



K-water 2012 Sustainability Report



**Publication Objective** By providing clean water resources on a stable basis, K-water has contributed to developing the welfare of the people. With this report, K-water will convey its sustainable business values which include economic profitability, environmental wholesomeness and corporate social responsibility, as well as its efforts to implement them and resulting performance in a transparent way.

**Report Publication** The "2012 Sustainability Report" is the 8th report of published. The Report is published every year, encompassing K-water's sustainable management strategies, activities and performance, and future plans. The Report summarizes K-water's economic performance, cenvironmental soundness and social responsibility. The previous Report was published in August, 2011.

**Reporting Principles** This Report was prepared based on GRI's O Sustainability Reporting Guidelines (G3.1). More details of the GRI Index N can be found within "GRI Report Index" (pages 96~99).

Target Readers This Report was prepared for all stake holders such as customers, local communities, government, cooperative firms, executives & employees, and non-governmental organizations (NGO) that are directly or indirectly influenced by K-water's management activities.

**Reporting Period** The reporting period is from January 1 to December 31, 2011. Qualitative performance up until August 2012 is partially covered in the Report, while the quantitative performance includes 4 years worth of data from 2008 to 2011. K-water's fiscal year is from January 1 to December 31.

Scope of Report This Report covers K-water's sustainable management status and performance of its head office, 8 regional headquarters, 24 domestic worksites, and overseas operations (14 projects in 9 countries). Nov. 2011 Since K-water's overseas operations are project-based and not worksites, only their business performances are reflected in the Report.

Changes during the Reporting Period there were no major changes in terms of size, structure, standard year, or governance structure. However, there were changes in application standards for comparing certain data and calculation methods compared to that of the previous year.

**Report Assurance** The Independent Assurance Statement and selected sentences of the Report was drafted by Samil PwC to enhance the credibility of the Report. The assurance statement is included at the page from 100 to 101.

Additional Information This Report can also be viewed on K-water's homepage (www.kwater.or.kr). for more information on K-water's sustainable management activities, please contact Performance Management Team of Performace Management Department of K-water (Tel: +82-42-629-2362, Fax: +82-42-629-2399).

The Applicable Level of GRI G3.1 Guidelines This is to disclose that K-water's Sustainable Management Report fully satisfies the requirements of 'A+' standards outlined in the GRI G3.1 Guideline. An independent 3rd party assurance agency, Samil PwC has verified that this Report is compliant with 'A+' standards of the GRI G3.1 Guideline.

#### Awards & Accomplishments

- Apr. 2008 Award for Korea's Digital Management Innovation (Ministry of Knowledge Economy, Maeil Economic Daily Oct. 2008 Grand Prize for Social Contribution (The Korea Journalist Forum) Oct. 2008 The Best Sustainable Management Award (Ministry of Knowledge and Economy, Korea Chamber of Commerce and Industry) Oct. 2008 2008 Korea Environment-friendly Award (Ministry of Environment) Oct. 2008 Asia Most Admired Knowledge Enterprise Award (Teleos/UK) Jan 2009 The Grand Prize for Sustainable and Creative Management [Environmental Management] (Ministry of Knowledge Economy, UN Global Compact) Oct. 2009 Low Carbon Green Growth Excellence Company Award (Presidential Committee on Green Growth, Ministry of Environment) New & Renewable Energy Prime Minister Grand Prize [Ministry of Knowledge Economy] Oct. 2009 Asia Most Admired Knowledge Enterprise Award (Teleos/UK) Oct. 2009 Oct. 2010 Asia Most Admired Knowledge Enterprise Award (Teleos/UK) Nov. 2010 National Grand Award for Green Technology (Ministry of Knowledge Economy and Ministry of Education, Science and Technology) May. 2011 Prime Minister Commendation for Excellence in Disaster Management Assessment for Public Corporations [Ministry of Public Administration and Security] 2011 Grand Award for Green Management in Korea Jun. 2011 (Ministry of Knowledge Economy and Ministry of Education, Science and Technology) Jun. 2011 Grand Prize for the Eco-STAR Water Distribution Network(Ministry of Environment) Oct. 2011 The President's Commendation for Low Carbon and Green Management as the first public company (Ministry of Environment) Oct. 2011 Asia Most Admired Knowledge Enterprise Award (Teleos/UK) Nov. 2011 2011 Award for the Best Company for Ethical Management (Ministry of Knowledge Economy) Nov. 2011 Award for the Best 100 Companies to Work for in Korea (GWP Korea) Nov. 2011 Certification of GMS as the first public company in Korea (Ministry of Knowledge Economy) The President's Commendation for Supporting SMEs for the Development of New Technologies (Ministry of Knowledge Economy) Grand Prize for a Public Institution for 2011 Korea IT Innovation (Ministry of Knowledge Economy) Nov. 2011 Nov. 2011 Grand Prize for Cooperation of High Quality Internaional Eduction for Developing Countries
- (WaterLinks) Jan. 2012 Award for Smart Work Organization as the frist public company
  - (Minstry of Public Administration and Security)
- Feb. 2012 Ranked at the First on the List of the Most Respected Companies in Korea [KMAC]

#### Membership Activities

- Nov. 1971 Korea National Committee on Large Dams
- Jan. 1976 Korea Electric Association
- Dec. 1985 Korea Energy Foundation
- Mar. 1997 Korea Electric Engineers Association
- May. 2001 Korea Power Exchange
- Sep. 2001 Korea New & Renewable Energy Association
- Jan. 2002 Korea Water and Wastewater Works Association
- Mar. 2004 Korean Association of Environment Impact Assessment
- Sep. 2004 Korea Business Council for Sustainable Development
- Oct. 2005 Korea Engineering and Consulting Association
- Jul. 2006 Business Ethics and Sustainable management for Top Performance (BEST) Forum
- Feb. 2007 UN Global Compact
- Feb. 2007 U-City Forum
- Mar. 2007 International Water Association (IWA)
- Mar. 2007 American Waterworks Association (AWWA), U-City Forum
- Jan. 2012 Korea Environmental Policy and Administration Society

#### **Overview of Company**

November 16, 1967

KRW 10.8449 trillion KRW 12.5809 trillion

KRW 23.4259 trillion

KRW 6.3257 trillion

industrial complexes

Business(14 projects in 9 countries)

P-Waters Co., Ltd. (Ownership 10%)

560 Sintanjin-ro, Deadeok-gu, Deajeon-si, Korea

complexes

4,200 people

#### Name

- Establishment • Equity Capital
- Total Debt Total Asset
- Sales

- Main Project
- Products & Services
- Number of Operations
- Number of Executives and Employees
- Composition of Investors
- Investment Companies

#### Head Office and 8 Regional Offices

0



Location of Head Office

## Sang Seon Yak Su (上善若水);

## The Highest Good is Like that of Water

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0

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- Lao-Tzu Within 〈Tao Te Ching〉

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Dear customers!

K-water is taking the lead in making the world more abundant and happier by enhancing the communication between nature and people through a new hope of waterway. I'd wholeheartedly like to thank our customers for supporting K-water, which makes the world more abundant and happier by water, and I am also glad to publish the 8th report about sustainable management activities and achievements of K-water.

K-water was established in 1967 as the only comprehensive water service corporation in Korea, and it is now operating and managing 16 multi-functional dams including Soyang Dam, and 39 water supply and sewerage systems across the nation including metropolitan areas. Over the last 50 years, it is taking the lead in improving the quality of people's lives by reliably supplying clean water and preventing damages from floods.

#### K-water is taking the lead in the global green growth.

The world's economic outlook is gloomy and the management environment at home and abroad is more difficult than ever. However, advanced countries are enhancing their green policies, as the OECD has declared green growth as their 'future core strategy' and European countries announced a road map for low carbon growth.

K-water has established its foundation for new sustainable growth by successfully implementing major national green new deal projects, such as the 4 Rivers Restoration Project and the Gyeong-in Ara waterway project, and started the construction project of eco-friendly cities including Songsan and Gumi, and has been leading green growth, which is a new global paradigm, by expanding the clean energy projects including the Sihwa Tidal Power Plant. Based on its achievements, the sales of K-water increased 11.9% in 2011 compared to the previous year, and the net profit during the term increased 106.4%.

#### K-water is supplying the best quality of water which everyone can trust and drink.

K-water has redoubled its efforts to improve the environment by increasing the investment rate for the environment by 48% compared to last year, in order to supply the best quality of water in an eco-friendly and stable way. By establishing the 'evaluation and rating system of water quality of water purification plants' based on IT and monitoring the management level on all water purification plants in the country and giving feedback about the result in real time, K-water acquired the 5-Star certification from the US Water Association, which guarantees the competency for managing water quality, as the first case in the world that the certification was issued for a region outside the Northern American regions.

Thanks to its efforts to supply the best quality of water, tap water produced by K-water was selected as one of the global top 10 tap waters for the two consecutive years from 2011 to 2012, competing excellent tap-waters from the U.S., and Canada in the International Water Tasting and Competition, and ranked the top on the survey of customer satisfaction for the six consecutive years since 2007.

#### K-water is achieving sustainable growth based on the best possible results.

K-water has been highly acknowledged for its economic, environmental and social achievements. K-water has been selected as an excellent organization with the A grade in the management performance evaluation for public organization of Korea for the four consecutive years, and it was selected as the best company for ethical management in 2011. Also, it received the Grand Award for green management in Korea and Asia Most Admired Knowledge Enterprise Award for four years in a row as the first company among public corporations in Korea. Last year, K-water announced its new management policy of as its new management in order to develop itself into a 'more influential K-water.' Moreover, K-water has enhanced its foundation as a global green company by acquiring the certification of green management system as the first public corporation in Korea.

#### K-water is opening a 'happy world by water' through global competition.

K-water has strived to advance the competency for water management and to enhance its global competitiveness through the improvement in the management efficiency with its creed that fostering global human resources and developing core technologies are the two main factors that will decide our future competitiveness. K-water is also actively pushing ahead with various overseas projects that serve as new growth engines for the future based on its advanced skills and experiences for water management. K-water is now conducting green projects with the size of about KRW 1.859 trillion in 15 countries. The ultimate goal of K-water is to make the world a better place where every citizen of the world, who suffers from water shortages and water damages, can limitlessly enjoy 'the benefits from clean water.' I'd like to ask you to keep supporting K-water for its passionate and creative efforts and challenges for the future. Thank you.

2012. 8 President of K-water Kim, Kuen Ho

Kyentho (Curs

Water never stops not even for a moment. It moves ceaseless up and down, creates waves and pushes forward based on its strength. K-water, just like the water that never tires, strives to push our current visions and strategies into the future.



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  - Creative Innovation Management
  - The Key to Sustainable Growth, R&D

## **Forecast and Outlook**

K-water will faithfully carry out its role as an anchor that leads the sustainable development and the expansion abroad of the water industry.

## Added Difficulties of Water Resources Management by the Effect of Climate Change

Water is an important element which restricts the birth and prosperity of the human civilization. Ancient civilizations were built around rivers where people could secure water, and the industrialization and urbanization were successfully realized by the introduction of a water supply system including the water supply and sewerage system. The water management and water industry have recently emerged as important issues due to the climate change, which causes rapid changes in the water cycle, the continuous increase of the population, and rapid growth of megacities. In other words, massive floods and droughts caused by climate change and the increase of the population and the rapid growth of megacities have added difficulties to water resources management in terms of supply and demand respectively.

During the 20th century, global water withdrawals have increased faster than the population growth rate. While the population increased by 3.7 times, the water withdrawals have increased by 6.7 times.

The total water resources that human can use on earth have reached its limit. According to a report entitled "Charting Our Water Future" presented by the World Bank and McKinsey Consulting, the global demand for water will increase from 4,500km<sup>2</sup> in 2009 to 6,900km<sup>3</sup> in 2030.



Outlook for Water Shortage in 2030 (unit: 1 billion m<sup>3</sup>, 143 territories/regions)

The global demand for water exceeds 40% of the current water supply that can be reliably secured. Under the circumstance, it is expected that some areas will suffer from extreme water shortages. About one of the third of the world population will live in the areas where the water demand exceeds more than 50% of the water supply, and most of the population will be concentrated in the developing countries.

Due to the influence of climate change, water resources management has become more complex and uncertain. The conventional water management method will no longer guarantee the safety of water use, flood defense and ecological environment under climate change.

The international community is trying to innovate water management in order to fulfill its mission for protecting people's lives, industrial activities and ecological environment safely from floods, droughts and pollutions.

Moreover, the needs for water by the people are more than just securing drinking water and handling sewage. Now, the people now want to be more prosperous by water, safe from disasters caused by water, and obtain aesthetic satisfaction from water. The water market has been rapidly expanded to meet the various needs for water.

#### Rapid Growth of the Global Water Market - A Big Opportunity of the Water Industry



<sup>\*</sup> Source: Global Water Market 2010, Global Water Intelligence

<sup>\*</sup> Source: 2030 Water Resources Group, 2009

According to a UK specialized water research institute, Global Water Intelligence, it is predicted that the size of water industry centered on the water supply and sewerage system will increase from USD 482.8 billion in 2010 to USD 865 billion in 2025. The size of the water industry is bigger than the semiconductor industry(USD 280 billion) and the shipbuilding industry(USD 250 billion).

According to the prediction by the OECD on the size of the combined water management market as of 2025, the investment demand for the infrastructure of the water industry will be USD 1.037 trillion which exceeds that of the electricity industry(USD 241 billion) and the communication industry(USD 171 billion). Booz Allen Hamilton also predicts that the annual average investment demand for the infrastructure of the water industry will be USD 870 billion by 2030, which largely exceeds USD 360 billion of that of the electricity industry.

## Trend of the Global Water Industry - Integration, Specialization and Technology Innovation

Three mega trends in the global water industry are integration, specialization and technology innovation.

First, integration of the water industry is to realize economies of scale, which are materialized as integrated operations, integrated or cooperated operators based on M&A, integrated management of the water supply and sewerage system in the area of the water supply and sewerage system, in which the private sector actively participates in, and integrated watershed management in the area of water resources development and management. Moreover, it is a trend that an operator integrates and manages both the water supply and the sewerage system in the same area based on economies of scope. If operations of the water supply and the sewerage system is classified by a type of contract, about 29.6% out of the entire contracts is the contract for integrated management of water supply and sewerage system. Also, the integrated management of water has been developing into a new growth market due to climate change.

Secondly, specialization in the water industry has been materialized as changes in the business management entities from local governments to companies specialized in water, for example, the rapid growth of multinational water companies, such as Veolia and Suez, as well as largesized water specialized public companies, such as SABESP of Brazil and ACEA of Rome, and appearance of local water companies, such as China Water Industry Group. However, water can be considerably political goods, as you can see in the failures in the privatization of the water industry of Manila of the Philippines and Buenos Aires of Argentina. In the situation, central and local governments of each country are trying to exercise significant control over water. The U.K., which chose the most radical model of the privatization of the water industry, strictly reset the criteria of water rate every five years through OFWAT, a Water Services Regulation Authority, thoroughly controls over M&A between water companies in order to maintain the availability of performance comparison between operators. In the case of Israel and Singapore, they foster various industries related to water, such as manufacturing, components and

materials, by utilizing state-own companies.

Thirdly, technology innovation in the water industry is implemented by the "Smart" supply of water by using the innovative technology of the water treatment based on membranes and IT. The current water treatment is mainly conducted by the physicochemical method of processing flocculation, precipitation and filtration in the water supply, and by the biochemical method of using microbes in the sewerage system. Recently, various membranes, such as MF, UF, NF and RO, are developed and widely used in supplying water, treating sewerage and waste water, and desalinating seawater, replacing the conventional water treatment methods. Moreover, the infrastructure of the water industry has become "Smart" based on IT. The "Smart" infrastructure is to make the most of water resources, maintain high water quality, and technologically support the optimal integrated water resources management , which deals with natural disasters, such as floods and droughts, through the bilateral exchange of information between consumers and suppliers.

## Role of K-water for Developing the Water Industry and its Advance into the Global Market

The Korean government selected "green growth" as a new national agenda for 2008. The aims of the green growth policy are to prepare for counter strategies against climate change on the national level, and to help developing countries better adjust to climate change and facilitate the sustainable development by disseminating Korea's experience of eco-friendly economic growth. In order to pursue the policy of green growth, one of the most important resources is water. Accordingly, the issues related to water, which the international community is now facing, is one of the most urgent tasks to be addressed.

The Korean government has increased its R&D investment in new technologies for the water industry, and has implemented the 4 Rivers Restoration Project, a major integrated water management project to respond to climate change. In particular, with the report of the water industry growth by the Presidential Committee on Green Growth in Oct. 2010 as the turning point, the efforts of government-wide levels have been focused on expanding the water industry to advance to overseas. K-water plans to do its best in maintaining and strengthening the national safety and competitiveness through stable water supply, disaster prevention, maintenance and restoration of ecology and environment, and others under the ever-complicated and uncertain water management condition caused by climate changes. Furthermore, with a water management institution equipped with global scale technologies, it plans to duly undertake the anchor role for advancing the water industry by utilizing its strength as a national public enterprise that encompasses water resources and water service fields. On the basis of accumulated technologies and knowhow, K-water is to contribute to the sustainable growth and advancement of our country's water industry through the advancement into overseas markets along with private construction companies, development of SMEs and venture technology companies, and expansion of low carbon green business.

## **G2** Wave Vision and Strategy

In 2012, K-water will emerge as the world's most comprehensive water service provider through Green to Great based Growth.

#### **Revision and Supplementation of Visions and Strategies**

To achieve visions that conform to establishment objectives, K-water has proposed the 'Green vision 2020' image of the future and established mid to long-term management strategy plans that develops new growth strategies following the 4 Rivers Restoration Project and Gyeong-in Ara Waterway Project. In order to actively respond to changing internal and external sentiments, K-water has established 9 implementation strategies and 22 practical tasks of Green to Great K-water. Through **Green** strategies, K-water will realize its vision with the sustainable development of water infrastructure and focused cultivation of new growth engine businesses.

#### Vision

K-water has established its vision as the 'world best comprehensive water services provider' that faithfully undertakes its establishment objectives, fulfills its social responsibilities and is equipped with global competitiveness.

#### K-water New Management 929 wave

To become a respected Great corporation through Green growth, K-water strives to become the best in the world in the following five areas.

Guard: A world-class company with ZERO accidents

Renovation: An innovation leader based on change

Environment: An eco-friendly company that creates green values

**Ability:** A company that cultivates global best human resources **Technology:** A technological company that leads future markets

#### **3 Key Strategic Directions**

The three key strategies for sustainable management are realization of future growth, strengthening of onsite management and acquisition of global competitiveness. In order to achieve such visions efficiently, K-water pursues Focused implementation of strategies and aligned organization activities.

**Realization of Future Growth:** Acquire foundations for continued growth through active responses against future risks, including climate change, water industry, and corporate restructuring

#### |K-water Strategic Management System|



## Strengthening of Onsite Management: An organization flexible to change based on advances in customer and onsite centered functions and strengthened risk management capabilities

Acquisition of Global Competitiveness: Strengthening of global capabilities, such as cultivating customized personnel and acquisition of future technologies as a means to achieve both quantitative and qualitative growth

#### Implementation of Sustainable Management System

The sustainable management pursued by K-water increases economic profitability as well as environmental stability. It is our aim to faithfully perform our social responsibilities as a public corporations so that our citizens in all areas of our nation can be supplied with clean water. Based on the foundations of economic efficiency, it is our goal to perform green management and socially-responsible management in a balanced way in order to create new corporate values and ultimately be respected as a 'Respected Corporation'. Through systematic management, including setting of core performances and targets [KPI] and linking with BSC based performance management, K-water has achieved 103% of performances compared to 2011 targets. Based on such efforts for sustainable management, K-water was against ranked within the top class in continuation from last year within the 'Sustainability Index' Assessment, which assesses efforts by a corporation for the economy, environment and society, conducted by Kyunghyang Newspaper.

#### |K-water Mid-to-Long Term Core Goals for Sustainable Management|



#### Implementation of Sustainable Management Organization

K-water operates four divisions and 25 departments at the head office, with 8 local headquarters and 24 nationwide management offices(construction offices). Under the direction of the vice president, the Sustainable Management Implementation Organization is in charge of the overall sustainable management, providing stake holders with related information through the Sustainability Report every year. At the same time, K-water operates advisory committees and councils to collect diverse opinions and suggestions regarding the economy, environment and society.

#### Sustainable Creative Management

K-water will modify and complement its middle and long term strategic management plans to achieve new growth engines in which the new management environment is reflected. Through these efforts, K-water will further strengthen its public service functions to improve the public welfare by preventing natural disasters that can be caused by water due to the worsening climate change and by stably securing water resources. Moreover, K-water will intensively promote new growth engine projects, such as waterfront projects, green energy projects and overseas projects through the selection and concentration strategy, while do it best for the sustainable development of the water infrastructure, such as unifying the management of dams in river basins, producing high-quality Tap Water, and maintaining water resources and waterworks.

#### Sustainable Green Management

K-water has declared its vision of the environmental management internally and externally, and continuously pursued the eco-friendly management since 2002, so that K-water has converted its management structure that is in harmony with the economic feasibility and the environment. Also, K-water established the Environmental Performance Evaluation(EPE) system to systematically manage the environmental effects caused by business activities and the environmental management performance, and it manages the system as an indicator for major achievements of the middle and long term management plan by setting up the EPE index to continuously improve the performance. K-water's environment management has been continuously strengthened to prevent environmental risks and to create new environmental values. such as Clean Development Mechanism(CDM), based on the legal management level of the environmental performance. K-water publishes the Sustainable Management Report by collecting the results. Through the Report, communications with stake holders have been enhanced, while greater transparency has been achieved in terms of access to information provided. K-water initiatively established a "Master Plan for Dealing with

#### |Sustainable Management Organization| CE0 Board of Directors Auditor General Management Services Advisory Organization Senior Executive Department K-water Management Advisory Vice President council Customer Participation Committee Water Environment, Heal Supervises Sustainable Advisory committee Management Quality of Tap Water Council Dam construction Local councils



#### | Green Management Implementation Strategies |





Climate Change" and has been actively cooperating with greenhouse gas reduction policies of the international community and the Korean government. As part of such efforts, K-water has been transformed into an effective carbon management system by setting up its internal carbon reduction targets and optimizing climate change adjustment system to prevent floods and droughts and preserve the aguatic ecosystem and biodiversity. Greater emphasis has also been placed on carrying-out its responsibilities in the environment sector by strengthening reservoir water quality and river management, creating Environmentally-friendly spaces at the areas adjacent to dams, and securing environmental soundness for the Green New Deal initiative. With the enactment of the Frame Act of Low Carbon Green Growth in 2010, the energy management, greenhouse gas management and social responsibility has been expanded and converted from the existing environment management system to the green management system, and accordingly, K-water has been undertaking the green management system certification as newly introduced in 2011. In addition, K-water is committed to strengthen its global green competitiveness through realizing the low carbon business premises with the certification for the carbon reduction label system in all business premises, designation for green enterprises and others.

#### Sustainable Open Management

Customers' demands for management transparency of public enterprises and environment-oriented green management have been increasing, so an open communication with customers has becoming an important issue. K-water's objective is to create a socially sustainable open management by establishing a win-win partnership with each stakeholder to fulfill its corporate social responsibilities. The social sustainable management strategy is selected and operated as one of the strategic tasks in connection with strengthening its social responsibility. Moreover, K-water strives to improve its competitiveness as well as enhance its partnership for venturing into the overseas water market by pursuing one of the national agendas of the coexistence and co-prosperity with small-medium sized enterprises, and the shared growth by supporting SMEs.

#### K-water Socially Responsible Management Directions





#### |Socially Responsible Management Measurement Index|

Classification	Performance			Target	Nata	
Classification	2009	2010	2011	2015	Note	
Public-Service Satisfaction Index (PCSI)	93.7 points	97.1 points	96.1 points	Highest Ranking (Over 90 points)	Ministry of Strategy and Finance	
Corporation's Integrity (Audit & Inspection Dept.)	Excellent	Excellent	Excellent	Excellent	Anti-corruption & Civil Rights Commission	
Social Contribution Index	83	84	86	90	K-water	
Core Personnel Index (Personnel Division)	-	-	37%	41%	K-water	

\* Social Contribution Index: Participation Level x 0.3 + Activity Rate x 0.4 + Employee Fundraising Participation x 0.3 \* Core Personnel Index: (Top Experts x 1.5 + Experts 1.2 + Semi-Experts x1) ÷ Total Personnel

## **Business Structure and Implementation Strategies**

K-water will continue achieving sustainable growth through continued pursuit of foundational businesses, such as water resources and waterworks, in addition to the cultivation of new growth engines, including energy and overseas projects.

#### Adjustment of Business Portfolio for Sustainable Growth

K-water has restructured strategic businesses by reflecting changing management conditions, including the utilization of water values through the 4 Rivers Restoration Project, and the Gyeong-in Ara Waterway Project, the establishment of energy business models in preparation of RPS (Renewable Portfolio Standards), and overseas exports based on accumulated capacities upon completing various national projects.

#### **Business Vision & Strategies**

K-water has been cultivating the water resources business, water supply business and waterfront business, green energy business and overseas businesses as its five strategic businesses. K-water has also reorganized its business visions and strategies to promote growth strategies that reflect the formation of new business areas in the aftermath of national projects, response to the restructured global water industry, re-establishment of K-water's green growth directions and secure financial stability.

The Water Resources business is focused on integrated management by region and strives for "Integrated Water Resources Management System to Counter Climate Change."

The Waterworks business pursues "the provision of a total waterworks service to lead the water industry" and has implemented integration of regional water and sewage systems and provided industrial water. The Water Front business strives for the "the creation of a Water Front space converging land and water" and has implemented the creation of Water Front spaces to increase available amenities around water front areas while spreading a leisure culture. The Green Energy business strives to "lead green energy use through converting and combining water and natural energies". This business domain has implemented small hydropower development, land and water based solar power generation, wind power generation, thermal difference generation and CDM businesses. For Overseas businesses, K-water pursues the "achievement of 50% of sales overseas" and has overseen increased investments and conducted nature-linked package businesses.

#### Water Resources Business

Damages caused by drought, flood and unusual temperatures have gradually increased alongside worsening climate change. In order to effectively respond to climate change, K-water has pursued the acquisition of abundant water supply through the 4 Rivers Restoration Project, the construction of eco-friendly green dams, and advances in the use of existing dams. The 4 Rivers Restoration Project scheduled for completion in 2012, has secured 1.3 billion m<sup>3</sup> of water annually and increases in flood adjusting volume by 920 million m<sup>3</sup>. The size performance improvement business and IT-based u-Dam safety construction have served to improve the stability of water resources facilities. For stability of dams during times of extreme flooding, the size performance improvement project is scheduled for completion for 10 dams by 2017.

K-water will also take the lead in disaster prevention by advancing ICT based maintenance and management systems. We will also environment improvement projects, including improved water landscapes within cities and rivers, increased amenities utilizing water front areas, and investigate new concepts in water management based on water resources surveys and information projects.

#### Waterworks Business

The paradigm and environment of the waterworks industry is shifting from increased water supply to improving customer services, water conflicts between regions (Gyeongnam & Busan areas and Gyeongbuk & Daegu areas) and participation by private corporations. Accordingly, K-water is pursuing the clean water supply an integrated water and sewage business





structure, and increased supply of value adding water. By achieving our goals, K-water aims to provide 17.71 million people with water by 2020 and achieve KRW 2.8 trillion in sales by 2020. For such to occur, K-water will supply high quality tap-water by securing a water flux of 18.874 million m<sup>3</sup>/ day, over 75% operation rate for multi-regional waterworks, enhancement of aged water purification plants, and the improvement of 649km of worn out pipes by 2020. K-water will respond to the water-sewage integration policy of the government and strengthen international competitiveness to realize the total water service by undertaking consignment projects for 19 regions and 96 local governments by 2020. K-water strives to be positioned atop of the future water market by acquiring core technologies to increase market participation. Through double-tracking of pipelines, strengthened emergency linkages, and periodic replacement of aging facilities, K-water will strive to stably supply water. Additionally, K-water will work hard to improve customer services by introducing advanced treatment facilities and improving facilities and services. Distribution systems, we will continue working to resolve shortages in limited supply areas and reduce costs based on improved operational efficiency.

#### Water Front Business

While there is an increased demand for waterfront areas following the spread the culture of recreation and leisure, there are not enough waterfront areas to meet the demand. With the enactment of the Special Act on the Utilization of Waterfront in December, 2010, it has become possible to systematically utilize various values of waterfront areas. Accordingly, K-water aims to create waterfront areas through a new high value and competitive business model that highlights the values of water.

First, K-water will focus on completing ongoing construction projects, including an industrial complex(extension of Gumi) and cutting-edge multifunctional cities (Sihwa MTV and Songsan GC). By integrating the water front environments of Sihwa Lake with tourism and leisure industries, we will increase the profitability of existing businesses. We will also push ahead with new profitable businesses using various tourist resources and leisure activities of waterfronts, including Suhyang 8 Beauty Spots, marinas and water leisure facilities of the Gyeongin Ara Waterway. We will also create a high-class waterway integrating green logistics by creating and optimizing a logistics complex of Ara Waterway and developing a hinterland of Incheon · Gimpo Terminal(2.05 million m²). Lastly, pursue regional economic development and regional growth by implementing the Busan Eco Delta City Project scheduled to commence from 2012.

#### **Green Energy Business**

The size of the renewable energy market is expected to grow to USD 1 trillion in 2020 and become a new Blue Ocean. And with the introduction of RPS (Renewable Portfolio Standards) from 2012, new business opportunities according to new markets (REC transactions) is also expected. K-water possesses abundant potential (89% out of 1,818MW) and is pursuing ways to increase supply by diversifying generation source with a focus on solar energy. K-water is pushing ahead with hypo power generation by 14 new facilities (7 facilities in 2011), such as the existing 24 facilities including Hapcheon Hydro Power Plant, and weirs of the four rivers including Gangcheon Weir, as well as 254MW tidal power generation at Siwha Tidal Power Plant. Also, K-water is pursuing various projects, such as wind power plants at Gyeongin Ara Waterway and Sihwa Bangameori, land and ocean solar power plants at 11 locations including Hapcheon Dam, and CDM project. In addition K-water is continuously developing new & renewable energy sources, such as air-conditioning system by thermal energy and wave-force generation.

#### **Overseas Business**

The size of the global water market is expected to grow by USD 1,000 trillion by 2025 while the scope of the market is continuing to increase. On the other hand, the domestic market is already saturated with water projects caused by a shift from new water system construction to service maintenance. In order to overcome such limitations, K-water is pushing ahead with new overseas projects based on the know hows that have accumulated through the Chao Phraya River Development Project in Thailand and the 4 Rivers Restoration Project. The business model has also shifted from the one focusing on ODA projects within developing countries to investment projects offering high profitability, as evidenced by the Patrind waterpower generation plant construction in Pakistan currently underway. Through such efforts, K-water will serve 40.15 million people for overseas services and achieve KRW 5.8 trillion in sales revenues in 2020. Additionally, in order to reduce risks that may occur alongside increased investments, K-water has organized a risk TF team while a risk management system is being operated from the pre-decision making stages and through the entire process. At the same time, K-water also strives to acquire financial stability organizing project financing procurement and regional funds.

#### |K-water Business Objectives|



## **Creative Innovation Management**

K-water is continuously applying systematic and scientific innovation techniques in order to achieve our vision of the world's best comprehensive water service provider.

#### Implementation Direction of K-water's Creative Innovations

K-water continues to actively promote creative innovations to secure global competitiveness despite the fast and ever-changing global business environment. K-water is doing whatever's possible to embody an innovativebased and active mentality for each employee by systematically operating the Communities of Practice (CoP), promoting knowledge management to provide concrete support to the work being carried-out on-site, and improving practices pertaining to the organizational culture based on the 3 core values, which includes purity, passion and creativity. This has resulted in our achieving a grade 6, the highest innovation level, within public organization innovation assessments.

