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, 10 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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Tel: 042-629-2442-4
Website: www.kwater.or.kr

APPENDIX

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2019 Sustainability Report
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.

Making new changes for a happier Korea with you

Hak-soo LEE
K-water CEO
November 2019
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.

Advancement of the water resource management system

- Safety Assessment (Grade A), Safety Level Assessment (Excellent), Infrastructure, and Transport) evaluations (Ministry of Public Administration and Security, Ministry of Land, Infrastructure, and Transport).
- 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).""
Looking back on the 1st year of water management unification

‘Water management unification’ refers to the consolidation of the water management system, which was previously diversified among various ministries in Korea.

Prevention of water disasters
- Establishment of region and people-centered drought response system

Water management unification

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

Waterfront spaces
- Creation of a futuristic water circulation city
- 2,271 GWh/year
- Clean energy produced annually by K-water (2018)
- 33%
- Reduction of Taste and odor compounds in the Han River
- 81%
- Reduction of algae in the Nakdong River

Securement of water quantity
- Activation of water recycling
- Elimination of water service gaps in all region, including isolated and sparsely population areas
- 1,390,000 people
- Prevention of water service gaps
- 100,000 tons, 4 plants
- Securing multiple water sources through the operation of seaside desalination plants in Western Chungnam Province

Energy
- Expanding the application of eco-friendly hydrothermal energy

Local governments
- 134
- No flood damages

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

Venture companies
- 48 companies
- Venture companies that improved performance through K-water’s fostering program (in 2018)
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

<table>
<thead>
<tr>
<th>Institution name</th>
<th>Foundation date</th>
<th>Purpose of establishment</th>
<th>Institution overview</th>
<th>Location of headquarters</th>
</tr>
</thead>
<tbody>
<tr>
<td>K-water</td>
<td>November 10, 1967</td>
<td>To contribute to the enhancement of human comfort and public welfare by ensuring the stable supply of water, the comprehensive development and management of water resources. (The Korea Water Resources Corporation)</td>
<td>General office (offices), 11 departments, 67 branches ([Local business sites]) 3 divisions, 8 head offices (including institutes, centers, and offices)</td>
<td>Seoul, 21-1, Sinhan-dong, Gangnam-gu, South Korea.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quasi-market type public corporation</td>
<td>206, Gotamro 7-ga, Gyeonggi-do, South Korea (K-water)</td>
<td></td>
</tr>
</tbody>
</table>

Overview

<table>
<thead>
<tr>
<th>No. of Employees</th>
<th>Organization</th>
<th>Assets</th>
<th>Sales</th>
<th>Liability rate</th>
<th>Credit rating</th>
<th>Shareholder composition</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,982</td>
<td>K-water</td>
<td>KRW 2.1768 trillion</td>
<td>KRW 3.3016 trillion</td>
<td>179.9%</td>
<td>In-country MA: MO and Ministry, JAP and U.S., others (10%)</td>
<td>K-water Corporation 43.0%, TAEHO Hydrogen Company 28.9%, LG Hydrogen Company 11.0%, others (10.1%)</td>
</tr>
</tbody>
</table>

Subsidiaries

- Waterway (share ratio: 20.7%)
- Phamen (share ratio: 2%)
- Korea Construction Management (share ratio: 19.4%)
- Korea Domestic Construction & Civil Development
- Cosumar (share ratio: 12.3%)
- K-water Operation and Management (share ratio: 10.8%)
- K-water Hydrogen (share ratio: 2.7%, Pakistan)
- K-water Construction Management (share ratio: 10.4%, Pakistan)
- PC America (share ratio: 10%, Philippines)
- PT. Hasang Operation and Maintenance (share ratio: 95%, Indonesia)
- Angat Hydropower Corporation (share ratio 40%, Philippines)
- JSC Nenskra Hydro (share ratio 93%, Georgia)
- Patrind O&M Limited (share ratio 100%, Pakistan)
- KDS Hydro PTE. Ltd. (share ratio 80%, Pakistan)
- Luzon Clean Water Development Co. (share ratio 3%, Philippines)
- PT. Hasang Operation and Maintenance (share ratio 95%, Indonesia)
- Tina Hydropower Limited (share ratio 80%, Solomon Islands)
- PT Hasang Operation and Maintenance (share ratio 95%, Indonesia)

Mission of the time

Establishment of the foundation for national economic development

Improvement of national welfare and livelihoods

Brief history

- 1967. 11. Foundation of the Korea Water Resources Development Corporation
- 1973. 10. Construction of Soyanggang, multipurpose dam
- 1981. 05. Construction of metropolitan 1st and 2nd stage large area watersheds (Seoul)
- 1992. 11. Construction of water supply facilities in Ibusi (Newtown)
- 1996. (ISO 9001 Certification (Quality Management System)
- 2002. ISO 14001 Certification (Environmental Management System)
- 2005. 05. Recognized as an international accredited testing institution by KSL QAS/IEC 17025 for the first time among domestic water service providers
- 2006. 01. Proclamation of G Sigma Management
- 2008. 11. Grand Prize at the National Ordering Office VE Competition hosted by Ministry of Land, Transport and Maritime Affairs (large-area watersheds)
- 2009. 11. The first public corporation in Korea to receive ISO 27001 certification
- 2010. 06. KOSHEE1001 Certification (Construction Industry Safety and Health Management System)
- 2011. 08. Commenced with the commercial development of Silhwa Tidal Power Plant, the largest of its kind in the world
- 2015. 04. Established Asia Water Course II (AWC), co-hosted the 70th World Water Forum
- 2016. 09. 2016 Minister’s Commendation at the 2016 National Sharing Awards
- 2016. 11. Declaration of 50th Anniversary New Management Policy
- 2017. 04. 2017 Public Agency Innovation Example Content Grand Award
- 2017. 10. Asian MAKE Award for the 10th consecutive year
- 2018. 01. Recognized as an Excellent Family-friendly Institution for the 10th consecutive year
- 2020. 05. Selected as a big data center
- 2020. 11. Award from Minister of Strategy and Finance for Social Responsibility
- 2021. 11. Obtained order of Solomon Tina Hydropower Project

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.

Creating the sustainable water circulation system

Mission of the time

Establishment of the foundation for national economic development

Improvement of national welfare and livelihoods

Brief history

- 1967. 11. Foundation of the Korea Water Resources Development Corporation
- 1973. 10. Construction of Soyanggang, multipurpose dam
- 1981. 05. Construction of metropolitan 1st and 2nd stage large area watersheds (Seoul)
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- 2020. 05. Selected as a big data center
- 2020. 11. Award from Minister of Strategy and Finance for Social Responsibility
- 2021. 11. Obtained order of Solomon Tina Hydropower Project
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.
**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 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**

<table>
<thead>
<tr>
<th>Stakeholder type</th>
<th>Stakeholder characteristics</th>
<th>Stakeholder</th>
<th>Interest issue</th>
<th>Shared strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal</td>
<td>Sponsor type</td>
<td>Awareness</td>
<td>Conflict</td>
<td>Encouraging active participation in management activities</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Building trust and maintaining cooperative relationships through understanding and persuasion</td>
</tr>
<tr>
<td></td>
<td>Cooperation type</td>
<td>Awareness</td>
<td>Conflict</td>
<td>National consistency, political interests</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Prevention of conflicts by sharing information and actively responding to issues</td>
</tr>
<tr>
<td></td>
<td>External</td>
<td>Awareness</td>
<td>Conflict</td>
<td>Service quality, environment and economic interests</td>
</tr>
<tr>
<td></td>
<td>Persuasion type</td>
<td></td>
<td></td>
<td>Forming friendly relations by improving services and creating shared value</td>
</tr>
<tr>
<td></td>
<td>Relation type</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

K-water will become a global public water company that realizes water safety and water welfare by unifying water management.
## 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 26 key sustainable management performance indicators to provide water safety services, water sharing services, water convergence 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.

### Organizational culture

**Board of Directors**
- Strategic Management Office
- Management Innovation Department
- Performance Management Office
- Planning and Coordination Office
- Legal Affairs Office

**CIO**
- Information and Security Management Office
- Technology Division
- Global Cooperation Head Office
- Innovation Division
- Performance Management Center, Creating Shared Value Team

**Management Innovation Department**
- Research and Development (Innovation)
- Investment Management
- Program Management
- Management Planning Division
- Management Advisory Bodies of K-water
- Innovation Division
- Technology Innovation
- Job Creation Bureau

**Planning Division**
- Project Planning Office
- Strategic Planning Office
- Management Innovation Department
- National Civil Defense and Disaster Management (NDIC)
- Global Cooperation Head Office

**Customer Satisfaction Office**
- Water Industry Management Office
- Job Creation Bureau
- Innovation Division
- Strategic Management Office
- Performance Management Office

**Audit**
- Risk Management Office
- Management Innovation Department
- Performance Management Office
- Monitoring and Evaluation Office
- Risk Management Office

**Global Cooperation Head Office**
- Integrated River Basin Management Office
- Information Management Office
- Global Cooperation Office
- National Civil Defense and Disaster Management (NDIC)
- Global Cooperation Head Office

**Water Industry Platform Center**
- Water Industry Platform Center
- Integrated River Basin Management Office
- Information Management Office
- Global Cooperation Office
- National Civil Defense and Disaster Management (NDIC)
- Global Cooperation Head Office

**Tap Water Quality Council**
- Tap Water Quality Council
- National Civil Defense and Disaster Management (NDIC)
- Global Cooperation Office
- National Civil Defense and Disaster Management (NDIC)
- Global Cooperation Head Office

**Conflict Management Team Water Environment Dept.**
- Conflict Management Team Water Environment Dept.
- Environmental Management Office
- Environmental Management Office
- Environmental Management Office
- Environmental Management Office

**Regional Office / Companies**
- Regional Office / Companies

### Organizational changes for sustainable management

**2013**
- Mutual growth with partnering companies
- Improvement of this company’s financial structure

**2014**
- Strategies for sustainable growth including innovation
- Strengthening of disaster safety management

**2015**
- Establishment of a Center dedicated to responding to climate change
- Establishment of a Center dedicated to responding to climate change

**2016**
- Establishment of a Center dedicated to responding to climate change
- Establishment of a Center dedicated to responding to climate change
- Establishment of a Center dedicated to responding to climate change

**2017**
- Agua control
- Water safety
- Water sharing services
- Water industry
- Water innovation
- Water convergence services

