Supporting utility	Water and Sewer Bureau of the City of Kitakyushu (**WSBK**)	Case No.	1
On recipient utility		Data from	2013 to 2017

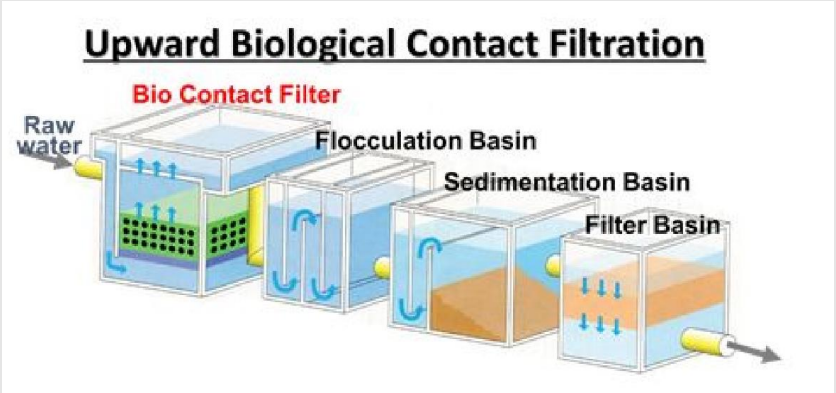
Recipient utility	Haiphong Water Joint Stock Company (**HWC**) in Vietnam		
Cooperation year	2009 to Present		
Service area	Haiphong City		
Service population※1	• Urban area: N/A※2 • Rural area: N/A • Total: 1.36 million	Service coverage※3	• Urban area: N/A • Rural area: N/A • 70% of service area
Water distribution※4	170,000 m^3/day	Maximum water distribution	Distribution capacity: 185,000 m^3/day
Water consumption per capita	N/A	NRW※5	13.0%
Water source	Rivers	Pipe length※6	2,300 km
No. of WTP※7	7	No. of Employees※8	1,157
Water treatment	Coagulation + Sedimentation + Rapid filtration + Chlorine Disinfection		
Water rates※9	4.7 USD/10m^3 (1 USD = 22,425 VND)		

On technical cooperation	
Background	• In April 2009, Haiphong City and Kitakyushu City signed a "Friendship Cooperation Agreement". • Upon the agreement, **HWC** called for **WSBK** to provide technical cooperation to solve HWC's water related issues. • WSBK submits a proposal to the Japan International Cooperation Agency (**JICA**) to provide technical cooperation for Haiphong City. • In August 2010, WSBK started JICA's technical cooperation project to

※1 Source: 2014 preliminary report to provide technical cooperation for An Duong Water Treatment Plant
※2 N/A = Not available
※3 Source: 2014 preliminary report to provide technical cooperation for An Duong Water Treatment Plant
※4 Source: 2014 presentation material by HWC trainees
※5 Ibid.
※6 Source: 2014 preliminary report to provide technical cooperation for An Duong Water Treatment Plant
※7 WTP = Water Treatment Plant
※8 Source: 2014 preliminary report to provide technical cooperation for An Duong Water Treatment Plant
※9 Water rates based on "Domestic use for urban area 10,600VND/m^3" http://capnuochaiphong.com.vn/danh-muc/1/gia-nuoc-dinh-muc-35.html (as of 2017)

	improve the efficiency of water treatment for organic substances.
Cooperative scheme	• Cooperation framework: JICA Partnership Project • Recipient organization: HWC • Assisting organization: Kitakyushu Overseas Water Business Association (**KOWBA**)
HWC's challenges	• Deterioration of water quality in source rivers • Water quality analysis • NRW Reduction • Distribution network management
Technical cooperation provided	➢ Water treatment • From 2010 to 2012, WSBK implemented a JICA's Partnership Program to enhance HWC's capacity to address water source pollution due to organic substances. • Project overview - Monitoring and treatment of organic substances - Introduction of an advanced water treatment technology called U-BCF (Upward Biological Contact Filtration)※10 - Verification of U-BCF at a demonstration plant in Haiphong City ➢ NRW reduction • For three years from 2013, WSBK implemented a JICA's Partnership Program to reduce NRW of HWC. • Project overview - Implemented WSBK method to reduce NRW - Explored possibility of sub-dividing the distribution network to better control and monitor the water flow and pressures - Adopted the same mapping system as WSBK's
Future plans and prospects	• HWC has actively introduced Japanese technologies and improved their technical level. These technologies include: - Purchase of Japanese water leak detectors - Introduction of WSBK method to reduce NRW - Adoption of WSBK-style mapping system