## K-water's Proprietary Creative Innovation Activity Structure (K-sigma)

K-water's innovative practice structure is organically linked to the BSC, Creative Implementation CoP and knowledge management through its middle and long-term management strategies. The mid to long-term management strategies offer a core performance index required to achieve K-water's strategic objectives, and various activities are needed, such as the 6 Sigma, JOA(an internal Innovation tool), and Creative Implementation CoP of the Research CoP to achieve these strategies. These various creative innovation practices have been established as K-sigma, K-water's proprietary CoP implementation brand. Particularly, core performance index 'Corporate Sigma Standard' is measured through 'Innovation Mileage', a measurement of the performances of CoP, knowledge and proposal activities. Creative innovation activities are directly linked to management strategies while annual targets are defined and managed systematically.

At the same time, performance results gained through CoP activities under the K-sigma brand consists of knowledge management (KM) which is based on knowledge proposals, and a circulation structure that is shared by employees through organizational cultural activities.

\* K-sigma is an abbreviation of K-water sigma or Knowledge sigma

#### What is CoP?

CoP (Communities of Practice) is a gathering of employees that generates an outcome by improving the works as a result of discussing the common agenda for certain period and sharing the knowledge to accomplish strategy and realizing the corporate vision.



#### K-water Creative Innovation Directions



K-sigma JOA+ 6-Sigma Research CoP Customization of workout technique of GE Strategy implementation Resolve inveterate issues in Creation of Knowledge •Voluntary Learning to Exchange Problem-solving Techniques departments Method of managing changes Work-related Knowledge & through Actual & Statistical Methodologies through logic, discussion and Current Information •Top-Down Method for Coming-up Voluntary Improvement Activities experience if Required by Departments Onwith Tasks Autonomous implementation for improving the organization culture site

#### Strategy Implementation Structure for Achieving Visions/ Values



#### **Cases of Creative Innovation Activities**

#### ► Department and Leader-oriented Voluntary Innovation Activities

K-water is actively supporting department and leader-oriented voluntary innovation activities to incorporate creative innovation activities for employees. Led by regional department heads and regional executive directors, required tasks to create customer value are voluntarily selected and implemented. These creative innovation tasks contribute to achievement of visions by facilitating the implementation of its middle and long-term strategies and solving chronic problems in departments. In addition, heads of departments provide active support and conduct progress inspections by activity stage to improve execution.

Tasks are continuously evaluated in stages to enhance the performance of these tasks. Also, the results of the tasks are presented on an intermediate basis and presented to the entire corporation through the Creative Innovation Festival. Excellent case samples are selected, shared, and dispersed company-wide.

In addition, we provide various support, including classes by specialized instructors and consulting for effective execution of Department-oriented creative innovation activities.

#### ► Enhancing Creative Innovation Minds

Special lectures related to innovation, such as "JOA+Work Management Method" and "Cultivating a Mind of Innovative Leaders," enhance employees' creativity. Voluntary activities for improving the organizational culture are conducted that focus on core values of Purity, Passion and Creativity, which incorporate the CEO's management philosophy.

#### Establishing Open Knowledge Network and Volunteer Knowledge-based Activities

K-water is distributing expert knowledge through diverse networks with external water professional firms, cooperative firms and outside customers. Through the Waterpedia portal system that was established in 2007 and updated in 2012, K-water is sharing and distributing its knowledge in water technology not only internally but also with numerous industrial, academic and institutional sectors. The policy to embrace customer proposals is operated as part of knowledge management to utilize the diverse and creative ideas provided through diverse sources, such as general customers, cooperative firms, and management. Existing scattered work manuals are arranged and provided on the basis of 112 core work cases, and these manuals structure and operate the Wikityped management system to complete by the participation of employees. In addition, it is connected to the KMS system to enable the knowledge proposal submittal through blog and network facilitation between individuals and organizations through company blogs, and it adds the reply function for users on knowledge proposals to facilitate knowledge management.

#### **Creating Creative Innovation Performance**

While the number of knowledge and proposals has decreased from 5,411 in 2010 to 3,958 in 2011, K-water has achieved KRW 21.4 billion in related financial results through valuable innovation activities. Also, presentations for creative innovative achievements company wide are implemented annually while a magazine for creative innovation is published and distributed to share the performance of creative innovation activities. By joining the academic-Industrial cooperation consortium of the Knowledge Management Society and presenting excellent innovative cases at the Asian Knowledge Management Conference, K-water could externally spread its excellent innovation activities outside the corporation. As a result, K-water was the first public-service in Korea to be selected as the "Most Respected Knowledge Management Corporation" by Teleos, a UK institution, resulting

in K-water receiving the globally respected and prestigious "Asian MAKE (Most Admired Knowledge Enterprise)" award for four consecutive years.

Annual Financial Results | (Unit: KRW 100 million)







Received Asian MAKE



Creative Innovation Festival

## The Key to Sustainable Growth, R&D

K-water is not only developing technologies for efficient water management, but also pursuing technology innovation to present a vision for the future water management.



K-water established its technology goal for 2020 after evaluating its technology level in 2011. It set up a plan for improving its technology competitiveness to the level of advanced countries by investing a total of KRW 200 billion by 2020 by classifying the entire stages for each area of water supply, and waterworks & sewerage system and green technology into the take-off stage (from 2012 to 2015), and the maturity stage (from 2016 to 2020).

Also, K-water defined types of technologies, which represent its technological strategies, and reviewed implementation methods and resources distribution methods by type, and reflected them in "CoreTech 2020 : New K-water Technological Strategies."

**(Future Technologies)** Technologies that have the high potential as a core technology related the water industry, and can be deployed on a commercial scale in seven years, so are needed for new growth industries.

**(Core Technologies)** Technologies that are needed for improving the competitiveness of the existing businesses and the expansion of new business areas, if K-water intensively invests in them by assigning a budget and human resources needed for the next four to five years.

(Base Technologies) Technologies that need to keep for maintaining the existing businesses, and whose functions needs to be improved or advanced.



#### **R&D** Development Capabilities

Korea Water Institute(KWI), which researches and develops core technologies for K-water has employed 228 professional researchers, who have a master's degree or a doctor's degree, and implemented various researches, which can realize the commercialization of new technologies, such as low carbon environmental technologies, and new & renewable energies to counter climate change, centered on the area of water resources environment, the area of water infrastructure, the area of waterworks, sewerage system, the area of green technologies, the area of policies and economies, and the area of water analysis.



#### **R&D Infrastructure**

K-water operates a world-class waterworks and a sewage research & training center which has a technology research & training support institution, an internationally certified control facility in the first domestic water level measurement sector, and a flow control system that has the largest diameter in Korea at 800mm. In addition, it has a specialized institution for facilities safety examination that undertakes on-site surveys and safety examinations on the facilities, such as, repairing facilities, ports, bridges, tunnels and others as well as professional certification institution for quality tests.

The Water Quality Analysis Research Center, developed into the world's top analysis institution, has been annually expanding the items for testing the water quality since 2002, and is monitoring 250 items of the water quality under the aim of providing clean and safe water to the public.



 Internationally-Certified Water Analysis Research Center  Nationally-Certified and the Nation's Largest Flowmeter Calibration Center



Demonstration Plant In Water Supply & Sewerage System Research and Education Center Tests



Water permeates into all places. Water brings new life by permeating in between solid land and hard rock, then permeates again deeper to bring about great fruition. K-water brings clear and bright water that leads mankind and nature while nurturing hope.

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## **Corporate Governance**

K-water is committed to improving corporate governance by increasing the participation of non-permanent directors in the management, and expanding the scope of the use of expertise.

#### **Composition of Investors**

The main mission of K-water is to construct and maintain dams and water supply system for comprehensively using and developing water resources, which has a significant impact on improving quality of life and public welfare. In accordance to the Korea Water Resources Corporation Act, K-water's investors are limited to the Korea Development Bank (KDB), central government and local governments. The central government has to invest more than 50% of the total capital. As of 2011, K-water's shareholders are comprised of the central government (90.9%), KOFC (9.0%) and local governments (0.1%).

#### **Composition & Operation of the Board of Directors**

The Board of Directors (BoD), the highest decision-making body, deliberates and passes resolutions on K-water's major issues, such as business plans, taking into consideration public, economical, social and environmental factors, and the BoD both checks and supports the duties of the management. The BoD is comprised of 15 directors, 7 permanent and 8 non-permanent directors, and the chairman position is served by a senior non-permanent director that contributes to reasonable checks and balances to improve the governance of the public enterprise and executives. General meetings of the board of directors in 2011 were held a total of 15 times to deliberate and process 45 agendas. In addition, three non-permanent director meetings, 13 work bull sessions and four special committee meetings were held to play an active role in providing management proposal by reviewing overall management affairs in-depth for K-water.

#### **Operational Evaluations the Board of Directors**

The activities of the K-water board of directors is under the objective evaluations across diverse fields, including management proposals, system operations, attendance rates and a proportion of remarks under the management evaluations and internal evaluations each year. In addition, permanent directors are paid on performance-based according to government evaluation results. The evaluations consist of a quantified outcome and a non-quantified outcome and implementation outcomes and other efforts.

## Enhancement of Non-permanent Directors' Participation in the Management and their Expertise

The board of directors of K-water solidifies the subjects for review, resolutions, and expands the scope of reports to strengthen the function for review and resolution on important matters of management in its activities. In addition, the company information network is broadly open to non-permanent directors to provide support for them to acquire the management information of permanent Directors level in real time to expand their participation in management and improve the decision-making capability of non-permanent directors.

Furthermore, the board of directors is supported in decision-makingand participate in the management process by receiving reports and required materials on agendas for the board of directors in advance through work bull sessions as a form of small-scale management activity of the board of directors. In addition, for enhancing the management capability of non-permanent directors, observation is provided for construction sites of various national tasks, such as dams, water purification plants, the 4 Rivers Restoration Project so that a comprehensive understanding of on-site management capabilities can be gathered. By combining the management activities by those non-permanent directors on national policy have been undertaken, resulting in significant management outcome by changing the perception of people on national projects and others.

#### | Board of Directors(As of August, 2012) |

Directors	Name	Title		
	Kim, Kuen Ho	President		
Permanent Directors	Kang, Dae Ka	Auditor General		
	Kim, Wan Kyu	Senior Executive Vice President		
	Jun, Chan Goo	Vice President for Administrative Services Division		
	Kim, Jong Hae	Vice President for Water Resources Business Divisi		
	Han, Geung Jeon	Vice President for Water Supply Business Division		
	Moon, IL Bum	Vice President for Land, Energy & Engineering Division		
Non- permanent Directors	Song, Jae Woo	Chairman / Professor, Dept. of Civil/Environm Engineering at Incheon Univ.		
	Kim, Kye Hyun	Professor, Dept. of Civil/Environmental/Geoinformatic Engineering at Inha Univ.		
	Ryu, Byong Ro	Professor, Dept. of Constructional/Environmental/ Design Engineering at Hanbat Univ.		
	Park, Tae Woo	Editorialist of Frontier Times		
	Kim, Young Kwan	CEO of EVAgreen company		
	Park, Myeong Hwan	Senior Managing Partner of Vision International Law-Firm		
	Park, Chan Jung	Professor, College of Business Administration an Economics at Cheong-ju Univ.		
	Yoon, Esook	Professor, Division of International Cooperation at Kwangwoon Univ.		

#### Internal Audit & External Supervisory Institutions

K-water has established and operated the audit committee to supervise the appropriateness and impartiality of the work carried out, and also operated an independent Audit & Inspection department to supervise public officials' disciplines, regular audits and comprehensive audits in order to improve the transparency of its management. In addition, K-water is prepared to faithfully answer to any external audits conducted by the Board of Audit & Inspection, Parliamentary Inspection, Ministry of Land, Transport and Maritime Affairs and the Prime Minister's Office.

## **Ethical** · Transparent Management

K-water strives to gain trust from various stakeholders through ethical and transparent transparent management by connecting ethics and transparent management with corporate strategies.

#### **Clean Corporation, Producing Clean Water**

"Internally, we have to realize a fair organizational culture with the practice of ethical management, and externally, we have to fulfill our corporate social responsibilities to develop as a more reliable company for the public. (President Kim, Kuen Ho, January 2011)"

K-water is aggressively pursuing ethical management under its creed that ethical management is the most fundamental and strongest competitiveness. In 2009, K-water took a powerful step towards becoming a global ethical corporation by reestablishing its core values to achieve its vision and setting up ethical management as a key management priority. In addition, it has strengthened its ethical organizations by introducing the Audit Committee in 2010, and further strengthened its internal regulations, such as establishing a Code of Ethics for Researches. It has also made the effort in advancing its ethics system by operating the 'Ethics Committee' as the highest policy making organization for ethical management and a "Clean Reporting Center," a place where employees can voluntarily return received gifts. Due to its efforts made by the management and employees, it was selected as an excellent institution in terms of public organization's integrity by the Anti-corruption & Civil Rights Commission of Korea in 2011.

Particularly, the 'Help Line' policy, an internal reporting system developed through a specialized agency organization, was introduced in 2011. Enabling reporter confidentiality, this system has been contributing to promotions of internal reporting policies and the spread of an upright culture.

#### |Performance Index in 2011|



Corporation Integrity: 8.94 points

공정사회는 국

Omission Rate of Comprehensive Public Disclosure of

#### Achieving Stakeholder-oriented Corporate Ethics

K-water is initiating diverse activities based on its management policies, ethical management organizations and systems to enhance trust between its customers, executives and employees, suppliers and the society. To protect customers' rights and eliminate inconveniences, K-water has promoted transparency and reduced documents required for submission to improve the Electronic Procurement System. By providing ethical training focused on actual examples and operating fair personnel management, and conducting systematic activities for preventing accidents at operations to its executives and employees, K-water has linked ethical activities with the high quality of water service system. A winwin cooperative relationship is maintained with its suppliers and partners by operating a consultative group for coexistence to achieve mutual growth. In addition, K-water has maintained sustainable partnerships with its partners by various supporting policies, such as increasing its support for the certification of Environmental Management System(ISO 14001) by signing a green partnership agreement with small and medium sized enterprises. These measures have been established to ensure a continuous healthy and sustainable partnership. Thanks to these efforts, K-water ranked at the top in the evaluation of ethical management by the

Ministry of Knowledge Economy, and it is also doing its best to implement Corporate Social Responsibilities(CSR) on the global standard level by conducting strategic domestic and overseas social contribution activities linked with various projects.



주요기업 지속가능경영 실태조사

Approach



▲ A video clip about CEO's message on integrity ▲ Ethics Committee





#### ▲ Employee Ethics Pledge



## **Customer Happy Management**

K-water is realizing a premier service company which can gains trust from customers with its creative CS management.

#### Customer Happy Management beyond Customer Satisfaction

In order to actively respond to increased demand for high-quality water service from the public and changes in the internal and external environment, K-water has systematized its customer satisfaction strategy and branded its services. First, it has set forth the CS vision of 'K-water, Making Customers Happy' and the customer value of 'Comfort, Security, Trust, One-step Advanced Services' based on an enterprise-wide participation and consensus in order to secure service differentiation and competitiveness. Under the vision, K-water established three strategic directions for the CS management of 'enhancing the CS Implementation system, advancing the operation and management of the VOC system, and improving its service and quality.' it has undertaken 9 strategic tasks and 42 practical tasks, such as customer-oriented improvement of processes. By doing so, it has significantly improved its internal and external service processes, and enhanced customers' loyalty to the company by preventing customers' dissatisfactions in advance. Also, K-water branded the 'Service Identity[SI],' for the first time in SOC public-services, to effectively deliver its customers' characteristics and to highlight its services, which is differentiated from its competitors, such as local governments. The service identity, 'Water-Pro Service,' reflects K-water's strong intention to provide proactive and professional services to its customers. It is used in various fields in the CS management, such as front-line employee uniforms, business cards, placards, various CS activities and others. Through these efforts, K-water has acquired the highest rating for the five consecutive years in customer satisfaction for public enterprise under the management of the Ministry of Strategy and Finance, along with winning

'excellent ratings' from the inspection on civil complaints administration and information disclosure conducted by the Ministry of Land, Transport and Maritime Affairs as a sign of recognition for the CS management of K-water as the highest in public enterprises.

#### Improvement of VOC(Voice of Customer)-based Management and Enhancement of Proactive Response to the Needs

K-water facilitates diversified outcome monitoring and exchanges, such as a systematic VOC collection under the all-phase network of diverse stakeholders, VOC analysis by customer portals, enterprise VOC sharing for market resources and customer satisfaction, Service Quality Index(SQI), a customer center of Happy Call, and others to realize the systematic and systemized VOC management as the original resources for customer satisfaction and management improvement. For example, for the VOC that requested the improvement in the water quality of reservoirs of dams, K-water has implemented fundamental preventive measures and improved the water quality by introducing a forecasting system of water guality as the first company in Korea; rapidly collecting and treating floating materials during flood seasons; and conducting a campaign titled 'Land Cleaning Up Movement' 102 times, in which 8,265 volunteers participated in. For the VOC that requested the improvement of the tap-water quality and increasing the rate of drinking tap-water, K-water has increased the number of water purification plants from 11 locations to 16 locations, which are on the same level with 5-Star of the US Water Association, which is the highest level in the certification system for management competency of water purification plants. In addition, it has established the radioactive

#### |Survey result of CS major outcome index and Public Service Satisfaction index |

Major Outcome index	2009	2010	2011	
Public service Customer Satisfaction	HighestRanking (93.7points)	HighestRanking (97.1points)	HighestRanking (96.1points)	
Customer Satisfaction on Local Waterworks Service	75.8points	77.8points	79.1points	
Fulfillment Rate of Service Performance Standards	e 98.4% 98.8%		99.5%	
Timely Processing Rate of VOC	99.0%	99.4%	99.9%	

We Public Service Satisfaction index (hosted by the Ministry of Planning and Finance): the grade system was implemented from 2007, the highest ranking(excellent) – 90 points or higher

Customer Satisfaction on Local Waterworks Service (consigned survey from external institution): its 79.1 points in 2011 is 6.1 points higher than 73.0 points of the average points in customer satisfaction on the water supply service in 2011.

# Timely Processing Rate of VOC: The rate of processing civil complaints within the designated period(99.9%: Out of 2,641 cases of civil complaints in 2011, only three cases exceeded the period.)





material emergency system, and continuously replaced old and corroded water pipes. Moreover, it has increased the number of apartments where residents can drink tap-water in the apartment, implemented a campaign for drinking tap-water, produced 'water sommelier' and registered water sommelier as a private certificate. As a result, the quality of tap-water has been improved and the public trust on the tap-water has been enhanced, and the rate of drinking tap-water has increased from 55.9% in 2010 to 57.2% in 2011. In addition, K-water has reliably supplied water without cutting off water by the non-suspension water supply method to minimize customers' inconvenience and introduced an advanced non-suspension water inspection system. It has also enhanced its door-to-door services, such as providing a service for inspecting tap-water leakage of households for free, distributing packs and pads for preventing water meters from being froze and burst in the wintertime for free, and providing a service for inspecting the tap-water guality. Thanks to its efforts to actively accept customers' opinions and handle customers' complaints in real time, the rate of timely handling VOCs of K-water has gradually increased every year from 99% in 2009, 99.4% in 2010 and 99.9% in 2011.

#### Standardized Management of Service Quality and Enhancement of Competency for Customer Satisfaction

K-water has introduced 'Service Quality Index (SQI),' an advanced service evaluation system, to minimize the customer dissatisfaction by intensively managing the quality of core services, preventing defects in the entire process of services, and improving the quality of services. K-water set up six indices, such as inspection service satisfaction, dissatisfactory VOC occurrence rate, compliance rate of handling civil complaints, and others, and has intensively managed and improved the six indices. Also, it has established a comprehensive quality management system through monitoring services and measuring data. In particular, K-water has been managing the customer satisfaction and the service quality by sharing the current status of SQI in real time and comparing the

#### |Implementation Structure of K-water Customer Happy Management|



performance by responsible employee and by management unit of water supply and giving them the feedback. K-water has achieved almost 100% of the fulfillment rate of service performance standards, followed by 98.8% in 2010 and 99.5% in 2011 by systematically managing the service performance standards, which are applied to 56 items, such as dams, water supply systems and complex projects, in order to enhance the corporate credibility through improvements in the service quality and fulfillment of its promises with customers. Meanwhile, K-water has continuously enhanced all employees' awareness of 'Water-Pro', exemplary service models of K-water, and tried to internalize the models in order to enhance the mindset of all employees towards customer satisfaction, and their competency for customer satisfaction. It has also tried qualitative and quantitative expansion of its education for employees about customer satisfaction by conducting traveling education for 650 employees at 40 offices every year and training for improving customer satisfaction, which are specialized by educational object through service academies. In addition, K-water has strengthened the reward system for employee in order to motivate employees to provide good services for customer satisfaction, and 'boom up' the atmosphere at work. Moreover, it has enhanced the competency of its employees for customer satisfaction by publishing a 'magazine about exemplary practices for customer satisfaction' with collected cases about excellent examples of improvements in VOCs, monitoring how to kindly answer to phone calls from customers, and promoting exemplary employees whom customers praise.

Service Quality Index(SQI): An index for measuring the service quality to prevent defects in the process of providing services and improve the quality.



#### Process of Improving Service Quality



## **Mutual Growth with Stakeholders**

K-water is implementing sustainable management strategies that enables mutual growth with stakeholders as coexistent partners through continuous and systematic communication with them.

#### **Communication with Stakeholders**

K-water has operated various systems where outsiders can participate in its management to enable stakeholders to directly and indirectly participate in management or offer their opinions. By enabling stakeholders to participate in the management at the decision-making stages and in project implementation processes, potential conflicts can be prevented in advance in addition to providing transparency and credibility to stakeholders. In addition, K-water has established advisory councils or committees to acquire advice on the entire businesses, and it has also operated local councils to smoothly solve any conflicts that can occur in the process of implementing projects.

Advisory councils and committees are comprised of professionals from NGOs, academia, media, etc. and local councils, which are mostly comprised of professionals, civil servants and local residents, are operated as an consultative group to discuss local issue. K-water also works closely with related governmental institutions, such as the Ministry of Land, Transport & Maritime Affairs and the Ministry of Environment when it establishes and implements policies related to water resources.

|Communication channel for each stakeholder group |



#### Stakeholders' Participation in Management

K-water gives heed to every opinion from diverse stakeholders. Various communication channels have been established for customers, NGOs, local communities, the government, suppliers and partners, and executives and employees to collect various opinions and suggestions regarding major issues of concern, and to actively reflect them in the management. Anyone can participate in the VOC system at the K-water homepage, and K-water is always trying to make sure that everyone's voice is heard.



Approach



Focus

#### Together with Customers: Commendations from the Prime Minister and Minister of Health and Welfare

K-water Water Love Sharing Volunteers has been providing Hyonanum Services, including the operation of the Hyonanum Welfare Center for senior citizens, Love Sharing medical volunteering, dispatching of helper assistances, and visiting welfare facilities. Such contributions in the improvement of senior welfare was recognized, resulting in K-water being awarded with the Prime Minister Commendation and Ministry Minister commendation in September 2011.

> Minister of Health and Welfare Commendation : Hoengseong Management, Andong Management

## **Communication with Stakeholders**

Through various communication channels, K-water is continuously communicating with its stakeholders to discuss major issues, and to reflect their opinions in the management.

#### Importance of the Communication with Stakeholders

Projects initiated by K-water have a direct or indirect influence on various stakeholders. At the same time, the stakeholders significantly influence K-water's corporate policies. To actively conform to the new environment, corporations need to further their communication with stakeholders. Communication with stakeholders is the best way for corporations to search for means to coexist with stakeholders. Communication with stakeholders is important in that it contributes to the sustainability of corporations through proactively identifying risk factors and taking counter measures.

#### Framework of Communication with Stakeholders

Communication with stakeholders starts from understanding its stakeholders. K-water has classified the stakeholders into five groups: customers and local communities that are direct object for business activities of K-water; the government that influences the direction of major policies; executives and employees that are at the center of its innovation and growth; and supplies and partners. Communication between these diverse interested parties and K-water is the most fundamental way for all concerned parties to grow together.







#### Implementing K-water's Materiality Test 1)

In the GRI (Global Reporting Initiative) guideline that provides the global guideline of the sustainable management report, it recommends the placement of highest priority on reporting the information that stakeholders want. In other words, it is required to find out, analyze and respond to the interests and demands of concerned parties, and include the contents in the report. K-water has established and maintained diverse communication channels, which enable the company to find out the importance of demands from stakeholders and to reflect them in the sustainable management strategies. In particular, the performance outcome of the sustainable management strategies, in which various demands from stakeholders are reflected, opens to the public through Sustainability Report of K-water, and diverse efforts are made by K-water to communicate with stakeholders.

To enable stakeholders to directly and indirectly participate in the management or provide their opinions, K-water has established and operates diverse communication channels which include the VOC, where stakeholders can suggest their opinions, customer participation committees & informal customer meetings, sustainable management advisory councils, government personnel dispatches, and surveys. Stakeholders' demands

1) Materiality Test Refers to a method of distinguishing issues by priority based on understanding important information for stakeholders to derive at issues of High Interest and High Risk for stakeholders. The aim is to configure contents of substantiality reports centered on issues designated as Material Issues.

that have been collected through various communication channels are first categorized before prioritizing them through the materiality matrix. Once the demands are prioritized, the materiality is evaluated. The matrix evaluation is initiated through a two stage-process. The first stage is evaluating internal and external interests. The second stage evaluation takes into consideration the impacts on businesses and management competencies. The detailed implementation and performance results about important issues on the first level, are passed by the second stage evaluation, will be included in Sustainability Report, and issues for the second and third stage evaluations will be summarized in a report. K-water has established and used the materiality evaluation model of K-water based on the advice of professional institutions.

#### K-water's Sustainable Management

To identify important issues for K-water's sustainable management, the following diagram outlines the major interests of stakeholders. These issues are implemented through management strategies of K-water and related departments and the performance result of implementing these issues are disclosed to the stakeholders through the sustainability report. K-water is actively trying to communicate stakeholders, such as customers, local communities, academia, NGOs, the government, executives and employees and supplies and partners. K-water will make a sustainable growth platform by identifying stakeholder demands in advance and by enhancing the values of both K-water and stakeholders through cooperation.



K-water has implemented a questionnaire for civil organizations, officers and employees for confirming the key issues through communication with various inside and outside interested parties.



Low Materiality: Don't Report

#### Key Sustainble Management Issues

## **Risk Management**

K-water Risk Management (Kew) is an act for achieving its management objectives, and increasing the values of the company by forecasting and efficiently managing potential risks(financial,non-financial) in the management from the perspective of the company wide.

#### Structure of Risk Management

K-water Risk Management (KRM) can be divided into pre- and post-risk management. Risks across four areas of management, conflicts, disasters and PR are managed. Risk management is a process of conducting preventive measures not to let potential risks develop into real risks, and refers to continuous activities of managing 'vulnerable facilities' and monitoring 'Key Risk indicator (KRI).' Risk management also refers to a post-management process after the risks happen. In the case of risk situations, recovery steps are to be taken, which includes deciding on the level of warning and setting up an emergency action headquarters based on the standard and countermeasure manual by risk type.

Risks are evaluated by the influence that can affect the management activities of K-water, and by the possibility of the occurrence, and K-water focuses on preventive measures by classifying the risks into KRM (important risks) and KRI (risk indexes by division).

result, about 870 working manuals for risk management on four risk areas including management, conflicts, disasters and PR were published and distributed to working-level employees so that they can easily utilize the manuals on-site. K-water responds to risks through the four levels (Moderate, Substantial, Severe, Critical), according to its severity based on comprehensive considerations on risks including ramifications, and if a risk is necessary to deal with company-wide, the Risk Management Committee headed by the Senior Executive Vice President as the Chief Risk Officer (CRO) is established to manage risks. The Business Planning & Coordinating Department is responsible to establish strategies for risk management and the risk management organization system is operated to enable responsible departments and on-site management departments to rapidly and efficiently respond to risks depending on a type and level of risks.

> Company-wide Management

Department

Management

Risk

Risk

Potential of

Occurrence

Monitorin Reportin

5

Importa Risk

Respondin

KRI

| Risk Segmentation



#### **Process of Risk Management**

K-water has established a phased risk management process to prevent risks from spreading by incorporating a standard model for publicservice risk management guidelines into its risk management. As a

#### K-water 2012 Sustainability Report



Farthquake detection (seismometer)

#### Establishment of Risk Management System for Maior National Disasters

It is becoming more important to make responsive manuals practical to better respond to natural disasters that affect the entire country and minimize secondary damages beyond the scope of regional disaster response. For such to occur, K-water has conducted various training to supplement inferior aspects within the process of disaster response and minimize damages from disasters through actual on-site response drills every year. In particular, K-water is trying to build a responsive system to minimize the inconvenience of the public, which can affect their daily lives, such as collapse of dams and shutdown of water purification plants, as the awareness that Korea is no longer a safe area from earthquakes is growing. Thanks to these efforts, K-water was selected as the most outstanding institution in the "2011 Central Administrative and Public Institution Disaster Management Evaluation" by the National Emergency Management Agency in 2011.

#### ZERO Flood Damage and Maximized Water Use Efficiency through Advanced Water Management System

In 2011, there were many difficulties in managing water resources: for example, due to climate changes, record torrential rain in the early of the flood season occurred, recorded as the second largest rainfall during the flood season in history; a typhoon hit the nation in June for the first time in the last 48 years; severe droughts occurred late in flood season with rainfall of only 37% compared to the previous year; and construction projects for 16 multi-functional weirs were conducted during the rainy and flood season. As K-water is in charge of operating 30 multi-purpose dams and water dams nationwide, it has made a lot of efforts to prevent damages from floods by completely improving the water management system, such as climate and flood analysis and providing the onestep faster forecasting information to local residents and construction sites in lower areas of dams based on the water management system. Moreover, K-water has enhanced the flood prevention system by expanding the education of dam-weir operation to related organizations, and by implementing a joint drill with related organizations under the assumption of real emergency situations occurred at the weirs of the four rivers. In order to make a rapid response to sudden flood situations, such as flash flood, it has maintained a 24 hour water monitoring system all year long. During the flood period, it has contributed to reduce damages caused by floods in the lower areas of dams by implementing an advance reserve discharge flow in consideration for rainfall forecasting to minimize the water discharge volume of dams. Thanks to these thorough preparations and efforts, there were no flood damages in rivers where dams are located in 2011, and the water reserve volume at the end of the flood period was 9.0 billion m<sup>3</sup>, which was 1.3 billion m<sup>3</sup> larger than that of the previous year. Also, K-water has considerably contributed to the security of the national electricity by producing 2.86 billion kwh of green energy, the largest amount in history.





Thorough advance preparation



Advanced Water Management System



▲ Optimized Dam Operation

There is power in water. Water exhibits an honest force that moves according to nature without any trickery or luck. Raindrops that break rock, the power of great waves that moves oceans - K-water strives to rise into a global corporation.

## Dynamic

## GREEN Economy 2012 Contraction Contraction

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#### Challenges

New Renewable Energy Operation and Total Capacity

## Low Carbon New Growth Green Business

As Korea's Green Hub, K-water is leading low carbon green growth by developing new renewable energy to counter climate change, such as hydro power, solar power and wind power and registering Clean Development Mechanism (CDM) projects in the UN.

