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FY2018

Report on a Study of International Cooperation in the Water Supply Sector

-Cooperation with other sectors and business expansion to overseas by Japanese water utilities and companies-

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	Policy for the FY2018 Study on International Cooperation in the Water Supply Sector

Chapter 1 Policy for the FY2018 Study on International Cooperation in the Water Supply Sector

1-1 Details of the Study

(1) Studies conducted in the preceding years

Ever since its inception as war reparation toward Japan's Asian neighbors, the Official Development Assistance (ODA) has been evolving to respond to the changing world and its economy. With respect to the water supply sector, initially ODA focused on providing direct assistance for construction of waterworks facilities. But Japan noticed the limited effect of sole assistance for facility construction and maintenance. The country's redirection of focus toward human resource development subsequently proved to be fruitful. In recent years, ODA has also been tasked with strengthening the financial standing of target companies, which is the basis of business management, ensuring proper planning and adequate implementation of phased maintenance, and pursuing other activities to consolidate and enhance their business management.

Through the Study Committee on International Cooperation in the Water Supply Sector that was established under this project, Japan's Ministry of Health, Labour and Welfare (MHLW) has been conducting studies and making proposals focused on providing assistance for soft infrastructure development. In the fiscal year 2006, the Review Committee for International Cooperation Projects (Water Supply Sector) issued a report identifying issues to be studied. This report proposed two approaches for conducting necessary activities: (1) developing human resources who will engage in international cooperation and (2) designing a comprehensive assistance program. Since then, proposals have been constantly made to enhance the effectiveness of training programs, improve the way they are organized, and build the capacity of hosting organizations. The following study in the fiscal year 2012 explored desirable assistance in the planning and implementation of water supply projects. It pointed out the need for assistance in the operation and management of water projects for strengthening partner governments' vulnerable fiscal footing and possible infrastructural and financial assistance for phased development and planning according to the reality in target countries and regions. Another study in the fiscal year 2013 mainly compiled and analyzed financial data to propose assistance for better management of water utility business. Examples included measures for increasing service revenue, ideas for reducing costs by streamlining operations, and methods for utilizing external funding. The study in the fiscal year 2014 proposed an analytical method for assessing the business environment in the water utility industry in each country, which was a precondition of assistance to the management of water utility business, in terms of governance, personnel systems, and financial basis. According to this method, assistance incorporated findings from the assessment of these three conditions. The study in the fiscal year 2015 sorted out international cooperation projects conducted by Japan in the water supply sector and compiled recommendations for better communication and publication of project outcomes both in Japan and overseas.

The study in the fiscal year 2016 kept track of the environment for maintaining international cooperation in the water supply sector and the change in the development goals in the previous decade and researched actual circumstances in the countries that Japan had been continuously assisted in international cooperation in the water supply sector during the period. After examining

how the proposed measures had been implemented, priority issues for further international cooperation were considered in terms of priority measures, priority regions, securing necessary human resources, and evaluation methods for international cooperation projects. The study in the last fiscal year (2017) further examined specific measures for such priority issues and actual monitoring of the outcomes.

(2) Background to the theme selected for this study

The United Nations (the UN) aimed at reducing the number of people who could not access safe drinking water sustainably by half by 2015 under its Millennium Development Goals (MDGs). This was achieved in 2010 and additional 2.6 billion people became to be able to use safe drinking water since 1990. However, approximately six hundred million people in the world were still without supply of safe drinking water. The UN adopted new Sustainable Development Goals (SDGs) in the General Assembly in September 2015 as post MDGs. Under the new goals, the UN aims at supplying safe drinking water to all people as its main task to change such situation better.

The SDGs are more varied goals evolved from the MDGs and each goal relates to and affects other goals mutually, demanding work considering comprehensive effects. Specifically, in addition to work for SDG 6 that was determined for water supply businesses, how such work relates to and affects other goals needs to be understood and more effective cooperation in consideration of such relationship is required. The viewpoints in Universal Health Coverage (UHC) that is an activity carried out in cooperation with the public health sector are particularly important.¹

Meanwhile, regarding Japanese government's work for water and health issues, one starting point is when Mr. Hashimoto (Prime Minister at that time) brought the importance of international measures against parasitic diseases up in the G8 summit held in Denver in 1997, stressing each G8 country had to cooperate with each other and share the responsibility for the issue. In the following 1998, in the G8 summit held in Birmingham in the U.K., the G8 announced that they needed to work to control parasitic diseases around the world (Hashimoto Initiative).

The first Abe Cabinet (September 26, 2006 to August 27, 2007) set out Asian Gateway Initiative as its policy. In May 2007, the Japanese government set up the Asia Gateway Strategy Council under the Cabinet Secretariat. On December 3 and 4 in the same year, the first Asia-Pacific Water Summit was held in Beppu, Oita.

Message from Beppu was released as a summary of the summit. The message stated that the participants in the summit understood the importance of water once again and, as a suggestion to the governments of the Asia-Pacific region, they reached the consensus: that they would increase the support for water and health as their priority tasks in their economy, development, and politics; and that, as specific goals towards the Hokkaido Toyako Summit, 1) they would provide support so as to achieve the goal on the water and health (one MDG) and 2) they would start activities immediately to assist developing countries in acclimatizing to climate change. Top-level politicians in the Asia-Pacific region where the water supply was a serious problem gathered in this summit and

¹⁾ As an example, Japan's Ministry of Health, Labour and Welfare's website https://www.mhlw.go.jp/stf/seisakunitsuite/bunya/0000202658.html

reconfirmed the common recognition that solving the water problems was the top-priority issue, which was very important.²⁾

After that, in December 2007, the Policy Research Committee under the Liberal Democratic Party of Japan set special mission committee "Water Security Council of Japan." The committee put together the final report in 2008, stressing that it was important for the industry, government, and universities to cooperate with each other toward the sustainable future of the international community along with other matters.

In 2008, the water and health were discussed at the Hokkaido Toyako Summit and the Team Water Japan was introduced as one result.

In addition to such activities, many other activities were carried out with the Team Water Japan (Water Security Organization) as its core: The Team Water Industry Japan under Federation of Japan Water Industries, Inc. formulated Water Industry Activation Plan 2008; Japan Water Works Association's Team-Water Service for Life-Japan discussed how to promote public private partnership and other matters; the Japan Water Research Center set up the Asia-Pacific Drinking Water Technology Information Station in cooperation with the Japan Water Forum; and various international programs for improving the safety of water as shown in the figure below (e.g., JICWELS and NIPH) were promoted.



Figure 1.1 Outline of activities under the International Program for Improvement of Water Safety and Health

As a change in recent years, the Japanese government reviewed the Official Development Assistance Charter (ODA Charter) in February 2015 and formulated the Development Cooperation Charter putting together the ODA concepts, fundamental principles, and other matters. The Japanese government selected independent development of developing countries as one important issue in

2) Japan's Ministry of Foreign Affairs' website

https://www.mofa.go.jp/mofaj/gaiko/kankyo/watersummit1/gaiyo.html

this charter, stating that Japan would provide support comprehensively for intangible elements, such as operation, management, human resources, and systems, in addition to tangible elements. In addition, in the Japan's Infrastructure Export Strategy, the Japanese government aims at improving the lifestyles of partner countries through transfer of Japan's advanced technologies, expertise, systems, and other matters mainly to emerging countries. The government also aims at contributing to realizing sustainable development and to solving global issues on environments, disaster prevention, health, and other factors as preconditions for such sustainable development while contributing to enhancing Japan's soft power and upgrading Japan's diplomatic position at the same time. To that end, it is necessary to consider improving environments so that water utilities that do practical operations in international cooperation activities and water service companies that plan to expand their businesses overseas can work more easily.

(3) Direction of this study

This fiscal year's study focused the mutual relationship between the water supply sector and other sectors in the SDGs considering the factors listed above. The SDGs are more varied goals evolved from the MDGs and each goal relates to and affects other goals mutually, demanding work considering comprehensive effects. Specifically, in addition to work for SDG 6 that was determined for water supply businesses, how such work relates to and affects other goals needs to be understood and more effective cooperation in consideration of such relationship is required. The viewpoints in Universal Health Coverage (UHC) that is an activity carried out in cooperation with the public health sector are particularly important.

In addition, to promote international cooperation projects, it is necessary to consider improving environments so that water utilities that do practical operations in international cooperation activities and water service companies that plan to expand their businesses overseas can work more easily. These points had been considered and discussed repeatedly in the past, but roles of private companies had not been discussed much, so their roles needed to be put together in line with the viewpoint in the support for water utilities' business expansion to overseas.

This fiscal year's study was done from the two viewpoints listed below by organizing the factors listed above.

i) Organizing mutual relationship between the water supply sector and other sectors in the SDGs

- Summarize the flow from the MDGs to the SDGs, latest situations, and international cooperation activities considering Japan's Development Cooperation Charter.
- Overlook the 17 SDGs and organize main entities and details of activities in Japan in sectors that may directly and indirectly relate to the water supply sector such as problems of poverty, food, and environments and industrial, energy, and health sectors.
- Specify details of activities related to UHC.
- Examine how details of Japan's international cooperation in the water supply sector that were organized by the last fiscal year—matters that should be preferentially worked on, in

particular—contribute to other sectors based on the results of the tasks above. Clarify what to do specifically.

ii) Organizing Japanese water utilities' activities in the past and Japanese companies' business expansion to overseas

- Summarize an overview of how Japanese water utilities have participated in international cooperation, including training programs carried out in Japan, for international cooperation activities of the Japanese water supply sector till now. Organize Japanese companies that have been participating in such activities as well.
- Studies in the past fiscal years collected various opinions on points to encourage Japanese water utilities to participate in international cooperation activities, so systematize and structurize them.
- In addition, understand the current situation of means to support activities of private companies that have been participating in actual international cooperation operations from many sides.

Analyze and examine means to carry out future international cooperation activities more effectively and efficiently based on the results of the examinations above. Discuss measures to be implemented in the water supply sector's international cooperation in the future.

- Based on the matters organized in i), analyze the mutual relationship with other sectors while referring to outcomes of projects carried out in recent years. Consider procedures to enhance the effects of international cooperation while deepening the relationship with the other sectors in the future.
- Based on the matters organized in ii), discuss what means could be taken to improve environments to allow Japanese water utilities to participate in international cooperation and Japanese companies to expand their businesses overseas in the future.
- Select a developing country that matches the points of this study and collect information from parties concerned on circumstances of the local water supply related to i) and ii) in the country. The country selected is shown in the following section.
- Organize and propose activities to be carried out in the future and items to be improved based on the examination results.

1-2 Selection of a Target Country

In this fiscal year's study, a field study was carried out by visiting a developing country: In the field study, mainly the following items required for examinations were studied: Current situation and problems of the country's water supply business, its activities for the SDGs, actual cooperation with other sectors considering UHC, and items that Japanese water utilities and companies can support.

The conditions for selecting a target county were 1) a country that is safe and politically stable, 2) a country where currently international cooperation activities in the water supply sector are being carried out, and 3) a country that is important for activities for the SDGs in the future. Considering

these conditions and other factors, the Democratic Republic of East Timor (East Timor) was selected.

1-3 The Task Force for the Study

(1) Committee structure

This study was conducted over a 1-year period, and the report of findings was drawn up through deliberations undertaken at three meetings held by the Study Evaluation Committee that was established in the fiscal year 2018 for this purpose. The committee members and the schedule of the committee meetings are presented as follows.

[Study committee members]

Hirokatsu Asakawa	Director, Contract and Inspection Division, Waterworks Management			
	Department, Osaka Water Supply Authority			
OHidetoshi Kitawaki	Vice President, Director, Center for Sustainable Department Studies,			
	Professor, Faculty of Global and Regional Studies, Toyo University			
Yosuke Saito	Deputy Director for International Affairs Team, Planning and			
	Coordination Section, General Affairs Division, Bureau of Waterworks,			
	Tokyo Metropolitan Government			
Dai Shimazaki	Chief Senior Researcher, Water Supply and Management Section,			
	Department of Environmental Health, National Institute of Public Health			
Toshimitsu Takahashi	Senior Staff, Management and Planning Division, Operation Department,			
	Saitama City Waterworks Bureau			
Daigo Takeda	Manager, International Project Division, International Project			
	Department, Water and Sewer Bureau, City of Kitakyushu			
Shigeyuki Matsumoto	Deputy Director General, and Group Director for Water Resources,			
	Global Environment Department, Japan International Cooperation			
	Agency (JICA)			
Ikuo Mitake	Senior International Director, Training and International Department,			
	Japan Water Works Association (JWWA)			
Tatsuo Morimoto	Senior Advisor, Federation of Japan Water Industries, Inc.			
Tomomi Yamashita	Director of International Operations Division, Yokohama Waterworks			
	Bureau			
(o: Chairperson)				
[Secretariat]				
Toru Kajiwara	Director, Office of Global Health Cooperation, Ministry of Health,			
	Labour and Welfare (MHLW)			
Tomoyuki Kado	Section Chief, Office of Global Health Cooperation, International Affairs			
	Division, Minister's Secretariat, Ministry of Health, Labour and Welfare			
	(MHLW)			

Ryota Ushio	Assistant Section Chief, Office of Global Health Cooperation,
	International Affairs Division, Minister's Secretariat, Ministry of Health,
	Labour and Welfare (MHLW)
Shigeru Sugawara	Director for Safe Drinking-water, International Cooperation and Training
	Department, Japan International Corporation of Welfare Services
	(JICWELS)
Takeo Yamaguchi	Technical Advisor, Japan International Corporation of Welfare Services
	(JICWELS)
Mayumi Kitajima	International Cooperation Section, International Cooperation and
	Training Department, Japan International Corporation of Welfare
	Services (JICWELS)

(2) Schedule for committee meetings

The Study Evaluation Committee held meetings in the fiscal year 2018 on the following three dates.

- 1st meeting: Tuesday, September 11, 2018
- 2nd meeting: Tuesday, December 25, 2018
- 3rd meeting: Thursday, February 28, 2019

(Domestic research)

• From September 2018 to March 2019

(Overseas research)

• From November 17 to 24, 2018

Chapter 2 Summary of the Interlinkages between the Water Supply and Other Sectors in the SDGs

2-1 Outline of the Transition from MDGs to SDGs and Japan's International Cooperation

The 1990s saw growing public concerns over the issue of poverty, which led the international community to establish the Millennium Development Goals (MDGs) in 2000 to pursue a common set of goals in the area of development. The MDGs consisted of eight goals which the international community should achieve by 2015, including eradication of poverty, universal primary education, gender equality, prevention of diseases and environmental sustainability in developing countries. In September 2015, the target year of the MDGs, the Sustainable Development Goals (SDGs) were set forth to replace the MDGs. The SDGs comprise 17 goals, underpinned by 169 targets to help define progress, and are targeted at all countries in the world, including the most developed ones, for example to encourage them to build resilient infrastructure, promote inclusive and sustainable industrialization, and so on. The major differences between the MDGs and SDGs are that the latter have more comprehensive and mutually-related goals and targets, as the numbers have increased from 8 goals and 21 targets to 17 goals and 169 targets, that the latter are targeted at all countries while the former were only set as goals for developing countries and that the latter are meant to be pursued between negotiations between all member states of the United Nations while developing countries worked towards the former under the leadership of United Nations experts.

As the international community's debate surrounding development has undergone such shifts, there have been changes also in the roles which Japanese Official Development Assistance (ODA) is expected to play. This is the reason that the ODA Charter, which had been serving as the base for ODA policies of the Japanese government, was revised into the Development Cooperation Charter in February 2015. One of the principles of the Development Cooperation Charter is "cooperation aimed at self-reliant development through assistance for self-help efforts, as well as dialogue and collaboration based on Japan's experience and expertise." In other words, it stipulates that Japan shall work for development of people and social and economic infrastructures by keeping up its tradition of backing up the self-help efforts of developing countries to help them prepare themselves for future self-reliant development. The priority issues set out in this new charter include: (A) "quality growth and poverty eradication" through such growth and (C) building a sustainable and resilient international community through efforts to address global challenges, which involve improving access to resources and energy, respectively.

Besides the above, there is also a cooperation initiative that is clearly targeted at Africa named Tokyo International Conference on African Development (hereinafter referred to as "TICAD").³⁾ The sixth TICAD became the first TICAD to be held in Africa and took place in Nairobi, Kenya, participated in by about 11,000 people, representing respective African countries, their development partner countries, international and regional organizations, private-sector organizations, NGOs, civil societies and so on. The next one, TICAD VII, is scheduled to be hosted in Yokohama City in 2019.

³⁾ Website of the Ministry of Foreign Affairs of Japan, https://www.mofa.go.jp/mofaj/area/ticad/index.html

2-2 Implementation System for the SDGs

(1) Main organizations involved with the SDGs

Here are organizations that have been playing major roles in the monitoring framework for the SDGs since the goals were adopted by the United Nations in September 2015:

[Inter-agency and Expert Group on SDG Indicators (IAEG-SDGs)]

The Inter-agency and Expert Group on SDG Indicators (hereinafter referred to as "IAEG-SDGs") is a working group tasked to develop the indicator and monitoring framework for the SDGs, which was established under the UN Statistical Commission in March 2015. The group, set up mainly to develop draft SDG indicators, consists of statistical experts. As the result of the first and second meetings of the IAEG-SDGs, 230 draft indicators were created to measure progress against the 17 goals, as well as the 169 targets underpinning the goals, and were presented to the 47th Session of the UN Statistical Commission in March 2016.⁴⁾ These indicators were then classified into three tiers and the organization of custodian agencies was arranged in May 2017, reflecting how far the discussions had proceeded, and how developed the monitoring framework was, for each indicator. Since then, the classification of the indicators has been revised on a continued basis based on their level of methodological development and the availability of data.

[UN Statistical Commission]

Being the highest body of the international statistical system, the UN Statistical Commission brings together the Chief Statisticians from member states from around the world, annually in principle, at the UN Headquarters. It is tasked to provide approval to proposed revisions to the monitoring framework for the SDGs.

[High-Level Political Forum (HLPF)]

The High-Level Political Forum (hereinafter referred to as "HLPF"), which convenes annually under the auspices of the United Nations Economic and Social Council (ECOSOC), plays a major role in regular SDGs monitoring. The forum reviews progress towards the SDGs at periodic intervals and discloses the results on its website (https://sustainabledevelopment.un.org/).

(2) Data collection and management system for the SDGs⁵)

While the above is the framework in which each SDG indicator has been reviewed and progress towards the SDGs has been discussed, the IAEG-SDGs has also been deliberating on data collection guidelines for the SDGs in their meetings. The (draft) guidelines submitted to the sixth meeting of the IAEG-SDGs in November 2017 propose data collection flows for the SDGs. In this proposal, official data submitted by each country should be used for the SDG indicators, while the respective custodian agencies should involve themselves in deciding what data each country should use when there is no official data.

a) The statistical system of each country compiles official data for SDG indicators (national government-initiated process).

⁴⁾ It has been clearly stated that the indicator framework agreed upon at the 47th Session of the UN Statistical Commission was nothing more than a draft to which improvements should be made on a continued basis.

⁵⁾ Website of the National Institute of Public Health, https://www.niph.go.jp/journal/data/66-4/201766040002.pdf

- b) The custodian agencies (CAs) check whether the data is appropriate for SDG indicators, and identify whether there is unofficial data that can be used when there is no proper official data for some indicators.
- c) The CAs sort out and analyze the (official or unofficial) data and decide which data should be used after consulting the statistical system of each country.
- d) The CAs create a report.
- e) The report is submitted to the UN Statistical Commission.

2-3 Indicators and Monitoring System for SDG 6 (Water and Sanitation)

In May 2017, the IAEG-SDG, responsible for leading overall monitoring of SDGs, assigned custodians for three different categories of goals according to the discussion on each item and indicator as well as readiness of the available monitoring system. Goal 6 is divided into Targets 6.1, 6.2, 6.a, and 6.b on water supply and sanitation, and Targets 6.3–6.6 on water resource management, water use, and water environment. Monitoring the progress made on the former targets is led by the WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (hereinafter referred to as "WHO/UNICEF JMP"). Since 1990, WHO/UNICEF JMP has been monitoring and reporting progress made on water and sanitation by country, region, and globally. The program has also been continuing to monitor progress made on water and sanitation under MDGs by following indicators on water and sanitation under SDGs since 2016.

Because Targets 6.1 and 6.2 have already been included in MDGs, they are classified to Tier II for precise monitoring by building on the earlier experience gained by WHO/UNICEF JMP.⁶) The breakdown of Goal 6, target indicators, and agencies assigned for their monitoring are presented as follows:

Target 6.1:	By 2030, achieve universal and equitable access to safe and affordable drinking water
	for all.
Target 6.4:	By 2030, substantially increase water-use efficiency across all sectors and ensure
	sustainable withdrawals and supply of freshwater to address water scarcity and
	substantially reduce the number of people suffering from water scarcity.
Target 6.5:	By 2030, implement integrated water resources management at all levels, including
	through transboundary cooperation as appropriate.
Target 6.a:	By 2030, expand international cooperation and capacity-building support to
	developing countries in water- and sanitation-related activities and program, including
	water harvesting, desalination, water efficiency, wastewater treatment, and recycling
	and reuse technologies.
Target 6.b:	Support and strengthen participation of local communities in improving water and
	sanitation management.