**2018**
- Increase in environmental values
- Meeting the demands of the public by practicing social values

### K-water Key Performance Indicators of Sustainable Management

#### 4 Major Services

<table>
<thead>
<tr>
<th>Key Performance Indicator (KPI)</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>Achievement Level</th>
<th>Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Water safety services</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supplied dam water (100 million mᵌ)</td>
<td>57.2</td>
<td>59.24</td>
<td>59.8</td>
<td>98.3</td>
<td>98.3</td>
</tr>
<tr>
<td>Supplied tap water (100 million mᵌ)</td>
<td>38.85</td>
<td>40.97</td>
<td>40.75</td>
<td>99.98</td>
<td>100.0</td>
</tr>
<tr>
<td>Water innovation services</td>
<td>147</td>
<td>109</td>
<td>114</td>
<td>116</td>
<td>116</td>
</tr>
<tr>
<td>Dam safety grade achievement rate (%)</td>
<td>84.2</td>
<td>86.2</td>
<td>86.7</td>
<td>99.98</td>
<td>100.0</td>
</tr>
<tr>
<td>Dam/river water quality management goal achievement rate (%)</td>
<td>54.6</td>
<td>42.6</td>
<td>49.0</td>
<td>50.0</td>
<td>50.0</td>
</tr>
<tr>
<td>Risk management efforts (points)</td>
<td>58.48</td>
<td>56.5</td>
<td>97.0</td>
<td>Changes in the Indices</td>
<td></td>
</tr>
<tr>
<td>Global water quality standard compliance rate (%)</td>
<td>95.9</td>
<td>95.99</td>
<td>95.98</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Top water quality safety rate (%)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Local waterworks flow rate (%)</td>
<td>85.9</td>
<td>84.3</td>
<td>84.3</td>
<td>82.0</td>
<td>82.0</td>
</tr>
<tr>
<td>Smart water management expansion (%)</td>
<td>-</td>
<td>5</td>
<td>9</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Sewage reuse (1 million mᵌ/year)</td>
<td>-</td>
<td>42</td>
<td>42</td>
<td>42</td>
<td>42</td>
</tr>
<tr>
<td><strong>Water sharing services</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greenhouse gas reduction converted into renewable energy (1,000 T CO2eq.)</td>
<td>1,012</td>
<td>988</td>
<td>1,009</td>
<td>1,133</td>
<td>1,133</td>
</tr>
<tr>
<td>Distributed waterfront project sales (1 million won)</td>
<td>5,091</td>
<td>8,024</td>
<td>8,572</td>
<td>5,242</td>
<td>5,242</td>
</tr>
<tr>
<td>SMEs that benefited from K-water’s mutual overseas marketing advancement program (no. of companies)</td>
<td>11</td>
<td>33</td>
<td>52</td>
<td>279</td>
<td>279</td>
</tr>
<tr>
<td>Enterprises newly selected for the support program to foster the Korean water industry (no. of companies)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>122</td>
<td>122</td>
</tr>
<tr>
<td>Sales of products developed with SMEs technology (100 million won)</td>
<td>514</td>
<td>811</td>
<td>1200</td>
<td>330</td>
<td>330</td>
</tr>
<tr>
<td>Environmental performance index (points)</td>
<td>153</td>
<td>151</td>
<td>158</td>
<td>155</td>
<td>155</td>
</tr>
<tr>
<td>Green product purchase rate (%)</td>
<td>81.3</td>
<td>88.8</td>
<td>84.3</td>
<td>80.0</td>
<td>80.0</td>
</tr>
<tr>
<td>Sales (100% in)</td>
<td>3.6</td>
<td>3.4</td>
<td>3.4</td>
<td>4.0</td>
<td>4.0</td>
</tr>
<tr>
<td>Liability rate (%)</td>
<td>204.8</td>
<td>180.5</td>
<td>179.3</td>
<td>175.4</td>
<td>175.4</td>
</tr>
<tr>
<td>Job creation (persons)</td>
<td>5,174</td>
<td>6,896</td>
<td>9,024</td>
<td>11,196</td>
<td>11,196</td>
</tr>
<tr>
<td>Social contribution index (points)</td>
<td>92.6</td>
<td>98.4</td>
<td>87.0</td>
<td>56.0</td>
<td>56.0</td>
</tr>
<tr>
<td>Human resource utilization index (%)</td>
<td>43.6</td>
<td>44.3</td>
<td>45.0</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td>Customer satisfaction (grade) Grade B</td>
<td>Grade B</td>
<td>Grade A</td>
<td>Grade A</td>
<td>Grade A</td>
<td>Grade A</td>
</tr>
<tr>
<td>Basic social management index (points)</td>
<td>77</td>
<td>74</td>
<td>74</td>
<td>75</td>
<td>75</td>
</tr>
<tr>
<td>Integrity level (grade)</td>
<td>Unsatatisfactory</td>
<td>Moderate</td>
<td>Unsatifiable</td>
<td>Tony good</td>
<td>Tony good</td>
</tr>
<tr>
<td>Industrial accident rate (%)</td>
<td>0.25</td>
<td>0.17</td>
<td>0.23</td>
<td>0.08</td>
<td>0.08</td>
</tr>
<tr>
<td>Information and security management level (points)</td>
<td>80.22</td>
<td>87.12</td>
<td>74.33</td>
<td>75.90</td>
<td>75.90</td>
</tr>
</tbody>
</table>

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. Since 2018, the ratio refers to the fulfillment rate of dam (DOC, T-P) and river (BOD, T-P) water quality management goals.
2. *Top 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.
Goverance 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.

**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)**

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Career</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hak-soo GWAK</td>
<td>CEO</td>
<td>Vice-President, K-water; Head of Urban Environmental Business HQ, K-water; Head of Audit Dept., K-water</td>
</tr>
<tr>
<td>Jeong Hyo-sun PARK</td>
<td>Standing Audit Committee member</td>
<td>Chief of Public Affairs, Office of the Prime Minister’s Editorial, the Seoul Shinmun (newspaper); Head of Management Planning Dept., the Seoul Shinmun (newspaper)</td>
</tr>
<tr>
<td>Su-dong HWAK</td>
<td>Vice President</td>
<td>Director of the Nakdonggang River Regional Head office, K-water; Head of Planning &amp; Coordination Dept., K-water; Chief Secretary, K-water</td>
</tr>
<tr>
<td>Bang-je Rha</td>
<td>Water Management Planning Director</td>
<td>Director of the Gyeongin Ara Waterway Business HQ, K-water; Head of Hydrology &amp; River Construction Office, K-water</td>
</tr>
<tr>
<td>Seong-ho LEE</td>
<td>Director</td>
<td>Director of the Gyeongin Ara Waterway Business HQ, K-water; Head of Strategic Planning Dept., K-water; Chief Secretary, K-water</td>
</tr>
</tbody>
</table>

**BOD Operation Status**

<table>
<thead>
<tr>
<th>Classification</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>Compared to the previous year</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of the BOD meetings (number)</td>
<td>118</td>
<td>115</td>
<td>116</td>
<td>6.7%</td>
</tr>
<tr>
<td>No. of agenda items</td>
<td>42</td>
<td>47</td>
<td>53</td>
<td>12.8%</td>
</tr>
<tr>
<td>Resolved agenda (case)</td>
<td>27</td>
<td>30</td>
<td>32</td>
<td>6.7%</td>
</tr>
<tr>
<td>Report agenda (case)</td>
<td>14</td>
<td>9</td>
<td>12</td>
<td>13.33%</td>
</tr>
<tr>
<td>Special reporting agenda (case)</td>
<td>1</td>
<td>1</td>
<td>9</td>
<td>12.5%</td>
</tr>
<tr>
<td>Preliminary review rate (%)</td>
<td>95.3% (25/26 cases)</td>
<td>97.3% (31/32 cases)</td>
<td>100% (48/48 cases)</td>
<td>9.9%</td>
</tr>
<tr>
<td>Original bid resolution rate (%)</td>
<td>92.0% (25/27 cases)</td>
<td>96.7% (29/30 cases)</td>
<td>100% (30/30 cases)</td>
<td>3.3%</td>
</tr>
<tr>
<td>Non-standing Directors’ management suggestion rate (%)</td>
<td>105</td>
<td>68</td>
<td>76</td>
<td>11.8%</td>
</tr>
<tr>
<td>BOD attendance rate (%)</td>
<td>95.8%</td>
<td>95.2%</td>
<td>95.2%</td>
<td>2.7%</td>
</tr>
</tbody>
</table>

* 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.
To ensure optimal decision making and enhance publicity by securing the expertise and performance of the Board of Directors, we continuously conducted based on the feedback.

In order to reinforce the role of the Board of Directors in line with the management environment, we conducted ‘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 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 evaluation and feedback on BOD operation.

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 an integrity and ethical company as one of its strategic promotion goals. 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.

### Integrity and Ethical Management System

**K-water Sound and Ethical Management System**

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 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

**Vision**

An integrity and ethical company trusted by the people and empowered by its members.

**Goal**

Realization of an integrity and ethical company that meets the standards of the people by practicing integrity internal policies.

**Basic Directives**

- Integrate the company vision into daily management and decision making.
- Promote frontline employees, customers and partners to practice integrity and ethics.
- Creation of work environment through leadership and promotion.

**Key tasks**

- Strengthening of the soundness and ethical system in the working environment.
- Zero corruption

#### K-water’s integrity and ethical practice tasks

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

<table>
<thead>
<tr>
<th>Goal</th>
<th>To ensure optimal decision making and enhance publicity by securing the expertise and independence of BOD members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation of the Parochial Decision Making Model</td>
<td>Support for Optimal Decision Making</td>
</tr>
<tr>
<td>tasks</td>
<td>Efforts to Revitalize the Board of Directors</td>
</tr>
<tr>
<td>* Regulation of employee director meetings</td>
<td>* Strengthening of ordinary deliberation functions</td>
</tr>
<tr>
<td>* Operation of Worker Observation System</td>
<td>* Strengthening of field management</td>
</tr>
<tr>
<td>* Preparation for Employee- Director System</td>
<td>* Providing more information on management issues</td>
</tr>
<tr>
<td>* Incorporation of BOD operation</td>
<td>* Strengthening of outside communication</td>
</tr>
<tr>
<td>* Incorporation of BOD operation</td>
<td>* Strategy promotion</td>
</tr>
<tr>
<td>* Incorporation of BOD operation</td>
<td>* Expansion of conflict of interest</td>
</tr>
<tr>
<td>* Incorporation of BOD operation</td>
<td>* Incorporation of ethical education</td>
</tr>
<tr>
<td>* Incorporation of BOD operation</td>
<td>* Operation of Integrity and ethical governance</td>
</tr>
</tbody>
</table>

#### Classification

- **Classification**
  - **Decision making**: activite the Integrity and Ethics Committee
  - **Evaluation of integrity**: integrity and ethical system
  - **Evaluation of integrity**: executive integrity leadership
  - **Evaluation of integrity**: high-level employees and reflection in individual evaluation
  - **Evaluation of implementation targets and share of integrity and ethics**

- **Improvements (2018 – 2019)**
  - **Expansion of decision making body**: establishment of executive body
  - **Establishment of an organic system between headquarters and region**:
  - **Expansion of integrity and ethical education**: network
  - **Expansion of integrity and ethical education**: web
  - **Expansion of Integrity and ethical education**: training for all departments
  - **Expansion of Integrity and ethical education**: training for all departments

#### Spread of integrity and ethical culture

- **K-water’s Integrity Model**
  - **Incorporation of Integrity and ethical education**
  - **Incorporation of Integrity and ethical education**
  - **Incorporation of Integrity and ethical education**
  - **Incorporation of Integrity and ethical education**