※10 U-BCF was developed by WSBK, which has its patent in Japan. For the technical features of U-BCF, please see a report regarding WSBK's water treatment processes on the website of NewTap: http://www.jwrc-net.or.jp/aswin/en/newtap/report/NewTap_Japan_002_04.pdf

		• By continuing this type of technical cooperation, WSBK also envisages to help Japanese companies to develop their businesses in foreign countries.
	Figures and photos	 ▲ U-BCF demonstration plant in Haiphong City  ▲U-BCF treatment process

Supporting utility	Yokohama City Waterworks Bureau (**YWWB**)	Case No.	2
On recipient utility		Data from	2017

Recipient utility	Thua Thien Hue Water Supply Joint Stock Company[1] (**HueWACO**) in Vietnam		
Cooperation year	2003 to Present		
Service area	Hue Province		
Service population	• Hue Province: 0.98 million (Hue City:0.35 million)	Service coverage	• Hue Province: 83.0% (Hue City: 99.5%)
Water distribution	• Urban area: N/A[2] • Rural area: N/A • 132,000 m^3/day	Maximum water distribution	200,000 m^3
Water consumption per capita	125 L/person/day	NRW	Approx. 11.5%
Water source	Rivers	Pipe length	3,450km
No. of WTP[3]	30	No. of Employees	550
Water treatment	Rapid filtration (urban area) + Chlorine disinfection		
Water rates	Ave. 0.37 USD/ m^3 *The tariff has three categories: domestic, governmental and commercial use. *Exemption is applied to suburb area and the poor, by approximately 10% and 20% respectively.		

[1] The company name changed on January 1, 2017. The former company name was Thua Thien Hue Construction and Water Supply State-Owned Company Limited (HueWACO)

[2] N/A = Not available

[3] WTP = Water Treatment Plant

On technical cooperation

Background	Since 2003, Yokohama Waterworks Bureau (**YWWB**) has provided technical cooperation to Thua Thien Hue Water Supply Joint Stock Company (**HueWACO**) in Vietnam. Such cooperation contributed to HueWACO's "Safe water declaration" in Hue Province in 2009, which assures citizens that the tap water supplied by HueWACO is safe enough to drink. YWWB continues technical cooperation through several JICA projects and the agreement between two parties concluded in 2017 The timeline of YWWB's technical cooperation for HuwWACO is shown below: ➢ **JICA Partnership Program:" Improvement of Water Utility Management" (2003-2006)** Through trainee acceptance and expert dispatches, YWWB worked with HueWACO to identify their technical and administrative challenges; and, based on discussion, it contributed to developing staffs' capacity enough to improve the management of water services. ➢ **JICA Project on Human Resources Development for Water Sector in the Middle Region of Vietnam (2007-2009)** YWWB offered technical cooperation in various fields including water quality management, water distribution management, human resource development and customer service, which consequently led to "Safe water declaration". ➢ **JICA Project on Capacity Development for Urban Water Supply Utilities in the Central Region of Vietnam (2010-2013)** Aiming to disseminate the HueWACO's achievement in "Water Safety Plan" to surrounding 17 provinces in the middle Vietnam, YWWB cooperated to establish a training center for the water utilities in the central region and to promote the use of various operational manuals of HueWACO in wider regions of Vietnam. These supports contributed to building a model of human resource development for water utilities in a targeted region. ➢ **JICA Partnership Program for Vietnam-Yokohama Safety Water Supply Management Project（2013－2016）** YWWB carried out the project aiming to establish a stable management of waterworks and to improve access to "Safe water" in Mid-South region of Vietnam through the technologies offered by the members of Yokohama Water Business Association.  Installation of SCADA system  Training on leakage detection