#### **Operation and Development of New & Renewable Energy**

K-water has aggressively taken measures to overcome climate change by utilizing the government's low carbon green growth plan as a platform to actively develop new renewable energy. As of 2011, K-water operates a 1,019MW hydropower plant that supplies 63% of the entire domestic hydropower plant capacity (1,621MW). K-water completed the construction of the Sihwa power plant, the largest tidal power plant in the world (254MW) last November, and supplies electricity from the plant. K-water has also developed and operated various green energies, such as hydro power from dams and weirs of the four rivers(51MW) and wind power from the Gveong-In Port (3MW). We have led the development of clean domestic energy. An example includes the solar power generation over water by using water surfaces of reservoirs at dams, the first such case in the world. In 2011, a total of 52 locations utilized hydro-power, tidal power, solar power, and wind power to supply 2,856GWh of clean energy, in turn, resulting in savings of 4.77 million barrels of oil and approximately 1.88 million tons of CO2. Solar power generation over water by K-water is a genuine eco-friendly technology that does not harm plants and animals while producing about 10% more electricity than solar power generation on land. It possesses huge potential for electricity of 3,100MW from 31 dams and will accelerate the shift in the paradiam to green growth. Moreover, K-water has actively pushed ahead with greenhouse gas emissions reduction projects by improving the efficiency of pumps at water supply facilities and increasing the equipment capacity for power generation through modernizing outdated hydro power equipment.

#### |New • Renewable Energy Operation and Development(2011. 12) | **bU**MW

N	ew • Renewa	able Energy Operation and Developr	nent(2011, 12)			(Unit: MW)
	Catagory	Operational Status		Development Status		Total Facility
	Category	Details	Facility Capacity	Details	Facility Capacity	Capacity
H	Large scale hydro power	· 10, including Soyang River Dam	1,000.6	-	-	1,000.6
pó	wer Small scale hydro power	· 31, including Andong Small-Scale Hydropower plant	36.3	· 16 facilities, including 9 weirs in 4 rivers	39.9	76.2
	Tital Power	· Sihwa Tidal power plant (world's largest)	254	-	-	254
	Wind Power	· Sihwa Bangameori, Gyeong-in Port Wind plant	6	-	-	6
	Solar Power	· 10 plants, including Bonpo solar power plant	0.7	· 3 facilities, including Jain Water Purification solar power plant	0.8	1.5
Co	ooling/Heating by ermal Difference	$\cdot$ 6 plants, including Daecheong Dam thermal plant	1.0	· 2 facilities, including No. 2 Lotte World	10.7	11.7
	Total		1298.6		51.4	1,350

#### Clean Development Mechanism(CDM) Projects and Trade of Carbon Credits

K-water is aggressively countering climate change by reducing the effects of greenhouse gases through the development of new renewable energy as a component of CDM projects. Having been the first government investment organization to start a CDM project in May 2005, K-water has registered a total of 6 projects including small-scale hydropower CDM businesses of Seongduk and Boohang, the most by one company in Korea, in the United Nations Framework Convention on Climate Change (UNFCCC) as of December 2010. Recently, K-water has obtained the approval from the government for the CDM projects of Angye and Hoengseong small-scale hydropower plants and waterworks facilities' energy efficiency improvement projects. We are in the process of registering new CDM projects in the UN Framework Convention on Climate Change. For the first time in Korea for unilateral CDM business in September 2008, K-water has sold carbon credits (6,782 CERs) for the CDM business to ABN-AMRO Bank of the Netherlands on reduction of greenhouse gas for the smal-scale hydropower I business in 2007, and also sold carbon credits(2009: 8,608 CERs and 2010: 8,080 CERs) to Korea Carbon Financing Co., Ltd. consecutively from 2009 to 2010 as a means to gain knowledge and experience in the transaction of carbon credits in Korea. Also, K-water acquired carbon credits(4,773CERs) for the small-scale hydropower || CDM business in 2011.

## 23,470 CERs, Total Carbon Credit Sales

#### CDM Registration Status(2011.12)

Project Name	Object	Registration Date	Annual Generation	Emissions	CO, Reduction
Sihwa Tidal Power	Sihwa Tidal Power	'06. 6	507,629	0.6214	315,440
Small-Scale Hydropower1	Andong, Jang Heung, Seongnam 1	'06.10	15,473	0.6262	9,689
Small-Scale Hydropower2	Daechung, Jooam, Dalbang, Seongnam 2	'07. 2	13,944	0.6214	8,664
Sihwa Wind Power	Sihwa Wind Power	'07. 11	6,293	0.6376	4,013
Small-Scale Hydropower3	Gosan, Pangyo	'09.11	5,557	0.5375	2,987
Small-Scale Hydropower4	Seongduk, Boohang	'10. 10	4,963	0.5561	2,759
Total			553,859		343,552

alles bell. \*\*\*\*\* 1014034 48 6.8 e 10891 997 4894 Metro c.es ----------41 1 194 50044 45149 944 4465 5+5 99914 ----44445.44

\*\*Carbon Emission Factors: Updated once a year based on the UN Tool to Calculate the Emission Factors
# **ICT-based Integrated Water Management**

K-water makes the land safe from natural disasters caused by water, such as droughts and floods, through an advanced ICT-based scientific integrated water resources management.

#### Scientific Management of Water Resources by Intelligence-typed Integrated Water Management System

Water in the 21st century is in the spotlight as "blue gold", but it has been more difficult to manage water resources, since the uncertainty about rainfall has increased and natural disasters caused by water have more often occurred due to the climate change. Now is the time when the national competitiveness depends on how to use the limited water resources efficiently and overcome natural disasters caused by water. K-water has been realizing a scientific water management to counter the climate change by establishing an integrated water management system, which converges its know-hows of water management accumulated for the last 40 years and high-tech ICT technology. It has prevented natural disasters caused by water and maximized the efficiency of water by stably managing floods and supplying water through seven advanced systems, which were established by process of water management, by using supercomputerbased Precision Forecasting System(PFS), Flood Analysis System(FAS), and Rural Water Supply and Sanitation(RWSS) and optimized operating 32 dams, including 16 multifunctional dams across the nation even within rapidly changing management conditions due to the climate change and the 4 Rivers Restoration Project. K-water has taken the lead in advancing technologies for the national water management and has ventured into the overseas market of water management technologies by making its own core technologies for water management a package, and releasing "K-HIT," its brand for integrated water management, a first such case in Korea.

#### Establishment of Structure for Integrated Water Management

The paradigm of water management in the world has changed to Integrated Water Resources Management(IWRM). IWRM means integrated management of water resources, considering water quantity as well as water quality and the environment of rivers in order to maximize socal and economic benefits through water. K-water has established an integrated water management system that manages water resources by basin unit, connecting dams, weirs and rivers after the 4 Rivers Restoration Project. K-water stably conducted a pilot operation of 16 weirs during the flood season in 2011 based on the 4 Rivers Integrated Water Management Center, which has newly established to manage scientific water management technologies and water management by basin unit. We have also enhanced its new integrated water management by basin unit by establishing systems needed for the operation connecting dams and weirs and standardizing an integrated water resources management system.

#### Major Achievements in Water Management in 2011

K-water successfully managed floods without any damages in the downstream areas of dams even though severe floods occurred in 2011, which recorded the second largest rainfall in history, and exceeded the designed capacity of four dams (Seomjin River Dam, Buan Dam, Nam River dam and Sueo Dam) based on efficient management; enhanced the national water security by securing a sufficiency of reservoir storage of 9 billion m<sup>a</sup> in the late of the flood season, which is additional reservoir storage of 1.3 billion m<sup>a</sup> compared to the previous year; and significantly contributed to the stability of the national electricity by producing a green energy (hydro power) of 2.86 billion kWh, which is the largest amount in history.



### | Decision-making Toolkit for Intelligence-typed Integrated Integrated Water Resources Management |

**K-HIT Structure** ICT (RHDAPS, IHDMS, WDWS) Weather (PFS) Observe Hydrological Data in Real Supercomputer-based Figure Ensemble Data Assimilation
 Short and Long-term Weather Time Manage Integrated Hydrological Data
 Monitor and Warn Water Disaster Forecasting Observe and Manage Hydrological Data Quantified Weather Forecasting Integrated Operation Center Generation (GIOS) Management of Water (FAS) Use of Water (RWSS) • Rainfall - Leakage Analysis (Long-term) Remote Control of Generation System • Rainfall - Leakage Analysis (Long-ter Standardized Integrated Operation
 Real-time Equipment Monitoring Dam - Reservoi Optimizatio River Water Quality Change Analysis River Water Level Change Analysis Optimal Flood Control Optimal Water Supply Creation of Green Energy Spatial Geographical • Precipitation, Efflux, Evapotranspiration Rivers • Origin of Water, Valleys, Rivers, Estuaries, Basins, Weirs, Dams Integrated Water Resources Management Water Volume Water Quality Rehaviors Security ce Where Each Stakeholder Participate in Functional Socia

# Successful Operations of Local Waterworks

Based on advanced management techniques and technological capabilities,

K-water is contributing to improved customer satisfaction and

enhanced competitiveness of national water supply services in preparation of an open water market.

#### Projects for Enhancing Efficiency of Local Waterworks

The operation of domestic waterworks is divided into the multi-regional waterworks (K-water) and local waterworks (162 local governments). The leakage rate of local waterworks is 83.2%, which is lower than 99.8% of multi-regional waterworks, and the rationalization rate for water bills of the local waterworks is low at 78.5%. In addition, most of the local waterworks are small in size, lack the manpower and technology, and are financially weak, making it difficult to invest in facility improvements. This causes a vicious cycle of low quality and poor service. Utilizing the experience and expertise gained from operating multi-regional waterworks, K-water is taking measures to enhance the efficiency of the domestic local waterworks. By integrating the operations of multi-regional and local waterworks, water resources utilization can be maximized, while redundant and excessive investments can be prevented.

#### The Current Status of Project Implementation

Since the Nonsan Water Supply Service Center was opened in April of 2004, K-water has taken care of all operations including water supply and management of 18 local waterworks (Nonsan, Jeongeup, Sacheon, Yecheon, Seosan, Cheonan(industrial), Goryeong, Geumsan, Dongducheon, Geoje, Yangju, Naju, Danyang, Paju, Hampyeong, Gwangju, Goseong and Tongyeong. In the next 20 to 30 years, K-water will invest a total of KRW 825.1 billion.

 2004
 2005
 2006
 2007
 2008
 2008
 2009
 2010

 Norsan-si
 Jengaug-si
 Secan-si
 Gengaug-si
 Gengaug-si
 Gengaug-si
 Bangaug-si
 B

| Consignment Management of Local Waterworks |

|Increased Number of Population for Local Water Supply Services (Accumulated) |



The investment will help replace worn out pipes, establish IT-based integrated operating systems, and enable scientific pipe network management. This will increase water revenue and reduce costs, helping maximize management efficiencies.

#### **Operational Performance of Local Waterworks**

Looking into the major outcome on the local waterworks business for 17 local governments (Nonsan, Jeongeup, Sacheon, Yecheon, Seosan, Goryeong, Geumsan, Dongducheon, Geoje, Yangju, Naju, Danyang, Hampyeong, Paju, Gwangju, Tongyeong and Goseong) in operation by 2011, K-water has implemented for reasonable facilities and operation improvement through scientific examination for reducing the leakage and relieving water quality issues. Also, K-water achieved a significant increase of water loss rate from 61.9% before the consignment management to 77.0% in 2011, which means water loss of 59.7 million tons was reduced after the consignment management through systematic and strategic measures for improving the water loss rate based on its middle and longterm plan Measures included conducting approximately 49,000 cases of water leakage recovery work and replacing 801 km of worn-out water



pipelines and approximately 140,000 units of water meters. In addition, K-water has expanded and improved water supply services through differentiated services, such as operating leakage recovery exclusive teams, 24-hour call centers, free internal leakage search and tap-water quality confirmation system, and striving to improve the water quality. Consequently, K-water was able to improve the customer satisfaction level to 79.1 points, 6.1 points higher than the average water supply customer satisfaction level of 73.0 in 2011. In particular, K-water has been highly recognized by the national and local governments for its "excellent systems for improving the public perception of tap-water" by introducing various campaigns and activities, such as introducing "Tap-water Drinking Apartment" and operating "Tap-water Quality Confirmation System" to relieve "a vague distrust about tap-water," one of the major reasons why people do not drink tap-water. The company has also supplied 1.3 times more clean water compared to the water guality of water purification plants in local areas across the country by improving the average turbidity

in water purification plants from 0.10NTU in 2010 to 0.08NTU in 2011 based on the "System of Targets for Water Quality of Water Purification Plants," which is higher than the legal standards of water quality.

#### **Future Plans**

K-water strives to improve local waterworks efficiencies through continuous expansion of its local waterworks projects, while improving the competitiveness of the domestic waterworks industry in preparation for an open water market. K-water aims to provide general water management services based on integrated operations and management of local waterworks as well as waterworks & sewage treatment integrated management linked to current sewage treatment project. Based on vast experience with technologies within the domestic waterworks & sewage treatment sector, K-water will establish a platform to expand into overseas markets.

#### Best Practice

#### Introduction of the Water Pipeline Equipment for Long Distance without Cutting off Water Supply(Sahara)

K-water has introduced and operated the Water Pipeline Equipment for Long Distance Without Cutting off Water Supply[Sahara], which can directly check inside the pipelines to prevent economic loss caused by broken pipelines and to relieve the distrust about the tap water. the Water Pipeline Equipment for Long Distance Without Cutting off Water Supply[Sahara] can check inside the pipelines for a long distance[maximum 1.5km] without cutting off water supply, so it can be used to inspect the pipelines of difficult areas to inspect, such as buried pipelines installed through rivers and roads, and check the conditions inside the pipelines, changes of the diameter of pipes, and branch pipes through CCTV. Also, it can detect a tiny amount of leakage[10/hr] through a leakage detection sensor, and it also can accurately inspect routes of pipelines and defective points in the pipelines[error is less than 1m].

It is expected that the Water Pipeline Equipment for Long Distance Without Cutting off Water Supply(Sahara) will lead the improvement in the management conditions of water supply business and advancement in management of pipelines by scientifically using the pipelines for water supply and maximizing the reduction of the leakage of water.



# **Integrated Management of Waterworks Facilities**

K-water establishes an integrated water supply system to secure the stability of water supply by efficiently using water resources, alleviating the imbalance in water supply between regions, and using connected systems.

#### The Current Status of the Integrated Operation of Waterworks Facilities

K-water has automated operations of all waterworks facility processes, including water intake plants, pumping plants and water purification plants through the development of an integrated waterworks management system. By operating the entire waterworks facility from the regional integrated operations center, and by remotely monitoring and controlling the water production and supply process 24 hours a day, facilities are not only efficiently operated and managed, but it also enables K-water to secure a leading role in water management technology. In addition, K-water was able to achieve personnel reduction and technological competitiveness improvements by integrating the operations across all areas, allowing the company to realize KRW 39.5 billion in tangible/intangible savings and create the operational foundation of metropolitans-locals linkage and strengthening waterworks facility maintenance by promoting the local operational center. In addition, K-water has developed into the world's largest general water service provider by developing the world's largest integrated operation center in which 23 water metropolitan waterworks facilities (capacity of 9.305 million m<sup>3</sup>/day) are operated within one place.

#### IT Based High Tech Waterworks Facility Integrated Operations System

K-water divided its operations into 7 sectors centered on the regional headquarters across the country to optimize water resources. To enable integrated operations of waterworks facilities in each sector, K-water is establishing an IT & automation technology-based waterworks integrated operations system. By successfully implementing the establishment of integrated operations across all areas and sectors from 2005 to 2010, K-water is expected to be the world's first to achieve a multi-regional integration operational system on a national level.



▲ World's Largest Metropolitan Integrated Operations Center

#### **Future Plans**

K-water is currently in the process of integrating the operations of multilocal waterworks for integrated operation. Once the establishment of the integrated water supply operation system by area is complete, K-water will do its best to more reliably supply clean water to the public by embodying a truly integrated water supply operation system that can rapidly respond to risks around the clock through upgraded plans in which changes in the operation environment of water resources are continuously reflected.



7 Areas (2011) Chungcheong Area Gyeongbuk Area Jeonbuk Area Jeonnam Area

Completed all areas of K-water waterworks integrated establishment

# Water Friendly Green City & High Tech Green Complex

K-water creates futuristic integrated cities and high tech national industrial complexes leading the national green growth initiative.

#### High Tech Green Technology Mecca, Sihwa MTV

To utilize the tideland formed as a result of the construction of the Sihwa embankment in an environmentally-friendly manner, the development of the Sihwa MTV (Multi-Techno Valley) located in the tideland area, North of Sihwa Lake, and Songsan Green City located in the tideland area, South of the Sihwa Lake are being pursued. The Sihwa MTV, aimed to supply hightech industrial areas in metropolitan areas and improve the environment of the Sihwa complex, will be a high-tech integrated industrial complex(9.76km<sup>2</sup>) with diverse functions and facilities, including eco-friendly high-tech and venture enterprises, logistics, distribution and supporting facilities by 2016. The Sihwa MTV development project will create approximately 70,000 jobs and result in approximately KRW 9 trillion annually from production to play a significant role in regional growth and the national economy.

#### Eco-friendly Future City, Songsan Green City

Songsan Green City is planned to establish the business undertaking direction through the operation of private-government council in "Sihwa District Sustainable Development Council" and urban planning management professional (MP) group undertaken with the goal by using the efficient use of the southern reclaimed area of Sihwa Lake. It is undertaken with the project costs of KRW 9.405 trillion at the site of 55.86 km²(16.9 million pyeong) to build the integrated city with the size of 150,000 people (60,000 households) harmonizing in a natural environment and tourism, leisure and residence with the goal of completion by 2022. We are also planning to achieve an environmentally-friendly future city where nature and humans co-exist by structuring the ecology of the entire city. The entire business district is specialized in 5 blocks for marine tourism and a leisure complex, city centered, automobile theme park, dinosaur fossil site, and ecology residence complex with the metro transportation improvement measures in the size of KRW 1.4 trillion. And the foregoing is connected to corporate investment and industrial facilitation to cause the employee effect of 173,000 employees, production of KRW 14.9 trillion, income of KRW 600 billion, added value of KRW 6.7 trillion for a total of KRW 22.2 trillion of economic dispersion effect.

K-water expects to revise the area into a pleasant integrated living



Bird-eye view of Songsan Green City

space from the representative industrial region of the capital area, and furthermore, it will play a significant role in contributing to the growth of the Northeast Asian economy.

#### Catalyst for National Economic Growth, Gumi · Yeosu National Industrial Complex

In line with the government's policy towards developing the infrastructure industry, K-water initiated the construction of national industrial complexes in the Yeosu, Changwon, Onsan and Gumi areas from 1974. The national industrial complexes Changwon and Onsan were completed and while the complexes in Gumi and Yeosu are currently under construciton. The Gumi industrial complex, started in 1977, currently has 2 complexes, #2 and #3, which were completed in 1995. The 2 complexes cover an area of 7.4km². The #4 Gumi industrial complex is targeted to be completed by 2010 with an area of 6.8 km². The complex has truly grown into Korea's largest national industrial complex with major domestic and overseas global corporations such as Samsung, LG and Exxon Mobil, and approximately 1,400 other companies will be located in the complex. In addition, K-water is pushing ahead with the construction of an 'expanded complex' to improve settlement conditions of the Gumi National Industrial Complex, which has led the economy of Korea, an high-tech industrial complex, 'high-tech Valley' and Digital Industrial Complex(Free Economic Zone), which is aimed to attract foreign investments. To comply with the government's low carbon green growth policy, the complex will be developed into an environmentally-friendly complex by adopting new renewable energy facilities, high efficient energy utilization facilities, and a bicycle network. As Korea's largest general petrochemical complex, the construction of the Yeosu national industrial complex was completed with an area of 11.3 km² between 1974 and 2000. The Yeosu complex expansion project that was initiated in 1992 is expected to be completed by 2012 with an area of 7.81km<sup>2</sup>. Currently, petrochemical companies such as GS Caltex and LG Chemicals have operations at the complex. By developing the complex in conjunction with the multi-regional Gwangyang Bay area, K-water is contributing to balancing regional development and to securing national competitiveness.



Bird-eye view of Gumi National Industrial Complex

### **Global K-water**

Utilizing its accumulated advanced technology and experience gained from domestic water management, K-water strives to share the benefits of clean water within regions that face water problems.

#### Trend of the Global Water Market

As of 2009, the competition between water companies in the world continues to intensify, within the private population of water service expected to increase from 800 million to 1.16 billion people by 2015. The size of the water market is also expected to increase to KRW 1,000 trillion in 2025. In the early 2000s, water companies in France and the UK dominated 70% or more of the market, but the competition for the water market between countries has getting fierce nowadays, as advanced countries including the Netherlands, Germany and Japan, are supporting their companies to advance into the global water market by forming an independent association for the water industry, and SUEZ of France, the worlds' second largest water company acquired a majority of shares of Agbar of Spain, the world's third water company. In the situation, K-water is taking the lead in creating the wealth of the nation through entering the global water market based on its technological capabilities, credibility, and internal/external networks accumulated for the last 40 years.

#### Strategy for Project Implementation

In order to respond to the rapidly changing market situation, K-water has established middle and long-term "overseas water market advancement strategy and road map" to undertake active advancement in technology service and investment business.

This strategy presents its strategic structure and action plans ranged from expanding the market that K-water participates in under the aim of serving 40 million people for overseas services and achieving 50% of overseas sales revenue (KRW 5.8 trillion) to improving the management of investment risks in order to realize the Five Great Global Best.



#### **Expansion of K-Water Markets**

K-water has advanced into the overseas market by undertaking a feasibility survey, implementation design and work supervision since the research project of the basin area of Fenhe River in Shanxi Province, and it has also contributed in diversifying business fields as well as enhancing business capability with its completion of 36 projects in 20 countries. Also, it has diversified its business structure through investments into the Patrind hydro power generation project in Pakistan and the local waterworks project of Shayang Xian, Jiangsu Province in China. In addition, K-water has made in-depth analysis of water market for water market size for each country, market entry type, status of market share for multi-national companies and others, and through the analysis of major evaluation categories on 146 countries worldwide, it has targeted specific countries (10 water market countries and 6 power market countries), and specialized entry strategy has been established to fit into the characteristics of the target countries in comprehensive consideration of local conditions, business type and others.

K-water is now pursuing a strategy to expand participation markets by forming a portfolio for strategic projects centered on water supply and sewerage

#### | Diagram of Participation Market Expansion |





#### |Participation Market Expansion Strategy

system and hydro power generation, in which K-water has a comparative advantage based on its accumulated skills and technologies, and raising funds through enhancing the connection between ODA projects and investment projects, financing projects and forming specialized local funds.

#### **Diversification of Business Types**

K-water is pushing ahead with an integrated water management system of Thailand based on its experiences with the 4 Rivers Restoration Project, IT and water resources management capacities. Thai high-level officials visited the water management center several times to better understand how to prevent floods within the Chao Phraya River area of Thailand. In response to interest in our water management system, K-water and Thailand have held discussions on future pursuits, such as a project TF team and on-site investigations. After the completion of the project for establishing the Integrated Water Management System of Thailand, K-water is planning to expand its exports of technologies of comprehensive water management, connecting the 4 Rivers Restoration Project, such as expanding water projects to neighboring countries in Southeast Asia and developing additional projects for comprehensive water management in Central and South America. Also, it is discovering high value complex businesses, such as package-typed water resources projects and IT-based intelligence-typed pilot project for water management, and it is diversifying business types, such as a pilot project for tidal power generation in Central and South America based on the world's largest Sihwa Tidal Power Plant and advancing green energy projects including new renewable energies to Southeast Asia

#### Enhancement of Management of Investment Risk

Any overseas business involves unique national risks, such as, policies of the advanced country, exchange rate and others in addition to the risk in the business itself. With respect to the response thereof, K-water publishes the information report for market trend and investment condition tailored for diverse entry type for each strategic country to respond thereof. Furthermore, it secures professional business information through international investment advisory companies and domestic and overseas strategic partners and through the strengthening of an information collection system for overseas employees and international education completed government employees through complete analysis for investment environment in advance in politics. laws. systematic part and others on major strategic countries. For each project, it organizes and operates a Risk Management Committee, consisting of professionals in respective fields, such as, law, finance, technology, and others, and undertakes the risk management system strengthening and the systemization with the focus on comprehensive risk management in a management resolution organization with regular reports and others, and has established a successful business plan by undertaking a business selection structure and risk recognition strengthening system through an international outside professional advisory company. To secure financial soundness following full-scale business investment, it seeks for an efficient procurement fund, including, domestic and an overseas project financing major financial institutions, participating of financial investors and others, and it subscribes to overseas investment insurance to assure the risks in default of terms, war, force majeure and others as well as seeking to disperse the risks through the joint advancement in overseas projects through the consortium organization with private companies.

#### World's Best Comprehensive Water Service Corporation

As Korea's representative water service corporation, K-water is following the government's policy to promote the overseas expansion of public enterprises. K-water is utilizing its overseas project execution capabilities and technological expertise accumulated over the past. With this, K-water will expand opportunities for private enterprises to enter into the overseas market as a result of public enterprises expanding overseas, and will also take the lead in creating national wealth. By realizing its corporate mission of "Water for a Happier World," K-water will do its best to advance in its goal of being the world's best comprehensive water service corporation.

In-progress Projects	<b>Completed Projects</b>		
19 Projects in 15 Countries (KRW 1.859 trillion) <sup>1)</sup>	36 Projects in 20 Countries (KRW 38.3 Billion)		
Pakistan, China, Indonesia, Nepal, Philippines, Laos, Thailand, Egypt, India, Equatorial Guinea, Kyrgyzstan, Cambodia, Vietnam, Mongolia, Iraq	Nepal, Laos, Rwanda, Mongolia, Vietnam, Bangladesh, Sri Lanka, Haiti, Afghanistan, Uzbekistan, Iraq, India, Indonesia, Equatorial Guinea, China, Kenya, Cambodia, Congo, Peru, Philippines		

 Standard of Total Project Cost: ODA and Technical Services[total cost spent for the project], Invested Business[Investment from K-water and joint participated companies and Project Financing] **GREEN Econom** 

#### Best Practice



Patrind Joint Development Agreement Agreement

#### Hydro Power Generation in Patrind of Pakistan

K-water is pushing ahead with the "Patrind Hydro Power Generation Project" to build and operate a hydro power plant with a capacity of 150MW near the branch of the Indus River of Pakistan. The Patrind project is to build a hydro power plant with the total cost of USD 4.36 million in the next four years, and K-water will hand over the operation right of the plant to the Pakistan government after K-water operates it for 30 years. K-water started the project by acquiring the shares of the local subsidiary, which was established for the Patrind Project, n 2009. K-water has acquired various licenses, and concluded financial agreements and concession agreements over the last three years to start the construction of the plant.

## Development of Technology for Industrial Water and Construction of Tailored Water Supply Facilities

K-water contributes to improve the national competitiveness and environmentally-friendly green growth by continuously conducting R&D and advancing the infrastructure.

#### Production of Industrial Water and Development of Technology for the Operation and Management for Industrial Water

K-water is producing and supplying industrial water[tailored industrial water] for the high-tech industry, such as semiconductor and LCD, and also pursuing the research and development of the technology for the production and operation of industrial water in order to meet the increasing demand for pure, ultra pure and high quality industrial water. In particular, it has established its road map for developing the technology competency for the management and operation at the global level in 2011 by reflecting the tasks for "Securing the Technology for the Production and Operation of Industrial Water" in the Core-Tech 2020, which is the middle and long-term plan for its technology development. K-water is planning to pursue R&D for the development of the management technology, which will reduce its operation cost by 10% and the development of the production cost by 20% more than the current production cost by investing KRW 4 billion by 2016.

#### K-water Industrial Water Project







ent and The Project for Integrated Supply y and Sewerage of Tailored Industrial Water for (192,000 m²/day) Daesan(119,000 m²/day)

| Research Plan for the Development of Production and Operation of Industrial WaterlCore Tech 2020) |

#### Design and Construction of Daesan Tailored Industrial Water Integrated Supply Facility

K-water has completed the design for the integrated facilities for supplying tailored industrial water for 5 companies in Daesan Coastal Industrial Region (Hyundai Oil Bank, Samsung Total, Honam Petroleum, LG Chemical and KCC) in May 2011 and it is in the process of the construction of the facilities. This construction project is scheduled to supply pure industrial supply to five companies in the Daesan Coastal Industrial Complex from August, 2012 after finishing a comprehensive pilot operation by May to August, 2012. The facilities has the sufficient application case to satisfy the needs of a customer with its excellent salt removal rate and MF pre-processing with outstanding processing capabilities and applies them with a high efficiency energy saving type reverse osmosis (RO) with high production. K-water is planning to accelerate its advance into overseas by establishing the global standards on the industrial water, such as translating the completion performance into English and making a standard manual for construction supervision of industrial water projects.



▲ Bird-eye view on Facilities ※ SBR: Sequencing Batch Reactor



▲ Design of the Integrated Facilities ※ RO: Reverse Osmosis MF: Micro Filtration

I Nesearch Flahtor the Development of Froduction and Operation of Industrial Water Core

• Secure the technology of the management

- Optimize the operation of preprocessing and reverse osmosis process
- Develop the technology to treat condensed water from industrial water facilities
- Standardize the operation and management of reverse osmosis process
- Secure the technology of the production(design)
- Develop new process including the optimized integration of processes integration
- Develop the technology of ultra pure water for energy-saving



2012 2013 2014 2015 2016



# K-water Technology Development

K-water continuously pursues the discovery of core technologies that reflect changing internal and external environment and management conditions as well as star brand technologies for use to develop our core technologies into brands.

In order to respond to internal and external environmental change, such as the 'low carbon green growth' national development strategy, K-water has strived to acquire core technologies in advance through 'selection and concentration'. In the case of the water resources sector, the 4 Rivers Restoration Project, Integrated water management, and other projects have been pursued as a means to develop core technologies that serve to response to global climate change. In the waterworks industry, K-water recognizes the water industry as a new growth motor and has developed brands for by-stage technologies while conducting strategic R&D activities to cultivate the advanced water processing industry as a new national growth engine. Accordingly, K-water is continuously pursuing the discovery of core technology tasks that reflects internal/external environmental changes and management issues in addition to the developing star brands within 'Core Tech 2020', a corporate-level comprehensive technology innovation plan.

#### Water Resources Sector



### Advanced Dam Safety Management and Decision-Making Support System



Over-Water Solar Power Generation System



#### Integrated Water Resources Management Operation Technology

In order to efficiently use and comprehensively manage limited water resources, K-water has led the Korean "Integrated Water Resources Management, sector and technologies since 2001 by developing the "IWRMS (Integrated Water Resources Management System)" with consideration of dams, river basins, rivers and water quantity and quality levels. This technology provides assistance to dam managers for optimal water distribution and decision making through comprehensive consideration of the water quantity and quality within rivers and reservoirs. The technology provides benefits that enable stable water supply and optimal river discharge adjustments even during droughts and floods. Additionally, this technology was not only applied within the 4 Rivers Restoration Project, but also within the 'Indonesia Citarum River Integrated Water Resources Management Decision Making Support System' led by the Asia Development Bank (ADB) and will continue to be utilized in entering overseas markets.

#### Advanced Dam Safety Management and Decision-Making Support System

For a conversion in the paradigm for dam safety management, K-water has developed an advanced dam safety management system. The advanced dam safety management system is comprised of a decision-making assistance system, dam monitoring system, dam DB system and dam alarm system.

The dam safety management decision making support system is a risk level-based dam safety management assessment tool (D-SMART) and is comprised modules according to risk factors, risk level analysis modules, and damages calculation module. The risk level-based dam safety management assessment tool (D-SMART) is a technique that provides scientific, engineering and quantitative assessment standards. Additionally, this tool supports management of risks through analysis of entire systems affected by dams through increased safety concepts limited to structures.

