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**Technical Q&A**



**Question & Answer Corner**

We welcome any opinions, and questions to this Q & A Corner. Please contact us.

Q: In Japan, is there water quality standard of raw water (surface water) used for water supply?  
(From Ms. S.W, Thailand)

**A1: Answered by Mr. Hiroshi Sasayama (Japan Water Works Association).**



There is no raw water quality standard for water supply use in Japan. You can use any water as raw water whenever you can ensure drinking water quality standard (DWQS) after an appropriate treatment. An article of Waterworks Law shows "An intake facility should be possible to take necessary amount of water with water quality as good as possible".

It means you can reduce or stop intake of raw water when its quality becomes worse. It is expected that the environment around water source is kept well. For this purpose, the basic Environment Law establishes two kinds of Environmental Quality Standard relating to water pollution.

1) The first standard shown Table 1, is concerned with protecting human health in any public water bodies. The standard values of 27 items are established as desirable values for achieving and maintaining public water bodies.

Most of items of this standard are also included in DWQS and their standard values are just same as DWQS. For these items, you can ensure DWQS easily in the case that the raw water quality meets this standard unless the treatment and distribution process increase concentration of some items.

2) The second standard is concerned with the living environment including water supply. The exception on water supply use from this standard is shown in Table 2. A prefectural

governor<sup>1</sup> can designate a class of public water bodies according to water use and the situation to prevent further deterioration by activating the standard. These environmental quality standards can be used as the indicator of enough quality for raw water. Then these two environmental quality standards seem de facto raw water quality standard for water supply.

1: Public water bodies extend over plural prefectures are designated to a class by central government.

Table 1. Environmental quality standard for protecting human health

Item	Standard value	Item	Standard value
Cadmium	0.003mg/L or less	1,1,2-Trichloroethane	0.006mg/L or less
Total cyanide	no detection	Trichloroethylene	0.03mg/L or less
Lead	0.01mg/L or less	Tetrachloroethylene	0.01mg/L or less
Chromium(VI)	0.05mg/L or less	1,3-Dichloropropene	0.002mg/L or less
Arsenic	0.01mg/L or less	Thiram	0.006mg/L or less
Total mercury	0.0005mg/L or less	Shimazine	0.003mg/L or less
Alkyl mercury	no detection	Thiobencarb	0.02mg/L or less
PCB	no detection	Benzene	0.01mg/L or less
Dichloromethane	0.02mg/L or less	Selenium	0.01mg/L or less
Carbon tetrachloride	0.002mg/L or less	Nitrate and nitrite as nitrogen	10mg/L or less
1,2-Dichloroethane	0.004mg/L or less	Fluoride	0.8mg/L or less
1,1-Dichloroethylene	0.1mg/L or less	Boron	1mg/L or less
cis-1,2-Dichloroethylene	0.04mg/L or less	1,4-Dioxane	0.05mg/L or less
1,1,1-Trichloroethane	1mg/L or less		

Note: Standard values are for annual average except total cyanide which value is for the highest value in a year

Table 2. Excerpton for water supply use from Environmental quality standard for protecting the living environment

River	Class	Use	pH	BOD	SS	DO	Coliform group
	AA	Water supply 1	6.5-8.5	1mg/L or less	25mg/L or less	7.5mg/L or more	50MPN/100mL or less
	A	Water supply 2	6.5-8.5	2mg/L or less	25mg/L or less	7.5mg/L or more	1,000MPN/100mL or less
	B	Water supply 3	6.5-8.5	3mg/L or less	25mg/L or less	5mg/L or more	5,000MPN/100mL or less

Lake (natural lake and reservoir which capacity is more than 10million cubic meter and detention time is longer than 4 days)

Class	Use	pH	BOD	SS	DO	Coliform group	Total nitrogen	Total phosphorous
AA	Water supply 1	6.5-8.5	1mg/L or less	1mg/L or less	7.5mg/L or more	50MPN/100mL or less	0.2mg/L or less	0.01mg/L or less
A	Water supply 2,3	6.5-8.5	3mg/L or less	5mg/L or less	7.5mg/L or more	1,000MPN/100mL or less	0.2mg/L or less	0.01mg/L or less
Note	Water supply 1:	Simple treatment with only filtration						
	Water supply 2:	Conventional treatment with sedimentation and filtration						
	Water supply 3:	Advanced treatment with some pre-treatment and/or advanced technology						

**A2: Answered by Mr. Manabu Sugino (Osaka Water Supply Authority)**



We have Drinking Water Quality Standards, which is stipulated in Japanese Water Works Law. On the other hands, we don't have specific standard values for raw water. However, water utilities confirm whether or not their water purification plants enable to treat the raw water to meet the standards at purified water. For that reason, we inspect necessary items of water quality such as Drinking Water Quality Standards except for 11 DBPs (Disinfection By-Products) and taste, THMFP (Trihalomethane Formation Potential), algae and pesticides. For example, if you draw from surface water, the turbidity would increase dramatically due to

heavy rain. It might be difficult to purify such turbid water. In that case, you conduct some measures such as the change of dosing rate of coagulant or the control of water intake.

As I tell you before, we don't have the standard value for turbidity in raw water, and it depends on the water purification process or the purified ability of the plant.

Furthermore, we also have "the Guideline for Protection of Waterworks from Cryptosporidium"<sup>2</sup>. It sets that in the case the water utilities use surface water which has a risk of Cryptosporidium, they should establish filtration system and check Cryptosporidium in the raw water periodically.

