

# Operation & Management: Overseas Support

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## Introduction

Supporting developing nations with Seoul's advanced waterworks technology

The Korean government began promoting and supporting the water industry and expansion overseas in 2010. In line with this initiative, the Seoul Metropolitan Government's Office of Waterworks implemented support mechanisms designed to utilize its operational experience and excellent technology in helping private companies tap into foreign markets.

The Office of Waterworks has also been expanding its own global network and exchange in response to the high demand from cities for Seoul's know-how and experience in operation of the water supply system and the related technology.

| Before the Policy Implementation  | After the Policy Implementation   |
|---|---|
| <ul style="list-style-type: none"><li>• Private companies had difficulties tapping into foreign markets due to the lack of operational experience.</li><li>• When domestic waterworks infrastructure projects ended, there was no growth engine for our companies.</li><li>• Despite our high technology, Korea only took up 2.1% of the global water market.</li></ul> | <ul style="list-style-type: none"><li>• Private companies receive support to make inroads into foreign markets.</li><li>• Foreign expansion has led to job creation and financial expansion.</li><li>• Seoul is sharing its know-how and best policies with other countries and strengthening its competitive edge.</li></ul> |

## Overview of the Policy

- << Cooperating with the private sector to participate in foreign water supply tenders
- << Using Seoul's own EDCF (Economic Development Cooperation Fund) to improve the water supply system in developing countries
- << Participating in feasibility studies of foreign waterworks projects with funding from relevant agencies
- << Establishing cooperative networks for overseas expansion in waterworks



Winning the contract for the infrastructure development consulting project for PMB Island, Brunei

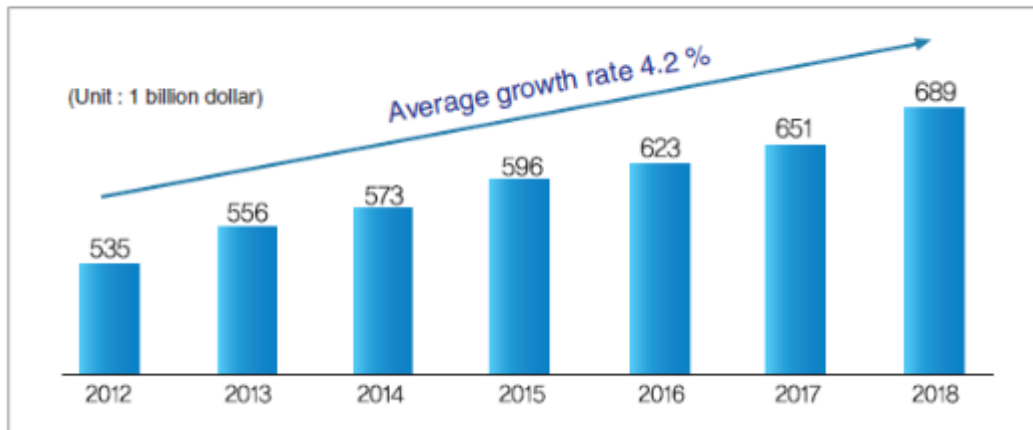


Completion of the 1st-stage waterworks improvement project in Chanchamayo Province, Peru

## Background

The global water market is emerging as a “blue gold” industry, growing at 6.5% annually. Dubbed a “blue gold” industry, water is an essential part of life for all human beings. Since the 21st century, the global water industry has been growing 6.5% annually, and is expected to reach a whopping USD 689 billion in market size by 2018. As a result, there is fierce global competition.

I Graph I Global Water Industry Forecast



Traditionally, water has been largely considered a public good and businesses in the industry have been state-owned. Today, however, it has become a commodity, and the industry looks promising in the 21st century. Despite the paradigm shift, Korea's water industry has only a 2.1% share of the global water market; even companies with advanced technology are finding it difficult to expand overseas due to trade barriers, lack of support, and hostile environments. Against this backdrop, public-private partnerships can be the answer to an industry that is currently controlled by only a few global companies.

**The Korean government is adopting strategies to promote the water industry in keeping with rapid changes in the market**

Having already recognized the water industry as an engine for growth, many advanced nations have strengthened their support mechanisms and formulated strategies for promotion. At the same time, specialized private companies have expanded operations and improved management to enhance efficiency and attract investment.