#### Progress of major integrity and ethical tasks

- **Incorporation of Integrity and ethical education**
  - **Incorporation of Integrity and ethical education**
  - **Incorporation of Integrity and ethical education**
  - **Incorporation of Integrity and ethical education**

### 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.

#### Board of Directors Composition

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Career</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gwan-ryun PAK</td>
<td>Non-standing Director * Chairman</td>
<td>President, Korea Drone Association Former Director of Gyeon City, Korea Land &amp; Housing Corporation</td>
</tr>
<tr>
<td>Hae-gyu LIM</td>
<td>Non-standing Director</td>
<td>Chairman, Democratic Party of Korea, Joint Verizon, Given &amp; G.S./ prosecution Committee Former Auditor, Korea Development Bank</td>
</tr>
<tr>
<td>Nam-hun JOONG</td>
<td>Non-standing Director</td>
<td>Vice Director, Environment Law Center</td>
</tr>
<tr>
<td>Sang-ku JOONG</td>
<td>Non-standing Director</td>
<td>CEO, Gymnastic Welfare Foundation Director, Gangwon YMCA</td>
</tr>
<tr>
<td>Jeong-wo KIM</td>
<td>Non-standing Director</td>
<td>Standing Representative, Gyeonggi Human Rights Peace Foundation Director, Sophia School</td>
</tr>
<tr>
<td>Sooyung YU</td>
<td>Non-standing Director</td>
<td>Prof. of Journalism &amp; Broadcasting, Sungkyong Univ. Former President, Korean Association for Communication And Information Studies</td>
</tr>
<tr>
<td>Hyun-ki PAK</td>
<td>Non-standing Director</td>
<td>Associate Prof. of Accounting and Tax Affairs, Korea Univ. Former Senior Newsletter, Financial Supery-boundary Services</td>
</tr>
<tr>
<td>Dong-jo CHOI</td>
<td>Non-standing Director</td>
<td>CEO, National Institute of Land and Environment Director, Institute for Climate Change Action</td>
</tr>
</tbody>
</table>

(As of August 2019)
Outsourcing Reporting Center

In order to implement integrity and ethical management, K-water is systematically operating the Management Innovation Depart, the Audit Depart, 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

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

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

<table>
<thead>
<tr>
<th>Classification</th>
<th>Highlights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Announcement of CEO’s pledge</td>
<td>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.</td>
</tr>
<tr>
<td>Customized integrity education</td>
<td>Mandatory management of integrity education such as new employees, promotion education, and executive leadership training</td>
</tr>
<tr>
<td>Code of conduct practice manual</td>
<td>Practical information for easy use by practitioners, including the importance of integrity and ethics, Q&amp;A, sharing of violations, and related regulations</td>
</tr>
<tr>
<td>Clean Master communication training and abuses of authority prohibition guideline</td>
<td>Clean Master (6-hour integrity instructor) tour training (2017) Distribution of abuses of authority prohibition guidelines (2020), etc.</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Classification</th>
<th>Highlights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establishment of a Records Management Center</td>
<td>Drawing up records standard about record management</td>
</tr>
<tr>
<td>Establishment of Records Management and Memo Reporting System</td>
<td>Transfer of important records (46,000 volumes in 4 departments)</td>
</tr>
<tr>
<td>Establishment of an Evaluation Council (Evaluation of standards and procedure)</td>
<td>*Evaluation Council: Council that evaluates whether we can destruct the record</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Organization - System Innovation</th>
<th>Process Innovation</th>
<th>Shift of Employees Awareness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establishment of a Records Management Center</td>
<td>Permanent preservation of four major records related documents</td>
<td></td>
</tr>
<tr>
<td>Establishment of Records Management and Memo Reporting System</td>
<td>Transfer of important records (46,000 volumes in 4 departments)</td>
<td></td>
</tr>
<tr>
<td>Transfer of important records (46,000 volumes in 4 departments)</td>
<td>Establishment of an Evaluation Council (Evaluation of standards and procedure)</td>
<td></td>
</tr>
</tbody>
</table>

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

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 reoccurrences 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

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.

Disaster management that is naturally occurring

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 Gyeonggi-do, 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.
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 50 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.

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.

### 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 Lit 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:**

Provided values:

- Achieving integrated water management
- Ensuring water safety

**Classification**

- Employee
- Service type

**Main interests**

- Water service improvement
- Fostering of the water industry
- National service improvement

**Communication performances**

- Quick sharing of information
- Policy communication, network
- Participation in key policy decisions

**Communication channels**

- CEO messages, management meetings, education, employee director meetings, etc.
- Operation of a dedicated organization
- Activating our communication platform
- Official communication, policy-making, public comments, etc.
- Mutual Prosperity and Cooperation Committee, burden-sharing, social activities, etc.

**Stakeholders**

- Executives and employees, customers, NGOs, local communities, government projects, labor unions, civic groups, citizens, etc.

**Stakeholder Communication**

- Enhancing participation in decision-making processes
- Participation in key decisions
- Targeted social activities
- Participating in policy decisions
- Participation in community activities
- Participating in community activities

**Liability rate scenario**

<table>
<thead>
<tr>
<th>Year</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate</td>
<td>181.2%</td>
<td>175.4%</td>
<td>173%</td>
<td>170%</td>
<td>168%</td>
<td>166%</td>
</tr>
</tbody>
</table>

**Suggested features**

1) Worker Direct Vision 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
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**

- **Goal**
  - Collection of various opinions, deliberation and mutual development
  - Communication platform (K-water Talk)
  - Idea contest, hackathon

- **Service Innovation**
  - Smart City IoT Street
  - Design group that make nation happier
  - 24 proposals reflected in the Busan Smart City Water Plan
  - Expansion of household water meter reading social safety net service for the elderly who are living alone

- **Participation in management**
  - "Share and collaborate with the public for decision making"
  - Open committee
  - Citizen Participation Innovation Group
  - Mutual Prosperity Plan (12 people in 4 regions) to resolve local issues and conflicts
  - Establishment of the national participation budget system and commercialization of 5 outstanding tasks

**Performance of Stakeholder Communication by Major Project**

<table>
<thead>
<tr>
<th>Major project</th>
<th>Performance</th>
<th>Major stakeholders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated water management task policy</td>
<td>Integrated water management tasks proposed by K-water are mostly reflected in the government’s water management utilization task</td>
<td>Government, National Assembly, Experts</td>
</tr>
<tr>
<td>Integrated operation of large area-province</td>
<td>Promotion of integrated waterworks pilot project (16.8 km) and integrated waterworks plan for Changan River 2.61 billion won can be saved annually due to the integration of large area-province</td>
<td>Local governments, local residents</td>
</tr>
<tr>
<td>Water environment improvement</td>
<td>First watershed management pilot project beyond the legal limits of water surface management (Jeonju-Namhang, 26.4 km) Establishment of an integrated management model of upstream rivers (77% of rivers), which is a small unit of a new [Jeonju-Changwon] Integration of restoration of habitats, reduction of nonpoint pollution, Seacarement of ecological flow, Public participation strategy</td>
<td>NGOs, press, local residents</td>
</tr>
<tr>
<td>Expansion of water welfare</td>
<td>Expansion of direct water supply to large areas-waterworks to areas with limited access to water (farmers and fishing village) (water supply to areas with 10,000 people or less) Implementation of groundwater reserve projects for remote islands (Shina, Shanki) (Medical drinking water shortages for 877 people a year) noodles</td>
<td>Customers, citizens, and community</td>
</tr>
<tr>
<td>Expansion of smart water management</td>
<td>Jayang City first national project, expanded high-quality water services to local waterworks in the local government / local governments, 4 - 12 (2017) / in 2018 / Busan for-GoHe-Da City selected as a National Smart City Taskforce (2021)</td>
<td>Local government, Central government, related institutions</td>
</tr>
<tr>
<td>Water energy development</td>
<td>Profit sharing of a floating photovoltaic project implemented as a model for overcoming regional opposition (Papyeong, Yeongnam)</td>
<td>Community, Employees, Partner Companies</td>
</tr>
<tr>
<td>Creation of a water circulation city</td>
<td>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 (Sogeum-GC, Busan)</td>
<td>Local government, community</td>
</tr>
</tbody>
</table>

**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” as an open advisory body. It consists of 14 private experts such as water management experts, academia, entrepreneurs, and socio-economic organizations, who 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**
- Human rights - Safety environment
- Employment and education
- Job creation (multi-private sector)
- Support for SMEs, mutual prosperity and improvement of public services
- Revitalization of local economies

**Key topics**
- Realization of human rights to water without discrimination
- Sustainable conservation of the environment
- Implementation of systems to protect people from disasters and accidents

**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.
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 analysis.

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 environment analyses. In addition to an in-depth media analysis, we derived 286 issues that are important to K-water through related company analyses, Trend & Impact analysis, government national project analyses, and management issue analyses.

STEP 2 | Selection of issues

Based on a total of 286 issues, we selected 32 key issues through the combination of similar and elimination of duplicating issues.

STEP 3 | Materiality test

We conducted a survey for key stakeholder groups, and a total of 431 people participated in our 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 resource, increase in requirements of transparency and ethical management, and increase in requirement of water management safety were notably high.

Analysis of identified issues

- Categorization of the issues
- Elimination of low impact issues
- Omission of expert topics that are deemed to have low impacts based on risk and impact

Criteria for evaluating key issues

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

STEP 4 | Third Party Verification

In order to ensure the reliability and transparency of the materiality testing process, we conducted third party verification of the priorities and issues. In the process of forming a pool of issues and evaluating priorities, we separately checked whether external stakeholders’ opinions were fully reflected in the earlier process.