Table 2.1 SDGs related to water, indicators, and their tier classification⁷)

⁶⁾ Tier I: Data are regularly accessible and progress is monitored according to an established method. Tier II: Data are not regularly accessible, although progress is monitored according to an established method. Tier III: No monitoring method has been established.

⁷⁾ Website of the Ministry of Foreign Affairs of Japan, https://www.mofa.go.jp/mofaj/files/000101402.pdf

	Indicators ⁸⁾	Tier ⁹⁾	Custodian
6.1.1	Proportion of population using safely managed drinking water services	II	WHO, UNICEF
6.4.1	Change in water-use efficiency over time	II	FAO
6.4.2	Level of water stress: freshwater withdrawal as a proportion of available freshwater resources	Ι	FAO
6.5.1	Degree of integrated water resources management implementation (0–100)	Ι	UN Environment
6.5.2	Proportion of transboundary basin area with an operational arrangement for water cooperation	II	UNESCO, UNECE
6.a.1	Amount of water- and sanitation-related official development assistance that is part of a government- coordinated spending plan	Ι	WHO, UN Environment, OECD
6.b.1	Proportion of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management	Ι	WHO, UN Environment, OECD

With a close reference to Target 6.1 as the most relevant to waterworks, "improved drinking water sources" were pursued under MDGs. Under SDGs, the expected water quality was redefined as "safe and affordable drinking water." In terms of service quality, "universal and equitable access" was pursued. More specifically, MDG to ensure access to limited water sources in level 3 in Table 2.2 was modified to the corresponding SDG by adding a condition that all people have access to affordable and safely managed water sources.

Considering expected improvement in the quality of services according to SDG, some water sources still need improvement even after achieving the corresponding MDG. Figure 2.1 presents the policy of WHO/UNICEF JMP. As shown in this hypothetical example, the proportion of "safely managed drinking water services" is calculated based on the smallest figure, i.e., "improved free of contamination (56%)" is the smallest compared with "improved drinking water sources (80%)," "improved within 30 minutes (70%)," "improved on premises (60%)," and "improved available when needed (64%)." Although SDGs are set for all countries, each country additionally sets its national targets according to their local reality.

⁸⁾ Website of the UN Water HP:

http://www.unwater.org/app/uploads/2017/04/SDG6_TABLE_INDICATORS_april2018_6.png

The classification in the table is sourced from a November 2018 report (Tier Classification for Global SDG Indicators 27 November 2018) and may be subject to review and change in the future.

⁹⁾ Website of the United Nations Statistics Division: https://unstats.un.org/sdgs/iaeg-sdgs/tier-classification/

Service level	Definition		
Safely managed	Drinking water from an improved water source that is located on premises, available when needed and free from faecal and priority chemical contamination		
Basic	Drinking water from an improved source, provided collection time is not more than 30 minutes for a round trip, including queuing		
Limited	Drinking water from an improved source for which collection time exceed 30 minutes for a round trip, including queuing		
Unimproved	Drinking water from an unprotected dug well or unprotected spring		
Surface water	Drinking water directly from a river, dam, lake, pond, stream, canal or irrigation canal		

Table 2.2 Classification of water sources under SDGs¹⁰)

The population using 'safely managed' drinking water is likely to be significantly lower than the population using 'improved' sources



FIGURE Hypothetical example of the population using improved, basic and safely managed drinking water services (%)



The latest WHO/UNICEF JMP report¹²⁾ states that the progress made with SDG on urban water supply in developing countries will be monitored in terms of access to water on premises or from shared facilities within 30 minutes from home, number of serviced households or people, collection time at facilities, and water quality against the standards. Progress in rural areas will be monitored in terms of distance to protected water sources free of contamination, queuing time for collecting water, seasonal change in the amount of available water, quality of drinking water brought home, and so forth. Considering the difficulty in setting a worldwide standard for affordability and universal access, the evaluation will take into account government subsidies, reduction or

¹⁰⁾ Source: Progress on Drinking Water Sanitation and Hygiene 2017

⁽https://www.unicef.org/publications/files/Progress_on_Drinking_Water_Sanitation_and_Hygiene_2017.pdf)

¹¹⁾ Safely managed drinking water - thematic report on drinking water 2017, figure 30

¹²⁾ Progress on Drinking Water, Sanitation and Hygiene: 2017 Update and SDG Baselines. Geneva: World Health Organization (WHO) and the United Nations Children's Fund (UNICEF), 2017.

exemption of water charge, and other factors when the poor spend > 3% of their income for accessing drinking water. Previously, water supplied by cistern trucks or the like and bottled and packaged water were not counted as safe drinking water. But the latest report set out a policy to count them in as long as necessary quality is ensured. An estimate conducted in this report with selected countries and regions concluded that 5.2 billion people used safe sources of drinking water.

Monitoring will be mainly based on data of water utilities, public waterworks corporations, and municipalities collected from responsible ministries and agencies and household survey conducted as a part of the monitoring program. Of these two sources of information, the latter will be employed as much as possible. The latest monitoring system for SDG 6 on water not necessarily limited to drinking water is presented in Figure 2.2. Monitoring takes place according to the following procedure: 1) an international agency in charge of monitoring requests the respective countries to provide data, 2) data from statistical systems of respective countries are provided to the international agency in charge, 3) the international agency in charge closely examines statistical data in consultation with the respective countries, 4) adjusted data are approved by the respective countries, 5) the international agency in charge submits approved data to the United Nations Statistical Database (hereinafter referred to as "UNSD"), and 6) UNSD publishes data.



Figure 2.2 Monitoring system for SDG 6 as defined in UN Water¹³⁾

2-4 Interlinkages between the Water Supply and Other Sectors in the SDGs

The purpose of this section is to have an overview of the 17 SDGs, summarize the players and their activities in the areas that are directly or indirectly related to the water supply sector, such as the issue of poverty, food problems, industry, energy, environmental problems and health, and discuss their cooperation possibilities from the perspective of their interlinkages with the water supply sector.

As regards the MDGs, the Ministry of Health, Labour and Welfare of Japan explored intersectoral collaborations towards the goals in the water supply sector in March 2012, in which collaborations in social security fields, such as health and social welfare, were discussed.¹⁴

14) Website of the Ministry of Health, Labour and Welfare of Japan, "Report on Possibilities of Intersectoral Collaborations towards the MDGs (March 2012),"

^{13) &}quot;Progress on SDG 6 Monitoring" 9th meeting of the OECD Water Governance Initiative, 3–4 July 2017 - Paris, France, https://www.slideshare.net/OECD-GOV/progress-on-the-monitoring-of-sdg-6-water-and-sanitation-for-all-unwater-who

https://www.mhlw.go.jp/topics/bukyoku/kenkou/suido/jouhou/other/dl/o4 0404b.pdf

One of the problems pointed out in the pursuit of the MDGs was a lack of positive relationship between different goals. By contrast, all goals of the SDGs, the new set of goals established to replace the MDGs, are related to one another, as achieving one of the SDGs often requires dealing with issues that are also related to other goals.

SDG 6 is dedicated to water and sanitation, which form part of the core pillars of human health and well-being and are particularly important for sustainable development. Targets 6.1 and 6.2 of SDG 6 not only contribute to eradication of poverty and improved access to basic services (Goals 1 and 11) but also are essential for improved nutrition (SDG 2), health (SDG 3), education (SDG 4), gender equality (SDG 5) and productivity (SDG 8).

Water is vital also for food, energy and industry, and thus is closely and mutually interrelated with these sectors. For example, the food and industrial sectors require enormous water resources, while at the same time they can cause pollution to water resources if they fail to appropriately control their water discharges. In fact, data of WHO/UNICEF JMP, which collects data for Targets 6.1 and 6.2, is used for calculation for the following indicators.¹⁵

- Target 1.4: Proportion of population living in households with access to basic services
- Indicator 3.9.2: Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services)
- Indicator 4.a.1: Proportion of schools with access to: (a) electricity; (b) the Internet for pedagogical purposes; (c) computers for pedagogical purposes; (d) adapted infrastructure and materials for students with disabilities; (e) basic drinking water; (f) single-sex basic sanitation facilities; and (g) basic handwashing facilities (as per the WASH indicator definitions)

In addition, UN-Water has issued a report to explore the linkages between different goals of the SDGs.¹⁶) The Synthesis Report on Water and Sanitation,¹⁷) submitted at the HLPF this July, also describes the links between SDG 6 and other goals, while referring to the UN-Water report.

More specifically, these reports state that water and sanitation are important sectors for the SDGs that have central roles to play in each of the three dimensions of the SDGs (economy, society and environment) and summarize the links between these sectors and other sectors in each of the three dimensions. The figure below illustrates the roles of the water supply sector in the three dimensions described in the reports.

¹⁵⁾ Website of JMP: https://washdata.org/how-we-work/sdg-monitoring

A Japanese translation of each target is available on the website of the Ministry of Health, Labour and Welfare of Japan: http://www.soumu.go.jp/main_content/000562264.pdf

 $^{16) \} Website \ of \ UN \ Water: \ http://www.unwater.org/publications/water-sanitation-interlinkages-across-2030-agenda-sustainable-development/$

¹⁷⁾ Website of UN Water: http://www.unwater.org/publication_categories/sdg-6-synthesis-report-2018-on-water-and-sanitation/



Figure 2.3 Links between the water supply and other sectors in three dimensions (economy, society and environment)¹⁷⁾

The table below summarizes the interlinkages between SDG 6 and other goals described in these reports.

Table 2.3 Links between SDG 6 and other goals				
Interlinked goals	Interlinkages			
SDG 7	Water and energy are mutually dependent, with all energy forms requiring water to varying degrees. In turn, water management, including treatment and pumping, requires energy.			
SDG 11	Cities and human settlements provide basic services to their inhabitants, including drinking water and sanitation. Cities are also increasingly playing a role in the management of water-related ecosystems, including floods and droughts.			
SDG 12	Water is an integral part of consumption and production cycles of food, energy, goods and services. Managing these processes sustainably is important in protecting the quantity and quality of water resources and using them more efficiently.			
SDG 15	Water and land management are closely associated, with activities taking place on land (including agriculture) using and potentially polluting water resources. Freshwater is also known as terrestrial water, and water is an indivisible part of what is known as the landscape approach. Water is also needed for all the world's ecosystems to function properly, including those on water, land and in seas.			
SDG 17	The MoI SDG is key to success of the 2030 Agenda, and includes partnerships, finance, technology, capacity-building, data acquisition and monitoring, and governance, all essential for SDG 6 achievement.			

BOX24 Transitioning towards sustainable and resilient societies: water and the other SDGs under review at HLPF 2018, Synthesis Report on Water and Sanitation 2018

In this way, the water supply and sanitation sectors have a wide variety of interlinkages with other sectors. The next table summarizes these interlinkages.

In reviewing the interlinkages between the water supply and other sectors, it is important to understand such diversity of the targets, aims, implementation organizations, etc. of the respective sectors and accordingly discuss the sectors that are particularly closely interlinked. The United Nations has established an organization tasked to undertake such coordination work named UN-Water, which has been acting as a liaison and coordinator, managed by people sent from many different agencies, including the WHO and UNICEF.

Goals	Descriptions	Main custodian agencies and related government departments ¹⁹⁾	(1) Influence to the watersupply sector (G6)(2) Influence from the watersupply sector (G6)
6 CLEAN WATER AND SANITATION	Ensure availability and sustainable management of water and sanitation for all	Cabinet Secretariat, Cabinet Office, Ministry of Foreign Affairs, Ministry of Land, Infrastructure, Transport and Tourism, Ministry of Internal Affairs and Communications, Ministry of Economy, Trade and Industry, Ministry of Finance, Ministry of Health, Labour and Welfare, Ministry of Agriculture, Forestry and Fisheries, Ministry of the Environment	
1 NO POVERTY	End poverty in all its forms everywhere	Cabinet Secretariat, Cabinet Office, Ministry of Internal Affairs and Communications, Ministry of Agriculture, Forestry and Fisheries, Ministry of Justice, Ministry of Economy, Trade and Industry, Ministry of Finance, Ministry of Health, Labour and Welfare, Ministry of Foreign Affairs, Ministry of Land, Infrastructure, Transport and Tourism	 (1) Increased incomes leading to improved access to water supply, sanitation and hygiene services (2) Contribution to improved access to water for better water supply, sanitation, hygiene, food and energy, and eradication of poverty
2 ZERO HUNGER	End hunger, achieve food security and improved nutrition and promote sustainable agriculture	Cabinet Office, Ministry of Foreign Affairs, Ministry of Health, Labour and Welfare, Ministry of Agriculture, Forestry and Fisheries	 (1) Saving water through reducing wasted food and increasing crop productivity per water unit and controlling water pollution from agricultural effluents (2) Water for food production and processing

Table 2.4 Links between SDG 6 and the other goals and Japan's related organizations
in the implementation of the $SDGs^{18}$

¹⁸⁾ Binaya Raj Shivakoti, Magnus Bengtsson, Placing Water at the Core of the Sustainable Development Goals (SDGs): Why an Integrated Perspective is Needed, https://pub.iges.or.jp/pub/placing-water-core-sustainable-development

¹⁹⁾ Prime Minister's Office, "Specific Measures to Achieve the Sustainable Development Goals (Appendix Table)," https://www.kantei.go.jp/jp/singi/sdgs/dai2/siryou2.pdf

Goals	Descriptions	Main custodian agencies and related government departments ¹⁹⁾	 (1) Influence to the water supply sector (G6) (2) Influence from the water supply sector (G6)
3 GOOD HEALTH AND WELL-BEING	Ensure healthy lives and promote well- being for all at all ages	Cabinet Secretariat, Cabinet Office, Ministry of Finance, Ministry of Foreign Affairs, Ministry of Economy, Trade and Industry, Ministry of the Environment, Ministry of Health, Labour and Welfare, National Police Agency, Ministry of Education, Culture, Sports, Science and Technology, National Tax Agency, Consumer Affairs Agency	 (1) Contribution to safe use of water, sanitation and hygiene (2) Improved access to water supply, sanitation and hygiene will promote healthcare and health and reduce diarrhea.
4 QUALITY EDUCATION	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	Cabinet Secretariat, Cabinet Office, Ministry of Foreign Affairs, Ministry of Education, Culture, Sports, Science and Technology, Ministry of the Environment, Ministry of Health, Labour and Welfare, Ministry of Agriculture, Forestry and Fisheries	 (1) Increased public awareness about safe use of water, sanitation and hygiene and sustainable use of water (2) Improved water, sanitation and hygiene at schools can increase attendance and reduce dropouts.
5 GENDER EQUALITY	Achieve gender equality and empower all women and girls	Cabinet Secretariat, Cabinet Office, Ministry of Foreign Affairs, Ministry of Education, Culture, Sports, Science and Technology, Ministry of Justice, Ministry of Health, Labour and Welfare, Ministry of Internal Affairs and Communications, Ministry of Agriculture, Forestry and Fisheries, National Police Agency	 (1) Gender empowerment can contribute to safe use of water, sanitation and hygiene and effective use of water. (2) Improved access to water can save the time (for work and education) and effort (for health) of girls and women who transport water. Provision of decent toilets at schools can lead to reduced school dropout of girls.
7 AFFORDABLE AND CLEAN ENERGY	Ensure access to affordable, reliable, sustainable and modern energy for all	Cabinet Secretariat, Cabinet Office, Ministry of Internal Affairs and Communications, Ministry of Economy, Trade and Industry, Ministry of Finance, Ministry of Land, Infrastructure, Transport and Tourism, Ministry of Foreign Affairs, Ministry of Education, Culture, Sports, Science and Technology, Ministry of the Environment, Ministry of Agriculture, Forestry and Fisheries	 (1) Efficient use of water for energy production, in other words, energy saving, leads to water saving. (2) Saved water leads to saved energy for pumping, water treatment and water supply, in other words, energy saving.

Goals	Descriptions	Main custodian agencies and related government departments ¹⁹⁾	(1) Influence to the watersupply sector (G6)(2) Influence from the watersupply sector (G6)
8 DECENT WORK AND ECONOMIC GROWTH	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	Cabinet Secretariat, Cabinet Office, Ministry of Internal Affairs and Communications, Ministry of Health, Labour and Welfare, Ministry of Foreign Affairs, Ministry of Economy, Trade and Industry, Ministry of Justice, Ministry of Agriculture, Forestry and Fisheries, Ministry of the Environment, Ministry of Land, Infrastructure, Transport and Tourism, Financial Services Agency, Ministry of Education, Culture, Sports, Science and Technology, National Police Agency, Reconstruction Agency	 (1) Construction of water supply, sanitation, hygiene and sewage infrastructure and services (2) Economical safety of water
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	Cabinet Secretariat, Cabinet Office, Ministry of Internal Affairs and Communications, Ministry of Economy, Trade and Industry, Ministry of Finance, Ministry of Agriculture, Forestry and Fisheries, Ministry of Foreign Affairs, Ministry of Land, Infrastructure, Transport and Tourism, Ministry of the Environment, Ministry of Education, Culture, Sports, Science and Technology	(1) Resilient water infrastructure(2) Industrial safety of water
10 REDUCED INEQUALITIES	Reduce inequality within and among countries	Cabinet Secretariat, Cabinet Office, Ministry of Justice, Ministry of Foreign Affairs, Financial Services Agency, Ministry of Health, Labour and Welfare	 (1) Contribution to improved access to water (2) Improved access to water, sanitation and hygiene for all people contributes to correcting inequality.

Goals	Descriptions	Main custodian agencies and related government departments ¹⁹⁾	(1) Influence to the watersupply sector (G6)(2) Influence from the watersupply sector (G6)
11 SUSTAINABLE CITIES	Make cities and human settlements inclusive, safe, resilient and sustainable	Cabinet Secretariat, Cabinet Office, Ministry of Internal Affairs and Communications, Ministry of Economy, Trade and Industry, Ministry of Finance, Ministry of Health, Labour and Welfare, Ministry of Foreign Affairs, Ministry of Foreign Affairs, Ministry of Land, Infrastructure, Transport and Tourism, Ministry of the Environment, Ministry of Agriculture, Forestry and Fisheries, Reconstruction Agency, Ministry of Education, Culture, Sports, Science and Technology	 (1) Resilient infrastructure that can deal effectively with water- related disasters (2) Supply of water to cities and residents
12 RESPONSIBLE CONSUMPTION AND PRODUCTION	Ensure sustainable consumption and production patterns	Cabinet Secretariat, Consumer Affairs Agency, Cabinet Office, Ministry of Economy, Trade and Industry, Ministry of Foreign Affairs, Ministry of Health, Labour and Welfare, Ministry of the Environment, Ministry of Land, Infrastructure, Transport and Tourism, Ministry of Agriculture, Forestry and Fisheries, Ministry of Education, Culture, Sports, Science and Technology	 (1) Application of reduction, recycling and resource recovery contributes to effective use of water. (2) Optimization of the distribution of water
13 CLIMATE ACTION	Take urgent action to combat climate change and its impacts	Cabinet Secretariat, Cabinet Office, Ministry of Internal Affairs and Communications, Ministry of Economy, Trade and Industry, Ministry of Finance, Ministry of Land, Infrastructure, Transport and Tourism, Ministry of Foreign Affairs, Ministry of Agriculture, Forestry and Fisheries, Ministry of the Environment, Ministry of Education, Culture, Sports, Science and Technology	 (1) Use of renewable energy for water (e.g. water conversion). Financing for water-related applications. (2) Supply of water for renewable energy (e.g. discharged water for biogas, hydropower generation, etc.). Adaptive water management.

Goals	Descriptions	Main custodian agencies and related government departments ¹⁹⁾	(1) Influence to the watersupply sector (G6)(2) Influence from the watersupply sector (G6)
14 LIFE BELOW WATER	Conserve and sustainably use the oceans, seas and marine resources for sustainable development	Cabinet Secretariat, Cabinet Office, Ministry of Internal Affairs and Communications, Ministry of Land, Infrastructure, Transport and Tourism, Ministry of Foreign Affairs, Ministry of Agriculture, Forestry and Fisheries, Ministry of the Environment, Ministry of Education, Culture, Sports, Science and Technology	 (1) Circulation of water and precipitation (2) Control of erosion and pollution in coral reef ecosystems
15 LIFE ON LAND	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	Cabinet Secretariat, Cabinet Office, Ministry of Foreign Affairs, Ministry of Economy, Trade and Industry, Ministry of the Environment, Ministry of Land, Infrastructure, Transport and Tourism, Ministry of Agriculture, Forestry and Fisheries, Ministry of Education, Culture, Sports, Science and Technology	 (1) Sound circulation of water and preservation of water sources (2) Pollution control and reduction of unsustainable water intake are essential for the preservation of healthy ecosystems and biodiversity.
16 PEACE, JUSTICE AND STRONG INSTITUTIONS	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	Cabinet Secretariat, Cabinet Office, Ministry of Justice, Ministry of the Environment, Ministry of Internal Affairs and Communications, Ministry of Land, Infrastructure, Transport and Tourism, Ministry of Foreign Affairs, Ministry of Health, Labour and Welfare, Ministry of Finance, Ministry of Agriculture, Forestry and Fisheries, National Personnel Authority, Ministry of Education, Culture, Sports, Science and Technology, Ministry of Defense, National Police Agency	 (1) Execution of the human right to water and minimization of conflicts around water (2) Implementation of Integrated Water Resources Management (IWRM) can lead to a more inclusive society, stronger organization and increased accountability.