2: [Outline of "the Guideline for Protection of Waterworks from Cryptosporidium"](#)

**Information of Overseas Members**

***Introduction  
of Overseas Members  
Mr. Pheng Ty  
(PPWSA, Cambodia)***

Mr. Pheng Ty is one of our members, and Deputy Director of Distribution and Production Department, PPWSA (Phnom Penh Water Supply Authority, Cambodia).

He worked hard in the field of leakage detection as a project member of JICA Technical Cooperation Project (Phase 1), and resulted in making great contribution to PPWSA's NRW reduction. He is enthusiastic about working but gentle, and a father of three sons and one daughter. (by Ms. Yariuchi)

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The reform of PPWSA has progressed rapidly as shown in the table1 and its success has been drawing attention.

Table1: Then and Now of PPWSA

| Indicators                             | 1993           | 2015                 |
|----------------------------------------|----------------|----------------------|
| Staff/1,000 Connections                | 22 staff       | <b>3.2 staff</b>     |
| Production capacity, m <sup>3</sup> /d | 65,000         | <b>460,000</b>       |
| Coverage ratio                         | 25%            | <b>85%</b>           |
| Supply Duration                        | 10hours/d      | <b>24hours/d</b>     |
| Supply pressure                        | <b>0.2 bar</b> | <b>2.5 bar</b>       |
| Number of connections                  | <b>26,881</b>  | <b>290,732</b>       |
| NRW                                    | <b>72%</b>     | <b>6.93%</b>         |
| Collection ratio                       | <b>48%</b>     | <b>99%</b>           |
| Financial situation                    | Heavy Subsidy  | Full Cost recovery   |
| Water Quality                          | N/A            | Satisfying standard* |

\*Drinking Water Quality Standard of Cambodia, Drinking Water Quality Standard by WHO

Currently, the vision of PPWSA is "Sustainable developing of our potable water supply services to cities and provinces of Cambodia, and, assisting other developing countries to supply potable water to their people". We actively cooperate with and contribute to domestic and foreign water utilities by utilizing our knowledge and experiences. First of all, we have been supporting water utilities in seven provinces in Cambodia. Since I have been engaged in the work of distribution management and NRW reduction all the time, I work for the improvement of provincial water utilities, which JICA supports, as a local expert under cooperation with Japanese experts. We also had opportunities to share our experiences and knowledge on NRW management to delegations from foreign utilities such as Myanmar (twice), Nepal (twice) and East Timor. By utilizing the framework of WOPs (Water Operators Partnerships), we made MOU aiming at sharing knowledge with MWA in Thailand and Manila Water in the

Philippines. We also signed MOU for cooperation with Kitakyushu Overseas Water Business in Japan.

"Water Supply and Sanitation Branch" was established within the PPWSA in order to promote various cooperative projects by utilizing our human resources and knowledge. I think that it will enable us to offer and participate in the water supply business in the world market with specialization such as 1) technical advisory services regarding studies and project management of the water supply system, 2) involving in bidding and project implementation for design and construction of water transmission main and distribution pipeline, and, 3) water leakage management.



*With my family  
(2<sup>nd</sup> from the right is Mr. Ty)*



*Mr. Ty (The 3<sup>rd</sup> from the left), Supporting provincial water supply with JICA Expert.*

**Activities in the world**

**My activities in Narok Water, Kenya**

*Jin Igarashi*  
*Former Japan Overseas*  
*Cooperation Volunteers,*  
*JICA*



I worked at Narok Water and Sewerage Services Company Ltd (NARWASSCO) in the Republic of Kenya from April 2014 to September 2016. My assignment place is called Narok Town which is on the way to Maasai Mara National Reserve. The population is about 50,000, it is the multi-tribal town. The half of population is Maasai people, the others are mixed several tribes.

NARWASSCO is a water services providers (WSPs) of private company in Kenya, They contract the management of water service with Rift Valley Water Services Board (RVWSB). JICA carried out a grant aid project for augmentation of Narok water supply from February 2014 to April 2016.

Now NARWASSCO has new water treatment plant (North WTP, 4,000m<sup>3</sup>/day) and new

distribution pipes, so situation of water is much better.

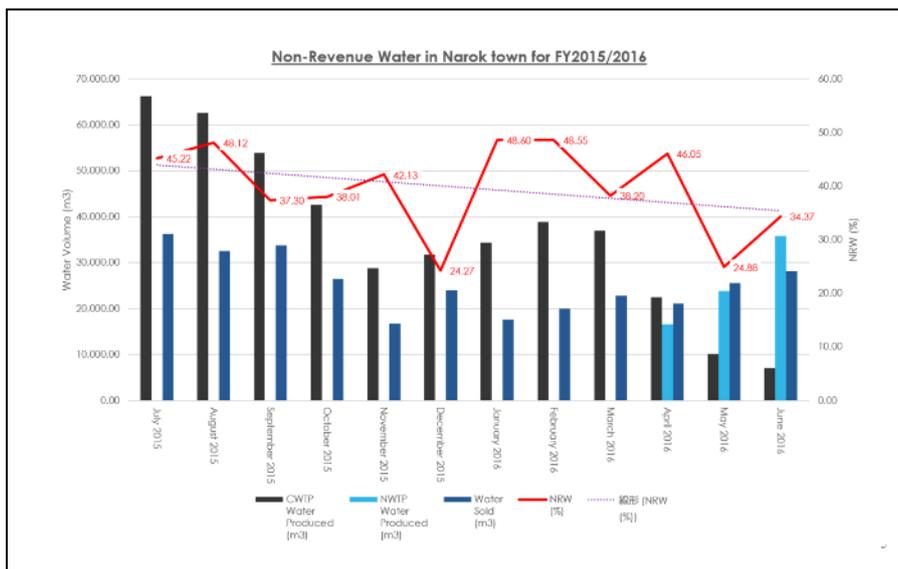


*New water Treatment Plant assisted by JICA*

Narok town has another old treatment plant (Central WTP). Central WTP was built by Britain in 1940s when Kenya was the British colony. Although the design capacity is 1,000 m<sup>3</sup>/day, NARWASSCO produced about 2,000 m<sup>3</sup>/day

before JICA project to meet the high water demand. Of course, the quality of water was not good, and there were a lot of leakages anywhere. Non-Revenue Water Ratio was about 40-50% in Narok.

