public's interest in water by establishing an open communication channel in which everyone can participate in and we will further strengthen communication in 2019 and spread social values by instituting a process in which the public can participate and their ideas can be reflected in policies.

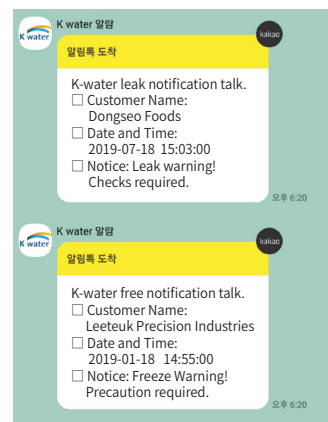
Customer Satisfaction Management Trusted by the People

By establishing an integrated customer management system to efficiently manage customer relationships, K-water proposes solutions by listening and analyzing the voices of direct customers as well as stakeholder customers including local residents and provides customized information for each customer through our accessible database. In addition, we provide professional telephone answering services to address customer inquiries through customer centers and conduct customer satisfaction surveys every year for quantitative management of customer satisfaction.

Mid and Long-term Strategies for Customer Satisfaction Management



Proactive SNS Service



Realization of visiting services

K-water provides visiting services using such as K-water's Leakage and Freeze and Burst Monitoring and Reporting System using SNS as well as offline services such as the operation and monitoring of apartment complaint booths. In case of a sudden increase in usage, SNS informs you of possible leaks and the recovery team is dispatched. If the temperature drops below 3 °C for more than 3 days, a warning message about potential freezing is sent. In addition, we have established and are now operating a water safety insurance service that provides compensation for physical and/or property damages caused by drinking tap water supply issues. As well, K-water operates a customer-only portal that allows customers to compare the status of various complaints and year-on-year usage.

Water Safety Insurance Service

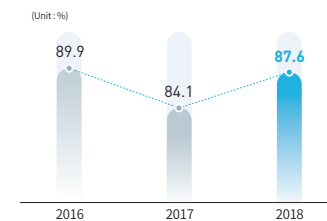


Establishment of 'Danbi Talk Talk', a two-way communication platform

National Danbi Talk Talk Homepage



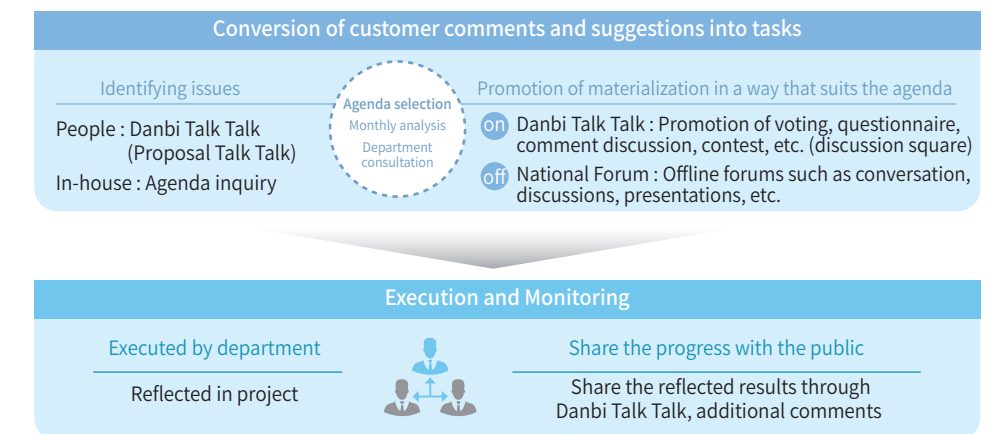
Information disclosure rate



'National Forum' that connects online and offline communication channels

Beyond one-way communication, K-water built and is operating 'Danbi Talk Talk', a two-way online communication platform that allows individuals to present their ideas and enables discussion and voting to ask the people's thinking about the opinions offered by the people or K-water. We also introduced the 'People's Happiness Design Group' in 2018, where the people directly participate in the policy design process to improve and discover consumer-centered services and systems. In 2019, we are to expand and operate it to each region in order to work with more local residents through field-oriented service innovation activities. The comments and suggestions made by customers through Danbi Talk Talk are selected as agendas by reviewing their feasibility, and the process is shared through an on- and off-line specification process and reflected in business area.

Process for converting customer comments and suggestions into tasks



The 'K-water National Forum' is held quarterly, where everyone interested in water management, regardless of gender or age, participates in discovering and discussing water ideas freely. As a national communication program that expands the scope of communication by connecting online and offline, the online communication platform 'DanBit Talk Talk' recruits discussion topics and participants, collects national online opinions on the topics and shares the progress of proposals drawn from the National Forum. Through this forum, we are striving to better understand the service methods and inconveniences that our customers experience. Their opinions are reflected in improved services that people can experience. For example, we collected the people's suggestions on topics such as safe tap water proposals to expand the supply of tap water quality information, develop technologies for eco-friendly cleaning of indoor piping, and reinforce the contents of education donation programs.



Official Announcement of the National Forum



National Forum

Operation of the Citizen-led 'Living Lab'

'Living Lab' is a social innovation method with which citizens take the lead in discovering problems in everyday life, devising solutions, and even solving problems directly. In 2019, K-water introduced the 'Water Experiment by Citizens,' which raises the social value of water through citizens' novel ideas and social innovation experiments that solve water problems. In order to solve social problems related to water, selected citizen experiment teams can realize their solution ideas directly. Anyone can form a citizen experiment team submit their application for selection consideration. In this process, K-water will connect civil teams and social innovation networks to support civil society's capacity building and establish a 'water sector social innovation platform' that leads social innovation in the water sector.



18 Official Announcement of the 'Living Lab'

19 Tasks for the Citizen Experiment Teams

Strengthening information accessibility by practicing transparent management

K-water continues to enhance customer conveniences by strengthening existing information retrieval functions before requesting information disclosures to satisfy customers' and people's right to know through active information disclosure, simplifying and expressing legal terms in information disclosure processes through simplified wording. We have also strengthened customers' accessibility to information through a permanent window for applying for items they want to view and conducting real-time satisfaction surveys. We also arranged a customer support menu on K-water's official website to provide information on 8 items including water utility bills, the water supply application guide, and water quality inspection requests to allow customers to search various related regulations, rates, and an online rate calculator. For questions frequently asked by customers, we have posted answers to common civil complaints on the FAQ section of our website so that they can obtain information easily.



20 Images of the Information Disclosure and Customer Support Screens Found on K-water's Website

Realization of social value through the National Water Management Innovation Idea Contest

K-water provides the 'Love Spring Service' with social enterprises as an excellent proposal selected through the National Water Management Innovation Idea Contest. 'Love Spring Service' is integrated services that provides living sanitation services such as laundry and shower using special vehicles, and welfare services such as medical care through collaboration with Korean Open Doctors Society and community service organizations. It tries to realize social values that are linked to K-water's business.

Love Spring Service



"A self-reliance support service for the vulnerable class"



21 Unveiling Ceremony of K-water Love Spring

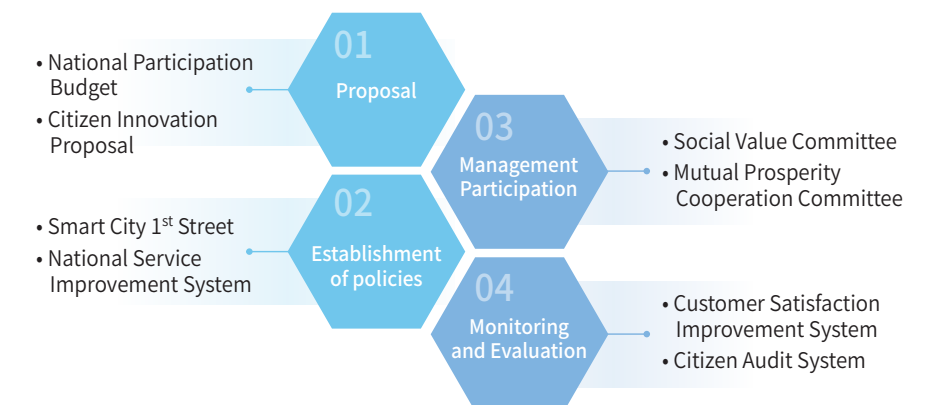
K-water Love Spring Service

- Target** Elderly residents living alone, residents living in dosshouses, and homeless people who have poor access to water
- Contents** Providing mobile water welfare services using specialized vehicles which can provide shower and laundry services
※ Case of a national water management innovation idea that was supported and implemented
- Plan** Expanded after pilot operation in Goryeong-gun, Gyeongbuk in July 2019
※ We plan to develop it as integrated support services for vulnerable classes by providing shower facilities, laundry machines, job / welfare counseling, and medical care in collaboration with local communities and welfare groups.

Pursuit of innovation through the realization of national participation

In order to pursue management that communicates with the people, K-water promotes trust and publicity by institutionalizing national participation in each stage of major tasks such as national proposal, policy, and management strategies. In addition, we are expanding the existing scope of the support limited to the improvement of the water environment to the residential environment by operating the Love Spring Service, which provides laundry and shower facilities, as a social contribution activity to fulfill our social responsibilities. Besides, we operate cultural, leisure, and educational services in farming and fishing areas and support customized local welfare for the elderly and children. In the future, we will lead the way through the development and implementation of positive social innovations by revitalizing the social economy and bridging the educational gap.

K-water National Participation System



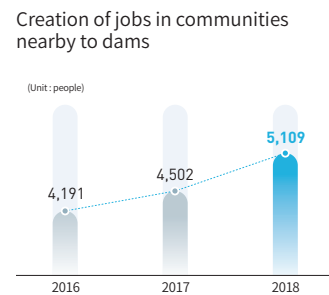
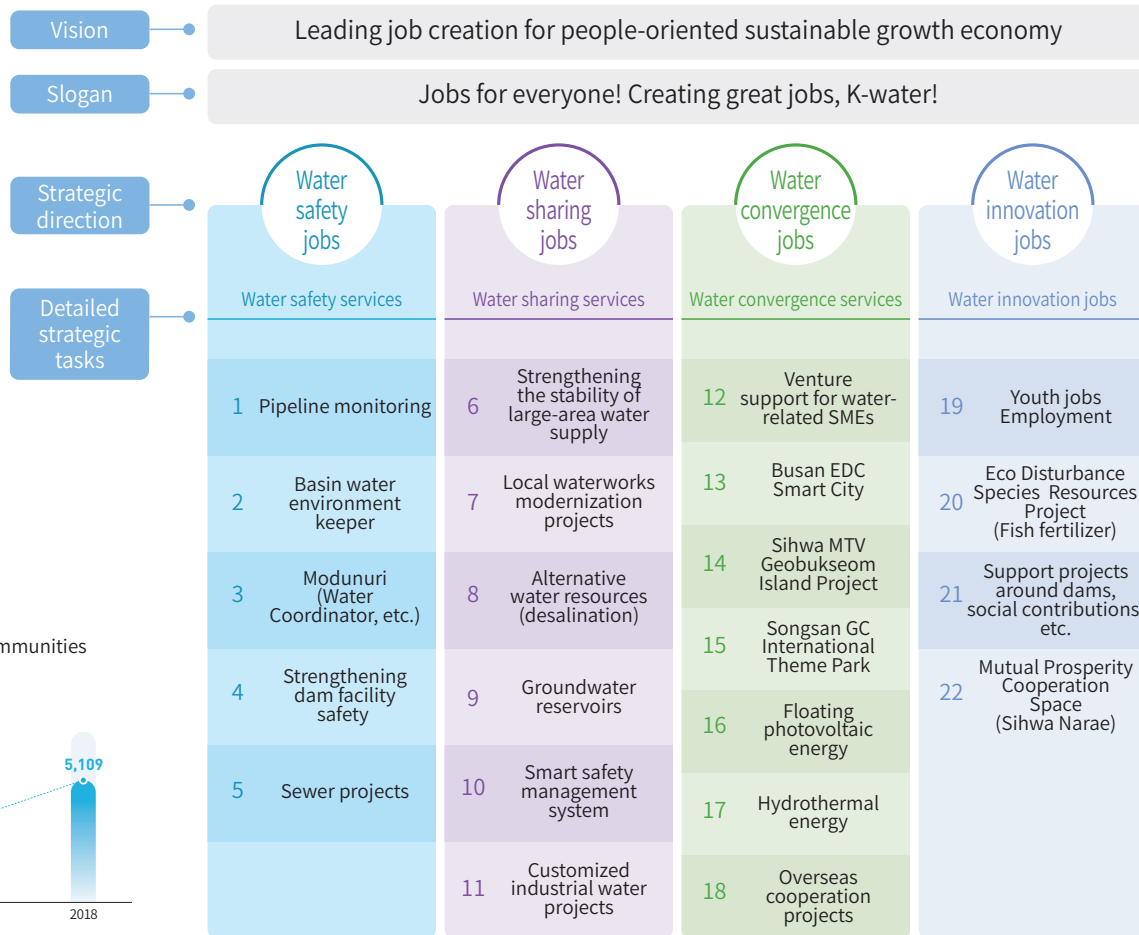
Improvement of peoples' lives

In line with government policies, K-water, the leading public water company in Korea, is at the forefront of job creation by concentrating its company-wide capabilities. We are to become a public institution that contributes to the realization of social values through job creation by implementing a 'people-oriented sustainable growth economy'.

Creating a brighter future through job creation

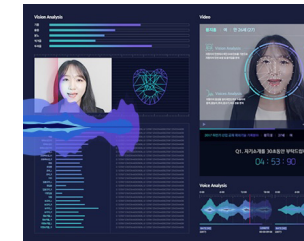
K-water is committed to the creation of more than 87,000 public and private water-related jobs over the next five years (2019 ~ 2023) in accordance with the 'Job Creation Roadmap' (established in February 2019). In the public sector, we aim to create 1,667 jobs through internal recruitment such as expansion of youth employment, and create 85,994 jobs in the private sector by fostering SMEs in the water industry and expanding investment in new businesses.

K-water's Job Creation Roadmap



Public sector job creation

AI-based (A.I.) interview



An algorithm that discovers talent based on machine learning, and analyzes and evaluates facial expressions, voice tones, words used, and pulses

In the public sector, we have innovated our recruitment system based on two-way communication such as recruitment inquiry chatbots and hired the largest pool of new recruits ever. We recruited 370 people by maximizing the scale of recruitment in various employment areas such as new employees, high school graduates, and part-time workers. 110 of the recruits are high school graduates and will work 52-hour workweeks for dams and water treatment plant as shift workers, in line with the high school employment expansion policy. In addition, we hired 166 experienced young interns who are planning to switch to full-time jobs, thereby providing job experience opportunities and linking them with job creation.

Expansion of Youth Employment



Youth Intern Training



Private sector job creation

K-water created 9,254 private jobs centered on vulnerable groups and small and medium-sized businesses, including the recruitment of public water quality service personnel to improve the reliability of tap water, which is K-water's unique business area. In particular, we expanded the number of water doctors, water quality prevention personnel such as indoor plumbing diagnosis and washing, including 'Water Cody', a visiting water quality inspector, from 45 in 2017 to 145 in 2018, creating jobs and increasing public confidence in tap water. In addition, we will continue our efforts to create water-related jobs by introducing the 'Pipeline Inspection Center' to check the holiday pipeline and 'Water Environment Researcher' who conducts waterfront water environment surveys and daily green algae surveys in order to strengthen the response to the pipeline.