Third Party Verification

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

Importance of K-water (Internal)

<table>
<thead>
<tr>
<th>No.</th>
<th>Key Issues</th>
<th>Stakeholders</th>
<th>Sustainable management indicators</th>
<th>Impact</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>Job creation and assurance of human resources</td>
<td>Employees</td>
<td>Society</td>
<td>Employees / Indirect economy</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Increase in requirements of transparency and ethical management from enterprise</td>
<td>Employees</td>
<td>General</td>
<td>Transparency management / Anti-corruption</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Increase in the requirements for water management safety</td>
<td>Government, NGO</td>
<td>Environment</td>
<td>Water resources</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Environmental pollution prevention (air, water quality, soil pollution)</td>
<td>NGO, Local governments</td>
<td>Environment</td>
<td>Environmental pollution</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Climate change</td>
<td>NGO, Local governments</td>
<td>Environment</td>
<td>Climate change</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Depiction of natural resources (water resources, mineral resources, fossil fuel)</td>
<td>NGO, Local governments</td>
<td>Environment</td>
<td>Resource depletion</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Increase in requirements for fair trade</td>
<td>Partner companies</td>
<td>Society</td>
<td>Fair trade</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Increase in consumers who value health, eco-friendliness, and life security</td>
<td>Customers (people)</td>
<td>General</td>
<td>Consumer rights</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>Development of core technology for water management</td>
<td>Government, employees</td>
<td>Economy</td>
<td>Technological advancement</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Increase in diverse and advanced customer demands</td>
<td>Customers (people)</td>
<td>Society</td>
<td>Consumer rights</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Reinforcement of environmental regulations</td>
<td>NGO, Local governments</td>
<td>Environment</td>
<td>Environmental pollution</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Inter-firm cooperation (technological development, patents, overseas expansion, etc.)</td>
<td>Government, employees</td>
<td>Economy</td>
<td>Economic performance</td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>Increase in requirements of water resources</td>
<td>NGO, Local governments</td>
<td>Environment</td>
<td>Water resources</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Increase in requirements of employee welfare and rights (making life better)</td>
<td>Employees</td>
<td>Society</td>
<td>Employees</td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>Increasing interest in governance (responsible management)</td>
<td>Employees</td>
<td>General</td>
<td>Governance</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Increase in requirements of fair competition</td>
<td>Customers (people)</td>
<td>Society</td>
<td>Fair trade</td>
<td></td>
</tr>
</tbody>
</table>
Multiply

Water Welfare for All People

Management Approach (MA)
Water Safety Services
Water Sharing Services
Water Convergence Services
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**

**Management Approach (MA)**

- **Vision**
  - Reducing flood damages by 60%
  - Reduction of the population affected in drought-prone areas by 70%
  - Fulfillment of water quality goals (including achievement of ecosystem health grade B)

- **National Healthy Water Circulation**
  - Fulfillment of water quality goals (Ia) by 86%
  - Reduction of flood damages by 60%
  - Reduction of the population affected in drought-prone areas by 70%
  - Achievement of ecosystem health grade B

- **Service Partner**
  - Creation of 5 water circulation cities
  - Creation of 1,600 private jobs
  - Accomplishment of overseas sales of KRW 332.2B

**Action plan**

1. Securing 420M ㎥ of sustainable water per year
2. Achievement of a water safety rate of 100%
3. Water supply to 14,000 residents in areas with limited access to water
4. Establishment of a basis for the fulfillment of water rate fairness
5. Creation of 5 water circulation cities
6. Reduction of 1.569 million tons of greenhouse gases (CO2)
7. Creation of 70,000 private jobs
8. Accomplishment of overseas sales of KRW 332.2B

**Strategic Directions**

- Safe and clean river basin management (7 strategic goals)
  - Making the country safe from floods
  - Integrated management of full cycle of droughts
  - Improve dam-water environment
  - Strengthening facility safety
  - Strengthening sewage management for healthier rivers
  - Strengthening capacity to respond to climate change
  - Establishment of a basin-based integrated water management system

- Clean water shared without shortage (6 strategic goals)
  - Optimizing existing facilities and strengthening the use of alternative water resources
  - Strengthening water demand forecasting and supply management
  - Securing a Stable tap water supply by constructing basin-based supply systems
  - Improvement of drinking water reliability by supplying high quality tap water
  - Bridging the water service gap in vulnerable areas
  - Resolution of basin water supply issues

- Water-Energy-Cities convergence services (7 strategic goals)
  - Restoration of river ecosystem health and creation of sustainable waterfront spaces
  - Creation of eco-friendly water circulation cities
  - Activation of clean water energy development
  - Innovation in the water industry with SMEs
  - Promotion of Korean companies to enter overseas business
  - Improved welfare on the Korean Peninsula

- Safe and clean river basin management (7 strategic goals)
  - Laying the foundation for integrated water management
  - Strengthening response to flood damage
  - Response to facility aging
  - Active implementation of over opening

- Water-Energy-Cities convergence services (7 strategic goals)
  - Creation of a new water industry ecosystem
  - Raising the value in developing smart cities
  - Promote the commercialization of hydrothermal technologies
  - Strengthening Global Network

**Major project performances**

<table>
<thead>
<tr>
<th>Project</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flood control capacity achievement rate</td>
<td>4.16</td>
<td>4.32</td>
<td>4.42</td>
</tr>
<tr>
<td>Reserve rate secured for potential droughts</td>
<td>52.3</td>
<td>59.3</td>
<td>69.9</td>
</tr>
<tr>
<td>Utilization of water facilities</td>
<td>74.9</td>
<td>78.8</td>
<td>79.5</td>
</tr>
<tr>
<td>Utilization of water supply facilities</td>
<td>78.9</td>
<td>76.8</td>
<td>63.3</td>
</tr>
<tr>
<td>Dam-reservoir algal concentrations (Chl-a) grade</td>
<td>Ⅰa</td>
<td>Ⅰa</td>
<td>Ⅰa</td>
</tr>
<tr>
<td>Global water quality standard achievement rate</td>
<td>99.95</td>
<td>99.99</td>
<td>99.98</td>
</tr>
<tr>
<td>Large-area waterworks flow rate</td>
<td>99.7</td>
<td>99.9</td>
<td>100</td>
</tr>
<tr>
<td>Local waterworks flow rate</td>
<td>83.9</td>
<td>84.3</td>
<td>84.3</td>
</tr>
</tbody>
</table>
Drought Information Portal

Establishing basin-based integrated water quality-water quantity management system according to the unification of water management, and supporting the establishment of national water management regulations, we have established the 'Danbi' service, which provides localized drought information to implement a drought response system that allows the citizens 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.

Based on the principle that drought vulnerability, is a necessary condition for drought response capability, local governments can experience drought vulnerability and establish vulnerability maps. Based on the principle, we built vulnerability maps in a step to supplement drought vulnerability made by periodically evaluating drought exposure, sensitivity, and response of local governments. Drought vulnerability and adaptation/vulnerability index is a necessary condition for drought response capability, local governments can experience drought vulnerability and establish vulnerability maps. Based on this principle, we built vulnerability maps in a step to supplement drought vulnerability made by periodically evaluating drought exposure, sensitivity, and response of local governments.

Water Safety Services

Overcoming Floods in and around Small and Medium Rivers

Flood damage reduction

Strengthened flood response capabilities based on comprehensive inter-agency cooperation minimize flood disasters in 22 local governments by enhancing flood response capabilities. Strengthening our cooperative network with local governments to minimize casualties and damages by floods and typhoons and heavy rains among which 98.7% occur in local small and medium rivers. In order to prevent and respond to floods, we have applied and established Integrated Flood Management Systems in A River and Medium Rivers Management System, on which inter-municipality integrated flood management systems have been built. The resulting flood management system has improved the flood response capability in and around small and medium rivers managed by local governments based on various water planning and management activities. To support this, K-water has established a flood integrated flood management system, a national flood decision support system that provides regional flood characteristics and vulnerability evaluations. We have also integrated flood information produced and provided by other institutions and stakeholders with relevant information that can be used to enhance response capabilities even in abnormal weather. We are also working hard to improve the flood response capability.

To people

Promotion of water saving

To increase the awareness of water saving, we have established a water saving recognition 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. 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 an advanced flood response system. In order to prevent and respond to floods, we will build a water supply and demand system based on performance data and improve drought forecasting and evaluation techniques to respond to droughts.

To people

Elevation of citizen participation

Operation of the integrated flood management system

To improve the awareness of water conservation and to respond to droughts, we have established a water saving recognition 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. 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 a water saving recognition 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.

To people

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 a water saving recognition 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. 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 a water saving recognition 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.

To people

Minimization of inconveniences to citizens by drought!

Overcoming Droughts in and around Small and Medium Rivers

Minimization of inconveniences to citizens by drought!

Overcoming Droughts in and around Small and Medium Rivers

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Overcoming Droughts in and around Small and Medium Rivers

Minimization of inconveniences to citizens by drought!
K-water has signed ceremony for the implementing arrangement on cooperation of satellite application Technology for Water Management and Flood Disasters with NASA. With this agreement, we plan to identify the major water resources on the Korean Peninsula and throughout Asia and obtain a variety of data on water-related disasters such as floods and droughts, green algae, red tide detection, and vegetation change observations. We will also enhance our capabilities to proactively respond to climate change by securing world-class satellite technology in cooperation with NASA.

### Characteristics of the water satellite’s operation

<table>
<thead>
<tr>
<th>Payload type</th>
<th>C-band SAR (infrared)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Channel</td>
<td>5.4 GHz</td>
</tr>
<tr>
<td>Observation</td>
<td>32m or more</td>
</tr>
<tr>
<td>Resolution</td>
<td>30m or more</td>
</tr>
<tr>
<td>Weight</td>
<td>250kg or less</td>
</tr>
<tr>
<td>Volume</td>
<td>8.6m or more</td>
</tr>
<tr>
<td>Operating altitude</td>
<td>562 km</td>
</tr>
<tr>
<td>Re-satellite cycle</td>
<td>2 times / Day (Observation of the entire Korean Peninsula)</td>
</tr>
<tr>
<td>Operational period</td>
<td>More than 4 years</td>
</tr>
</tbody>
</table>

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 landfall.

### Integrated Flood Management System Construction Process

- **Establishment**
  - Establishment of work processes for system construction and distribution of guidelines
- **Cooperation System**
  - Establishment and expansion of management for flood analysis and system construction
- **Information sharing**
  - Linkage and integration of flood information of relevant organizations for each local government
- **Technology development**
  - Development of an inter-agency information linkage method and advancement of disaster prevention technologies using cutting-edge technology
  - Establishment of work processes for system construction and distribution of guidelines
- **Construction of inter-municipality integrated flood management systems and continuous expansion to local governments**
  - Completed in three local governments (Jeonju-si, Jeongseon-gun, Gyeongju) in 2019 and scheduled for three local governments (Cheongju-si, Danyang-gun, Gurye-gun) in 2020

### 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 N&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 forecast 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.
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 2014 to supply water as needed. In total, 134 million m³ 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 a 11-day reduction in the number of the day when odor are caused in Paldang Dam.

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.

**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-HT package (2012), an intelligent integrated basin water management decision-making support tool that integrates weather forecasting, hydrological observations, fixed 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.

**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 ‘disclosing new projects in the aquatic sector’.

Advantages of eco-friendly fish fertilizer

- Why eco-friendly fish fertilizers are better than liquid fertilizers
- Shortening the growth period
- Improvement of overall performance
- Improved performance after production process
- Eco-Fertilizer Production Procedure

- Technology development
- Support for pilot facilities
- Fish catch
- Plant
- Purchase business
- Production
- Fish, lake
- Local governments
- Local farmers

- Support for mobile (self-use), factory (sales, profit) production facility construction
- Support for pilot supply (12 tons), effect verification, 28 cases of press invitations (JTBC, KBS, etc.)
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.

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

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.