#### Development of Commercialization Technologies for Over-Water Solar Power Generation Systems

Over-Water Solar Power is new concept in solar power generation technology that combines existing Over-Ground solar power with Over-Water Technologies. By utilizing unused water surfaces within reservoirs, this truly is a green energy technology which minimizes environmental damage upon power generation while generating clean energy. Over-Water solar power generation is most suited to our domestic conditions in terms of efficient utilization of available lands and is a value-adding technology that converts unused water surfaces into potential resources and enables eco-friendly energy generation, suppresses occurrence of green algae while preserving ecological systems. There is huge potential for the development of a futuristic reservoir model converged with IT and BT technologies. K-water installed an over-water solar power generation test plant (2.4kW) on Juam Dam for the first-ever time in Korea during August 2009. Based on gathered from at Juam Dam, the world's first commercial 100kW over-water solar power generator was developed at the Hapcheon Multipurpose Dam in August 2011. By 2022, we plan to achieve KRW 1 trillion in sales by installing facilities of a total capacity of 1,800MW.

#### Waterworks Sector



# Development of Pipe Network Program

#### Development of Sewage Treatment Diagnostics Program



Development of Fast Screening of Water Quality/Harmful Substance



#### Water Purification Sector: Development of Water Purification Plant Diagnostics Program (Dr.Wastewater)

For over 20 years, K-water has accomplished the development and high level maneuvering of water processing examination technology on the basis of its performance in over 2,000 on-site examination supports and its examination technology, and as a result, it has developed an integrated technology examination program for water purification plants, the integrated body of high added value core technology (Dr. Water). Dr. Water is a knowledge based type integrated technology examination system for a water purification plant that can examine 14 processes and 67 categories through the standard processing (base capability evaluation, discharge water processing facilities evaluation, sterilization and other corrosion index evaluation and high level processing ozone and active carbon absorption processing evaluation) examination technique, and it is expected to undertake a major role in leading the domestic water facility technology examination and the strengthening of competitiveness in water businesses for K-water.

#### Pipeline Sector: Development of Pipe Network Program (Dr.Pipe)

Dr. Pipe is Korea's first computer program for evaluation and examine the performance of distribution network for water supply, and it is comprised of the hydraulic field, water quality field and facility field to make an accurate decision based on the evaluation of each field. On the basis of CAD and GIS, anyone can easily draw the distribution network to interpret the network, and predict the flow of the distribution network of underground water through the water volume and water quality forecasting simulation model. In addition, it also supports the decision-making process for scientific improvement of facilities through the evaluation and estimation of remaining life of old corroded pipes.

#### Sewage Sector: Development of Sewage Treatment Diagnostics Program (Dr.Wastewater)

Since 2004, the K-water Research Institute has developed 'Self-examination type sewage treatment facilities operation and management system: Dr. Wastewater' comprised with the 'deductive examination technique' and 'core element technology' that it has independently developed. Dr. Wastewater facilitates the TMS measurement figure as the data for processing the examination and problem solution for the first time in Korea and it enables the real time inflow water for characteristics analysis and discharged water quality forecasting. In other words, this is the first self-examination type processing at the complicated water treatment plant, analysis and forecasting of discharged water quality, real time problem solution and independent examination of water treatment plant. Considering the emergence of importance in water treatment for the 4 Rivers Restoration Project and linkage with the stringent water quality management system of the government in TMS, Dr. Wastewater is expected to undertake a great role.

#### Development of Fast Screening of Water Quality / Harmful Substance

Thanks to increased economic scale and improved quality of lives, we are on the receiving end of the benefits that come with abundance of chemical and medical materials. Yet, at the same time, numerous types of materials are being introduced to our rivers and water sources, making quick and efficient water quality management techniques vital. In order to quickly and accurate diagnose many types of minute organic compounds, K-water has developed a fast screening technique that combines online sample injection, real-time ionization (DART), and high-resolving scanning technologies and have been in use since 2010. Particularly, we have been quickly delivering analysis results of all samples to sites within 24 hours based on utilization at various water accident sites that require expediency, including clarification of landfills of defoliant by US Armed Forces, emergency diagnosis of phycotoxins according to accurrence of winter algae in Bukhan River investigations on causes of fish deaths, and pesticide-induced water contamination.

# GREEN Environment Chalenges

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  - Source Water Quality Improvement 58



Water drops gather to wet the hot land and becomes a stream to quench the thirst of animals passing the grasslands, and allows trees with roots deep in the ground to grow. K-water strives to protect the important values of green through valuable water.

### **Green Management System**

K-water is improving green management performance, reducing potential environmental risks and creating new environmental values by operating diverse green management programs.

#### Green Management System

Since K-water first received the Environmental Management System (ISO14001) certification in October 2002, K-water's Environmental Management System has continuously been evaluated for its effectiveness through annual post management audits and renewal audits every 3 years. ISO9001 & ISO14001 standards are reflected in K-water' s corporate regulations. According to the environmental management work process outlined in the corporation's regulations, each department is carrying-out duties related to Environmental Impact Evaluations, Establishing Environmental Targets Establishment, Environmental Audits and Environmental Performance Evaluations (EPE). In 2009, K-water was the first company in Korea to receive the ISO/CD26000 (Corporate Social Responsibility International Standard) level diagnostic evaluation. As a result of the evaluation, out of the 200 items in 7 categories, K-water was in compliance with 187 items achieving a compliance rate of 94%. This elevated K-water's status as a corporate leader in social responsibility. Also, K-water has reported seven key topics of social responsibilities by applying the ISO26000 checklist to the Sustainability Report since 2011. Pursuant to the 'Frame Act of Low Carbon Green Growth', enacted in 2010, K-water has undertaken a green management system certification by connecting the revision of internal regulations in existing quality and environment management regulations for revision and existing environment management system in undertaking green performance evaluation and others for the initiative introduction of a green management system as it was introduced in 2011. Through this effort, K-water uses the synergy effect with the existing environment management system with the conversion into the company-wide low carbon management in doing its best for strengthening the capability as a global company through securing the global low carbon competitiveness.



#### **ISO Internal Review**

In accordance to ISO14001, KS I 7001 and corporate regulations, K-water holds an environmental audit every year for each business site to evaluate and improve the environmental management system.

After an internal audit on the entire management process for all departments through the ISO dynamic cycle (P-D-C-A), an external certified institution carries out an overall audit on K-water's environmental management system. To internalize environmental management and strengthen internal management quality assurance competencies through a strategic audit of the overall environmental management system, between 2007 and 2012, 97 internationally certified ISO certification auditors were trained. Through this, K-water was able to strengthen its internal assurance capabilities regarding ISO standards. In 2011, inappropriate practices and recommendations from the internal audit, the renewal audit, and the first

#### ISO Certification Training for Employees

Cultivating ISO Certification Auditors ('07~'12)  $\rightarrow$  97 people signment Training by a Select Candidates Participation by Certified Institution External Company through Internal Job Test Application Offerings in Audits Obtain Qualificatio Diverse Environmental Audit Management Utilization for ISO Internal Audit Quality Innovation for all Sites On-site Departmental nternalizatio Internal Training Evaluation, Innovation Activities Cooperative Firm Suppo

The Establishment of Consulting Support for the Green Management System





2011 Investment in Environment

#### Green Management System and Program

#### Plan

- Green Management guideline
- / Implementation Act
   Establishment of green
- management targets
- Green management
   implementation plan
- Environment friendly design

#### Action

- Management Examination
- Global Reporting Initiative Correction/improvement of
- inappropriateness · Communication among the
- stakeholders

audit for the green management system were reflected to the management and the internal report for the management according to their priorities, and proper measures and corrections were immediately taken to prevent the unsuitable practices from reoccurring.

#### Environmental Performance Evaluations(EPE)

In 2003, K-water implemented the Environmental Performance Evaluation (EPE) program based on ISO14031, to carry-out regular measurements and a diagnosis on its environmental performance as part of its environmental management activities, and for systematic management through continuous improvements. EPE electronic system is established and EPE is implemented its system from 2006. In January 2007, K-water was the first company domestically to acquire a patent for its EPE Electronic System. EPE Index was adopted to understand relative improved level compared to that of the base year of environmental performance(2006), is managed as the core index of corporation for medium and long-term strategic plan. The EPE Index score in 2011 was 141 points, an improvement of 41% more than its base year in environmental performance.

#### **Calculation of Environmental Expense**

K-water adopted environmental accounting as a strategic tool to enhance environmental investment efficiencies and environmental performance by measuring the performance of the environmental management. By establishing eco-cost concepts & standards that are appropriate to K-water in 2000, environmental costs and investments are calculated annually. An electronic management accounting system is used to more systematically utilize environmental accounting results, enabling new environmental investment and capital budgets to be used in decision-making. The environmental cost of 2011 was KRW 146.4 billion, an increase of 8% compared to the previous year, but due to the increase of the entire cost, it has accomplished 11% of business costs, and the environment investment was KRW 98 billion, an increase of 48% compared to the previous year, but due to the increase of total investment expenses, it was around 5% level of total investment that the intense investment has been made for environment pollution prevention and disposition costs.

|EPE Index| 141 FPF Index 137 41% 132 100 2010 2011 2006 2009

| Total Cost / Environmental Cost Ratio |



#### | Total Investment / Environmental Investment Ratio | [Unit: KRW 100 million/%]



GREEN Environment Challeng





#### Korea's First Public Service That Certified the Green Management System

Kwater

### **Green Network**

K-water has enhanced the infrastructure of the entire supply network of K-water and realized the eco-friendly supply network to accomplish mutual growth with the stakeholder.

By managing its environmentally-friendly supply network for the entire supply network process from purchasing to wastes, which includes expanding green purchasing, supporting small & medium businesses' green management, carrying-out coexistent cooperation with construction companies, and supporting environment-friendly farming, K-water is seeking to achieve mutual growth with cooperative firms and local citizens.

| Management of Eco-friendly Supply Network by Stakeholder |



Coexistent Council", the problems between contractor and subcontractor are adjusted and the troubled matters and work process are to be improved. In 2011, the consultative group was expanded to 68 construction businesses, which include dams and waterworks construction. K-water is creating a sound sub-contracting culture to achieve mutual growth with small & medium institutions in the construction sector.



#### **Green Purchasing**

To strengthen its environmental management practices from production to consumption, K-water adopted green purchasing policies in 2002. Purchasing was strengthened by efficiently managing green purchasing. Green purchasing operating policies & the system are being improved through a joint system operations with the Korea Environmental Industry & Technology Institute. Going a step further, by applying and managing environmentally-friendly products as part of the EPE System, K-water's 2011 green purchasing performance increased to KRW 17.7 billion, an increase in growth of 53% when compared to that of the previous year. Environmentally-friendly products include those with the Environment Mark or Energy Recycling Mark, and Environmental Labeling & Energy Efficiency Management Products. This is 76% of the compulsory purchase target for environmentally-friendly products which the Ministry of Environment established.



Purchases of Green Products in 2011

**Coexistence and Cooperation with Construction Companies** To establish and expand coexistent cooperative partnerships with the construction sector, a Coexistent Consultative Group consisting of construction organizations, principal business recipients and subcontractors Through the communication channel in a "consultative group with construction companies

#### Support of Eco-friendly Farming in Areas near Dams

The purpose of the project for support of eco-friendly farming in the areas near dams is to encourage farmers who cultivate the land for controling floods near dams to use eco-friendly farming methods, such as organic farming and non-agricultural chemical farming to create a dynamic economy and to preserve the water quality of reservoirs. As a result, 1.127 million m³ of land was converted to eco-friendly farmland in 2011. K-water provided environmentally-friendly farming equipment, natural composts and agricultural training to support farmers. Also, residual agricultural chemical testing on soil and cultivated products, and heavy metal inspection are supported to order to secure the objective credibility on agricultural products grown in the land. K-water also assisted in farmers acquiring environmentally-friendly farm product certifications for no or little use of agricultural chemicals. K-water also played a role in helping local farmers achieve KRW 8.786 billion in sales between 2005 and 2011 by arranging sales to large outlets such as women's association in apartments and large food processing plants, and through participation in various farm product sales events. By converting to environmentally-friendly farming, the water guality of dams, which is the supply source for water, has been preserved, while the local farming income has increased. This contributed to the national and local citizens' appreciation of the dams.

#### Support for the Establishment of Voluntary Environmental Management System of Suppliers and Parter Companies

Now corporate social responsibility is not just limited to the company alone. Responsibility has been extended to the entire life-cycle of production. Cooperative firms voluntarily participate in environmental management

Current Status and Plan of Eco-friendly Farming					(Unit: 1,000m²)	
Classification	2008	2009	2010	2011	2012	Total
Conversion Area	1,170	1,468	1,396	2,215	1,127	7,376
Sales Profit of Eco-friendly Farm Produce <sup>1)</sup>					(Un	it: KRW million )
Classification	Total	2007	2008	2009	2010	2011
Sales Profit	8,272	709	1,805	2,371	1,986	1,401

1) The sales profit can be different from the actual profit, because it is an estimated calculation based on Consumer Price Index by National Statistical Office, and an estimate of farm income by area(m<sup>2</sup>)

and the establishment of the clean production system establishment helps strengthen small & medium businesses environmental management capabilities. At the end, it can also strengthen K-water's competitiveness. K-water also provides diverse environmental management programs to cooperative firms (small & medium enterprises) that lack the personnel, information and infrastructure to help them develop into environmentally -friendly corporations. The programs include environmental management training to help establish ISO14001, environment management technology support service, certification auditing, certification expense & post-management expense support. Through this, K-water was able to establish a coexistent green partnership, enabling provision of environmentally-friendly products and services. Each of the cooperative companies structures the tailored environment management system for each company through the environment management support business along with the diverse business performances in a structuring law complying process, securing the crisis management responding capability, structuring environment management infrastructure, environmentallyfriendly products and service enhancement, structuring VOC management, structuring of clean production, consumption system. It is expected to lead diverse environment management benefits in improving the corporate productivity, sales increase through customer satisfaction enhancement, cost savings through environment cost reduction and others. Nine companies have acquired the certification of the Environment Management System by 2011, and three companies are applying for the certification of

# 2,215 million m<sup>2</sup>,

Total Area of Eco-friendly Farming around Dams in 2011

KRW 1.401 billion,

Sales from Eco-friendly Farm Produce in 2011

the Environment Management System and six companies are applying for the certification for the post-management. K-water plans to complete its social contribution with cooperative companies through structuring the environmentally-friendly supply network with cooperative companies as well as structuring its overall environment capability in industry. K-water plans to expand the environment management program on structuring the environment management system for ISO14001, Carbon Reduction Label Certificate System, introduction of green purchasing, and publication of sustainable management report. And it further plans to strengthen even more for corporate environment soundness by undertaking the corporate social contribution together with cooperative companies through securing the green growth foundation on an entire supply network and the completion of environmentally-friendly network.



#### SMB Green Management Implementation System



### **Countering Climate Change**

K-water is leading the low carbon green growth by the government by actively participating in the efforts made by the international community for reducing global green house gas to counter climate change.

### Enhancement of Technologies for Managing Water to Counter Climate Change

Following the prospect of acceleration of global warming by the intergovernment bodies on climate change, IPCC(Intergovernmental Panel on Climate Change), and other international organizations, response to climate change has emerged as the priority agenda of the international community. For joining the effort to respond to world-wide climate changes and realize green growth, the government has completed a comprehensive plan for responding to climate change in September 2008 and K-water has established the strategy master plan in December 2009 to respond to the climate change crisis and convert it as an opportunity to generate a new growth engine.

In addition, K-water declared the *Gef week* New Management in August, 2011, and established action plans for the new management. According to the new management strategy, K-water is planning the integrated water management system by basin in order to respond to the increasing uncertainty about the water management due to climate change. To the end, K-water developed the water management system operated by connecting dams and multi-functional weirs in 2011. Moreover, thanks to the 'Green Technology Examination' brand, the amount of orders for services increased from KRW 680 million in 2010 to KRW 1.01 billion in 2011. Also, K-water will take the lead in the national policies for low carbon green growth by developing technologies of new renewable energy, as it is the first company in the area of new renewable energy.

#### Systematic Efforts for Reducing Greenhouse Gases

Since K-water was designated as a company managed by the Green House Gas Energy Target Management System in 2010, it has conducted various activities to meet its target. K-water has made the statement about its greenhouse gas emissions from 2007 to 2010 in June 2011 based on the greenhouse gas inventory system, which is certified by a world-renowned accreditation agency, Det Norske Veritas(DNY), Norway. In addition, K-water has implemented various activities to reduce its greenhouse gas emissions after making the implementation plan in December 2011 in order to meet the 2012 target(the greenhouse gas emission allowances: 669,576 ton  $CO_2$ ) decided by the negotiation with the government. Moreover, it enhanced its responding capability on the regulations for greenhouse gas reduction of the government by being acknowledged

#### |Reduction Target for 2012 |

Classification	Emissions of Base Year (Consumption)	Expected Emissions of 2012 (Consumption)	Emission Allowances of 2012 (Consumption)
Green House Gas (tonCO <sub>2</sub> )	497,230	687,120	669,576
Energy ( TJ)	9,580	13,256	12,923



#### |The GHGs Internal Emission Trading System |

with the performance of reducing 9,511 ton  $CO_2$  of its greenhouse gas emissions caused by the small-scaled hydro power generation project at Yongdam Dam and Daegok Dam earlier than the schedule. By furthering these efforts, K-water will reduce the greenhouse gas emissions and actively cooperate with the government for the low carbon green growth.

Moreover, K-water concluded an agreement for pilot trading as part of the GHGs Internal Emission Trading System with Korea Energy Management Corporation in February 2011 to reduce greenhouse gas emissions voluntarily, and it has implemented the GHGs Internal Emission Trading System since 2011. The year of 2011 was the period of the introduction of the system, so It conducted two cases of trading with 12 offices, whose emissions are more than 10,000 ton CO<sub>2</sub>, in July and in October 2011 respectively. It is planning to expand the applicable object of the system to the entire offices, and use the system as a tool for meeting its target by connecting the system with the Green House Gas - Energy Target Management System after 2012. It is expected that all employees will develop a consensus on the need to reduce greenhouse gas emissions thanks to the GHGs Internal Emission Trading System, and each office will voluntarily reduce the emissions. Also, K-water will be able to prepare for the domestic GHGs Emission Trading System, which is scheduled to be implemented after 2015, thanks to the GHGs Internal Emission Trading System.

Moreover, K-water has increased the number of offices that acquired the certification of Tap Water Carbon Reduction Label from 7 offices to 25 offices in order to establish the foundation for monitoring carbon at its water supply offices. It also developed an Excel VBA-based automatic carbon calculation program, which is expected to perform various functions, such as automatic calculation and prediction of carbon emissions, analyzing the level of contribution and embodying graphs, automatic producing carbon reduction labels.



Response to the Green House Gas - Energy Target Management System

K-water has introduced the Carbon Reduction Label system for the first time for the domestic water business and public enterprise to realize the low carbon green business premises, and in addition, it has implemented all events of K-water with carbon neutral ways that all major events with certain size or larger are required to undertake in green events through carbon neutral certification. In addition, within the scope of improving energy efficiency and carbon efficiency together with the reduction of direct greenhouse gas discharge volume, K-water manages the carbon cleanliness (total greenhouse gas discharge volume/energy use volume) and carbon efficiency (total greenhouse gas discharge volume/sales revenue) through the carbon intensity index management.

The carbon cleanliness of 2011 based on the inventory system has shown to be 2.15, the same as the previous year, and it has maintained a lower level than the domestic average. This means that, when 1 TOE is consumed, it generates 2.15 ton  $CO_2$  of greenhouse gas. The carbon cleanliness is an index to tell how much carbon is discharged when energy is consumed. As the cleanliness is lower, it means less discharge of carbon and a reduction of global warming

The carbon efficiency in 2011 was 8.72, which is higher than the previous year (8.26) and it means to use 8.72 ton  $CO_2$  of greenhouse gas for accomplishing sales of KRW 100 million. The total discharge volume of greenhouse gas in 2011 was an increase of 4% from the previous year for

551,000 ton  $CO_2$ , and it is attributable to an increase of power used volume following the increase of water supply volume compared to the previous year.

\* Carbon Efficiency was recalculated as the sales of 2011 changed according to the standard of K-IFRS

The total amount of greenhouse gas emissions in 2011 was 551,395 ton CO<sub>2</sub>. Direct greenhouse gas discharge volume from the use of gasoline, gas and others is 3,961 ton CO<sub>2</sub>, and the indirect greenhouse gas discharge volume from the use of electricity and others is 547,434 ton CO<sub>2</sub>. The main discharge volume of greenhouse gas from K-water would be the indirect energy source for the operation of water facilities. K-water has full-time measurement of greenhouse gas discharge volume in double following the energy use by facilitating the EPE system and recently structured inventory system, and operates the energy savings program for each field to contribute to the corporate competitiveness improvement in reducing greenhouse gas, improving atmospheric environment, reduction of tapwater production costs and others. For the conversion into a high efficiency energy consumption system, the energy efficiency is evaluated from the survey and design phases of various facilities and the power source management on existing facilities has been strengthened. In particular, it has thoroughly managed the power unit for reducing greenhouse gas in the water business field, the main carbon discharge volume of K-water.



# **Development of Eco-friendly Water Resources**

K-water is trying to develop and manage eco-friendly, sound and sustainable water resources by complying with the guideline for eco-friendly designs and implementing the Environment Impact Assessment.

The basic direction of K-water is to minimize the environmental damages by implementing the Environment Impact Assessment in the entire process from planning to design to construction for building an eco-friendly dam.

| Development of Water Resources Harmonizing with the Environment |





#### Implementation of the Environment Impact Assessment as a New Project

K-water is implementing the Environment Impact Assessment by phase, such as the administration planning, development planning, and implementation planning, in order to prevent the environmental impact in advance that can be caused by the implementation of new projects of water resources, and it conducted the assessment on the Andong-Imha dam connection project, the Yeongju dam relocating road construction project and the river management project in 2011.





#### Implementation of Measures for Reducing the Environment Impact at Construction Sites of Dams

K-water strives to minimize the environment impact, such as the air pollution, the water pollution and noise and vibrations that occur at the construction sites of dams. K-water has made the installation of facilities for washing wheels and cars, and a temporary dust proofing net compulsory in order to fundamentally prevent dust scattering, and it is always operating grit chambers and using contamination proofing layers to prevent water pollution.



Also, it installs and operates temporary noise proofing panels to reduce noise that can affect the neighboring areas. In addition, K-water has contributed to improve water quality, prevent river pollution, and protect the ecology by applying proper environment protection facilities, which are suitable to the characteristics of dams.

#### Post Environmental Impact Assessment

The Post Environmental Impact Assessment is a system for monitoring the environment to prevent environmental damages as possible as it can by monitoring the environment impact that can occur in the process of the implementation of projects, and conducting further measures if unexpected environment impact occurs. K-water has implemented the post environmental impact assessment for the ongoing seven projects of development of water resources, and it is surveyed that all of the offices of K-water meet the environmental requirements.



#### Creating of Water-friendly Ecological Space

K-water has recreated dam facilities and areas near dams as a regional tourist destination and a place to facilitate local economies by designing the facilities and areas as a special place that is reflected by the regional ecology, culture and history with interesting stories. By doing so, K-water has contributed to improve the quality of the people's lives and local economies by giving local residents an opportunity to enjoy their spare time in the facilities and areas.

Category	Design Concept	Facility
Goonnam Dam	Love and Peace of Red-crowned Cranes (Durumi)	Durumi Theme Park
Bohyunsan Dam	Stars that shine in Bohyeonsan	Astronomy Learning Space
Youngju Dam	Golden Sand and Scholar Culture	Culture Experience Space
Buhang Dam	Reflect regional fables	Nature Ecology Pathways
Sungduk Dam	Green pine trees and rest area	Pine Tree Forests and Woodlands



 Gunnam Dam Love and Peace of Red—Crowed Cranes



 Bohyeonsan Dam Stars that shine in Bohyeonsan GREEN Environment Challene

### • Best Practice



Main Screen of CAMAP

#### Development of Analysis System of Climate Characteristics in the Areas near Dams as the First Company in the World

K-water developed the Climate Analysis and Mapping System[CAMAP] that can objectively analyze the increase of the number of days when fog occurs by the construction of a dam. It is a system that can measure and analyze changes in the climate characteristics before and after the construction of a dam, and it is expected to actively deal with civil complaints related to environmental damages. K-water is planning to announce the performance result in the International Association for Impact Assessment[IAIA] in 2012, and is in the process of the application of a patent of invention. \*CAMAP: Climate Analysis and Mapping System

# **Protection of Bio-diversity**

K-water is doing its best to minimize changes in the ecological environment and maintain a healthy ecosystem where nature and man coexist through environmentally-friendly green development.

K-water is implementing various projects for restoring the ecology to protect the habitat environment for animals and plants, such as minimizing the environment impact that can be caused by the implementation of projects, and restoring the damaged ecological environment.



#### Inspection of the Ecological Environment

K-water is regularly monitoring the current status of the habitats for animals and plants, such as birds, mammals, amphibians and reptiles, insects, benthic invertebrates and plankton, to inspect changes in the ecological environment. According to its research about ecological conditions in areas near dams, various living creatures are living in the areas: 11 to 19 kinds of mammals, 14 to 39 kinds of fish, 28 to 73 kinds of birds, and 8 to 26 kinds of amphibians and reptiles. Also, K-water has been implementing research on the ecological environment in the areas near major dams, which are managed by K-water, regularly every 10 years to collect data about the current status of species including protected species. It uses the data as basic information for establishing a plan of restoring the ecology.



#### The Current Status of Projects for Restoring the Ecology

K-water has installed alternative habitats and artificial wetland to protect major species, such as mammals, insects, amphibians and reptiles and birds, as well as fish ladders and spawning grounds to protect fisheries resources. Also, it has installed ecological paths, which are harmoniously connected with the nature, to prevent the ecological environment from being cut off because of the construction of a dam. In particular, it installed Korea's first natural waterway-typed fish ladder[Pool type, Terraced-typed fish ladder, L=423m] at the body of Gunnam Dam in 2011, so that it helped fish better migrate through the ladder.

#### New Dam Ecology Preservation Development Plan(until 2014) Unit: Places)



#### **Completion of Facilities for Preserving the Ecology**



▲ A fish spawning ground at Gunwi Dam



▲ A fish spawning ground at Gunwi Dam



Category	Rare and endangered species			
Soyang Dam	Siniperca Scherzeri (golden freshwater mandarin fish) & 3 other Fish Species, Paeonia Obovata Maxim (Obovata) & 2 other Plant Species, Short-tailed Viper Snake & 3 other amphibia & mammals, leopard cat & 7 mammal	2002		
Namgang Dam	Anax Nigrofasciatus Nigrofasciatus & 2 other Insect Species, Pseudobagrus Brevicorpus & 1 other Fish Species, Otter, Common Kestrel & 1 other Bird Species	2002		
Chungju Dam	Crassirhizoma & 4 other Plant Species, Shorttailed Viper Snake & 1 other amphibian & reptilia, Siberian Flying Squirrel & 2 other mammals	2004		
Juam Dam	Reeve's Turtle & 5 other amphibian & reptilia, Yellow-throated Marten & 3 other mammals	2004		
Andong Dam	Korean Rat Snake, Siberian Flying Squirrel & 4 other mammals, Common Kestrel & 2 other Bird Species	2003		
Imha Dam	Reeve's Turtle, Leopard Cat & 3 other mammals, Mandarin Duck & 4 other Bird Species	2003		
Boryeong Dam	Otter & 1 other mammal, Chinese Sparrow Hawk & 4 other Bird Species	2006		
Buan Dam	Otter, Cobitis Koreensis Pumilus, Korean Rat Snake, Narrow-mouth Frog & 1 other amphibia, Common Buzzard & 4 other Bird Species	2006		
Daecheong Dam	Mandarin Duck & 10 other Bird Species, Otter & 1 other mammal	2005		
Hapcheon Dam	Sparrow Hawk(Accipiter Nisus), Mandarin Duck, Leopard Cat & 2 other mammals	2005		
Yongdam Dam	Otter, Mandarin Duck & 5 other Bird Species, Pseudopungtungia Nigra & 4 other Fish Species, Goodyera Schlechtndaliana & 3 other Plant Species, Korean Rat Snake & 1 other amphibian & reptilian	2011		
Seomjingang Dam	Acheilognathus Somjinensis, Fareastern Brook Lamprey, Microphysogobio Koreensis (3 Fish Species); Otter, Leopard Cat (2 Mammals); Lilium Distichum (Kochang Lily) (Total 10 Plant Species	2010		
Unmun Dam	Otter, Leopard Cat, Mandarin Duck, Northern Goshawk, Golden Eagle, Pied harrier, Cinnib Jestrek	2010		
Hoengseong Dam	Otter, Leopard Cat, Eurasian Buzzard, Striated Bittern, Long-Billed Ring Plover, Osprey, Hen Harrier	2011		
Milyang Dam	Milk vetch root & 4 other plants, Otter & 3 other mammal, Cinereous vulture & 5 other birds	2009		



- - ▲ A terraced fish ladder installed on the body of Gunnam Dam

#### Best Practice



▲ The Current Status of Operation of Fish Ladders

#### Korea's First Natural Waterway-typed Fish Ladder at Gunnam Dam

▲ An ecological path at Gunwi Dam



- Type : Pool Type, Terraced Fish Ladde
- O Size : L=422.5m(Rapids-type 1/100, Terraced-type 1/30)

### Management of Tap Water Quality

K-water has gained trust from the public by providing the high quality of tap-water through advanced water quality management, such as the expanding advanced water treatment processes and lowering the carbon level at all offices.

Production and Supply of the World's Best Quality of Tap Water

K-water has improved the water quality by adopting upgraded water processes, such as ozone and granular activated carbon process, that can treat and eliminate substances with tastes and smells, and by-products produced by the process of disinfection, and harmful substances, which cannot be hard to be treat or eliminated by the conventional water treatment processes. K-water completed the introduction of advanced water treatment processes in 5 water purification plants by 2011, including Bansong, Goryeong, Banwol, Goyang, and Gongju and is planning to expand to a total 14 plants by 2015. Moreover, it is evaluating the management level of the quality of tap water in real time by establishing the second generation rating and evaluation system of water purification plants[K-water QPI], which utilizes IT and Web technologies. "K-water QPI" has greatly contributed to upgrade the quality of tap water by applying K-water's own standards, which are stricter than legal standards, and evaluating the quality in terms of 14 items, including turbidity.

Thanks to these efforts, K-water was highly recognized around the world for the excellent quality of tap water produced by K-water, as it acquired '5-Star' certification of the IWTA program organized by American Waterworks Association (AWWA) while overseeing 16 plants receive '5-Star' grades

#### |Results of Improving Water Quality|





during 2011. Tap water produced by the Milyang water purification plant was selected as one of the top 10 tap water of the world at the 2011 International Water Testing Competition, competing 35 countries including the U.S. and Canada. In 2012, K-water is planning to prove the world's best quality of its tap water by applying the global water quality standards, which is the most strict standards on water quality applied to drinkable water by WHO, the U.S., Japan, the E.U. and Australia, to all of the water purification plants, which under the management of K-water.

#### Improvement of the Public Trust about Tap Water by Providing Customer Interactive Services and Improving the Quality

K-water is trying to improve the public trust about tap water by finding out the reason of distrust about tap water and improvement measures. In order to ease "vague distrust about tap water," which is the most major reason why the people do not drink tap water, K-water has undertaken diverse improvement activities, such as "introducing the tap water drinking apartment" and "operating the tap water quality confirmation system." Particularly in 2011, the drinking rate of tap water at the "tap water drinking apartments," which include 1,600 households in four apartment buildings, increased by 14%. Moreover, K-water has continuously managed the quality of tap water by expanding the inspection items to 250 items, which is much more than 84 items of the national water quality inspection, and it has also opened to the public about the comprehensive information on the water quality of the entire process from the production to supply of tap water on the Internet in real time.

In addition, K-water set up the water quality target based on the Langelier Index as the first company in Korea to produce tap water without any rust water, and it has reached the target of its Langelier Index at 19 water purification plants in 2011. K-water will do its best to supply the high quality of tap water to its customers by minimizing the occurrence of rusty water in the process of supply in the future.