Tap water relief inspection service (Water coordinator)



Indoor piping diagnosis and washing service (water doctor)



Method	130 people in total	17 people in total (15 in Yangju, 2 in Dongducheon) * In 2019, Water Doctors were introduced in Geoje and Naju
Target	Entrusted local waterworks (22 projects)	Yangju-si, Dongducheon-si
Period	June-December 2018 (7 months)	June-December 2018 (7 months)
Goal	80,000 cases (About 10% of all entrusted households local households)	Total 1,750 cases (1,250 in Yangju, 500 in Dongducheon)
Task	Home water quality inspection and providing information, solving supply water quality problems	Indoor piping diagnosis and prevention of water quality problems

Establishment of clean organizational culture centered on human rights

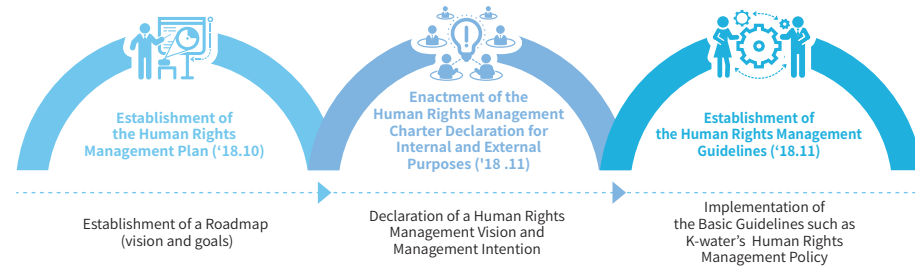
K-water has established a roadmap that reflects human rights management in its corporate strategies and objectives, and implements human rights management in practice by linking integrity, ethical management, and sustainable management. K-water will continue to do its best to become a leading human rights management company. In addition, we have established a mid-to long-term roadmap for human rights management to ensure the protection and promotion of human rights of stakeholders as well as our employees by expanding the scope of management of human rights, establishing global human rights policies, and striving to realize social values.

K-water's Human Rights Management Roadmap



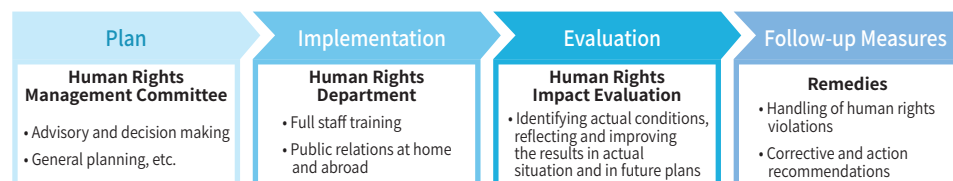
Human Rights Management Code

K-water proclaimed its human rights management vision both internally and externally with the CEO's strong will, and enacted human rights management guidelines for practice. K-water's employees and stakeholders at home and abroad are internalizing and practicing a human-centered culture of human rights based on the human rights management guidelines.



Systematization of Human Rights Management

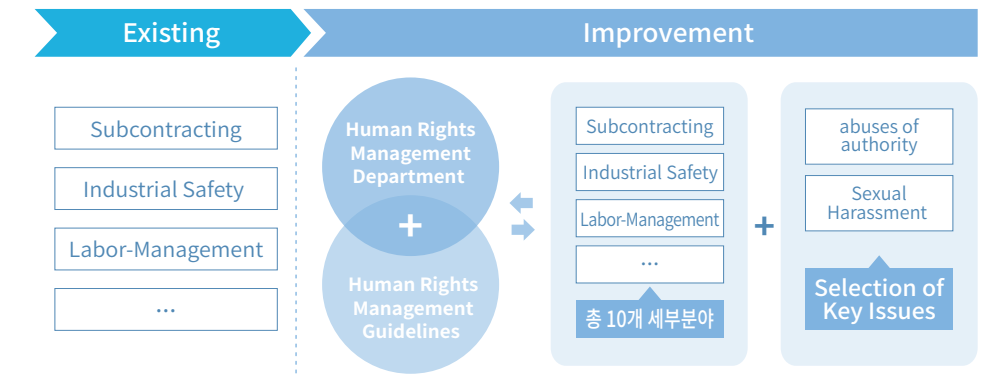
Based on human rights management standards, K-water has established and operates the Human Rights Management Committee, which includes internal and external experts. In order to identify and analyze the actual and potential risk factors for human rights, we designate departments in charge and conduct human rights impact assessments. We have also established procedures and are operating them to remedy human rights violations.



Expansion of the human rights management scope

K-water has expanded the scope of human rights management to cover social issues, established the departments and systems of human rights management to systematically manage abuses of authority and even sexual harassment, which are social issues by designating 10 subdivisions and departments related to human rights.

K-water's human rights management scope



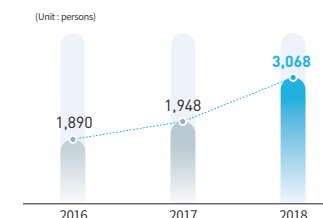
Creation of a working environment to improve employees' quality of life

K-water has established the operation direction of a new welfare system called 'Improving Quality of Life,' which pursues employee happiness first. In 2016, we have newly set up an organizational culture department directly under the CEO to systematically promote company-wide organizational culture innovation activities so that employees can work smarter and enjoy working with pride. In September 2017, we have established the 'Working Standards for Work-Family Reconciliation,' an internal regulation on efficient work performance and work-life balance for the first time in public corporations, laying the foundation for the implementation of 'quality of life' through employee participation and internalization of organizational culture. To implement 'Improvement of Quality of Life' and 'Work & Life Balance' (WLB), K-water is operating various programs and awarded 'GWP (Great Work Place) Korea' through this. The company has been selected as an excellent family-friendly organization (Ministry of Gender Equality and Family) for 10 consecutive years, approaching the realization of a good workplace to work.



Joint Labor-Management Family Camping Event

Employees using flexible working hours



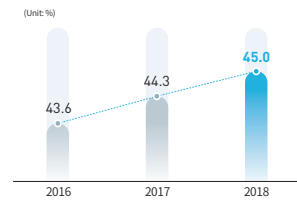
Operational status of the Organizational Culture Improvement System such as flexible working

Category	Operation system and contents
Flexible working expansion	<ul style="list-style-type: none"> Expansion of Smart Work Centers and remote work on workdays interspersed with holidays Introduction and operation of a short-time work system and a self-designed flexible work system
Improvement of work practices	<ul style="list-style-type: none"> Family Day (every Wednesday and Friday) Weekday PC-off and Shut-down (power off) at 19:00 on weekdays, Weekend PC-off (power off)
Encouragement of childbirth and strengthening the childcare support system	<ul style="list-style-type: none"> Maternity leave and parental leave notice system (Possible to secure substitutes and budget) Operation of daycare centers (expanding the fixed number of people by additionally converting work facilities to childcare facilities) Expansion of maternity leave for spouses (5 → 10 days) Expansion parental leave policy for their 1st born child (1 year → 3 years) Child Care Leave (2 days / year)
Support for work-family balance	<ul style="list-style-type: none"> Family Participation Education such as Couple Coaching and Fathering School Support for a labor-management joint family participation culture and experience programs for each headquarters and regional headquarters (once / year) The Department of Leisure and Entertainment, expansion of cultural performance support and securing additional recreational facilities

* Family Day refers to days where K-water events and meetings are prohibited after 19:00 (implying staff should go home and spend time with family and friends)

Fostering convergence water experts to lead the future changes

K-water Human Resource Development Index



Establishment of a culture of trust based on autonomy and responsibility

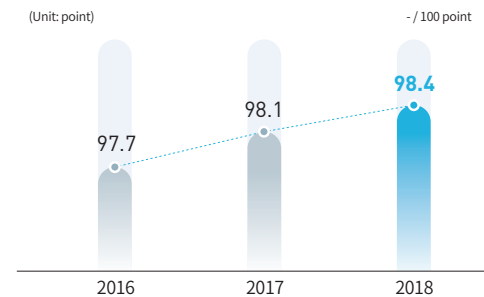
By providing accurate and timely hiring information, we resolve the asymmetry of information and improve job fairness and efficiency by providing job application analysis data using big data and AI. In addition, to proactively respond to internal and external environmental changes, we are allocating manpower to the right places and securing the highest level of professional manpower in key areas in response to future changes. In particular, we operate a support system for fostering convergence water experts with insights on creating new businesses and solving problems.

Selection of core fostering fields

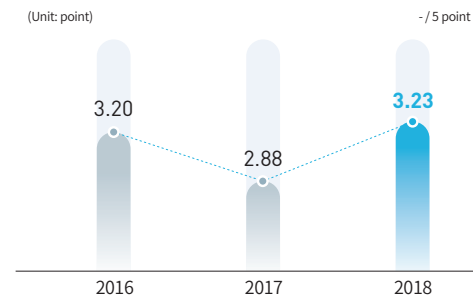


In order to create a work-life balance culture, K-water is conducting monitoring and customized improvement activities by developing a work-life balance index. In 2017, satisfaction declined during the transition to non-monetary welfare, but we have raised the level to the previous year's level by establishing a system for work-life balance considering life cycles, such as childbirth and childcare and striving to create a culture in which employees design their own working schedules and fulfill the responsibilities by eliminating inefficient practices and spreading flexible working systems. In addition, we have strengthened the motivation for employees to work diligently and focus on their work by linking with organization vision and discovering the meaning and purpose of work.

Awareness of Internal Vision and Strategy



Welfare Satisfaction



Based on the analysis of the causes of 294 safety accidents since 2010, K-water has developed a hazardous substance measuring sensor using IoT technology in cooperation with startups. As a result, we solved the 'enclosed space oxygen deficiency,' which is the number one cause of death, and established fundamental safety measures. In addition, we are striving to create a safe working environment by actively improving hazardous and obsolete facilities such as the introduction of high risk chemical substitutes at water purification plants, installation of leak-proof walls, sensors, and anti-disaster facilities. As a result of these efforts, we have expanded the number of certified workplaces with 'excellent risk assessment' from 3 in 2017 to 11 in 2018, and was selected as an 'excellent organization' according to the results of the Ministry of Land, Infrastructure and Transport's safety management level evaluation.



Creation of a safe working environment

Environmental Management

K-water conducts its management activities in consideration of not only the environmental impacts caused by climate change but also the influences they have on the entire supply chain and the environment. In addition to the planning, construction, production, and operation of facilities, we are striving to improve environmental soundness from the supply of raw materials by suppliers to the use and disposal of them by consumers.

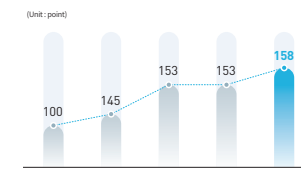
Eco-friendly Management System

The effects of climate change, such as massive floods and droughts, are spreading throughout the world and water management has become a key factor in the preparation for the future as it accounts for 90% of the responses are climate change-related. K-water conducts its management activities in consideration of not only the environmental impacts caused by climate change but also the influences they have on the entire supply chain and the environment. As Korea's leading public water management corporation, we have striven to implement environmental management throughout the entire business process. K-water is encouraging all employees to adopt an environmentally-friendly lifestyle. It is also actively participating in the reduction of disposable products used in public organizations, promoting the use of multi-use products, and hosting paperless conferences to create a workplace where a green lifestyle is put into action and a better environment will be handed down to generations to come.

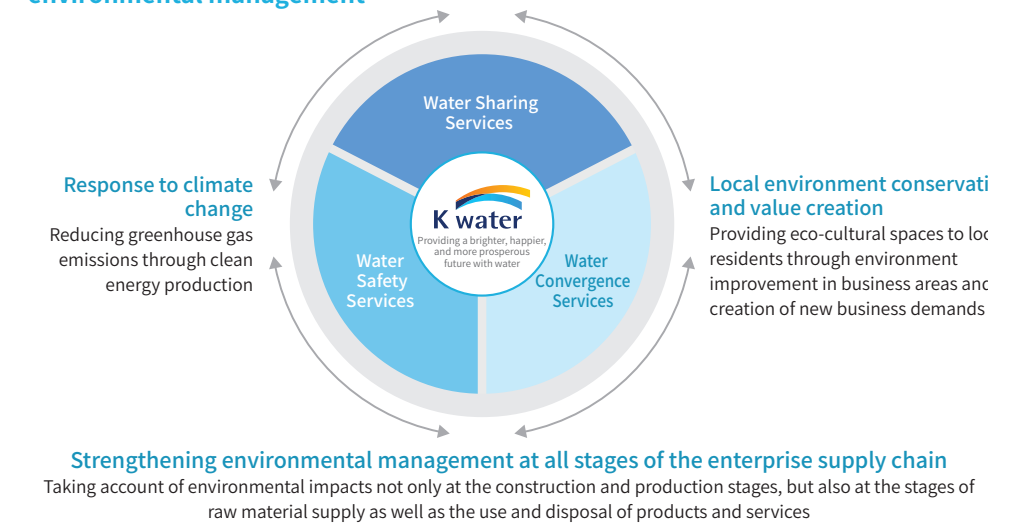
Overview of K-water's environmental management

Practice System Quality, Environmental, and Green Management Complying with Global Standards	<ul style="list-style-type: none"> Acquisition of international standardization certification (ISO) for Quality, Environmental and Green Management Changes to ISO9001/ ISO14001 certification in July 2018 [ISO9001 (Quality Management) / ISO14001 (Environmental Management) / KSI7001 (Green Management)] Every year, improvements are made in every department based on the assessment by internal and external experts on the performances in quality, environmental, and safety management (customer service quality, environmental and safety management, etc.)
Environmental Performance Evaluation (EPE)	<ul style="list-style-type: none"> Comprehensive and quantitative measurement of the performance in environmental management across all management sectors The EPE indicates a relative improvement in environmental performance in comparison with the base year (2006). The evaluation has been conducted since 2007 and K-water has constructed Korea's first computerized environmental performance evaluation system and acquired a patent for the system. The EPE score for 2018 was 158 which indicates that the environmental performance has enhanced by 58% from the base year (2006).
Support Base Fostering Internal Experts in Quality, Environmental and Green Management	<ul style="list-style-type: none"> Training in ISO quality and environmental management certification auditing has been provided to selected internal employees since 2007. A total of 179 ISO quality and environmental management auditors have been certified as of October 2019. The internal experts have provided a practical understanding of quality and environmental management in accordance with international standards at every K-water business site.