In Korea, too, the Ministry of Environment has come up with a plan to make the country a water industry powerhouse. The plan's specific targets include: a domestic water industry valued at USD 2.6 billion; 38,000 new jobs; 10 Korean water-related companies competing on the global stage; and water market exports worth USD 8 billion (1% of global market share).

[Ministry of Environment's Water Industry Promotion Strategy]

| Core Strategies  | Major Policies   |
|--|--|
| Strengthening competitiveness by developing source technology                | <ul style="list-style-type: none"> <li>• Developing source technology in the water market</li> <li>• Promoting the commercialization of new technology: Give companies an opportunity to test the technology.</li> </ul> |
| Nurturing water specialist companies   | <ul style="list-style-type: none"> <li>• Integrate regional water supply &amp; sewage.</li> <li>• Nurture water specialist companies through private engagement.</li> </ul>  |
| Promoting industries related to water (bottled water, water recycling, etc.) | <ul style="list-style-type: none"> <li>• Implement the water recycling project and pass the relevant act.</li> <li>• Promote bottled water domestically as well as an export item.</li> </ul>                            |
| Supporting foreign expansion   | <ul style="list-style-type: none"> <li>• Formulate policy tailored for each region.</li> <li>• Form public-private partnership as well as the basis of foreign expansion.</li> </ul>                                     |

More countries and cities are reaching out to Seoul to learn from its water policies and experience in operation and management and to receive support

As the country's largest water utility provider (making up 20% of the domestic water market), the Seoul Metropolitan Government (SMG) has been moving to expand overseas through partnerships with the private sector since 2012.

Many developing countries or their cities have shown interest in learning from Seoul's water policies and technology and have asked for support in this industry. To meet this growing demand, we have used a variety of channels to share our best practices and policies as well as the city's EDCF (Economic Development Cooperation Fund) to help upgrade their outdated water supply systems.

### Foreign expansion has created jobs and served as a growth engine

Most water infrastructure projects have been completed in Korea, which means there's not much room for Korean companies to grow within the country. Given this lack of demand in the country, expansion overseas provides the answer to job creation and profit-generation for companies that are struggling otherwise. When Korean companies participate in water project tenders, most of the time they are required to partner with public entities, such as the SMG, which have several years' operational experience in the water supply system.

# Process of Policy Implementation

Since 2012, the SMG has made a variety of efforts to prepare for expansion in the global water market. First of all, we have laid a solid foundation for public-private cooperation, by, for example, signing MOUs with relevant organizations and holding the Arisu Globalization Forum and briefing sessions. Second, we have worked to lay a solid foundation for overseas support projects such as training for foreign civil servants in the water sector and providing consulting services through dispatches of our specialist staff. At the same time, we have also formed a consortium with private companies to submit tenders for foreign water projects and used Seoul's EDCF to help developing countries upgrade their water supply systems.

In July 2012, the SMG, in consortium with private companies, became the first local government in Korea to win a waterworks project from the Brunei government. Seoul plans to participate in similar projects in partnership with the private sector for Indonesia's Bandar Lampung.

Since 2013, Seoul has been using its EDCF to help improve the waterworks of Chanchamayo City, Peru. This is the first case in which a Korean municipality has used its own waterworks technology and Korean-made materials in waterworks improvement projects in developing countries.

Seoul formed another consortium with private companies in 2014, and has been conducting feasibility studies for a purification facility improvement project in Port Moresby, Papua New Guinea, and 8 purification centers in Central Java, Indonesia.

## Details of the Policy

In 2012, a consortium of the SMG and a business in the private sector won the tender for Brunei's PMB Island Infrastructure Development Consulting Project, in which Seoul will provide consulting services without the need for financial investment.

Seoul is currently moving forward with the water facilities improvement project in Chanchamayo City, Peru using the city's EDCF.

In addition, the SMG is currently conducting feasibility studies for foreign waterworks projects through private-public consortia.

### **Cooperating with the private sector to participate in foreign water supply tenders**

- Brunei PMB Island Infrastructure Development Consulting Project

In July 2012, Seoul signed an agreement with the Brunei government to perform auditing and operational tasks within consulting service, which it is still performing today.