#### The reason why the people do not drink tap water

- Vague distrust(30.2%) Odor(18.1%)
- Old and corroded pipelines and water tanks(17.7%)
- Pollution of the source water(14.3%)
- Harmful substances including rust(11.6%)
- Just habit(4.0%) Others(4.2%)



Comparison of Water Quality Inspection Items by Country

#### Measures to enhance the public trust about tap water

- Implement the tap water quality confirmation system, and
- tap water drinking apartment
- Provide the information about the water quality
- Improve the Langelier Index to prevent rusty water

#### Langelier Index

It is one of the most representative indexes to indicate the degree of the corrosion of water pipes, and the degree of LI  $\geq$  -1.5, it indirectly indicates that rust water barely occurs.

#### Acquisition of the Certification for Tap Water and Low Carbon Product as the World's First Company

The Carbon Reduction Label System is a system that discloses the information about the volume of greenhouse gas emissions of a product or service by putting a label on them, and supports low carbon green production and consumption through the certification for low carbon products to counter climate change.

Since K-water applied its tap water, which had been produced since 2009, for the certification of the carbon reduction label system, as the first phase, K-water's 25 water purification plants out of 39 acquired the certification in 2011, and the remaining 14 plants will acquire the certification in 2012. Also, as the second phase, K-water completed the process of acquiring the certification for the tap water produced by Cheongju Water Purification Plant, which successfully carbon dioxide by 5.3% of carbon, and it will expand the number of products with the certification through the efforts to reduce greenhouse gas emissions.







## Source Water Quality Improvement

Supply of clean tap water starts from completely managing the quality of source water. K-water is supplying the high quality of source water by the scientific management of dams and basins.

#### |Implementation System for Water Quality Management of Dams and Basins |



### Enhancement of the Management of Sources of Pollution in Upstream Areas of Dams

The recent climate change due to abnormal climate activities have caused huge amounts of soil and floating materials to flow into dams for prolonged periods of time. To overcome the limitation of the management of water quality, current remaining as a post-response to water quality problems, K-water is implementing pre-inspection and preventive measures on sources of turbid water and floating materials in cooperation with related organizations, and is also pushing ahead with the establishment of comprehensive measures for preventing turbid water by basin along the five major rivers as a fundamental policy. Also, it has founded the efficient system for inspecting and managing sources of pollution through the establishment of the Management System of Information on Sources of Pollution, which is based on IT and GIS.

#### Expansion of the Participation in the Water Quality Improvement Projects for Upstream Areas of Dams

K-water has made a great effort to reduce non point source pollution in upstream areas of dams, such as participating in the national project for managing water quality in basins, such as creating ecological wetland in Daecheong Lake So-ok Stream. It has also founded the ground for integrated management of water quality against sources of pollution in basins of dams, such as domestic sewage and livestock waste water, through the construction of six basic environmental facilities in upstream areas of dams, and the operation and management of 103 basic environmental facilities.

#### Scientific Management of the Water Quality of Dam Reservoirs

For management of dam reservoir water quality, scientific forecasts of future water quality are required. However, since dam reservoirs are huge, stay for a long time of period, and involve diverse factors, including seasons and weather, it is difficult to understand the cause and effect relation within water quality changes. An alternative method to overcome the limitation is a water quality forecasting method through modeling, so K-water has adopted the three dimensional forecasting technology, which is more advanced technology than the two dimensional technology to make more reasonable decisions and apply better technologies. In the situation, K-water completed to apply the technology to 8 dams in 2011, following the first pilot application in 2009, and it will expand to apply the three dimensional model to the entire dams by stage.

### Adoption and Application of Efficient Technology for Controling Green Algae

In general, green algae occur in eutrophic reservoirs and rivers in summer, and it causes water pollution and hinders the process of water purification. K-water is operating various water quality improvement facilities, such as layers of preventing the inflow of algae, water circulation systems (aeration facilities) and selective intake equipment to efficiently control algae. It has implemented various researches for the analysis of effects and the establishment of operation guidelines. In particular, it successfully developed a sophisticated technology that can monitor the current status of pollution sources in upstream areas and water quality in reservoirs by using satellites in 2011.

### ••• Focus



#### Development of New Technology for Monitoring Basins and Reservoirs by Using Satellite Videos

There are many difficulties to find out the conditions of dam basins and reservoirs on the land, since the range of basins and reservoirs is very broad. K-water implemented the applicability evaluation for a new technology that can monitor changes in the use of land in dam basins and water quality in reservoirs by analyzing videos shot by satellites in 2011, so it confirmed the performance of the technology with the accurate monitoring rate of 88.7% for Daecheong Dam and 84.0% for Juam Dam respectively. K-water is planning to apply the technology to basins of Nakdong River in 2012, and improve the accuracy. It is expected for K-water to be able to manage water quality more efficiently through the development of professional systems that can be used with videos from the Science and Technology Satellite 3, which will be launched.

# GREEN Society Chalenges

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Hold

Water can hold all and everything. From the children running around excitedly within valleys, rivers hold the boats that ride it. Oceans amply take it all that comes from the land. From the generosity of water, K-water learns how to live in our world as well as the happiness gained from sharing.

### **Respecting Human Rights & Diversity**

K-water is taking the lead in protecting human rights & interests by protecting social minorities and respecting diversity.

#### **Efforts to Protect Human Rights**

K-water is protecting the rights of minorities while implementing policies to resolve difficulties faced by employees & executives. Diverse policies, including programs to expand employment opportunities, maintain gender equality and protect workers during pregnancies are being initiated to protect the rights of minorities, including individuals with disabilities, female employees and contract workers. A Gender Equality Department has been established by the labor union, which has strived to provide the same benefits to contract workers as offered for regular employees.

Human rights training are being offered the rights of minorities. The training courses mainly consist of company-wide sexual harassment prevention training and personal information protection training courses. In the future, human rights training courses will be expanded to over a wider-range of subject topics. In addition, guaranteed rights to form collective agreements and initiate collective bargaining prevents all possibility of rights being infringed upon at any of K-water's work-sites.

#### **Achieving Gender Equality**

Since the announcement of Gender Equality regulations in 2004, discriminatory factors in employment and promotion of female employees have been eliminated. Counseling for female employees facing problems has been actively promoted while gender equality programs have been implemented by actively managing and supporting the female workforce through strengthened maternity protection. Basic salaries are the same for male and female employees in similar positions and for those that entered the company in the same year. Promotions and compensations are also being equally provided to both male and female employees.

As of December 2011, there were 449 female employees, comprising 10.7% of the total work force. The number of female managers continues to grow in numbers, having reached 34 currently in 2011. The ratio of female employment in 2011 comprised 18.4% of all employment.







In accordance with article 17 of the Framework Act on Women's Development and Enforcement Ordinance Article 27-2 of the same act, sexual harassment prevention training program is held once a year with results being reported to the Ministry of Gender Equality and Family. To prevent decreased labor productivity within worksites, a member from each department is required to complete a cyber training course once a year to disseminate the contents of the training program within subject departments.

#### **Resolving Employee Problems and Difficulties**

A permanent counseling window is being operated within HR-BANK (Integrated HR Management System) to assist in resolving problems and difficulties faced by employees. In 2011, a total of 52 problem cases were resolved through online and face-to-face consultations. Unresolved cases are continuously monitored for resolution at a later date.

#### |Employee Problem Resolution|

Category	2008	2009	2010	2011
Total Number of Problem Cases	39	98	78	73
Cases Resolved	28	67	56	52
% of Cases Resolved	71.8	68.4	71.8	71.2

#### Strengthening Personal Privacy Security

K-water established infrastructures and regularly holds information security enhancement training courses to protect personal privacy and information. Collection of personal information for information services offered by K-water is minimal. Particularly, the company website utilizes I-PIN (Internet Personal Identification Number) rather than the personal registration number, helping further protect personal privacy while

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personal information is systematically managed by establishing personal information protection standards. To emphasize the importance of personal privacy and the severity of potential damages, we have shared cases of information leakages and infringements of personal privacy. Additionally, we are regularly offering prevention training for newly entering employees, information security personnel, and employees of cooperating companies.

At the same time, we have been operating the K-water Cyber Security Center 24 hours a day in connection with the National Cyber Safety Center as a means to protect government infrastructures and personal information from potential cyber attacks. By encrypting personal information of customers, K-water is doing its utmost for the protection of personal privacy.

### Increasing Employment Opportunities for the Socially-Disadvantaged

K-water has introduced and operates a policy that provides additional points for people with disabilities upon hiring employees. In regards to testing, depending on the level of the disability, an additional 3~5% points are added to applicants with disabilities. A supplement in the form of 70% of basic salaries is offered even for employees that become disabled after entering the company. For registered disabled individuals, 3 days of paid leave and gifts of encouragement are provided around Day of People with Disabilities. Various convenience facilities have been installed, including designated parking zones, elevators, restrooms, stairways and roadways. The disabled employment rate was 3.1% (151 employees) in 2011, over the legally set employment rate of 3.0%.

#### **Maternity Protection Program**

Breast feeding and female employee rest areas have been installed within the head office while a corporate child care center has been established



to provide assistance for female employees. In order to help relieve the pressures of child care and create a balance between work and family life, K-water is operating child care facilities needed by employees. In addition, we are operating a variety of maternity protection programs, such as the child care temporary leave and selective child care work time reduction policy. We have also been operating maternity protection programs, such as providing breast pumps for breast feeding employees.

• In-Company Child Care Center: Water Love Children's House

- Family Day Designated Every Week Wednesday
- Joint Spouse Leave of Absence Policy
  - Conditions for Leave: When spouse if working overseas, training, or on leave for over 1 year
  - Leave of Absence: Once, Three Years
- Improved Childcare Leave of Absence Policy
- For employees with children under 8 years of age (For children in school, those under 2nd grade in elementary school)
- Childbirth Encouragement Assistance
  - Payment of Childbirth Encouragement Assistance, Work Circulation Exceptions for Pregnant Employees
- Breast Feeding Facilities, Parking spots designated for pregnant women
- Increase Miscarriage / Stillbirth Leave Days: Provide sufficient time to recover physically/mentally



## **Fostering Global Human Resources**

K-water is cultivating global human resources by concentrating our corporate-level competencies in order to become the world's best water service provider.

#### **Global Human Resources Fostering Roadmap**

As K-water's key partner in achieving set visions and strategies, all HR functions are aligned based on competencies and performance. For such to occur, we have secured global competitiveness of personnel and HR resources.



#### **Competency-based HR Management & Information System**

K-water has established a competency (Common, Leader, Position) model to manage HR personnel based on competence. By identifying capacities required to achieve the desired performance, we are operating a competency-oriented educational training system that can improve individuals above their current performance level. Such HR personnel management is managed through the HR-Bank (Integrated Human Resources Management System), in turn, fundamentally preventing errors by systemizing and operating 100% of all functions through the system.



#### Capability & Performance-based Compensation & HR Personnel Management

The monthly salary of new employees is set at 205% of the minimum wage in accordance with the public corporation advancement policies of the Government. All employees and executives are subject to regular performance evaluations. In the case of executives, compensation is based on

performance in accordance with the management contract signed with the President. As the executives are paid annual salaries, level 1 and 2 employees receive compensations based on the results of division evaluations, department evaluations, and individual MBO (Management by Objectives) results. For general employees who are level 3 or below, compensations are based on the results of division evaluations, department evaluations and team evaluations. Such compensations based on performance motivates employees to strengthen capabilities while fostering a performance and competence based organizational culture. In addition, we have implemented a policy that allows administrative and technical employees to exchange functions to provide opportunities to develop one's capacities through experiencing various work functions. At the same time, various awards for outstanding results, model employees, outstanding proposals, etc. have served to maximize operational focus.

#### **Employee Career Development**

Since 2003, K-water has developed and operated a CRP (Competency Reinforcement Plan) system to help employees & executives in their career development. The CRP system assists in providing a balanced career development plan by appropriately reflecting organizational and individual needs. From 2010, occupational limits on educational/ training curriculums were eliminated in order to widen the selection of educational/training opportunities for employees. At the same time, "Modular Curriculum Operation<sub>J</sub>, "Open Operation of All Curriculums' were implemented to increase opportunities for employees to participate in education/training.

Particularly in 2011, K-water introduced the Training Summation System that recognizes OJT and Educational Club activities as study hours in order to activate work-centered education and training. By conducting special

training, including risk management special classes (3,315 people), G2G New Management Strategy Training (1,929 people) in addition to recognizing career educational training, including OJT, as study hours, the number of students and training time have significantly increased over the previous year.

#### Cultivating Key K-water Specialized HR Personnel

K-water opened the 'K-water Expertise Course,' in 2008 to acquire global competitiveness by cultivating specialized personnel and has been cultivating specialists across all sectors. Based on specialized subject matter related to the Key 5 Strategic Businesses, including '3G Integrated Water Management Technology, K-water is cultivating 75 personnel in 2012 equipped with specialized knowledge of at least a masters' degree based on an over 360-hour high-quality training program.

#### **Cultivating Strategic Leaders**

K-water introduced and has operated a one-of-a-kind systematic leader cultivation program called <sup>r</sup>Creative Innovation Leader Forum, from 2010. In 2012, 30 outstanding HR personnel were selected from leader groups of 2 Grade of above to conduct strategic leadership strengthening programs. With the objective of enhancing implementation capabilities through communications and consensus building capabilities, this course provides diverse learning activities (workshops, seminars, knowledge training) such as leader competency assessment and coaching. In addition, the <sup>r</sup>Leadership Academy, introduced in 2011 is a custom-tailored leader cultivation program designed to develop insufficiencies through diagnosis of individual leader shortcomings. This program is also contributing in the systematic cultivation of strategic leaders.



### **Creating a Great Work Place**

K-water operates various welfare programs to pursue improved quality of life and balance work and personal life while strengthening collaborative labor management relationship.

#### **Promoting Employee Welfare**

Due to the characteristics of the water business that includes dams and waterworks, K-water's regional headquarters and management offices are scattered all across the country. To resolve housing problems for employees that have been transferred to different areas for work purposes, employees are provided with support for living and rental homes. A portion of home purchase loans are provided for to assist in purchasing private homes to ensure stable housing and living conditions. K-water received the Family Friendly Corporation Certification (November 17, 2009) by operating family friendly welfare policies and programs, including recreational facilities accessible to all family members, cultural & arts experiencing opportunities, writing classrooms & English camps for employees' children. It has undertaken active activities as a member of family friendly forum as supervised by the Ministry of Gender Equality & Family.

#### An Enjoyable Workplace opened through Smart Work

K-water has been fostering a smart management environment that allows employees to work creatively and intelligently without being hindered by time and place in response to paradigm changes in the way people work. To create a smart work environment, K-water has been operating 11 smart work centers within regional divisions and overseas operations (Thailand, Philippines). Mobile service systems have been developed, including customer service centers. We plan to continue expanding our mobile services offered for the general public, including bidding, leases, and 4-River use.

K-water also contributes to horizontal communication across employees by utilizing corporate SNS 'Yammer' and in the establishment of a Paperless Reporting culture. Additionally, we are test operating a policy that allows employees capable of smart work to work from their homes 1~3 days a week for periods within 3 months (possible to extend once).

#### **Development of a Self-Led Learning System**

K-water is helping employees continuously upgrade their capabilities by providing diverse training programs. A representative program is the Competency Reinforcement Plan (CRP), which helps individual employees enhance expertise in their specialized work functions on their own. The CRP is a 'T-shaped' personnel development concept. A 'T-shaped' employee refers to someone that is not only specialized in one's traditional sector, but is also well-versed in adjoining areas around the employee. It is a program that enables employees to acquire in depth knowledge in one area through expert training for a certain period of time when first entering the corporation. Once the employee reaches a managerial position, the employee is allowed to participate in training to expand his/her knowledge in a field that is relevant to the overall corporation.

#### Welfare Safety

K-water is creating a Great Work Place (GWP) for healthy people. Results of health examinations in 2011 showed that 63.9% of employees were Healthy (Grade A, B), while 36.1% were classified has possessing health diagnosis (Grade C2, D2). Compared to the previous year, the diagnosis group increased by 2.1%. Among all of those receiving examinations, the prevalence rate, or the ratio of those diagnosed with a disease increased, from 6.4% in 2010 to 9.2% in 2011. Within regards to this, smoke cessation programs, obesity clinics, and onsite employee weight control programs (Fat Loss Programs) are being offered to positive reviews in order to prevent adult diseases from occurring in healthy patients and to manage the health of employees shown to have health risks. In 2012, an integrated health management system was established for continuous

Category	Contents	Effects		
Health Management System	100% Database of individual health management issues	Provide real-time health information and consultations		
Comprehensive Health Inspection Policy	Support for health inspection	Early detection of cancer in 2011 was 12 cases		
Harmful Workplace Health Management Policy (11 places, including Tap Water Analysis Centers)	Work Environment Assessment     Conduct Specialized Health Diagnosis	<ul> <li>Measurement of work places, such as experimental labs</li> <li>Conduct specialized health diagnosis for 92 employees working in harmful workplaces</li> </ul>		
Smoke-Cessation Programs         • Operating Period : '11.3 ~ 9           • Participants : 21 people		<ul> <li>Success cases : 6 cases (37.5%) ⇒ 3 month post management(119 success cases in 5 years)</li> </ul>		
Obesity Clinics         • Operating Period : '11. 4 ~ 9           • Participants : 41 people		<ul> <li>Success cases : 7 cases (Average 7.4% reduction in body fat)</li> </ul>		
Fat Down Clinic	Operate visiting obesity clinics for offices with weak welfare environments	• 120 participants in 6 business sites		
Maternity Protection Programs	Support for advanced pregnancy screening     Provide female employee rest areas and breastfeeding areas     Innvide breast numbel	Minimize operational loss due to pregnancy     Encourage breastfeeding		

#### Integrated Operation of Health Improvement Programs

and systematic health management. We are also operating the smokingcessation and weight control program in addition to heart related health programs (exercise inspections, CPR classes).

#### **Development of an Advanced Labor Management Culture**

Established in 1987, the labor union can be subscribed to by employees of Grade 3 or lower. All employees become members upon entering the company. As of July 2012, 82.1% of our entire employees or 3,494 employees were members.

The organization has been contributing to increased corporate-level consensus based on strengthened mutual trust through improved policies, management explanatory sessions, and increased information sharing between labor and management through corporate-level cooperation systems. The unique labor and management cooperation system has organized and operated the practical team for system improvement, such as, personnel organization, organizational culture, welfare system, integrated water facilities operation and others to resolve management issues since 2006, resulting in improvement plans and step-based

#### execution of pending cases.

Particularly in 2011, the organization finalized a sisterhood relationship with the Daegu Dongu Multicultural Family Support Center to promote support for multicultural families and gathered various positive results that served to establish new paradigms for labor union activities, including 'Campaign to Find Missing Children', 'Agreement to Purchase Gift Certificates for Traditional Markets', etc.

At the same time, as 2012 will mark the first year of the  $\mathcal{G}_{\mathcal{G}}$  and the formation of the 9th Labor Union, labor and management have jointly declared a win-win relationship. K-water complies with Labor Standards Act Article 7, (Prohibition of forced labor) and strives to guarantee and improve the legal working conditions of laborers.



Cases, Cases of Labor Disputes in 2011



**GREEN** Society



#### National Project Mission Accomplished Through Win-Win Labor and Management

K-water has realized an advanced management labor culture through the creation of new labor management paradigms undertaken social contribution activities based on joint participation from labor and management, including 'Finding Missing Children by Utilizing Water Bills' and 'Agreement to Purchase Gift Certificates for Traditional Markets'. Labor and management become one to successfully complete key national projects, including the 4 Rivers Restoration Project through activities including 'National Project Success Hope Celebration' and 'Labor Management Unity Declaration for National Projects'. In all, labor and management plans to do its baset in pursuing init growth directions and a win-win labor management relationship based on



## **Social Contribution Activities**

K-water will lead the way in the establishment of an ecosystemic foundation and spread a culture based on sharing and social contributions.

#### **Promoting Strategic Social Contribution Activities**

K-water has set a vision, three major values, five major core areas and strategic directions uniquely to K-water's social contribution activities to fulfill its mission of creating a "Happier World with Water." K-water is also implementing its social contribution activities strategically based on choice and concentration strategies to achieve sustainable corporate development and fulfill its social responsibilities.



#### **Environment** · Culture Sharing

K-water has conducted projects to protect the river ecology and improve the environment to create clean rivers. Our projects to create beautiful dams, such as eco-friendly dam repair, operation of water culture centers, etc. serve to maximize the utility of dams while helping the general public learn more about dam functions. In addition, we have implemented water tours and held water culture events to inform people about the value of water and garner participation in cleaning the environment.

• Making a clean river: The maintenance project has been made for the lower streams of the rivers with 22 dams. The diverse efforts have been unfolded to make a clean river such as the unleashing 1.58 million native fries, and supplying of 71.091 million m<sup>3</sup> of water for the environment.

• Making a beautiful dam: The rest relaxation areas are provided to the residents by establishing environmentally-friendly spaces at 16 dams and operating the water culture halls in 13 multi-purpose dams. The dam arranging project has been expanded to 19 dam water areas by entering into an agreement with the Korea Forest Service until 2011. Rape flower seeds

were planted in flood control area in 3 dams of  $269,759m^2$  in 2011 and it provided environmentally-friendly areas for the people.

•Water culture sponsor: The high grade culture performances were provided for residents near dams and the clean water music concert and sponsoring local culture events have been performed for the activation of the local economy. In 2011, we have been cultivating and supporting water related sports sectors by employing disabled rowing athletes and swimming (synchronized) athletes. In addition, we have strived to increase awareness and interest in the importance of water within the general public through events as the Water-Tour experience and Water Love Exhibit Competition.

#### **Regional Communities Sharing**

K-water has operated the Filial Duty Welfare Centers (Hyonanum Welfare Center) and the Share Love Medical Center to improve welfare conditions for the elderly residing in areas nearby damns. We have also offered income support for youth and adolescents, Water Love scholarship programs for future generations and sponsorships for multicultural families to provide differentiated assistance suited to regional characteristics. At the same time, we have been delivering recycled PCs to social classes lacking access to information.

• Filial Duty Service (Hyonanum): K-water established the Filial Duty Welfare Center (Hyonanum Welfare Center) to improve the welfare of seniors residing in areas nearby dams by providing lifestyle based welfare services related to culture, medical needs and housework. The centers provide services, such as physical therapy and free meals with resident social works and physical therapists as well as senior protection and housework services for seniors with difficulty moving. As of 2011, a total of 8 centers are in operation. In addition, the 'K-water Love Water Medical Volunteer' program was established in conjunction with Korea Open



Doctors Society from 2009, helping residents nearby dams to receive free medical care. The program is being offered for 5,200 regional residents in 18 areas. Such efforts to improve the welfare for seniors were recognized to receive a Prime Minister Commendation (2 commendations) on Senior Citizen Day and a Ministry of Health and Welfare Minister Commendation (2 commendations) in 2011.

•Income Assistance: K-water provides support for jobs and income through a job placement/sharing program designed for youths and adolescents within dam areas. In 2011, a total of 715 people were first employed within subject regions for placement in various jobs, such as assistances and helpers for seniors and maintenance/repair personnel to improve neighborhood environments. In addition, an eco-friendly agricultural complex was created in dam regions subject to limits on agricultural production to protect water supply sources, which was used to improve the quality of water but also promote regional economic activities. In 2011, an eco-friendly agricultural complex of a size of 2.215 million m<sup>2</sup> was developed, in which various activities are being conducted, such as sales of eco-friendly agricultural produce, installation of sales networks for regional crops/produce.

• Water Love Scholarships: To minimize the education gap between dam areas and urban areas, K-water has provided native speaker language training for elementary school students, science classes for middle school students, and online education classes for high school students. In addition, K-water strives to improve learning conditions for students residing nearby dams by providing scholarships and meal service support, school supplies and textbooks to schools in remote areas.

• Support for Multicultural Families: With consideration for regional migrations and living conditions, K-water is providing living assistance, hometown visitation assistance, and Korean language training so that multicultural families residing nearby dams can stably adapt to society and achieve economic autonomy. In 2011, K-water provided assistance to 1,051 people in 12 dam areas.

• PC Sharing with Love: Starting from 2006, K-water has conducted repairs of aging PCs to provide assistance in accessing information and reduce differences in information access levels. PCs are being donated to low income families. In 2011, 477 PCs were donated to the Korea Culture Association for the Disabled.

#### K-water Water Love Volunteers

Established in July 2004, K-water Water Love Volunteers Group has 4,185 volunteers, or 99% of all employees of 2011. The volunteers have registered in 102 volunteer clubs and spent a total of 55,000 hours (13 hours per person) to conduct volunteer activities. A fund comprised of a set amount taken from employee salaries and matched by the company is being used as funding. We are operating various policies to support employee volunteer activities, such as a social volunteer management system to systematic manage volunteer activities and online classes to improve volunteer expertise.

#### Work Characteristic Sharing

K-water has strived to create a "Happier World with Water" by concentrating on social contribution activities that are suited with the characteristics of water sector specialists that stably supply clean water. We work to supply clean water that can be conveniently used by regional residents through support for drinking water for secondary school students, free water quality inspections for lower classes, and seawater desalination activities. At the same time, we have been working to spread our water related technologies and experiences by conducting classes with water sector technologies and skills.

• Clean Water Sharing: K-water has strived to create a world without water shortages based on circular inspection and regular water quality tests for water supply facilities for 65 elementary schools and secondary schools that use underground water. We have also conducted 1,095 free of charge water quality inspections. In addition, K-water operates and supports 40 desalination facilities in 9 cities and counties suffering from chronic water shortages while supplying clean and safe water service in remote areas and island areas.

• Water Education Sharing: K-water provides opportunities for children of lower classes to properly understand water through science experience camps. We have also spread our construction technologies and knowhows with water corporations and officials in overseas developing countries by conducting water related technology and management training and education.

#### The Global Sharing

As a global water specialist, K-water has strived to create a "World Happier through Water" by developing town waterworks facilities and supporting residential activities for people all across the world suffering from a lack of water. Starting with a drinking water project within in Tajikistan in 2006, K-water has conducted global social contribution activities by dispatching 180 volunteers to seven countries, including Cambodia, Vietnam, Philippines and Laos, until 2011. In 2011, we installed 50 ton water tanks and 6.4km waterways in addition to conducting medical volunteering and maintenance of public facilities in two villages within in Paksan District of Bolikhamsai Province, Laos. Such efforts was designated as an outstanding example of social contribution by the Council of Fair Social Practices within Public Corporations in 2011.

Details on social contribution activities of K-water can be viewed within the K-water website (http://www.kwater.or.kr).



Investment in Social Contribution Activities in 2011



GREEN Society

# **Activities of K-water Water Love Volunteers**

A happy society achieved with sharing and understanding together with K-water.

K-water Water Love Volunteers have undertaken service activities to contribute to improving local communities and the lives of citizens throughout Korea. It delivers love and happiness to local communities with its diverse activities, including helping needy neighborhoods, environment protection activities, disaster relief activities, contributions to local communities and much more.











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2	1	7		9
3		10	11	12
6	4	13	1	,
Ū	5	15	14	

- 1. Bathing Volunteers giving the Gift of a Clean Body and Mind
- 2. Filial Duty Welfare Center (Hyonanum Welfare Center) full of laughter and affection
- 3. K-water home nursing assistant acts as hands and feet for the elderly
- 4. Lively English class with native speakers
- Energy English cass with harde speakers
   Love Sharing Medical Volunteers giving a Helping Hand
   Meal Service Volunteers Serving People a Tasty Lunch
- Delivery of Coal with Care and Love
   Setting free young fish to protect native fish species

- 9. Technological Volunteers Helping Fix Areas Hard to Reach
- 10. Grand Cleaning Activities to Foster a Clean Environment
- 11. Assistance for Disaster Areas to Share the Difficulties of Regional Residents
- 12. Emergency Water Support for Disaster Areas
- 13. (Global Sharing) Laotian Children Pouring Cool Water in front of the School Water Area
- 14. (Global Sharing) Medical Volunteers Working for the Health of Children
- 15. (Global Sharing) Helping Hand in Installing Water Pipelines

















Water proceeds to one place. A drop of water comes together to become a stream, then a river, then proceeds to the endless ocean. Just like water that never yields in pursuing its objective, K-water will never yield in its pursuit of its goals to create a happier world with water.

# Proceed
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# Global Reporting Initiative (GRI)

#### Economy

#### **Direct Economic Effects**

#### O Economic Value Creation & Distribution

The comprehensive water resources industry, including dams, 4 Rivers Restoration Project, Gyeong-in Ara Waterway Project, and other water resource and waterworks businesses are businesses directly related to the national economy that efficiently facilitate limited resources in the creation of economic values.

The economic value generated in 2011 increased over the previous year regardless of whether private investments are included as a means to apply the K-IRFS(International Financial Reporting Standards selected for use in Korea). The distributed economic value increased as well. More than 96% of sales revenue generated in 2011 were invested in business expenses, capital expenses and others for production activities.

Economic Value Creation	(Ur	iit: KRW million)		
Category	2008	2009	2010	2011
Created economic value(1)	2,066,036	2,032,624	2,167,345	6,354,088
a) Net sales	2,044,533	2,005,384	2,144,750	6,325,786
b) Interest income, rent, and profits from sale of assets	21,503	27,240	22,595	28,302
Distributed economic value(2)	1,619,246	1,511,841	1,678,756	6,139,990
<ul> <li>a) Operating expenses: production costs, and asset purchasing expenses</li> </ul>	1,127,327	1,160,601	1,077,896	5,260,373
<ul> <li>b) Wage and welfare: wage, benefits</li> </ul>	303,943	285,818	341,990	357,221
<ul> <li>c) Capital cost: interest paid, dividends</li> </ul>	67,155	63,971	160,662	399,552
d) Taxes: corporate tax, local tax	65,033	26,176	37,708	68,159
<ul> <li>e) Investment in local community: contributions, various allotted charges</li> </ul>	55,788	61,051	60,500	54,685
Surplus economic value(1-2)	446,790	520,783	488,589	214,098

\* Standard applying the international accounting standard used in Korea from 2011 is applied

#### **Countering Climate Change**

#### O Financial Effects and Risks and Opportunities of Climate Change

According to forecasts of an acceleration of global warming by intergovernment bodies on climate change, IPCC (Inter-government Panel on Climate Change), and other international organizations, response to climate change has emerged as the priority agenda for the international community. In joining the efforts to respond to worldwide climate changes and realizing green growth, our government has completed a comprehensive plan for responding to climate change (Sep. 2008). K-water has established a strategy master plan (Dec. 2009) to respond to the climate change crisis and utilize it as an opportunity to generate a new growth engine.

In addition, K-water made the 527 km Management Declaration in August 2011 and has established action plans accordingly. Within the

new management strategy, we are planning to introduce an integrated water management system to better respond to the water management uncertainties within our time of drastic climate change. For such, K-water developed a multifunctional water management system in 2011. In addition, service contract size was increased from KRW 680 million in 2010 to KRW 1.01 billion in 2011 as part of the 'Green Technology Group' brand responding to low-carbon green growth. Additionally, K-water is at the forefront of our national low-carbon green-growth polices by developing new and renewable energy related technologies as Korea's no. 1 new and renewable energy corporation.

\*Refer to pages 50~51 for more information.

#### **Retirement Pensions**

In preparation for the possible retirement of employees, retirement provisions have been allocated in accordance with the Labor Standard Act. Taking the average wage of employees during their employment period and 3 months before retirement as considerations, K-water guarantees that employees will receive retirement grants on the date of retirement. K-water is considering converting the current retirement grant system into a retirement pension policy, which will be introduced after an agreement is reached with the labor union.