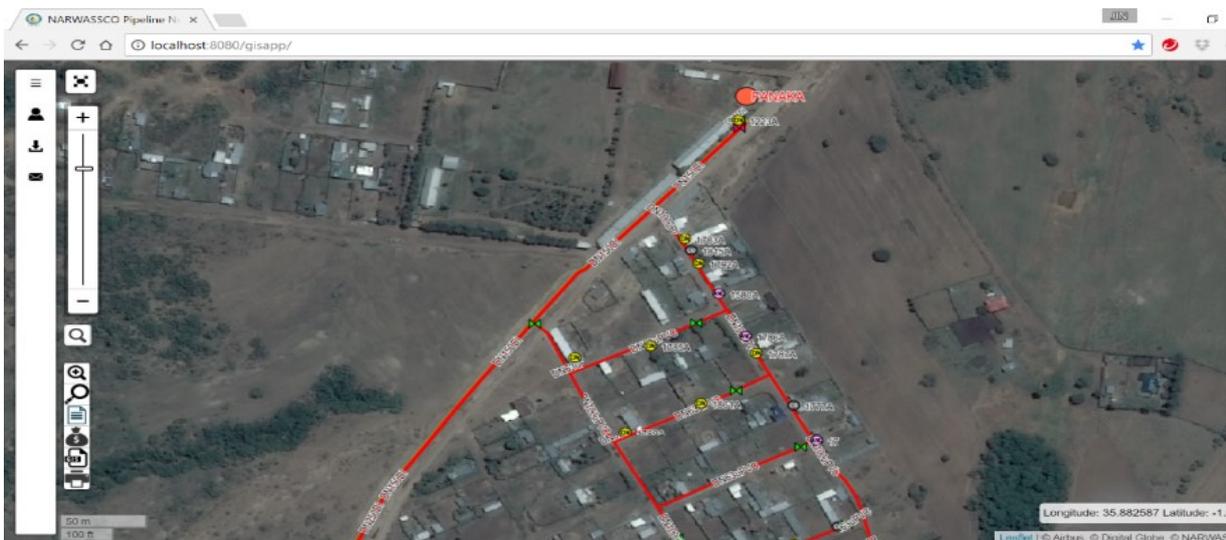
My activity was to cooperate to map the distribution network by GIS,



then to improve the data management by GIS data. JICA had procured Trimble GPS and ArcGIS through NRW project before, but they had never used equipment after JICA experts left. Those licenses were already lost when I came to NARWASSCO. So, my first job was to recover licenses of GPS and ArcGIS through ESRI Eastern Africa office.

After that, I started to map distribution network with my workmates in fields. NARWASSCO supply water to 2 towns – Narok town (3,000 connections) and Ololulung’a town (500 connections). I spent about 6 months in each town to complete mapping. The total length of distribution and service pipe is about 300 km, it was not easy to map those network under very strong sunshine of Africa. When I was mapping,

I found a lot of complicated network like spaghetti. Because every field officer has different knowledge of fields before, they sometimes installed very long service pipe from distribution pipe. For example, 15 mm’s small pipe supplied water to 20-30 connections. Those house connections had never got water since installation for several years. Then, I found a lot of illegal connections and officers’ corruptions in the fields. I thought how they can solve those situation through GIS. I thought it will be better if our officers can access to map of distribution network easily. Then, I created web-based GIS application for NARWASSCO. But they did not use my application to see map, so I created other function to link billing system from GIS. Since then they started to use my GIS application to



**Web-GIS system of Naroc Water Supply**

share distribution map.

The other important job was the way to establish GIS firmly in NARWASSCO. There was no GIS officer when I worked. I found an attachment at town planning office of Narok county government. I knew he has good skill of GIS. I recommended managing director of NARWASSCO to employee him. Although it took bit time to employee him because his tribe is not majority,

he was employed in August 2016. I rushed to teach my all knowledge and skills for 2 months, before leaving Kenya.

Except NARWASSCO’s job, I went to observe 14 WSPs in other towns. Especially, observation of Nyeri Water and Sanitation Company (NYEWASCO) was very exciting experience for me. NYEWASCO is the best WSP in Kenya. Their NRW is 15% on average, sometimes it was less than 10%. They set about 200 DMAs and 10

staff for NRW work. The materials and equipment for repairing were inventoried properly. When a leakage found, they can go to repair immediately even at night. After observing NYEWASSCO, I thought NARWASSCO also can do the same things as NYEWASSCO because they are same Kenyan.

I want to write about life of Kenya now. The life of Narok was quite comfortable for me. Since the elevation is about 1,900m, sunshine is very strong, but temperature is 12-28 degree, and climate is like spring all year around. Fortunately, I found very nice house which has water anytime. There are 2 supermarkets in Narok, so I could buy most of necessary items. When I went to Nairobi – capital city of Kenya, I also could buy Japanese foods. In weekend, sometimes I walked about 20 minutes to watch wild zebra baby.