I Table 5-1 I Overview of the Brunei PMB Island infrastructure development consulting project

| Name of the project                        | Brunei PMB Island infrastructure development consulting project  |
|--|--|
| Overview                                   | <ul style="list-style-type: none"> <li>• Overview               <ul style="list-style-type: none"> <li>– Scope: Construction of bridges, roads, waterworks, communications, and electricity on PMB Island</li> </ul> </li> </ul> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;">           2.8 km bridge and 5.0km road connecting to the bridge, 400m<sup>3</sup>/day of drinking water, 2,000m<sup>3</sup>/day of industrial water (for oil refining, gas, petrochemical)         </div> <ul style="list-style-type: none"> <li>– Order placed by: Department of Economics and Development, Brunei</li> <li>– Order amount: 13.5 billion won (500 million won for Seoul in accordance with its 3.6% share)</li> <li>– Duration of project: 6 years</li> <li>– Form of participation: Consortium with the private sector</li> </ul> |
| Partners                                   | <ul style="list-style-type: none"> <li>• Domestic companies: Pyung-Hwa ENG (PM), Korea Expressway Corporation (O&amp;M), Sam-An Ltd. (water and sewage)</li> <li>• Local companies: OMC (design of construction, machinery, electricity)</li> </ul>  |
| Roles of the Seoul Metropolitan Government | <ul style="list-style-type: none"> <li>• Main R&amp;R: Supervision and operation work from the construction period with Sam-An Ltd.</li> <li>– Full-time (resident) staff to be dispatched for 2 years to cover supervision with the designer of the construction</li> <li>- 1 supervising manager and 1 staff to be dispatched for 4 months as part-time workers</li> </ul>   |

Project involving production and installation of water meters and construction of a remote control network for Trinidad and Tobago

Production and installation of water meters and construction of a remote control network for Trinidad and Tobago

Table 5-2 | Overview of the project involving the production, installation of water meter and construction of remote control network for Trinidad and Tobago

| Name of the project                        | Production, installation of water meter and construction of remote control network for Trinidad and Tobago   |
|--|--|
| Overview                                   | <ul style="list-style-type: none"> <li>• Overview <ul style="list-style-type: none"> <li>– Scope: Production, installation of water meter and construction of remote control network for Trinidad and Tobago</li> </ul> <div>Production, installation, and test run of 15,000 units of water meters</div> <li>– Order placed by: Government-run water and sewage corporation in Trinidad and Tobago</li> <li>– Order amount: 9 billion won estimated (no financial investment from the Seoul Metropolitan Government)</li> <li>– Duration of project: about 11 months</li> <li>– Form of participation: Consortium with private sector</li> </li></ul> |
| Partners                                   | <ul style="list-style-type: none"> <li>• Domestic companies: HITEC</li> </ul>  |
| Roles of the Seoul Metropolitan Government | <ul style="list-style-type: none"> <li>• Main R&amp;R: Supervision and management of construction (the Seoul Metropolitan Government has no stake)</li> <li>– Personnel dispatch: under discussion</li> </ul>  |

#### Using Seoul's own EDCF to improve the water supply system in developing countries

This project first began in May 2012 when the mayor of Chanchamayo, Heung-won JUNG, the first ethnic Korean to be elected as a mayor in Peru, visited the mayor of Seoul. The two discussed Seoul's support for the Peruvian city's water facility improvement project. Seoul put words into action by sending technicians to Peru in July 2012 to conduct preliminary research. The support project kicked off in May last year, and Korean technology and materials are being transported to Peru for construction of their waterworks.