#### **Government Subsidy Benefits**

As K-water conducts national projects, a portion of project costs is supported by the government in the form of government subsidy benefits. For the past four years, K-water has received a total of KRW 256.1 billion in government subsidy benefits, KRW 12.8 billion for innovation city construction projects, KRW 80 billion for pure industrial water construction projects, and KRW 234.2 billion for financial costs for the 4 Rivers Restoration Project.

#### | Recipients of Government Subsidies |

11 678
678
19
3
4
47
11
000
294

#### **Market Status**

#### O Legal Minimum Wage Vs. New Employee Wage Ratio

The monthly wage for entry level employees with a university degree (level 5) is 205% of the legal minimum wage.

#### O Local Purchasing Policy

Purchasing by K-water is conducted through the electronic purchasing system and procurement purchases. However, to promote local purchasing by field offices, regional purchases is possible for construction contracts or merchandise purchases in amounts less than a maximum value amount set by the Korean government (Ministry of Strategy and Finance).

#### O Local Hiring for Domestic & Overseas Project Sites

In general, K-water ensures equal employment opportunities for all new employees, eliminating limitations on academic background, regionalism, and age. However, K-water hires local personnel for local waterworks meter reading personnel and water project operators. Since initiating local waterworks consignments in 2004, K-water hired 461 personnel locally as of the end of 2011. In addition, K-water has helped relieve youth unemployment problems and contribute to the development of the local communities by hiring a total of 725 young interns from 2009 to 2011.

#### Indirect Economic Effects

#### O Investment in SOC Facilities

In 2011, K-water has contributed to the national economic advancement by investing a total of KRW 5.5 trillion in SOC projects, including KRW 3.7702 trillion on facilities for water resource development in major policy businesses, such as key national projects including the 4 Rivers Restoration Project and Gyeong-in Ara Waterway Project as well as new dam construction, including Hantan-gang Dam and Youngju Dam and construction to increase the capacities of existing dams, KRW 188.7 billion in new and renewable energy facilities, including Sihwa tidal power and Sihwa Bangameori wind power, KRW 345.2 billion in waterworks construction, including waterworks facility construction and water distribution system adjustments and KRW 745.9 billion in new city construction and industrial complex development.

O Dam Environment Improvements and the Opening of the Water Cultural Center

The construction of a new dam takes environmental factors into consideration from the beginning. However, since existing dam facilities tend to be worn-out and obsolete, they are not able to provide much support to the local economy. Considering this, K-water is establishing comprehensive measures aimed to improve the environment of existing dams while substantially renovating the surrounding facilities. Some of these efforts include setting up observation decks, elevators and promenades. Water Cultural Centers are also either being newly constructed or renovated to create a resting area and cultural space for visitors.

#### O Assistance for Residents in Areas Nearby Dams

K-water has implemented its 'Support Businesses' since 1990 to increase the income and improve the welfare of residents in areas nearby dams. In 2011, it has structured a total of KRW 55.19 billion for the resident support business for local support business, resident welfare, and learning capabilities to improve the local environment and agriculture, livestock and fishery industry building up business. In particular, it enhances resident satisfaction through the tailored support business for each household by providing native English speaker education for elementary school students, job-sharing businesses for youths and adults, operation of Filial Duty Welfare Center (Hyonanum Welfare Center) to promote the welfare of seniors and to reduce the gap between urban and rural areas.

#### | Contents of Assistance Projects for Residents nearby Dams |

Categories		Contents			
Local Support	Income Enhancing Project	Agricultural and Livestock Industry, such as Farm Roads, Composts, Farming Facilities			
	Projects to Create Foundations for Livelihood	<ul> <li>Living Environment Improvement Projects such as Medical Equipment, Town Centers, and Town Access Roads</li> </ul>			
Resident Support	Local citizen Livelihood Support Projects	Medical Expense / Expert Health Support, Electricity Expenses / Living Expense Support & Job Sharing Projects			
	Child Raising Support Projects	Child Raising Support such as Education through Native English speakers, Scholarships, & School Meal Expense Support			
Other Support	Dam Reservoir Usage Fee Subsidy	Providing a 50% Subsidy for Local Governments using Dam Reservoirs			
	PR & Auxiliary Projects	Projects Reflecting the Dam's Characteristics such as Constructing Filial Duty Welfare Centers & Supporting Environment-friendly Farming			

#### O Supporting eco-friendly Agriculture in Areas Nearby Dams

Fertilizers, pesticides, and soil improvement works utilized for farming activities in areas adjacent to dams are non-point source pollutants resulting in water pollution including eutrophication, and turbid water in reservoirs. The 7.376 million  $m^2$  of land that has been designated as farm land from 2008 in the flood control land areas nearby dams are being encouraged to be converted into eco-friendly farm land. Through this conversion, pollution sources are minimized, helping preserve dam water quality. In return, K-water is helping farmers acquire eco-friendly certifications for their agricultural products, while helping enhance their income by securing sales channels. Farmers in areas nearby dams that are carrying out ecofriendly farming are cultivating potatoes, corn and other crops using organic methods. K-water is helping these farmers by providing eco-friendly farm equipment and natural compost depositories. In addition, to enable the agricultural products produced in these areas to acquire environmental certifications, K-water is providing eco-friendly agricultural technology through technology support agreements with Agricultural Technology Centers of local governments. To secure objectiveness in the credibility of agricultural products produced in these areas, K-water is providing support in inspecting agricultural products for residual agricultural chemicals and heavy metals and in acquiring eco-friendly agricultural product (no or low agricultural chemicals) certifications.

#### | Eco-friendly Agriculture Conditions & Plans |

1	0					
Category	2008	2009	2010	2011	~2013	Total
Conversion Area	1,170	1,468	1,396	2,215	1,127	7,376

### **Environment**

#### Use of Raw Materials

In 2011, 3.507 billion tons of tap water was produced. For detailed information on the quantity of source water used to produce water and materials, such as purification chemicals used for water purification, refer to page 57, Carbon Reduction Label. For details on purification and sewage sludge produced during the production process and the recycling of construction wastes, refer to page 76.

#### **Energy Saving**

#### O Energy Consumption Amounts

The total energy consumed in 2011 totaled 10,605TJ, an increase of 4.6% over the previous year. Most of the energy was used during waterworks processes, such as the intake and supply of water and the operation of pumps in pumping plants. Direct energy consumed through diesel and gas was 76TJ, while indirect energy consumption through electricity stood at 10,529TJ.



#### O Energy Reductions

Energy savings contribute to reducing green house gases and water production costs. To convert into a highly-efficient energy consumption structure, equipment should be inspected and energy efficiency assessments should be carried-out during the design stage, while power unit costs should be managed carefully for existing facilities as power unit costs comprise the largest portion of waterworks expenses.

#### O Energy Efficiency Enhancement in Dams & Waterworks Facilities

To reduce green house gas emissions and counter the energy crisis due to recent oil price hikes, improvements are being made to enhance energy efficiencies by deciding on optimal pump specifications and optimizing internal coating & pump operation scheduling. By enhancing the performance of multipurpose dam hydropower plants, K-water is contributing to the increased supply of clean energy domestically and effectively countering climate change. Accordingly in 2011, K-water has commenced the feasibility study on effects of greenhouse gas emissions by CDM Project with improved hydropower facility energy efficiency, which is scheduled to complete registration after passing registration review by the UN in 2012.

#### | Energy Savings Implementation Plan & Performance |

<ul> <li>Energy Expense Reduction through Equipment Improvements (Lighting Equipment)</li> <li>Operational Efficiency through Lighting &amp; Air Equipment Improvements</li> <li>Energy Reduction through Rational Utilization of Electrical Appliances</li> <li>Energy Consumption Total Amount Policy Management &amp; Energy Reduction Target Management</li> </ul>
<ul> <li>Develop &amp; Operate an Electricity Charge Calculation Program</li> <li>Revise Optimal Electricity Rate Contracts for each Project Site</li> <li>Apply &amp; Improve High Efficient Equipment such as Improving Capacity of Transformers</li> </ul>
<ul> <li>Equipment Improvement to Maintain a Load Power Factor over 95%</li> <li>Target Establishment &amp; Management of Dam Power Consumption Rate &amp; Savings Rate</li> <li>Expanding the Applications of New &amp; renewable energies</li> </ul>

#### | Energy Savings Implementation Performance |

Total Energy Savings in 2011	- Waterworks business energy reductions $\Rightarrow$ 12,056MWh
→ <b>18,364</b> MWh	- Power generation sector energy reduction $\Rightarrow$ 6,308MWh

#### | Total Energy Reductions by Division |



#### Water Usage

#### O Water Sources Affected by Water Intake

K-water initiated the Gyungnam/Busan Area Multi-regional Waterworks Project to supply clean water to the Gyungnam/Busan Nakdong River main stream area, an area with vulnerable water conditions.

Initially K-water had plans to supply water by developing the Namkang Dam water intake level and river bank filtration water. Due to concerns over increasing the intake level, however, plans to secure a water source through utilizing surplus Namgang Dam water and river bank filtration water was revised and a feasibility test was conducted. The Daap intake facility located in Gwangyang City, Jeonnam, supplies natural and industrial water to the Gwangyang Port area by intaking water from the Seomjin River. To minimize environmental effects and damage from sea winds, sufficient water from the rivers was secured and an environmental impact survey was conducted. Recently, changes have been occurring in the ecology as the river mouth of the Seomjin River converts into a sea, such as ocean organisms inhabiting the river mouth. Investigations on the causes of the phenomena were conducted, resulting in multiple factors, in addition to the Seomjin River water intake were the cause. Causes include a drop in the river bed due to rock extraction, an increase in the tide level due to the landfill of Gwangyang Bay, and Dam construction upstream. Through the urging of local citizens, K-water will initiate impact surveys on the damages caused to the fishing industry due to the intake from Seomjin River and construction of Juam Dam. Continuous monitoring of the changes in environment will also be carried-out.

#### O Reusing & Recycling Water

K-water has been collecting and recycling backwash water, with the recycling quantity being 18.806 million m<sup>3</sup> in 2011. For customers using recycled waste water, a rate reduction (30% off of water rates) policy is applied to increase the use of recycled waste water and to establish a circulation-type society. In 2011, customers using recycled waste water increased by 3.9% compared to the previous year, resulting in a rate decrease of KRW 3.7 billion.



#### **Preservation of Bio-diversity**

Diverse activities are being implemented to preserve bio-diversity, including designing, constructing & operating eco-friendly water resources facilities, creating bio-diversity preservation facilities & space, and preserving the habitat environment of organizations & natural cultural treasures. Detailed information related to bio-diversity identification, continuous environmental monitoring of management plans & project areas, and identification of species in danger of extinction, can be found on **pages 54~55**.

#### Green House Gas Emissions

#### O Total Green House Gas Emissions

Total green house gas emissions in 2011 reached 551,395 ton  $CO_2$ , a 4.5% increase over the previous year. This was mainly due to the increase in power consumption stemming from an increase in water supply. Direct green house gas emissions from the usage of diesel fuel and gas increased to 3,961 ton  $CO_2$ , while indirect green house gas emissions

from the use of electricity increased to 547,434 ton  $CO_2$  over the previous year. In addition, indirect green house gas emissions from transportation of employees & executives to and from work, and business trips were 2,037 ton  $CO_2$  in 2011.



#### O Green House Gas Reduction Project & Performance

Refer to **page 34** for details regarding K-water's CDM projects & performance.

#### **o** Quantity of Ozone Layer Destroying Substance & Air Pollution Substance Emissions

There are no processes in the production of water that emits ozone layer destroying substances, such as Freon gas. There could be potential leakages from cooling facilities that contain Freon gas. To prevent this from occurring regular safety inspections are carried-out on all cooling facilities. At the same time, there are no production processes that directly emit air pollution substances at any of the K-water project sites. However, there could be air pollutants emitted while using oil to operate the project sites and facilities. To minimize this, the departments implement diverse activities to reduce the consumption of kerosene by reflecting this into each department's environmental target.

#### | 2011 Air Pollution Discharge Status |

				(Unit: kg)
Particulate Matter	SOx	CO	НС	NOx
26	133	2,965	829	7,001

#### Total Waste Water Discharge Quantity & Water Quality

As the amount of water discharged from water purification plants and its quality directly affect the water quality of rivers and the ecological environment, K-water applies management standards stricter than legal standards. To minimize effects on the ecological environment within water discharge areas and preserve water quality in rivers, the quality of discharged water is continuously monitored by a water quality remote inspection system. By selecting discharged water quality as the waterworks project environmental target, and as a core index of the environmental performance evaluation, K-water started reflecting the target and index in departmental evaluations from 2004.



#### O Water Purification Plant

In 2011, the average quality of discharged water from water purification plants was BOD 2.0mg/L, COD 4.0mg/L, SS 3.1mg/L, which was only 10%, 10%, and 16%, respectively of the discharge tax levy standard of BOD 20mg /L, COD 40mg/L, and SS 20mg/L.

#### O Sewage Treatment Plants

In 2011, the average water quality of discharged water from the 20 sewage treatment plants over 500 tons were BOD 2.6mg/L, COD 7.7mg/L, SS 2.8mg/L, which was similar to the public sewage treatment facility discharge water quality standards of BOD 10mg/L, COD 40mg/L, SS 10mg/L 26%, 19%, 28%. Dr.WW, an internally developed sewage treatment program, has stood at the forefront of improving the quality of discharged water.

#### O Simple Sewage Treatment Facilities

The average water quality of discharged water is BOD 6.5mg/L, SS 6.5mg/L, which is within 32% and 32%, respectively of the legal standards of BOD 20mg/L and SS 20mg/L.

#### **Discharging & Recycling Waste Products**

#### O Sludge from Waterworks & Sewage Treatment Systems

In 2011, the amount of sludge produced from purifying  $1m^3$  of water was approximately 73.1g. The total amount of sludge produced at water purification plants for one year was 131,615 tons, with 100% of the sludge

being recycled and used as cement material (76.7%), planting soil (13.5%), potting soil (7.1%), and cover materials (2.5%).

Sludge produced at sewage treatment plants operated by K-water was 44,288 tons. From the total amount of sludge produced, the percentage of sludge recycled increased 4% to 40% of total sludge, or 17,671 tons, based on active efforts in the utilize of sludge as a resource and in strict compliance with the prohibition of ocean disposal. The sludge was mostly used for planting soil, fertilizer, earthworm breeding. K-water will gradually increase the recycling rate of sludge by converting sludge into a resource and to prevent ocean disposals.



#### O Recycling of Construction Waste Materials

By promoting the eco-friendly treatment and recycling of construction waste generated as a result of K-water's water resources business, K-water is contributing to the green preservation of the country, resource reductions and public welfare enhancement. The total construction waste generated in 2011 was 583,591 tons and from this 93.8% or 547,556 tons was used as road pavement material, material for creating green tracts of land through mounding and soil covering, recycled rock, and wood chips. Going forward, K-water will minimize construction waste generation and create a resource recycling green society by "initiating designs for an environment that can coexist with nature" from the construction business planning stage, and "realizing a productive construction site through the recycling of construction waste" during the construction stage.

#### |Results of Recycled Construction Waste Materials|

Classification	Total	Waste Concrete	Waste Ascon	Waste tree and plant	Waste synthetic resin	Combine waste materials and others
Created quantity (tons)	583,519	312,996	187,295	20,315	10,166	52,747
Recycled quantity (tons)	547,556	312,996	187,295	19,992	79	27,194
Recycling ratio (%)	93.8	100	100	98.4	0.8	51.6

#### Effects from Hazardous Material Spillage, Waste Material Treatment, Sewage Water

O Hazardous Material Discharge Management

Hazardous materials such as waste oil and chemical substances

discharged from the project sites can have a serious effect on the surrounding environment, bio-diversity and health of local citizens. All hazardous substances from K-water's project sites are strictly treated according to related regulations. As of now, there have been no cases of accidents due to any leakages of hazardous substances. However, K-water is enhancing its ability to take measures to counter potential accidents by establishing an accident manual and holding regular training activities to prepare for hazardous substance leakage accidents.

#### O Waste Material Discharge Management

As a result of the London Dumping Convention (1996) banning the dumping of waste materials into the ocean, there was an amendment of enforcement regulations in the Maritime Pollution Prevention Law (Ministry of Maritime Affairs & Fisheries Regulations No. 330 on February 21, 2006). As a result, disposing sludge from purification plants into oceans has been banned as of 2007. Since 2006, all sludge generated from purification plants has been recycled, and no sludge is exported.

#### | Response System for Harmful Substance Emission Accidents |



#### **Products & Services**

#### O Environmental Impact Reduction Activities & Performance

K-water is continuously achieving high-level environmental performance through a dynamic circulation process of P (Plan), D (Do), C (Check), and A (Action) that reflects the prerequisites of ISO14001. In 2011, 30 environmental targets in 8 categories were set while 98.9% of the targets were achieved.

#### | Green Management Procedure |



#### | 2001 Green Management Performance Results |

	3 Cases of Design for Environment (DfE)
Eco-friendly -	22 Cases of Environmental Impact Assessments by Projects
	7 Cases of eco-friendly Development
&	8 Cases of eco-friendly Management of Facilities
Management	77.0% Achieved in Management of Revenue Water at Local Waterworks
	17 cases of Carbon Reduction Label Certificate System
	KRW 98 billion Environmental Investment
	Improvement in the Quality of Dam Water (Average COD 2.8mg/L)
Supplying	Improvement in the Dam watershed Area Sewage Treatment Rate [57%⇒68%]
Water	Tap Water Quality Improvement Level 50% Settled Water Below 1NTU 98%
	Alleviate Distrust towards Tap Water (Supplied 10,770 bottled waters)
Production &	Production of Hydropower Energy (2,799GWh)
Consumption	57 GWh for solar energy, wind power and others
eco-friendly	CDM emission rights 4,773 CERs
Products	Green Purchasing (KRW 17.7 billion)
	Reduction in the Cost of Chemicals for Purification of Water (KRW 7.49/m³ - Chemical Unit Cost)
Resource	Electricity Consumption at Project Sites (reduction of 18,364 MWh)
Conservation	6% Reduction in Oil Consumption against Target
& Recycling	Reduction in Usage of Backwash Water at Water Purification Plant (1.25% of Clean Water Production)
	Reduction in food waste (discharge of food leftovers generated from head office 293kg/day)
Reduction of	Control of Discharged Water Quality From Waste Water Treatment Facility (BOD 6.5mg/L (under 10 mg/L), SS 6.5 mg/L(under 10mg/L )
Pollutant Discharge	Reduction in Discharge of Sludge From Water Purification Plants [Discharge of Sludge: 0.07kg/㎡]
Environment,	Training for Water Quality Accidents (104 cases)
Safety,	Industrial Disaster Ratio : 0.12%
Management	Fines Paid for Violating Environmental Regulations 0 Cases
Strongthoning	Environmental Volunteer Activities 189 Times
Cooperation with	Council (Sihwa, Daechungho) Activities, & Participation & Support of Various Events 19 Cases
Civil Society	Support Water Resources Facility Tours (Water Tour 24,802 Visitors)
	Promoting Taking Care of Forests (area 198,000ha)
Other Environmental - Management Activities	Transparent Disclosure of Environmental Management Performance, Publishing the Sustainability Report & GRI Reporting Registration (A+)
	Development of Water Resources in Underdeveloped Countries (11 Overseas Projects/ KRW 563.4 billion)
	95 published thesis and 100 cases of research technology development/ intellectual property rights

#### Legal Compliance, Transportation, Environmental Accounting

#### O Legal Compliance

No fines or cases of non-monetary sanctions were levied due to environmental regulation violations in 2011.

#### O Environmental Effects from Transporting Employees & Executives

The results of analyzing the environment effects caused by transportation, such as employee business trips, showed emissions of 4,072kg of air contaminants, such as SOx. The use of commute buses and public transportation is being recommended to minimize environmental effects.

#### Air Pollution Materials Discharged during the Transporting of Employees & Executives

Particulate Dust	S0x	СО	нс	NOx
192	1,362	481	54	1,923

※ Ministry of Environment Announcement 2009-30, The Discharge Index of the partly revised policy toward the method of calculating the total automobile pollution substance discharge amount was applied.

#### O Expenditures for Environmental Protection and Total Investment

For more information on environmental accounting, including environmental investments and environmental costs, refer to **page 47**.

### Labor

#### **Employment Conditions**

The total number of employees working for K-water is 4,200 (based on full time positions as of December 31, 2011), including seven executives. Departments with similar functions were integrated to strengthen global competitiveness while human resources operation was increased in efficiency by simplifying organization ranks. A total of 173 personnel [141 males, 32 females] was publicly recruited in 2011 to improve organizational activities through involvement in large scale national projects.

#### | 2011 Employees & Executives (Personnel) Ratio |





#### | Number of Employees & Executives by Age Group |







| Personnel Status by Region |





#### O Employee Turnover Rate

Efforts to improve the Efficiency of Public Enterprise Management is being conducted from 2009 to 2012. The turnover rate of employees for 2011 was 2.95% (124 employees), an increase of approximately 30 employees over 2010 caused by an increase in the number of age-limit retiring employees.

#### | Employee Turnover Rate |



| Status of departure in 2011 |

turnover (age-limit retirement)

1 Status of ucp			(Unit: people	
Category	Total	General position	Special position	Expert position
Total	124	70	7	47
Male	117	65	7	45
Female	7	5	-	2

#### O Employee Welfare Policies

In addition to the legally guaranteed four major social insurance coverage for full-time employees, a variety of welfare policies are being provided to increase productivity by helping stabilize living conditions, enhancing quality of life and providing incentives. In addition, maternity leave is being offered to all 100% of male and female employees.

#### | Maternity Leave Status |

					(orne people)
Category	Total	2008	2009	2010	2011
Maternity Leave	43	8	3	8	24
Male	7	1	1	2	3
Female	36	7	2	6	21

#### | Employee Welfare Policies |

Category	Contents
Contents	<ul><li>Home Purchase Loans</li><li>Company–owned Housing such as Dormitories</li></ul>
Education	<ul><li>Tuition Support for Middle and High School Students</li><li>Financial Aid for College Tuition</li><li>Head Office Child Day Care Center</li></ul>
Health Management	<ul> <li>Health Examination &amp; Health Management Programs (Non-smoking &amp; obesity clinics)</li> <li>Head Office Medical Infirmary &amp; On-site Safety / Health Personnel Designation Policy</li> <li>In-house Dentist and Oriental Medicine Clinic</li> </ul>
Maternity Protection	<ul> <li>Providing Feeding Rooms and Female Employee Resting Area</li> <li>Interim Workforce for Maternal &amp; Child Care Leave Employees</li> </ul>
Disaster Compensation	<ul> <li>Disaster Compensation Policy for Work–related Disasters</li> <li>Support for Difficult–to–cure Diseases such as Cancer &amp; Group Insurance Policy</li> </ul>
Others	<ul><li>Physical Training Center</li><li>Club Activity Support</li><li>Funeral Articles Support</li></ul>

#### Labor-Management Relations

In accordance to Article 35 of the Labor Union & Labor Related Conciliation Law, the rights to collective bargaining and to negotiate collective agreement are guaranteed for all employees. The current labor union membership rate is 82.1% as of July 2012. Based on Article 21 of the Collective Agreement (Responsibility to Notify), any changes made to labor conditions or the Articles of Incorporation should be notified to both parties without delay.

#### Workplace Safety & Health

The Labor-Management Joint Project Safety & Health Committee was replaced by a Joint Labor-Management Council, which is comprised of 8 members each from labor and management. The council opens meetings quarterly to discuss management issues. Through the Council, sufficient explanations on management issues are provided, and labor management disputes are reduced while achieving mutual benefits for both labor and management by enhancing productivity and welfare standards for employees through mutual discussion and understanding. To ensure workplace health & safety for project sites with over 100 employees, a joint labor-management Industrial Safety & Health Committee has been created to discuss industrial safety & health issues within the workplace.

#### O Safety and Health Issues From the Labor-Management Meeting Agendas

Improvements to the maternal instinct protection system	<ul> <li>Improvements to the child nurturing support system</li> </ul>		
Specialized employee inspections     within harmful environments	<ul> <li>Improvements in the operation of medical facility in headquarter</li> </ul>		

have been imple mented and strengthened to prevent safety accidents while policies on performing accident prevention activities during operations and the stable return to work for injured employees are being operated.

Great results were achieved by conducting strict health inspections for early discovery of diseases, smoke cessation programs and obesity clinic for systematic management by care takers.

#### Injuries, Occupational Disease, Lost Work Days, Work–related accident rate and Prevalence Rate

#### | Injuries, Occupational Disease, Lost Work Days |



#### Disease Prevention & Risk Management Program for Employees & Local Citizens

K-water operates an employee counseling support program for employees and their families, and a 'Filial Piety Sharing Welfare Center (Hyonanum Welfare Center)' to enhance the welfare of regional senior citizens.

#### O Ombudsman window

Through the Ombudsman window in HR-BANK (Human Resource Capital Management Integration System), K-water has strived to aggressively resolve the problems of employees. detailed matters are referred to on **page 60** (Human Rights and Respect for Diversity).

#### O Filial Duty Welfare Center (Hyonanum Welfare Center)

In order to relieve senior welfare issues in dam areas with a relatively higher ratio of elder citizens, K-water established the Hapcheon Dam Filial Duty (Hyonanum) Welfare Center in 2006, with a total of 8 centers currently in operation. By implementing various programs, such as dispatching home volunteer service member, weekly care, and leisure welfare businesses, we have strived to resolve regional senior welfare issues while working to improve the satisfaction for local residents each year through the consignment of superior senior welfare institutions within surrounding areas.

#### **Education & Training**

| Annual Average Training per Employee |



| Annual Average Training per Person by Grade |



#### O Evergreen Program for Retirees

An 'Evergreen Program' is being operated to effectively prepare employees planning for retirement. K-water has been providing assistance for that retiring employees can prepare for a second life through training courses related to change management & personal finances, real estate, and start-ups.

#### O Subjects of Performance Evaluation

All employees receive regular performance evaluations. In the case of executives (Vice President), management contracts are entered with the President to determine the personnel and performance level in accordance with the internal management performance evaluation, such as, Division evaluation, department evaluation, and team evaluation for departmental heads and lower ranks. The evaluation categories consist of a department core index and company-wide common index in accordance with the four key viewpoints (customer, finance, process and learning growth) of BSC (Balanced Score Card).

#### **Diversity & Equal Opportunities**

#### O Employee & Executive Composition

As of 2011, the ratio of male and female employees stood at 89.3% (3,751 employees) and 10.7% (449 employees), respectively. Although the ratio of female employees is relatively low, K-water established a female employee hiring quota system from 2004, with the number of female employees standing at 449 as of December 2011. Among them, there are

five employees in directors and team manager (Grade 2) positions and 29 employees in manager (Grade 3) positions.

| Employee Composition |



O Base Salary Comparison

In cases when the position and date of company entrance is the same, similar base salaries are being paid to male and female employees.

### **Human Rights**

#### **Investment & Procurement Practices**

In the preamble of K-water's Ethical Principles, in addition to clearly stating the principles of respect for human rights, a clause is included that states that individual diversity and dignity are respected. It is stipulated so that all management activities are carried-out based on the principles of human respect.

#### O Human Rights Review on Investment Agreements

Since the overseas projects that K-water is involved with are small investment projects that are mostly Official Development Assistance (ODA) projects and engineering (Survey & Design, Construction Inspection) technology export projects, the projects do not include a clause related to human rights protection. However, K-water is scheduled to review the inclusion of human rights protection clauses in future direct investment projects and its decision-making process.

#### O Human Rights Review for Contract Companies

When conducting transactions with companies, such as construction, service and merchandise suppliers, the contract review standard is set to exclude unfit companies and by comprehensively reviewing the financial soundness, corporate credit rating, quality and supply performance to substitute for human rights review. In particular, the accident rate is included in the pre-qualification for bidding participation (PQ) for major projects to strengthen the human rights and labor part review, preferring companies with lower accident rates. In addition, when entering into the private contract for protecting the socially vulnerable classes (general project: KRW 200 million, specialized project: KRW 100 million, electric

communication project and others: under KRW 80 million), products from women corporations and social corporations are purchased with priority and leads the protection of equipment and material suppliers and construction workers through substantive performance of payment confirmation system for subcontract payment. In addition, for protecting the human rights of temporary workers in construction, K-water reflects the social insurance premiums (health insurance and national pension) on the cost of work and settles them at the time of project completion as a means to increase the payment rate of worker's compensation insurance premium for contract parties. Starting from the first half of 2012, the scope of such post-compensation of insurance payments is being extended to serve and merchandise purchases.

#### O Human Rights Training

Currently, human rights training courses focus on protecting the rights of minority employees, such as company-wide sexual harassment prevention training and personal information protection training. In the future, K-water plans to continue expanding the contents of human rights training. For more details, please refer to **page 60** of this report.

#### Anti-Discrimination

In K-water's Ethical Principles, it is clearly stated that individual personalities are to be respected, and that there should not be any discriminatory treatment. Through this, K-water complies with ILO policies (No. 111, "Convention on Discriminatory Treatment of Employment & Work"). To protect the rights of minority employees including the disabled, female, and & non-regular employees, various measures are being implemented, including the expansion of employment opportunities for minorities, reduction of work hours for child care purposes, and securing interim workers in case of child caring or maternity leave. A Gender Equality Department was created in the labor union to protect the rights of female workers. For further details, please refer to **page 60** of this report.

#### Freedom to Form Organizations & Collective Bargaining

Based on the 3rd Labor Standard principles from the 10 principles of the Global Compact, the right to form organizations in collective agreements and collective bargaining is guaranteed. There are no grounds for infringing on these rights at any of the project sites.

#### **Eradication of Child Labor**

K-water prohibits the use of child labor at all project sites and there have been no cases of child labor in any of K-water's project sites. Through regulations on the prohibition of child labor, anyone under the age of 15, or students in middle-school under the age of 18 are prohibited from employment. All new employees are required to provide documents that demonstrate their age. Through these efforts, K-water is faithfully abiding by the 5th Labor Standard principles from the 10 principles of the Global Compact.

#### **Eradication of Forced Labor**

K-water complies with Korean Labor Laws and ILO policies (No. 105, "Convention on Eliminating Forced Labor") to prohibit forced labor. K-water is faithfully abiding by the 4th Labor Standard principle from the 10 principles of the Global Compact.

#### **Security Practices**

K-water has been development infrastructures for the protection of personal privacy and regularly conducting information security education and training. K-water has been systematically managing personal information protection by establishing personal privacy protection standards in addition to operating personal information exposure inspection solutions and privacy protection systems. For more details, please refer to **page 60** of this report.

#### **Rights of Local Residents**

As an SOC investment related public corporation that oversees the construction of dams, waterworks, and complexes, there are inadvertent disputes with local residents in the process of implementing projects. As most are related to property compensations, a total of 56 lawsuits occurred in 2011 (44 cases related to property compensation). Nonetheless, K-water strives protect local citizens that must leave their residences while working to resolve the cases expediently. As part of a support package provided to local citizens forced to emigrate from their residences for construction, K-water is providing a variety of benefits to local citizens through various support projects for local residents.

#### Society

#### Impact on Local Communities

O Environmental Assessments by Project Stage & Local Environment Management Taking the environmental & social effects by project stage into consideration, K-water has been conducting sustainable water resources development. From the administrative planning stage of a water resources project, suggestions & opinions from local citizens are collected. At the same time, a local council is established based on participation of local citizens and project related parties to alleviate various problems that might affect the local community. In addition, when participating in overseas water resources development projects, such as Pakistan and Cambodia, K-water is contributing to the sustainable development within the subject country by conducting environmental assessments to implement sustainable development from the planning stage.

#### O Strategic Environment Assessment

As a strategic decision-making support measure taking into consideration administration planning, the first stage in each development project, to environmental, economic and social effects, the environmental feasibility of a plan must be secured so that it contributes to an environmentally rational dam candidate location and selection process achieved through strategic environment assessments conducted since 2007.