Goals	Descriptions	Main custodian agencies and related government departments ¹⁹⁾	 (1) Influence to the water supply sector (G6) (2) Influence from the water supply sector (G6)
17 PARTNERSHIPS FOR THE GOALS	Strengthen the means of implementation and revitalize the global partnership for sustainable development	Cabinet Secretariat, Cabinet Office, Ministry of Internal Affairs and Communications, Ministry of Finance, Ministry of Foreign Affairs, Financial Services Agency, Ministry of Health, Labour and Welfare, Ministry of Education, Culture, Sports, Science and Technology, Ministry of the Environment	 (1) Contribution to taxation and international transactions for water-related targets (technology, finance and capacity building) (2) Water charges and other revenues from water services (water supply, sewage, irrigation, hydraulic power and channels). Transfer of experiences (supervision, organizational reforms and technological advances). Supply of water services towards the SDGs (G1–5 and G7–16).

(Note) The items that are particularly closely related to the water supply sector are shadowed in the table above.

2-5 Relationship between Universal Health Coverage (UHC) and the Water Supply Sector

UHC means that "all individuals and communities receive the health services they need without suffering financial hardship. It includes the full spectrum of essential, quality health services, from health promotion to prevention, treatment, rehabilitation, and palliative care."²⁰⁾ UHC consists of three components: (A) coverage for the entire populations, (B) the full spectrum of health services according to need, and (C) financial protection from direct payment for health services when consumed.

²⁰⁾ Ministry of Health, Labour and Welfare of Japan, "The theme of World Health Day 2018 is 'Universal Health Coverage (UHC)'" http://www.mhlw.go.jp/stf/seisakunitsuite/bunya/0000202658.html



Three dimensions to consider when moving towards universal coverage

Figure 2.4 Three dimensions to consider when moving towards UHC²¹⁾

Japan declared, at the G7 Ise Shima Summit/G7 Health Ministers' Meeting in 2016, that it would work in cooperation with the international community and organizations to support the establishment of UHC mainly in Africa and Asia. In July 2017, Japan and the Association of South-East Asian Nations (hereinafter referred to as "ASEAN") held a health ministers' meeting themed on UHC and population ageing. At this ASEAN-Japan Health Ministers' Meeting, the ASEAN-Japan UHC Initiative was issued with the core goals of supporting the promotion of Civil Registration and Vital Statistics (CRVS), development of human resources for health policy and sharing of knowledge and lessons.²²⁾ The UHC Forum 2017, co-hosted by the Government of Japan, WHO, World Bank and other organizations, brought together senior government officials, international organization representatives, experts and other people from over thirty different countries in the world to discuss promotion of UHC in their respective countries. The functions of the "Tokyo Declaration on Universal Health Coverage (UHC)," adopted at this forum, include to commit to investing in "building a sound foundation for healthy societies with equitable access to social services such as water, sanitation, nutrition, housing, and education" with the aim of accelerating country-led process towards UHC.²³⁾

According to the 2017 Global Monitoring Report, created by the WHO and World Bank, however, at least half the world's population (3.5 billion people) still lacks access to the quality essential services they need to protect their health and there are regional disparities within countries, as suggested by the fact that those living in rural areas have lower coverage, while low-income

22) Ministry of Health, Labour and Welfare, "ASEAN-Japan UHC Initiative (Tentative Japanese Translation)" http://www.mhlw.go.jp/file/04-Houdouhappyou-10501000-Daijinkanboukokusaika-Kokusaika/0000171525.pdf

²¹⁾ Website of WHO, http://www.who.int/health_financing/strategy/dimensions/en/

²³⁾ Ministry of Health, Labour and Welfare, "Tokyo Declaration on Universal Health Coverage (UHC): All Together to Accelerate Progress towards UHC" http://www.mhlw.go.jp/file/04-Houdouhappyou-10501000-Daijinkanboukokusaika-Kokusaika/02 Japanese.pdf

people and the socially vulnerable, such as women, people with disabilities and ethnic minorities, are more likely to be left behind from healthcare services.²⁴

The SDGs also have a target about UHC: "Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all" (Target 3.8). The indicators for this target are: 3.8.1 "coverage of essential health services (defined as the average coverage of essential services based on tracer interventions that include reproductive, maternal, newborn and child health, infectious diseases, non-communicable diseases and service capacity and access, among the general and the most disadvantaged population)" and 3.8.2 "proportion of population with large household expenditures on health as a share of total household expenditure or income."

For Indicator 3.8.1, coverage is measured on a scale of 0 to 100, with 100 as the target, and the larger the number the higher the service coverage becomes.²⁵⁾ As regards Indicator 3.8.2, when the proportion of population with large household expenditures on health as a share of total household expenditure or income is low, that can mean either that effective health-related financial systems help curb personal expenditures or that quality healthcare services are unavailable.

Furthermore, there is also an academic article that discusses the interlinkages between the entire health sector and other sectors.²⁶) The article states that the environment is a decisive factor governing the health conditions of an individual and that 23% of deaths in the world are attributed to manageable environmental risk factors, as well as describes how SDG 3 and other SDGs (e.g., water and sanitation, access to basic services, infrastructure and urban development and climate change) are strongly linked to public health through their potential impact on environmental, social and economic determinants.

Table 2.5 shows the case of East Timor as an example of the UHC indicators in the 2017 UHC Global Monitoring Report. The term, "poverty line," as used in the table, is defined as a minimum income deemed necessary for an individual in order to obtain all the goods and services which satisfy his or her basic needs. "Purchasing power parity (PPP)" relates to a presumed equilibrium between exchange rates, based on price; without barriers to trade, the assumption is that identical goods will have the same price in different markets. The poverty gap is the ratio by which the mean income of the poor falls below the poverty line.

SDG-UHC indicator 3.8.1: Service coverage index, 2015		
Data availability to construct SDG-UHC 3.8.1		
Availability of estimates for SDG-UHC indicator 3.8.2		
SDG-UHC indicator 3.8.2, most recent available estimate (year)		
SDG-UHC indicator 3.8.2, latest	at 10% of household total consumption	2 50
	or income	2.39
expenditure (%)	at 25% of household total consumption	0.00
experienter (76)	or income	0.00
Availability of estimates on impoverishing spending on health		

Table 2.5 UH	C indicators	(East Timor) ²⁴⁾)
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²⁴⁾ WHO, Tracking Universal Health Coverage: 2017 Global Monitoring Report,

http://apps.who.int/iris/bitstream/handle/10665/259817/9789241513555-eng.pdf?sequence=1

²⁵⁾ For details of how to calculate the service coverage based on various indicators related to healthcare services, please refer to the 2017 UHC Global Monitoring Report.

^{26) &}quot;The Fundamental Importance of Environmental Determinants of Health" by Robert Bos

Incidence of impoverishment due to	Poverty line: at 2011 PPP \$1.90-a-day	1.00
out-of-pocket health spending (%)	Poverty line: at 2011 PPP \$3.10-a-day	0.65
Poverty gap due to out-of-pocket	Poverty line: at 2011 PPP \$1.90-a-day	0.80
health spending expressed in cents	Poverty line: at 2011 PPP \$3 10-2-day	1.85
factors	1 overty line. at 2011 111 \$5.10-a-day	1.05

As the global value for Indicator 3.8.1 in 2015 was 64, the value of East Timor was below that. For Indicator 3.8.2, the values of East Timor (2.59% and 0.00%, respectively) were also lower than the global averages at 10% and at 25% of household total consumption or income, which were 11.7% and 2.5%, respectively. This suggests that household expenditures on health only occupies a small share of total household expenditure or income because the service coverage is low in the country.

2-6 Summarized Information on the Interlinkages with Other Sectors in Japan's Assistance

The purpose of this section is to summarize information about the following six plans that set policy targets based on which to discuss Japan's international cooperation, mainly at national government level, namely the Development Cooperation Charter, which provides basic guidelines governing all international cooperation activities of the country, Infrastructure System Export Strategy, which is exclusively focused on infrastructure export, Basic Design for Peace and Health, which supports the promotion of UHC, Implementation Guiding Principles and Action Plan, aimed at implementing the SDGs, and the Water Supply Vision, government guidelines for the water supply sector.

1) Development Cooperation Charter

In 2014, Japan's ODA marked its 60th anniversary. In the following year, the government revised the ODA Charter that had set forth the philosophy and basic principles of ODA. It was renamed the Development Cooperation Charter. One of the top priorities for this charter, which aims at sustainable development for developing countries, is comprehensive assistance in building not only physical infrastructure but also operational and management capacity, human resources, institutions, and other soft infrastructure. Regarding water supply, the charter set forth a policy to "provide necessary assistance for promoting human-centered development that underpins people's basic livelihood" as a part of the pursuit of "(A) quality growth and poverty eradication." One of the targets was ensuring access to safe water and sanitation. Although the Development Cooperation Charter first mentions deeper partnership in Asia, Africa is mentioned as a next target region that requires coordinated assistance by the government and private sectors.

 Ministerial Meeting on Strategy relating Infrastructure Export and Economic Cooperation and Infrastructure System Export Strategy

The government has developed the Infrastructure System Export Strategy in a series of Ministerial Meetings on Strategy relating Infrastructure Export and Economic Cooperation since 2013 to establish the Japan brand through broad international partnership in infrastructure development.

In the latest revision of the Development Cooperation Charter in the fiscal year 2017, Japan aimed to establish its leading position in quality infrastructure investment through summits and other international meetings. In the water supply sector, the charter maintains its priorities to (1) organize seminars related to water supply by partner governments, water utilities, and other stakeholders and (2) propose solutions to the challenges they face.

The Ministerial Meeting on Strategy relating Infrastructure Export and Economic Cooperation was held to discuss the export of Japanese infrastructure systems, assistance to secure overseas concessions to energy and mineral resources, and key issues involving Japan's economic cooperation with other countries; all of these aimed at a more strategic and effective implementation. The Infrastructure System Export Strategy formulated in May 2013 aimed at winning orders worth ca. 30 trillion yen in 2020 (ca. 10 trillion yen in 2010) including revenue from business investment. Accordingly, assistance in the water supply sector should also encourage Japanese companies to receive orders.

3) Universal Health Coverage (UHC)

The Basic Design for Peace and Health, announced by the Japanese government in September 2015, sets forth the achievement of UHC among other policy goals and basic principles. Among the basic principles is also the "contribution to quality growth and poverty eradication through assistance in the health sector." Detailed description also mentions assistance to improve nutrition as well as access to water and sanitation to directly help prevent diseases.²⁷

4) Asia Human Well-Being Initiative

The purpose of the Asia Human Well-Being Initiative is to establish UHC in response to the rapid ageing of populations in Asia, create societies of health and longevity, and regenerate Asia, so that it can achieve sustainable economic growth, through mutually beneficial cooperative approaches, such as constructing community-based integrated care systems, encouraging Japanese private-sector companies to expand their business across Asia, and so on.²⁸⁾ The development of community-based integrated care systems, mentioned above, means the broad-based enhancement of healthcare, including healthcare services such as prevention of diseases and healthy diet, revolving around appropriate medical services and long-term care, as well as creation of communities for a healthy life. Through the maintenance and improvement of people's health, it can be expected to lead to the virtuous cycle of reducing burdens of medical services and long-term care, as a result.²⁹

28) Website of the Prime Minister's Office of Japan,

29) Website of the Prime Minister's Office of Japan,

²⁷⁾ Website of the Ministry of Foreign Affairs of Japan, Basic Design for Peace and Health, https://www.mofa.go.jp/mofaj/files/000099126.pdf

https://www.kantei.go.jp/jp/singi/sdgs/entakukaigi dai1/siryou5-1.pdf

https://www.kantei.go.jp/jp/singi/kenkouiryou/kokusaitenkai/kenkokoso_suishin_dai3/siryou1.pdf



Figure 2.5 Mt. Fuji-shaped healthcare³⁰⁾

5) SDGs Implementation Guiding Principles and Action Plan 2018

On May 20, 2016, the Government of Japan established a Cabinet body called the "SDGs Promotion Headquarters," headed by the Prime Minister and comprising all ministers. The headquarters established the Sustainable Development Goals (SDGs) Implementation Guiding Principles in December 2016 and the SDGs Action Plan 2018 in December 2017.

The SDGs Implementation Guiding Principles have been developed as Japan's national strategy to implement the 2030 Agenda for Sustainable Development, adopted by the United Nations in September 2015. In more specific terms, the guidelines set out Japan's vision, priority areas, implementation principles, implementation framework and approach to the follow-up and review processes, as well as concrete measures clustered under priority areas. The aim is to mobilize all ministries and government agencies by partnering with all relevant stakeholders to implement a wide variety of measures and resources in an effective and coherent manner, based on an analysis of the present situation.

The SDGs Action Plan 2018, established to follow on from the guidelines, refers to the water supply, sanitation and hygiene sectors as part of the international cooperation in promotion of UHC, as shown below.

³⁰⁾ Website of the Prime Minister's Office of Japan,

https://www.kantei.go.jp/jp/singi/kenkouiryou/suisin/ketteisiryou/dai22/siryou22_1.pdf



Table 2.6 Action Plan on the website of the Prime Minister's Office³¹⁾

At the same time, the SDGs have also been promoted at municipal level for regional revitalization purposes. For example, 29 cities that have proposed excellent municipal initiatives to help achieve the SDGs have been selected as SDGs Future Cities, while ten particularly leading projects have been picked out as Local Government SDGs Model Projects. It is planned to support these initiatives and widely promote and apply resulting best practices in the future, thereby contributing to further regional revitalization.³²

6) Policy for international cooperation in the water supply sector

In 2002, the Japanese Ministry of Health, Labour and Welfare announced a comprehensive vision that clarifies the priority policy agenda in the water supply sector, along with specific measures, tactics, and processes for addressing them. International cooperation in the water supply sector was clearly mentioned under "international contributions" as one of the five measures for achieving the goals set forth by the Water Supply Vision. This encouraged international activities by water utilities in Japan. The later review in 2008 pointed out the importance of cooperation among water utilities and private companies to recruit and train human resources for assisting developing countries.

 ³¹⁾ Website of the Prime Minister's Office of Japan, https://www.kantei.go.jp/jp/singi/sdgs/pdf/actionplan2018.pdf
 32) Website of the Prime Minister's Office of Japan,

https://www.kantei.go.jp/jp/singi/tiiki/kankyo/teian/pdf/result01.pdf

The current Water Supply Vision was announced in 2013 to encourage continued international efforts by encouraging the Japanese water supply industry to expand its international operation and by building and retaining the capacity of personnel of water utilities.

In this way, it is clear that great importance is placed on international cooperation in the water supply sector at many different layers of Japan's international cooperation and special attention is paid to the interlinkages between the water supply and other sectors as well.

The implementation of the SDGs itself, however, is an initiative that spans an extremely wide range of sectors and involves diverse links. At the same time, the current reality is that overall coordination between different sectors does not necessarily work well and only limited cooperation is available depending on each situation, as the Government of Japan only issues separate policies for different purposes, ranging from international cooperation to infrastructure export, and has no special headquarters for cooperation.

Chapter 3 Water Sector Overseas Engagement by Water Supply Corporations and Enterprises of Japan

3-1 Summarizing Examples of How Japanese Water Supply Corporations Have Engaged Abroad

Figure 3.1 and Table 1 show cases of how Japanese water supply corporations have engaged and set up operation overseas. This survey illustrated water supply project activities executed by Japan to date, based on lists of such activities (overseas dispatches and domestic training programs) as identified by the Ministry of Health, Labour and Welfare and the Japan International Cooperation Agency ("JICA") and by drawing on public information such as a report titled "Collected Cases of Municipalities' Overseas Engagement" released last year by the Ministry of Internal Affairs and Communications³³⁾ as well as data of municipality websites. Table 3.1 also includes Grassroots Cooperation Projects implemented by JICA.



Map of water supply corporations' international contribution

Figure 3.1 Map of water supply corporations' international contribution³⁴⁾

³³⁾ Collected Cases of Municipality Water Supply Corporations' Overseas Engagement, March 2018 from Ministry of Internal Affairs and Communications website, http://www.soumu.go.jp/main_content/000543167.pdf

³⁴⁾ Japan Water Research Center website, http://www.jwrc-net.or.jp/map/kouken map.html

Water supply corporation	Project name	Description	Process
Sapporo Waterworks Department	Water Transmission and Distribution System Improvement Project for Water Supply in Ulaanbaatar City (JICA Grassroots Technical Cooperation Project)	This is a project to foster water supply engineers in Ulaanbaatar, Mongol through a transfer of technologies on water supply and drainage, thereby improving the city's water supply system in the future.	February 2016: A kick-off seminar was held. Fiscal year 2016: Technical cooperation was implemented in the form of three dispatches and two hostings. Fiscal year 2017: Technical cooperation was implemented in the form of three dispatches and two hostings.
Chiba Prefectural Waterworks Bureau	Water supply improvement advisor (JICA expert dispatch)	The bureau has been providing technical guidance mainly on water treatment plant operation, water quality management, water supply pipe network block generation and water leak detection by dispatching engineer staff at the request of JICA, starting from fiscal year 2012.	Long-term personnel dispatches (two to three years each) From fiscal year 2012 and ongoing Water supply improvement: Three persons in total Short-term personnel dispatches (one to four weeks each) From fiscal year 2014 to 2017: Water treatment plant operation and water quality management: 15 persons in total Water leak detection: 2 persons in total Technology management: 4 persons in total
Saitama Prefectural Government	Water Treatment Technology Improvement Assistance Project in Chonburi Province, Thailand (from 2011 to 2014)/ Water Treatment Plant Maintenance and Management Skill Improvement Assistance Project for the Thai Provincial Waterworks Authority (from 2013 to 2016) (JICA Grassroots Technical Cooperation Project)	The municipality provided guidance on water treatment plant management and operation skills by dispatching engineers to a water treatment plant under the control of the Provincial Waterworks Authority (PWA) of Thailand and receiving participants there from fiscal year 2011 to fiscal 2015	From May 2011 to March 2014: Implemented technical assistance for the Chonburi Province (two water treatment plants) (dispatched 38 personnel in total with 14 participants in total being hosted by the provincial water treatment plants) From October 2013 to March 2016: Implemented technical assistance for Chiang Mai Province (five water treatment plants) and Nong Khai Province (two water treatment plants) (dispatched 55 personnel in total with 20 participants in total being hosted by the provincial water treatment plants)
Saitama Prefectural Government	Water treatment plant operation, maintenance and	Starting from fiscal year 2015, the municipality has been providing water	November 2015: An agreement was entered into. February 2016: Implemented a

Table 3.1 Examples of water supply corporation setting up operation abroad (in a descending order of nationwide municipality code number)³³⁾

Water supply corporation	Project name	Description	Process
	management skill improvement assistance project for waterworks authorities (JICA Grassroots Technical Cooperation Project)	treatment plants under the control of the Laos Water Authority with technical assistance on the operation and management and maintenance of water treatment plant and water quality management skill improvement by dispatching engineers and receiving participants	baseline survey (three persons) Fiscal year 2016: Implemented technical assistance (dispatched 13 personnel) Participants (three persons) were hosted by a Saitama Prefecture water treatment plant. Fiscal year 2017: Implemented technical assistance (dispatched 12 personnel) Participants (three persons) were hosted by a Saitama Prefecture water
Saitama City	Waterworks pipeline	The municipality	December 2016: Signed a
Government	maintenance and management skill improvement assistance project for waterworks authorities (for three years from 2018) (JICA Grassroots Technical Cooperation Project)	implemented the project for water authorities in three Laos regions (capital Vientiane, Luang Prabang and Khammouane Province). This project was aimed to reduce non-revenue earning water with a focus on water supply pipes, and the Saitama City Government dispatched staff to the water authorities and held training sessions in Japan for participants from them to provide technical assistance.	memorandum of understanding (MOU) with the Laos Water Authority on cooperation to enhance water supply (Vientiane Capital, the Luang Prabang Province Water Supply Enterprise and the Khammouane Province Water Supply Enterprise) Established in April 2017 a working group for international contribution promotion consideration meeting (enhanced the international cooperation implementation system) December 2017: Entered into an implementation memorandum of understanding with the Department of Waterways, Ministry of Public Works and Transport, Laos on cooperation to enhance water supply
Tokyo Metropolitan	Anti-non-revenue earning water	A specific purpose company established	September 2013: Entered into a memorandum of understanding on
Government Bureau of Waterworks	measure project in Yangon (technical cooperation/project and operation right handling-based loan aid)	jointly by TSS Tokyo Water Co., Ltd., a management company of the Tokyo Metropolitan Government Bureau of Waterworks and by a private-sector firm is now in the process of implementing an anti- non-revenue earning water measure project in Yangon, Myanmar.	technical cooperation October 2014: Implemented an anti- non-revenue earning water measure project (until March 2015) June 2015: Launched a JICA technical cooperation project (until June 2020) October 2016: Launched an anti-non- revenue earning water measure project for an area larger than that for the above-mentioned project July 2017: Entered into an agreement on basic matters for maintenance and management project
Tokyo Metropolitan	Non-revenue earning water	Based on a project proposal from the Tokyo	2011: Implemented JICA Grassroots Technical Cooperation Project (until
Government	reduction	Metropolitan	2014)