	➢ **Memorandum of Understanding on Technical Cooperation with Water Supply Utilities and Other Entities in Vietnam (2009 to 2012 and 2012 to 2015 with three entities, 2015 to 2018 with five entities)** In August 2009, YWWB signed a Memorandum of Understanding (MoU) on a three-year technical cooperation with three entities: HueWACO, Ho Chi Minh City Waterworks Corporation, and a southern waterworks training center of the second construction school of the Ministry of Construction.  Seminar in July, 2017 Based on this MoU, YWWB contributed to the capacity development of the three entities by hosting training programs for their staff members and by sending YWWB experts to deliver a presentation at various technical seminars hosted in Vietnam. In November 2014, the MoU was renewed for three more years. Further, in July 2015, two more entities joined the MoU: Da Nang Municipal Water Supply Company and a central region's waterworks training center of the urban construction school of the Ministry of Construction.
Cooperative scheme	Primary organizations are as follows: • Vietnam: HueWACO • Japan: YWWB and member companies of the Yokohama Water Business Association
Recipient utilities' challenges	• Expansion, to other water utilities, of YWWB's technical expertise and experiences shared so far with HueWACO • Further capacity development of HueWACO staff • Building of a cooperative relation between Vietnam and Japanese companies. For this purpose, YWWB has been working on public-private partnership based on its 15-year cooperative relations with HueWACO to improve water services in Vietnam
Technical cooperation provided	➢ **Memorandum of Understanding Between Yokohama Waterworks Bureau – Japan And Thua Thien Hue Water Supply Joint Stock Company – Vietnam (2017-)** YWWB and HueWACO concluded MoU with the aim of further developing both parties' water services and supporting business promotion of Yokohama Water Business Association member companies. Based on this MoU, YWWB plans to work on the following activities through training programs, expert dispatches, exhibitions and seminars. -Improvement of water treatment plant -Establishment of training center -Construction of water memorial museum -Support and opportunity offering for the business promotion of Water Business Association member companies
Future plans and prospects	YWWB will continue dialogue with HueWACO and other utilities in Vietnam to consider how YWWB could further support water supply in Vietnam through public-private partnerships. YWWB will share the project outcomes with members of the Yokohama Water Business Association so that the association members could refer to the pioneering examples of international public-private partnerships and enhance their future activities.

Supporting utility	Saitama City Waterworks Bureau (**SCWB**)		Case No.	3
About recipient utility			Data from	2018
Recipient utility	Three leading Water Supply State Enterprises of Lao PDR			
Cooperation year	1992 to present			
Service area	Vientiane Capital, Luang Prabang Province, and Khammouane Province			
Service population	Urban area: 767,000 Rural area: - Total: 767,000	Service coverage	Urban area: 70.4% Rural area: -	
Water distribution	204,000 m^3/d	Maximum water distribution	402,000 m^3/d (32.9+5.5+1.8) (facility capacity)	
Water consumption per capita	135-200 L/person/d[1]	NRW	32.15%	
Water source	Rivers	Pipe length	2,998 km (2,404+409+185)	
No. of WTP[2]	25 (12+9+4)	No. of Employees	1,051 (688+156+207)	
Water treatment	Coagulation + Sedimentation + Rapid filtration + Chlorine Disinfection			
Water rates	2.07 USD (17,690 LAK)[3]			
About technical cooperation				
Background	The Saitama City Waterworks Bureau (**SCWB**) has provided technical cooperation primarily to the Vientiane Capital Water Supply State Enterprise (**NPNL[4]**) that services Vientiane Capital in Laos. NPNL's service coverage is 69% and its population served accounts for 40% of the whole population. For comparison, the average service coverage in Laos is 21%. As the largest state enterprise of water supply, NPNL is expected to be a role model for other water utilities and support their activities. In addition to NPNL, SCWB is currently working with two other water supply state enterprises, the Luang Prabang Province Water Supply State			

[1] Based on 2015 statistics

[2] WTP = Water Treatment Plant

[3] 1LAK = 0.0001117 USD (as of April 1, 2019) Basis for calculation: [1,300 (LAK/m^3, 1-10 m^3) x 10 m^3 + 3,900 (LAK/maintenance fees /month/ϕ15 mm)] Calculated according to the water rates in Vientiane Capital

[4] The acrynyms for the three leadning utilities of Laos (NPNL, NPLB, and NPKM) are all based on the Laos language. For example, NPNL stands for "NamPapa Nakhong Luang" in Laos language, which means "Vientiane Capital Water Supply State Enterprise" in English. NamPapa means "water supply utility" and Nakhong Luang means "Capital".