#### O Pre-Environmental Review System

As a policy to prevent any environmental effects through the establishment of environmentally desirable administrative plans and development plans by reviewing the environmental effects and appropriateness of the selected development site based on administrative plans, which is the higher ranking stage of development projects, and development plans, the prior environmental review helps in selecting an eco-friendly site when establishing basic plans for the construction of dams. A preenvironmental review was conducted during the decision-making process for national projects, such as the Andong-Imha Connection Project, Yeongju Dam Road Relocation Project, and River Improvement Projects (Gunnam Dam, Milyang Dam, Pyeongrim Dam) of 2011. Such reviews facilitated the decision-making process by taking into consideration the economical, technological and environmental factors.

#### | K-Water Environment Assessment Process |



 Operation of cultural heritage conservation and damaged environmental restoration program

#### O Environmental Impacts Assessment

.....

As a policy to minimize environmental impacts by forecasting  $\cdot$  evaluating environmental effects from the actual design stage of a development project

and by identifying ways to reduce impact on the environment, K-water strives to protect the local environment by pursuing for appropriate reduction methods through environmental impact assessments when establishing plans for the construction of industrial complexes, cities, dams and roads. In 2011, environmental impact assessments were conducted for large scale national projects, such as construction of Dongseo (East West) Access Roads and National Highway No. 77 of the Songsan Green City Project, while environmental impact reduction measures were established through the development of eco-corridors and alternative habitats for endangered wildlife.

#### O Post Environmental Audit

Through environmental impact assessments, an environmental audit is conducted from the start of construction until the fifth (5th) year of construction within sites to monitor strict compliance of agreements as well as to prevent potential environmental impacts from construction and operations. Measures were established to minimize the environmental impacts by initiating post environmental audits on 16 projects including the Gunwi Multipurpose Dam, 4 Rivers Restoration Project, Sihwa Hydropower Plant, etc in 2011.

#### O Environment Restoration & Cultural Treasure Preservation

Efforts are being taken to restore local environments by creating ecofriendly facilities such as eco-corridors, fish ways and substitute habitats to prevent changes in the environment from water resources development projects, and to secure ecological soundness. As can be seen through the Jangheung Dam Prehistory Cultural Park and the Daegok Dam Cultural Exhibition Hall construction, K-water is placing its efforts on preserving local cultural assets that can be potentially submerged or damaged.

#### **Corruption Prevention**

#### O Efforts to Discover Corruption Factors and Removal Methods

We have improved operational transparency and strengthened anticorruption internal controls by discovering · improving areas with potential corruption vulnerabilities and self-regulating improvement tasks. In 2011, from its 87 self-regulated system improvement tasks, K-water has implemented 25 tasks, such as the introduction of a total business expense review system for preventing budget waste, enhancement of transparency in bidding by structuring the illegal bidding prevention system, and others. K-water was recognized for its outstanding results for system improvement by the Anti-Corruption and Human Rights Commission in February 2012.

#### O Operation of Corruption Impact Assessment System for various Internal Regulations

We are operating a 2-phase corruption assessment system that strengthens the appropriateness and transparency of internal regulations through reasonable analysis and evaluations of potential corruption factors within internal regulations. Through effective execution of the autonomous corruption assessment system, we have revised 19 potential corruption factors in 2011 as a means of advanced prevention.

#### O Strengthening of Integrity Monitoring for Corruption Prevention

By utilizing CAATs (Computer Assisted Audit Techniques), k-water has advanced its internally-developed intelligent monitoring system WARN (Wide Audit & Risk Network) so that 75 risks of 43 management systems are monitored in daily units to strengthen our corruption prevention function (in 2011, real-time resolution of 204 abnormal conditions). At the same time, K-water operates 'integrity call' and 'integrity envelop' for aggressive gathering of customer opinion on fair, transparent and corruption experience cases related to major civil works of the public corporation to strengthen communication with customers by preparing customer complaints and its related improvement plans.

# • Establishment and Expansion of an Honest Organizational Culture through Communication–centered Integrity/Ethics Training

K-water has strived to establish honest and integrity based leadership by creating an Integrity/Ethics video featuring the CEO and Auditor General to distribute and share online while making management-level Integrity training (10 hours completion) mandatory. In addition, a situation-based, easy to understand 'behavioral practice manual' was produced and distributed based on strategies to prevent potential behavioral violations. Special training and ethics classes were held for a total of 21,345 personnel in 2011 as part of efforts to establish and spread anti-corruption and an honest organizational culture.

## O Selection as an outstanding institution for integrity in the public sector based on comprehensive integrity measurements

Based on various corporate-level efforts, such as strengthening employee ethical levels by introducing improved ethics guidelines and regulations, self-purification activities by introducing an internal public service notification 3rd Party Support System (confidentiality assured), selfdiagnostic corruption-risk warning system, increased assessment and subjects for assessment for upper levels, continuous improvements to inferior areas through corruption risk investigations, and strengthened full-time monitoring, K-water was designated as an outstanding institution (II Grade) for Overall Integrity for the second consecutive year within the Government Integrity Survey conducted by Anti-Corruption and Civil Rights Commission in 2011.

# **o** Selected as an outstanding institution for 6 consecutive years in corruption prevention policy evaluation

With aggressive participation by all officers and employees in anticorruption and integrity activities and its drive for powerful transparent management by the CEO, K-water has received an 'outstanding' grade for anti-corruption action implementation from the Anti-Corruption and Human Rights Commission in 2011 based on an assessment of 208 nationwide public enterprises. Of the 208 institutions, there are only five institutions, including K-water, which has received special recognition as an outstanding institution for 6 consecutive years.

#### Participation in Public Policy

K-water works very closely with related government organizations such as the Ministry of Land, Transport & Maritime Affairs and Ministry of Environment when establishing water resources related policies and enacting / revising related laws. In addition, employees are being dispatched to various organizations, such as The Office of Government Policy Coordination, Ministry of Land, Transport and Maritime Affairs, and the Anti-corruption & Civil Rights Commission.

Since it is prohibited for legal entities to provide political donations or making donations of any kind under its name is prohibited by K-water.

#### Anti-competitive Behavior & Legal Compliance

In accordance with monopoly regulations and fair trade law, K-water observes fair trade. K-water receives regular audits from the Fair Trade Commission to search for any unlawful competitive behaviors or antitrust activities. There have been no items that have been pointed out over the past 4 years, and K-water has in no way been levied fines or non-monetary sanctions due to violations of laws or regulations.

### **Product Liability**

Through the Customer Charter, based on a management philosophy that believes the customer's value is K-water's value, K-water is practicing a customer-oriented management system to get a step closer to customers.

#### **Compliance with Customer Health & Safety**

Within the IWTA, International Water Treatment Alliance program sponsored by AWWA, K-water acquired a "5-Star" grade in 2009, signifying the highest quality. In 2011, 16 purification plants achieved 5-star quality levels. K-water strives to continue strengthening our global safety and environmental grades for tap water by increasing such quality levels across all of our plant facilities.

Since 2003, targeted towards all multi-regional purification plants, K-water has been operating a water quality rating system internally on 14 items, including turbidity, residual chlorine, taste, smell and disinfection by-products. The evaluation standard that K-water applies is stricter than legal standards. In accordance to the internal 'Service Implementation Standards,' the frequency of cases of nonconformity in regards to water quality standards is managed by K-water. There have been no cases of violations in 2011.

#### **Product & Service Labeling**

To satisfy the diverse needs of customers, customers have been segmented into groups, and customized services are provided to customers. A monitoring and feedback system has been established to analyze customer satisfaction. There have been no product and service labeling related regulations that have been violated. For detailed information such as customer satisfaction level assessments, please refer to Customer Satisfaction Management on **page 24**.

#### **Marketing Communications**

Efforts are taken to provide accurate information to customers so as not to effect their judgement. Related regulations and company-wide work principles are observed, including marketing communications such as advertisements, promotions and sponsorships. For all advertisements, such as property sales advertisements, an internal selection standard is applied in selecting the advertisement medium to ensure impartiality. K-water observes the review regulations and laws of the Korea Advertising Review Board. There have been no cases of any violations related to marketing.

#### Customer Privacy Protection & Compliance with Supply-related Regulations

Customers' personal information is protected by establishing customer & data base security policies such as Access Restrictions, Authorization Controls and Post Audits. In relation to protecting customer personal information, there have been no cases of complaints by any customers. To expediently process civil complaints, K-water applied stricter internal standards, resulting in K-water achieving a timely processing rate of 99.9%. Customer complaints are being minimized by observing service implementation targets that have been detailed by work sectors through the revision and implementation of the Customer Charter. K-water is striving to provide answers to concerned customers in a timely manner by operating a dissatisfaction receipt window that is open and accessible at all times on K-water's homepage (Customer's Voice, Bulletin Board). The dissatisfaction items received are utilized as a precious resource to identify management improvement projects. There have been no fines paid as a result of violations of laws and regulations related to products and services.



# **Financial Performance**

Through increased sales for new businesses, including increased water, dam water supply and an increase in power generation, and local waterworks, the total sales reached KRW 2.4002 trillion, an increase of 11.9% over the previous year. When including private investment projects in accordance with K-IFRS, sales reached KRW 6.3258 trillion. Even with the freeze in charges for the seven consecutive years, sales revenue continued to increase to result in a net income of KRW 293.3 billion, a 106.4% increase over the previous year. In 2012, continued growth and profitability is expected based on increased investment in green technology sectors, strengthened competitiveness against climate change, customer-oriented management, and vitalization of new growth motors, such as new and renewable energies.



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# Consolidated statements of financial position 38th Term (Current) As of December 31, 2011, 37th Term (Previous) As of December 31, 2010 Company: Korea Water Resources Corporation and Subsidiary Corporations

(Unit : KRW)

Catagory	38th Term (Current)		37th Term (Previous)	
Category	Am	ount	Amo	ount
Assets				
I. Current assets		4,352,289,094,762		3,431,064,901,736
1. Cash and cash equivalents	215,555,164,692		177,023,465,063	
1) Cash	215,555,164,692		177,023,465,063	
(1) Cash on hand	4,890,831		166,100	
(2) Other demand deposits	215,550,273,861		177,023,298,963	
2. Current financial assets	15,740,004,879		65,573,576,397	
1) Current derivative assets	15,740,004,879		65,573,576,397	
3. Trade and other current receivables	468,959,225,346		360,140,377,442	
1) Short term trade receivable	421,435,825,177		317,676,224,445	
(Allowance for doubtful acccount)	(23,973,870)		(471,251,242)	
2) Short term other receivables	58,011,403,758		52,679,517,298	
(Allowance for doubtful acccount)	(22,311,923,020)		(16,006,687,831)	
3) Short term accrued income	11,700,941,760		6,128,019,536	
4) Short term deposits provided	146,951,541		134,555,236	
4. Inventories	3,503,777,564,609		2,793,820,283,198	
1) Raw materials	2,554,469,748		2,428,098,686	
2) Finished goods	3,495,657,138,869		2,786,506,686,583	
3) Supplies	5,309,057,274		4,885,497,929	
4) Other inventories	256,898,718		-	
5. Other current non financial assets	148,257,135,236		34,507,199,636	
1) Short term advance payments	143,386,549,817		31,477,037,075	
2) Short term prepaid expenses	4,870,585,419		3,030,162,561	
. Non current assets		19,073,626,535,439		15,211,944,981,443
1. Other non current financial assets	147,534,027,446		135,299,267,431	
1) Non current available for sale financial assets	5,023,065,000		4,000,000,000	
2) Long term loans and receivables	23,250,328,330		19,208,078,023	
3] Non current derivative assets	119,260,634,116		112,091,189,408	
2. Long term trade and other non current receivables	451,878,666,076		527,192,604,129	
1) Long term trade receivables	337,883,045,598		427,478,079,365	
(Present value discounts)	(9,089,895,610)		(14,728,491,324)	
2) Long term deposits provided	123,085,516,088		114,443,016,088	

	(Unit : KRW)
ie)	

	38th Term	n (Current)	37th Term	(Previous)
Category	Amount		Amount	
3. Property plant and equipment	1,416,635,028,312		1,225,194,085,414	
1) Land	202,067,989,318		202,288,245,866	
2) Buildings	353,629,204,917		332,804,614,879	
(Government grants)	(921,740,333)		(959,242,333)	
(Accumulated depreciation)	(110,306,463,065)		(98,124,625,403)	
3) Structure	343,442,077,411		130,344,260,889	
(Accumulated depreciation)	(49,779,728,848)		(42,391,563,309)	
4) Machinery	704,870,823,239		487,491,254,442	
(Accumulated depreciation)	(294,949,623,372)		(270,734,698,479)	
5) Ships	10,931,409,937		9,826,211,746	
(Accumulated depreciation)	(6,042,043,538)		(5,336,002,933)	
6) Vehicles	11,436,497,691		11,595,346,387	
(Accumulated depreciation)	(9,103,485,599)		(8,945,796,970)	
7) Office equipment	43,608,201,956		41,918,319,147	
(Accumulated depreciation)	(31,171,349,452)		(28,723,330,430)	
8) Tools and instruments	54,803,057,174		52,082,304,505	
(Accumulated depreciation)	(42,064,199,778)		(37,637,284,374)	
9) Construction in progress	236,184,400,654		449,696,071,784	
4. Intangible assets other than goodwill	17,043,716,053,645		13,305,314,593,169	
1) Computer software	17,155,136,724		18,911,424,835	
2) Copyrights patents and other industrial property rights	207,344,687		195,488,317	
3) Intangible assets under development	9,506,763,785,750		5,520,337,198,344	
(Government grants)	(14,805,392,734)		(13,756,815,784)	
4) Service operating right	7,559,111,942,183		7,800,538,352,837	
(Customers contribution)	(7,804,683,125)		(8,290,525,625)	
(Government grants)	(22,287,180,154)		(17,361,340,192)	
5) Other intangible assets	5,375,100,314		4,740,810,437	
5. Investments in associates	8,036,402,773		6,089,357,208	
6. Deferred tax assets	1,210,775,363		10,265,934,119	
7. Non current non financial assets	4,615,581,824		2,589,139,973	
1) Other non current non financial assets	4,615,581,824		2,589,139,973	
Assets		23,425,915,630,201		18,643,009,883,179
Liabilities				
I. Current liabilities		1,351,279,630,469		1,085,572,642,071
1. Trade and other current payables	304,567,955,376		311,569,882,162	
1) Short term trade payables	9,911,130,321		8,208,412,824	
2) Short term other payables	98,948,010,945		146,713,904,647	
3) Short term accrued expenses	188,864,417,728		132,639,190,471	
4) Dividends payable	108,637,660		91,313,980	

(Unit : KRW)

Catagony	38th Term (Current)		37th Term (Previous)	
Category	Amo	ount	Amo	ount
5) Other current payables	6,735,758,722		23,917,060,240	
2. Current financial liabilities	433,209,180,134		407,321,317,840	
1) Current portion of long term borrowings	46,595,540,000		46,778,317,840	
2) Current portion of bonds payable	362,941,001,000		360,543,000,000	
3) Current derivative liabilites	23,672,639,134		-	
3. Current tax liabilities	42,079,368,378		22,191,171,740	
4. Other current non financial liabilities	571,423,126,581		344,490,270,329	
1) Short term advances customers	533,750,184,253		320,415,975,260	
2] Short term unearned income	196,510,894		44,129,561	
3) Short term withholdings	27,128,849,073		15,336,858,296	
4) Other current non financial liabilites current	10,347,582,361		8,693,307,212	
. Non current liabilities		11,229,656,590,139		6,999,797,119,372
1. Other non current financial liabilities	10,953,144,840,800		6,749,481,087,045	
1) Long term borrowings gross	300,172,561,252		336,684,225,000	
2) Bonds payables	10,588,920,021,000		6,316,144,290,000	
(Discount on bonds)	(2,846,669,707)		[4,772,243,453]	
3) Non current derivative liabilites	66,898,928,255		101,424,815,498	
2. Postemployment benefit obligations	275,063,172,914		248,714,957,886	
1) Present value of defined benefit obligation	275,063,172,914		248,714,957,886	
3. Deferred tax liabilities				
4. Non current provisions	1,448,576,425		1,601,074,441	
1) Long term legal proceedings provision	1,448,576,425		1,601,074,441	
Total Liabilities		12,580,936,220,608		8,085,369,761,443
Equity				
I. Contributed equity		6,694,440,906,386		6,672,249,776,764
1. Issued capital	6,694,987,385,367		6,672,837,445,091	
2. Discount on stock issuance contributed equity	(546,478,981)		(587,668,327)	
II. Retained earnings		2,727,507,488,528		2,453,776,630,052
1. Legal reserves	676,475,039,313		644,681,545,877	
2. Other legal appropriated retained earning	1,723,289,198,973		1,616,983,296,457	
3. Voluntary reserves	8,669,215,669		25,532,838,240	
4. Retained earnings before appropriations	319,074,034,573		166,578,949,478	
III. Elements of other stockholders equity		1,413,143,637,132		1,422,774,935,816
1. Other capital surplus	2,360,168,627		2,360,168,627	
2. Other comprehensive income (loss) accumulated amount	(36,607,550,170)		(28,604,230,392)	
3. Other equity interest	1,447,391,018,675		1,449,018,997,581	
IV . Equity attributable to owners of parent company		10,835,092,032,046		10,548,801,342,632
V. Non controlling interests		9,887,377,547		8,838,779,104
Total Equity		10,844,979,409,593		10,557,640,121,736
Total equity and liabilities		23,425,915,630,201		18,643,009,883,179

Consolidated statements of comprehensive income 31, 2010 Company: Korea Water Resources Corporation and Subsidiary Corporations (Unit : KRW)

Catagami	38th Term (Current)		37th Term (Previous)	
	Amount		Amount	
. Revenue		6,325,785,989,121		6,399,217,489,980
1. Revenue from sale of goods	1,708,331,580,693		1,495,126,497,922	
2. Revenue from rendering of services	94,292,688,268		71,667,497,869	
3. Revenue from construction contracts	4,437,056,829,122		4,750,189,684,105	
4. Other revenue	86,104,891,038		82,233,810,084	
II. Cost of sales		5,843,977,245,238		6,059,690,240,089
1. Cost of sales from sale of goods	1,218,341,336,395		1,147,604,183,138	
2. Cost of sales from rendering of services	92,887,965,336		80,163,820,387	
3. Cost of sales from construction contracts	4,436,530,362,067		4,749,536,562,601	
4. Other cost of sales	96,217,581,440		82,385,673,963	
III . Gross profit		481,808,743,883		339,527,249,891
IV. Other income		242,315,515,417		26,685,575,774
1. Other reversals of provisions	152,498,016		14,095,105,630	
2. Gains from government grants	234,294,704,765			
3. Reversal allowance doubtful accounts	447,074,802		84,923,276	
4. Rental incomes	903,650,867		1,077,378,728	
5. Other incomes others	6,517,586,967		11,428,168,140	
V. Total selling general administrative expenses		115,403,078,475		94,637,972,220
1. Salaries wages	32,160,554,842		27,724,818,731	
2. Provision for severance indemnities	4,001,211,851		3,777,052,308	
3. Employee benefits	13,701,312,778		9,291,793,316	
4. Insurance premiums	1,084,318,685		839,755,308	
5. Depreciation expense	5,125,512,263		3,634,671,495	
6. Amortisation expense	2,916,872,078		877,664,844	
7. Bad debt expenses	-		284,370,681	
8. Commissions	5,106,505,999		5,001,728,682	
9. Advertising expenses	8,226,357,337		6,897,415,521	
10. Training expenses	4,386,383,001		4,145,171,839	
11. Vehicle maintenance expenses	566,475,150		504,334,907	
12. Publication expenses	492,190,511		550,233,092	
13. Operating promotion expenses	113,743,350		151,431,713	
14. Rental expenses	1,025,885,129		694,751,824	

(Unit : KRW)

<u>.</u>	38th Term (Current)		37th Term (F	Previous)
Category	Amour	nt	Amou	nt
15. Communication expenses	2,635,977,390		1,797,500,168	
16. Freight expenses	20,000			
17. Taxes dues	1,225,518,843		1,429,200,477	
18. Supply expenses	569,059,475		478,695,775	
19. Utility expenses	1,220,833,086		1,208,772,465	
20. Repair expenses	5,723,444,432		5,595,244,118	
21. Ordinary development expense	19,232,139,785		15,778,138,453	
22. Travel expenses	1,821,916,914		1,630,422,257	
23. Clothing expenses	139,753,902		49,019,605	
24. Research and analysis expenses	104,093,636		88,904,561	
25. Sales promotion expenses	559,873,678		541,071,629	
26. Sales commisions	1,869,702,556		20,000,000	
27. Other selling and administration expenses	1,393,421,804		1,645,808,451	
VI. Other expense		8,881,378,184		6,221,146,626
1. Transferred amount of provision of other allowance			1,599,026,041	
2. Other bad debt expenses	6,372,665,389			
3. Donations	1,015,781,256		999,571,430	
4. Other expenses	1,492,931,539		3,622,549,155	
VII. Other gains (losses)		(2,557,316,319)		(947,292,763)
1. Gains on disposals of property plant and equipment	1,382,160,804		1,333,404,242	
2. Gain on foreign exchange translations	8,528,015		-	
3. Gains foreign currency transactions	1,214		16,178,939	
4. Losses on disposals of property plant and equipment	(354,970,074)		(608,723,300)	
5. Losses on disposal of intangible assets	(313,284,016)		(3,275,521)	
6. Writedowns of property plant and equipment	(2,994,244,527)		(1,567,966,894)	
7. Miscellaneous losses	(285,507,735)		(116,910,229)	
VIII. Operating income (losses)		597,282,486,322		264,406,414,056
IX .Finance income		87,393,183,610		136,673,481,004
1. Interest income	21,574,354,610		13,023,891,004	
2. Dividend income	89,100,000		106,920,000	
3. Gains on evaluation of derivatives	52,647,731,000		64,699,240,000	
4. Gains on foreign currency translations	1,949,999,000		58,843,430,000	
5. Gains on foreign currency transactions	11,131,999,000			
X . Finance costs		317,627,966,331		213,929,365,398
1. Interest expense	251,810,412,052		90,386,695,398	
2. Losses on evaluation of derivatives	1,949,999,000		58,843,430,000	

(Unit : KRW)

Catagory	38th Term (Current)		37th Term (Previous)	
Category —	Amount		Amount	
3. Losses on trading of derivatives	11,131,999,000		-	
4. Losses on foreign currency translations	52,647,731,000		64,699,240,000	
5. Losses on foreign currency transactions	87,825,279			
XI. Gains and losses from equity method affiliates		219,309,413		(2,451,253,334)
1. Gains on evaluation of interests in affiliates	486,497,228		1,214,185,051	
2. Valuation loss on investments in associates	(265,681,003)		(3,601,603,908)	
3. Losses on disposal of interests in affiliates	(1,506,812)		(63,834,477)	
XII . Profit (loss) before tax		367,267,013,014		184,699,276,328
XIII . Income tax expense continuing operations		73,999,842,319		36,551,396,113
XIV. Profit (loss) from continuing operations		293,267,170,695		148,147,880,215
XV . Profit (loss) from discontinued operations				-
XVI. Profit (loss)		293,267,170,695		148,147,880,215
XVII. Other comprehensive income (loss)		(7,250,941,234)		(103,967,743,577)
1. Other comprehensive income net of tax cash flow hedges	(7,885,417,536)		(65,554,363,354)	
Gains (losses) on cash flow hedges net of tax	(7,885,417,536)		(65,554,363,354)	
2. Net of tax, actuarial gains (losses) on defined benefit plans	1,265,437,656		(38,413,380,223)	
<ol> <li>Share of other comprehensive income of associates and joint ventures accounted for using equity method</li> </ol>	74,449,202		-	
Share of other comprehensive income of associates and joint ventures accounted for using equity method	74,449,202		-	
4. Gains and losses from foreign currency translations	(705,410,556)		-	
After tax gain (loss) on gain on overseas business translation	(705,410,556)		-	
XVIII. Comprehensive income		286,016,229,461		44,180,136,638
XIX. Profit (loss) attributable		293,267,170,695		148,147,880,215
1. Profit (loss) attributable to owners of parent company	293,333,492,046		148,147,880,215	
2. Profit (loss) attributable to non controlling interests	(66,321,351)		-	
XX . Comprehensive income attributable		286,016,229,461		44,180,136,638
1. Comprehensive income attributable to owners of parent company	286,595,609,924		44,180,136,638	
2. Non controlling interests	(579.380.463)		_	

# Statements of appropriations of retained earnings 38th Term (Current) From January 1, 2011 to December 31, 2011, 37th Term (Previous) From January 1, 2010 to December 31, 2010 Company: Korea Water Resources Corporation (Unit : KRW)

Catagany	38th Term (Current) Amount		37th Term (Previous) Amount	
Category				
. Retained earnings before appropriations:		322,189,476,188		169,226,153,117
Unappropriated retained earnings carried forward from the prior yea	27,122,308,510		56,859,950,055	
Profit for the year	293,801,730,022		150,779,583,285	
Actuarial gains and losses	1,265,437,656		(38,413,380,223)	
. Voluntary reserve		8,669,215,669		16,863,622,571
Reserve for investment in social overhead	8,669,215,669		16,863,622,571	
III. Total		330,858,691,857		186,089,775,688
IV. Appropriations:		330,858,691,857		158,967,467,178
Legal reserve	58,760,346,004		31,793,493,436	
Amortization of discount on stock issuance	311,637,147		262,349,196	
Business expansion reserve	220,077,304,156		106,305,902,516	
Dividends	51,709,404,550		20,605,722,030	
V. Unappropriated retained earnings carried forward to the next year		-		27,122,308,510

 

 Consolidated statements
 38th Term (Current) From January 1, 2011 to December 31, 2011, 37th Term (Previous) From January 1, 2010 to December 31, 2010

 of cash flows
 Company: Korea Water Resources Corporation and Subsidiary Corporations

 (Unit : KRW)

Catagony	38th Term (Current) Amount		37th Term (Previous) Amount	
I. Operating activities		385,251,987,203		(327,247,310,778)
1. Profit for the year	293,267,170,695		148,147,880,215	
2. Adjustments to reconcile profit (loss)	628,217,932,856		636,317,783,607	
1) Income tax expense	73,999,842,319		36,551,396,113	
2) Finance costs	(6,217,136,417)		67,066,459,925	
<ol> <li>Depreciation of property, plant and equipment and amortization of intangible assets</li> </ol>	552,448,607,967		529,773,271,101	
4) Impairment of property, plant and equipment	8,919,835,114		1,767,414,299	
5) Loss on foreign currency transactions	50,697,732,000		5,855,810,000	
6) Gain from valuation at fair value	(50,697,732,000)		(5,855,810,000)	
7) Loss (gain) on valuation of investment in associates	(220,816,225)		1,801,201,456	
8) Gain on disposal of non-current assets	(712,399,902)		(642,435,529)	
9) Other adjustments			476,242	
3. Adjustments for decrease (increase) in operating receivables	(497,820,007,327)		(1,058,526,785,821)	
1) Increase in inventories	(709,957,281,411)		(1,065,210,928,181)	
2) Increase in trade receivables	(13,904,764,560)		(71,946,494,158)	
3) Increase in other receivables	(16,248,347,712)		(40,479,275,972)	
4) Increase in trade payables	2,746,645,877		1,336,843,715	
5) Increase in provisions	26,434,023,718		6,112,829,591	
6) Increase in other payables	213,109,716,761		111,660,239,184	
4. Net cash flows from (used in) operating activities	423,665,096,224		(274,061,121,999)	
5. Interest paid	(14,046,002,534)		(48,755,898,391)	
6. Interest received	16,044,564,567		10,963,751,392	
7. Income tax paid	(40,411,671,054)		(15,394,041,780)	
. Net cash flows used in investing activities		(4,532,732,874,988)		(4,381,641,579,344)
1. Proceeds from disposal of shares or bonds	-		702,074,880	
2. Acquition of shares or bonds	(1,666,509,000)		(13,081,329,692)	
3. Proceeds from disposal of property, plant, and equipment	1,786,361,845		9,519,855,246	
4. Purchase of property, plant, and equipment	(258,548,325,469)		(181,366,510,047)	
5. Proceeds from disposal of intangible assets	15,096,484		14,275,086	
6. Purchase of intangible assets	(4,230,090,658,319)		(4,207,087,967,248)	
7. Proceeds from disposal of available-for-sale financial assets	661,990,792		-	
8. Acquisition of available-for-sale financial assets	(1,648,065,000)		-	

(Unit : KRW)

Catagory	38th Term	(Current)	37th Term	(Previous)
Category	Amo	unt	Amo	unt
9. Proceeds from disposal of other long-term assets	-		1,736,263,858	
10. Purchase of other long-term assets	(148,000,000)		(3,625,008,688)	
11. Proceeds from government subsidy	7,384,000,000		_	
12. Increase in advance payments and loans	(110,596,101,747)		-	
13. Collection of advance payments and loans	207,961,426		-	
14. Proceeds from derivatives	59,909,374,000		-	
15. Other cash inflows			11,546,767,261	
III. Net cash flows from financing activities		4,186,597,346,730		4,767,713,142,108
1. Increase of paid-in capital	9,815,840,150		88,308,794,200	
2. Proceeds from borrowings	10,083,876,252		700,000,000	
3. Repayment of borrowings	-		(33,453,517,770)	
4. Proceeds form issuance of bond	4,583,475,347,518		4,724,800,875,708	
5. Repayments of bonds	(396,189,318,840)		-	
6. Dividends paid to the equity holders	(20,588,398,350)		(12,643,010,030)	
IV. Net increase in cash and cash equivalents (before reflecting foreign exchange difference)		39,116,458,945		58,824,251,986
V. ENet foreign exchange difference		(584,759,316)		586,217,401
VI. Net increase (decrease) in cash and cash equivalents		38,531,699,629		59,410,469,387
VII. Cash and cash equivalents at January 1		177,023,465,063		117,612,995,676
VIII. Cash and cash equivalents at December 31, 2011		215,555,164,692		177,023,465,063

# **Positive & Negative Information**

K-water is maintaining a balance in disclosures by providing both positive and negative news to allow readers to objectively assess the overall sustainable management performance of K-water.