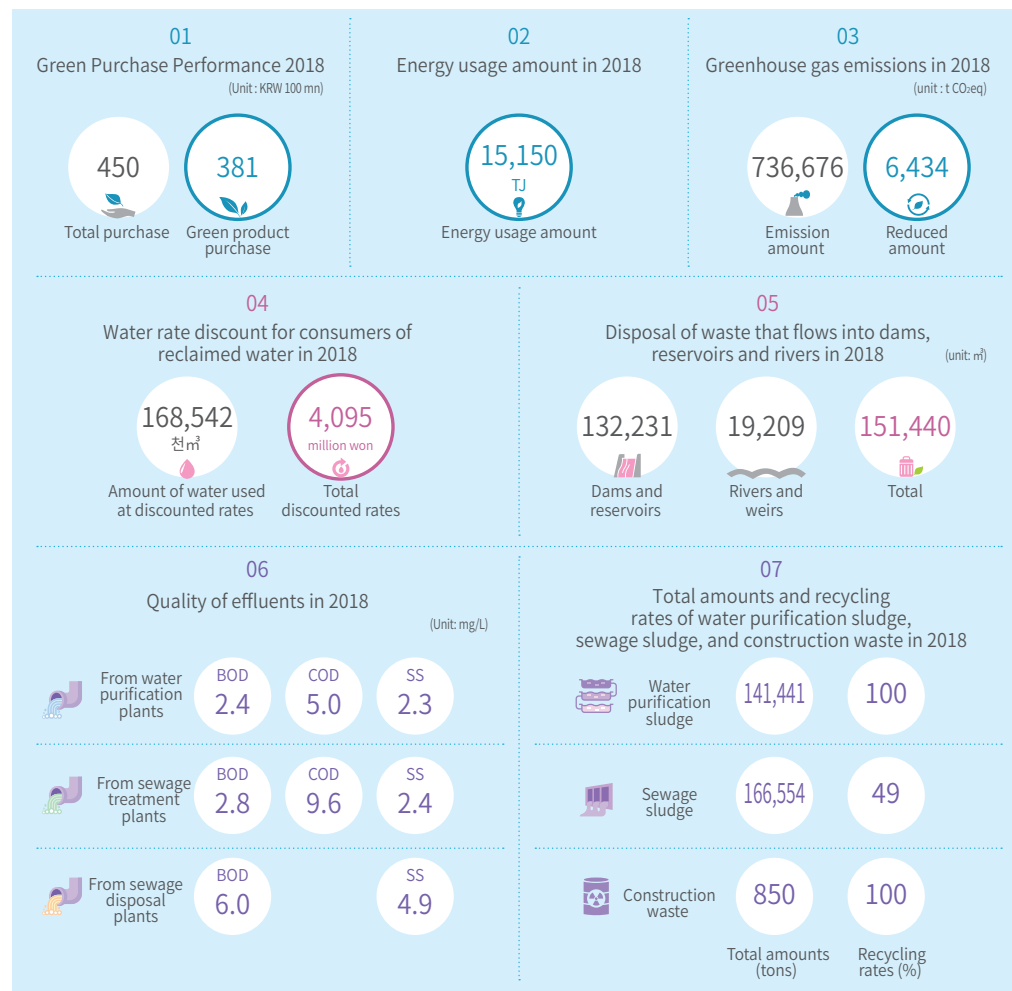
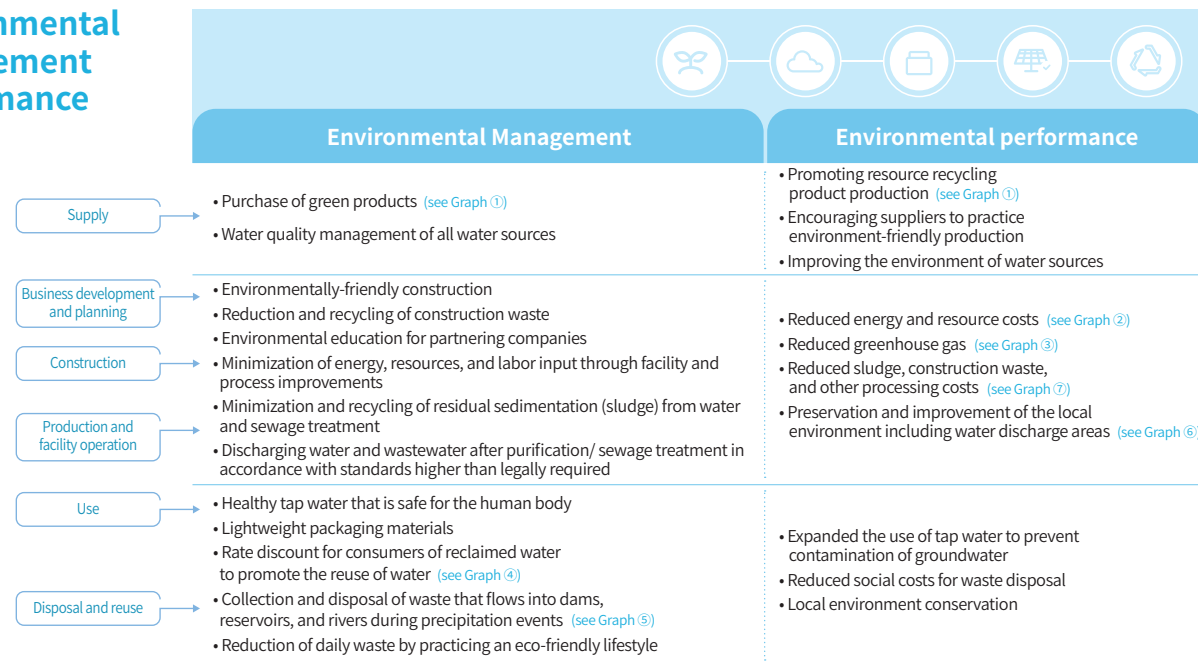
Environmental Performance Evaluation (EPE)



Strategies for implementing environmental management



Environmental Management Performance

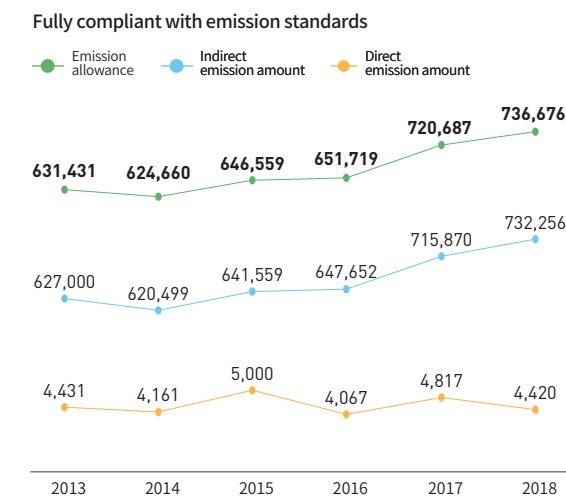


Response to climate change

K-water's response to climate change

K-water, designated as a business subject to the national greenhouse gas emissions trading system, has made efforts to reduce greenhouse gas emissions and complied with the government's emission limitations. In 2018, K-water's greenhouse gas emissions amounted to 736,676 tCO₂-eq, abiding to the Ministry of Environment's greenhouse gas emission regulations for the 7th consecutive year. Most of the greenhouse gases were indirectly emitted, mainly caused by the use of electricity to supply tap water. In May 2005, K-water launched its Clean Development Mechanism (CDM) Projects, registering 12 projects to the United Nations Framework Convention on Climate Change (UNFCCC) and securing a total of 530,000 tons of potential greenhouse gas reduction per year.

Greenhouse gas emission amount (tCO₂-eq)



Current status of CDM Projects

Classification	Target	UNF registration date	Annual energy production (MWh/y)	Expected emission reduction (tCO ₂ -eq/y)
Total	-	-	827,722	530,840
Sihwa Tidal Power Plant	Sihwa Tidal Power Plant	2006년 6월	507,629	315,440
Small Hydro Power Plant 1	Andong, Jangheung, Seongnam 1	2006년 10월	15,473	8,103
Small Hydro Power Plant 2	Daecheong, Juam, Dalbang, Seongnam 2	2007년 2월	13,944	8,331
Sihwa Wind Power Plant	Sihwa Wind Power Plant	2007년 11월	3,839	2,521
Small Hydro Power Plant 3	Gosan, Pangyo	2009년 11월	5,557	2,987
Small Hydro Power Plant 4	Seongdeok, Gimcheon Buhang	2010년 10월	4,963	2,759
Small Hydro Power Plant 5	Angye, Hoengseong2	2012년 4월	4,603	3,100
Waterworks Efficiency Improvement	Paldang	2012년 8월	-	7,044
Hydro Power Plant 6	Ipo, Yeosu, Gangcheon	2012년 10월	76,406	50,772
Hydro Power Plant 7	Sejong, Gongju, Baekje, Sangju	2012년 9월	57,541	38,237
Hydro Power Plant 8	Nakdan, Gumi, Chilgok, Gangjeong Goryeong	2012년 9월	58,170	38,654
Hydro Power Plant 9	Dalseong, Hapcheon Changnyeong, Changnyeong Haman, Seungchon, Juksan	2012년 9월	79,597	52,892

Response technology development

In order to develop a systematic response strategy for climate change in the water sector, K-water has established domestic and international cooperative systems and is reinforcing its capacity to respond to climate change through climate change adaptation technologies and institutional improvements. K-water has prepared a climate change response strategy in the water sector in connection with climate change-related national plans such as the National Greenhouse Gas Reduction Roadmap, Climate Change Response Master Plan, and a roadmap for securing climate change response technology and developed K-water's customized refinement technique and application technology according to the climate change scenario of GCM (Global Climate Model, General Circulation Models).

Refinement technique

Creation of high resolution climate information for specific regions by using GCM (Global Climate Model) climate information (over 100km)			
Statistical method Use of statistical relationships between GCM and climate variables in specific regions (regression equation, neural network, etc.)	Advantage Generation of a lot of information in a short time	Disadvantage Lowered reliability on complex topography such as linearity, normality and mountainous effect	
	Mechanical method Refinement using Regional Climate Model (RCM) with GCM results as boundary conditions	Advantage Improved reliability of complex topography such as nonlinearity, abnormality, and mountainous effect	Disadvantage Calculation takes a long time

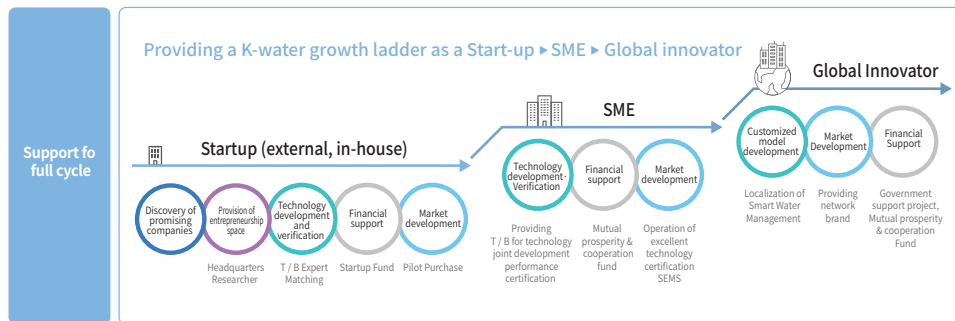
K-water and SMEs

K-water has established a small and medium-sized venture business development system for the water industry. In particular, we are concentrating our company-wide capabilities on the growth and development of water-related SMEs and venture companies based on K-water's knowledge, technology, and infrastructure in response to the unification of water management. We are strengthening the existing SME technology development support system and provide customized support for each stage of business growth from start-up to export.

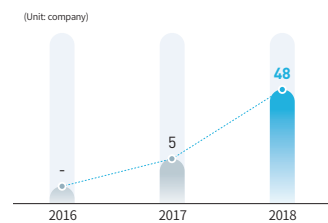
Fostering small and medium-sized venture companies

K-water, a public corporation specializing in water management, is implementing a systematic policy for fostering small and medium-sized venture companies and SMEs to contribute to the creation of an innovative business ecosystem and creation of jobs in the water industry. Since 2017, we opened the 'Water Industry Platform Center', an organization dedicated to fostering the water industry in the form of an open platform, and is striving to foster 450 SMEs and venture companies and create 14,000 jobs in the water industry by 2023.

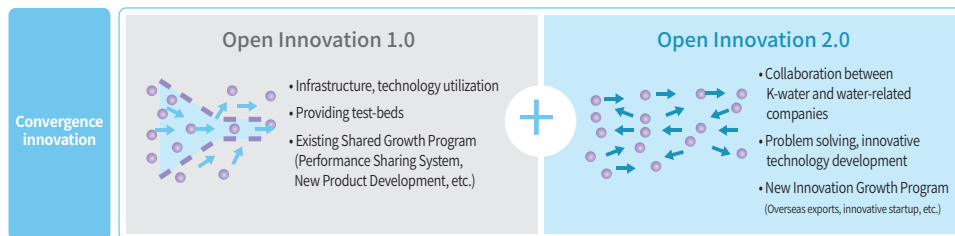
K-water Water Industry Open Platform



Number of startups in the water industry



*Fostering startups from 2017

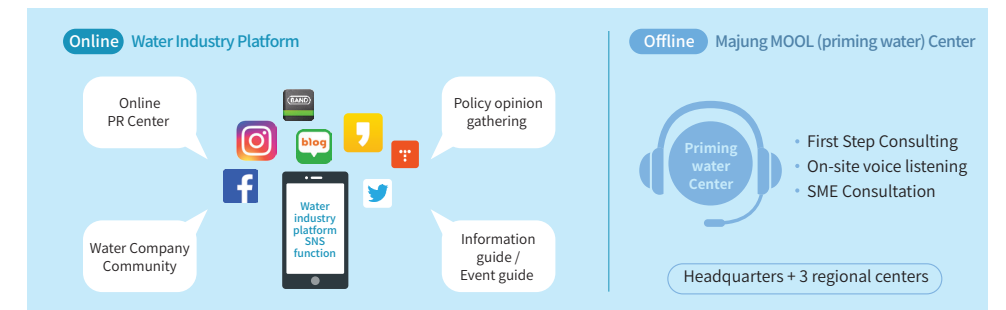


Support Plan by Unit Platform



Development of new technology with SMEs

K-water supports the innovative growth of SMEs and venture companies and creates private jobs through the open platform of the water industry by fully opening and sharing tangible and intangible assets. We support the expansion of start-up incubators, regular competitions for startups, specialized accelerator programs, the creation and operation of the start-up initial fund in the water sector and promote the selection of a consignment agency for the national water industry. We also expanded government-linked programs to support Promising Startup Scale-up. In addition, we have set up an overseas expansion program for innovative technology startups in cooperation with the professional accelerator agencies in the water industry of hub countries.