Narok's majority tribe is Maasai people, so I learned Maasai language from my teacher. Though he is 85 years old, he is very active, and went to take care of patients as a Maasai traditional doctor. Most of my workmates are also Maasai, so sometimes I visited their home. The life of Maasai is very simple. Their main food is milk from cow. They take blood with milk for taking vitamin and iron. They normally do not eat meat nor vegetable. Maasai people live with cow.

Their daily life starts from taking milk. After milking, they go to savanna to take care of cows until sunset. There is no electricity and water in Maasai village. I cannot forget the beautiful stars and lightning bugs when I saw at night in their village.

However, such a traditional life of Maasai might be lost after several years. Now the government of Kenya promotes to market lands so that Maasai would settle there. But, Maasai is nomadic people. Unless they can move freely, they cannot have a lot of cows and keep their traditional life. I hope my friends of Maasai can keep their traditional life style.

My 2 years and 6 months stay of Kenya was unbelievable experience for me. That experience taught me interesting of water jobs. Now, I am working at water and sanitation sector for developing countries as consultant. I want to make full use of my experience of Kenya for other countries.



*With staffs of NARWASSCO at farewell party*

**International cooperation of Chiba Prefectural Waterworks Bureau**

***Yasuo Kobayashi***  
***Former JICA Expert***



**1. Introduction**

Chiba Prefectural Waterworks Bureau (CPWB) has been supporting water supply utilities in developing countries using its technology and know-how that have been accumulated since its establishment through requests from Japan International Cooperation Agency (JICA), Japan International Corporation of Welfare Services (JICWELS) and others. The cooperation is made by dispatching technical staffs to developing countries and accepting trainees from developing countries. From 1980 to 2015, CPWB dispatched 31 technical staffs to Asia, Latin America, Africa and other area and accepted 233 trainees from 30 developing countries such as Bolivia, Mexico and other countries. On this report, I would like to report on the CPWB's ongoing technical cooperation.

**2. Technical cooperation for Republic Democratic Timor Leste (RDTL)**

CPWB has been conducting a technical support of water supply for RDTL since 2012 as requested by JICA (Fig.1). In RDTL, water supply is run by DNSA under Ministry of Public work, Transportation and Communication. Especially, water supply in Dili (Capital of RDTL) had a wide variety of problems caused by "leaks and illegal connections in distribution network", "improper O&M and water quality control for water treatment plant", "unstable management", "insufficient organization and human resources" and others. Therefore, CPWB addresses to them

by dispatching some technical staffs as short or long term expert. CPWB's TOR for RDTL is as follows;

- (1) Improvement of water distribution system to achieve 24h/7d water supply,
- (2) Improvement of O&M and water quality control for water treatment plant, and
- (3) Establishment of organization to achieve autonomous management.

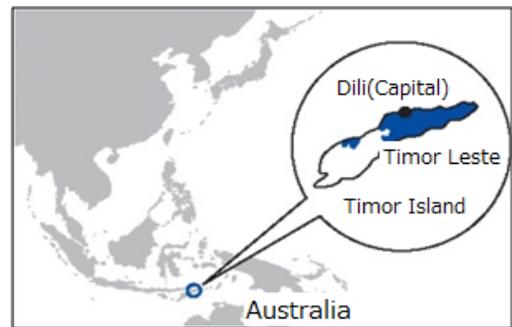
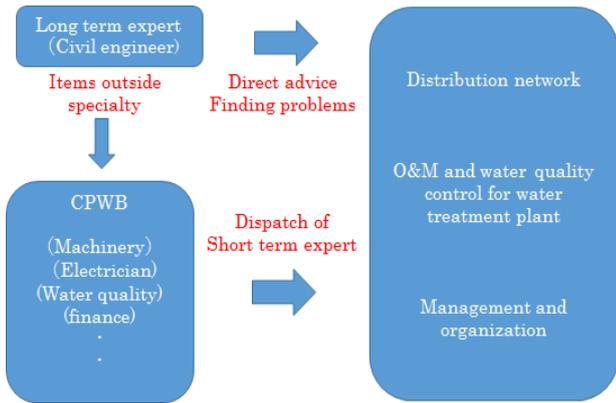


Fig.1 Location of RDTL

**3. CPWB's arrangement for technical support**

CPWB responds to the wide variety of problems mentioned above using its organization's power because CPWB can cover general matters of water supply management in every aspect. Now, a technical staff with a career of civil engineer has been dispatched to DNSA as a long term expert since 2015. He is supposed to solve the problem by himself if it is within his reach. However, the problem is beyond his reach, CPWB dispatches some staffs that can solve it as a short term expert.

As to improvement of water distribution system, the long term expert mainly takes care of it. Meanwhile, as to improvement of O&M and water quality control for water treatment plant and establishment of organization to achieve autonomous management, the short term expert mainly takes care of them (Fig.2).



**Fig.2 CPWB's arrangement for technical support**

**4. CPWB's activities to RTDL**

**4.1 Improvement of water distribution system to achieve 24h/7d water supply**

This activity is mainly taken care of by the long term expert. As a result of activities, previous long term expert dispatched from 2012 to 2015 could finally realize 24h/7d water supply in a partial area in Dili by means of leak detection together with introduction of the block water supply in the pilot project. After this project, importance of leak detection was recognized. So, CPWB dispatched 2 technical staff in charge of leak detection to DNSA for 3 weeks as short term expert. During the dispatch, the short term expert trained DNSA staffs on how to make a leak detection plan, how to use the detection devices as well as how to reflect found leaks on the next leak detection plan and pipe replacement plan (Fig.3, 4).