		Enterprise (**NPLB**) and the Khammouane Province Water Supply State Enterprise (**NPKM**). NPLB and NPKM respectively provide water service in Luang Prabang Province in the country's north and Khammouane Province in the country's south. The working relation between SCWB and NPNL, NPLB and NPKM is part of a technical cooperation project managed by the Japan International Cooperation Agency (**JICA**). The three utilities were selected as pilot areas of this project, whose purpose is to expand areas of JICA's assistance outside Vientiane Capital. At the moment, SCWB is also working with the three utilities in a JICA grass-roots technical cooperation which started in June 2018. • **2002 – 2005**: JICA technical cooperation project: Capacity development of water supply system • **2006 – 2008**: JICA grass-roots technical cooperation: Improvement of pipe maintenance and management • **2010 – 2011**: Twinning program between SCWB and NPNL • **2012 – 2017**: JICA technical cooperation project: Capacity Development Project for Improvement of Management ability of Water Supply Authority (MaWaSU project)[5] • **December 2016**: SCWB signed a Memorandum of Understanding (MOU) with NPNL, NPLB, and NPKM on cooperation to enhance Laos water supply sector • **2018 – 2023:** JICA project for Improvement of Management Capacity of Water Supply sector (MaWaSU2 project)[6] • **2018 – 2021:** JICA grass-roots technical cooperation for Improvement of Pipeline Management and Maintenance in water supply state enterprise of Laos

[5] About MaWaSU project:
In 1999, the Prime Minister of Laos issued an ordinance aiming to provide safe and reliable water supply for 24 hours a day to 80% of the urban population by 2020. As of 2010, service coverage in the urban areas is 55%. To achieve the target, it is necessary to make further investments and save finances where possible by improving service efficiency. The MaWaSU project was initiated in 2012 with a five-year implementation period in order to help all water supply state enterprises in Laos to make proper facility enhancement and renewal as well as to achieve stable water supply based on mid to long term service plans. For this project, the Water Supply Division of the Ministry of Public Works and Transport plays a central management role, and three leading utilities, NPNL, NPLB and NPKM were selected as pilot utilities.
Source: JICA (https://www.jica.go.jp/project/laos/012/index.html)

[6] About MaWaSU2 project:
Even after the completion of MaWaSU, the operational foundations are still weak in most of the water supply state enterprises, including the three utilities, and their capital investments and renewals are heavily dependent on funds from donors and private investments. In recent years, the number of private companies involved in the development and operation of facilities has been increasing, but the legal system for the supervision of these private companies and the approval of related projects has not been fully developed, resulting in the lack of an environment required for the proper operation of water supply by the public and private sectors. In light of this situation, the Laos government requested the implementation of the technical cooperation project (Phase 2), and the MaWaSU 2 project started in May 2018 for a five-year period. MaWaSU 2 aims to address the remaining challenges of MaWaSU: strengthen the service management capacity in the water sector and enhance related capabilities of nation-wide water supply state enterprises, with the main target being NPNL, NPLB and NPKM.
Source: JICA (https://www.jica.go.jp/project/laos/023/index.html)

Cooperative scheme	• Relevant authority in Laos: Water Supply Division of the Ministry of Public Works and Transport • Recipient utility: NPNL, NPLB and NPKM
Recipient utilities' challenges	Water supply in Laos is not in pace with its rapidly growing population and water demand. Countries including Japan and China have provided support to enhance water supply capacity and construct new water treatment plants, but it has not been sufficient to meet the growing demand. Another challenge is a self-governance in water supply. Due to a prime minister's ordinance, Laos has now in place a legal framework that requires utilities to provide water services based on mid to long term planning as well as conduct proper performance monitoring. However, the effectiveness of this new requirement is rather skeptical at the moment because the country has long depended on assistance from other countries to improve water supply service, and thus it was not easy for the utilities to become sufficiently self-reliant in the service management and objective settings. Under these circumstances, the MaWaSU project enhanced the capacity of the three utilities to develop service management plans and they acquired basic capabilities for managing services based on those plans. However, the operational foundations are still fragile and the environment for effective public-private partnerships for service management is not yet in place.
Technical cooperation provided	The technical cooperation started in 1994 when the predecessor of SCWB sent its employees to Laos for the first time. Since then, SCWB has assisted with the country's pipeline management and human resources development. The MaWaSU project was conducted to enhance the service planning and monitoring capabilities of the related utilities in Laos. The subsequent MaWaSu2 project has aimed to further enhance management structures and operational foundations of nation-wide utilities, mostly targeting NPNL, NPLB, and NPKM. Both MaWaSU and MaWaSU2 have been implemented in collaboration with three water utilities in Japan from Saitama Prefecture, Kawasaki City, and Yokohama City. Also, in response to the high demand in Laos for reducing non-revenue water, the ongoing JICA grass-roots technical cooperation has been providing assistance in improving the construction management and establishing construction standards for distribution pipes and service lines, as well as in selecting and managing proper pipe materials.
Future plans and prospects	The scope of the projects cover every state enterprise of water supply in Laos. As part of the implementation, NPNL, NPLB and NPKM are providing various lectures for other utilities in Laos. These three utilities are expected to play a leading role in supporting other utilities after the end of the projects. Thus, the three utilities are required to further develop their leadership and overall management capabilities. For this reason, future technical cooperation by Japanese water utilities would need to be more extensive and advanced in terms of human resources development as well as to encourage more voluntary, self-regulated service management on the part of NPNL, NPLB and NPKM.