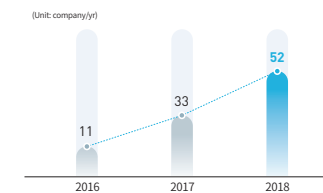


One-stop support system for the fostering and distribution of innovative technology of SMEs

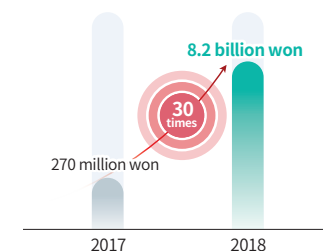
Technical development support	Technical demonstration and verification	Market expansion
Transfer of intellectual property rights (patents and copyrights), customized R & D	Provision of test-beds	K-water's excellent technology certification system (BEST-Tech, NEW-Tech)

Support for SMEs' overseas expansion

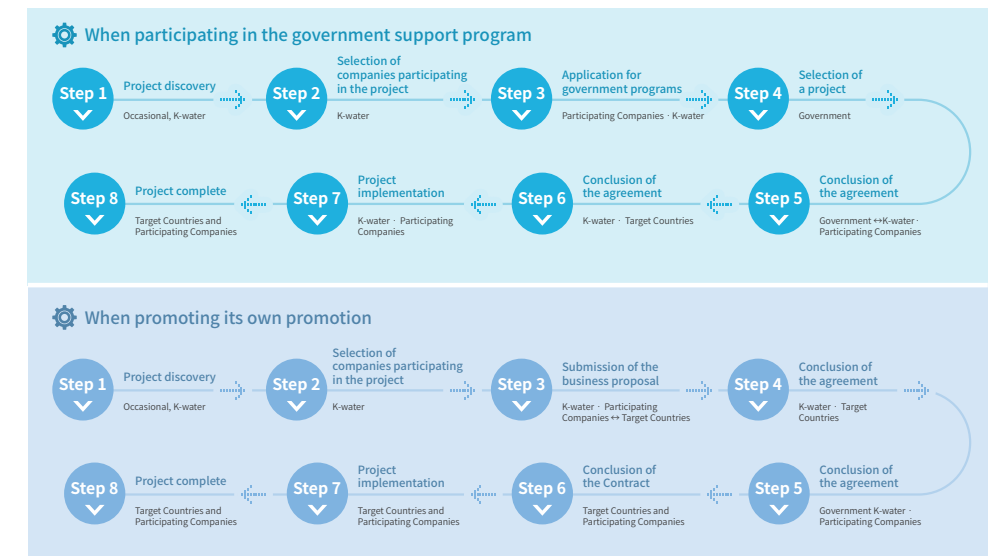
Number of SMEs entering overseas



Overseas exports of SMEs



K-water opened the 'Priming Water Center', a one-stop counseling center, and held purchase consultations and meetings. Using the excellent know-how and experience of K-water's wage peak employees, we consulted SMEs in four regions across the nation and held the Water Industry Technology Competition. By supporting IP and incubation of technology transfer companies, we prevent the dead storage of transferred technology and continuously protect the technology. In addition, through the K-water localization support project, we have combined our experience in water management and excellent SME technologies to brand them as 'smart water management technology' and presented customized solutions. As a result, we have successfully entered various overseas markets such as Vietnam, Indonesia, Singapore, and the Philippines.



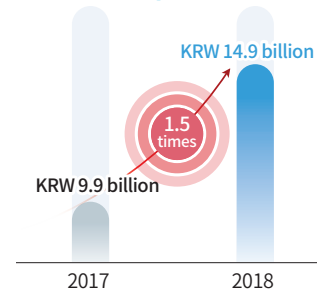
Fostering and Support of Social Enterprises

Beyond simple support, K-water is pursuing a win-win growth strategy with Social Enterprises as a collaborative partner. Through collaboration with specialized institutions, we are striving to foster technology-based social ventures by discovering social enterprise ideas and supporting commercialization. In addition, we have increased the amount of purchases from social enterprises through a system that considers the weak and improved awareness, and purchased 1.5 times compared to the previous year. We continuously train contract managers and monitor them every month.



- Creation of jobs for the elderly... Display of hand-knitted wooden clothes
- Culture revitalization... Support for Korean traditional music with a modern twist social enterprise
- Social enterprise competition performance presentation

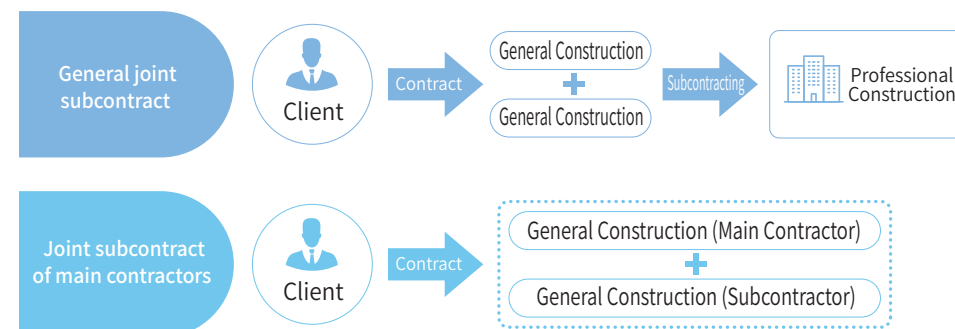
Purchases from social enterprises



Leading Fair Trade Culture

K-water has mandated the 'joint subcontract of main contractors' contract method of large constructions projects to solve low-cost subcontracting and improve the financial structure of specialized construction companies. By specifying a professional contractor as a subcontractor equivalent to a general contractor, we succeeded in securing construction quality and establishing a fair contract relationship. In addition, we are working to establish overhead payment standards through the collaboration with internal and external experts and to improve the stability and unfair practices of the domestic construction industry. Besides, we introduced fair wage system, established social valuation and contract local mutual cooperation and caring for the weak.

Classification of general co-subcontract and main contractor co-subcontract



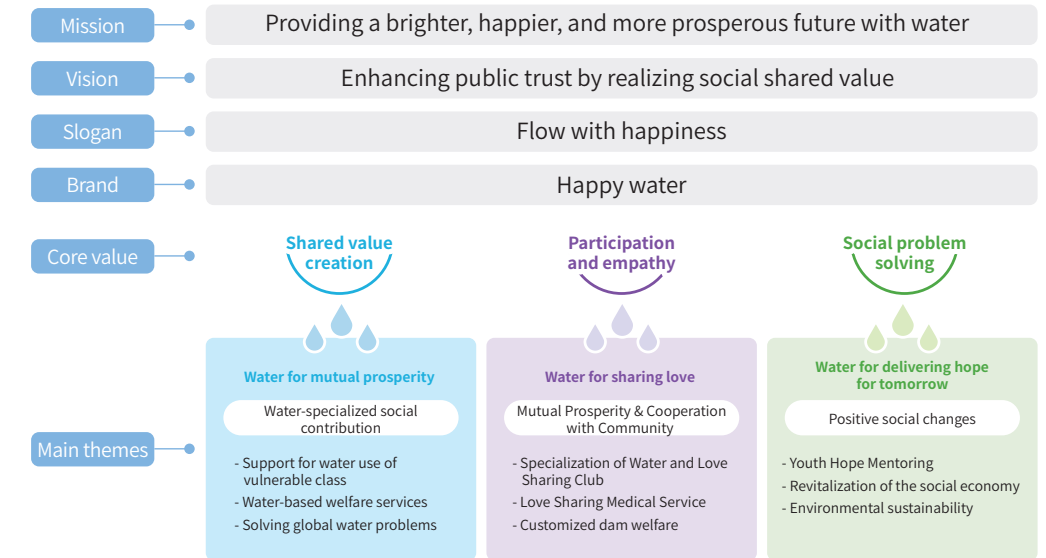
The Role of Priming Water for Community

As a water management company, K-water is striving to realize water welfare so that everyone can enjoy the benefits of clean water, while promoting various social contribution activities for the mutual prosperity of communities. In particular, we are striving to become a partner with communities through warm sharing based on three social contribution themes: Water for mutual prosperity, Water for sharing love, and Water for delivering hope for tomorrow.

K-water's social contribution promotion system

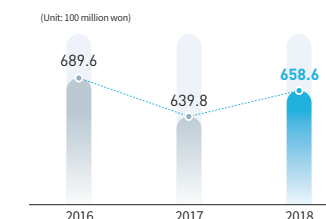
For the sustainable development of the company and society and creation of social value, the company has established its own vision for social contribution activities, three core values and directions, and provides practical benefits to beneficiaries through strategic activities that take advantage of its characteristics by focusing resources and capabilities. With the intention of realizing happiness through water, we have set up a new social contribution integrated brand, 'Happy Water', and are carrying out various activities under the themes of mutual prosperity, love, and hope.

K-water's social contribution promotion system



Social Contribution through the Water and Love Sharing Club

Scale of Social Contribution Investment by Year



Since its founding in July 2004, K-water's Water and Love Sharing Club, a social contribution club, has gathered employees' willingness to continuously carry out various activities such as environment conservation, relief in disaster areas, helping the underprivileged to share love with the underprivileged, and contribution to the community. Through '1% of each employee's salary' for the first time in public corporations in 2013, all employees participate in active sharing, fulfilling corporate social responsibilities and enhancing social contribution. In 2018, a total of 33,000 hours of volunteer work were conducted in 123 volunteer clubs composed of employees. K-water has established a social contribution management system to support volunteer activities of the Water and Love Sharing Club, and systematically manages volunteer activities in real-time through the entire process of volunteer activities, from the establishment of clubs to performance management. We are operating a matching grant on a budget that corresponds to the Water Love Sharing Fund, where employees raise a certain amount from monthly salary. In addition, K-water is striving to share the growth benefits of K-water with society through active support and participation of employees in order to solve community problems and share with them. In 2018, we used KRW 65.9 billion for social contribution activities.

「Water for mutual prosperity」 to deliver water benefits for vulnerable classes

As a public corporation specializing in water management, K-water is carrying out the project 「Water for Happy Life」, a representative social contribution program to realize clean water supply, which is essential for the health and hygiene of vulnerable classes. We are engaged in global social contribution activities and river ecosystem protection activities to solve global water issues and support sustainable development. In addition, we are promoting water welfare projects such as support for lunch water for elementary and secondary schools and desalination projects. Since 2018, we have fostered and supported outstanding social enterprises by conducting idea contests to revitalize the social economy. In particular, we are promoting water environment improvement, such as obsolete piping and sinks through the ‘Water for Happy Life Project for Water Environment Improvement’ provided by self-support companies and cooperatives.



④ Social Contributions Overseas



④ Improvement of the Water Environment for Low-Income Classes

「Water for sharing love」 to support community development

In order to reflect the needs of the community and to provide a ‘life cycle customized social contribution’ for each beneficiary, we are carrying out various projects to maximize the useful value of dams through Beautiful Dam Creation Project such as Love Sharing Medical Service, filial duty sharing services for the silver generation including Filial Duty Sharing Welfare Center, support for income growth for the young and the elderly, and operation of Water Culture Centers. In particular, as the Filial Duty Centers around dams are mixed and the service level of each center is different, we are promoting the establishment of the Social Welfare Foundation to improve and specialize the senior welfare services.

Specialization of welfare service for the elderly in dam areas by establishing a welfare foundation



「Water for delivering hope for tomorrow」 that gives hope to future generations

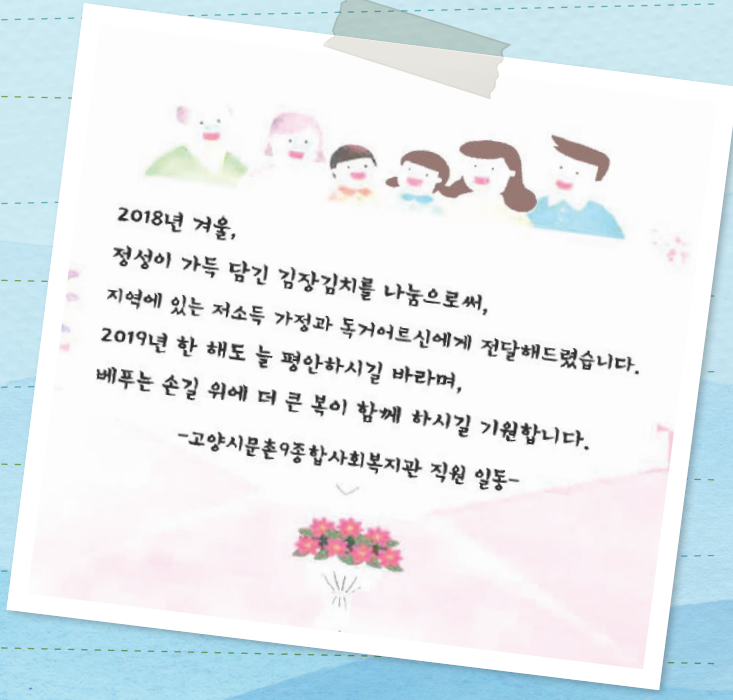
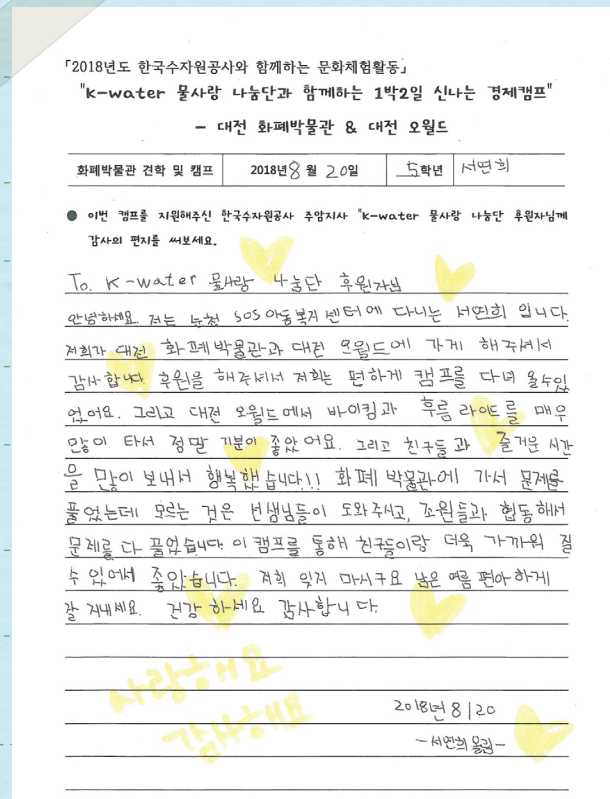
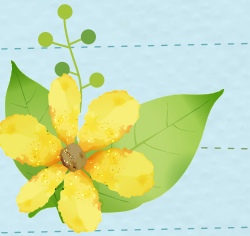
K-water promotes various activities for the healthy growth of the future generations and social economic revitalization, and conducts hope mentoring, water dream camps, and youth outdoor camps for vulnerable youth.