**Fig.3 Workshop with DNSA staffs**



**Fig.4 Training on leak detection in Dili**

**4.2 Improvement of O&M and water quality control for water treatment plant**

This activity is mainly taken care of by the short term expert because this is beyond the long term expert's specialty. So, CPWB has dispatched some technical staffs in charge of O&M and water quality control in CPWB's water treatment plant as short term expert to DNSA on regular basis since 2014. During the dispatch for 3-4 weeks, the short term expert trained DNSA staffs on how to maintain facility equipment such as chemical dosing pump and others. For activities' effectiveness, the short term experts made prior arrangement by collecting a manual of equipment in use at the site and studying about how to fix malfunctioned equipment.

Through these activities, DNSA staff in the water treatment plant could finally not only operate properly and maintain the facility including regular cleaning and repair for chemical dosing pump and others but also handle bad raw water quality in a rainy season (Fig.5. 6).



**Fig.5 Training on O&M and water quality control in water treatment plant**



**Fig.6 Training on maintenance of chemical dosing pump**

#### 4.3 autonomous management

This activity is also mainly taken care of by the short term expert. CPWB considered that awareness-rising for DNSA staff and RDTL's senior governmental official is necessary to make this happen. So, director general of CPWB visited RDTL and acted as instructor in the seminar held by JICA in January 2016. Contents of the lecture are as follows;

- (1) Outline of CPWB
- (2) Responsibility of water supply utility
- (3) CPWB's actions for a stable water supply
- (4) Difference between CPWB and DNSA
- (5) Suggestion

Especially speaking about suggestion, as management aspect, DNSA should start to collect tariff in responsible area and have a communication with the central government about establishment of framework for autonomous management. As organization aspect, DNSA should set a position of technical administrator that takes leadership on technical matters and a department of production and distribution that supports local office and water treatment plant so that assuming responsibility can be made. Also, director general emphasized that development of water supply that is indispensable to people depends on strong leadership of director of DNSA and senior governmental officials of RDTL (Fig.7, 8).

#### 5. Summary

CPWB uses its wide variety of know-how and high technology abroad and feeds back the experiences that are gained abroad to customers. I also use the 3 year's experiences as JICA expert in RDTL to a future business.



**Fig.7 CPWB's DG and Minister of PWTC**



**Fig.8 Seminar**

----- E-mail Interview -----

**Professor Ishibashi, assigned to Khon Kaen University**

Professor Dr. Yoshinobu Ishibashi has been contributing to research and human resource development in the field of water supply in Japan for many years. After retiring from Tohoku Gakuin University, he was assigned to the Faculty of Public Health, Khon Kaen University in Thailand. He has responded pleasantly to my interviews by e-mail during his busy days just starting his new work. (by Ms. Yamamoto)

**Q1: Congratulations on your assignment to Khon Kaen University. Could you tell us what you want to do in Khon Kaen University?**

**A1:** I have been working as a foreign professor of Faculty of Public Health, Khon Kaen University in Thailand since February 2017. Khon Kaen University is a major national university in northeastern Thailand and consists of 17 Faculties and 3 Colleges. The number of students is approximately 40,000 and graduate students account for more than half, and faculty members and staff are also working about 10,000 people. In addition, Khon Kaen University has concluded numerous agreements with universities around the world as a leading university in Thailand, and many foreign researchers have been adopted. Moreover, the university has become a base university in the ASEAN countries, and it contains many projects etc. and I feel the enthusiasm to spread knowledge to ASEAN countries.

By the way, my work contents are mainly

research guidance and advice, classes and seminars for graduate students. In my first seminar I talked about water vision and the challenges of water supply in Japan. Classes and seminars are usually required for 3 hours in the morning or afternoon.

As my role in the project, I will give advice to the water purification plant that distribute finished water to university campus, and assess the water quality of water purification plant of Faculty of Medicine that has advanced water purification treatment system. The former water purification plant has recently been rebuilt and uses chlorine dioxide for disinfection which is not permitted in Japan. However, there are doubts as to whether the technicians who manage the plant fully understand the purification theory and are performing appropriate operation. Therefore, the project members are planning to educate and train as university to technicians and administrators of small scale water supply in villages as described later.



**Campus of Khon Kaen University**

On the other hand, project members will consider countermeasures against eutrophication of lakes scattered in the Khon Kaen region, together with local government offices like the Ministry of Environment in Japan. We have already identified *Microcystis aeruginosa* in an artificial lake that was built in

2002 and is being investigated. We will be bothered by drainage measures and nutrient removal for algae bloom control from now. Regarding health, "health promotion" is progressing in Thailand. The new King proposed health promotion policy, and the people are doing aerobics etc. for 1 hour from 3:30 p.m. on Wednesday. Jogging courses and exercise facilities are also set up on the eutrophicated lakeside.

Furthermore, I am planning to help increase the number of agreement universities (MOU) and invite acquaintances from Japan to give lectures.

**Q2:** Since you have been a professor at AIT (Asian Institute of Technology, Thailand), you keep friendship with Thailand for long time. How do you think on Thai Water Supply?

**A2:** I have been working with Khon Kaen University for more than 10 years through leptospirosis. Especially, I have got a grant four to five years ago and have been collaborating research with Khon Kaen University. The contents were "diseases accompanying floods in the Khon Kaen region and their water quality trends, and actual conditions of small water purification plant in rural areas".