Water supply corporation	Project name	Description	Process
Bureau of Waterworks	technology training and skill improvement project in Hanoi (JICA Grassroots Technical Cooperation Project)	Government, TSS implemented a JICA Grassroots Technical Cooperation aimed to improve the skill to reduce non-revenue earning water in Hanoi, Vietnam.	February 2016: Implemented JICA Grassroots Technical Cooperation (until January 2019)
Tokyo Metropolitan Government Bureau of Waterworks	SCADA-based water operation and non-revenue earning water management skill improvement project (JICA Grassroots Technical Cooperation Project)	Based on a project proposal from the Tokyo Metropolitan Government Bureau of Waterworks, TSS and other entity have been implementing a JICA Grassroots Technical Cooperation Project for water operation and non- revenue earning water management skill improvement, a project using a computer-based surveillance and control system for infrastructure (SCADA) in Labuan	August 2017: Implemented JICA Grassroots Technical Cooperation (until March 2020)
City of Yokohama, Water Works Bureau	Project for Strengthening Non- Revenue Water Control in Kigali City Water Network (JICA Grassroots Technical Cooperation Project)	Yokohama Water Co., Ltd., in which equity interest is held by the City of Yokohama, Water Works Bureau, won a contract for the Project for Strengthening Non- Revenue Water Control in Kigali City Water Network in Rwanda, a project to be implemented in collaboration with private-sector companies. This project was intended to contribute to strengthening non- revenue earning water control skills of the city.	From July 2016 to June 2019 January, August and November 2017: The City of Yokohama, Water Works Bureau hosted participants.
City of Yokohama, Water Works Bureau	The Project for Water Supply, Sewerage and Drainage Master Plan of Faisalabad, Pakistan	In collaboration with private-sector company, Yokohama Water Co., Ltd. won a contract for the JICA Project for Water Supply, Sewerage and Drainage Master Plan	From July 2016 to July 2019 December 2016: The City of Yokohama, Water Works Bureau hosted participants. September 2017: Launched new service in a pilot area (Sarfraz area) (secured 12-hour water supply,

Water supply corporation	Project name	Description	Process
	(JICA development study type technical cooperation)	of Faisalabad, Pakistan. To check the effectiveness of the project, financial improvement measure is being verified in a pilot area.	appropriate water pressure and drinking water quality)
City of Yokohama, Water Works Bureau	Bilateral memorandum of understanding with the Thua Thien Hue Construction and Water Supply State One Member Company Limited, Vietnam	The City of Yokohama, Water Works Bureau had a long cooperative relationship with the Thua Thien Hue Construction and Water Supply State One Member Company Limited, Vietnam. Based on the relationship, the bureau entered into a memorandum of understanding intended to grow the two water supply corporations further and assist member firms of the Yokohama Water Business Association.	July 6, 2017: Entered into the memorandum of understanding (in effect until December 31, 2019)
Waterworks Bureau, City of Kawasaki	Project for improvement of the water environment in Ba Ria-Vung Tau Province, Vietnam	The Kawasaki City Government and Kawasaki Water Business Network (KaWaBiz NET) member firms conducted a study of water supply and sewage in Ba Ria-Vung Tau Province with the view to improving its water environment. The Kawasaki City Government provided advice on policies and engineering in the water supply and sewage segments.	February 2014: The KaWaBiz NET held a seminar on Ba Ria-Vung Tau Province. May 2014: KaWaBiz NET member firms and the Kawasaki City Government conducted the study in cooperation with each other (until March 2016).
Waterworks Bureau, City of Kawasaki	The Project for Capacity Building on Taking Measures against Groundwater Leaks in Makassar (JICA Grassroots Technical Cooperation Project)	The Waterworks Bureau, City of Kawasaki implemented assistance on measures against groundwater leaks as a JICA Grassroots Technical Cooperation Project with the aim of reducing non-revenue	For three years from April 2018

Water supply corporation	Project name	Description	Process
		earning water, a significant challenge for Makassar City, Republic of Indonesia.	
Hamamatsu City Government	Skills Support Regarding Leak Prevention Initiatives in Bandung City (JICA Grassroots Technical Cooperation Project)	Hamamatsu City Government has been providing Bandung City, Republic of Indonesia with technical assistance for water leak prevention initiatives as a JICA Grassroots Technical Cooperation Project.	December 2014: Entered into a Letter of Intent (LOI) July 2017: Dispatched personnel to Bandung City (seven persons in total for two weeks) September 2017: Dispatched personnel to Bandung City (five persons in total for two weeks) October 2017: The Hamamatsu City Government hosted participants (six persons for 10 days). December 2017: Dispatched personnel to Bandung City (three persons for five days)
Nagoya City Waterworks & Sewage Bureau	Capacity Development Project for Management of Water Supply Pipe Laying (JICA Grassroots Technical Cooperation Project)	The Nagoya City Government provided the National Water Supply and Drainage Board of Sri Lanka with technical cooperation aimed to improve the nation's capacity for laying and managing water supply pipes as a JICA Grassroots Technical Assistance Project.	July 2013: Implemented a JICA Grassroots Technical Cooperation Project titled "Capacity Development Project for Construction Management of Water Supply Pipe Laying" (until February 2014) March 2014: Implemented a JICA Grassroots Technical Cooperation Project titled "Capacity Development Project for Construction Management of Water Supply Pipe Laying" (until March 2017)
Nagoya City Waterworks & Sewage Bureau	Verification project for the dissemination and business development of "The Package Type Non-revenue Water Reduction Program with the Private Sector based on Japanese Technology" (JICA's Overall Support for Japanese SMEs Overseas Business Development)	The Nagoya City Government and the Life of Water Chubu Forum, Nagoya (Chub Forum) member firms entered into an agreement on mutual cooperation concerning JICA's Overall Support for Japanese SMEs Overseas Business Development in Sri Lanka. The Nagoya City Government provided advice and guidance in technical aspects.	January and May 2015: The Nagoya City Government and the Life of Water Chubu Forum, Nagoya (Chub Forum) member firms entered into an agreement on mutual cooperation.
Osaka Water Supply Authority	Technical exchange with the Metropolitan Waterworks	Osaka Water Supply Authority entered into a memorandum of understanding (MOU)	November 2012: Entered into the memorandum of understanding (MOU) on their technical exchange program
Water supply corporation	Project name	Description	Process
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	Authority, Kingdom of Thailand	with the Metropolitan Waterworks Authority, Kingdom of Thailand on their technical exchange program with the aim of further developing the two parties' water supply operations.	
Osaka City	The detailed design	The Osaka City	December 2009: Entered into a
Waterworks Bureau	study on Ho Chi Minh City water environment improvement project (JICA technical cooperation project)	Waterworks Bureau entered into a memorandum of understanding with Saigon Water Corporation (SAWACO), the water supply corporation of Ho Chi Minh City, on technical exchange, and conducted studies aimed to form commercialization projects through technical exchange endeavors and private-public sector collaboration toward improving the water environment in Ho Chi Minh City.	memorandum of understanding on technical exchange (renewed in November 2015) From fiscal year 2010: Conducted a technical cooperation program for technical exchange with SAWACO (a total of 29 persons were hosted) From fiscal year 2009 to fiscal year 2010: NEDO Water Saving and Environmentally-friendly Water Recycling Project Fiscal year 2011: Survey of Direction for Public-Private-Sector Partnership Water Project by the Ministry of Economy, Trade and Industry From Fiscal year 2012 to fiscal year 2013: The detailed design study on Ho Chi Minh City water environment improvement project by JICA From fiscal year 2013 to fiscal year
			2015: Cooperation preparation study by JICA (PPP infrastructure project) From fiscal year 2017 to fiscal year 2018: JICA Capacity Development Project for Management of Water Supply Pipe Laying
Kobe City Waterworks Bureau	Technical cooperation in Sri Lanka (Democratic Socialist Republic of Sri Lanka)	Implemented an initiative for improving water affairs in Sri Lanka. Assisted local companies' activities aimed to introduce automatic monitoring and control systems in the country.	December 2015: Conducted a local study in the Program to Discover and Form Public-Private-Sector Partnership Project for Water Sector Overseas Business June 2017: Participated in a prior study aimed to launch a technical cooperation
Kitakyushu City Water and Sewer Bureau	JICA Project on Capacity Building for the Water Supply System in Cambodia (JICA technical cooperation project)	A technical cooperation initiative, after having been implemented for capacity building for water supply systems in nine major cities, was expanded to cover entire Cambodia. While the Kitakyushu City	December 2011: Entered into a memorandum of understanding on urban Cambodia water supply development December 2015: Formed a consortium jointly with council member companies to win a contract in an international competitive bidding

Water supply corporation	Project name	Description	Process
		Water and Sewer Bureau cooperated for formulating and developing plan, the project operator aimed to win contracts from local companies for post-plan- formation development business.	January 2016: Entered into a memorandum of understanding on activities to secure a sustainable development of the water supply system in the Kingdom of Cambodia
Kitakyushu City Water and Sewer Bureau	Overseas project engagement in Hai Phong City (Socialist Republic of Vietnam)	To spread upward biological contact filtration (U-BCF), a technology developed by the Kitakyushu City Government, across Vietnam, the project operator collaborated with a local joint venture established by Kitakyushu City companies and Hai Phong Water Supply Company, and aimed to win contracts for designing and construction by making sales pitches to water supply companies across Vietnam.	December 2013: Introduced U-BCF at the Bimbao Water Treatment Plant July 2014: Conducted a study with the aim of introducing U-BCF at the An Duong Water Treatment Plant January 2016: Established a joint venture with Hai Phong City companies and organizations totaling six entities and Hai Phong Water Supply Company February 2016: Launched a project to demonstrate and spread U-BCF to six cities in Vietnam July 2016: Conducted a detailed design for introducing U-BCF at the An Duong Water Treatment Plant
Fukuoka City Waterworks Bureau	Preparatory survey for greater Yangon water supply improvement project (Republic of the Union of Myanmar) (JICA Cooperation Preparation Study Project)	The Fukuoka City Waterworks Bureau won a contract for a cooperation preparatory survey project (JICA) in Yangon City through public-private sector collaboration by using the framework of Fukuoka City's international business engagement platform. The city bureau conducted a study on operation and management fields.	May 2014: Entered into a memorandum of understanding on urban development cooperation and assistance (in the water supply and sewage sector) May 2015: Won the contract for the JICA cooperation preparation study project
Fukuoka City Waterworks Bureau	(i) Project to support reducing Non- Revenue Water (NRW) through effective control on Nadi/Lautoka regional supply in Fiji	The Fukuoka City Waterworks Bureau provided the Republic of Fiji waterworks operation with technical cooperation on water leakage prevention and maintenance and	 (i) March 2014: Implemented JICA Grassroots Technical Cooperation (Phase 1) (until July 2017) (ii) January 2018: Implemented JICA Grassroots Technical Cooperation (Phase 2) (until 2021 according to plan)

Water supply corporation	Project name	Description	Process
	(ii) Project to support reducing Non-Revenue Water (NRW) through effective control on Nadi/Lautoka regional supply in Fiji	management of water supply facilities.	
	Technical		

As described above, the reader can see a variety of international cooperation initiatives being underway in different countries in the world, even among main ongoing ones alone. They, although consisting chiefly of initiatives for non-Japan Asian nations, include programs in Africa, a region having drawn much attention in recent years, as evidenced by the Yokohama City Government's activities in Rwanda.

3-2 Municipalities' Implementation Policies for Setting up Operation Overseas

The following paragraphs outline water supply corporations' policies on, and purposes of, participation in international cooperation activities, coupled with feedback from citizens as shown on corporative websites. This examines what these corporations' international cooperation aims for and what are required of them.

Water supply corporation	Implementation policy	Citizens' opinions on international contribution in water supply vision
Sapporo	The Sapporo Waterworks Department	Not applicable
Waterworks	works on international contribution efforts	
Department ³⁵⁾	in order to leverage the municipality's	
	expertise in water supply operation to assist	
	developing nations in improving their water	
	supply technique and with the aim of	
	fostering officials into internationally-	
	minded ones seeking to resolve challenges	
	from a broad perspective.	
Tokyo	To deliver needs-meeting, diverse and	Findings from a questionnaire
Metropolitan	sustained cooperation to developing nations,	survey showed 27.7% of the
Government	the Tokyo Metropolitan Government	respondents to be aware of the
Waterworks	Waterworks Bureau continues international	Tokyo Metropolitan Government
Bureau ³⁶⁾	engagement efforts in collaboration with	Waterworks Bureau's international
	Japanese companies in the form of	engagement endeavors with the
	providing information and matching	respondents' level of satisfaction

 Table 3.2 Water supply corporations' implementation policies for international cooperation (in a descending order of nationwide municipality code number)

35) "Waterworks Department International Cooperation," Sapporo Waterworks Department website http://www.city.sapporo.jp/suido/overview/kokusai/documents/kokusai.pdf

³⁶⁾ Tokyo Water Supply Management Plan 2016, Tokyo Metropolitan Government Waterworks Bureau website https://www.waterworks.metro.tokyo.jp/suidojigyo/torikumi/kadai/plan2016/

Water supply corporation	Implementation policy	Citizens' opinions on international contribution in water supply vision
	opportunities to approximately 70 registered private-sector enterprises. The Tokyo Water Administration Plan 2016 prescribed in February 2016 stipulates that the bureau shall contribute to improving developing nations' water environment and raise Tokyo's profile, based on the Tokyo Water Supply International Engagement Program, which was a comprehensively systematized concept for the bureau's international engagement endeavors, as a contribution to overseas water supply corporations.	with, and expectations on, the endeavors standing at 82.5% and 70.1%, respectively. ³⁷⁾
City of Yokohama, Water Works Bureau ³⁸⁾	The City of Yokohama, Water Works Bureau cited the following as what are behind international contribution it pursued: 1) responsibility as a water supply corporation; 2) human resource cultivation; and 3) Yokohama City policies. For point 3, in particular, the bureau pointed out as one policy to help resolve global issues such as for water supply operation, thereby contributing to peace, stability and development in the world. This was with the aim of putting into practice the "A Yokohama Growing with the World" slogan set forth in the Medium-term Four-year Plan 2014–2017. In addition, the bureau engaged in an international technical cooperation project (Y-PORT Project) which, being based on the public private partnership, used the resources and technologies of Yokohama. This project was aimed to assist emerging market countries in resolving their urban challenges and aid Japanese companies in running operations abroad. Yokohama City is scheduled to host the 7th Tokyo International Conference on African Development (TICAD) for 2019 like for the 4th and 5th conference of the same kind. To date, the city government provided assistance for African nations in earnest in the form of dispatching experts to Kenya, Tanzania and Malawi.	 For international cooperation, we think the interface between citizens and foreign entities should be stressed a little more. International cooperation by way of a water supply project would not only yield results for it and achievements for international city Yokohama but also create a catalyst for the city to let its citizens begin to look abroad. Moreover, in addition to making local citizens feel a sense of affinity with foreign peers, international cooperation would have a marked influence on Yokohama's urban development projects. In this respect, it should be important to link water supply projects to education and international contribution fifth in an awareness survey conducted in 2014 in the "future initiative requirement" category with 12.0% of respondents concurring with the choice. Given that citizens would find future project domains increasingly unfamiliar as they expand, Yokohama City Government officials would need to further provide citizens with an explanation that make them find relevance in initiatives each aimed for a future picture in different domains.

³⁷⁾ Fiscal 2015 Survey of Customer Needs, Tokyo Metropolitan Government Waterworks Bureau website https://www.waterworks.metro.tokyo.jp/kouhou/enq/okyakusamaanke-to/h27/
38) International Contribution Initiative, City of Yokohama, Water Works Bureau website http://www.city.yokohama.lg.jp/suidou/kyoku/torikumi/kokusai-kyoryoku/gaiyou.html

Water supply		Citizens' opinions on international
corporation	Implementation policy	contribution in water supply vision
I		thought officials should preferably
		argue for a strategy of deeming
		them as business propositions,
		instead of just assisting Yokohama
		City business operators and
		generating business. (This was
		because the overseas market was
		rising while the domestic one was
		falling.)
		Privatization and
		internationalization of waterworks
		bureau
		There should be demand abroad. ³⁹⁾
Waterworks	The Waterworks Bureau, City of Kawasaki	No applicable document
Bureau, City	has been engaging in activities under two	
of Kawasaki	basic policies comprising international	
	engagement via public-private-sector	
	collaboration and international contribution	
	through technical cooperation in conformity	
	to the Implementation Policy for	
	International Engagement in Water Supply	
	and Sewage Section, a policy laid down in	
	2012 (revised in 2017). ⁴⁰⁾ To further	
	promote the international engagement via	
	public-private-collaboration, private-sector	
	companies have been working and	
	Covernment to get up a platform on which	
	Government to set up a platform on which	
	to pursue water supply business with the	
	of identifying needs, building schemes and	
	providing information	
Hamamatsu	To contribute internationally with its	No applicable document
City	accumulated water supply techniques in	
Waterworks	water supply management plans the	
Bureau	Hamamatsu City Waterworks Bureau has a	
Durouu	policy of fostering internationally-minded	
	talent and providing technical assistance	
	and intends to engage in overseas technical	
	cooperation activities each year. In	
	September 2016, the bureau set up a	
	platform on which to exchange opinions on	
	technical assistance activities and	
	technology penetration measures based on	
	public-private-sector collaboration between	
	the bureau and Hamamatsu City companies	

39) Result of public comment made on the Yokohama Waterworks Long-term Vision and Medium-term Management Plan (fiscal 2016 to fiscal 2019) (Draft), City of Yokohama, Water Works Bureau website http://www.city.vokohama.lg.ip/suidou/kvoku/suidouijgvo/plan/pdf/public-comment.pdf

http://www.city.yokohama.lg.jp/suidou/kyoku/suidoujigyo/plan/pdf/public-comment.pdf 40) Implementation Policy for Water Supply and Sewage Sector International Engagement (Revised) 2016, Waterworks Bureau, City of Kawasaki website

http://www.city.kawasaki.jp/800/cmsfiles/contents/0000083/83451/hosin01.pdf

Water supply	Implementation policy	Citizens' opinions on international
corporation		contribution in water supply vision
	(Hamamatsu Technology Platform to Enrich Water Supply and Living: HARP♪). The Nagoya City Government, Toyohashi City Government, Hamamatsu City Government and the Mie Prefecture Government Enterprise Agency jointly implemented JICA challenge-by-challenge training Water Supply Non-Revenue Water Control Measure (Water Leakage Prevention Measure), a unique form of municipalities jointly conducting a JICA training program.	
Nagoya City Waterworks & Sewage Bureau	Areal expansion and international cooperation is a measure item (3) contained in the MIZU Plan 32, a Nagoya City medium-term water supply and sewage business plan. This item describes assistance for international water supply business engagement aimed to promote international cooperation with developing nations, bolster the collaboration with private-sector companies and relevant associations and help vitalize industries. To enhance the collaboration with private- sector companies and relevant associations and help vitalize local industries, bureau officials took part in the Water, Living and Manufacturing Chubu Forum, an event by Chubu area industry-academia-public entities, assisting international water supply business activities by Chubu Form member companies.	 It is praiseworthy that the bureau hosts many engineers from abroad to provide training to them. The bureau should provide assistance for the purpose of fostering leaders of a water supply operation that is adaptable to regions and countries and is friendly to a sustainable environment instead of seeing overseas as an infrastructure investment target. The bureau should continue to actively provide technical assistance to developing nations. The bureau should develop water supply business by giving guidance to developing nations.⁴¹
Osaka city Waterworks Bureau ⁴²⁾	The Osaka City Waterworks Bureau has been continuing overseas engagement initiatives through public-private-sector collaboration with the aim of developing its water supply operation mainly in Asia, vitalizing the Osaka and Kansai economies and raising officials' engineering skills. To promote water supply and environment area overseas engagement based on public- private-sector collaboration, the bureau set up the Osaka Water & Environment Solutions Association, a public-private- sector collaboration platform. By way of its	 It should be for international contribution that public-private-sector collaboration is seemingly important. The bureau should set specific goals, explore the potential of each project and define merits and demerits. Water supply technologies accumulated to date by Japan are at the world's top level, so it is advisable to use them for the world and earn revenue from them.⁴³