# **GRI Report Index**

Unitary and Major         Unitary and Major         4-6, 10-11         9           1.1         Major dited, Threatening factors and Opportunity factors         Continuum opposity Martice, Nitros         4-6, 10-01         9           2.1         Structure Nume         Company Nume         2         9           2.2         Major hrands, products and one operating inputsion, including key devicem, dispatrimets, financing controlosies, etc.         9, 12         9           2.3         Opposition controls reported structure is operating in, Names of controls, financing controlosies, etc.         9, 12         9           2.4         Incision of head office         Incision of head office         2         9           2.4         Incision of head office         Incision of head office         2         9           2.5         Major dited, malations with the problem distructure         Incision of head office         2         9           2.6         Object trainice and logic from of ound structure         Incision of head office         2         9           2.7         Subject trainice and cost one of structure is operating in the structu	Index	Contents of Index	K-water Adaptation Index	Global Compact	Page	Report Rate
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2.7       Subject market and customer categories       26~27       •         2.8       Subject market and customer categories       Number of executives, sales, total assets,       2       •         2.9       Important changes in size, structure or owned structure during reported period       No major changes       1       •         2.10       Awards during reported period       Breakdown of verseas awards and certificates       1       •         3.1       Report period       2010, Part of 2011       1       •         3.2       Date of most recent report       August, 2010       1       •         3.3       Report period       Annual       1       •         3.4       Inquiries on report and related areas       Report inquiries       1       •         3.6       Report border       Accomplichments       2       •         3.7       Detaild restrictions of report range or report border       Accomplichments       2       •         3.8       Report border       Accomplichments       2       •       •         3.8       Report orgetion structure, group or structure, such as collaborating companies, audia during information presented in information collection organing accomplichments of overseas business and celection contain regories audia acties and collaba measurement method structure group or structure, such	2.6	Characteristics and legal form of owned structure	Financial provider structure, shares structure		22	•
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3.4       Inquiries on report and related areas       Report inquiries       1       •         3.5       Report contents definition process       Subject readers and stakeholders       1       •         3.6       Report border       Subject readers and stakeholders       2       •         3.7       Detailed restrictions of report range or report border       Accomplishments of overseas business       2       •         3.8       Reporting standard of things that may have a large effect on comparing possibilities according to period or structure, such as collaborating companies, subsidiary companies, rented facilities or outside duties       Same as period of seven investing companies, Accounting Equity Method or Cost Method applied       103       •         3.9       Data measurement methods including presumptions and methods that support accomplishment index and other predictions adapted in information collection percess, and calculation standard       103       •         3.10       resort renework the position of standard notices in the report       Report loaker       9       •         3.11       Big change in report range, border and measurement method compared to last report and explanation of report standard notices in the report       GRI Report Index       96~99       •         3.12       Index that shows the position of standard notices in the report       GRI Report Index       96~99       •         4.1       Dominating stru	3.3	Report cycle	Annual		1	٠
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3.8       Reporting standard of things that may have a large effect on comparing possibilities according to period or structure, such as collaborating companies, subsidiary companies, rented facilities or outside duties       Same as period of seven investing companies, astubidiary companies, rented facilities or outside duties       103       •         3.9       Data measurement methods including presumptions and methods that support process, and calculation standard       financial, environmental, social data measurement technique and calculation standard       103       •         3.10       Effects of re-statements       financial, environmental, social data measurement technique and calculation standard       2       •         3.11       Big change in report range, border and measurement method compared to last report and explanation of report       No change       2       •         3.12       Index that shows the position of standard notices in the report       GRI Report Index       96~99       •         3.13       Policies and current activities to find an outside verifier       Third Party's Assurance Report       100~101       •         4.1       Dominating structure of organization       Authority, structure and responsibility of Board of Directors       22       •         4.2       Chairman Board of Directors is unified, the Board of Directors states the number of independent people who are not executives       Permanent and temporary directors       22       •         4.3	3.7	Detailed restrictions of report range or report border	Accomplishments of overseas business		2	•
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3.11       Big change in report range, border and measurement method compared to last report       Change in Korean place of business and overseas projects       2       •         3.12       Index that shows the position of standard notices in the report       GRI Report Index       96~99       •         3.13       Policies and current activities to find an outside verifier       Third Party's Assurance Report       100~101       •         Dominating structure, responsibility, participation         4.1       Dominating structure of organization       Authority, structure and responsibility of Board of Directors and executive       22       •         4.2       Chairman Board of Directors is unified, the Board of Directors states the number of independent people who are not executives       Permanent and temporary directors       22       •         4.3       Amechanism where stockholders and employees give advice to or present a direction for the Board of Directors       Operation of Youth Board of Directors       22       •	3.10	Effects of re-stating information presented in last report and explanation of reason for re-statements	No change		2	•
3.12       Index that shows the position of standard notices in the report       GRI Report Index       96~99       •         3.13       Policies and current activities to find an outside verifier       Third Party's Assurance Report       100~101       •         Dominating structure, responsibility, participation         4.1       Dominating structure of organization       Authority, structure and responsibility of Board of Directors       22       •         4.2       Chairman Board of Directors and executive       Appointed non-executive director serves as chairman of board of directors       22       •         4.3       In case the Board of Directors is unified, the Board of Directors states the number of independent people who are not executives       Permanent and temporary directors       22       •         4.4       Amechanism where stockholders and employees give advice to or present a direction for the Board of Directors       Operation of Youth Board of Directors       22       •	3.11	Big change in report range, border and measurement method compared to last report	Change in Korean place of business and overseas projects		2	•
3.13       Policies and current activities to find an outside verifier       Third Party's Assurance Report       100~101       •         Dominating structure, responsibility, participation         4.1       Dominating structure of organization       Authority, structure and responsibility of Board of Directors       22       •         4.2       Chairman Board of Directors and executive       Appointed non-executive director serves as chairman of board of directors       22       •         4.3       In case the Board of Directors is unified, the Board of Directors states the number of independent people who are not executives       Permanent and temporary directors       22       •         4.4       Amechanism where stockholders and employees give advice to or present a direction for the Board of Directors       Operation of Youth Board of Directors       22       •	3.12	Index that shows the position of standard notices in the report	GRI Report Index		96~99	•
Dominating structure, responsibility, participation         4.1       Dominating structure of organization       Authority, structure and responsibility of Board of Directors       22       •         4.2       Chairman Board of Directors and executive       Appointed non-executive director serves as chairman of board of directors       22       •         4.3       In case the Board of Directors is unified, the Board of Directors states the number of independent people who are not executives       Permanent and temporary directors       22       •         4.4       A mechanism where stockholders and employees give advice to or present a direction for the Board of Directors       Operation of Youth Board of Directors       22       •	3.13	Policies and current activities to find an outside verifier	Third Party's Assurance Report		100~101	•
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LA13	Structure of Board of Directors and employees Status of executives structure		6	81	•
LA14	Ratio of basic salary of newly recruited men and women personnel according to employee range	Ratio of basic salary of newly recruited men and women personnel	6	81	٠
LA15	Re-instatement and Maintenance Rates by Sex following Child Care Leave	Re-instatement Rates following Child Care Leave	6	79	•
	Human rights accor	nplishments index			
HR1	Number and ratio of major investing agreements that include human rights	Contracts and agreements including	2	81	•
HR2	Human rights evaluation ratio of major supply companies and contract	Method of evaluating human rights of	2	81	•
HR3	Employee training on duties related human rights policies and processes	Human rights related education (Sexual barassment prevention education)	2	81	•
HR4	Total discrimination cases and related handling	Management and counseling through executives difficulties handling system	1	81	•
HR5	Duty fields evaluated to have a chance of serious violation of association or group negotiations freedom, and management to guarantee such rights	Rights and benefits protection for women and the disabled, etc	1	81	•
HR6	Business fields with a high chance of child labor and management to stop	Restraint against employing youths	5	81	•
HR7	Business fields with a high chance of forced labor and management to stop	Forced labor prohibition rule (Korean	4	81	•
HR8	Ratio of security personnel that have certified the human rights policy and process education	Education accomplishments of human	1	82	•
HR9	Number of local residents rights violation and related management	Civil treatment of local residents	2	82	•
HR10	Number and proportion of businesses subject to human rights review and impact assessment	Gathering of local resident opinions by conducting environmental impact assessment	1	82~83	•
HR11	Number of human rights issues that were registered/processed/resolved through official resolution mechanism	Operation of consultation window	1	60	٠
	Social accompli	shments index			
S01	Characteristics, range and effect of program that evaluates local social effects from beginning, during and finishing stages of duties	Environmental evaluation according to stages, aftereffects evaluation		82	•
S02	Number and ratio of business units analyzed to have corruption risk	Inspection of high positions or departments with high chance of corruption through department purity evaluation	10	83	•
S03	Ratio of employees who received anti-corruption policy and process related education	Rate of ethical management training certification	10	83	٠
S04	Management of corruption cases	Handling of corruption cases	10	83	•
S05	Position on public policies, establishment of public policies and participation in lobbving	Participation in public policies, such as carrying out government policies		83	•
S06	Total amount donated to parties, politicians or related facilities according to nation	Donations using the K-water name is prohibited by law		83	N/A
S07	Number of unfair competition activities and monopoly actions that were dealt with legally, and the results	Regular Free Trade Commission	10	83	٠
S08	Number of cases of fine and non-financial restraint due to violation of law or regulations	Number of violation cases and fines		83	•
	Product liability acco	mplishments index			
PR1	Stage of deliberation of life cycle that evaluates health and safety effects of product and service, ratio of major products and services that actually carry out the evaluation	Introducing 5-Star water purification plant & CO labelling, and advanced water purification plant, the evaluating system of water purification level		56~57	•
PR2	Number of violation of customer health and safety effects related restraints	Efforts to abide by laws related to health		84	•
PR3	Necessary product and service information type for process, ratio of products and services with such information	Efforts to provide information on tap water		84	•
PR4	Number of product or service information labeling related restraint voluntary violation	Efforts to provide information on tap water quality, etc		84	•
PR5	Customer satisfaction related activities including customer satisfaction evaluation survey results, etc	Customer satisfaction research results		84	•
PR6	Marketing communications such as advertisement, promotion, sponsorship restraints, standard and voluntary rule abiding program	Abiding by marketing related restraints		84	•
PR7	Number of marketing communications such as advertisement, promotion, sponsorship restraints, standard and voluntary rule violation cases	Efforts to abide by promotion related laws		84	٠
PR8	Number of complaints on violation of customer personal information protection and customer data loss	Number of Internet civil cases and breakdown		84	•
PR9	Total fine from violation of laws and regulations on product and service supply	Efforts to abide by service supply laws		84	•

# **Independent Assurance Report**

### To the management of K-water

We have been engaged by K-water to perform an independent assurance engagement in regard to the following aspects of K-water's 2012 Sustainability Report (the "Report").

#### Scope and subject matter

The information for the year ended December 31, 2011 (hereinafter, collectively referred to as the "Sustainability Information") on which we provide limited assurance consists of:

- K-water's conclusion on meeting the principles of Inclusivity, Materiality and Responsiveness in the AA1000 Accountability Principles Standard 2008 ("AA1000APS")
- The "Performances" information on pages 71 through 84 in the Report (the "Sustainability Data") which is based on the reporting standard set out on "Performance Data Reporting Standard" (the "Reporting Standard").

With regard to the financial data included in the key figures on pages 85 through 94, our procedures were limited to verifying that they were correctly derived from K-water's audited consolidated financial statements.

We read the other information included in the Report and consider whether it is consistent with the Sustainability Information. We consider the implications for our report if we become aware of any apparent misstatements or material inconsistencies with the Sustainability Information. Our responsibilities do not extend to any other information.

#### Assurance work performed

We conducted our engagement in accordance with ISAE 3000(1) and AA1000AS(2). The term 'moderate assurance' used in AA1000AS is designed to be consistent with 'limited assurance' as articulated in ISAE 3000. Our assurance is a Type II assurance engagement as defined in the Guidance for AA1000AS.

- 1. International Standard on Assurance Engagement 3000 (Revised) 'Assurance Engagements other than Audits or Reviews of Historical Financial Information' issued by International Auditing and Assurance Standards Board
- 2. AA1000 Assurance Standard(2008), issued by AccountAbility

Our work involved the following activities:

- 1. Interviews with the personnel responsible for internal reporting and data collection to discuss their approach to stakeholder inclusivity, materiality and responsiveness.
- 2. Visits to K-water's head office and Yeosu management office to review the systems and processes in place for managing and reporting the Sustainability Data.
- 3. Review of a sample of internal documents relevant to output from the risk assessment process, sustainability-related policies and standards, the sustainability Materiality Assessment Matrix and other documents from stakeholder engagement activities,
- 4. Evaluating the design and implementation of the key processes and controls for managing and reporting the Sustainability Data.
- 5. Limited testing, through inquiry and analytical review procedures, of the preparation and collation of the Sustainability Data.

#### Respective responsibilities of the management of K-water and Samil PricewaterhouseCoopers

The management of K-water is responsible for establishing assessment criteria that meets the principles of Inclusivity, Materiality and Responsiveness in the AA1000APS, measuring performance based on the "Assessment Criteria", and reporting this performance in the Report.

Our responsibility is to provide a conclusion based on our assurance procedures in accordance with ISAE 3000 and AA1000AS.

This report, including the conclusion, has been prepared for the management of K-water as a body, to assist the management in reporting on K-water's sustainability performance and activities. To the fullest extent permitted by law, we do not accept or assume responsibility to anyone other than the management of K-water as a body and K-water for our work or this report save where terms are expressly agreed and with our prior consent in writing.





#### Inherent limitations

Non-financial performance information is subject to more inherent limitations than financial information, given the characteristics of the subject matter and the methods used for determining such information. Qualitative interpretations of relevance, materiality and the accuracy of data are subject to individual assumptions and judgments.

A limited assurance engagement is less in scope than a reasonable assurance engagement under ISAE 3000. Consequently, the nature, timing and extent of procedures for gathering sufficient, appropriate evidence are deliberately limited relative to a reasonable assurance engagement. In particular:

- We did not attend any stakeholder engagement activities. Therefore our conclusions are based on our discussions with management and staff of K-water and our review of selected documents provided to us by K-water.
- The scope of our work was restricted to 2011 performance only, as set out in the scope and subject matter section above. Information relating to the year ended December 31, 2010 and earlier periods have not been subject to assurance by us.

#### Conclusion

Based on the results of the assurance work performed and the Assessment Criteria, our conclusion is as follows:

- On the AA1000APS principles;
- O Inclusivity
  - K–water has collected concerns and opinions through stakeholder communication channels that include customers, business partners, stockholders/investors, the government, NGOs, employees and local communities.
  - Nothing has come to our attention to suggest that material stakeholder groups were excluded in these channels.
- O Materiality
  - K-water has identified most relevant and significant sustainability issues through process for identifying material issues.
  - Nothing has come to our attention to suggest that material issues were omitted in this process.
- O Responsiveness
  - K-water has included in the Report its response to the material sustainability issues which are defined through process for identifying material issues.
  - Nothing has come to our attention to suggest that there is material deficiency in issue management system.
- Nothing has come to our attention that causes us to believe that Sustainability Data for the year ended December 31, 2011 are not fairly stated, in all material respects, in accordance with the Reporting Standard.

#### Recommendations

From our work, we have provided the following recommendations to the management.

- We recommend K-water to establish more elaborate materiality assessment procedures to manage significant issues in respect of stakeholders and K-water's business environment.
- We recommend K-water to improve sustainability data management system such as data collection and review process for using sustainability information in management's business decision making.
- K-water needs to consider more balanced reporting to enhance reliability of the Report for various stakeholders.

August 31, 2012

Samil PricewaterhouseCoopers CEO Samil Priseantabouse Coy



Performances

# ISO 26000

ISO 26000 is an international standard guideline that integrates social responsibility across an entire organization based on 7 core subjects founded upon the basic principles of social responsibility. The contents of K-water according to the 7 core subjects can be found at the pages described below.

ржс		RESPECTED TRUSTED SAMIL
Core Subject	lssues	Page
Organizational governance	Organizational governance	4~5, 10~13, 22
	Due diligence	81
	Human rights risk situations	81
- - Human rights - - -	Avoidance of comp	81
	Resolving grievances	60, 81
	Discrimination and vulnerable group	60, 61, 81, 104
	Civil and political rights	81
	Economic, social and cultural rights	81
	Fundamental principles and rights at work	60, 61, 81, 104
	Employment and employment relationships	78, 79, 104
	Conditions of work and social protection	65, 79
Labour practices	Social dialogue	65, 79
	Health and safety at work	64, 79, 80
	Human development and training in the workplace	64, 80
	Prevention of pollution	52, 53, 74~77, 104
The environment	Sustainable resources use	34, 74, 76
i ne environment	Climate change mitigation and adaptation	34, 50, 51, 75
	Protection of the environment, biodiversity and restoration of natural habitats	54, 55, 75
	Anti-corruption	23, 82, 83, 104
	Responsible political involvement	83
Fair operating practices	Fair competition	83, 104
	Promoting social responsibility in the value chain	60, 61, 80, 81, 104
	Respect for property rights	82~83
	Fair marketing, factual and unbiased information and fair contractual practices	84
	Protecting consumers' health and safety	56, 57, 84, 105
	Sustainable consumption	52, 53, 57
Consumer issues	Consumer service, support, and complaint and dispute resolution	84
	Consumer data protection and privacy	84
	Access to essential services	66, 84
	Education and awareness	65, 84
	Community involvement	66~69, 73, 104
	Education and culture	66~69
	Employment creation and skills development	67, 73
Community involvement and development	Technology development and access	73
acrosophicit	Wealth and income creation	72, 73
	Health	67
	Social investment	66, 67, 73

# **Publishing the Sustainability Report**

Efforts were taken to reflect the voices of our internal and external stakeholders when publishing this Report, and to ensure credibility, assurance on the contents of this report was provided by a third party.

The main objective of this Sustainability Report is to provide stakeholders with credible transparent corporate information and to gain the respect of the stakeholders. Matters of concern of the internal employees were accumulated through a survey, while those of the stakeholders were gained through advisors. The issues of concern were evaluated for their materiality and through the analysis of the evaluations, major issues of concern were established. K-water has tried to provide full disclosure of the performance indicators outlined by the G3.1 guideline, which is the international standard.

#### Scope of the Performance Indicator Report

The scope of this Report covers 24 domestic business sites, including the main office and 9 overseas business sites, providing sustainable management conditions and performances. Since the accounting periods for K-water and its seven investors are the same, it does not affect the comparison in terms of the period or structure. The equity method or cost method is applied depending on share ownership.

#### Performance Data Reporting Standard

Report Application Level

Profile Disclosures

Disclosures on

Management Approach

Performance Indicators

Performance Indicators

& Sector Supplement

Standard Disclosures

K-water has made every effort to follow the reporting principles stated in the G3.1 guidelines in the preparation this Report. Each of the economic, environmental and social performance data was derived based on the indicator covenants attached to the G3.1 guidelines. Environmental related data was mainly guoted from data derived from the Environmental

С

Report fully on a minimum of any 10

Performance Indicators, including

at least one from each of: social

economic, and environment.\*\*

Report on:

3.1-3.8, 3.10-3.12

4.1-4.4.4.14-4.15

Not Required

2.1-2.10

C+

**Externally Assured** 

Report |

В

Report on all criteria listed for

Level C Plus

4.5-4.13 ,4.16-4.17

Management Approach

Disclosures for each Indicator

Report fully on a minimum of any

20 Performance Indicators, at least

one from each of: economic, and

environment, human right, labor,

society, product responsibility.\*\*\*

3.9, 3.13

Category

12

Performance Evaluation (EPE) electronic system developed as a computer-based system in 2006 and the Inventory system developed in 2010. Financial data was derived from audited financial statements and statements of accounts. Information related to society and other sectors were directly received from related departments. K-water has tried to provide greater clarity by providing 3~4 year performance indicator data. and ratios and absolute data at the same time.

#### Efforts to Enhance Sustainability

It has been 8 years since K-water first published its Sustainability Report. Over the course of 8 years, K-water has painstakingly tried to identify the expectations and concerns of stakeholders, but there's still room for greater improvements. In the next Sustainability Report, K-water will listen more carefully to the suggestions from our stakeholders to create a more advanced Sustainability Report.

#### G3.1 Guideline Application Standard

K-water has tried to satisfy the requirements of the 'A' standards outlined in the GRI G3.1 Guideline for the "2012 Sustainability Report." An independent 3rd party assurance agency, Samil Pricewaterhouse Cooper, has verified that this report is compliant with 'A+,' GRI G3.1 Guidelines.

B+

**Report Externally Assured** 

А	A+
Same as requirement for Level B	Ired
Management Approach disclosures for each Indicator Category	rt Externally Assu
Respond on each core and Sector Supplement* indicator with due	Repol

Supplement\* indicator with due regard to the materiality Principle by either: a) reporting on the

indicator or b) explaining the

reason for its omission.

# Code of Ethics Preamble, Eco-friendly Management Principles, Customer Charter Preamble, Mission Statement for Innovative Vision

### **Code of Ethics Preamble**

Korea Water Resources Corporation is an organization for Korean people to develop, maintain and preserve Korea's water resources to make sure they are sustainable environmentally, economically and socially, and to provide them with the best products and services in order to contribute to improved quality of life and national development. With this pride and confidence, we commit ourselves to the following code of ethics to be reborn as a world-renowned corporation specializing in water in this era of water in the 21st century.

**To** accomplish our mission with a creative and open-to-challenge mind and do our given work with honest and fair attitudes and to make efforts for transparent management.

**To** commit ourselves to eco-friendly management with a keen awareness that the environment is an invaluable asset to hand down to the next generation and a foundation for a healthy and pleasant life.

**To** provide customers with the best products and services to ensure customer satisfaction and value-oriented management to live up to customer-first principles.

**To** respect local traditions and cultures, contribute to community development and enrich the lives of community members with due obligation as a community member.

**To** observe moral and legal values, respect market orders of free competition, and pursue fair competition.

**To** respect individual persons without any discrimination and respect differences and creativity.

**To** develop a partner relationship between union and management based upon trust and harmony with a strong sense of unity to pursue mutual prosperity.

\*\* For detailed information on ethical principles and the employee code of conduct, please refer to our website (www.kwater.or.kr), Ethical Management.

### **Environmentally-friendly Management Principles**

K-water is keenly aware of the need for the utmost effort for sustainable development in harmony with nature for more pleasant and better-to-live-in environment. In this vein, therefore, K-water, as a corporation specializing in water, the origin of life, announces the following eco-friendly management principles in order to be reborn as an eco-friendly corporation loved and trusted by people.

**To** take the lead in preserving clean water and air and healthy natural environment.

**To** predict the effects of water resources development and management on the environment and consistently pursue the preservation of the eco-system, prevention of pollution and environmental improvements in order to make sure that our activities are in harmony with environmental preservation.

**To** establish sound consumption culture of cutting down on supplies and energy and recycling them and always be alert against environmental destruction out of carelessness.

**To** accommodate people's opinions as much as possible in making environmental related plans and promote trust and transparency of our business by opening related information and materials.

**To** bear the primary obligation of preventing environmental pollution in advance, make efforts to settle problems in case pollutions take place, and bear in mind that words put into practice are the fundamentals of corporate ethics.

**To** constantly offer employees environmental training and focus on research and development for environmental preservation and improvement to ensure that out activities for the environment suit codes of ethics.

All the employees of K-water hereby declare that we do our utmost to guarantee that future generations will live in a pleasant environment by putting the principles into practice.

### **Customer Charter Preamble**

Based on a management philosophy that 'Values for Customers are Values for Use', we are committed to the following to practice customer-oriented management and business practices.

### **Mission Statement for Innovative Vision**

To provide people with clean and safe water, protect their lives and property from disasters caused by water, to be reborn as the best water service organization through change and innovation, K-water declares the following:

**To** establish credibility from our customers, we will stably provide high quality water and land.

**To** guarantee our customers' safety and property rights, we will provide necessary information and services even before our customers' request it.

**To** continuously improve customer service, we will regularly collect opinions from our customers by carefully listening to our customers' advice and suggestions.

**To** maximize customer benefits, we will strive to achieve management efficiencies and carry-out duties without discrimination towards all customers.

To be able to achieve these objectives, we will establish the highest performance standards. We also promise to abide by these standards.

**To** make customer satisfaction top priority in management and rectify existing practices, systems and values to be customer-driven.

**To** do our work with honest and fair attitudes without deviating from conscience, common sense and law to be a trustworthy public corporation, and to actively participate in socially beneficial activities to engage in the community.

**To** secure a world-level competitive edge to achieve our vision with confidence and passion defying changes and establish a sustainable and stable foundation for growth.

**To** raise awareness of the importance of the environment for a healthy life and sustainable growth of the future generations and to make efforts to preserve the environment.

K-water will concentrate on devoting itself to growing into a business that works well, has a competitive edge and is loved by people by putting the above mentioned statements into practice.

# **UN Global Compact**

The principles of Global Compact are based on the following international agreements.



- Universal Declaration of Human Rights
- International Labor Organization's (ILO) "Declaration of the basic principles and rights of Labor"
- Rio Declaration on the Environment and Development
- United Nations Convention against Corruption

The Global Compact urges corporations to uphold, select and legalize the 4 major provisions, which include human rights, labor, environment and anti-corruption,



Principle 1 : We support and respect the protection of internationally proclaimed human rights. Principle 2 : We confirm that we are not complicit to human rights abuses.



Principle 3 : We uphold the freedom of association and the effective recognition of the right to collective bargaining.

- Principle 4 : We uphold the elimination of all forms of forced and compulsory labor.
- Principle 5 : We uphold the effective abolition of child labor.
- Principle 6 : We uphold the elimination of discrimination in respect of employment and occupation.



Principle 7 : We support a precautionary approach to environmental challenges.

- Principle 8 : We undertake initiatives to promote greater environmental responsibility.
- Principle 9 : We encourage the development and diffusion of environmentally-friendly technologies.



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

K-water is upholding and practicing the 10 principles of the UN Global Compact

President of K-water Kim, Kuen Ho

Kyentlo (Cum
# **Definition of Terms**

- •Planting Soil Soil used to spray over dirt to make a foundation for grass to grow.
- •Membrane filtering processing This is the technology that is widely used for industrial ultra-pure manufacturing or water purifier for homes and this advanced water purification technique produces clean water by filtering into polymer membrane for water containing pollutant substances.
- Non-point Pollution Source A pollution source having an irregular discharge route, unlike point pollutants sources, such as human populations or livestock having regular points of discharge. This pollution source is calculated by the pollution load arising from land use in watersheds (including paddies, fields and forest), and usually discharged to water system by rain.
- •Disinfection by-product Cancer-causing substance such as THM or HAA that is produced when disinfection products used in the purification process reacts to organic compounds in the water.
- •New and Renewable Energy Three kinds of new energy including hydrogen, fuel cells, and liquefied coal gas and eight kinds of renewable energy including solar heat, solar light, bio energy, wind power, hydro-electric power, terrestrial heat, marine energy and energy from waste.
- •Sludge Sediments produced from sewage treatment or water purification process.
- Ozone A bluish, trioxygen gas, Ozone has strong oxidizing power and is used as one method of advanced tap water treatment to remove smells
- •Reverse Osmosis (RO) Water processing method that can eliminate the smallest ionic compounds with sizes less than 1mm. This is frequently used in ultrapure water production or ocean water desalination.
- Prevalence Rate Ratio that shows the frequency of subject cases within a certain region at a certain time against the total regional population
- •Life Cycle Assessment (LCA) Technique for evaluating environmental impact of a product or service by quantitatively measuring the substances and energy consumed and discharged in an entire process of the product or service.
- •Environmental Impact Assessment Estimations analyses and assessments of the impact of Social Overhead Capital (SOC) facilities, such as roads, ports, railroads, airports and industrial complexes, as well as reclamation projects, on the environment.
- Seawater Desalination As a technique used to eliminate chemical substances, such as salts within salt water, Reverse Osmosis, a membrane filtering technique advantageous from a maintenance/management perspective, is mostly used
- •Carbon Reduction Label A Labeling System which converts CO<sub>2</sub> emissions that occur in the entire manufacturing process a product or service to label on the product
- Integrated Water Resources Management Management that comprehensively manages water quantity, quality, ecosystems, and integrates surface water, underground water, and alternative water resources for integrated management
- •CDM(Clean Development Mechanism) A Policy in which developed countries obligated to reduce greenhouse gases can invest capital in developing countries to have occurring greenhouse emission allowances as part of the reduction results of their own country (Unilateral CDM businesses conducted independently by developing countries allowed from 2005)
- •COD[Chemical Oxygen Demand] Amount of oxygen consumed by oxidizing pollutants contained in water by an oxidizing agent. Higher levels of COD indicate higher water pollution amounts.

- •CRM(Customer Relation Management) A strategy to obtain new customers, keep relations with existing customers, and to maximize customer's lifetime value by supplying products and services in customers' needs.
- •GRI(Global Reporting Initiative) Organization founded with the support of the UNEP in 1997 to develop the guidelines for "Sustainable Management Reports."
- •CS(Customer Satisfaction) Customer satisfaction to the product and service
- CSR(Corporate Social Responsibility) Social responsibility of the Cororation.
- •EPE(Environmental Performance Evaluation) Customer expectations and requirements to the products and services provided by the company.
- •ISO14001 International environmental management system standards as prescribed by the ISO (International Organization for Standardization).
- •ISO 26000(International standard for the social responsibility) Issued by the International Organization for Standardization (ISO) in November 2010. An international master guideline of standardized social responsibility which covers the many conventional guidelines for the 7 core subjects and management integration such as the participation and development of every organization into the governance, human rights, labor practice, environment, fair operation practice, consumer issue and communication.
- JOA+(Join, Open, Advance) K-water's own innovative technique for problem solving. Work-out method of GE was modified and advanced to be suited to the environment of K-water.
- K-sigma(K-water/Knowledge Sigma) 6 sigma emphasizing the cost reduction and process improvement and unique innovative method of K-water in combination of removing the unnecessary affairs and encouraging the R&D activities.
- MTV(Multi-Techno Valley) 21st century type cutting edge complex such as the electronics/electricity, R/D which are established on the northern reclaimed land of Sihwa.
- •NTU(Nephelometric Turbidity Unit) Unit for measuring the turbidity. The turbity of the water measured using the intensity of the light scattered by projecting on the specimen.
- •QPI(Quality Performance Index) K-water unique automatic evaluation method on the tap water quality control performance index, tap water quality and level of effort to control the water quality utilizing the IT and web technology.
- •SS(Suspended Solid, Floating material) The particles of diameter over 0.1µm which float in the water. It makes the turbidity of the water.
- SQI(Service Quality Index) Objective measuring index for the core quality of service to prevent the combination of service process and to improve the quality.
- TOE(Ton of Oil Equivalent) The amount of energy use such as use of electrical energy, gas and oils, converted to crude oil (tons).
- •UNFCCC(United Nations Framework Convention on Climate Change) A convention organized to regulate artificial emissions of greenhouse gases for prevention of global warming. Its full name is the United Nations Framework Convention on Climate Change.
- •VOC(Voice of Customers) An expected or requested matter of customers on products and services provided by the company.

# We express our deepest appreciation to all those involved in the publication of this report.

Performance Management, Pricing and	Director Hyong Joon Koun, Team Manager Sun Young Kim		
Legal Affairs Dept.	Jin Seok Kim, Hye Min Kim, Jae Sik Jang, Eun Seok Yang, Sang Yong Lee		
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K-water Academy	Hong Seok Oh, Jin Hee Jang		

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## Readers' Voice

We are grateful to all our stakeholders that have an interest in K-water's sustainable management and have read the '2012 Sustainability Report' Each opinion and suggestion provided by you will be preciously utilized in further developing K-water's sustainable management. We value and accept your suggestions and we will try to reflect the suggestions in the next report.

Performance Management Team of Performace Management Department of K-water / Fax: 042) 629 - 2399 E-mail : sustainability/dkwater.or.kr

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	ste here!	From Name Telephone E-mail Address		Paste he
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				* *
5			Water Nature People <sup>®</sup>	
		Kwater		3 1



## 1. Which of the following would best describes you?

① Customer② Investor/Shareholder③ Go⑤ Citizens, Social Group, NGOs⑥ Bu⑧ Journalist⑨ K-water employee⑩ O

③ Government/Civil Servants
⑥ Business partner
⑩ Others ( )

④ Local Residents⑦ Scholar

#### 2. What brought your attention to K-waters Sustainability Report?

① K-water's homepage② Internet Search engine③ Newspaper/Magazines④ Recommendation by K-water staff⑤ Others ()

### 3. Which section was the most interesting?

① Strategy ② Approach ④ Challenges(Green Environment) ③ Challenges(Green Economy)⑤ Challenges(Green Society)⑥ Performances

## 4. Which section do you think needs improvement?

① Strategy② Approach④ Challenges(Green Environment)

③ Challenges(Green Economy)⑤ Challenges(Green Society)

6 Performances

5. Please feel free to give us your comments about the overall structure and contents of this report or our activities.

We are waiting for your valuable opinions. Your opinion will be of great help and will be used to continue sustainable management activities.

We will review your opinions and we will reflect them in our next report.

This report can be downloaded in PDF file format from the K-water homepage (www.kwater.or.kr).

Anyone who would like more detailed information on sustainable management activities and outcomes introduced in this report, please contact the following person in charge of this report.

We deeply appreciate you for your profound interest on the sustainable management activities of K-water.

#### Imformation

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