Upgrading the water pipe network



Repairing water intake facilities



I Table 5-3 | Waterworks Improvement Project for Chanchamayo, Peru

| Name of the project | Waterworks Improvement Project for Chanchamayo, Peru (ODA)   |     |           |      |                                 |               |
|---------------------|--|-----|-----------|------|---------------------------------|---------------|
| Overview            | <div>• Overview</div> <div>– Scope: Waterworks Improvement Project for Chanchamayo, Peru (ODA) 1st Stage (2013~2015): Water facility improvement in the San Ramon region</div> <div><div>• Repair water intake facilities in San Ramon (3,530m<sup>3</sup>/day), Repair water pipe networks (HDPE 3,091m)</div><div>• Construct the San Ramon purification center (3,000m<sup>3</sup>/day)</div></div> <div>2<sup>nd</sup> Stage (2015-2017): Water facility improvement in La Merced</div> <div>3<sup>rd</sup> Stage (2018):Water facility improvement in Pichanaki</div> <div>– Amount : Approx. 2.7 billion won</div> |     |           |      |                                 |               |
|                     | Type of Work   |     | 1st Stage |      | 2nd & 3rd Stages<br>(2015~2018) |               |
|                     |  |     | Total     | 2013 |                                 | 2014          |
|                     | Total  |     | 648       | 318  | 330                             | Approx. 2,052 |
|                     | 1. Water intake facility   |     | 11        | 11   |                                 |               |
|                     | 2. Water pipe network  |     | 140       | 140  |                                 |               |
|                     | 3. Purification facility   |     | 330       | -    | 330                             |               |
|                     | 4. Transmission pipe   |     | -         | -    | -                               |               |
|                     | 5. Reservoir   |     | -         | -    | -                               |               |
|                     | 6. Distribution pipe   |     | -         | -    | -                               |               |
| 7. Design           |  | 9   | 9         | -    |                                 |               |
| 8. Supervision      |  | 102 | 102       | -    |                                 |               |
| 9. Etc.             |  | 56  | 56        | -    |                                 |               |
| Partners            | <div>• Main R&amp;R : Overall project management</div> <div>– Select a PMC (Project Management Consultant)</div>   |     |           |      |                                 |               |

Participating in feasibility studies for foreign waterworks projects with funding from relevant agencies

- Feasibility studies for projects to improve purification centers and RWR (revenue water ratio) in Central Java, Indonesia
  - Scope/Expenses: upgrading 8 purification centers and a water pipe network, for a cost of KRW 120 billion
  - Order placed by: Central Java Government of Indonesia
  - Amount: KRW 76 million (funding from the Foreign Construction Association: KRW 68 million / private companies: KRW 8 million)
  - Duration of study: May ~ Dec. 2014 (8 months)
  - Executing organizations: Consortium (Roswell Watertech Global and other private companies, SMG)
  - Role of the SMG: Increasing RWR, technical consultation on efficient operation and facility improvement of purification centers





- Feasibility study for the water facility improvement project in Port Moresby, Papua New Guinea
  - Scope/Expenses: upgrading/expanding & operating/managing the Eriama purification center (Q=184,000 rf/day), KRW 16 billion
  - Amount: KRW 140 million (funding from the Environment & Industry Technology Institute: KRW 70 million / private companies: KRW 70 million)
  - Duration of study: June 2014 ~ March 2015 (10 months)
  - Executing organization: Consortium with private companies (Dohwa Engineering, Daewoo Construction)
  - Role of the SMG: Reviewing and analyzing site inspection results for upgrading/expanding & operating/managing purification facilities

### **Signing MOUs with foreign cities and inviting foreign waterworks personnel for training opportunities**

The SMG has signed MOUs with 6 different water-related institutions around the world, including the Water Authority of Bangkok, Thailand in 2012. MOUs have also been signed with domestic institutions such as the Korea Environment Corporation.

These MOUs help form cooperative networks that will serve as the basis for the city's future attempts to tap into foreign markets.

Meanwhile, water-related officials and other personnel were also invited from Latin America, including the Mayor of Chanchamayo, Peru in 2012, to Seoul where they can learn about the city's technology and policies as well as take a look around our water facilities.

In 2013, 30 policymakers from the water sector were invited from 18 cities (in 12 countries) for 2 different training sessions, through which we established close networks.



Training for policymakers in the water sector from southeastern countries

## Details of the Policy

### Setting up a task force for foreign expansion of water projects

In 2012, we formed a task force to expand Arisu overseas and created a master plan, that includes manuals, for selecting target cities and support works. The following year, a dedicated department was set up for this purpose, which devoted its resources to making a professional manpower database and reviewing the relevant acts and regulations, among other activities.

### Sharing Seoul's best policies and technology with foreign personnel related to the water industry

Countries around the world are looking into and asking Seoul to share its experience and know-how in tap water production and management. In fact, more than 300 foreign guests from 30 countries, including Azerbaijan, have visited the Office of Waterworks to learn and benchmark our sites, such as the Advanced Purification Facility and the Arisu Integrated Information Center.