⁴¹⁾ Citizen opinions and city government approach on the Nagoya City Medium-term Management Plan for Water Supply and Sewage Operation "Mizu Plan 32" (Proposed), Nagoya City Waterworks & Sewage Bureau website http://www.water.city.nagoya.jp/file/17696.pdf

⁴²⁾ Osaka City Waterworks Bureau website, http://www.city.osaka.lg.jp/suido/page/0000099244.html

⁴³⁾ Public comment on the Osaka City Water Supply Management Strategy (2018–2027) (provisional name) (Draft), Osaka City Waterworks Bureau website

http://www.city.osaka.lg.jp/templates/jorei_kohyo/cmsfiles/contents/0000428/428539/03.pdf

Water supply	Implementation policy	Citizens' opinions on international
corporation	activities, the bureau has been engaging in	contribution in water suppry vision
	endeavors such as new project formulation.	
Kobe City Waterworks Bureau ⁴⁴⁾	endeavors such as new project formulation. At assistance requests from Kobe companies seeking to engage overseas, the Kobe City Waterworks Bureau assists overseas engagement by Kobe companies by tapping into urban development experiences and expertise accumulated by the city government such as in a set of water recycling systems and urban development as well as into lessons learned from earthquakes. This will likely lead to not only international contribution that improves living standard and stimulates development in overseas locations but also a vitalization of the Kobe economy, something made possible by its companies setting up operation abroad. By aiding facility development and management & operation abroad, the bureau will assist efforts to hand over technologies and techniques in water supply and infrastructure projects, thus contributing to growing and advancing Kobe City and its local companies.	 Overseas water supply infrastructure assistance projects should be regarded as ones aimed to vitalize Kobe City companies and export technologies to bolster their business platforms, instead of going only so far as to foster talent and make social contribution. To further public-private-sector collaboration, assist peripheral corporations and promote water supply infrastructure export to foreign countries, it is necessary to reform the structure of the entire Kobe City water supply operation including Kobe Water Service Corporation. The system should probably be developed upon verifying the merits and demerits of joint stock company establishments in other cities, among other steps. It would be advisable to actively arrange for events enabling Kobe companies to interact with Japanese companies and overseas municipalities such as the water supply technology international symposium held in fiscal year 2015 (which would likely generate an
Kitakyaishii	With aim of leveraging its superh skills and	No applicable document
City	expertise to make contribution in and	No applicable document
Water and	outside Japan, the Kitakyushu City Water	
Sewer	and Sewer Bureau claims to do so and	
Bureau ⁴⁶⁾	further bolster the collaboration with	
	Kitakyushu Water Service Co., Ltd., a local	
	city company. The bureau set up	
	Association a public-private-sector	
	collaboration with the participation of local	
	firms, relevant international institutions and	
	Japanese government agencies. The public-	
Kitakyushu City Water and Sewer Bureau ⁴⁶⁾	With aim of leveraging its superb skills and expertise to make contribution in and outside Japan, the Kitakyushu City Water and Sewer Bureau claims to do so and further bolster the collaboration with Kitakyushu Water Service Co., Ltd., a local city company. The bureau set up Kitakyushu Overseas Water Business Association, a public-private-sector collaboration with the participation of local firms, relevant international institutions and Japanese government agencies. The public- private-sector entities work as one team to	(which would likely generate an economic effect for the city). ⁴⁵⁾ No applicable document

⁴⁴⁾ New Initiative for International Contribution for Water and Infrastructure Development (Basis Policy), November 2010, Kobe City Waterworks Bureau website

http://www.city.kobe.lg.jp/life/town/waterworks/mizbiz/kokusai_kihonhoshin101124.pdf

⁴⁵⁾ Result of citizen opinions solicited on the Next Term Kobe Water Supply Vision (Proposed) (2016), Kobe City Waterworks Bureau website

http://www.city.kobe.lg.jp/information/public/comment/gyoute/150suidou/160331vision_iken.pdf

⁴⁶⁾ Kitakyushu City Water and Sewer Bureau website, http://www.city.kitakyushu.lg.jp/files/000736299.pdf

Water supply corporation	Implementation policy	Citizens' opinions on international contribution in water supply vision
	formulate water business projects.	
Fukuoka City Waterworks Bureau	A long-term vision statement from it says the Fukuoka City Waterworks Bureau will foster talent through international cooperation activities and provide local companies with overseas business opportunities. In 2014, the bureau set up the Fukuoka City International Business Engagement Platform. By working on international contribution efforts, the bureau seeks to secure contract wins for overseas projects through public-private-sector collaboration and generate business opportunities for Fukuoka companies.	 The Fukuoka City Waterworks Bureau should work hard to provide overseas business opportunities to Fukuoka-based companies through international contribution activities. While the bureau says it seeks to raise personnel's water supply techniques through international contribution activities, it should clearly outline the expected cost- benefit profile. While the bureau says it seeks provide overseas business opportunities to Fukuoka-based companies through international contribution activities, private- sector companies prioritize the profitability and future potential of each project. In this respect, the bureau is hoped to go so far as to tackle a G to G proposition as a proactive function to work with such companies including local ones to win a contract in order for each country's government, the bureau and private-sector companies to build a Win-Win-Win relationship.⁴⁷

The following three points broadly sum up the objectives of international cooperation pursued by water supply corporations as described above.

- For asserting a role as an international city, a water supply sector international cooperation project represents a specific initiative that puts the role into practice.
- A water supply sector international cooperation project delivers an effect of fostering water supply sector human resources.
- Deploying Japan's water supply expertise generates business opportunities via-a-vis local private-sector enterprises, and the project is intended to be worked on from a perspective of seeing overseas demand as business opportunities for Japan.

3-3 Issues in Overseas Expansion of Water Utilities

While a large number of water utilities are moving ahead with overseas expansion, as they gain experience due to their activities overseas, a range of problems have been noted, such as ensuring workers or adapting to the needs of the other country. At a workshop on overseas expansion for water utilities, municipality international cooperation issues raised at a JICA workshop were

⁴⁷⁾ Result of citizen opinions, Fukuoka City Water Works Bureau, Fukuoka City Water Long-term Vision 2028 (Draft), http://www.city.fukuoka.lg.jp/data/open/cnt/3/13713/1/shiminikenbosyukekka.pdf?20170329094635

presented.⁴⁸⁾ In addition, case studies on changes made by municipalities for these sorts of issues were summarized at a municipalities workshop run by JICA. From the issues shown by these⁴⁹⁾ and from the case studies of how they were dealt with, the initiatives to tackle to achieve goals have been organized as follows.

1) Obtain the understanding of chiefs, councils, and residents in municipalities

In order for water utilities to move ahead with international cooperation, it is necessary to have the understanding and support of the municipality's decision-makers—the chiefs and the council as well as that of the residents. Local activities are easier in municipalities where understanding is advanced and international cooperation is easy to actively carry out. It is easy to create a startingpoint in cases where the municipality is cognizant of its role as an international city, or when international expansion is held up as a principle, or where the other city is a sister city and it is natural to have a relationship.

In addition, the most effective way to promote understanding among residents is to create success stories locally and present them to the residents in a way that they can see, thereby increasing their levels of satisfaction. Thus, it is vital to engage in activities designed to spread results among residents and gain their understanding. These two have a "chicken and egg" relationship, and the best way is to start small-scale and gradually work up once results start to show.

Specific initiative to promote these sorts of initiatives are shown in the table below.

Item	Specific initiatives
Clarifying	• Clearly state strategy of municipality overall and overseas strategy in the
strategy and	plan (urban development strategy, international strategy, mid-term plan,
organizing	etc.).
systems	• Deepen connections with any union of legislators, etc. aimed at
	international cooperation as a municipality.
	• Establish a cross-sector department responsible for international work.
	• Clearly state international contributions and international cooperation in
	the water utility's vision and management plan.
Promoting	• Promote visits with local chiefs and leaders.
exchange	• Plan for visits by local chiefs and leaders.
	• Include visits to municipalities and discussions with chiefs when key
	government players (head of state, etc.) visit Japan.
Strengthening	• Actively engage in public relations and use a range of opportunities to
explanations for	present results in an ongoing, organized manner that is easy to
residents	understand.
	• Deepen understanding among younger residents by holding town
	meetings or providing training to promote understanding for high-school

Table 3.3 Initiatives by municipalities to gain residents' understanding

⁴⁸⁾ WaQuAC-NET Osaka Workshop: "International Cooperation for Municipalities Seen From JICA"49) JICA, Case Studies of How Municipalities Customize International Contributions and International Cooperation

⁽from the Workshop for Persons Connected with Water Utilities in Municipalities, etc.), January 4, 2018

students.
• Analyze the merits for the municipality more quantitatively and present
the results.

While this issue is the most important foundation for carrying out international cooperation, the attitudes of the municipality are also very significant. In general, it is believed that steady, down-toearth PR is important to increase opportunities. In particular, while a quantitative evaluation (B/C) of the merits is considered extraordinarily difficult, if that could be made clear, then it is felt that understanding would take a great leap forward.

2) Ensuring and training human resources who can work overseas

Overseas experience for specialists gives them a wide range of experiences and adaptability due to the fact that they need to engage in solving a range of issues when backup from the organization is difficult to obtain, and training human resources can include notable effects that are difficult to obtain through OJT or training in Japan. The effects of training human resources extolled by water utilities are, specifically, the effects that ensure these sorts of human resources.

However, some of the issues that have been raised are that as personnel in Japanese water utilities are being downsized, there are fewer opportunities for them to be dispatched overseas, it is hard to secure long-term specialists in particular, hosting training also places a heavy burden on specific departments, and there are few office staff compared to technicians and a general lack of specialists in improving management.

To close this gap, the following initiatives are being taken.

Item	Specific initiatives
Clarification of	• Clarify participation in international cooperation in the utility's HR
policy	training policy.
	• Spread awareness and report on international projects at times like
	management meetings in the waterworks bureau.
Organization of	• Organize a training host secretariat and an organization responsible for
systems	international cooperation.
	• Organize a working group of staff interested in international
	cooperation.
	• Participate in international contribution/cooperation activities and hold
	training. Hold regular report meetings.
Training to	• Training to educate people who can work in international cooperation,
discover and	training in English language, utilization of Capacity Enhancement
educate people	Training, discover people actively interested in international
who can work in	cooperation.
international	• Publish articles in the English section of the IWA international
cooperation	symposiums or the JWWA National Water Works Conference.
	• Assign veteran staff as support members (mentors) to work with

Table 3.4 Special measures for ensuring human reso	ources for overseas dispatch
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	younger staff, training them.
	• Work on training for overseas participants. Through presentation of
	Country Reports and guidance on creating action plans, give them
	experience with the work of specialists. In addition, discover people
	who can work in international cooperation by increasing both on-site
	experiences when hosting overseas participants and the number of staff
	who come into contact with them.
	• Share expertise through dispatch of multiple staff members to local
	sites.
	• Visit training sites of municipalities with plenty of experience and learn
	about their initiatives.
Development of	• Work to train through the flow of human resources (secondment,
implementation	reinforcement) between investing private-sector companies and water
systems that also	works.
utilize outside help	• Actively utilize private-sector companies for aspects such as highly
	specialized content, construction methods, content related to materials,
	etc.
	• Utilize former water utilities or private-sector company staff with
	experience of being dispatched to developing nations.
Promote	• Persons in charge of international projects visit various departments to
understanding	create information-sharing connections during events such as per-issue
within the bureau	training or specialist dispatch.
	• Hold regular meetings to allow personnel dispatched overseas to report.
	Request bureaus other than waterworks bureaus to participate.
	• Ensure awareness through sharing information at regular meetings
	among the support team.
	• Have medium- to long-term specialists send weekly and daily reports on
	local events and present these.

It is clear that, despite the issue of how actively these sorts of activities are carried out varying by the level of understanding within the city as a whole, issues of training waterworks personnel must be tackled.

3) Initiatives for supporting the overseas expansion of local companies

If international cooperation comes as initiatives contributing to the development of municipalities, it is easy to obtain the understanding of local people. Engaging in international cooperation from the perspective of seeing overseas demand as a business chance for your country through creating business opportunities for local companies is both governmental policy, and considered a relatively easy way to obtain the understanding of local residents.

For this reason, initiatives to create collaborative relationships with local companies are carried out.

Item	Specific initiatives	
Collaboration	• Establish discussion meetings for the purpose of expanding business	
with local	through international expansion, deepening cooperation.	
companies, etc.	• Establish a framework for collaboration with companies and propose	
	JICA programs based on proposals from companies.	
	• Introduce technologies, products, and services of Japanese companies	
	through per-issue training. Additionally, actively connect this to the	
	formulation of business cases if participants show interest.	

Table 3.5 Initiatives for collaboration with local companies

However, private-sector companies are extremely diverse, and initiatives for organizing them for overseas expansion are still being developed. Even compared with the previous two sections, this is a difficult issue, including as it does the extraction of issues and their organization. Based on previously voiced opinions, we have organized areas related to supporting reaching out to private-sector companies as follows, but these areas are very diverse and hard to summarize. This is perhaps because these opinions mainly come from water utilities and not the companies, and companies are extremely diverse and have different expectations for international expansion.

- It is possible that something will need to be done to align with the opinion that, while fairness is required in ODA procurement, local companies are given priority.
- There is the concern that too ready a linking of assistance and business could damage the trust built by that assistance.
- It has always been difficult to generate results in the short-term when the business environment is different to Japan and there are risks of political change, etc. Nevertheless, it is not clear what should be done to ensure overseas waterworks businesses succeed.
- In order for the water utilities in the other country to sense the appeal of Japanese waterworks technology and corporate products, more effort needs to be put into conceptualizing Japan's strengths so that these merits can be easily presented.
- However, in order for local companies to expand overseas, they need that company's passion; products, technology, and so on that are competitive in developing nations. It is vital that the company itself draw up its own overseas expansion strategy and actively carry it out.
- While the government has been strengthening its support to Africa over the last few years, a large number of water utilities and companies are focused on Asia. Countries that companies are interested in expanding into are not necessarily the developing nations that are the recipients of international cooperation from water utilities. Information-sharing and coordination of support areas need to be strengthened.

In this way, while there are some cases of local company support that have led to actual results, we are still at the stage of needing to extract more effective know-how.

According to the results of a questionnaire of members of the Yokohama Water Business Association conducted by the city of Yokohama in 2018, future activities desired of the Association include providing information on overseas expansion and introducing Yokohama's own international cooperation activities, as well as success stories in overseas water businesses. There is a need to study systems that respond to these needs of companies.

3-4 Organization of Case Studies of Overseas Expansion of Japanese Companies in the Waterworks Business

The previous section presented issues in international cooperation seen mainly from the perspective of water utilities. This section will organize information from general-use materials regarding the overseas expansion status of Japan-based waterworks-related businesses.

To analyze the international cooperation situation in the field of waterworks as seen from the Japanese industrial world, information was collected with the help of groups that included the Federation of Japan Water Industries, the Japan Water Forum, and the Global Water Recycling and Reuse System Association, and an attempt made to grasp an overall image, but no information was found that would allow such a birds-eye-view of the industry overall. This in itself is an issue for the future, but the information related to the overseas expansion of private-sector companies within the scope that could be collected has been organized.

(1) General trading company activities

In water businesses done by general trading companies, the stance on international expansion in the waterworks field is close to what is termed a "water major" and close to lumping it together as a water business. Each trading company draws on its own expertise in international capital procurement and its connections with companies around the world to promote waterworks businesses that suit the characteristics of each region through a range of business styles such as links with local waterworks companies or state-owned enterprises in the relevant country, or with water majors.

The following table lists examples of waterworks business activities in general trading companies.

Country/Region	Company name	Outline
Colombo	Toyota Tsusho	Water supply business surveys
suburbs, Sri	Corporation	Signed agreement with the Nagoya City Waterworks &
Lanka, etc.		Sewerage Bureau for mutual cooperation related to surveys
		on commercialization of the water business in Sri Lanka.
		Signed an agreement on mutual cooperation with the Nagoya
		City Waterworks & Sewerage Bureau for surveys (JICA
		contracted work) to study the commercialization of
		community water supplies in areas in suburban Colombo
		which currently lack water supplies (March 2011).
Sulawesi,	Hitachi High-	Treated water supply
Indonesia	Technologies	Completed experiments on water purification systems using
	Corporation	solar power generation in non-electrified villages in
		Indonesia.
		Under commission from the Ministry of Economy, Trade and
		Industry, installed a water purifier combined with a solar
		power generation system in Bekkae Village, South Sulawesi,
		Indonesia, and provided clean water for drinking and living in

Table 3.6 Examples of general trading co	ompany	activities	in inter	national	activities	in th	e water
	secto	or ⁵⁰⁾					

⁵⁰⁾ Japan Foreign Trade Council, Inc.: http://www.jftc.or.jp/shosha/activity/now/water/region4.html

Country/Region	Company name	Outline
		this non-electrified village.
Jiangsu Province, China, etc.	MITSUI & CO., LTD.	Water supply, sewerage treatment, water recycling businesses Entered the water business in China and signed a joint venture agreement with Hyflux. With the goal of large-scale expansion of the water business in China, Mitsui entered into a half-and-half investment with
		Hyflux Ltd., a major Singapore water company, and established a joint venture company, Galaxy NewSpring Pte. Ltd. The company operates drinking water supply plants, sewerage treatment plants, and water recycling plants it owns in places like Jiangsu and Hebei provinces.
Nakhon Pathom Province, Thailand, etc.	MITSUI & CO., LTD.	Water supply business Joined the water supply in Thailand through investment participation in a Thai water company. Invested in Thai Tap Water Supply Public Company, a Thai water company, and is rolling out water supply in the provinces of Nakhon Pathom and Samut Sakhon based on a 30-year contract with the Thailand Provincial Waterworks Authority. In addition, is expanding its business by bringing under its umbrella in July 2007 Pathum Thani Water, which supplied water based on a 25-year contract with the PWA in the province of Patong.
Rabigh, Saudi Arabia	ITOCHU Corporation	Manufacture and sale of reverse osmosis membranes element for seawater desalination Joined the manufacturing and sales of reverse osmosis membranes element for seawater desalination in Saudi Arabia in conjunction with Saudi and other companies. Agreement was reached in February 2010 to establish a company to manufacture and sell reverse osmosis membranes element for seawater desalination, the first in Saudi Arabia, through a joint venture with Arabian Company for Water & Power Development and Toyobo, and production began in January 2012.
Shuweihat S2, Abu Dhabi, UAE	Marubeni Corporation	Power and water production project Participation in the Shuweihat S2 Water and Power Project in Shuweihat, United Arab Emirates with Abu Dhabi Water & Electricity Authority and others. In the Shuweihat region of the Emirate of Abu Dhabi in the UAE is the Shuweihat S2 independent water and power project (Output: 1.5 million kilowatts, 450,000 tonnes per day), formed from Abu Dhabi Water & Electricity Authority (ADWEA), the Abu Dhabi National Energy Company PJSC (TAQA), the major French power company International Power GDF Suez (IPR-GDF Suez), and Osaka Gas. For 25 years after plant completion, it will supply water and power to ADWEA. Plant maintenance and operation is also carried out jointly with IPR-GDF Suez and Osaka Gas. (Achieved conclusion of loan agreement in October 2009.)
Fujairah F2, Fujairah, UAE	Marubeni Corporation	Power and water production project Participation in the Fujairah F2 Water and Power Project in Fujairah, United Arab Emirates with Abu Dhabi Water & Electricity Authority and others. In the Qidfa region of the Emirate of Fujairah in the UAE is

