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Water Industry Special

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GETTY IMAGES

Overseas water industry expansion helps Japan, world

Chiho Iuchi
CONTRIBUTING WRITER

In 2010, the United Nations General Assembly recognized access to safe and clean drinking water and sanitation as a human right, and called for international efforts to help countries provide safe, clean, accessible and affordable drinking water and sanitation.

In 2015, the U.N. General Assembly established the sustainable development goals (SDGs), a collection of 17 interlinked global goals designed to be a "blueprint to achieve a better and more sustainable future for all." At the time, 193 countries reaffirmed their commitment to the human right to water and sanitation with the official wording of SDG 6: "Ensure availability and sustainable management of water and sanitation for all."

However, despite some progress, the U.N. reports that 2.2 billion people still had no access to safely managed drinking water, and 4.2 billion people were living without safely managed sanitation in developing countries as of 2017.

As global water issues are becoming increasingly serious, countries that face challenges are rushing to build water infrastructure.

"Japan's water industry has addressed the global water challenges using advanced technologies for chemicals, filters, machines and equipment, reverse penetration membranes and plant engineering," said Sawaka Takazaki, director for project coordination at the Office for Promotion of International Project(s), Infrastructure System(s) and Water Industry at the Ministry of Economy, Trade and Industry.

In March, METI released a report that

reviewed the policies supporting the overseas activities of Japan's water industry for the past 10 years to establish a future direction toward further expansion.

The global market for the water industry (excluding Japan) expanded from ¥49.7 trillion in 2010 to ¥71.9 trillion in 2019. METI estimates the market will reach ¥84.4 trillion in 2025 and surpass ¥110 trillion in 2030.

Besides population growth, which has had a fundamental impact on the global water balance, urbanization and industrialization in emerging countries, as well as outdated water infrastructure in developed countries, have contributed to market expansion.

"In addition to technological strength, we regard expertise, including on-time delivery and steady service on a long-term basis, as Japanese assets," Takazaki said. "The Japanese business style that encompasses cultivation of local human resources and long-term scheduled, efficient service while transferring technology and operations will eventually contribute to achieving the SDGs."

However, according to a survey by METI, 73 Japanese companies involved in the water industry generated overseas sales of ¥347 billion in 2019, which accounted for only 0.48% of the ¥71.9 trillion overseas market.

"From this survey, we can only learn the sales of the companies that responded to the questionnaire, but it is true that the Japanese water industry has a very low share of the overseas market," Takazaki admitted.

"However, overseas sales have been increasing for the past 10 years, nearly doubling from ¥176 billion in 2010. On a positive note, there is room to grow for the Japanese water industry."

The term water industry covers many fields, such as supply and sewerage systems, industrial water and seawater desalination.



Sawaka Takazaki,
director for project
coordination at the
Office for Promotion of
International Project(s),
Infrastructure System(s)
and Water Industry at
the Ministry of Economy,
Trade and Industry,
speaks to The Japan
Times. METI

In Japan, the water supply is regulated by the Ministry of Health, Labor and Welfare and the sewerage systems by the Ministry of Land, Infrastructure, Transport and Tourism. Industrial water supply is regulated by METI. Some have observed that the lack of an overall strategy for the water industry is due to bureaucratic sectionalism.

"Since our office was established in METI in 2009, we have been making efforts to enhance collaboration among ministries, local governments and relevant institutions, such as Japan International Cooperation

Agency (JICA), Japan External Trade Organization and the New Energy and Industrial Technology Development Organization," Takazaki said. "We are also promoting public-private partnerships. In 2019, a task force for international business promotion of water infrastructure was established, and that is expected to serve for a platform for further public-private collaboration."

In the water supply and sewerage systems fields, which account for over 73% of the

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GLOBAL WATER ISSUES

Partnerships help address global water challenges

Chiho Iuchi
CONTRIBUTING WRITER

It is not easy to grasp the big picture of water issues, which range from public health and environmental problems to socioeconomic challenges and technological solutions.

Professor Satoshi Takizawa, director of the Research Center for Water Environment Technology at the Graduate School of Engineering at the University of Tokyo, who also teaches at the university's Department of Urban Engineering, has studied engineering and management of urban water systems in Japan and developing countries. He taught at the Asian Institute of Technology in Bangkok from 1997 to 1999 and has participated in many international research projects.