	Photos	 ▲JICA MaWaSU2 project (Suggestion for Laos members in meeting  ▲JICA Grass-roots technical cooperation (Coaching for method of pipe installation)

Supporting utility	Water and Sewer Bureau of the City of Kitakyushu (**WSBK**)	Case No.	4
On recipient utility		Data from	2015-2017

Recipient utility	Eight provincial cities in Cambodia		
Cooperation year	1999 to Present		
Service area	• Kampong Cham • Komponom • Siem Reap • Battambang • Pursat • Sihanoukville • Subarien • Kanpot		
Service population※1	• Urban area: 301,000 • Rural area: N/A※2 • Total: 301,000	Service coverage※3	• Urban area: 41.5% • Rural area: N/A • Total: 40.6%
Water distribution※4	65,000 m^3/day	Maximum water distribution※5	Distribution capacity: 77,000 m^3/day
Water consumption per capita※6	90-150 L/person/day	NRW※7	10.4%
Water source	• Rivers • Groundwater	Pipe length※8	1,034 km
No. of WTP	8	No. of Employees※9	351
Water treatment	Coagulation + Sedimentation + Rapid filtration + Chlorine Disinfection		
Water rates※10	3.3USD/10m3 (1USD=4,000KHR)		

※1 Data from a 2015 human resources development project.
※2 N/A = Not available
※3 Data from a 2015 human resources development project.
※4 Data from a 2015 human resources development project.
※5 Ibid.
※6 Data from a preliminary report for the preparation of assistance.
※7 Data from a 2015 human resources development project.
※8 Ibid.
※9 Ibid.
※10 Water rates based on the average of the eight provincial cities as of 2017: 1322.5KHR/m3 x 10m3

On technical cooperation	
Background	• The Cambodian civil war ended in 1991, but it devastated water supply facilities as well as claimed many human resources in Phnom Penh. At the time, the water supply system was almost inactive with NRW ratio over 70%. • Aids from various countries enabled the post-water reconstruction of the water supply facilities. However, as the reconstruction progressed, a lack of human resources became apparent to operate and maintain the water supply system appropriately. • The Japan International Cooperation Agency (**JICA**) asked Japan's Ministry of Health, Labour and Welfare (**MHLW**) to send Japanese water experts to Cambodia for human resources development. Upon the request, MHLW consulted with the Water and Sewer Bureau of the City of Kitakyushu (**WSBK**), which agreed to send their staff to Cambodia. • In 1999, WSBK's first staff member was sent to the Phnom Penh Water Supply Authority (**PPWSA**).
Cooperative scheme	• Cooperation framework: JICA Technical Cooperation Project • Regulatory agency in Japan: MHLW • Regulatory agency in Cambodia: Ministry of Industry and Handicraft • Cooperative utility: PPWSA
Recipient utilities' challenges	• Operation and maintenance of water supply facilities • Distribution management • Water quality analysis • Water treatment process • Sustainable service management • Financial management • Customer satisfaction
Technical cooperation provided	To help with an appropriate water governance, a highly comprehensive support is being provided under The Capacity Building for Water Supply System in Cambodia Phase3. The scope of the support concerns establishing a water supply law as well as improving a service management. Specifics of the support are as follows: ➢ Dispatch of experts (PPWSA) • Support operation and management of water treatment facilities ➢ JICA technical cooperation project (PPWSA) • Provide technical expertise regarding facility operation and water