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)**

**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, 240 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 off-site plans such as facility planning and project cost calculation of wastewater treatment water reuse facilities
- Target : 641.2 billion won
- Period / Project cost : 2013-2030
- Related law : Act on the Promotion and Support of Water Reuse
- Organizer / Cycle : Ministry of Environment / 10 years
- Period / Amount : August 2019 ~ November 2020 (16 months) / KRW 1,500 million
- Modernization Project for Obsolete Hydraulic Equipment

**Modernization Project for Obsolete Hydraulic Equipment**

- Contents : To enhance the capacity and efficiency of obsolete hydropower facilities [water turbine power generation facilities, outdoor subsolation facilities] with the useful life of 40 years and secure operational stability
- Status : TA project expansion, technical support for new projects, linking hydropower facilities (water purification plant pipeline) - Amendment of the Waterworks Law to conduct integrated diagnosis of water facilities (water purification plant pipeline)
- Period / Project cost : August 2019 ~ November 2020 (16 months) / KRW 1,500 million
- Contents : TA project expansion, technical support for new projects, linking hydropower facilities (water purification plant pipeline)
- Status : 2 locations completed (Andong, Hapcheon), 3 locations in operation (Namgang, Baechihoeng, Hapcheon) 4 places scheduled (Soyanggang, Chungi, Juam, Imha Dam)

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, 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.

**K-water’s Vision 2030**

- Related law : Act on the Promotion and Support of Water Reuse
- Contents : The government’s most significant plan related to water reuse such as rainwater use, reclaimed water, treated sewage and wastewater to secure sustainable water resources
- Organizer / Cycle : Ministry of Environment / 10 years
- Period / Amount : August 2019 ~ November 2020 (16 months) / KRW 1,500 million
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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 62 core technologies that the public can experience, including the removal of algae 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 expanded the analysis, utilization, and sharing of big data.

Data-based proactive water management

K-water is promoting the introduction of eco-friendly small and medium-sized multi-purpose water detention ponds 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

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.

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). 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 realized the water supply problem without developing a new water source by installing water intake pipes to transfer the downstream river water which rains to the island villagers who are suffering from water shortage due to limited water supply reserves of water supply sources.

Establishment of a social safety net including smart meter reading

Establishment of social safety net through smart meter reading

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

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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.

Supply water sources by using downstream river water of island areas

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

Optimizing Existing Facilities and Strengthening the Use of Alternative Water Resources

Customized and Integrated Industrial Water Supply Project

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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 compiled 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. Also recognized for K-water's safe tap water management capacity, we completed the agreement with 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.

K-water’s Safe Water Management Capacity

- Compliance with global water quality standards
  - Achieved 95.5% (developed countries: 85%)
  - Pollutant analysis technology
    - Field of 300 items (300 items/yr)

Operation of the own water quality evaluation tool and promotion of diagnostic policy

- WSP in operation (2013)
  - Improved 0.277 towards - Located in WHO as an excellent operating country

Best waterworks diagnosis capacity

- 36% cases for 5 years
  (76 cases in 2018)

Proposal of an international certification standard evaluation system for tap water

- Presenting the highest level of evaluation including K-water's capacity
  - (Safety) 50 items of water quality evaluation
  - (Untreated treatment evaluation) 70 items based on K-water’s WSP

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 as rainwater storage tank, we have established a plan to supply flow rate of iners at locations where it is difficult to secure ecological flow rates.
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.

**Improve water reliability by supplying high-quality tap water**

**Introduction of K-water’s Smart Water Management**

- **Operational Efficiency Project Cost**
- **Recipient Population** Smart Water Management Service for 540,000 people

<table>
<thead>
<tr>
<th>Classification</th>
<th>Existing project method</th>
<th>Improved project method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Cost</td>
<td>5.7</td>
<td>-</td>
</tr>
<tr>
<td>Recipient Pop.</td>
<td>540,000</td>
<td>540,000</td>
</tr>
</tbody>
</table>

**Water supply service**

- 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 and 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 consigning 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 Island, supplying water and deriving rational facility improvement plans through an intelligent pipeline operation 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 managing the causes of salt damage in the Seomjin River with related organizations to prepare fundamental improvement measures. 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 region-based integrated water resources management.

**Resolving the Water Supply in the Basin**

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.

**Region-based integrated water resources management**
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.

**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.

**Waterfront Eco Belt Standard 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 ‘K-water’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

Years

Development

Capacity (㎿)

2016

2017

2018

2019

2020

2021

2022

2023

Development Scale and Construction Schedule

Development capacity (㎿)

518

517

438

412

346

257

148

190

Notes on the table above:

- Development capacity (㎿) indicates the total capacity of photovoltaic power generation that will be obtained from the development of floating photovoltaic energy in the future.

- The total capacity will be realized through the construction of multiple floating power plants.

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-friendly city by improving water quality and recovering the natural water circulation process (precipitation – river – water purification – sewage – reuse) in the city.

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.

K-water is actively responding to the government’s climate change and energy policy through the active development of alternative sources of water 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 550㎿ 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

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.
K-water has strengthened its technological capabilities for the entire process of informatization by operating technologies to foster innovation of the water technology management system to lead the 4th industrial revolution. 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

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 technologies with indigenous technologies and securing core water management technologies for future water management by obtaining smart 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.

Applications of smart water management technology

In addition, K-water is driving 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.

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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.).

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

- **Development and selection step**
  - Preliminary Feasibility Study (Government)
  - Overseas Business Selection Committee
  - Review of Preliminary and Main Investments
  - Review of Business Agreement
  - Overseas Business Risk Management Committee
  - Occasional Reporting to Management and Board of Directors

- **Due Diligence and investment analysis step**
  - Identification and Responding to Anticipated Risks through the Analysis of Processes and Financial Performances
  - Task Force for Responding to Construction and Operation issues

- **Construction and operation step**
  - Review of technical and financial feasibilities by internal and external experts

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.

**Strengthening of leadership and competencies to solve global water problems**

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.

**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 resource 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.

**Groundwater Information System**

- **Grounds for promotion**
  - Article 1 (2) of Groundwater Law (Informationization of Groundwater Conservation and Management)
- **Support contents**
  - Construction of an integrated GIS and information management system linked with observation networks and introduced and applied to infrastructure
- **Support target**
  - 22 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

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**K-water**

Leaping forward to become a leading global water company

Overseas business sales

<table>
<thead>
<tr>
<th>Year</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
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<tr>
<td>Sales</td>
<td>$3,820</td>
<td>$8,844</td>
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**MULTIPLY | Water Welfare for All People**
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 workforce 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

**Vision**

- Improving the quality of people’s lives by realizing water welfare for all

**Strategic direction**

- Protection of water rights
- Decrement of a healthy and safe environment
- Provisions of decent jobs
- Provisions of Customized service
- Implementation of clean, responsible management

**Strategy tasks**

1. Water balance realization
2. Elimination of local water shortage
3. Strengthening the water rights of vulnerable classes
4. Strengthening facility safety and preventing water disasters
5. Recovery of the natural water cycle
7. Improved quality of employment and work
8. Creation of jobs for the youth and private sector
9. Strengthening the role of innovation growth priming water
10. Providing services that the people want
11. Pursuing win-win cooperation and fair competition
12. Pursuing regional development and regional economic revitalization
13. Strengthening ethical management and transparency
14. Respecting human rights and protecting labor rights
15. Implementation of internal and external checks for autonomous and responsible management

**Execution system**

- Activation of external communication and cooperation
- Strengthening of site-based activities
- Management of membership changes in terms of internal personnel

**Performance verification**

- Two-track verification through the operation of the social value groups and the social value committees
- Performance checks and regular monitoring by tasks using a performance management system

---

**Key Achievements of Social Value Realization**

- **Customer (Complaints) Business Process Satisfaction** (Unit: point)
  - 2016: 43.45
  - 2017: 40.42
  - 2018: 43.45

- **Human Resources Cultivation Index** (Unit: %)
  - 2016: 45.0
  - 2017: 44.3
  - 2018: 43.6

- **Job creation Around Dams** (Unit: people)
  - 2016: 5,109
  - 2017: 4,502
  - 2018: 5,109

- **Number of Water Industry Startups** (Unit: company)
  - 2016: 48
  - 2017: 5
  - 2018: 48

- **Water Information (My Water) Satisfaction** (Unit: point)
  - 2016: 4.11
  - 2017: 4.02
  - 2018: 4.11

- **Social Contribution Program Satisfaction** (Unit: %)
  - 2016: 94.4
  - 2017: 94.2
  - 2018: 94.4
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 their ideas can be reflected in policies.

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

Realization of customer satisfaction from the customers’ perspective

- Enhancement of management technology for making customers happier
- Strengthening communication with customers
- Construction of communication management system
- Engagement of customer value

Target

- CS Vision: K-water making customers happier
- Service orientation: One step ahead service, professional service
- Strategy direction: Realization of customer satisfaction from the customers’ perspective

Shared value

- Customer Orientation, Expertise, Reliability, Safety, Promptness, Leadership

Proactive SNS Service

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 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 reviewed for 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 ‘DanBiTalk 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.
‘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.

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 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 quality inspection requests.

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 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.

**Operation of the Citizen-led ‘Living Lab’**

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

**K-water Love Spring Service**

**Pursuit of innovation through the realization of national participation**

**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’.

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

- **Vision**: Leading job creation for people-oriented sustainable growth economy
- **Slogan**: Jobs for everyone! Creating great jobs, K-water!

**Water safety jobs**
1. Pipeline monitoring
2. Basin water environment supervisor
3. Mudumuri (Water Coordinator, etc.)
4. Strengthening dam safety
5. Sewer projects

**Water sharing jobs**
6. Strengthening the stability of large-area water supply
7. Local waterworks modernization projects
8. Alternative water resources (irrigation)
9. Groundwater reservoirs
10. Smart safety management system
11. Customized industrial water projects

**Water convergence services**
12. Venture support for water-related SMEs
13. Busan EDC Smart City
14. Sihwa MTV Coastal Ecosystem Island Project
15. Sanguan GC International Theme Park
16. Floating photovoltaic energy
17. Hydrothermal energy
18. Overseas cooperation projects

**Water innovation jobs**
19. Youth jobs Employment
20. Eco Disturbance Survey Resources Project (Fish Anesthesia)
21. Support projects around dams, social contributions,
22. Mutual Prosperity Cooperation Space (Shine Water)

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.

**Water Cody**
- Target: 130 people in total
- Method: 17 people in total (15 in Yangju, 2 in Dongducheon) *(in 2019, Water Doctors were introduced to Goseong and Naju)*
- Period: June-December 2018 (7 months)
- Goal: 80,000 cases (About 10% of all entrusted households, local households)
- Task: Home water quality inspection and providing information, solving supply water quality problems

**Water Doctor**
- Target: 30 people in total
- Method: 17 people in total (15 in Yangju, 2 in Dongducheon)
- Period: June-December 2018 (7 months)
- Goal: Total 1,750 cases (1,750 cases in Yangju, 500 in Dongducheon)
- Task: Indoor piping diagnosis and prevention of water quality problems
K-water has established a roadmap that reflects human rights management in its corporate strategy 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-term 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

- Realization of a trusted human rights management organization with the people
- Expansion of the field of human rights impact evaluations
- Raising awareness through the strengthening of education and public relations
- Dissemination of K-water’s human rights culture internally and externally
- Excellent human rights management company with the people

K-water’s Human Rights Management Vision

- To operate them to remedy human rights violations.
- To conduct human rights impact assessments. We have also established procedures and are analyzing the actual and potential risk factors for human rights, we designate departments in charge of 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.