This survey also included questionnaires on the actual conditions of floods, water supply and use, living and medical care at evacuation centers, social backgrounds, and so on. In this research, I experienced a small water purification plant in village and I was interested. This water purification plant is located in most villages using a rapid filtration method like Japanese small scale water supply. The water purification plants have been built under the guidance of Ministry of Health since about 1990. Currently it is supposed to be under the jurisdiction of subordinate organizations such as Ministry of National Resources and Environment and PWA (Provincial Waterworks Authority, Thailand), but villagers manage empirically because of lack of aid. As a result, shower and washing became convenient. However, despite the large number of coliform bacteria and fecal coliform bacteria detected from the tap water, and about 5% of the villagers drink it. Therefore, I feel that there is a need to teach water purification theory and proper operation with enlightenment of concept of public hygiene.

In addition, many metals are included in the water quality standards in the Ministry of Health, and overall water quality items are not so much compared with Japan. Even if it is not custom to drink tap water, I think that related ministries and agencies should increase the necessary items and supply safe water. However, the water quality standards of local administrative agencies have become compliant with WHO. I also wonder that there is no duty to disinfect. I saw a place where calcium hypochlorite is placed in the village's water purification plants, but I could not detect residual chlorine. Moreover, leakage is also remarkable.

Regarding general local water purification plants, Buddhism in Thailand is Hinayana Buddhism and Japan is Mahayana Buddhism. The rhythm Buddhism values our individual thinking. I feel that this idea makes it difficult to operate the water treatment plant. From the past experience in local water purification plant, the operator responsible for coagulation manages coagulation basin, the operator for sedimentation controls sedimentation basin, and the operator for filtration watches only filtration basin, and each operator tends not to interfere except for the assigned responsibilities. I felt similar emotions with attitudes toward students' research. In the experience at Asian Institute of Technology (AIT), Students did not work collaboratively, even if the direction of their work was the same. They were individual players. Collaboration would always be done in Japan.

Water source as the raw water is also polluted. Total nitrogen and total phosphorus concentrations are roughly ten times as much as Japan, and the number of coliform bacteria groups and fecal coliform bacteria are also extraordinarily detected. Therefore, I am keenly aware of the need to fully pay attention to raw water. Regarding diseases, diarrhea is not distinguished from cholera, typhoid fever, *Cryptosporidium*, etc., and it is expressed collectively as acute diarrhea. I would like to have a more detailed description available. In addition, as information from student, diarrhea is frequent in the eastern area of Thailand near the Mekong River due to ice and drinking of groundwater containing *E. coli*. Leptospirosis is a disease that we cannot ignore yet.

Japan recommends exporting infrastructure as a national policy. It seems to be trying to sell highlighting of drinkable water and advanced

technology. These targets would be in the metropolitan area. On the other hand, there are still many problems such as infrastructure improvement, community water supply, leakage, disinfection, etc. in rural areas. As for my feelings, I would like to aim for a water supply that can prevent diseases before using a medical institution, while acknowledging the customs of local people,

**Q3:** Do you plan to set up some cooperation work with Japan?

**A3:** Regarding cooperative projects, the National Institute of Advanced Industrial Science and Technology (AIST, Japan) conducts collaborative research with the Thai research institute, and I would like to take part of it. I hope that I can associate with AIT that I belonged to once. I am also contacting Ms. Siwilai Kitpita of MWA (Metropolitan Waterworks Authority, Thailand) who is a member of WaQuAC-NET. In addition, I would like to respond if I can cooperate for WaQuAC-NET and international cooperation in Japan on water supply.



*In center, Professor Ishibashi and both sides, participants from MWA at 2016 JWWA Conference in Kyoto.*

**Q4:** Do you have favorite Thai culture, history, lifestyle and so on?

**A4:** I am not acquainted with many people, so I

will describe about university. Student members are also very kind. Students are more familiar to me than Japanese students. The graduate school of Khon Kaen University intensively gives lectures on Saturdays and Sundays. Because the university accepts workers and trainees, university is taking such a system. In Japan, I was struggling with schedule of classes with regular graduate students and graduate students with work, but I am impressed that Khon Kaen University is using Saturdays and Sundays easily. Graduate students are helping faculty members as research assistants along with their own research on weekdays. Although it depends on the faculty, I feel that research is not theoretical, but it is done with the custom of the past. From this situation I am getting new experiences every day through my university life. My life has just begun. I live alone in a student town and I cannot afford to enjoy it yet. Only time flows slowly. But this is a problem for me. If there are plenty of time, I should be able to think about various things, read books, write obscene essays and drive etc. I will be scolded for having time, but I still feel confused compared to life in Japan, and I am struggling with time. The work ends at 4:30 every day, and the time to sleep is very long. Also, there are many public holidays in April and May. In addition, due to the Academic calendar that changed in many Asian countries two years ago, the university will be closed in June and July. Even with a long break, faculty members are basically not holidays. Project members are busy so I cannot see them at all times. Appointments are easily changed. Also, suddenly they come into my office and ask me some work. It may be their way. On the other hand, I often hear about the methodology of the project contents. At that time, I try to answer politely and not to act like taking leadership since it is a country that respects individuals.

Invitation to Khon Kaen University is fruitful opportunity for me. In response to this given opportunity, I would like to contribute to Thai society through waterworks.