	distribution block management ➢ Technical support for water supply system (PPWSA) • Water distribution management • Operation and management of water treatment plant • Facility maintenance • Water quality analysis ➢ The Capacity Building for Water Supply System in Cambodia Phase2 (eight provincial cities) • Water quality analysis • Water treatment process • Maintenance of electrical facilities • Maintenance of machinery • Maintenance of distribution facilities ➢ The Capacity Building for Water Supply System in Cambodia Phase3 (eight provincial cities) • Development of customer ledgers • Development of water supply asset ledgers • Development of financial statements • Expansion of water treatment plants • Preparation of fiscal plan
Future plans and prospects	• WSBK needs to utilize its human resources and budgets as efficiently as possible in implementing related projects, considering a demand for international cooperation is on the rise in the field of water supply and wastewater services. • WSBK will further increase the efficiently of related projects through a closer collaboration and information exchange with JICA and various regulatory and donor agencies.
Figures and photos	 ▲ Photo from the Cambodian Human Resources Development Project

Supporting utility	Chiba Prefectural Public Enterprises Bureau (**CPPEB**)		Case No.	5
About recipient utility (* data in the capital Dili)			Data from	2017
Recipient utility	National Directorate for Water Service (**DNSA**), Democratic Republic of Timor-Leste			
Cooperation year	2012 -			
Service area	Dili (capital) and 12 other cities			
Service population	Unknown	Service coverage in Dili		46.6% (2015)
Water distribution*	41,360 m^3/d	Maximum water distribution*		48,880 m^3/d (facility capacity)
Water consumption per capita*	120 L/person/d	NRW*		98.8%[1]
Water source*	Rivers and wells	Pipe length*		387.7 km
No. of WTP[2]*	4 (rapid filtration) and 28 (wells)	No. of Employees		185 (2015)
Water treatment*	Coagulation + Sedimentation + Rapid filtration + Chlorine disinfection			
Water rates*	Residential: 0.2 USD/m^3 for up to 14 m^3 and 0.4 USD/m^3 for above 14 m^3 (water use charged only in limited areas of the capital Dili)			
About technical cooperation to DNSA				
Background	Timor-Leste became independent from Indonesia in 2002. The conflict for independence caused destruction to water facilities such as water treatment plants. Further, the Indonesian engineers who had operated the facilities went back to Indonesia post-conflict. After the independence, therefore, the government of Timor-Leste made the development of water supply system a top priority in both structural and nonstructural aspects, and requested assistance from Japanese government. Upon the request, the Japan International Cooperation Agency (**JICA**) asked the Chiba Prefectural Public Enterprises Bureau (**CPPEB**) to provide technical cooperation to the country.			
Cooperative scheme	From April 2012 to July 2020, CPPEB have dispatched 29 engineers to Timor-Leste to help improve the country's water supply. Of the 29 engineers, four people have been involved in a long-term dispatch program and 25 people in a short-term dispatch program.			

[1] The extremely high NRW rate is due to multiple factors including water theft, illegal connections, leakage from aging mains, and users' refusal to pay for the service, which make the rate collection highly difficult.

[2] WTP = Water Treatment Plant

	[Long-term dispatch programs and the number of staff dispatched] • **Apr 2012 - Apr 2015:** one advisor for water supply improvement • **Jul 2015 - Jul 2017:** one advisor for water supply improvement • **Aug 2017 - Aug 2019:** one advisor for water supply improvement • **Jul 2019 - Jul 2020:** one advisor for water supply improvement [Short term dispatch programs and the number of staff dispatched] • **May - Jun 2014:** two engineers for operation of water treatment plants • **Jan - Feb 2016:** one engineer for operation of water treatment plants, water quality management, and other management issues • **Feb - Mar 2017:** one engineer for leakage prevention • **Nov 2017 -:** two engineers for management planning • **Feb 2018:** five engineers for operation of water treatment plants and water quality management • **Jan - Feb 2019:** four engineers for operation of water treatment plants and water quality management
DNSA's challenges	Timor-Leste government has set a goal of providing all residents with access to safe drinking water[3] by 2030 as well as achieving a 24/7 water supply in the urban areas of 12 districts by 2030. According to the Joint Monitoring Program (2015) of WHO/UNICEF, the average access to safe drinking water is 71.9% in the country and 95.2% in the urban areas. In most cases, however, their water supply is intermittent with running water available only a limited number of hours a day.
Technical cooperation provided	CPPEB have provided the following technical assistance to improve Dili's water supply. 1. Technical guidance on regular inspection and repair of water treatment facilities and related chemical injections in the capital Dili 2. Technical guidance on the planning and construction of distribution network and leak surveys in the capital Dili. 3. Advising and making suggestions for mitigation of DNSA's challenges in terms of organizational structure and rules and for improvement of the water supply system in Timor-Leste CPPEB contributed to achieving a 24/7 water supply in portions of the capital Dili, where the supply had been intermittent previously.
Future plans and prospects	Further international assistance will be needed so that the country can be more self-reliant in achieving 24/7 water supply in wider areas.