④ Youth Hope Mentoring



Memory Sharing of Water and Love Sharing Club



..... **086** Performance of Sustainability Management

..... **096** Third Party Assurance Statement

..... **098** GRI Standard / ISO 26000 Index

..... **100** Code of Ethics, Quality · Environmental and Green Management Policy,
Customer Charter Statement, Human Rights Centered Management

..... **102** UN Global Compact Activities

..... **104** Membership Activities and Awards

..... **106** Questionnaire for Readers



APPENDIX



Sustainability Highlights

Economic Performance | Financial Performance

Summary of consolidated statement of financial position

(Unit: KRW in millions)

Category	2016	2017	2018
Assets			
Current assets	6,422,010	7,041,806	8,208,278
Non-current assets	13,877,420	13,825,489	13,588,480
Total	20,299,430	20,867,295	21,796,758
Liabilities			
Current liabilities	3,154,565	3,056,095	2,901,471
Non-current liabilities	10,484,290	10,577,196	11,108,159
Total	13,638,855	13,633,291	14,009,630
Capital			
Capital	7,692,548	8,108,974	8,486,338
Others	▲ 1,064,523	▲ 908,919	▲ 740,756
Equity attributable to owners of the parent company	6,628,025	7,200,055	7,745,582
Non-controlling interest	32,550	33,949	41,546
Total	6,660,575	7,234,004	7,787,128

Summary of consolidated statement of income

(Unit: KRW in millions)

Category	2016	2017	2018
Turnover	3,618,084	3,375,560	3,391,568
Cost of sales	3,105,616	2,793,724	2,745,361
Selling and maintenance expenses	148,369	154,120	170,185
Operating profit	364,099	427,716	476,022
Other income	20,053	68,450	140,705
Other expenses	120,128	42,887	20,146
Other gains (loss)	▲ 143,011	▲ 1,889	441
Financial income	46,182	125,341	64,617
Financial costs	329,105	383,290	380,958
Related profit (loss) of affiliates	▲ 3,309	▲ 1,145	▲ 7,141
Net profit before corporate tax deduction	▲ 165,219	192,296	273,540
Corporate tax expenses (profits)	▲ 48,254	7,362	33,366
Net profit during the term	▲ 116,965	184,934	240,174
Other comprehensive income	2,844	▲ 27,521	▲ 31,259
Total comprehensive income	▲ 114,121	157,413	208,915
Net profit during the term attributable to owners of the parent company	▲ 120,913	179,248	240,449
Net profit during the term attributable to non-controlling interest	3,948	5,686	▲ 275

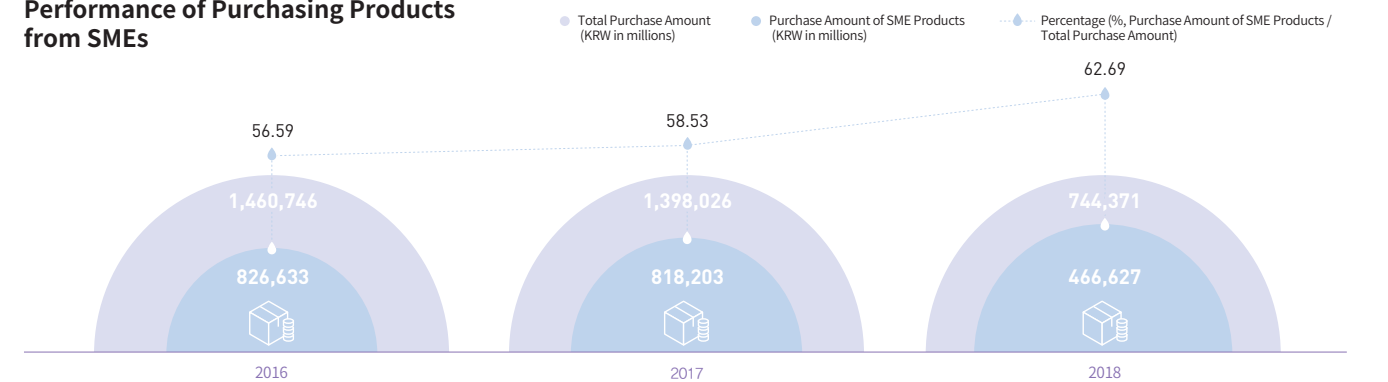
Social value creation

Turnover by business sector

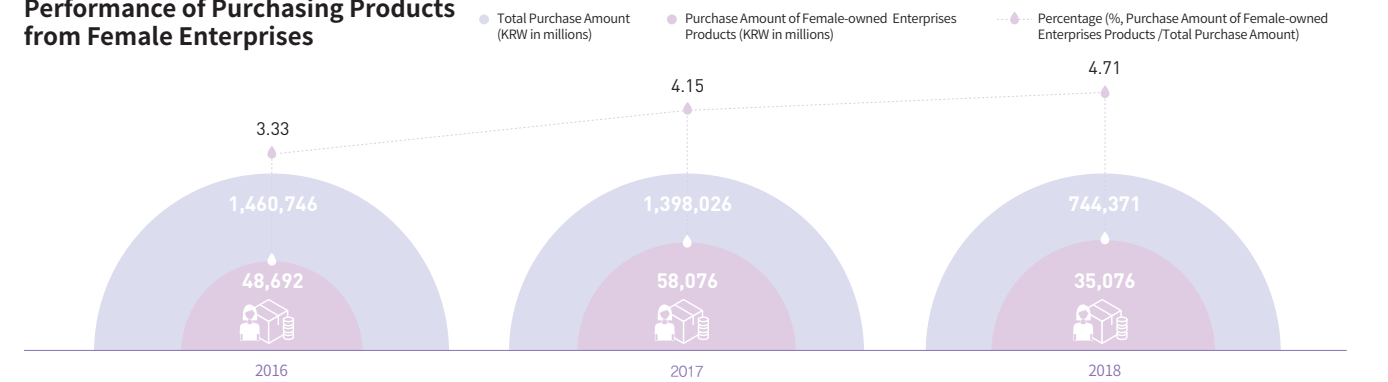
(Unit: KRW in millions)

Sector	2016	2017	2018
Integrated Water Resources Management (IWRM)	667,037	551,021	715,607
Tap water production (healthy water)	1,222,661	1,300,988	1,327,239
Waterfront city development	689,741	544,912	572,864
Clean energy production	218,930	229,469	270,073
Overseas projects	3,820	7,284	9,063

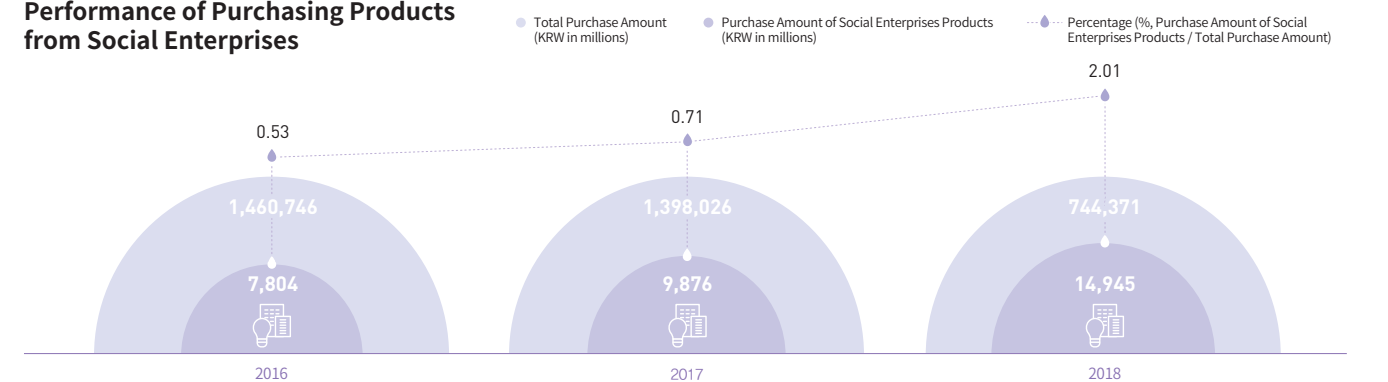
Performance of Purchasing Products from SMEs



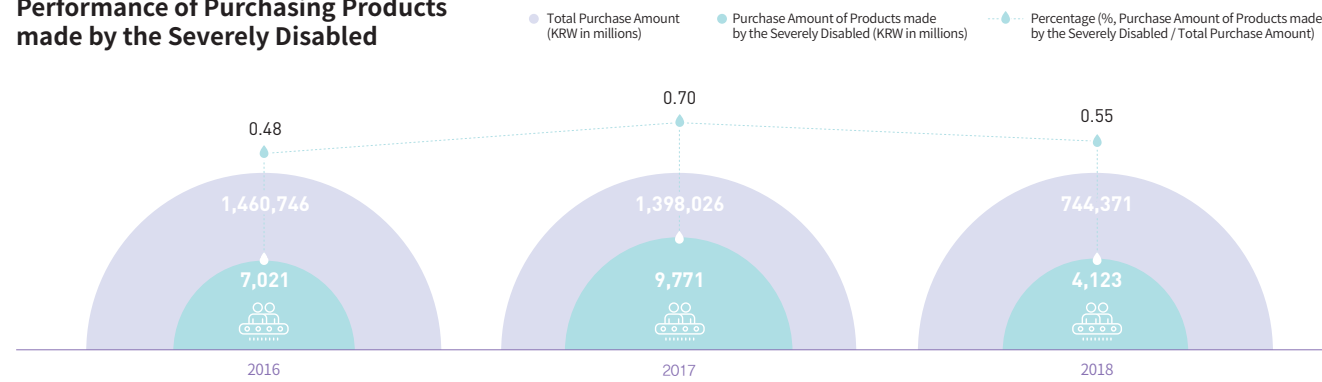
Performance of Purchasing Products from Female Enterprises



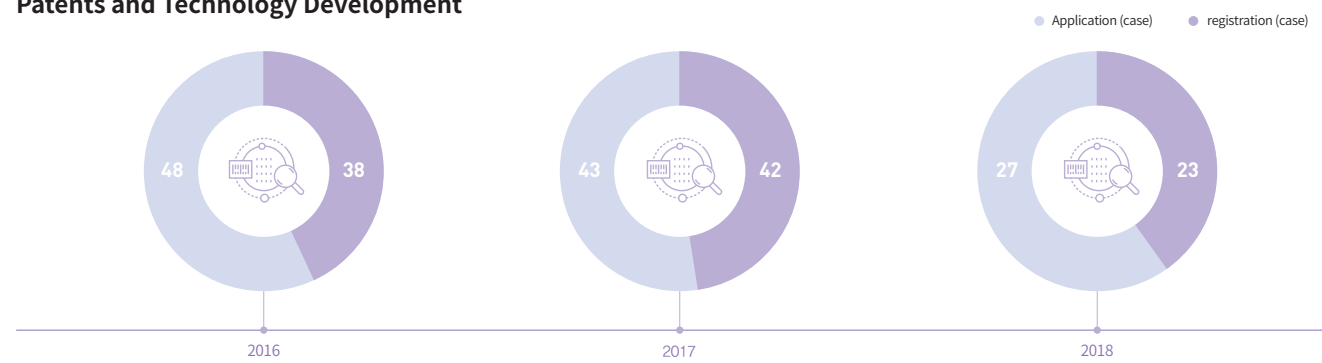
Performance of Purchasing Products from Social Enterprises



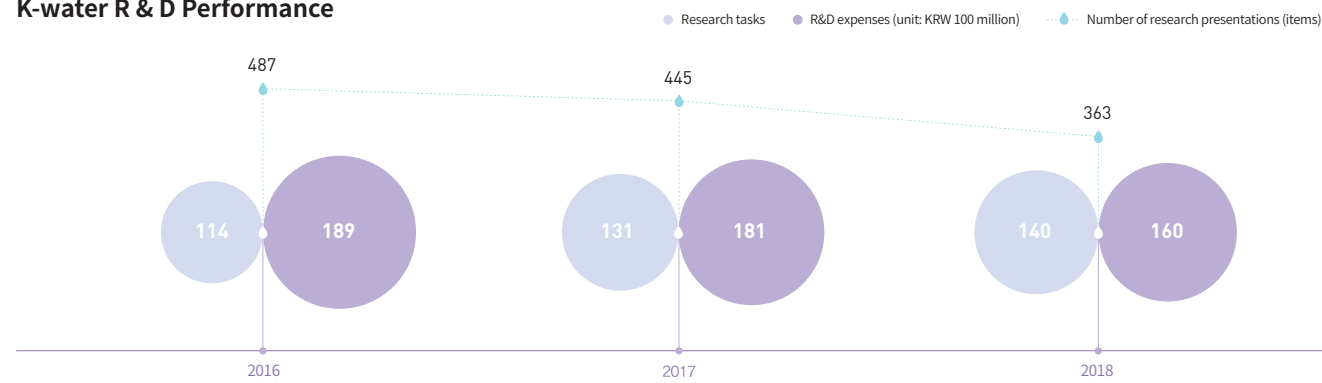
Performance of Purchasing Products made by the Severely Disabled



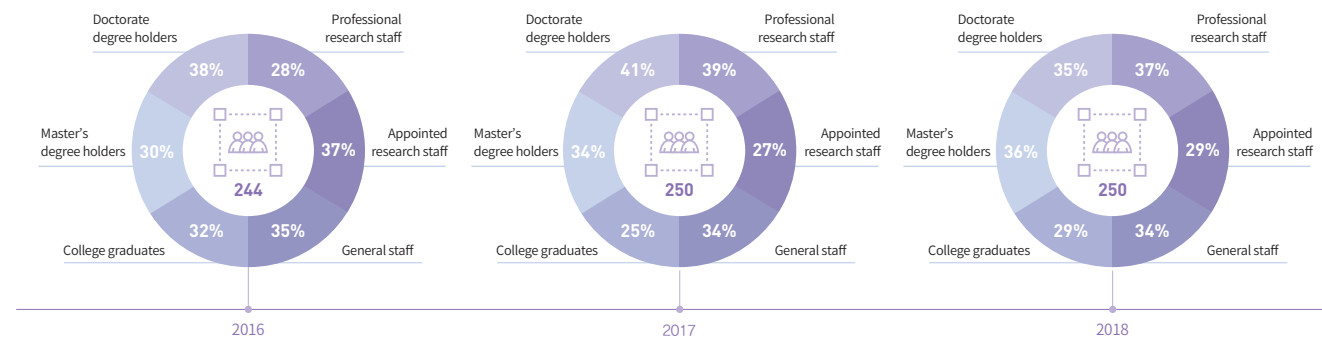
Patents and Technology Development



K-water R & D Performance

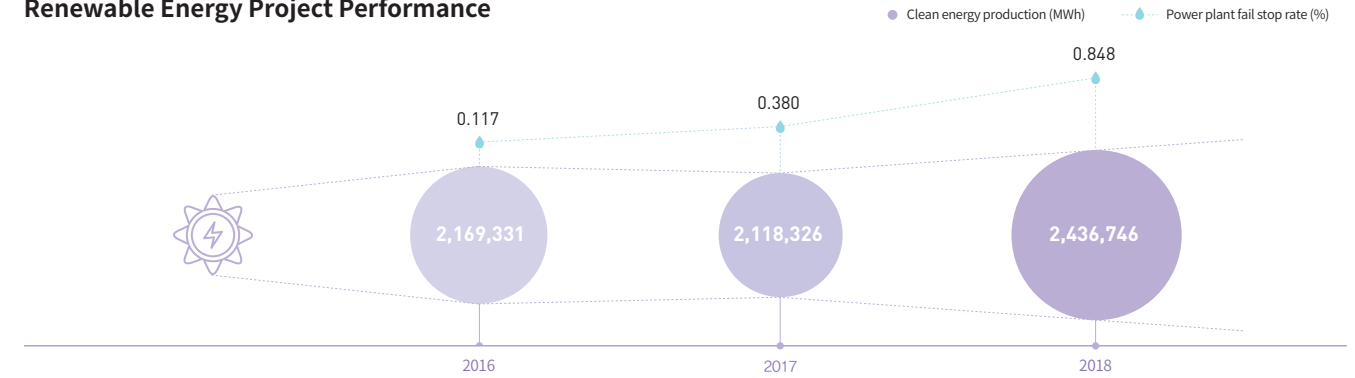


R&D Professionals



Environmental performances

Renewable Energy Project Performance



Greenhouse Gas Emissions

Category	2016	2017	2018
Emissions			
Total (ton CO2-eq)**	651,719	720,687	736,676
Direct (ton CO2-eq)	4,067	4,817	4,420
Indirect (ton CO2-eq)	647,652	715,870	732,256
Carbon cleanliness (ton CO2-eq/TOE)	18.01	19.92	20.36
Reduction			
Reduction target (tonCO2-eq)	53,531	86,524	141,292
Estimated emissions (ton CO2-eq)	679,933	720,687	736,676
Emission amount (ton CO2-eq)	626,402	634,163	595,384
Total reduction (ton CO2-eq)	50,615	4,522	6,434
Reduction in the year (ton CO2-eq)	2,844	4,522	6,434
Early reduction_used (ton CO2-eq)	47,771	0	0