Having served over a decade leading a panel on overseas expansion of the Japanese water industry for the Ministry of Economy, Trade and Industry, professor Takizawa shared his thoughts on water with The Japan Times.

JT: What made you study urban water systems?

Takizawa: As a student in the 1980s, I became aware of water pollution in Japan and beyond, as well as diseases caused by unsafe water in developing countries. That led me to think of solutions making use of waterworks engineering rather than manufactured products. It's been nearly 40 years.

JT: What are the major challenges?

Takizawa: Water is distributed unevenly across the Earth's surface. The annual average rainfall in Japan is about 1,700 millimeters, while countries in the Middle East receive very little rainfall, less than 50 millimeters a year. There is no point of discussing the world average. That's one of the difficult points regard-



Professor Satoshi Takizawa of the University of Tokyo shares his insights on the water industry during a recent interview with The Japan Times at the university's Hongo Campus in Bunkyo Ward.
YOSHIKI MIURA

ing water resources.

Another challenge is water scarcity due to population growth. In particular, population growth and industrialization in urban areas are causing serious water shortages. How to manage urban water systems has become a major issue for the industry.

JT: Do you think businesses can contribute to solutions or should the challenges be basically addressed through official development assistance (ODA)?

Takizawa: Water is essential for life, but water issues have many aspects. On one hand, all people should be ensured access to safe water to maintain the minimum standards of wholesome and cultured living. To address challenges in this field, Japan has built wells in rural areas of developing countries as part of its ODA. This is not business.

On the other hand, advanced urban water and sewerage systems should be supported by residents who benefit from them. And it's natural that those who pay for such services

demand that they be run economically and efficiently. That's where we need to see the issue from a business point of view.

JT: How has the Japanese water industry been involved in projects overseas?

Takizawa: In Japan, operation and maintenance (O&M) of waterworks systems are basically handled by local governments. Some of them started supporting water projects in developing countries around 2000, as shown by Kitakyushu's work in Cambodia (from 1999) and Yokohama's work in Vietnam (from 2003).

Those activities were done at the request of the Japan International Cooperation Agency, a government agency that delivers much of Japan's ODA. But it is not easy for local governments to further extend their investments abroad because they need to get approval from their assemblies and such business activities are not something that benefit local residents.

JT: How about Japanese companies?

Takizawa: Although some companies have exported equipment and components for waterworks systems, there are no Japanese companies like the so-called water majors, such as the French-based Veolia and Suez groups that have undertaken comprehensive projects including O&M. So we discussed this at the METI panel a decade ago and suggested that collaboration between local governments and private companies should take place.

JT: How do you see progress in such public-private partnerships unfolding over the decade?

Takizawa: Efforts have been made as far as possible. For example, Kitakyushu city government has succeeded in involving local Japanese companies in water supply projects in Cambodia, while the city, thanks to research funding from JICA, continues to send experts to the country, thus collaborating with private companies in waterworks O&M on-site. The Japanese government will further encourage such practices in public-private partnerships, in which local governments are expected to support private companies and work together with them on overseas water projects.

Another potential area of business is in concession, in which a private company is granted the exclusive right to operate, maintain and carry out investment in a water utility while the local government retains ownership of the assets.

Miyagi Prefecture is scheduled to enter into a concession agreement for its water supply, sewerage and industrial water system in 2022, which will be the first water supply concession case in Japan. In March, the prefectural government chose a group of companies as the contractor. The group will have the rights to perform all O&M activities for the three water projects for 20 years.

JT: How does the concession agreement benefit the companies?

Takizawa: Having experience with concessions will qualify the companies for comprehensive overseas water projects. With long-term and large-scale O&M expertise, Japanese companies will be able to apply for overseas water projects on their own, without involving local governments.

JT: In addition to public-private partnerships, are alliances between Japanese and foreign companies growing?

Takizawa: There are many examples. For

instance, one member of the group mentioned above is the Japanese subsidiary of French-based water major Veolia. Japanese companies may be able to absorb expertise in efficient O&M by collaborating with Veolia, which has extensive experience in water business.

JT: Can Japanese companies further expand business abroad by promoting advanced products with a technological advantage?