[3] "Access to safe drinking water" is defined by WHO as having 20 liters per person per day of water available within one kilometer radius from the residence.

Photos	 ▲ CPPEB providing technical advice to local staff member  ▲ Children in an area of improved water supply

Supporting utility	Bureau of Waterworks Tokyo Metropolitan Government (**BWTMG**)	Case No.	6
About recipient utility		Data from	2011-2014
Recipient utility	• Ministry of Energy, Green Technology and Water (**KeTTHA**) In Malaysia • Penang Water (Perbadanan Bekalan Air Pulau Pinang: **PBAPP**)		
Cooperation year	January 2014 – November 2016		
Service area	State of Penang, Malaysia		
Service population	Urban area: Unknown Rural area: Unknown Total: 1,646,000[1]	Service coverage	Urban area: 100%[1] Rural area: 99.7%[1]
Water distribution	813,000 m^3/d[1]	Maximum water distribution	Unknown
Water consumption per capita	Unknown	NRW	18.25%[1]
Water source	Rivers[2]	Pipe length	4,294 km (≥ 100 mm)[1]
No. of WTP[3]	10	No. of Employees	1,263
Water treatment	Chemical injection + Coagulation + Sedimentation + Filtration[1]		
Water rates	0.074 JPY/10 m^3 (1 JPY≒0.03 MYR)[4]		
About technical cooperation to KeTTHA			
Background	■ Building a relationship of trust through technical cooperation consisted of water facility tours and technical training conduced in Tokyo since 2010. ■ Conducted technical training (including measures to reduce non-revenue water) locally and in Japan as part of JICA's Technical Cooperation Project from 2011 to 2013. • In 2012, the Director General of the Ministry of Energy, Green Technology and Water (**KeTTHA**)'s Waterworks Bureau requested the Director General of the Bureau of Waterworks Tokyo Metropolitan Government (**BWTMG**) to assist in their non-revenue water reduction. ■ Since the above-mentioned technical cooperation, there have been multiple requests from the Malaysian side to assist in their human resources development.		

[1] Based on the annual report 2014 of PBAHB
[2] Based on the website of PBAHB
[3] WTP = Water Treatment Plant
[4] Based on the Tariff 2015 of the PBAPP website on 26 May 2015

Cooperative scheme	■ JICA Technical Cooperation Project ■ Partner Organization: KeTTHA, PBAPP ■ Supporting organization: Tokyo Water Co., Ltd. (BWTMG)
Recipient utilities' challenges	■ Stable water supply management ■ Development of human resources who can contribute to non-revenue water reduction
Technical cooperation provided	■ Development and utilization of a training field for leakage prevention and plumbing ■ Training of 15 staff members of PBAPP in non-revenue water reduction measures ✹ Dispatched staff to provide technical guidance ✹ Accepted trainees and conducted training to learn about related Japanese technology, construction management, and quality control ■ Conducted training for all states of Malaysia with PBAPP staff serving as instructors ✹ Dispatched operational staff to prepare training materials and give guidance to provide training using these materials ✹ Hosted workshops where PBAPP staff conducted practical training on non-revenue water reduction measures for the selected trainees from each state (77 trainees in total)
Future plans and prospects	■ In addition to the training of instructors, this project has created an organizational framework that enables human resources development based on BWTMG's technology and know-how even after the project completed, including the preparation of training fields and training textbooks. By utilizing this framework, BWTMG will continue its contribution to their human resources development.

