WaQuAC-NET Newsletter

Water Quality Asian Cooperation Network

http://www.waquac.net

Volume 44 issued on April 15, 2020

For Safe Water, Do Network.

Special Report: WaQuAC-NET's Study Tour in Myanmar

WaQuACNET conducted a study tour in December 2019 as an opportunity for members to see the situation of water supply in developing countries. The destinations are Yangon City Development Committee (YCDC) and Mandalay City Development Committee (MCDC) in Myanmar. The schedule is as the right table.

The participants; (from left) Mr. Umeyama, Mr. and Mrs. Kagata, Ms. Yamamoto, Mr. Igarashi, Ms. Sivilai, Mr. Arimura, Mr. Sugawara and Yariuchi. In addition, Mr. Morita joined in Mandalay. Totally 10 members joined. Thank you very much for everyone who participated and cooperated. Each participant wrote their impressions on their interested areas (WaQuAC-NET Office).

Contents: Vol. 44

Date	Activities
10 Dec	Arrival at Yangon, Orientation.
11 Dec	Site observation of YCDC: Nyaunghnapin WTP, Hlawga Reservoir/ Pumping Station, Papedan T/S Office
12 Dec	Courtesy call to Chief Engineer, YCDC, Interview with C/Ps, sightseeing
13 Dec	Moving from Yangon→Mandalay Courtesy call to Chief Engineer, MCDC, Site observation of MCDC: WTPs with rapid sand filtration, and slow sand filtration, water quality analysis laboratory.
14 Dec	Sightseeing, moving from Mandalay→ Yangon.

1) Situation of water treatment

Kagata Katsutoshi,
OB, Kitakyushu Water and Sewer Bureau

I joined Myanmar tour from Fukuoka via Hanoi, and visited the waterworks facilities in YCDC and MCDC. Both waterworks got grant aid from Japan. In addition YCDC has the technical cooperation project and MCDC has the JICA

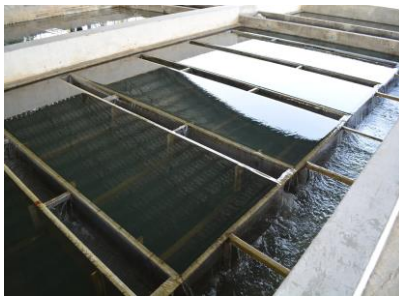
Obituary: Mr. Mitake Ikuo, Japan Water Works Association

In November 2019, Mr. Mitake, who had been involved in the international affairs of water supply for a long time and had a wide network in Japan and overseas, passed away. Since the launch of WaQuAC-NET, he had the close friendship with many members, and contributed to our third newsletter. He has long been famous as a lecture of training courses inviting water supply officials from various countries to Japan, and inspired many water supply people around the world. He contributed in the development of the world's water supply a lot, and just received the JICA President's Award in October. May he rest in peace.

partnership program from Kitakyushu water-works bureau. I would like to comment on the status of water treatment, which is my specialty, about both of YCDC and MCDC.

Treated water is not distributed to all areas in Yangon; only Nyaunghnapin treatment plant is in operation. Raw water from the reservoirs is distributed directly to the other areas as tap water. At Nyaunghnapin treatment plant, floc was small and settled water still had some turbidity. The reason seemed that the amount of intake raw water is more than the actual treatment capacity, though the dosing rate of coagulant is also related. YCDC was working on the demonstration experiment to improve the filtration speed (improvement of filtration capacity) by changing the filter layer into double layers. But I felt that it was necessary to work on not only the filtration but also the coagulation and sedimentation. Regarding chlorination, the manufacturing plant of sodium hypochlorite has been newly constructed in Myanmar and the dosing facility of sodium hypochlorite at water treatment plant was near its completion so that the safe water supply will be possible in the near future.

Dosing facilities of sodium hypochlorite, Nyaunghnapin WTP



Well-functioning settled water collecting basins, No.4 WTP in Mandalay

No.4 treatment plant in Mandalay is a renovated plant from slow filtration system to coagulation and rapid filtration system. They carried out the design and construction for the conversion of system by themselves; the state of sedimentation was quite good. I was regretful that I couldn't confirm the filtered water visually. I was impressed that the staff of both cities do not only depend on foreign assistance, but work on improving their water treatment by themselves. As long as their effort goes on, the waterworks in Myanmar will be developing in the future.

This time I took this tour with my wife, it was very meaningful tour visiting attractive sites such as Shwedagon Pagoda. I felt that I was able to have a glimpse of the religion and daily life of Myanmar people.

2) Safe water supply

Ms. Siwilai Kitpitak
(OG, MWA, Thailand)

Nyaunghnapin WTP of YCDC; has separate offices for WQ management and WQ monitoring, and the latter was impressed by the fact that water quality analysis was conducted on six items at WTP. In order to manage treatment process properly, I felt that it was necessary to implement jar-test to get the optimum dose of coagulant, and check the alkalinity of the settled water. Experiments of changing the filter media and introduction of a chlorine injection facility are good efforts. However, these will also need to be monitored by collecting water quality data. There was not enough time to visit the central lab and provide more useful comments on how to make reliable data and work, for example. I would like to recommend that YCDC start Water Safety Plan with simple procedures, step by step.

Hlawga Reservoir; has a small lab for water quality checking, and good to monitor five parameters there, but it is more important to use those data effectively. From the viewpoint of water source protection, I thought that the water safety plan should be started from the simple

step. Monitoring of residual chlorine is important for chlorine facilities. Township (T/S) offices should also monitor residual chlorine.

No.8 WTP of MCDC, algae in receiving tank

No.8 WTP of MCDC: Its slow sand filtration system was very impressive.