Country/Region	Company name	Outline
		the Fujairah F2 independent water and power project (Output: 2.0 million kilowatts, 590,000 tonnes per day), formed from Abu Dhabi Water & Electricity Authority (ADWEA), the Abu Dhabi National Energy Company PJSC (TAQA), and the major French power company International Power GDF Suez (IPR-GDF Suez). For 20 years after plant completion, it will supply water and power to ADWEA. Plant maintenance and operation is also carried out jointly with IPR-GDF Suez. (Achieved conclusion of loan agreement in December 2007.)
Ras Laffan,	MITSUI &	Power and water production project
Qatar Lima, Peru	CO., LTD. Marubeni Corporation	Participation in a power and water production project with a Belgian company in Ras Laffan, Qatar. Jointly with the Belgian company Tractebel Engineering of SUEZ to obtain the business right to generate power and water in the Ras Laffan region of northern Qatar from the Qatar General Electricity & Water Corporation (Kahramaa) (March 2008). Through a business company (10% funded by MITSUI & CO., LTD.) jointly funded by Qatar Petroleum, Qatar Electricity & Water Co. (QEWC), SUEZ, Shikoku Electric Power, and Chubu Electric Power, a power and water production plant was built (total project cost: 3.9 billion USD, output: 2.73 million kilowatts, 280,000 tonnes per day). It will supply power and water stably for 25 years following completion using the BOOT method. Operation and maintenance of water treatment plant Participated in an operation and maintenance business for a
		water treatment plant in Lima, Peru, by acquiring stock in a Peruvian waterworks company. Obtained stock (29%) in July 2009 of Consorcio Agua Azul S.A., which operates a water treatment business in Lima, Peru, and is operating and maintaining for the Lima Water and Sewerage Service Company a water treatment plant in north Lima that supplies 216,000 m ³ of water daily to 800,000 people.
Tarapacá Region, Chile, etc.	Marubeni Corporation	Waterworks and sewerage business Participated in the full-service business for waterworks and sewerage in the Tarapacá Region in Chile after buying out a Chile waterworks company jointly with the Innovation Network Corporation of Japan. In conjunction with INCJ, bought out 100% of shares in Aguas Nuevas, Chile's third-largest waterworks company (Marubeni Corporation with 50%) (November 2010). Currently rolling out a full-service waterworks business that includes the development and maintenance, meter-reading and charges collection for water treatment, sewage treatment, and water pipe networks covering around 1.2 million people in 48 cities in Chile's Tarapacá, Araucanía, Magallanes, and Arica y Parinacota regions.
Valdivia, Chile	Marubeni Corporation	Waterworks and sewerage business Participated in a waterworks business in Valdivia, Chile, after buying out a Chilean waterworks company. In conjunction with Marubeni Chile, bought out 100% of shares in Aguas Decima S.A., which operated a waterworks

Country/Region	Company name	Outline
		business in Valdivia in Chile's Los Lagos region (October
		2006). Currently rolling out a full-service waterworks
		business that includes charges collection for water treatment
		and sewage treatment for 140,000 people in the city of
		Valdivia.
Queretaro,	MITSUI &	Clean water supply and sewage treatment business
Mexico	CO., LTD.	Participated in a clean water supply and sewage treatment
		business in Queretaro, Mexico.
		Through MITSUI & CO., LTD. (USA), acquired business
		rights related to a clean water supply business (total business
		cost: 2,854 million pesos) and a sewage treatment business
		(total business cost: 3/4 million pesos) for 20 years with the
		state waterworks bureau of Queretaro, Mexico. The state of
		Queretaro will be supplied with around 50 million tonnes of
		sewage treatment canacity will be boosted
The Philippines	Marubeni	Investment in Magnilad Water Services ⁵¹
The Timppines	Corporation	Maynilad Water Services Inc. is a major waterworks
	corporation	company that operates a water and sewerage business based
		on a concession contract with the Metropolitan Waterworks
		and Sewerage System in the West Zone of the Greater Manila
		Area. Marubeni Corporation announced in 2012 that it had
		acquired a 20% stake in Maynilad.
The Philippines	Mitsubishi	Investment in Manila Water Company ⁵²⁾
	Corporation	With the 1997 privatization of the water business in the
		Greater Manila Area, in conjunction with the Ayala Group, a
		major local conglomerate, Mitsubishi Corporation made a
		capital participation in Manila Water Company (MWC),
		which is responsible for the East Zone, covering 5 million
D.L.		people.
Dubai	Mitsubishi	In 2014, Mitsubishi Corporation and Mitsubishi Heavy
	Corporation	Industries acquired with the Japan Bank for International
		cooperation about a 40% stake in Metric Holdings Ltd., a
		EPC and Ω & M in the Middle East North A frice and
		China ⁵³⁾
Brazil	Sumitomo	In 2017 Sumitomo Corporation acquired a 70% stake in 26
Diuzh	Corporation	companies in the water/sewerage and industrial water
		treatment business in Brazil owned by Odebrecht Ambiental
		in conjunction with Brookfield Business Partners (Canada)
		and Brookfield Asset Management. The total amount invested
		by Sumitomo Corporation was approx. 250 million USD. ⁵⁴⁾
China	Marubeni	Water supply BOT (jointly with Veolia) for Chengdu, China
	Corporation	Commercial operation started in February 2002, and presently
		supplies drinking water to 3.2 million people in Chengdu. ⁵⁵⁾

55) Marubeni Corporation website:

⁵¹⁾ Marubeni Corporation website: https://www.marubeni.com/jp/dbps_data/news/2012/121227a.html

⁵²⁾ Mitsubishi Corporation website: https://www.mitsubishicorp.com/jp/ja/csr/library/sr2008/sr2008-02.html

⁵³⁾ Mitsubishi Corporation website: https://www.mitsubishicorp.com/jp/ja/pr/archive/2014/html/0000025193.html 54) Nikkei Shimbun website: https://www.nikkei.com/article/DGXLRSP443700_W7A420C1000000/

https://www.marubeni.com/jp/dbps_data/_material_/maruco_jp/data/ir/pdf/report110/report110_project.pdf

Taking an overview of the various initiatives by these companies, in terms of developing the water businesses of general trading companies, many of them take a stance of expanding the field-specific strengths of each company, such as resources or electrical power, or getting involved in the water business to acquire an interest in such. As the table above shows, there are also some companies who gain steady revenue through the operation of waterworks businesses.

(2) Status of overseas expansion of waterworks-related industries

Support systems such as infrastructure export strategies by governments have been adopted, and at the 38th Ministerial Meeting on Strategy relating Infrastructure Export and Economic Cooperation on Overseas Development Strategy in the Field of the Water Industry, fields where Japanese companies could deploy products and services in the water industry were specifically organized. However, this organization was limited to introducing case studies in a somewhat restricted scope, such as the water business deployment by general trading companies discussed earlier, or EPC projects in the water treatment field by electrical device manufacturers, and could not be said to be an overview of the status vis-à-vis Japanese companies.

2-4 上水道



出典:水道技術研究センター資料等を元に内閣官房作成」



Figure 3.2 Japan's strengths in the water supply field and collaboration with overseas partners⁵⁶)

The companies related to the waterworks industry who are rolling out services for water utilities each establish their own branch offices overseas to expand their business. These companies have a history of originally expanding business as the "implementation squads" of Japan's international cooperation projects, and match the needs of Japan's international cooperation where the same levels of reliability as in Japan are demanded, so have been rolling out services using products developed in Japan as their basis. As a result, while the quality is high, they have been criticized in terms of cost-competitiveness, and their low market share in overseas markets.

⁵⁶⁾ Overseas Development Strategy in the Field of the Water Industry, Ministerial Meeting on Strategy relating Infrastructure Export and Economic Cooperation: https://www.kantei.go.jp/jp/singi/keikyou/dai38/siryou2.pdf



Figure 3.3 Trends in Japanese companies⁵⁷⁾

However, in the infrastructure export strategy (revised version of FY2018),⁵⁸⁾ specific measures related to international contributions through the promotion of high quality infrastructure are discussed, one of which is the international standardization of high quality infrastructure. This includes the active use of opportunities such as summit meetings, international symposiums, and infrastructure-related events to move ahead with initiatives to establish internationally the idea of "high quality infrastructure." The framework from Asia-Pacific economic cooperation has been utilized to create guideless in 2018 that lay out things like assessment methods for procurement or ways of looking at things to ensure quality in water infrastructures, including life cycle costs.

In terms of initiatives for life cycle costs (LCC), examples of procurement that incorporated LCC assessment were introduced in the study session on measures, etc. for overseas expansion of the water business held by METI and announced in March 2017.⁵⁹⁾ In addition, LCC assessment methods in procurement for introducing LCC were also listed, and points raised regarding the utilization of consultants with experience and technology to assess LCC in bids at the procurement stage.

However, the understanding and agreement of the target country's government is required for including LCC in assessment methods for procurement under yen-loan projects. As the quality of products from competing companies in other countries increases, it is the responsibility of Japanese

59) METI website:

⁵⁷⁾ METI website:

http://www.meti.go.jp/policy/mono_info_service/mono/waterbiz/kenkyukai/kaigai_infra/business/02_reference.pdf 58) Prime Minister's Office website: http://www.kantei.go.jp/jp/singi/keikyou/dai37/kettei.html

http://www.meti.go.jp/policy/mono_info_service/mono/waterbiz/kenkyukai/kaigai_infra/001_business.html

companies to prove that using LCC really is effective. It needs to be verified whether these sorts of efforts are being carried out sufficiently.

In addition, for the target country to judge LCC, it is important to have both a business management-based perspective and a technology-based judgment. In addition to this sort of judgment being difficult for some countries, overcoming the significant negative effects of the very obvious size of the initial costs and the difficulty of raising funds to gain the target government's understanding is difficult.

To deal with this situation, Japan needs to proactively explain the importance of LCC to the target government not just when formulating the proposal, but when carrying out appropriate seminars. Japan will be required to construct a specialist support system at both the implementation and procurement stages. However, the companies also need to work to transform the merits of LCC into strengths, matching the developing nation's technical and financial situation, such as by proposing contracts that include initial investment reduction and long-term maintenance.

4. 質を担保する調達方法 ①実例比較

仕様発注により、大幅な入札価格差で 日本企業が失注した例 (カルナフリ上水道整備事業(バングラデシュ))		日本1 (パリ	と業の優位性が評価され、受注に至った例 ャニャーケ下水処理場建設(フィリピン))
 ◆ チッタゴン市の上水道施設整備において、①取水施設 ②浄水場の新設 ③送水管の敷設 ④貯水池の新設 ⑤組織改善 ⑥コンサルのコンポーネントについて、仕様発注で入札を実施。 (総額 122億円(円借款)) ④取水施設の入札において、中国企業が約3.9 		 <i>→</i> フィリピン	ン・マニラッド水道サービス会社が、LCC(ライフ シコスト)の評価を導入した入札を実施。 *業(JFEエンジニアリング株式会社)の限られ -スでのプラント配置や現地の下水の水質に最 ザインビルド提案が高評価を得て受注(2015)。
億円、日本企業は約57億円で応札し、圧倒的 か価格差で日本企業が生注		発注者	フィリピン国マニラッド水道サービス会社
		受注者	J F E エンジニアリング株式会社
 (その後の経緯) 中国企業と契約後、完了を2010年9月までの2年 6ヶ月としていたが、政情不安や実施事業者の能力に問 題(現地施工事業者に対するマネジメントカの欠如や支 払遅延等)があり、<u>大幅な工期の遅延</u>が発生。 受注企業のプロジェクトマネージャーを変更し、2016年 		施工範囲	 ・下水処理施設の設計、調達、建設、機電工事、 試運転、実証運転 ・完工は2016年7月(予定) ・施設完成後、2016年10月~2017年 10月の試運転(予定) ・2016年7月~2018年10月の瑕疵担 保期間を経て引渡し(予定)
5月に完成としたが、当初計画からは5年8ヶ月の遅延。		契約金額	34.2億円(税抜き)
(山記) 宮崎カ五抵港湾駅取びレマル・ガーロロマンボーマル・ガナールの ご ねばは書		処理容量	76,000㎡/日
(山内)/国际協力の使用具科及UE/ソノク、JFEエノンニ/ソノクハームペーン、報道情報より経済産業省作成		資金	JICAセクターローン 15

Figure 3.4 Procurement methods that assure quality: Comparison of case examples⁵⁸⁾

4. 質を担保する調達方法 ②VFMの最大化を図る調達方法

項目	方針	した。	
P/Q審查	単なる受注実績ではなく、当該業務が成功裏 に実施されたという履行実績を確認する	・既存発注者からの証明の取り付け ・コンサルタントを活用した実績確認等	
発注方式	応札者の創意工夫を高め、VFMを最大化する 発注方式・事業スキームの採用を進める	・性能発注方式(アウトブット仕様)の導入 ・DB/DBO方式の積極的活用 等	
契約条件	提案内容(質と価格の両面)が確実に履行 されるための仕組みや措置を講じる	・適切な保証条件の設定 ・適切なモニタリングとインセンティブ及びペナルティ条項の規定	
評価方法	単に価格だけでなく、技術要素やサービスの質 も適切に評価を行った上で落札者を決定するこ とが望ましい	・事業を実施する国や機関の規則、能力、経験に応じた最適 な評価方法(総合評価方式含む)の決定 ・価格評価における <u>ライフサイクルコスト(LCC)評価</u> の採 用等	
備考	 ○性能発注の場合のRFP(request for proposal)の作成や、LCC計算の条件(単価等)設定・評価においては、必要に応じて、関連する技術や経験を有するコンサルタントを活用することも重要。 ○また、提案内容が適切に担保される仕組みを構築することも重要。 		

事業のVFM (Value For Money)の最大化を図る調達方法の例

Figure 3.5 Procurement methods that assure quality: Procurement methods designed to maximize VFM⁶⁰

However, there are a number of fields where Japan is technologically very strong, and one method is to focus on countries with needs in these fields. There are cases where Japanese companies have offered superior competitiveness in fields where there is already a track record, such as in the formation of projects for seawater desalination using reverse osmosis membranes. This started in desert oil-producing countries which needed to procure water even if they had to resort to desalination, which was extremely expensive to begin with, but as it spread, costs gradually dropped, and it spread to other countries as well. There is a lot to learn from this business.

Examples of lateral deployment utilizing the strengths of Japanese companies include Marubeni Corporation, which became involved in waterworks from its expertise in hydroelectric power plants, and Yokogawa Electric, which expanded its management service net for controlling chemical plants into the waterworks field.

In addition, Japan, a country very at risk for natural disasters, is a world leader in the field of disaster measures. The high quality of "disaster-resistant waterworks" may only be required in a few countries, but Japan has extremely high levels of experience and competitiveness. Strategies that appeal to this strength would likely be effective for countries that require disaster measures even though they are still developing (such as Indonesia for earthquake), so it is important to search out these sorts of targets.

60) METI website:

http://www.meti.go.jp/policy/mono_info_service/mono/waterbiz/kenkyukai/kaigai_infra/business/02_reference.pdf

3-5 JICA SME Advancement Support Project

JICA's Small and Medium Enterprise Overseas Business Development Support Project is aimed at contributing to solving development issues, utilizing the superior technology and products of SMEs in Japan in the development of developing nations. In addition, by supporting the overseas expansion of SMEs from around Japan, we contribute to revitalizing Japan's economy and local communities. Our support menu is divided into the SME Support Model and the SDGs Business Model, and its outline is shown below.



Figure 3.6 Menu for private-sector liaison project support⁶¹⁾

The following figure from JICA shows our support track record in the field of water supply. As the figure shows, Asia accounts for the bulk, followed by Africa.

⁶¹⁾ JICA HP, https://www.jica.go.jp/priv_partner/activities/index.html



Figure 3.7 Support track record (by region/country)⁶²⁾

The figure below shows our track record in supporting technology, products, and services. Water treatment equipment accounts for more than half, and if chemicals related to water quality are added, the total accounted for by water quality rises to 60%. This is followed by 10 cases of element technology and 9 of non-revenue water countermeasures.



Figure 3.8 Technology/product/service types and examples⁶²)

This shows that support for the overseas expansion of SMEs is achieving a certain level of results in terms of promoting internationalization through utilizing the products and individual situation of each case. However, as can be seen from the diversity of these examples, they are often cases of initiatives by companies where, essentially, the owner can make these decisions.

Another perspective is needed in the sense of extracting knowledge that offers a birds-eye-view of the international expansion of the waterworks industry by each company.

3-6 Other (Activities with Private-sector Companies in WaterAid)

In considering tie-ups between public international cooperation and the waterworks industry, the example of WaterAid will be instructive. Instead of simple contributions like tie-ups with the stock market, support based on the concept of business expansion in international cooperation recipient

⁶²⁾ JICA website, JICA Developing Nations Issues Awareness Seminar (Urban Water Supplies & Rural Water Supplies) https://www.jica.go.jp/priv_partner/information/2018/ku57pq00002aw02r-att/ku57pq00002bcyt6.pdf

nations, or support based on the concept of hiring people in international cooperation recipient nations, this is a case of win-win CSR that includes merits for companies as well.

Column 1: Tie-ups with private sector companies within WaterAid

WaterAid, an NGO mainly active in the fields of water and hygiene, developed a guidebook with Diageo, GAP, Unilever, PwC, and ODI, "Strengthening the business case for water, sanitation and hygiene - how to measure value for your business,"⁶³⁾ as a way to deal with the issue of giving figures to the benefit to a business when investing in water and hygiene. This guidebook is both practical and can be introduced in stages. This guidebook makes it possible to calculate the ROI while also helping companies understand the business value of investing in water and hygiene.

In addition, WaterAid has carried out water and hygiene projects in India with the cooperation of a number of private companies. According to the 2013 Companies Act, which for the first time anywhere in the world lays out legal requirements for corporate social contributions, all companies registered in India are legally required to use 2% of their profits in development projects. So WaterAid, an international NGO, is working with companies to carry out the following activities related to water and hygiene.

HSBC (Hong Kong): Carrying out the HSBC Water Project in two phases from 2012 to 2020. The project's expenses of approx. 280 million yen are being used to ensure access water supply facilities and hygiene facilities and promoting hygiene customs in cities in four states and six regions in India. HSBC's long-standing relationship with WaterAid has led to this project.

Pepsi Foundation: Using project funds of 330 million yen, it is carrying out a project to ensure access to drinking water for 107,000 households. This development project was started due to Pepsi selling its beverages in India.

Oracle: Implemented a project to secure access to safe drinking water for 10,000 people in 20 villages affected by fluorine contamination. Oracle originally entered India for IT-related business, and has been carrying out this project.

Issues related to these WaterAid projects are, according to responses to company requests, infrastructure prejudices, geographical bias, lack of interest in equality issues such as gender, and other issues that have shortsighted aspects. However, they are seen as opportunities in tie-ups with private-sector companies by being able to approach people, regions, and fields where the government cannot reach, and making it possible to adapt new technologies.

3-7 Summary of the Status of Overseas Expansion by Waterworks-related Companies in Japan

We looked at examples of overseas expansion by Japanese waterworks companies, but were not able to obtain enough information to grasp the overall picture. There is a certain level of understanding already accumulated regarding support for water utilities moving into these areas, but not enough debates and information have been accumulated on companies moving into these areas.

In future, regarding the status of activities by private-sector companies involved in overseas expansion, it is necessary to gather information and analyze it. This should be done by requesting

⁶³⁾ WaterAid, HP, https://washmatters.wateraid.org/publications/strengthening-the-business-case-for-water-sanitation-and-hygiene-how-to-measure-value

industry groups like the Federation of Japan Water Industries, holding hearings with companies taking part in overseas seminars, etc. hosted by the MHLW on elements hampering or promoting their overseas expansion, collecting ideas and ways of thinking of related companies, etc. through bodies such as JICA or Yokohama City that support international cooperation, and collecting information published by individual general trading companies, engineering trading companies, etc. on the web, as some can be found there.

Chapter 4 Results of the Field Survey in East Timor

4-1 Outline of the Target Country (East Timor)⁶⁴⁾

(1) General circumstances⁶⁵⁾

Located between 123 and 127 degrees east longitude and 8 and 10 degrees south latitude, East Timor comprises the eastern half of the Timor Island in Lesser Sunda Islands and Oecusee, an exclave on the West Timor. The country size is about 14,000 km² (as large as Iwate Prefecture) and the population is about 1.183 million people. It has a tropical monsoon climate with rainy and dry seasons. The highest temperature in a day is in the 30s throughout the year, except mountainous regions, which is relatively high. The rainy season is from December to April and the dry season is from June to October. May and November fall under the transition season.

Tetum and Portuguese are used as official languages, and Indonesian and English are used as practical languages.



Figure 4.1 Location of East Timor

1) History and the internal political situation

East Timor became independent in 2002 after colonial rule by Portugal from the 16th century and annexation by Indonesia in 1976 after World War II.

Mr. Xanana Gusmao was elected in the presidential election held on April 14, 2002 and inaugurated as the first President on May 20. Currently, the president of Fretilin, Francisco "Lu-Olo" Guterres remains the President since he was inaugurated as the result of the presidential election held in March 2017.

In East Timor, although the President is the head of the state, he assumes mainly ceremonial roles, and the Prime Minister appointed by the National Parliament has stronger authority. With respect to the Prime Minister, as the result of the National Parliament election held in July 2017, Mr. Alkatiri was inaugurated as the new Prime Minister in September of the same year. However, the management of the Parliament became deadlocked because his party was a minority party, which

https://www.mofa.go.jp/mofaj/area/easttimor/data.html

65) Ministry of Foreign Affairs' website, Medical circumstances in the world, East Timor,

https://www.mofa.go.jp/mofaj/toko/medi/asia/easttimor.html

⁶⁴⁾ Ministry of Foreign Affairs' website, Basic information on East Timor,

ended up dissolving the National Parliament on January 26, 2018. After that, an election was carried out in May 2018. The "Alliance for Change and Progress (AMP)" led by Mr. Xanana Gusmao defeated the former Prime Minister Alkatiri's Revolutionary Front for an Independent East Timor (Fretilin) and won 34 seats, which became the biggest force, achieving the change of government, and then Mr. Taur Matan Ruak was inaugurated as the Prime Minister on June 22.