**PS) This manuscript is my initial impression of being assigned to Khon Kaen University. At the present time, my close colleagues have increased and I am having a fulfilling day.**

### Activity in Japan

#### Sudanese executives visit to a water treatment plant in Japan

On Mid of April, representatives of Sudanese government came to Japan and I attend them. The purpose of visit the water treatment plant in Japan is to see the rapid sand filtration system. Hereafter Japanese government is going to construct water treatment plant in Sudan by ODA. That is why representatives of Sudanese government would like to see same type of rapid sand filtration system and study operation and maintenance of Japanese waterworks.

The water treatment plant visited has advanced water purification system which contains ozonation system and biological activated carbon. Industrial water is also supplied.



*Observing Ozonation System*

The chief engineer of the water treatment plant explained how to intake the water, geographical features of this area, water treatment process. Since we strongly request to know rapid sand filtration system, he showed us inside of rapid sand filter and explained how to operate and maintain it. He also advised effectiveness of powdered activated carbon, because Sudanese engineer asked measures against the problem of taste and odor of the water source in Sudan. Sudanese engineer really satisfied with this observation study. I hope this visit will be good opportunity for them to rethink operation and maintenance of water treatment plant.

*(by Mr. Horie)*



**Mr. Kunnarith from PPWSA arrived at Narita IAP**

In the early morning on May 21<sup>st</sup>, 2017, Mr. Por Kunnarith who is a staff of water laboratory in PPWSA, Cambodia and a member of WaQuAC-NET arrived at Narita International Airport. His purpose is to participate in six months training organized by CLAIR (Council of Local Authorities for International Relations, Japan). Mr. Sasaki and I met him and talked recent situation of water issues for 3 hours in the airport. He takes 2 days orientation in Tokyo and then move to JIAM (Japan Intercultural Academy of Municipalities) in Shiga Prefecture for studying Japanese language for 1 month. And then he will take a training course in Kitakyushu Waterworks and Sewerage Bureau till the end of November.

I want to invite him on Kyushu Meeting, if possible.

*(by Ms. Yamamoto)*



**Mr. Kunnarith in Center**

**Yoshi-Tomo Report**

**What should I inform the foreign C/P ?**

**Yoshinobu Ono**

**Yokohama Water Co., Ltd.**



➤ **Report to original workplace**

When you work as an expert in a foreign country, you may make and send an activity report for an origin of workplace. When I worked at Hue, Vietnam as a short-term expert of JICA in 2011, I also submitted a report to my workplace in Japan once a week. There were many contents in the report, about working in the country appointed, about meals that is important for living, about my holiday's activities and the culture of the country. I wrote a report 13 times during 3 months of business trip. I wrote them with enjoying because there were many interesting things and experience for me for the first time to visit this country.



➤ **What would I tell C/P?**

I finished writing the last report to the workplace in the last week of the dispatch, I thought something incidentally. What would I tell the counterparts? Of course I made an effort to tell them everything I had for improving their service level of the waterworks. However, I thought I

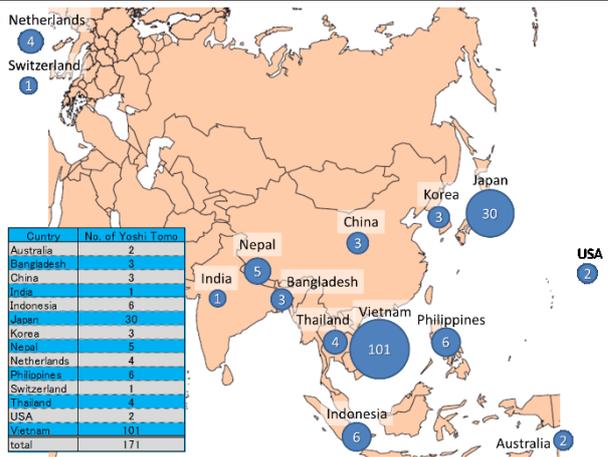
should tell more, for example about Japanese culture and my private to them as same as the report to Japan.

➤ **Staring Yoshi-Tomo Report**

I started to send an international report named "Yoshi Tomo Report" to my friend after coming back to Japan, the end of 2011. The origin of the name "Yoshi Tomo report" means my friends, "Yoshi" is from my name and "Tomo" means friends in Japanese. The concept of Yoshi Tomo Report is to inform Japanese culture, our waterworks situations and my private things in English. It is also aiming to improve English skills each other.



It passed 5 years to start sending Yoshi Tomo Report, and total number of reports are reached 72 times now. I am aiming for writing a report once a two month now, although I cannot do every week. The number of "Yoshi Tomo" addressees is increasing year by year. I send it to 171 persons of 14 countries in total now.



The latest topic of report was Japanese cherry blossoms. I am very glad when Yoshi Tomo sends me some reaction. It becomes clear that another merit exist for us. Sometimes, Yoshi Tomo helps me when I visit the foreign countries by work, and the work goes smoothly. I think this is a kind of effect of keeping in touch. In addition, I was glad when Yoshi Tomo said, "your English is improving compared with the past".

➤ **From now**

It is a kind of my lifework and I will continue to send this report as long as possible. By the way, there is a ceremony to become Yoshi Tomo. It needs to take a photograph with me by two-shot. When I meet you somewhere in the world, I would ask you "let's take a photograph together!". And then, you are Yoshi Tomo, too. I wish to meet you somewhere someday!!