Takizawa: Again, rather than just selling products, it would be better to have a design, build, operate, transfer form of contract with the client country. In most cases of seawater desalination plants, for example, Japanese companies are appointed to operate the plant on behalf of their client countries for 20 years, in addition to designing and building before transferring O&M back to the client. This is a very stable way of business to recover their investment via operation fees at a long-term fixed rate.

JT: Please tell us about the Water Engineering and Utility Management Future Leaders Training Program at the University of Tokyo.

Takizawa: It's a master's degree program offered by the Department of Urban Engineering in collaboration with JICA. Starting in 2018, we began accepting five students per year from Asian countries. They are young officers at governmental institutions in charge of water systems.

The program is designed to cultivate problem-solving capacity so that students will lead the water supply sectors in their respective countries to achieve better water supply service and waterworks management. We encourage them to discuss the challenges of their countries with other students, analyze the complex issues logically and identify underlying root causes. Once the students identify the root cause, they begin to address it through field research, formulating hypotheses and testing them, and eventually propose solutions.

Although many foreign students in Japan have had difficulty going home or coming back since the beginning of 2020 due to the COVID-19 pandemic, our students were able to continue their field research thanks to JICA, which helped provide chartered flights.

A student from Indonesia discovered that seawater desalination plants, which were provided by the Indonesian government for isolated islands without water sources, do not function properly because residents don't know how to operate the plants. As a result, islanders continue to purchase expensive tanks of water from peddlers.

We also let the students analyze the cost and revenue of their projects and how long it will take to recover the initial investment. Projects will not be sustainable if they cannot generate enough revenue to offset costs.

A student from Myanmar found out that 80% of the water meters in Yangon were broken, which reduced the fare receipts to one-fifth of what was considered reasonable for the actual amount of water residents used. The student proposed to replace the broken meters with new ones and proved that the replacements helped achieve an increase to the proper revenue, recovering the cost of the meter replacements in eight months.

In their project proposals to address water challenges, we may find some areas where Japanese technologies could be of help, and those might develop into collaborations with Japanese companies. During the five-year program scheduled with JICA, we will be able to collect 25 case studies that will be widely applicable.

JT: Finally, please share your thoughts on the future direction of water issues.

Takizawa: On one hand, water is a basic need to maintain life and health. On the other hand, we need economic rationality and advanced technologies to manage and operate the complex water systems of today. It's important to understand both aspects. We cannot just focus on either business or assistance, but need to consider which way may be more suitable, case by case. Japan's international cooperation and the Japanese water industry are expected to further expand projects and businesses abroad while building constructive partnerships in the next 10 years.

Towards the Realization of Zero Emissions in 2050

Japan Times ESG Symposium (Japanese / English)



Date and time:

May 13, 2021 from 13:30 to 17:30

Location: Roppongi Academy Hills Auditorium

* Depending on the COVID-19 situation, the event may be moved online

To join use the QR code or visit:

<https://peatix.com/event/1886814>



Guest introduction and greetings

Yuriko Koike

Governor of Tokyo

Rintaro Tamaki

President, Japan Center for International Finance

Keiko Honda

Columbia University, Adjunct Professor

"Communication strategy with ESG promotion and stakeholders" (English)

"The power to promote ESG – from an investor's perspective" (Japanese)

"ESG efforts by leading companies in the industry" (Japanese)



Mr. Ken Shibusawa
Commons Asset Management, Inc. Executive Chairman and ESG Chief Executive Officer
Moderator



Ms. Mitsuyo Morisawa
PRI Secretariat Japan Head and CDP Japan Director



Mr. Naonori Kimura
Industrial Growth Platform, Inc. (IGPI), Managing Director



Ms. Jin Montesano
LIXIL Corporation Director, Executive Vice President, Chief People Officer
Panelist



Mr. Hiroshi Ozeki
Nissay Asset Management, President and CEO



Ms. Tomomi Fukumoto
Suntory Holdings Limited, General Manager of Corporate Sustainability Promotion Division



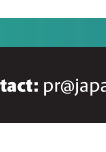
Ms. Mariko Kawaguchi
FUJII OIL HOLDINGS INC., Assistant to CEO
Panelist



Mr. Masafumi Hikima
a Specially Appointed Professor at Sophia University



Mr. Fumiaki Koizumi
President (Chairman) of Mercan Co., Ltd. and CEO of Kashima Antlers FC Co., Ltd.