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 has established a roadmap that reflects human rights management in its corporate strategy 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-term 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.

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.

Conversion of Improvement of Balance Scorecard

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’ (W&LB), 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.

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

Category
Flexible working system
- Introduction of the employee working schedule and overtime system
- Introduction of a short-term work system and a self-designed flexible work system
- Introduction and operation of a short-term work system and a self-designed flexible work system

Improvement of work practices
- Family leave system (every Wednesday and Friday)
- Weekend PC-off and Shut-down (power off) at 19:00 on weekends
- Weekend PC-off (power off)

Encouragement of childbirth and strengthened child care support system
- Maternity leave and parental leave notice system
- Maternity leave and parental leave notice system (Possible to secure substitutes and budget)
- Child Care Leave (2 days / year)
- Child Care Leave (2 days / year)
- Additional support for childcare

Support for work-family balance
- Family Participating Education such as Couples Coaching and Delivering School
- Family Participating Education such as Couples Coaching and Delivering School
- The Department of Work and Employment Promotion of cultural performance support and wearing additional protective facilities
- Flexible Family leave system
- Flexible Family leave system
- Family leave system

Examples of the human rights management scope

- K-water 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 for establishing internal and external empathy

- Joint Labor Management Family Camping Event
- Employees using flexible working hours

<table>
<thead>
<tr>
<th>Year</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workforce Count</td>
<td>1,890</td>
<td>1,942</td>
<td>2,008</td>
</tr>
</tbody>
</table>

* Family Day refers to the dates when 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

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.

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 substances 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 9 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.

Selection of core fostering fields

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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.

Overview of K-water’s environmental management

- Acquisition of international standardization certification (ISO) for Quality, Environmental and 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.)

- Comprehensive and quantitative measurement of the performance in environmental management across all management systems
  - The EPE indicates a relative improvement in environmental performance in comparison with the base year (2000).
  - The evaluation has been conducted since 2007, and K-water has constructed and operated a first-computerized environmental performance evaluation system and acquired patent for the system.
  - The EPE score for 2018 was 153 which indicates that the environmental performance has enhanced by 58% from the base year (2000).

- Environmental Performance Evaluation (EPE)
  - Changes to ISO9001/ ISO14001 certification in July 2018
  - 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.)

- Strategies for implementing environmental management
  - Training in ISO-quality and environmental management certification auditing has been provided to selected employees (since 2007)
  - The internal experts have provided a practical understanding of quality and environmental management in accordance with international standards for every K-water business site
  - The internal experts have provided a practical understanding of quality and environmental management in accordance with international standards for every K-water business site
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- Local environment conservation and value creation
  - Providing eco-cultural spaces to live residents through environment improvement in bus stops areas and creation of new business demands

- Environmental Performance Evaluation (EPE)
  - Reducing greenhouse gas emissions through clean energy production
  - Water Sharing Services
  - Local environment conservation and value creation
  - Providing eco-cultural spaces to live residents through environment improvement in bus stops areas and creation of new business demands

- Response to climate change
  - Reduction of green house gas emissions through clean energy production
  - Water Sharing Services
  - Water Management Services
  - Water Safety Services

- Eco-friendly Management System

Making a Happier Korea Together

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 99% 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.
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)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total emission amount</th>
<th>Direct emission amount</th>
<th>Indirect emission amount</th>
<th>Total reduction amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>631,431</td>
<td>620,499</td>
<td>10,932</td>
<td>715,870</td>
</tr>
<tr>
<td>2014</td>
<td>627,000</td>
<td>611,923</td>
<td>15,077</td>
<td>715,870</td>
</tr>
<tr>
<td>2015</td>
<td>630,018</td>
<td>619,566</td>
<td>10,452</td>
<td>715,870</td>
</tr>
<tr>
<td>2016</td>
<td>637,751</td>
<td>623,494</td>
<td>14,257</td>
<td>715,870</td>
</tr>
<tr>
<td>2017</td>
<td>637,931</td>
<td>623,620</td>
<td>14,311</td>
<td>715,870</td>
</tr>
<tr>
<td>2018</td>
<td>639,701</td>
<td>625,499</td>
<td>14,202</td>
<td>715,870</td>
</tr>
</tbody>
</table>

Current status of CDM Projects

<table>
<thead>
<tr>
<th>Target</th>
<th>Project Type</th>
<th>Total Amount (tCO2-eq)</th>
<th>Power Plant 1</th>
<th>Power Plant 2</th>
<th>Power Plant 3</th>
<th>Power Plant 4</th>
<th>Power Plant 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td></td>
<td>736,676</td>
<td>623,494</td>
<td>619,923</td>
<td>623,620</td>
<td>623,566</td>
<td>623,566</td>
</tr>
</tbody>
</table>

Disadvantage

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 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 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 improvements.
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 have 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.

Support Plan by Unit Platform

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.

Development of new technology with 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 water 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’.

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

Support for SMEs’ overseas expansion

K-water supports the innovation and 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-step support system for fostering and distribution of innovative technology of SMEs

Technical development support

- Transfer of intellectual property rights (patents and copyrights)
- Customized R&D
- Market expansion

- Provision of test-beds
- K-water’s excellent technology certification system

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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 more than the previous year. We continuously train contract managers and monitors them every month.

**Leading Fair Trade Culture**

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

- **General joint subcontract**
  - **Client**
  - **General Construction + Professional Construction**

- **Joint subcontract of main contractors**
  - **Client**
  - **General Construction (Main Contractor) + General Construction (Subcontractor)**

**Social Contribution through the Water and Love Sharing Club**

**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.

**Leading Fair Trade Culture**

Classifications of purchases from social enterprises

<table>
<thead>
<tr>
<th>Year</th>
<th>KRW (×10 Billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>81.8</td>
</tr>
<tr>
<td>2018</td>
<td>90.1</td>
</tr>
</tbody>
</table>

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.
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.

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.

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.

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.

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.
Sustainability Highlights

Economic Performance | Financial Performance

Summary of consolidated statement of financial position

<table>
<thead>
<tr>
<th>Category</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assets Current assets</td>
<td>6,422,010</td>
<td>7,041,806</td>
<td>8,208,278</td>
</tr>
<tr>
<td>Non-current assets</td>
<td>13,877,420</td>
<td>13,825,489</td>
<td>13,588,480</td>
</tr>
<tr>
<td>Total</td>
<td>20,299,430</td>
<td>20,867,295</td>
<td>21,796,758</td>
</tr>
<tr>
<td>Liabilities Non-current debts</td>
<td>10,484,290</td>
<td>10,577,196</td>
<td>11,108,159</td>
</tr>
<tr>
<td>Total</td>
<td>13,638,855</td>
<td>13,633,291</td>
<td>14,009,630</td>
</tr>
<tr>
<td>Capital Capital</td>
<td>7,692,548</td>
<td>8,108,974</td>
<td>8,486,338</td>
</tr>
<tr>
<td>Equity attributable to owners</td>
<td>1,064,523</td>
<td>908,919</td>
<td>740,756</td>
</tr>
<tr>
<td>Non-controlling interest</td>
<td>32,550</td>
<td>33,949</td>
<td>41,546</td>
</tr>
<tr>
<td>Total</td>
<td>6,660,575</td>
<td>7,234,004</td>
<td>7,787,128</td>
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</table>

Summary of consolidated statement of income

<table>
<thead>
<tr>
<th>Category</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turnover</td>
<td>3,618,084</td>
<td>3,375,560</td>
<td>3,391,568</td>
</tr>
<tr>
<td>Cost of sales</td>
<td>3,103,616</td>
<td>2,793,724</td>
<td>2,745,361</td>
</tr>
<tr>
<td>Selling and maintenance expenses</td>
<td>148,369</td>
<td>154,120</td>
<td>170,185</td>
</tr>
<tr>
<td>Operating profit</td>
<td>364,099</td>
<td>427,716</td>
<td>476,022</td>
</tr>
<tr>
<td>Other income</td>
<td>20,053</td>
<td>68,450</td>
<td>140,705</td>
</tr>
<tr>
<td>Other expenses</td>
<td>120,128</td>
<td>42,887</td>
<td>20,146</td>
</tr>
<tr>
<td>Other gains (loss)</td>
<td>▲ 1,064,523</td>
<td>▲ 908,919</td>
<td>▲ 740,756</td>
</tr>
<tr>
<td>Financial income</td>
<td>48,182</td>
<td>125,341</td>
<td>64,517</td>
</tr>
<tr>
<td>Financial costs</td>
<td>329,105</td>
<td>383,290</td>
<td>380,958</td>
</tr>
<tr>
<td>Related profit (loss) of affiliates</td>
<td>▲ 3,309</td>
<td>▲ 1,145</td>
<td>▲ 7,141</td>
</tr>
<tr>
<td>Net profit before corporate tax deduction</td>
<td>▲ 193,219</td>
<td>192,296</td>
<td>273,540</td>
</tr>
<tr>
<td>Corporate tax expenses (profits)</td>
<td>▲ 48,254</td>
<td>7,362</td>
<td>33,366</td>
</tr>
<tr>
<td>Net profit during the term</td>
<td>▲ 116,965</td>
<td>184,934</td>
<td>240,174</td>
</tr>
<tr>
<td>Other comprehensive income</td>
<td>▲ 2,844</td>
<td>▲ 27,521</td>
<td>▲ 31,259</td>
</tr>
<tr>
<td>Total comprehensive income</td>
<td>▲ 114,121</td>
<td>157,413</td>
<td>209,915</td>
</tr>
<tr>
<td>Net profit during the term attributable to owners</td>
<td>▲ 120,128</td>
<td>179,248</td>
<td>240,449</td>
</tr>
<tr>
<td>Net profit during the term attributable to non-controlling interest</td>
<td>▲ 3,948</td>
<td>▲ 5,686</td>
<td>▲ 275</td>
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</tbody>
</table>

Social value creation

Performance of Purchasing Products from SMEs

<table>
<thead>
<tr>
<th>Sector</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Purchase Amount</td>
<td>1,460,746</td>
<td>1,398,026</td>
<td>1,378,012</td>
</tr>
<tr>
<td>Purchase Amount of SME Products</td>
<td>826,633</td>
<td>819,203</td>
<td>744,371</td>
</tr>
<tr>
<td>Percentage (%, Purchase Amount of SME Products / Total Purchase Amount)</td>
<td>▲ 0.53</td>
<td>▲ 0.71</td>
<td>▲ 2.01</td>
</tr>
</tbody>
</table>

Performance of Purchasing Products from Female Enterprises

<table>
<thead>
<tr>
<th>Sector</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Purchase Amount</td>
<td>1,460,746</td>
<td>1,398,026</td>
<td>1,378,012</td>
</tr>
<tr>
<td>Purchase Amount of Female-owned Enterprises Products</td>
<td>9,874</td>
<td>9,978</td>
<td>11,943</td>
</tr>
<tr>
<td>Percentage (%, Purchase Amount of Female-owned Enterprises Products / Total Purchase Amount)</td>
<td>▲ 0.53</td>
<td>▲ 0.71</td>
<td>▲ 2.01</td>
</tr>
</tbody>
</table>