**On July 11, WaQuAC-NET is awarded the Health, Labor and Welfare Minister's Award in the 19th Japan Water Prize by the activities up to now! All members and friends, thank you very much for your support. Details will be reported on Newsletter vol.34**

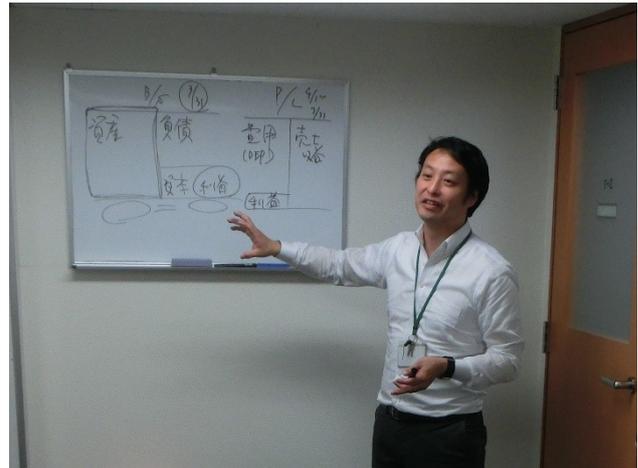
**10th Mini-workshop**  
**"Finance and Accounting of Japanese Waterworks Utility for Engineers"**

The workshop was held on 28th April, 2017 at meeting space near Tokyo Station. Participants were Mr. Sasaki, Ms. Ohno, Mr. Igarashi, Mr. Gondaira, Ms. Yamamoto and Mr. Horie. Lecture was made by Mr. Oshima, Certified Public Accountant / Manager, Public Sector Advisory, Deloitte Touche Tohmatsu LLC. This workshop was initially one of the interests among New Year's meeting participants held in Tokyo, and realized thanks to Mr. Oshima offered the lecture voluntarily. Topics covered questions concerning money to financial and human resource management of local government and water utilities in Japan. The basic ideas of financial issues are as follows.

**1. Difference between private company and public enterprise**

Water utilities are local public enterprises and Special Account is applied. Therefore, they should adopt double-entry accounting system.

In general, private companies aim to make profit and share it to stockholders, ultimately make company value higher. On the other hand, the aim of public enterprise is to maximize the public welfare. In this regard, public fund from national treasury can be used for public enterprise, and this is one of special features of them.



*Mr. Oshima making explanation*

**2. Basics of finance**

**(1) Balance Sheet (B/S)**

| Assets                           | Liabilities and Equity                          |
|----------------------------------|-------------------------------------------------|
| Current Asset<br>(Cash): 100 Yen | Financial Liability<br>(corporate bond): 50 Yen |
|                                  | Capital surplus<br>:50 Yen                      |

Balance Sheet (B/S) is a summary of the financial balances of a project or organization. Items in B/S include assets, liabilities and Equity/Capital. Assets are all the things the business own, such as property, building, land, cash etc. Liabilities/Capital displays how the Assets are gained. B/S enables to understand the financial condition of a project or entity.

Sum of assets (in left column) should be equal to sum of Liabilities and Equity (in right column) of B/S. In water utilities' B/S, Property (distribution pipes and other equipment) is the biggest portion, which accounts for approximately 90% of Assets. Asset is total value of tangible and intangible assets, accounts receivables and meters. In Japan, B/S shows the status as of 31st March, matching the fiscal year

(1st April-31st March)

(2) Profit and Loss (P/L)

Profit and loss (P/L) is one of the financial statements of an organization, which shows organization's revenues and expenses during particular period. By checking P/Ls, we can understand what kind of activities done, how much profit made, and overall information allows us to analyze past activities and reflect the lesson learnt in planning future strategies.

(3) Cash flow statement (C/F)

C/F is a financial statement that shows how changes in B/S accounts and income affect cash and cash equivalents, and breaks the analysis down to operating, investing and financing activities. As accounting of public enterprise is based on accrual principle, there is a time gap between the point of gaining/expenses and actual income/spending of cash. It is possible to have the information about the flow of cash in and out of the utilities, and determining the short-term viability of an organization.

### 3. Indexes to analyze financial status of water utilities

It is difficult to judge financial status of a water utility only with financial statement explained above, because characteristics of water bodies such as potential of staff cannot be evaluated with financial statement sheets. Under Japanese environment, these additional evaluations can be made with progress of renewal of aged pipe, pipe efficiency (how many customers are connected per distribution pipe) etc., and judged by investments and financial status. In addition, it is useful to monitor cash flows and rise and fall of deposit and savings.

(editor's note)

I have been wanted to learn about Financial and Management issues, but they are often left aside while working as an engineer in water related project. Moreover, it was difficult to understand by self-study as I didn't know where to start in the beginning. Mr Oshima's lecture became a great opportunity to start learning about Financial Statements. In many cases, water utilities in developing countries should work with not only insufficient facilities and operational capability, but also inappropriate financial management and records. For example, even after facility were granted by donor, it cannot perform well without sound financial management and timely investment in maintenance. So for the sustainable cooperation, both technical and financial points of view are important. In WaQuAC-NET gatherings, we tend to discuss more about technical issues rather than financial issues. But taking this opportunity, I want to widen our view to financial issues and keep on learning, and sharing the knowledge.

Thank you again for Mr. Oshima for giving us the lecture and sharing your expertise.

(by Mr. Horie)



from left: Mr. Igarashi, Mr. Horie, Mr. Gondaira, Mr. Sasaki and Ms. Ohno

### Introduction of new members

- Mr. Satonori Takahashi (Japan)
- Mr. Jin Igarashi (Japan)

***We welcome new members anytime  
Please contact us***

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#### **Next Activity**

|              |                               |
|--------------|-------------------------------|
| August       | Meeting of Africa             |
| September 1  | 4 <sup>th</sup> Osaka Meeting |
| September 10 | Newsletter 34 in Japanese     |
| October 10   | Newsletter 34 in English      |