Energy Consumption and Savings

Category	2016	2017	2018
KRW Unit			
TJ / KRW 100 million	3.70	4.09	4.19
Consumption			
Total	13,399	14,783	15,150
Direct (TJ)	64	79	73
Indirect (TJ)	13,335	14,704	15,077
Savings			
Power Generation Energy Savings (MWh)	8,336	6,100	-

Reduction of Waste

Category	2016	2017	2018
Water Purification Plant Sludge			
Generated amount (tons)	119,898	121,581	141,441
Generation source unit (g/m ³)	56.4	59.9	62.1
Recycling rate (%)	100	100	100
Raw material of cement	61	37	24
Soil covering material, fill dirt material	39	63	73
Green soil	0	0	0
Pebbles	0	0	0

Creation of Local Eco-cultural Spaces

Category		2016	2017	2018
Total	Alternative habitat (No. of places)	54	53	53
	Fish spawning ground (No. of places)	13	13	13
	Eco-corridor (No. of places)	116	116	116
	Artificial marsh (No. of places)	20	20	20
	Fishway (No. of places)	5	5	5
Gunwi Dam	Alternative habitat (No. of places)	6	5	5
	Fish spawning ground (No. of places)	5	5	5
	Eco-corridor (No. of places)	6	6	6
	Artificial marsh (No. of places)	6	6	6
	Fishway (No. of places)	0	0	0
Gunnam Dam	Alternative habitat (No. of places)	8	8	8
	Fish spawning ground (No. of places)	0	0	0
	Eco-corridor (No. of places)	6	6	6
	Artificial marsh (No. of places)	1	1	1
	Fishway (No. of places)	1	1	1
Hantan Dam	Alternative habitat (No. of places)	0	0	0
	Fish spawning ground (No. of places)	0	0	0
	Eco-corridor (No. of places)	7	7	7
	Artificial marsh (No. of places)	0	0	0
	Fishway (No. of places)	0	0	0
Gimcheon Buhang Dam	Alternative habitat (No. of places)	12	12	12
	Fish spawning ground (No. of places)	3	3	3
	Eco-corridor (No. of places)	46	46	46
	Artificial marsh (No. of places)	4	4	4
	Fishway (No. of places)	3	3	3
Seongdeok Dam	Alternative habitat (No. of places)	24	24	24
	Fish spawning ground (No. of places)	3	3	3
	Eco-corridor (No. of places)	45	45	45
	Artificial marsh (No. of places)	2	2	2
	Fishway (No. of places)	0	0	0
Yeongju Dam	Alternative habitat (No. of places)	0	0	0
	Fish spawning ground (No. of places)	1	1	1
	Eco-corridor (No. of places)	1	1	1
	Artificial marsh (No. of places)	3	3	3
	Fishway (No. of places)	1	1	1
Bohyeonsan Dam	Alternative habitat (No. of places)	4	4	4
	Fish spawning ground (No. of places)	1	1	1
	Eco-corridor (No. of places)	5	5	5
	Artificial marsh (No. of places)	4	4	4
	Fishway (No. of places)	0	0	0

Major Achievements in Water Recycling

Sewage Treatment Facilities	Standard	2016	2017	2018
BOD (mg/L)	-(Average)	2.3	2.6	2.8
	5 (1~2 areas)	1.1	1.1	1.1
	10 (3~4 areas)	3.1	3.8	4.1
COD (mg/L)	-(Average)	8.0	9.4	9.6
	20 (1~2 areas)	7.2	7.4	7.4
	40 (3~4 areas)	8.6	10.9	11.3
SS (mg/L)	-(Average)	2.8	3.0	2.4
	10 (1~2 areas)	2.0	1.9	1.6
	10 (3~4 areas)	3.4	3.9	3.0

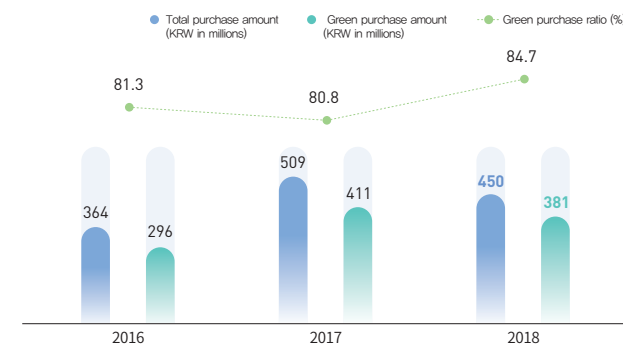
Major Achievements in Water Quality Improvement Activities

Category	2016	2017	2018
Pollution source (No. of places)	374	360	300
Improvement action (No. of places)	370	348	286
Action rate (%)	98.9	96.7	95.3

Major Achievements in Water Quality Improvement

Category	2016	2017	2018	
Water purification plants Quality of effluents	BOD(mg/l)	1.9	2.2	2.4
	COD(mg/l)	3.9	4.3	5.0
	SS(mg/l)	2.0	2.2	2.3
Sewage disposal plants	BOD(mg/l)	5.9	5.4	6.0
	SS(mg/l)	5.6	5.3	4.9

Green Purchase Performance



Social performance | Executive Related Performances

Status of Executives

Category	2016		2017		2018			
	Personnel (people)	Ratio (%)	Personnel (people)	Ratio (%)	Personnel (people)	Ratio (%)		
Fixed number	4,625		4,781		4,955			
All	Total	4,848	-	5,091	-	5,293	-	
	Gender	Male	4,177	86.2%	4,334	85.1%	4,472	84.5%
		Female	671	13.8%	757	14.9%	821	15.5%
	Age	20s and under	714	14.7%	822	16.15%	678	12.81%
		30s to 40s	2,780	57.3%	2,821	55.41%	2,735	51.67%
50s and over		1,354	27.9%	1,448	28.44%	1,880	35.52%	
Executives	Total	7	-	7	-	6	-	
	Age	20s and under	-	0.0%	-	0.0%	-	0.0%
		30s to 40s	-	0.0%	-	0.0%	-	0.0%
		50s and over	7	100.0%	7	100.0%	6	100.0%
	Gender	Male	7	100.0%	7	100.0%	6	100.0%
General	Total	3,826	-	3,956	-	3,953	-	
	Age	20s and under	479	12.5%	582	14.7%	351	8.9%
		30s to 40s	2,323	60.7%	2,337	59.1%	2,248	56.9%
		50s and over	1,024	26.8%	1,037	26.2%	1,354	34.3%
	Gender	Male	3,317	86.7%	3,380	85.4%	3,340	84.5%
Operating	Total	509	13.3%	576	14.6%	613	15.5%	
	Age	20s and under	233	46.7%	239	35.6%	325	39.6%
		30s to 40s	220	44.1%	333	49.6%	354	43.2%
		50s and over	46	9.2%	100	14.9%	141	17.2%
	Gender	Male	449	90.0%	518	77.1%	645	78.7%
Professional	Total	50	10.0%	154	22.9%	175	21.3%	
	Age	20s and under	192	-	197	-	207	-
		30s to 40s	2	1.0%	1	0.5%	2	1.0%
		50s and over	127	66.1%	140	71.1%	133	64.3%
	Gender	Male	63	32.8%	56	28.4%	72	34.8%
Special	Total	170	88.5%	171	86.8%	176	85.0%	
	Age	20s and under	22	11.5%	26	13.2%	31	15.0%
		30s to 40s	2	0.0%	-	0.0%	-	0.0%
		50s and over	110	34.0%	11	4.2%	-	0.0%
	Gender	Male	214	66.0%	248	95.8%	307	100.0%
Current No. of employees	Total	324	-	259	-	307	-	
	Age	20s and under	-	0.0%	-	0.0%	-	0.0%
		30s to 40s	110	34.0%	11	4.2%	-	0.0%
		50s and over	214	66.0%	248	95.8%	307	100.0%
	Gender	Male	234	72.2%	258	99.6%	305	99.3%
Special	Total	90	27.8%	1	0.4%	2	0.7%	

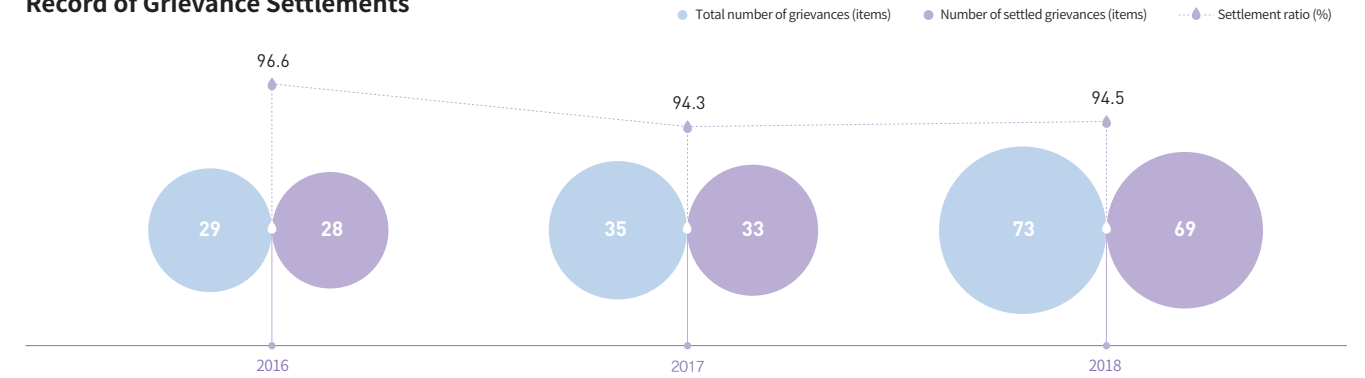
Turnover Status (Unit : %, people)



Parental Leave Return Rate

Category	2016	2017	2018	
All	Target person (person)	54	117	125
	Person who is laid off (person)	54	117	125
	Reinstatement rate (%)	100	100	100
	Maintenance rate (%)	100	100	100
Male	Target person (person)	12	23	21
	Person who is laid off (person)	12	23	21
	Maintenance rate (%)	100	100	100
Female	Target person (person)	42	94	104
	Person who is laid off (person)	42	94	104
	Reinstatement rate (%)	100	100	100
	Maintenance rate (%)	100	100	100

Record of Grievance Settlements



Status of Flexible Working

Category	2016	2017	2018	
Time selective job system	Recruitment (Number of people)	13	13	9
	Conversion (Number of people)	29	21	16
Flexible work system	Staggered office hours	1,828	1,903	2,427
	Flexible working hours	0	0	595
	Intensive work	14	11	10
Remote work system	Discretionary work schedule	0	0	0
	At-home work	0	0	8
Smart work	6	0	3	

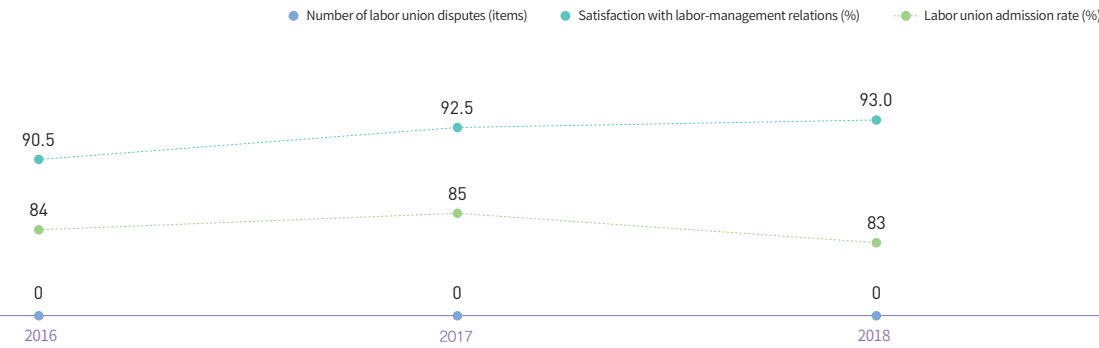
Non-regular Employment

Category	2016		2017		2018		
	Personnel (people)	Ratio (%)	Personnel (people)	Ratio (%)	Personnel (people)	Ratio (%)	
Total number of people	360.81	6.92	161.63	2.99	221.75	4.02	
Type	Short-term employees	343	6.58	153	2.83	220	3.99
	Part-time employees	17.81	0.34	8.63	0.16	1.75	0.03

Employment of Minority Workforce

Category	2016		2017		2018		
	Personnel (people)	Ratio (%)	Personnel (people)	Ratio (%)	Personnel (people)	Ratio (%)	
Total No. of new recruits	309.75	6.39	327.5	6.43	365.5	6.91	
Type	Selective working hours (people)	13	0.27	13	0.26	9	0.17
	Women	87.25	1.80	92.5	1.82	90.5	1.71
	Disabled	5	0.10	3	0.06	1	0.02
	Non-capital area talents	157.25	3.24	171.5	3.37	197	3.72
	High-school graduates	62.5	1.29	57	1.12	148.5	2.81

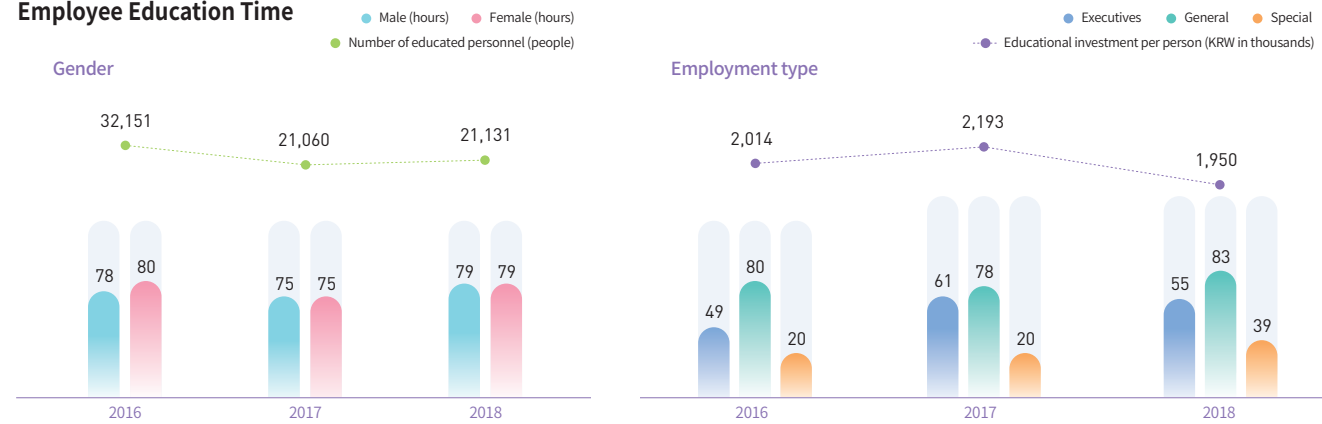
Union Membership and Labor-Management Satisfaction