Performance of Purchasing Products from Social Enterprises

<table>
<thead>
<tr>
<th>Sector</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Purchase Amount</td>
<td>1,460,746</td>
<td>1,398,026</td>
<td>1,378,012</td>
</tr>
<tr>
<td>Purchase Amount of Social Enterprises Products</td>
<td>7,804</td>
<td>7,976</td>
<td>9,053</td>
</tr>
<tr>
<td>Percentage (%, Purchase Amount of Social Enterprises Products / Total Purchase Amount)</td>
<td>▲ 0.53</td>
<td>▲ 0.71</td>
<td>▲ 2.01</td>
</tr>
</tbody>
</table>

Turnover by business sector

<table>
<thead>
<tr>
<th>Sector</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated Water Resources Management (IWRM)</td>
<td>167,037</td>
<td>551,021</td>
<td>713,607</td>
</tr>
<tr>
<td>Tap water production (healthy water)</td>
<td>1,322,661</td>
<td>1,200,988</td>
<td>1,257,239</td>
</tr>
<tr>
<td>Waterfront city development</td>
<td>689,741</td>
<td>344,932</td>
<td>573,864</td>
</tr>
<tr>
<td>Clean energy production</td>
<td>218,930</td>
<td>229,469</td>
<td>270,073</td>
</tr>
<tr>
<td>Overseas projects</td>
<td>3,820</td>
<td>7,284</td>
<td>9,063</td>
</tr>
</tbody>
</table>

2016 2017 2018
APPENDIX

Performance of Purchasing Products made by the Severely Disabled

Add Multiply Divide

0.48
0.70
0.55

Patents and Technology Development

R&D Professionals

K-water R & D Performance

2016
2017
2018

0.48
0.70
0.55

Environmental performances

Renewable Energy Project Performance

2016
2017
2018

Greenhouse Gas Emissions

Category
2016
2017
2018

Emissions

Total (ton CO2-eq)**
651,719
720,687
732,256

Direct (ton CO2-eq)
4,067
4,817
4,440

Indirect (ton CO2-eq)
647,652
715,870
732,256

Reduction target (ton CO2-eq/TOE)
18.01
19.92
20.36

Estimated emissions (ton CO2-eq)
679,933
720,687
736,676

Reduction in the year (ton CO2-eq)
50,615
4,522
6,434

Early reduction_used (ton CO2-eq)
41,771
0
0

Energy Consumption and Savings

Category
2016
2017
2018

Total

13,399
14,783
15,150

Direct (TJ)
64
79
73

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
122,581
141,441

Generation source unit ([$/T])
96.4
99.9
82.1

Recycling rate (%)
100
100
100

Raw material of cement
61
57
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

<table>
<thead>
<tr>
<th>Category</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>54</td>
<td>53</td>
<td>53</td>
</tr>
<tr>
<td>- Waterbird habitat (No. of places)</td>
<td>13</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>- Fish spawning ground (No. of places)</td>
<td>116</td>
<td>116</td>
<td>116</td>
</tr>
<tr>
<td>- Eco-corridor (No. of places)</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>- Artificial marsh (No. of places)</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>- Fishway (No. of places)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>- Total</td>
<td>57</td>
<td>57</td>
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### Guwal Dam

<table>
<thead>
<tr>
<th>Category</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waterbird habitat (No. of places)</td>
<td>6</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Fish spawning ground (No. of places)</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Eco-corridor (No. of places)</td>
<td>6</td>
<td>6</td>
<td>6</td>
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<tr>
<td>Artificial marsh (No. of places)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fishway (No. of places)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>17</td>
<td>17</td>
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### Guunam Dam

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<th>Category</th>
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<th>2018</th>
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</thead>
<tbody>
<tr>
<td>Waterbird habitat (No. of places)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fish spawning ground (No. of places)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Eco-corridor (No. of places)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Artificial marsh (No. of places)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fishway (No. of places)</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>1</td>
<td>1</td>
<td>1</td>
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</tbody>
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### Hantam Dam

<table>
<thead>
<tr>
<th>Category</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
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</thead>
<tbody>
<tr>
<td>Waterbird habitat (No. of places)</td>
<td>12</td>
<td>12</td>
<td>12</td>
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<tr>
<td>Fish spawning ground (No. of places)</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Eco-corridor (No. of places)</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Artificial marsh (No. of places)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fishway (No. of places)</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>20</td>
<td>20</td>
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### Gimcheon Buhak Dam

<table>
<thead>
<tr>
<th>Category</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waterbird habitat (No. of places)</td>
<td>24</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Fish spawning ground (No. of places)</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Eco-corridor (No. of places)</td>
<td>45</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td>Artificial marsh (No. of places)</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Fishway (No. of places)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>77</td>
<td>77</td>
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### Songdak Dam

<table>
<thead>
<tr>
<th>Category</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waterbird habitat (No. of places)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fish spawning ground (No. of places)</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Eco-corridor (No. of places)</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Artificial marsh (No. of places)</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Fishway (No. of places)</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td>12</td>
<td>12</td>
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</table>

### Yonnj Dam

<table>
<thead>
<tr>
<th>Category</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waterbird habitat (No. of places)</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Fish spawning ground (No. of places)</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Eco-corridor (No. of places)</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Artificial marsh (No. of places)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fishway (No. of places)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>13</td>
<td>13</td>
<td>13</td>
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</tbody>
</table>

### Bohyunam Dam

### Major Achievements in Water Recycling

<table>
<thead>
<tr>
<th>Category</th>
<th>Standard</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOD (mg/L)</td>
<td>(average)</td>
<td>2.3</td>
<td>2.6</td>
<td>2.8</td>
</tr>
<tr>
<td>SS (mg/L)</td>
<td>(average)</td>
<td>3.1</td>
<td>3.8</td>
<td>4.1</td>
</tr>
</tbody>
</table>

### Major Achievements in Water Quality Improvement Activities

<table>
<thead>
<tr>
<th>Category</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pollution source (No. of places)</td>
<td>374</td>
<td>360</td>
<td>300</td>
</tr>
<tr>
<td>Improvement action (No. of places)</td>
<td>370</td>
<td>348</td>
<td>286</td>
</tr>
<tr>
<td>Action rate (%)</td>
<td>98.9</td>
<td>96.7</td>
<td>95.3</td>
</tr>
</tbody>
</table>

### Major Achievements in Water Quality Improvement

<table>
<thead>
<tr>
<th>Category</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water purification plants (Quality of effluents)</td>
<td>BOD(㎎/ℓ)</td>
<td>1.9</td>
<td>2.2</td>
</tr>
<tr>
<td>COD(㎎/ℓ)</td>
<td>3.9</td>
<td>4.3</td>
<td>5.0</td>
</tr>
<tr>
<td>SS(㎎/ℓ)</td>
<td>2.0</td>
<td>2.2</td>
<td>2.3</td>
</tr>
<tr>
<td>ROO(㎎/ℓ)</td>
<td>5.9</td>
<td>5.4</td>
<td>6.0</td>
</tr>
<tr>
<td>SS(㎎/ℓ)</td>
<td>3.6</td>
<td>5.3</td>
<td>4.9</td>
</tr>
</tbody>
</table>

### Green Purchase Performance

- Total amount spent (KRW in millions): 4,625
- Green purchase amount (KRW in millions): 2,821
- Green purchase ratio (%): 58.2%

### Social performance | Executive Related Performances

#### Status of Executives

<table>
<thead>
<tr>
<th>Category</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>4,177</td>
<td>4,334</td>
</tr>
<tr>
<td>Female</td>
<td>671</td>
<td>13.8%</td>
<td>757</td>
</tr>
<tr>
<td>Age</td>
<td>714</td>
<td>14.7%</td>
<td>822</td>
</tr>
<tr>
<td>30s to 40s</td>
<td>2,780</td>
<td>57.4%</td>
<td>2,821</td>
</tr>
<tr>
<td>50s and over</td>
<td>1,354</td>
<td>27.9%</td>
<td>1,448</td>
</tr>
</tbody>
</table>

#### Current No. of employees

<table>
<thead>
<tr>
<th>Category</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>4,944</td>
<td>5,091</td>
<td>5,203</td>
</tr>
<tr>
<td>Fixed number</td>
<td>3,956</td>
<td>3,956</td>
<td>3,953</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>22</td>
<td>27</td>
</tr>
<tr>
<td>Female</td>
<td>90</td>
<td>112</td>
<td>99</td>
</tr>
<tr>
<td>Age</td>
<td>7</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>30s to 40s</td>
<td>7</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>50s and over</td>
<td>1,024</td>
<td>1,024</td>
<td>1,024</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>509</td>
<td>576</td>
</tr>
<tr>
<td>Female</td>
<td>317</td>
<td>340</td>
<td>345</td>
</tr>
<tr>
<td>Operating</td>
<td>20s and under</td>
<td>479</td>
<td>441</td>
</tr>
<tr>
<td>30s to 40s</td>
<td>2,323</td>
<td>2,377</td>
<td>2,248</td>
</tr>
<tr>
<td>50s and over</td>
<td>1,024</td>
<td>1,037</td>
<td>1,354</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>509</td>
<td>576</td>
</tr>
<tr>
<td>Female</td>
<td>317</td>
<td>340</td>
<td>345</td>
</tr>
<tr>
<td>Professional</td>
<td>20s and under</td>
<td>22</td>
<td>19</td>
</tr>
<tr>
<td>30s to 40s</td>
<td>127</td>
<td>140</td>
<td>133</td>
</tr>
<tr>
<td>50s and over</td>
<td>63</td>
<td>56</td>
<td>72</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>170</td>
<td>171</td>
</tr>
<tr>
<td>Female</td>
<td>22</td>
<td>25</td>
<td>31</td>
</tr>
<tr>
<td>Special</td>
<td>20s and under</td>
<td>110</td>
<td>11</td>
</tr>
<tr>
<td>30s to 40s</td>
<td>214</td>
<td>248</td>
<td>307</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>234</td>
<td>285</td>
</tr>
<tr>
<td>Female</td>
<td>90</td>
<td>28</td>
<td>2</td>
</tr>
</tbody>
</table>

#### Green Purchase Performance

- Total amount spent (KRW in millions): 4,625
- Green purchase amount (KRW in millions): 2,821
- Green purchase ratio (%): 58.2%
### Turnover Status (Unit : %, people)

<table>
<thead>
<tr>
<th>Category</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>1.1</td>
<td>1.1</td>
<td>1.1</td>
</tr>
<tr>
<td>Male</td>
<td>2.0</td>
<td>2.6</td>
<td>2.0</td>
</tr>
<tr>
<td>Female</td>
<td>0.2</td>
<td>0.3</td>
<td>0.2</td>
</tr>
</tbody>
</table>