As seen in the information of each cabinet member posted on the website of the East Timor government, some posts, including the Minister of Finance, the Minister of Health, etc., are not appointed yet at the time of access on January 21, 2019, which appears that the government system is still under construction.⁶⁶

2) Economy

Agriculture (mostly petty farming, cultivating rice, corn, tubers and roots, coconuts, etc.) is the main industry. They are making special efforts on cultivation of coffee as farm products for export. Development of petroleum and natural gas (Timor Gap) is being promoted as valuable national resources.

Item	Details
1 Main industry	Agriculture (e.g. coffee and tea)
2 GDP	1.783 billion USD (2017, World Bank)
3 GNI per person	1,790 USD (2017, World Bank)
4 Economic growth rate	5.6% (2016, World Bank)
5 Price rise	-1.2% (2015, World Bank)
6 Total amounts of trade	(1) Export: 0.02 billion USD
$(2016)^{67}$	(2) Import: 0.78 billion USD
7 Main trading items (2016,	(1) Export: Coffee
Ministry of Finance of East	(2) Import: Mineral fuels, automobiles and parts, electrical
Timor)	equipment, grains, and machinery
8 Main trade partners (2016,	(1) Export: U.S., Germany, Canada, Belgium, Australia and Japan
Ministry of Finance of East	(2) Import: Indonesia, China, Hong Kong, Singapore and Vietnam
Timor)	(Japan: the 12th place)

Table 4.1 Social and economic indexes of East Timor

Maintaining the high economic growth rate since 2007, the growth rates between 2014 and 2016 exceed 4% respectively. The largest target of the government of East Timor is to establish sustainable economy by 2030 with objectives of (a) diversifying the economy away from their dependence on resource revenue (petroleum and natural gas), (b) aiming at sustainable and balanced growth instead of the government-initiated growth, and (c) transition to a higher rank middle income country of which per national income is between 3,956 and 12,235 dollars (currently, a lower rank middle income country).

⁶⁶⁾ East Timor government's website, http://timor-leste.gov.tl/?p=13&lang=en

⁶⁷⁾ United Nations Conference on Trade and Development's website, http://unctad.org/en/Pages/Statistics.aspx

(2) Situation of the water supply sector in the target country⁶⁸)

1) Outline

In East Timor, the water supply rate was 91% and the access rate to sanitary facilities was 73% in urban cities in 2015, which achieved the targets of MDG. On the other hand, the rate of connection to each house is still low, and it is estimated that the proportion of non-revenue water (NRW) is 90% in Dili City according to the report of WaterAid in 2010. It is said that this has been caused by insufficient maintenance and management of main pipes as well as a considerable number of illegal connections, etc.⁶⁹

On the contrary, in rural areas, the water supply rate was 60% and the access rate to improved sanitary facilities was 30% in 2015, which did not hit the targets of MDG.

According to the surveys on the actual situation of the urban environmental health sector conducted by JICWELS in 2005, 90% of households in the urban area of Dili uses some water supply facilities such as water pipes, pumps, public waterworks, artesian wells, etc., instead of rain fall, spring water, surface water, etc. However, the half of households still uses wells, spring water and surface water from rivers and lakes throughout the country.

Development of water supply systems has been already carried out in the urban area of Dili, and it can be generally divided into 1) a system developed by the government, 2) a water supply system developed by a community, 3) a water supply system by a water wagon, and 4) a well.

2) Situation of the support provided by donors

Many donors are working on international aide activities in the water supply sector as follows;

(1) Asia Development Bank (ADB)

ADB has been continuing financial and technical support to date. In project areas, development of water supply systems and improvement of the efficiency of bill collection are their main contents. The following are main projects that they have conducted.

- Technical cooperation project for urban water supply sanitation in East Timor (joint support with JICA)
- Capacity improvement project for management and operation organization for water supply system
- Improvement project for water supply system in Dili
- (2) Australian Government Department of Foreign Affairs and Trade (DFAT) (the former International Development Agency (Aus-aid))⁷⁰⁾

DFAT has been supporting rural water supply projects and national hydrogeographical mapping of East Timor. Furthermore, it has been dispatching experts to National Directorate of Water Services (hereinafter referred to as "DNSA") and National Directorate for Water Quality Control

⁶⁸⁾ Final report of urban planning project for Dili City in East Timor (summary version)

⁶⁹⁾ Timor-Leste Water Sector Assessment and Roadmap, World Bank, 2018,

http://documents.worldbank.org/curated/en/433121521173685667/pdf/124329-WP-P163648-PUBLIC-Timor-Leste.pdf

⁷⁰⁾ AusAID was absorbed into the Department of Foreign Affairs and Trade in November 2013. After that, a new structure in the Department of Foreign Affairs and Trade was established in July 2014 through consideration of treatment of a division responsible for development assistance within the Department of Foreign Affairs and Trade.

(hereinafter referred to as "DNCQA") for the purpose of technical support and strengthening of capacity of the organizations. During the period from 2007 to 2016, the support program for rural water supply and sanitation (BESIK) was carried out over the phase 2. Aus-aid has been financially supporting projects of which purposes are organization reinforcement, development of a legislative system for the water supply sector and improvement of the rural water supply system as follows;

i) Support for establishment of the water law

DFAT has been dispatching engineers to DNCQA in order to technically support preparation of the water law (proposal). The purpose of this law is to manage the existing water use and new development of surface water and groundwater.

ii) Evaluation of the rural water supply system and assessment of the water supply capacity of the existing wells

DFAT has been financially supporting a project that aims to improve the duration, quality and amount of water supply for small-scale waterworks in rural areas. Such project consists of a survey on the water supply capacity and a salinization risk of the existing wells, assessment of the capacity of the existing water supply pipe network, and consideration of planning for reconstruction of water supply systems.

(3) Japan International Cooperation Agency (JICA)

JICA has been providing financial support for development of water supply systems since the period during which East Timor was under the control of the United Nations. Due to such financial support, waterworks systems including water supply systems, pump systems, reservoirs, etc. were constructed in Bemus, Maloca, Lahaina and Bonampak. Furthermore, JICA has been dispatching experts on waterworks to DNSA. The following table summarizes past activities of JICA.

Fiscal	Name and description	Outline
2000–01	The study on urgent improvement	• Formulation of the urgent rehabilitation and
	project for water supply system in	improvement plan for major cities (15 cities) across
	East Timor (development survey)	the country including Dili City
		• Water conveying pipes in Manatuto and leakage
		prevention measures in Dili were implemented as a
		quick impact project.
2000-03	The project for improvement of water	• New construction of a central water treatment
	supply facilities in Dili (grant aid)	plant in Dili
		• New construction of a water conveying pipe from
		the Bemos River
		• Improvement of six deep wells and new
		construction of two reservoirs, water pipes, etc.
2002–03	The project for improvement of water	• Repair and new construction of water intake

Table 4.2 Cooperation of our country to East Timor in the water supply sector⁷¹⁾⁷²)

⁷¹⁾ Report of the study on the project for urgent improvement of water supply system in Bemos-Dili phase 2 (2010)

⁷²⁾ For example, JICA Knowledge Site, http://gwweb.jica.go.jp/km/FSubject0301.nsf/NaviSubjTop?OpenNavigator

Fiscal year	Name and description	Outline
	supply in local areas (grant aid)	facilities, water conveying pipes, water pipes, distributing reservoirs and water distributing pipes in each city of Liquicia, Lospalos and Manatuto (including repair of a slow sand filter bed in Liqucia) • The total pipeline length is 19.8 km.
2002–04	The project for improvement of water supply facilities in Dili City (grant aid)	 Improvement of information on water pipe network and mapping for water distributing zones 2, 3 and 4, and water distribution planning Survey for two new wells for the east Dili
2004–06	The project for improvement of water supply in Dili (grant aid)	 Renewal of water treatment facilities, construction of administrative buildings, renewal of electrical and machinery equipment in Bemos, Lahane and Benamauk in Dili City Replacement of a 19.6 km-long water distributing pipe from which leakage is significant
2005–07	The project for improvement of water supply in Same and Ainaro (grant aid)	 Water intake facilities in Ermera, Same, Ainaro and Maubisse Improvement of water treatment facilities, water distribution facilities, etc.
2008–11	Capacity development project for water supply system in Dili and four towns (Ainaro, Same, Liquicia and Lospalos)	To improve systems for operation, maintenance and management of water treatment plants and water quality control
2009–12	The project for urgent improvement of water supply system in Bemos-Dili (grant aid)	• Repair of a water intake facility in Bemos and a water conveying pipe from the Bemos River (partially transferred to the phase 2 project), repair of a river-crossing structure, repair of pipeline revetment works (including rockfall guard work), repair of a distributing reservoir in the lower part of the water treatment plant in Bemos (transferred to the phase 2 project)
2011–13	The project for urgent improvement of water supply system in Bemos-Dili phase 2 (grant aid)	 Protection of a water conveying pipe from the Bemos River Repair of a distributing reservoir in the water treatment plant in Bemos and valves, and repair of access roads
2012–15	Water supply improvement adviser	Instruction on maintenance/management and operation management of water treatment plants Proposals for understanding of the actual situation and improvement of water supply systems Consideration of JICA's support plan in the water supply sector
2015–17	Water supply improvement adviser	Instruction on maintenance/management and operation management of water treatment plants Instruction on water quality control of water distributing pipes

Fiscal year	Name and description	Outline
		Instruction on maintenance of water distributing
		pipes
2017–	Water supply improvement adviser	Instruction on operation and
		maintenance/management of water treatment plants
		Instruction on operation and
		maintenance/management of water distributing
		pipes and measures against water leakage
		Instruction for the management base of DNSA

In addition to the above, Ono City, Fukui Prefecture has been working on the improvement of facilities for water supply to schools and communities in East Timor in cooperation with the Japan Committee for UNICEF since 2017.

Column 2: Support for water in East Timor by Ono City, Fukui Prefecture

As a new form of regional revitalization and measures against depopulation, Ono City has been promoting the "Carrying Water Project" of which theme is "water." Well-watered Ono City has been making various efforts through the water. They are making those efforts with an eye toward the medium-to-long term goal such that those results would bring improved attraction and recognition of the whole region, leading to increase in the number of tourist arrivals, industrial development and eventually measures against depopulation, such as expansion of employment as well as promotion of immigration and settlement.

As part of this activity, they have been implementing a project to support East Timor that has been struggling for "securing of clean and safe water sources" in cooperation with the Japan Committee for UNICEF since 2017.

They have solicited donations through measures in the "Meisui Marathon," which has been held 50 times or more in the past, and various activities conducted in the "Carrying Water Project" and improved water supply systems in East Timor.

Specifically, in Ermera and Ainaro of East Timor, designating six schools and communities to which a gravity type water supply system is introduced preferentially based on collaboration with the education department and water supply authorities, they have planned to implement installation of six gravity type water supply systems in total (two per year), targeting children and students (1,500 persons) as well as people in the surrounding area (1,800 persons). They have been also working on the improvement of a management system after establishing the water supply systems, such as assistance for establishment of a water equipment management committee represented by teachers and students as well as communities, operation and maintenance of waterworks, and support for development of a mechanism for collecting water bills, aiming at the access to sustainable water.





3) Organizations and the structure

The administrative system of East Timor was reconstructed in 2013, and the Ministry of Public Works (MoPW) became responsible for development, management and operation of water resources, public water supply, sanitation and drainage after the reconstruction. For the actual operation of waterworks, the National Directorate of Water Supply and the National Directorate of Water Resource and Water Quality have been established under the umbrella of MoPW to assume the following roles;

(1) National Directorate of Water Supply

The National Directorate of Water Supply is a department that is responsible for development, management and operation of waterworks. All of water supply systems under the control of the government are managed by this organization.

(2) National Directorate of Water Resource and Water Quality

The National Directorate of Water Resource and Water Quality is responsible for inspection of water quality of groundwater, surface water and tap water as well as management of the criteria with respect to the water supply sector.

The following is an organization chart for the water and sanitation sectors of East Timor. The following chart is an excerpt from the report of the World Bank published in 2018. However, according to the latest website of the government of East Timor (as of August 16, 2018), the Minister of Public Works and the Minister of Transport and Communication have been appointed respectively, and the structure has been reconstructed with the inauguration of the new government in 2018.

⁷³⁾ Carrying Water Project HP, http://www.carrying-water-project.jp



Figure 4.2 Organization chart for the water and sanitation sectors of East Timor

In East Timor, according to the data of WHO/UNICEF JMP,⁷⁴) the access rate to basic water sources was 70% in the entire country, 90% in urban areas and 60% in rural areas in 2015.

⁷⁴⁾ WHO/UNICEF JMP, https://washdata.org/

(3) Implementation system for UHC

UHC is under the jurisdiction of the Ministry of Health. The Ministry of Health has five departments under the Director General (the following figure). (1) The Planning & Financing department handles health policies, budget and international cooperation, and (2) the Community Health department handles the whole diseases such as infection and lifestyle diseases, maternal and child health, and nutrition, (3) The Human Resource department plans and manages human resources, (4) the Hospital Services department implements clinical services, support for hospitals and a referral system, and (5) the Admin, Logistics & Procurement department manages facilities and equipment. As for indicators for UHC, (1) the Planning & Financing department is collecting those voluntarily, however, these results are not open to the public.



Figure 4.3 Organization chart for the health sector of East Timor⁷⁵)

In addition, the website of WHO contains the 2011–2030 national strategic plan for the health sector of East Timor, and the organization chart (proposal) is also posted as follows;

⁷⁵⁾ Health Sector Strategic Plan 2008-2012, Ministry of Health of East Timor



Figure 4.4 Organization chart for the health sector in the 2011–2030 national strategic plan for the health sector of East Timor (proposal)⁷⁶

(4) Implementation structure for SDGs⁷⁷)

In 2011, East Timor formulated the Strategic Development Plan (hereinafter referred to as "SDP") in the structure in accordance with MDGs, with an aim to enter advanced developed countries in 2030. After that, while transiting from MDGs to SDGs, the SDG working group was established under the Office of Prime Minister, and a road map to achieve SDGs was created in the form harmonized with implementation of SDP. A monitoring system for SDGs in East Timor has been established in such road map. In addition, the SDG working group has designated responsible ministries and agencies for indicators of SDGs.

However, due to replacement of the top level caused by the recent change of government, the progress of this system seems to be forced to remain stagnant.

⁷⁶⁾ WHO HP, Timor Leste National Health Sector Strategic Plan 2011–2030,

http://www.searo.who.int/timorleste/publications/national_health_sector_plan.pdf

⁷⁷⁾ TIMOR-LESTE'S ROADMAP FOR THE IMPLEMENTATION OF THE 2030 AGENDA AND THE SDG, the website of the government of East Timor (http://timor-leste.gov.tl/wp-content/uploads/2017/08/UNDP-Timor-Leste_SDP-Roadmap_doc_v2_English_220717.pdf)


UPMA: Planning, Monitoring and Evaluation Unit

Figure 4.5 Implementation structure for SDGs of East Timor⁷⁷⁾

4-2 Content of the Field Survey

In the field survey, based on the outcomes from summaries of materials mentioned so far, the existence and content of policy guidelines for SDGs of the target country, interrelationship with other sectors, the situation of cooperation of our country's water suppliers, and future needs in the light of possible advance by Japanese companies are surveyed through interviews.

The method of survey is mainly exchange of opinions with the local government and water supply related parties as well as JICA and experts on waterworks, and understanding of the process and results of activities, practical issues, future activities to be implemented, etc. are summarized also based on the results of observations of water facilities and water use behavior of users. Table 4.3 shows the content of the field survey.

Items surveyed	Target of survey	Content of survey	Remarks
The existence and content of policy guidelines for	MoPW (water supply)	• After confirmation of the national policy and implementation plan to achieve the entire SDGs, to collect information on the progress and challenges related to SDG 6.	
SDGs of the target country	ЛСА	• To exchange opinions about partnership with related promotion bodies for SDGs other than SDG 6.	
		• To otherwise confirm requests, etc. from the local side.	
Interrelation with other sectors	MoPW (water supply)	• To confirm organizations relating to the water and sanitation sectors and circumstances of their establishment as well as history of activities.	
	Embassy JICA ADB	• To inquire specifically whether these organizations are operating policies with an awareness of SDGs.	
		• Whether explanation about partnership with donors from other countries can be given. Whether there is a system such as coordination and segregation.	To check a master plan, which was formulated by ADB.
		• To confirm requests, etc. from the local side.	
Possibilities of cooperation of our country's	MoPW (water supply) JICA	• To confirm the implementation state of water supply projects of East Timor and understand about challenges through exchange of opinions and recognition of the site.	Exchange of opinions based on the survey on the local water supply situation.
water suppliers and advance by Japanese	ADB	• To exchange opinions about the history of past activities and challenges in their implementation in the water and sanitation sectors.	Survey also on the activities of the embassy and Ono City.
companies		• To discuss experiences of Japanese water suppliers and the effect obtained from international cooperation as water suppliers.	Discussion also about experiences, etc. of a responsible person from Chiba Prefecture.

Table 4.3	Content	of the	field	survey	1
	~ ~	~ ~ ~ ~ ~ ~			

• To discuss possibilities of advance by Japanese water suppliers/companies and advantages as well as issues related to such	
purpose.	
• To confirm requests, etc. from the local	
side.	

4-3 Schedule for the Field Survey

The following tables show the schedule for the field survey and members of the survey team.

Date and	time	Schedule and place	Content
Saturday		Departure from Narita/Kansai	Content
November	11:00	airport	
17	17:40	Arrival at Denpasar, Bali	
~ .	10.40	Departure from Denpasar, Bali	
Sunday,	10:40	Arrival at Dili and transfer to a	
November	13:35	hotel	
18	18:00	Mr. Sakurai (Expert)	Interview
	10.00	UCA Office	Discussion and interview about the
	12.00	JICA OILCE	water supply situation, the situation of
Monday,	12.00		SDGs, etc.
November			Courtesy call, explanation of the
19	14:00	MoPW, head (DGAS)	purpose and permission of the site
	17:00	MoPW, water supply (DNSA)	inspection, request for a guide, and
			interview related to the survey
	10:00	Benamauk water treatment plant	Site inspection
Tuesday.	12:00	and its surrounding area, wells,	
November		etc. existing along the way	x 7 ¹ ·
20	14:00	Bemos water treatment plant and	Visits to the water treatment plant, the
	17:00	its surrounding area, wells, etc.	site against NRW, etc.
		existing along the way	Counterry call and insuraction of Dihau
	07:00 09:00 11:30 14:30 19:00		Couriesy call and inspection of Rineu water treatment plant (total about 1
		Departure from the hotel	hour
		Arrive at Ermera water supply	Facility improved by the embassy
Wednesday,		department (1 hour)	(about 30 minutes at the site)
November		Talimoro water supply facility	Request for a guide to a staff of Ermera
21			district
			Small-scale facility improved by Ono
		Hatulia B water supply facility	City and UNICEF
			(about 30 minutes at the site)
	10:00	DGAS/DNSA	Report of the results of the site
Thursday, November	12:00		inspection, etc. (1 hour)
	16:00	Embassy	Courtesy call on the embassy and report
	17:30	-	of the results of the field survey
	08:30	JICA	Report of the results and exchange of
Friday,	09:30		general opinions
November	10:00	ADB	A person in charge of water at ADB
23	11:30		(Mr. Tiago)
	14:15	Departure from Dili	

Table 4.4 Schedule for the field survey

Date and time		Schedule and place	Content
	15:00	Arrival at Denpasar, Bali	
Saturday, November 24	00:45 08:40	Departure from Denpasar, Bali Arrival at Narita/Kansai airport	

Member	Position	Remarks		
Tatsuya	Equipment First Section, Facility Improvement Center,	Person with local		
Sasaki	Waterworks Bureau of Chiba Prefecture	experience		
Tatsuo	Senior Advisor, Federation of Japan Water Industries, Inc.	Committee member		
Morimoto		Advice on logistics		
Ryota Ushio	Unit Chief, Office of Global Health Cooperation, International Affairs Division, Minister's Secretariat, Ministry of Health, Labour and Welfare	Secretariat		
Takeo Yamaguchi	Technical Advisor, Japan International Corporation of Welfare Services	Secretariat		

Table 4.5 Members of the survey team (honorifics omitted)

4-4 Summary of Results of the Field Survey with Interviews

The table in the following sections summarizes the results of the field survey with interviews by subject. The points of findings are summarized as follows;

- Japan is recognized as one of important partner countries and expected to continue to provide assistance in the water supply sector also in the future. There are still many needs for support. However, unless there is a custom of using water carefully, we cannot catch up no matter how far we develop waterworks. The successive experts have been working on this issue, however, making a custom takes time, and therefore, it is necessary to continue those efforts.
- The promotion structure for SDGs is not developed yet and depends on the political situation. It seems that donors including Japan are required to make proposals about partnership between sectors in order to use limited resources effectively.
- Apart from cases such as participation in support projects, there are obviously difficult elements such as high labor costs, small market, etc. as a target country for private companies to set up operations.
- The partnership between supporters are relatively maintained. In particular, the master plan formulated by ADB is a drastic plan such as replacing the whole organizations and human resources, and it is worth paying attention to how it will be operated by the local side.