Visiting the Arisu Integrated Information Center (by the Water Authority in Taipei, Taiwan)



Visiting the Office of Waterworks HQ (by Water and Sewage Corporation in Papua New Guinea)

### Forming a network for public-private partnerships

Since 2013, we have hosted a variety of meetings and discussions to share our thoughts regarding water industry trends at home and abroad, the water supply situation in Seoul, and technology, to encourage the private sector to participate in public-private partnerships. On

top of this, the Arisu Globalization Forum was launched in November 2012 as an advisory body in the water business. Consisting of 25 members from academia, government, the private sector, and other agencies, the forum has provided valuable research and advisory input for our common objective.



Presentation for the Private Sector



Arisu Globalization Forum

## Policy Outcomes & Future Challenges

The SMG has been supporting private water sector companies interested in tapping into foreign markets, offering them our own experience and technology in operation. The SMG too, is making inroads into overseas markets to strengthen the city's competitive edge at the same time.

In addition, the SMG has offered its own funding facility (the EDCF) to help developing countries upgrade their obsolete water facilities, thus contributing to making the world a better place to live for all.

Thanks to efforts such as these, the SMG became the first city government in Korea to win a contract in Brunei for its PMB Island Infrastructure Development Consulting Project, which is an opportunity for Seoul to not only support the private sector but also to export its operational expertise to other countries. Furthermore, the EDCF is also being used to implement ODA in Chanchamayo, Peru, with that city's water facility improvement project. By lending a helping hand to places struggling with water shortages, Seoul is enhancing its overall image on the global stage and helping people around the world live in a cleaner place with enough tap water to go around.

Despite considerable progress, there still remain multiple challenges that need to be addressed.

First, is the general lack in Korea of legal and regulatory systems needed to implement foreign projects, which has delayed the authorization process for personnel dispatches or business trips. This lack and inflexibility have delayed or hindered some projects from moving forward. Second, financing for and participation in projects are limited. For development projects in general, financial investment is required from the feasibility study stage. Under our current system, however, any development project without specific plans cannot get funding, thereby

making it difficult to participate. Even if a consortium is formed with private companies to win a tender, our role is limited to operation due to the lack of financing.

Third is the lack of information and poor ability to manage risk appropriately. Since we cannot open an overseas office or dispatch expats, our understanding of the business practices and water environment in the target country is extremely limited. Such lack of professional manpower and information on local situations also increases our exposure to risk.

Under the current legal system, local government personnel are not allowed to be dispatched to private for-profit corporations in foreign countries. To deliver the Brunei PMB Island project that was won earlier, however, the SMG was required to dispatch our people in 2015 for 2 years to a for-profit corporation established in Brunei. To address this issue, we are currently working with the Ministry of Safety and Administration to amend the relevant law but have yet to reach agreement.

## Applicability of the Policy

Under Korea's current legal system, only municipalities and K-Water are authorized to operate and manage water supply. Due to this limitation, private water companies in the country have had considerable difficulty winning contracts in foreign countries that are looking for operational experience. To compensate for their lack of eligibility, we have cooperated on several occasions with the private sector to help such companies tap into foreign water markets. Other municipalities in Korea can do the same by providing their operational experience to private companies that are otherwise qualified to win tenders placed by foreign countries.

In Japan, where foreign expansion was pursued earlier than Korea, many cities, including Tokyo, Nagoya, Yokohama, and Kitakyushu, have already begun ODA projects. After having built trust in the recipient countries, they have since been able to turn a sizable profit. To facilitate expansion overseas, some large municipalities in Japan have established subsidiaries under the Waterworks Bureau, formed cooperative mechanisms with the private sector, and signed MOUs with investment fund companies for financing.

## Q&A

**How can Seoul's Waterworks Office use its experience and technology in water supply to help other countries?**

The Office of Waterworks has invited various government personnel from different countries to participate in training opportunities on Seoul's policies and advanced technology as well as to be a part of a friendly network with the SMG.

The city has also signed MOUs with developing nations whose water facilities are obsolete

and has dispatched its professionals to teach the specialized technology on site selection, design and construction of purification facilities, and the purification process and management, among many other items.

In addition, we are opening our doors to our counterparts in other countries who wish to visit our office to learn and benchmark Seoul's system, including its advanced purification, purification facilities, direct water supply system, integrated information center, and remote metering, etc.

Furthermore, we are involved in forming consortia with private companies to win water projects.