### Parental Leave Return Rate

<table>
<thead>
<tr>
<th>Category</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>62</td>
<td>60</td>
<td>75</td>
</tr>
<tr>
<td>Male</td>
<td>63</td>
<td>63</td>
<td>73</td>
</tr>
<tr>
<td>Female</td>
<td>62</td>
<td>59</td>
<td>53</td>
</tr>
</tbody>
</table>

### Record of Grievance Settlements

- **2016**: 29
- **2017**: 38
- **2018**: 35

### Status of Flexible Working

<table>
<thead>
<tr>
<th>Category</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time selective job system</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recruitment (Number of people)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conversion (Number of people)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staggered office hours</td>
<td>1,828</td>
<td>1,903</td>
<td>2,477</td>
</tr>
<tr>
<td>Flexible work system</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexible work system</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staggered office hours</td>
<td>0</td>
<td>0</td>
<td>595</td>
</tr>
<tr>
<td>Permanent work schedule</td>
<td>14</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>Remote work system</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At-home work</td>
<td>0</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>Smartwork</td>
<td>6</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

### Non-regular Employment

<table>
<thead>
<tr>
<th>Category</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of people</td>
<td>360.81</td>
<td>6.92</td>
<td>161.63</td>
</tr>
<tr>
<td>Type</td>
<td>Ratio (%)</td>
<td></td>
<td>Ratio (%)</td>
</tr>
<tr>
<td>Short-term employees</td>
<td>343</td>
<td>6.58</td>
<td>153</td>
</tr>
<tr>
<td>Part-time employees</td>
<td>17.81</td>
<td>0.34</td>
<td>8.63</td>
</tr>
</tbody>
</table>

### Employment of Minority Workforce

<table>
<thead>
<tr>
<th>Category</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total No. of new recruits</td>
<td>309.75</td>
<td>6.39</td>
<td>107.5</td>
</tr>
<tr>
<td>Type</td>
<td>Ratio (%)</td>
<td></td>
<td>Ratio (%)</td>
</tr>
<tr>
<td>Selective working hours [people]</td>
<td>13</td>
<td>0.27</td>
<td>13</td>
</tr>
<tr>
<td>Women</td>
<td></td>
<td></td>
<td>87.25</td>
</tr>
<tr>
<td>Disabled</td>
<td></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Non-capital area talents</td>
<td>157.25</td>
<td>3.24</td>
<td>171.5</td>
</tr>
<tr>
<td>High-school graduates</td>
<td>62.5</td>
<td>1.29</td>
<td>57</td>
</tr>
</tbody>
</table>
APPENDIX

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

<table>
<thead>
<tr>
<th>Gender</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male (hours)</td>
<td>2,876</td>
<td>2,880</td>
<td>2,931</td>
</tr>
<tr>
<td>Female (hours)</td>
<td>2,704</td>
<td>2,690</td>
<td>2,721</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Employment type</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executives</td>
<td>2,193</td>
<td>2,193</td>
<td>2,193</td>
</tr>
<tr>
<td>General</td>
<td>1,950</td>
<td>1,950</td>
<td>1,950</td>
</tr>
<tr>
<td>Special</td>
<td>83</td>
<td>83</td>
<td>83</td>
</tr>
</tbody>
</table>

Major Achievements of Workplace Safety

<table>
<thead>
<tr>
<th>Category</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel (people)</td>
<td>Ratio (%)</td>
<td>Personnel (people)</td>
<td>Ratio (%)</td>
</tr>
<tr>
<td>Industrial accident rate</td>
<td>12</td>
<td>0.25</td>
<td>9</td>
</tr>
<tr>
<td>Disease prevalence</td>
<td>457</td>
<td>8.80</td>
<td>592</td>
</tr>
</tbody>
</table>

Social Contributions Related to Major Achievements

Customer related performance

Communication with Customers

Customer Satisfaction

Community performance
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 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 KWR 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 following.

- 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
    - Effluents and Waste : 306-2, 306-3
    - Emissions : 305-1, 305-2, 305-3, 305-4, 305-6, 305-7
    - 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 : 407-2
    - 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.
  - 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 inadequately 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
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 develop partnerships with labor and management based on mutual trust and harmony, promoting our mutual prosperity.

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.

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.
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:

**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.  

**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.  

**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.  

**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**

K-water’s efforts have 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 Korean representative public water company, promises to strive to align 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 deterioration of water quality, and enhancing the water quality and water ecology.  

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 cleanliness 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 systems 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 robust as a public company for all citizens through our innovations to provide greater benefits and make a happier world with water.

March 20th, 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

- **1975**
  - Korean Electric Association, International Contractors Association of Korea

- **1993**
  - Korean 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**
  - Engineering & Consulting Association

- **2006**
  - Ethical Management Forum, River Association, Korea Society for Environmental Analysis

- **2007**
  - 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**

- **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

- **April 2008**
  - Knowledge Management Innovation Grand Prize from Government (Ministry of Knowledge Economy and Mass Business Newspaper)

- **Oct. 2008**
  - National and Local Government Award (Korea Journal of Excellent Services), Sustainability Management Top Award (Ministry of Knowledge Economy and Korea Chamber of Commerce and Industry), 2008 Korea Excellence Company Award (Ministry of Environment), Korean Most Admired Business Enterprise (Korea Times)

- **Jan. 2009**
  - Carbon Neutral Management Award (Ministry of Environment), Korea Ministry of Knowledge Economy and the Ministry of Environment and Water Resources

- **Oct. 2009**
  - National Environment Award (Ministry of Environment), Ministry of Environment Award, Green Environment Award, Ministry of Environment (Korea Times)

- **Dec. 2010**
  - National Green Technology, Gold Award from Korea Ministry of Knowledge Economy and Korea Ministry of Education

- **Jul. 2011**
  - National Digital Green Management Award (Ministry of Knowledge Economy and Ministry of Environment), Eco-Friendly Technology Award at More People in Korea Ministry of Environment

- **Jan. 2012**
  - First Korean public company to be awarded Excellent Smart Work Agency Award (Ministry of Public Administration and Security)

- **Feb. 2012**
  - World Adm. Company in Korea (KMAC)

- **Jun. 2012**
  - Knowledge Management Innovation Grand Prize from Government, National Local Government Award (Ministry of Knowledge Economy), Korea Ministry of Environment, Korea Ministry of Environmental Management

- **July 2012**
  - National Digital Innovation Award/Grand Prix in the Public Sector (Ministry of Knowledge Economy)

- **Sep. 2012**
  - Korean Digital Government Award/Excellence in e-government (Korea Digital Government Management Administration of Korea)

- **Dec. 2012**
  - Family-Friendly, Entrepreneur Ministry of Gender Equality and Family, Selected as one of the 201 Best Companies in Korea for SMEs, Korean Most Admired Business Enterprise (Korea Times)

- **July 2014**
  - National Digital Green Management Award (Ministry of Knowledge Economy and Ministry of Environment)

- **Jul. 2017**
  - Korea Management Innovation Grand Prize in Public Service (Ministry of Knowledge Economy and Ministry of Environment)

- **Aug. 2017**
  - National Environment Award, Top Prize in Water Business Assessment (Ministry of Environment)

- **Dec. 2017**
  - National Innovation Award, Most Admired Company in Korea (KMAC), National Innovation Award, Global Environment Award for the 30th consecutive year (Hall of Fame, Korea Times)

- **Feb. 2018**
  - Ministry's Commendation in recognition of contribution to the development of munisipalization and measurement (Ministry of Environment)

- **Oct. 2018**
  - Ministry's Commendation in recognition of contribution to the development of munisipalization and measurement (Ministry of Environment)

- **Nov. 2018**
  - National Environment Grand Award (Ministry of Environment), Asian Most Admired Knowledge Enterprise (Korea Times)

- **Dec. 2018**
  - Asia Pacific Stevie Award Silver Prize in Corporate Communication

- **July 2019**
  - National Sustainability Management Award in Social Contribution (Ministry of Health and Welfare)

- **Nov. 2019**
  - Korea Management Innovation Grand Prize in Public Service (Ministry of Knowledge Economy and Ministry of Environment)

- **Dec. 2019**
  - National Environment Grand Award (Ministry of Environment), Asian Most Admired Knowledge Enterprise (Korea Times)

- **Feb. 2020**
  - National Environment Grand Award (Ministry of Environment), Asian Most Admired Knowledge Enterprise (Korea Times)

- **Oct. 2020**
  - Ministry's Commendation in recognition of contribution to the development of munisipalization and measurement (Ministry of Environment)

- **Nov. 2020**
  - National Environment Grand Award (Ministry of Environment), Asian Most Admired Knowledge Enterprise (Korea Times)

- **Dec. 2020**
  - National Environment Grand Award (Ministry of Environment), Asian Most Admired Knowledge Enterprise (Korea Times)

- **Feb. 2021**
  - National Environment Grand Award (Ministry of Environment), Asian Most Admired Knowledge Enterprise (Korea Times)

- **May 2021**
  - National Environment Grand Award (Ministry of Environment), Asian Most Admired Knowledge Enterprise (Korea Times)

- **Dec. 2021**
  - National Environment Grand Award (Ministry of Environment), Asian Most Admired Knowledge Enterprise (Korea Times)

- **Jan. 2022**
  - National Environment Grand Award (Ministry of Environment), Asian Most Admired Knowledge Enterprise (Korea Times)

- **May 2022**
  - National Environment Grand Award (Ministry of Environment), Asian Most Admired Knowledge Enterprise (Korea Times)

- **Dec. 2022**
  - National Environment Grand Award (Ministry of Environment), Asian Most Admired Knowledge Enterprise (Korea Times)

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- **May 2025**
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- **Dec. 2025**
  - National Environment Grand Award (Ministry of Environment), Asian Most Admired Knowledge Enterprise (Korea Times)
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
   - Happy Korea We Make Together
   - Water Welfare for All the People
   - Others

5. Which section requires more supplementing information? (Multiple answers are allowed)
   - Power that makes the world flow, K-water
   - Happy Korea We Make Together
   - Water Welfare for All the People
   - 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
     - Very Satisfied
     - Satisfied
     - Neither Satisfied nor Unsatisfied
     - Unsatisfied
     - Very Unsatisfied
   - Accuracy of information
     - Very Satisfied
     - Satisfied
     - Neither Satisfied nor Unsatisfied
     - Unsatisfied
     - Very Unsatisfied
   - Quantity of information
     - Very Satisfied
     - Satisfied
     - Neither Satisfied nor Unsatisfied
     - Unsatisfied
     - Very Unsatisfied
   - Design
     - Very Satisfied
     - Satisfied
     - Neither Satisfied nor Unsatisfied
     - Unsatisfied
     - Very Unsatisfied

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

Send to Management & Innovation Service Department
Corporate Sustainability Management Team, K-water, 200, Sintanjin-ro, Daejeon 34350, Republic of Korea
Providing a brighter, happier, and more prosperous future with water

Publication date  November 2019
Published by  Management & Innovation Service Department Corporate Sustainability Management Team, K-water, 200, Sintanjin-ro, Daedeok-gu, Daejeon
www.kwater.or.kr
Production agency  Design Erum Co., Ltd.
82-32-891-3040