Results of Employee Satisfaction Survey

Category	2016	2017	2018
Satisfaction with remuneration and welfare (points)	3.2	3.3	3.3

Employee Education Time

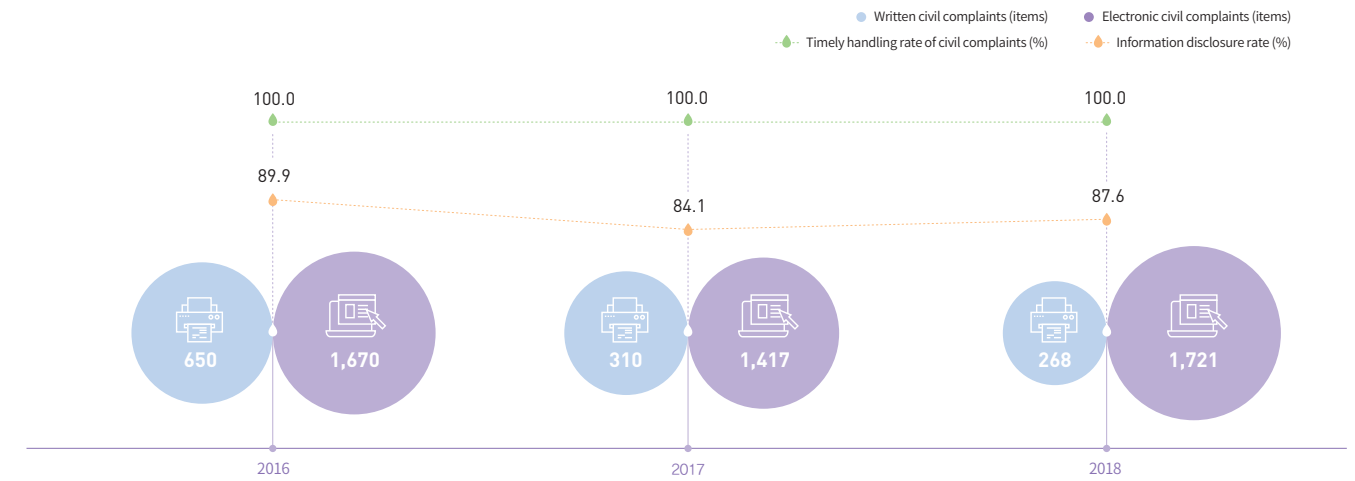


Major Achievements of Workplace Safety

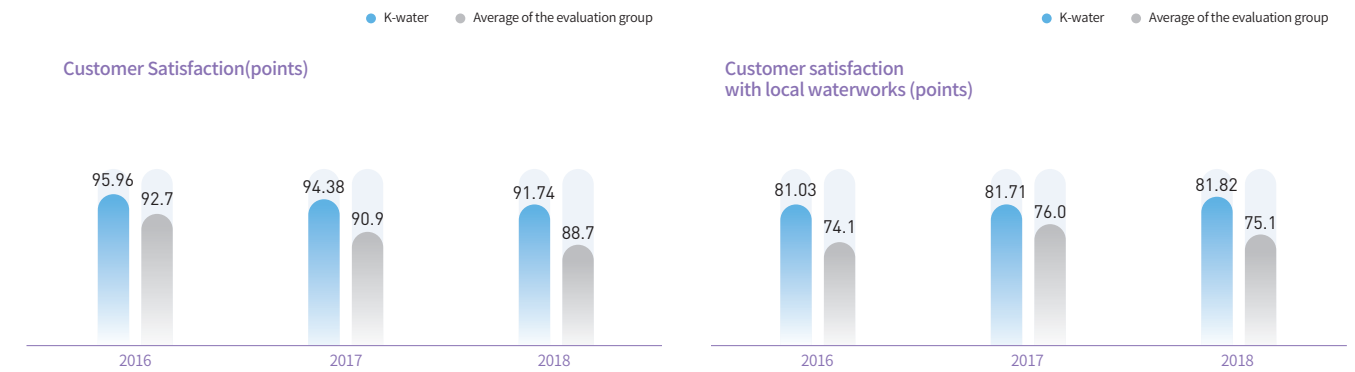
Category	2016		2017		2018	
	Personnel (people)	Ratio (%)	Personnel (people)	Ratio (%)	Personnel (people)	Ratio (%)
Industrial accident rate	12	0.25	9	0.17	12	0.23
Disease prevalence	457	8.80	592	11.63	588	11.10

Customer related performance

Communication with Customers



Customer Satisfaction



Community performance

Social Contributions Related to Major Achievements

Category	2016	2017	2018	
Social contribution engagement level(points)	92.6	93.4	87.0	
Social contribution engagement levels	Number of engaged employees(people)	4,233	4,617	3,364
	Ratio compared to the current total number of employees(%)	87.3	90.7	63.5
	Total engagement time	58,432	67,608	33,481
	Time of engagement per person(hour)	13.804	14.643	9.953
Social contribution investment amount	Amount (KRW 100 million)	689.6	639.8	658.6
	Ratio vis-a-vis turnover (%)	1.9	1.9	1.9

Third Party's Assurance Statement

To the Readers of 2019 K-water 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 2019 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 type2, moderate level of assurance using AA1000AS (2008) and SRV1000 from KMR Global Sustainability Committee as assurance standards. KMR's assurance team(hereinafter "the team") evaluated the adherence to Principles of Inclusivity, Materiality and Responsiveness, and the reliability of the selected GRI Standards indices as below, where professional judgment of the team was exercised as materiality criteria.

The team checked whether the Report has been prepared in accordance with the 'Core Option' of GRI Standards which covers the followings.

- ◆ GRI Standards Reporting Principles
- ◆ Universal Standards
- ◆ Topic Specific Standards
 - Management approach of Topic Specific Standards
 - Procurement Practices : 204-1
 - Anti-Corruption : 205-1, 205-2
 - Anti-Competitive Behavior : 206-1
 - Energy : 302-1, 302-4, 302-5
 - Emissions : 305-1, 305-2, 305-3, 305-5, 305-6, 305-7
 - Effluents and Waste : 306-2, 306-3
 - Labor/Management Relations : 402-1
 - Occupational Health and Safety : 403-1, 403-2, 403-3
 - Training and Education : 404-1, 404-2
 - Diversity and Equal Opportunity : 405-1
 - Non-Discrimination : 406-1
 - Human Rights Assessment : 412-2
 - Local Communities : 413-2
 - Supplier Social Assessment : 414-1
 - Customer Health and Safety : 416-1
 - Marketing and Labeling : 417-2, 417-3

This Report excludes data and 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 standards.

Recommendation for improvement

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

- ◆ K-Water not only provided the progress from the last year and future goals in terms of sustainability KPIs but also aligned the indicators with UNSDGs. It also demonstrated outstanding indicator management and visual representations such as "Integrated Water Management for the Past Year" and "Management Approach(MA)" webpages for creative, effective communication. Appropriate, diverse information items (for example, compensatory habitats and artificial wetlands etc.) as well as details about turnover rates and debt ratio facilitated a clear understanding of the report. In the future, the organization is advised to include the information about the distribution of economic gains, add explanations about indicators which are difficult to understand, and avoid redundancy with a goal of improving the quality of the report.

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, 25, 2019



CEO *E. J. Hwang*

GRI Standard Index/ISO26000

Topic	Disclosure	ISO 26000	Verification		
			Page	Omissions / Comments	
Organizational Profile	102-1	Name of organization	12		
	102-2	Activities, brands, products, and services	8-9		
	102-3	Location of headquarters	12		
	102-4	Location of operations	14-15		
	102-5	Nature of ownership and legal form	12		
	102-6	Market area	6.3.10/6.4.1-6.4.2/6.4.3/6.4.4/6.4.5/6.8.5/7.8	12	
	102-7	Scale of the organization		12	
	102-8	Information on employees and other workers		91	
	102-9	Organization's supply chain		36, 64	
	102-10	Significant changes to the organization and its supply chain		GRI STANDARDS INDEX	No significant changes
	102-11	Precautionary principle or approach		26-28	
	102-12	External initiatives		98-103	
	102-13	Memberships of associations		104-105	
Strategy	102-14	Statement from senior decision-maker	4.7/6.2/7.4.2	4-5	
Ethics and Integrity	102-16	Values, principles, standards, and norms of behavior	4.4/6.6.3	100-101	
Governance	102-18	Governance structure	6.2/7.4.3/7.7.5	20-22	
	102-40	List of stakeholder groups engaged by the organization		28-29	
Stakeholder Engagement	102-41	Collective bargaining agreements		66-67	
	102-42	Identifying and selecting stakeholders	5.3	29-31	
	102-43	Approach to stakeholder engagement		29-31	
	102-44	Key topics and concerns that have been raised through stakeholder engagement		29-31	
	102-45	List of all entities included in the organization's		12	
Material Topics and Reporting Practice	102-46	Consolidated financial statements (subsidiary and joint venture)		32-33	
	102-47	List of material topics		32-33	
	102-48	Restatements of information		GRI STANDARDS INDEX	No significant changes
	102-49	Changes in reporting		About This Report	
	102-50	Reporting period	5.2/7.3.2/7.3.3/7.3.4	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 GRI content index		About This Report	
	102-55	GRI index		98-99	
	102-56	External assurance		96-97	
Procurement Practice	103	Management Approach	6.4.3/6.6.6/6.8.1-6.8.2/6.8.7	64	
	204-1	Percentage of spending paid to local suppliers		78-80, 87	
Anti Corruption	103	Management Approach		64	
	205-1	Operations assessed for risks related to corruption	6.6.1-6.6.2/6.6.3	23-25	
	205-2	Communication and training on anti-corruption policies and procedures		23-25	

Topic	Disclosure	ISO 26000	Verification		
			Page	Omissions / Comments	
Fair Competition	103	Management Approach	64		
	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	GRI STANDARDS INDEX	No violations
Energy	103	Management Approach	64		
	302-1	Energy consumption in the organization	6.5.4/6.5.5	89-90	
	302-4	Energy consumption reduction		89-90	
	302-5	Reduction of energy requirements for products and services		89-90	
Discharge	103	Management Approach	64		
	305-1	Direct (Scope 1) GHG emissions		77, 89-90	
	305-2	Energy indirect (Scope 2) GHG emissions		89-90	
	305-3	Other indirect (Scope 3) GHG emissions	6.5.3/6.5.5	89-90	
	305-5	Reduction of GHG emissions		89-90	
	305-6	Emissions of ozone-depleting substances (ODS)		89-90	
	305-7	Nitrogen oxides (NOX), sulfur oxides (SOX), and other significant air emissions		89-90	
Waste	103	Management Approach	64		
	306-2	Waste by type and disposal method	6.5.3/6.5.4	89-90	
	306-3	Significant spills of harmful substances		89-90	
Labor Management Relations	103	Management Approach	64		
	402-1	Minimum notice periods related to operational changes	6.4.3/6.4.4	72-74	
Health and Safety	103	Management Approach	26-28		
	403-1	Ratio of all workers represented by labor-management joint health and safety committee		94	
	403-2	Injury type, injury rate, occupational disease rate, number of days off work, absenteeism rate, work-related deaths	6.4.6/6.8.8	94	
	403-3	Workers at high risk for occupational diseases		94	
Training and Education	103	Management Approach	64		
	404-1	Average education time per executive	6.4.7	94	
	404-2	Programs for employee competency and transition support		74	
Diversity and equal Opportunities	103	Management Approach	6.2.3/6.3.7/6.3.10/6.4.3	70-73	
	405-1	Governance body and executive diversity		70-73	
Prohibition on Discrimination	103	Management Approach	70-73		
	406-1	Cases of discrimination and corrective actions for them	6.3.6	GRI STANDARDS INDEX	No discriminations
Human Rights Evaluation	103	Management Approach	70-73		
	412-2	Executive training on human rights policies and procedures related to business	6.3.5/6.3.6	70-73, 94	
Community	103	Management Approach	81-82		
	413-2	Workplaces that have significant local or potentially negative impacts on society	6.3.9/6.5.1-6.5.2/6.5.3/6.8	GRI STANDARDS INDEX	No business place having a negative impact
Social Evaluation of Supply Chain	103	Management Approach	78-80		
	414-1	New partners screened through social impact evaluation	6.4.3/6.6.6/6.8.1-6.8.2/6.8.7	78-80	
Customer Health and Safety	103	Management Approach	66-69		
	416-1	Assessment of the health and safety impact of products and services	6.7.1-6.7.2/6.7.4/6.7.5/6.8.8	66-69	
	103	Management Approach	38-41		
Product and Service Labeling	417-2	Violation of legal and autonomous regulations on product and service information and labeling	6.7.1-6.7.2/6.7.3/6.7.4/6.7.5/6.7.9	GRI STANDARDS INDEX	No violations
	417-3	Breach of regulations related to marketing communications		GRI STANDARDS INDEX	No violations

Code of Ethics



K-water is a business of the people that contributes to the quality of life of all citizens and the development of the country by developing, managing, and preserving Korea's water resources to be sustainable in environmental, economic, and social aspects and by providing the best products and services. Based on our experience, know-how, and advanced technology, we promise the following to become a global professional water business.

We accomplish our missions through creative thinking and challenges and make efforts to actualize transparent management by processing tasks with an honest and fair attitude.

We recognize that the Earth is a precious heritage for our offspring and is a healthy and clean shelter, and as such, we are obligated to practice eco-friendly management.

We provide the best products and services to customers and actualize a consumer-oriented policy through customer satisfaction and management of new value creation.

As a part of the local community, we respect the traditions and cultures of the community and enrich the lives of local residents by contributing to the development of the local community.

We comply with ethical/legal values, respect market order of free competition, and seek realization of fair competition.

We respect the unique personalities of all people without discrimination, and respect personalities and creativity.

We develop partnerships with labor and management based on mutual trust and harmony, promoting our mutual prosperity.

Quality, Environmental and Green Management Policy



We fully understand that it is high time to make all-out efforts for the promotion of sustainable development harmonized with the environment to create and maintain a pleasant and livable environment for all. Therefore, in order to enhance the public values of K-water so that all citizens will lead a happy life thanks to water, and to solve global water problems in the era of climate change, we declare our Quality, Environmental and Green Management Policy as follows, based on the strong will of all the executives and employees to put it into action.

We all take the initiative in preserving clean water and air, and a livable natural environment.

For establishing and implementing plans related to quality, environmental and green management, we enhance the reliability of K-water and the transparency of our business by collecting extensive opinions from the public and disclosing information and data.

We take the lead in pollution prevention, climate change mitigation and adaptation, and biodiversity and ecosystem protection throughout the entire process of our businesses including water resources development and management and water supply.

We faithfully fulfill our obligations required to the practice of quality, environmental and green management and achieve continuous improvements by enhancing our performance.

Implementing this policy, we, all the executives and employees of K-water, will take responsibility for the water welfare of the people through by pursuing mutual prosperity and do our utmost to achieve sustainable growth

Customer Charter Statement



K-water will make its best efforts to put customer's value first, communicate with customers and innovate services together to realize national happiness and become a trusted public corporation,

We will provide the world's best water management services safely and equally.