Ms. Emi Onozuka
Japan Catalyst, Inc., Executive Vice President and COO
Panelist



Ms. Tomomi Otsuka
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GLOBAL WATER INDUSTRY

New policies to support water business overseas

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global water industry market, Japanese companies have been primarily expanding business in Asia rather than in developed countries, where the so-called water majors, such as French-based Veolia Environment and Suez Environment have already launched businesses.

"These large companies have provided consistent service from the planning stage and engineering, procurement and plant construction to investment, operation and maintenance. Although Japanese companies that have focused on selling equipment look small when compared on such a scale, we see progress in their respective fields," Takazaki said.

In fact, some of the Japanese companies, such as Kubota Corp., Kurita Water Industries Ltd. and Toray Industries Inc., are high on the list of global water companies in terms of sales.

"Also, local companies have been emerging in developing countries in recent years, and the positions of the water majors are not as stable as before. In the increasingly competitive circumstances in the global water indus-



Sawaka Takazaki says the government is determined to further provide active support to the water industry to extend business abroad. METI

try, Japanese companies are seeking further entry into the market," Takazaki said.

In Japan, the operation and maintenance of water supply and sewerage systems have been basically left to local governments. To provide operation and maintenance service overseas, rather than just selling equipment and components, collaboration between local governments and companies is indispensable.

According to the latest report by METI, a leading example of good practices is a water project in Cambodia that started from cooperation between local governments and developed into businesses between private Japanese and Cambodian companies.

In 1999, Kitakyushu started supporting a water project in Phnom Penh by sending staffers from its water division as part of a JICA technical cooperation project. This helped the government succeed in providing almost all of the capital's population of more than 1 million with a low-cost, safe and stable water supply. This achievement has been dubbed "the miracle of Phnom Penh."

In 2010, the city established the Kitakyushu Overseas Water Business Association to support local Japanese companies' efforts abroad. Member Kobelco Eco-Solutions Co. jointly founded Soma Kobelco Water Supply in partnership with a Cambodian company and joined various Cambodian water supply projects.

"This is an ideal case. Local governments are expected to build a relationship with their counterparts, share their challenges and needs with Japanese companies and provide them with domestic opportunities to gain experience," Takazaki explained.

Also, alliances between Japanese and foreign companies in such areas as sales, technical cooperation, financing and acquisition are growing, further expanding business opportunities overseas.

Another example is a diagnostic technology developed to spot deteriorating pipes. Developed by Fracta, a California-based venture led by Japanese, the new technology, which leverages the power of artificial intelligence, is expected to rapidly identify weaknesses in water pipe networks, a crucial, yet



Safe water is essential for human life, health and future generations. KAZUYUKI OKAMOTO

challenging task for developed countries with outdated infrastructure. The company is currently expanding its business in both the United States and Japan.

"Our government intends to introduce such good practices among other companies and encourage them to enter the overseas water industry market," Takazaki said. "Also, we are promoting better understanding of the life-cycle cost and the Asia-Pacific Economic Cooperation guidelines for the quality estimation of infrastructure among potential Asian counterparts to take another look at high-cost Japanese products."

Reviewing past achievements and current trends, METI came up with a strategy to further expand the Japanese water industry overseas in the future. The strategy comprises five pillars.

First, the Japanese government will help its foreign counterparts change their legal systems, including those that lay out basic rules stating that "the people should pay for water supplies and sewerage systems," as well as improve their regulations so that new technologies can be introduced.

Second, business proposals from Japan should include sharing operational expertise, including financial arrangements, with its national and local counterparts so that local water projects can secure a proper management base.

Next, it is important to offer appropriate

levels of service at a cost as low as possible from the point of view of the counterpart country. To this end, it is necessary to engage in business operations, in addition to selling plants and equipment.

Fourth, it is necessary to promote understanding of water charges and public service to make the water supply and sewerage systems sustainable, thus achieving SDG 6.

Finally, the Japanese government should provide Japanese companies with opportunities to prove their newly developed technologies.

Due to the COVID-19 pandemic, international businesses in the water industry have been affected, as companies note delays in sales negotiations and ongoing construction. From the point of view of public health, however, the U.N. points out that 3 billion people worldwide lack basic hand-washing facilities at home, which is the most effective method for COVID-19 prevention.

In December, the Japanese government launched the Strategy in Overseas Expansion of Infrastructure System 2025. The strategy emphasizes encouraging counterpart countries to resume suspended projects and contribute to the medical and health fields according to local needs.