Table 4.6 Results of the field survey with interviews			vey with interviews	
Item	Information required	DGAS/DNSA	ADB	JICA, JIC
a) Various efforts from the perspective of achievement of SDGs	INational programs for achievement of the entire SDGs and roles of waterworks development	 In conaboration between the 2011–2030 National Development Plan (NDP) and SDGs, wishing to achieve SDG 6 under NDP. The government program is being implemented in the water supply sector. It is a five-year plan that continues to 2023 with objectives such as providing water service for 24 hours and providing sustainable water supply systems to all communities in rural areas, which has been established at the national level. However, it is expected that direct water supply will be available for 10% and a common faucet for 5 to 6 households will be provided to the rest. 	 (with respect to the master plan) It is the final draft and not published conclusively due to political factors. If political support is provided, it can be forwarded, however, it remains as the proposal of ADB under the circumstances. Currently it is being prepared while discussing with the minister-level members. 	
	• Organizations that are responsible for promotion of the national programs. Among them, organizations that take charge of SDG 6 and efforts relating to waterworks development.			 In the Office build new g Accord they h support coord The p of SD
	• Subject for monitoring of SDGs and the activity situation	• The policy is to monitor SDGs by developing the information gathering structure that integrates the water supply sector and the sanitation sector.		 It is n secon indication indication is not In the of inf
b) Interrelationship with other sectors	 Organizations related to the water and sanitation sectors. Circumstances of establishment of those organizations and history of past activities. The existence of a case where the water supply sector conducts development and operation of waterworks in cooperation with other sectors or where the water supply sector decides development and diffusion policies considering a request from other sectors. 	 The water supply sector is under the jurisdiction of DNSA, which is a national government agency. However, the jurisdiction structure of ministries was changed recently. Currently, there are three departments under DGAS. For urban waterworks, water is supplied through O&M, which is a water facility. Although bills are collected to the extent of maintenance and operation costs, the procedure is that those are incorporated into the revenue of the government and budgetary provision is made to pay O&M costs. The waterworks is a social project. For rural water supply, activities of communities are supervised in order to supply water. After constructing water supply facilities in partnership with NGOs, etc., instructions on skills to manage the facilities are provided. DNSA provides O&M such as operation, etc. of water treatment plants. They are responsible for supply of water from the water source to home. In SDGs, the water supply sector is equivalent to SDG 6 at the national level. The water supply sector and operated 	 ADB is promoting development of waterworks based on the master plan, while encouraging activities of the government and other sectors at the same time. 	 With water DNSA origin decem gover thems do so other canno suppo budge acces diffic JICA There comp and tw sector provid

CA Experts and Embassy

e former government, the Prime Minister's ce played a coordination role and attempted to l partnership. However, the situations in the government has not been grasped yet. ording to a person in charge of aid dination at the Ministry of Finance, although have independently surveyed sectors orted by donors, they have not been able to dinate the whole activities as the government. partnership is not built within the framework DGs.

not the situation that allows monitoring. The nd last government had a policy to establish eators, however, what has happened thereafter t grasped.

health sector, the situation of development formation on SDGs is generally vulnerable. respect to the implementation system of the supply sector, it used to be a system that A would implement technical support nally. However, it was decided to promote ntralization by a bill in 2016. Currently, local rnments are supposed to operate waterworks selves officially, however, they are unable to due to lack of technical capability. On the hand, DNSA is in the situation that they ot provide assistance due to lack of budget to ort local governments. They must receive et from the district, however, it is difficult to ss the Ministry of Finance, and they are in a ult situation without support nor budget. is supporting advance by private companies. are three activities that involve private anies with the results of one fishing industry wo road constructions. In the water supply r involving JICA, no support has been ded to a private company yet.

ently, PPP is not being conducted for rworks, however, it is being implemented by a ch company for a port.

Item	Information required	DGAS/DNSA	ADB	JICA, JIC
Item c) Possibilities of cooperation of our country's waterworks and advance by Japanese companies	 Information required What do they think is the top priority issue for diffusion and improvement of urban and rural water supply? Governance (master plan, legal system and division of duties) Engineering (securing of water sources, development and management of facilities) 	 DGAS/DNSA along with public sanitation, education, etc. Information is shared with other sectors. However, there are distribution and allocation of budget, and roles within each sector are defined. Although they are aiming at the achievement of goals for water supply, on the other hand, they are facing many problems in supplying water. New water sources are also required, and they have a policy to develop water sources, secure financial resources and expand capacity of facilities based on the master plan. However, they are having various problems. 	 ADB The government is holding five basic plans for water supply and sanitation = master plans (four water supply and sanitation master plans, four cities, waterworks in Dili, etc.). They are promoting partnership through these master plans. It is considered from the experience that efforts on waterworks should be transferred from grant aid to loan. To do so, it is necessary to improve O&M, 	 JICA, JIC The N has ju There manag politic are alv discus intuiti There place.
	 Finance (financing and collection of bills) Human resources (employment and development of human resources) 	 In Dili, groundwater is 80% and surface water is 20%, and water supply becomes short in the dry season. That is the reason why the master plan considers securing of water sources important. Renewal of old pipes are also necessary. Waterworks were constructed in 1960s. There are various types of pipes and not only DCIP but also ACP are used. 	 however, they are facing problems. It is required that people who have experience of being involved in practice of waterworks come over here to improve billing system and consider investment planning. Consultants will make a plan, however, for such practical aspects, Chiba Prefecture, which is experienced in project operation, assumes a major role of support. It is desirable to have support for management practice as well. To improve quality of tap water in order to make it drinkable water. To improve the water pipe network by 2037 and extend it further. Since it is important for the waterworks project to be independent and take measures according to the situation (flexible plan) for the first year of the master plan, it has been proposed to establish an independent official organization under the direct control of the national government to observe waterworks. 	small, numb Portug langua
	 From which country's company do they purchase products and services related to waterworks? Is there any standard for products and services related to waterworks (ISO, etc.)? Is there any proposal from overseas private companies such as water majors? Is there anything that they are expecting from Japanese water related companies? 	 Materials and equipment made in Indonesia, Japan, Australia, South Korea, etc. are used for waterworks. ISO is used for the standard. With respect to entry to water supply operation, water majors have not accessed. There is a survey related to PPP, which is waiting to be implemented. Since it is the matter of political decision making, how it is going to be in the future is unknown. Although there is no idea about PPP related legal system, there is a PPP project implemented at the port and the Ministry of Finance is responsible for it, and therefore, probably the PPP related legal system may be existing. 		 Mater mainly Accor a polic are de The gr indust establic constrimpler Althou high a for pri In the at alm
	 How the past support provided by our country's water suppliers is 	 Japan is one of important partners for East Timor. The Japanese government has supported 		 Power therefind for est Experimental Experimental Experim

CA Experts and Embassy Ministry of Tourism, Commerce and Industry urisdiction over industrial policies.

is an issue in the human resource gement (HRM). The top-class members are cally appointed, and the chief-class members ways at the site. There are people who can ss technically, however, to Japanese person's ion, the organization is not well managed. is a problem with education in the first The ratio of people who are educated are not , however, many people are not good at ers. It may be affected by the fact that guese is used for education, though their age is Tetum.

rials and equipment for waterworks are y imported from Indonesia.

rding to the water master plan for Dili, it has cy to replace all pipes, and therefore, there emands for pipes and meters.

overnment are also thinking to construct an trial park and considering leveling of ground, ishment of a power station, etc. If they ruct something, there is a possibility for mentation.

ugh it is a developing country, labor costs are and a market is not large, so that it is difficult ivate companies to set up operations there. ease of doing business ranking, it is ranked nost 160s, which is low, due to problems in opment of laws and procedures.

r infrastructures have been developed, and fore, a risk is low in terms of infrastructures tablishment of factories.

rts from Chiba Prefecture have been nuously working on making a custom of

Item	Information required	DGAS/DNSA	ADB	JICA, JICA Experts and Embassy
	evaluated?	improvement of many water supply facilities,		using water carefully and penetration of payment
	• Is there any specific request for	mainly waterworks facilities in the central area of		in exchange for water. Although they are
	expectation of ODA provided by the	Dili. Further, the Japanese government has		implementing a pilot project, etc., it can be hardly
	Japanese government including	provided training to operate these facilities. They		penetrated, and they are struggling.
	JICA?	have participated in many training courses, such as		• (As opinion exchange) Unless a custom of using
		water treatment, management, O&M, water quality		water carefully, such as shutting off the faucet
		control, facility management, human resource		whenever water is not used, is made, we cannot
		development, water quality analysis, customer		catch up no matter how far we develop
		management, etc. Amount of water supply is still		waterworks. To do so, it may be necessary to
		short, and therefore, they are expecting continuous		install water meters. There is an idea such that
		support from Japan.		water is free of charge until certain amount and it
				is charged if it is wasted. For public information
				distributed to residents, those are piled for
				elementary school classrooms, etc. also in Japan,
				which could be developed.

Chapter 5 Proposal on Future Water Supply Sector International Cooperation

5-1 Consideration of Matters Required to Be Worked on in a Focused Manner

A: Outline of mutual relationship between the water supply sector and other sectors in SDGs

This survey first gave an overview of the shift from MDGs to SDGs and recent developments as well as of international cooperation activities reflecting the Japanese policymakers' guidelines on development cooperation (Chapter 2, 2-1 to 2-3). Moreover, this survey took a bird's eye view of 17 SDGs goals to consider i) program operators existing in fields that were involved directly or indirectly with the water supply sector, including poverty issue, food issue, the industry, energy, environmental issues and the health domain as well as ii) such operators' activities. This clarified that water supply sector initiatives could help many sectors move forward toward their goals (Chapter 2, 2-4).

This survey also outlined highly specific activities relevant to UHC, a domain seemingly requiring further collaboration efforts in particular (Chapter 2, 2-5). We then sought to identify a system controlling different sectors in Japan, which showed the nation did not have any clear system performing communication and coordination for individual sectors. Thus, we concluded that collaboration with non-water supply sector entities must still be worked on individually.

Moreover, in the onsite study in East Timor, we ascertained the state of collaboration between health sector entities and water sector entities. We failed to identify any sector-to-sector collaboration in the country although finding that the country, having certain awareness as a nation, engaged in relevant activities to the extent possible for individual fields with the active cooperation of the WHO and other entities. Among other reasons, this was attributable to the fact that the East Timor administration changed its stance on policy priority levels and the nation occasionally experienced a halt of collaboration requiring efforts by entities involved, as the government structure was insufficient in laws and talent with heads of many organizations being replaced upon a change of power. Experts cited as a challenge the fact that East Timor's monitoring framework intended to put SDGs ideals into practice was weak although local organizations seemed to gather and arrange information internally to the extent possible.

B. Overview of past activities by Japanese water supply corporations and overseas operation by the nation's companies

We highlighted the state of Japanese water supply sector corporations' overall past endeavors on participation in international cooperation including training in Japan, coupled with challenges discovered through their experience (Chapter 3, 3-1). In East Timor, we also checked a program done locally by the Ono City Government of Fukui Prefecture. We paid attention to the program as an independent assistance initiative not going through JICA.

We also gave an overview of overseas business engagement by Japanese companies, sampling feedback obtained from them (Chapter 3, 3-2).

Various surveys to date such as last fiscal year's one led the personnel to identify challenges for Japanese water supply corporations' endeavors on international cooperation. Arranging these challenges systematically again resulted in us classifying them into attainment of urban ideals, fostering of water supply talent and assistance for local companies. It was somewhat evident what should be done for the first two points, and we succeeded in verifying the actual endeavors and their effects. Meanwhile, a number of Japanese municipalities engaged in initiatives on assistance to local companies by way of water business councils. We noted cases in which Japanese municipalities; i) worked with local non-Japanese Asian companies to use JICA small- to medium-sized enterprise assistance projects; ii) implemented their independent initiatives by utilizing a JICA Grassroots Technical Cooperation project; and iii) leveraged a JICA scheme to assist companies.⁷⁸⁾ These endeavors culminated in results by progressive municipalities such as the Kitakyushu City Government, Fukuoka City Government, Yokohama City Government and Kobe City Government and certain active participant companies. Although being highly reliant on individual municipalities' efforts, these initiatives offer much to be drawn on by other corporations and companies engaging in activities.

Moreover, in the local study in East Timor, the personnel exchanged opinions on assistance to private-sector enterprises setting up operation there. Although some had raised an issue beforehand about the country's import-export procedures, the local fact-finding process did not point to any particular difficulty as compared to other countries. Meanwhile, some opined that only a small number of companies set up operation in East Timor mainly because it was small in size and its market was not large enough, which was the case with not only the water supply sector but also all other industries. The nation's labor cost was not necessarily low, affected by state revenue from oil interests, showing East Timor to be not really attractive as a source of workforce.

5-2 Proposal on Activities Required to Be Worked on in the Future

A: Proposal on the mutual relationship between water supply sector entities and non-water sector entities for SDGs

Water supply sector entities should analyze the mutual relationship with non-water sector entities with reference to results from projects carried out in recent years and consider ways to deliver increased effects of international cooperation in the future while developing the relationship with such entities.

• The theme of achieving UHC is an internationally-shared action policy, and water supply sector international cooperation is one of key steps toward doing so. Given that the Japanese government is committed to streamlining the platform for UHC achievement, each project operator should probably know countries' UHC promotion platforms more clearly than now, adding UHC achievement to the theme list of its water sector international cooperation project.

⁷⁸⁾ JICA HP, https://www.jica.go.jp/priv_partner/information/2018/ku57pq00002aw02r-att/ku57pq00002bcyt6.pdf

The operator, however, must bear in mind that it is highly difficult to measure the effect of UHC as various factors affect UHC achievement.

- For achieving UHC, it is important to improve not only urban water supply but also regional water supply. In developing countries, urban water supply and rural water supply tend to be controlled by separate government agencies, which occasionally do not necessarily collaborate with each other. On the other hand, Japan has a historical experience of promoting public health on a nation-wide basis through the collaboration between water supply corporations and public health centers, based on securing relevant talent by educating prefectural public health officials in a concentrated manner.⁷⁹⁾ Japanese water supply corporations, being thus equipped with expertise able to be applied to the collaboration between an urban water (pipe water) supplier and a rural water supplier, are thought to further enhance their collaborative efforts.
- It is important to i) further raise water supply corporations' awareness about the importance of supplying clean water from a health (e.g. mother-child health) perspective as a specific first step, for example and ii) show to the water service beneficiary the importance of investing in clean water from the same perspective, thereby fostering a water rates payment mindset. Also important is to encourage non-water sector entities such as health and finance ministries to incorporate water supply into their policies and activities, by demonstrating the importance of water supply delivering clean water, something required for UHC and SDGs efforts.
- While UHC was spotlighted for this fiscal year, the personnel received comments saying noteworthy developments were in progress as evidenced from i) the fact that, amid the ongoing urbanization, deliberations were increasingly done from the contexts of an urban development perspective (particularly megacity-related efforts) as well as of urban water recycling management and urban resilience and ii) the fact that entities attached importance to water and health sector cooperation as an adaptive measure to deal with the climate change issue. Among things encouraged by Japan are to mainstream disaster management and take a nutrition approach. To further broaden the collaborative horizon, the personnel must consider collaborating with entities in such non-water supply sectors more actively than now.
- The water supply community is not fully aware of various initiatives pursued in the water supply and health sectors by the personnel. These activities comprise, among others, the JICA Japan Overseas Cooperation Volunteers and JICA Senior Volunteers programs in addition to Grassroots Technical Cooperation Projects. Suppose, for example, water supply corporations assist the above-mentioned initiatives. That would probably contribute for international cooperation projects of an increased variety. To this end, the water supply community must strive to disseminate information by continuing to wholly identify what activities are underway.

⁷⁹⁾ JICA HP, http://open_jicareport.jica.go.jp/618/618/618_000_12285276.html

B: Proposal on the activities of Japanese water supply corporations and overseas business engagement by the nation's companies in the future

In the following paragraphs, we consider what actions can possibly be taken for environment streamlining aimed for future international cooperation by the nation's water supply corporations and overseas business engagement by Japanese companies in the future.

- We generally understand a bottleneck to a planned overseas engagement by Japanese companies is the fact that these private-sector entities are not equipped with sufficient expertise for water supply operation as a whole due to being involved in the form of providing materials or equipment or certain services under vender contract as local municipalities hold expertise and experience for water supply operation and maintenance & management. If based on this assumption, i) one conceivable option would be to accelerate overseas water supply engagement by quasi-public sector entities set up with capital contribution from municipalities and ii) another would be to encourage project participation by private-sector companies engaged in water supply operation and maintenance and management services, such as corporate members of Japan Waterworks Operation and Management Association. Among them, Yokohama Water Co., Ltd. has accumulated overseas experience by winning many contracts for JICA projects, making itself a success. If individual city governments share different successful cases with each other with quasi-public entities in other cities (such as Tokyo, Nagoya, Osaka and Kitakyushu) following suit, these governments will be able to engage in further endeavors, which would enhance municipality-company collaboration patterns even more. On the back of the planned revision to the Waterworks Act, private-sector companies would probably be allowed to be involved in water supply project operation, helped by progressing public-private sector collaboration in the future, but it will take much time before this scenario comes true.
- Looking back on Japan's penetration-stage simplified water supply development, operators continued water supply diffusion and development efforts even though having only a few experienced engineers and experts at local sites, something made possible as prefectural governments led the move to use approval and other schemes inventively. Developing nations would have a viable option of employing such expertise for urban water supply development in rural areas. This is given that some developing countries have likewise used their licensing systems inventively to upgrade regional water supply systems (mainly privately-run water supply systems). This seems to present a promising business engagement prospect for private-sector companies.
- On the other hand, looking at assistance to local companies, a move included in the purposes of water supply corporations' international cooperation, we have come to see cases of results having been attained thanks to efforts by certain municipalities and companies. However, their expertise appears to be still not high enough to further expand the scope of their activities to involve other municipalities and companies and turn the efforts into a nation-wide movement. It would be necessary to closely examine successful cases (or unsuccessful cases as well) one by one in the future and analyze the causes of each success (or failure) more expansively than before.

- The Japanese water supply community has a basic strategy of improving foreign counterparts' understanding of the significance of minimizing LCC by using highly-reliable water supply equipment and materials exceled in by Japan. This is through demonstrating to the counterparts the importance of what is commonly referred to as high-quality infrastructure. Accordingly, it remains important to i) spread design standards and equipment and materials certification standards that reflect the concept of high-quality infrastructure, ii) provide enhanced seminars and training courses and keep providing information and iii) showcase the Japanese water supply industry's technologies in keeping with the above-mentioned steps. Meanwhile, we must be fully aware that Chinese or Thai operators, posing business competition, i) demonstrate the appeal of the cost performance of their equipment and materials by conversely claiming Japanese products to be expensive and ii) stress the advantage of adopting equipment and material categories not made in Japan. As a measure to counter the above-mentioned, the Japanese business community must seemingly deal with them systematically and strategically.
- Meanwhile, given that developing nations in particular are chronically short in cash, it is extremely important to pursue water supply equipment and materials of low prices. Instead of being solely devoted to expanding sales channels for Japanese products, the personnel must also tackle the challenge of offering low prices in consideration of developing countries' circumstances, as expressed in what is commonly called the philosophy of optimal technologies.
- Disaster management measure is a domain in which Japan is most advanced in the world, meaning the nation is much competitive in quality excellence involving disaster-resistant water supply systems. For developing nations acutely needing disaster management measures (such as Indonesia for earthquake), there is an option of using the strategy of demonstrating this strength.
- CSR activities as social contribution have affinity with the water supply sector in financial cooperation. Taking the example of WaterAid programs, we found typical cases comprising the initiatives to: i) to provide CSR assessments in a deeper collaboration with stock exchanges and fund operators that deliver service to investors, thus continuing to provide cash indirectly (WaterAid and the Hong Kong Stock Exchange); ii) partner with companies running operations having affinity with beverage businesses in the country (PepsiCo in India and Heineken in East Timor; iii) use CSR activities with the aim of acquiring advanced talent in the country (India and IT companies). We would need to import these kinds of activities to Japan as well.
- A systematic opinion gathering is effective as a measure to assist business endeavors by international-cooperation participant private-sector companies. One likely option is to propose an initiative to consolidate water supply sector opinions with the cooperation of the Federation of Japan Water Industries, Inc.