We will provide a pleasant environment and contribute to the preservation of ecosystems by practicing environmental management.

We will practice ethical management to secure management transparency and contribute to establishing fair competition.

We will expand mutual prosperity & cooperation to foster the water industry and contribute to the vitalization of local communities

Human Rights Centered Management Statement



In order to fulfill our goal of "Opening the Future and Providing Happiness by Sharing Water," we will actively practice human rights centered management emphasizing and protecting human dignity and values in all our business activities and pursue the actualization of social values and the achievement of sustainable development.

For this, we support and resolve to practice human rights centered management in accordance with the following criteria for our actions and value judgment which all the executives and employees should abide by.

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.

We do not discriminate against any stakeholder including the executives and employees on the basis of race, religion, disability, sexual orientation, place of birth, educational level, age or political opinion.

We are committed to the protection and promotion of the human rights of the executives and employees and guarantee the freedom of association and collective bargaining.

We do not use any form of forced labor in employment and do not allow child labor.

We guarantee workers' safety and health rights by providing a safe and hygienic working environment.

We respect and protect the human rights of local residents in the areas where we carry out our businesses.

We comply with domestic and international environmental laws and regulations and practice environmental justice to prevent any environmental problems from occurring.

We strive for mutual growth with our partnering companies, support their practice of human rights centered management and cooperate with them in it.

We do our best to provide our customers with the best water services and to protect their human rights.

We take prompt and appropriate actions on any human rights violations that arise from our business activities and actively work to prevent such violations in advance

UN Global Compact Activities

Support for the UN Global Compact's 10 Principles

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



- The Universal Declaration of Human Rights
- The International Labor Organization'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 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.
 - Principle 2** : Make sure that they are not complicit in human rights abuses.
- Labour**
 - 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 labour.
 - Principle 5** : The effective abolition of child labour.
 - 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
 - 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 practices and complies with the ten principles of UN Global Compact.

CEO Statement of Support for the Sustainable Development Goals



CEO Statement of Support for the Sustainable Development Goals



[SDG 6 · 7 · 9 · 11 · 13 · 17]

K-water's efforts has laid the foundation for national economic growth and contributed to raising the quality of life for all people trying to protect citizens from natural disasters and supply them with clean and sufficient water. K-water, as Korea's representative public water company, promises to strives to fulfill the UN's Sustainable Development Goals (SDGs) and to meet the demands of the times and live up to the expectations of the people.

First, K-water will provide safe, clean and secure water services with river basin-based integrated water resources management. We will contribute to the successful establishment of river basin-based integrated water resources management systems by concentrating our capacity on the improvement of water environment, safeguarding citizens from water disasters such as floods, droughts and deteriorating water quality, and enhancing the water quality and water ecology health.

Second, K-water will continue with our commitment to ensure the supply of clean and stable water. We will link existing dams and reservoirs and discover alternative water sources to secure the necessary amount of water, while preventing the waste of water through scientific demand management. In addition, we will narrow the gaps in water quantity, quality, and supply rates among different regions and strengthen the safety and cleanness of drinking water so that people can drink tap water anytime, anywhere.

Third, K-water will create new values of water through the convergence of water, energy, and urban technologies. We will actively develop eco-friendly water energy sources such as floating photovoltaic energy and hydrothermal energy. In addition, we will strengthen the competitiveness of the domestic water industry by expanding our support for SMEs (small and medium enterprises). Also, we will also take the lead in resolving water issues globally, centered on the Asia Water Council (AWC).

K-water will provide water services that the public can sympathize with through communication with a wider range of stakeholders and sharing values with them. So, we will be reborn as a public company for all citizens through our innovations to provide greater publicness and make a happier world with water.

March 26th, 2019

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

Membership Activities and Awards

Membership 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	Korea Water Resources 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 Wastewater 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	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 of Quality Management, International Hydropower Association, Korea Association of Conflict Studies
2015	Korean Society of Ecology and Infrastructure, Korea Society of Hazard Mitigation
2016	Asia Water Council, International Water Resources Association
2017	Society of Korea Industrial and Systems Engineering, Korean Society of Public Enterprise
2018	Association of Great Dams

Awards

Apr. 2008	Korea Management Innovation Grand Prize (Awarded by Ministry of Knowledge Economy and Maeil Business Newspaper)
Oct. 2008	Korea Social Contribution Grand Award (Korea Journalist Forum), Sustainable Management Top Award (Ministry of Knowledge Economy and Korea Chamber of Commerce and Industry), 2008 Korea Eco-Friendly Company Grand Award (Ministry of Environment), Asian Most Admired Knowledge Enterprise (UK Teleos)
Jan. 2009	Continuity & Creation Management Award in Environmental Management (Korean Ministry of Knowledge Economy and UN Global Compact)
Oct. 2009	Low Carbon Green Growth Commendation (Green Growth Association and Korean Ministry of Environment), New Regeneration Energy Awards Prime Minister Commendation (Ministry of Knowledge Economy), Asian Most Admired Knowledge Enterprise (UK Teleos)
Dec. 2010	National Green Technology Grand Award (Korean Ministry of Knowledge Economy and Korean Ministry of Education)
Jun. 2011	Korea Green Management Award (Ministry of Knowledge Economy and Korean Ministry of Environment), Eco-Star Eco-Technology Award in Water Pipeline (Korean Ministry of Environment)
Jan. 2012	First Korean public company to be awarded the Excellent Smart Work Agency Award (Ministry of Public Administration and Security)
Feb. 2012	Most Admired Company in Korea (KMAC)
Jun. 2012	Environmental Impact Management Grand Prize (Korean Ministry of Environment), Excellent Global Social Contribution Agency Commendation (Ministry of Health and Welfare), Selected as an excellent company with outstanding performance in Labor and Management Relations (Korean Ministry of Employment and Labor)
July 2012	Korea Digital Innovation Award Grand Prize in the Public Sector (Ministry of Knowledge Economy)
Sep. 2012	Presidential citation for outstanding performance in purchasing goods from SMEs (Small and Medium Business Administration of Korea)
Oct. 2012	Family-Friendly Enterprise (Korean Ministry of Gender Equality and Family), Selected as one of the 100 Best Companies to Work For (GWP Korea), Asian Most Admired Knowledge Enterprise (UK Teleos)
Nov. 2012	Sustainability Grand Awards Innovation Management Award (Ministry of Knowledge Economy)
Dec. 2012	Public Company Management Award Grand Prize (Sisa Journal)
July 2013	Korean Digital Green Management Award (Ministry of Science, ICT and Future Planning)
Oct. 2013	Korea Green Architecture Competition Award of Excellence (Presidential Committee on Architecture Policy), Commendation in recognition of contribution to renewable energy supply obligation system (Korean Ministry of Trade, Industry and Energy)

Nov. 2013	Natural Environment Grand Award (Korean Ministry of Environment), Asian Most Admired Knowledge Enterprise (UK Teleos)
Dec. 2013	Global Most Admired Knowledge Enterprise (UK Teleos)
Feb. 2014	Most Admired Company in Korea (KMAC)
Jun. 2014	Top Prize in Water Business Assessment (Ministry of Environment)
Aug. 2014	Korean Digital Award (Ministry of Science, ICT and Future Planning), Achieved Carbon Trust Standard (UK Carbon Trust)
Sep. 2014	International Water Association Global Project Innovation Award
Oct. 2014	Asian Most Admired Knowledge Enterprise (UK Teleos)
Nov. 2014	Ranked as one of the top 100 Best Korean Companies to Work For (GWP Korea), Outstanding Agency in Anti-Disaster Drilling Assessment (National Emergency Management Agency), Korea Quality Management Enterprise Presidential Citation (Ministry of Trade, Industry & Energy), Advanced Public Enterprise in Shared Growth Prime Minister Award (Ministry of Public Administration and Security)
Dec. 2014	Sustainable Science Award in Environment (Society of Sustainable Science), Korea Volunteer Work Grand Prize (Ministry of Public Administration and Security), Global Most Admired Knowledge Enterprise (UK Teleos)
Jun. 2015	National Sustainability Management Award in Social Contribution (Ministry of Health and Welfare)
Nov. 2015	Most Admired Company in Korea (Ministry of Trade, Industry & Energy)
Dec. 2015	Minister's Award in recognition of support for youth outside the school system (Ministry of Gender Equality and Family), Educational Donation Grand Prize for Public Enterprises (Ministry of Education), Asian Most Admired Knowledge Enterprise (UK Teleos)
May 2016	Minister's Commendation in the Selection of Excellent Institutions at the Unification Expo (Ministry of Unification)
Sep. 2016	Minister's Commendation at the 2016 National Sharing Awards (Ministry of Health and Welfare)
Oct. 2016	Minister's Commendation in recognition of contribution to the development of mensuration and measurement (Ministry of Trade, Industry & Energy)
Nov. 2016	Double awards in the Web Awards Korea (Ministry of Science, ICT and Future Planning), the 2016 Asian-Pacific Stevie Award (in Local Community PR and Public Service and Communication Innovation)
Dec. 2016	Asian Most Admired Knowledge Enterprise (UK Teleos)
Apr. 2017	Korea Social Contribution Grand Award in CSV, 2016 Public Agency Innovation Example Contest Grand Award (Ministry of Economy and Finance), 2017 Public Agency Innovation Example Contest Grand Award (Ministry of Economy and Finance), Leading Utilities of the World Trophy (Global Water Summit 2017)
Jun. 2017	Asia-Pacific Stevie Award Silver Prize in Corporate Communication
July 2017	2017 Safety and Health Activity Case Presentation Contest Excellency Prize in Service Sector (Ministry of Employment and Labor)
Sep. 2017	Korea Employment-Friendly Management Grand Award
Oct. 2017	The 5th Applied Ecologic Technology Contest Excellency Prize for the 5th consecutive year (Korea Society of Ecology and Infrastructure Engineering), Asian MAKE Award and Global MAKE Award for the 10th consecutive year (Hall of Fame, UK Teleos)
Nov. 2017	Selected as an Excellent Ordering Agency in SW Business and Minister's Award (Ministry of Science and ICT), Prime Minister's Citation at the 2017 Safety Culture Awards (Ministry of the Interior and Safety), Korea Social Media Grand Award in the Public Sector (Award of the Minister of Science and ICT), Korea Data Quality Awards Excellency Prize (Ministry of Science and ICT) 2017 Ranked as one of the top 100 Best Korean Companies to Work For list for the 5th consecutive year
Dec. 2017	Minister's citation at the 2017 Korea Volunteer Work Awards (Ministry of the Interior and Safety), Korea Social Contribution Grand Award in Overseas Volunteer Work, Educational Donation Grand Prize for Public Enterprises (Ministry of Education), Prime Minister's Award for Outstanding Personnel Innovation Performance (Office of the Prime Minister), Prime Minister's Citation at the 2017 Safety Culture Awards (Ministry of the Interior and Safety)
Jan. 2018	Selected as an excellent family-friendly organization for 10 consecutive years (of Gender Equality and Fa), Selected as an excellent organization for evaluation of anti-corruption measures (Anti-Corruption & Civil Rights Commission)
Mar. 2018	2018 Korea Human Resources Development Grand Prize (Korea HRD Association)
Apr. 2018	2018 One of Best 65 Companies to Work in Asia for 2 Consecutive Years (GPTW)
May 2018	Selected as big data center (Ministry of Science and Technology Information and Communication)
Jun. 2018	Minister's Commendation in Collaboration Best Practices (Ministry of Public Administration and Security)
Sep. 2018	Selected as the best agency for public agency disaster management (Ministry of Public Administration and Security)
Oct. 2018	2018 Environment Minister's Commendation in Best Practices of Government Innovation (Ministry of Environment), 2018 Small and Medium Venture Business Minister Award (Ministry of SMEs and Startups)
Nov. 2018	Minister of Strategy and Finance Award for Social Responsibility (Ministry of Strategy and Finance) 2018 Korea's 100 Best Companies to Work for 6 consecutive years (GPTW Korea) 2018 Data Quality Award Excellence Award (Ministry of Science and Technology Information and Communication) Participation Award for Active Cases of Best Practices (Human Innovation Division)
Dec. 2018	Prime Minister's Award for Best Practices of Government Innovation 2018 (Prime Minister's Office) Grand Prize in 2018 Water Supply Status Assessment (Ministry of Environment) 2018 National Contents Service Grand Prize Excellence Award (Korea Data Agency) Selected as the best organization for cyber response simulation training (National Intelligence Service) Water Safety Assurance System Minister of Environment Award (Ministry of Environment) Grand Prize at the Construction and Facility Safety Contest (Ministry of Land, Infrastructure and Transport) Blind Job Minister of Employment and Labor Award (Ministry of Employment and Labor)

Questionnaire for Readers

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 2019 Sustainability Report. Please complete the following and send it to the address listed at the bottom of this questionnaire by mail or fax.

1. Which of the following groups do you belong to?

- Customer
- Government
- Partner
- Employee
- Local resident
- NGO and Civic Group
- Specialized organization
- Others()

2. How did you find this sustainability report?

- K-water's home page
- Web surfing
- Seminar · lecture
- Media such as newspaper
- K-water's employee
- Others()

3. For what purpose do you use this report? (Multiple responses are allowed)

- 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 allowed)

- Power that makes the world flow, K-water
- Water Welfare for All the People
- Happy Korea We Make Together
- Appendix
- Others()

5. Which section requires more supplementing information? (Multiple answers are allowed)

- Power that makes the world flow, K-water
- Water Welfare for All the People
- Happy Korea We Make Together
- Appendix
- Others()

6. Was this report helpful for you to have a better picture of K-water's sustainable management activities?

- Very helpful
- Helpful
- Moderately helpful
- Slightly helpful
- Not at all helpful

7. How satisfied are you with this report?

- | | | | | | |
|--------------------------------|---|------------------------------------|--|--------------------------------------|--|
| • Understanding of information | <input type="checkbox"/> Very Satisfied | <input type="checkbox"/> Satisfied | <input type="checkbox"/> Neither Satisfied Nor Unsatisfied | <input type="checkbox"/> Unsatisfied | <input type="checkbox"/> Very Dissatisfied |
| • Accuracy of information | <input type="checkbox"/> Very Satisfied | <input type="checkbox"/> Satisfied | <input type="checkbox"/> Neither Satisfied Nor Unsatisfied | <input type="checkbox"/> Unsatisfied | <input type="checkbox"/> Very Dissatisfied |
| • Quantity of information | <input type="checkbox"/> Very Satisfied | <input type="checkbox"/> Satisfied | <input type="checkbox"/> Neither Satisfied Nor Unsatisfied | <input type="checkbox"/> Unsatisfied | <input type="checkbox"/> Very Dissatisfied |
| • Design | <input type="checkbox"/> Very Satisfied | <input type="checkbox"/> Satisfied | <input type="checkbox"/> Neither Satisfied Nor Unsatisfied | <input type="checkbox"/> Unsatisfied | <input type="checkbox"/> Very Dissatisfied |

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

Send to Management & Innovation Services Department
 Corporate Sustainability Management Team, K-water, 200, Sintanjin-ro, Daedeok-gu, Daejeon (34350) / Tel. 82-42-629-2442~4 / Fax. 82-42-629-2399



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Providing a brighter, happier,
 and more prosperous future with water

K water 2019 Sustainability Report



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