"METI made our strategy in response to this. The government is determined to further provide active support to the water industry," Takazaki said.

Growing global water crises fuel new ESG investment market

Tim Quinson
BLOOMBERG

About six weeks ago, millions of homeowners across Texas suddenly found their water to be possibly contaminated - or lost access to it entirely - when freezing temperatures and the state's decrepit infrastructure led to widespread blackouts.

Last week, on the other side of the planet, Taiwan cut water supplies to areas including a key hub of semiconductor manufacturing, thanks to the worst drought in decades.

These back-to-back crises are emblematic of a global catastrophe that is only now getting the attention it deserves. And unlike other calamities that may recede over time, this one is only going to get worse. The World Health Organization estimates that in less than four years, half of the world's population will be living in water-stressed areas. "These risks are only expected to grow as climate change effects intensify," said Thomas Schumann, the founder of Thomas Schumann Capital, a firm that's created investable water indexes for the U.S. and Europe as part of the uptrend in environmental, social and governance investment. "Not only that, but the business costs associated with these risks are projected to be \$300 billion ... or five times greater if left undressed."

While most environmental discussions focus on greenhouse-gas emissions, nine of the 10 greatest risks faced by humanity are linked to a lack of water, Schumann said. Water is irreplaceable when it comes to sup-



The dried-out bed of the Second Baoshan Reservoir in Hsinchu, Taiwan, is shown on April 7 after semiconductor plants called in water trucks earlier this year to ensure supply during a drought caused by the absence of monsoon rains. BLOOMBERG

porting life and well-being. By definition, that means there's an investor and business case for prioritizing water stewardship, he said.

The events in Texas and Taiwan "directly speak to the impact and to so many stakeholders," said Jade Huang, a money manager at Calvert Research and Management, which oversees almost \$32 billion, including the \$494 million Calvert Global Water Fund.

Taiwan Semiconductor Manufacturing Co. needs "extensive amounts of clean water," Huang said. On March 24, Taiwan issued its first red alert on water supply in six years. While the government restrictions aren't directed at TSMC, the company said it plans (as a contingency) to increase the amount of water it uses from tanker trucks.

In Texas, the main challenge from the February winter storm was gaining access to clean water for basic health and sanitation, said Yijia Chen, an ESG analyst at Calvert.

Valuing water, she said, has never been more important.

Calvert invests in water utilities and distributors; emerging technologies that test, monitor or enhance water quality; companies that focus on improving water efficiency; and companies that provide solutions to global water challenges. One such firm is Danaher Corp., which is a market leader in the water-purification business, Huang said. Another is LG Chem Ltd., which is involved in desalination projects.

Companies can of course continue to operate while spewing massive amounts of carbon into the atmosphere. But without access to water, many would be unable to survive, Schumann said. As a result, investors increasingly use water security as a proxy for climate security, he said.

Thomas Schumann Capital has developed the TSC U.S. Water Security Index, which

includes about 550 of the nation's biggest companies, and the TSC Euro Water Security Index, which is composed of about 225 large-cap stocks from the eurozone.

Firms with lower water footprints and water-risk exposure, such as AT&T Corp., Microsoft Corp. and Citigroup Inc., are given proportionately higher weightings in the indexes, he said. They automatically exclude firms that operate in the gambling, tobacco and defense industries, as well as those with the worst combined ESG and United Nations sustainable development goal ratings.

The TSC U.S. Water Security Net Return Index generated a cumulative return of 116.5% between its creation in October 2015 and last month, compared with the 104% gain in the S&P 500 Index, including reinvested dividends, in the same period. The Calvert Global Water Fund climbed at annual rate of 12.4% in the past five years, trailing the 14.2% gain of its benchmark, the MSCI ACWI Index.

The \$1.5 billion Invesco Water Resources ETF is the largest U.S. fund investing in companies that make products to conserve and purify water for homes, businesses and industries. The exchange-traded fund, which tracks the Nasdaq OMX U.S. Water Index, rose at an annual rate of 17.8% in the past five years, beating the 16.3% advance of the S&P 500.

The World Economic Forum identifies transformational investment as the solution to systemic risks such as water crises, Schumann said. These investments can tackle long-term water risks and also generate competitive returns, which he calls "a win-win-win for the environment, society, and investors."



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