Pictures	 ▲Developed training field  ▲Training at the training field  ▲Group photo

Supporting utility	Bureau of Waterworks Tokyo Metropolitan Government	Case No.	7
About recipient utility		Data from	2012-2017

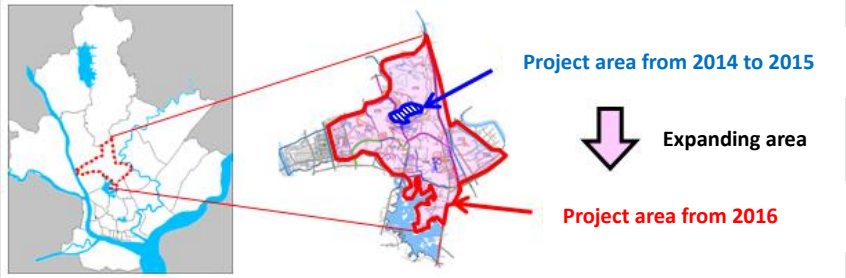
Recipient utility	Yangon City Development Committee, Myanmar (**YCDC**)		
Cooperation year	2013-		
Service area	Yangon City		
Service population	City area: 1.92[1] Metropolitan area: 1.92[1]	Service coverage	City area: 37%[1] Metropolitan area: 24%[1]
Water distribution	636,440 m^3/d	Maximum water distribution	Unknown
Water consumption per capita	Unknown	NRW	66%[1]
Water source	Storage water・Ground water	Pipe length	71.73 km
No. of WTP[2]	6[1]	No. of Employees	2,196 (as of June 2012)
Water treatment	Coagulation + Sedimentation + Rapid filtration + Aeration + Micro strainer[3] *water not treated for 2/3		
Water rates	Public: 4.4 JPN /m^3 General: 7.0 JPN /m^3 Commercial: 8.8 JPN /m^3 (Calculated with 1 MMK=0.08 JPY)		

About technical cooperation to YCDC

Background	■ December 2012 and January 2014: HIDA training in Japan ■ September 2013: Signed a Memorandum of Understanding for technical cooperation ■ October 2013: Held a seminar ■ January 2014: Made a proposal for non-revenue water project ■ October 2014: Signed a contract for the non-revenue water project (grass-root gratuitous) ■ October 2016: Concluded a contract for a non-revenue water project (grant aid with project management right type)

[1] According to a cooperation preparatory report of JICA
[2] WTP = Water Treatment Plant
[3] According to a preparatory report for Yangon City Development Program Formation

Cooperative scheme	■ Cooperative scheme: Grant aid with project management right type ■ Partner organization: Japan International Cooperation System (YCDC's procurement agency) ■ Supporting organization: Japan Consortium, LLC. (Tokyo Suido Services Co., Ltd., Toyo Engineering Corporation)
Recipient utilities' challenges	■ Deterioration of water quality in raw water rivers ■ Water quality analysis ■ Reduction of non-revenue water ■ Management of water distribution network ■ Financial management and human resources development

Technical cooperation provided	<Non-revenue water reduction project: grant aid with project management right type> ■ Implementation of non-revenue water reduction (infrastructure development) project from 2016 (scheduled to be completed in 2022) ■ Project contents Leakage survey, replacement and repair of water pipes, replacement and installation of meters, etc. ■ Target area Mayangon District in Yangon City (expanding the area covered by the above project) ■ Project cost Approximately 1.8 billion JPY (ODA funds)  [References: status of other cooperation projects] <Technical cooperation project> ■ From 2014 to 2018, a JICA's technical cooperation project was implemented to improve the service management capacity of YCDC staff ■ Implementation details ✹ Strengthening of water supply management capacity ✹ Strengthening of non-revenue water reduction capacity ✹ Strengthening of water quality management capacity ＜Non-revenue water reduction project: Grassroots grant aid> ■ A non-revenue water reduction project was implemented from 2014 to 2015. ■ Project contents Leakage survey, replacement and repair of water pipes, replacement and installation of meters, etc. ■ Target area Part of Mayangon District in Yangon City ■ Project cost Approx. 50 million JPY ■ Results ✹ Halved the non-revenue water rate from 77% to 32% ✹ Realized 24/7 water supply

Future plans and prospects	Following the non-revenue water reduction (infrastructure development) project from 2016, the below project is scheduled to be implemented for the management of water facilities. ＜Water facility maintenance and management project> ■ Project Description Sharing technical knowledge through consultations and training on reducing non-revenue water (*Yangon City will conduct daily maintenance and management of water distribution pipes) ■ Implementation period At least 5 years (the project will be implemented sequentially, starting from the areas where infrastructure development is completed. The project is scheduled to start in FY 2018) ■ Project cost Funds of Yangon City (amount to be determined)
Pictures	 ←Pipe replacement in Yangon City  ←Water pipes in Yangon City (Installations not well organized  ←Utilization of Japanese products (leakage detector)