Most people may frighten the greenish algae water in the receiving tank. It looks dirty, but these function as a pre-sedimentation process. I confirmed it to WaQuAC-NET expert Mr. Sasaki Shinichi, who said these are kind of *Spirogyra sp.* Most of them are green algae, which glow together with other algae to form colonies, and are good in pre-precipitation tank. On the other hand, there is a problem when flowing into the slow sand filter. The dead cells are non-toxic but release gooey and musty odor. For improvement, it may be better to inject chlorine, monitor residual chlorine and start a simple step of WSP.

Water quality laboratory: was very impressive as well. While most necessary works have been carried out, I felt that the challenge was how to make a better lab working system; challenging to easy way and easy style to get reliable data in the future.

3) Visit to MCDC Waterworks Facility

Morita Yasuhiko
（TEC International ）

On Dec. 13, we visited the MCDC's waterworks facility. This was my third visit to Mandalay City in four years; the first being in 2013 under the UNICEF WASH Project, and the second in 2016 under the JICA Grant Aid Project.

The major water source of MCDC waterworks facility is ground water. However, it also operates two WTPs that utilize surface water, namely No. 4 WTP (from Sedawgyi Rainwater Reservoir) and No. 8 WTP (from Ayeyarwaddy River). During the first visit in 2013, both No. 4 and No. 8 WTPs utilized gravel filtration and sand filtration for water treatment. No.8 WTP still operates with this treatment process. However, No.4 WTP has been modified to coagulation – sedimentation and rapid sand filtration process with the technical cooperation of Kitakyushu-City Waterworks which overcame challenges of limited site area while also including existing structures. The modified No.4 WTP has a good operation and maintenance (O&M) system and is expected to be a model for O&M of small-scale water purification plants in the future.

Simple water quality monitoring equipment in MCDC lab

MCDC's water quality laboratory has not been upgraded since 2013, as it still uses simple HANNA and HACH brands of water quality measurement equipment. In Yangon, YCDC also utilizes similar simple equipment. Owing to the difficulty in obtaining pure reagents, it is highly unlikely for the cities to implement the water quality analysis according to the standard methods described in the Myanmar Drinking Water Quality Standards (promulgated in December 2019). This is also one of the major barriers to an advanced water quality monitoring in Myanmar.

Microbiological (E-Coli) test equipment

At present, MCDC employs only three water quality analysts, which is insufficient given the large scale of MCDC's water supply system. In this visit, MCDC's water quality monitoring plan was not confirmed. Due to an insufficient human resource, it is assumed that MCDC's water quality monitoring is less frequent and limited at WTP, service reservoir, and major water source. However, MCDC water quality analysts are eager to learn new monitoring techniques and have even participated in a lecture on Microbial testing held in YCDC in November 2019. They have been utilizing the lecture knowledge in their daily analysis work.

4) GIS in Myanmar

Igarashi Jin

We visited water supply facilities and offices at Yangon and Mandalay from 10 to 14 December 2019. This visit to Myanmar was the first time for me, and the second visit of water supply facilities in South East Asia since I have been at Bangkhen WTP of MWA in Bangkok in July 2019. I think other participants will describe the details of WTP, so let me write what I feel about GIS in Myanmar.

First, on the afternoon of 11, we had an opportunity to visit township office, which is in charge of meter readings, billing, leakage repairing, etc. They put distribution network maps on the wall of office, and I found they were trying hard to capture existing fixed assets on GIS database. I felt they already mapped most of main distribution network. But when observing a household connection later, I realized it was not very easy to map all assets in detail including service pipes. This is because there are so many house connections, of which installation from main distribution pipe are too complicated. Many booster pumps are used at customer's houses because of low pressure.

On 12th, we had a meeting at the head office of YCDC, and a chance to ask about GIS. I felt C/P has his own idea what they need to do by GIS, for example, use of open source GIS software such as QGIS. And it is also very nice that he has already understood the importance of asset management.

About Mandalay, I was asked how to use Garmin GPS when we went to laboratory of MCDC on 13th. She said they wanted to use GPS to capture locations of water sampling points to improve their operations. I was very impressed their work which they want to improve daily works by themselves.

Overall, it was my second country of visiting water supply facilities in South East Asia; however, I very much admired most of staff for having their own questions to improve something in their work. Finally, I really appreciate both YCDC and MCDC gave us great opportunity to understand their waterworks. It was really fruitful observation for me!

5) People I met in Myanmar

Yamamoto Keiko（WaQuAC Office）

First day of the tour, we visited the Ngamoeyeik WTP which was only one big-scale WTP in YCDC. There, we had a lecture on the water supply systems in Yangon City. The other 3 water supply systems distribute untreated water from reservoirs by pump and gravity. These reservoirs might be clean by recently. But now installing treatment facilities is urgent. In the treatment plant, I noticed a label written ACH (Aluminum Chlorohydrate) on the solution tanks. It was a coagulant. I saw it for the first time. Its

concentration of Aluminum Oxide was 23%~24%, which was double of PAC (poly-aluminum chloride). ACH was imported from China. The WTP is conventional rapid filtration method. But they has been producing water more than its capacity in order to meet the demand in Yangon city which has increased rapidly. I think it is a hard condition for the JICA capacity development project. In the WTP, another JICA loan project on installing chlorine dosing system has been going on. There I met Mr. Yagi, a member of WaQuAC-Net by chance. It was so nice surprising for me. He had desired to work in the field of international cooperation for many years. He is working in JICA Myanmar project now. I really want to say him congratulation!

After having a lunch which was interesting Myanmar cuisine, we visited a township office in busy downtown. Officer Ms. Kim welcomed us in Japanese. She had taken JICA training in Japan. She took us to show service pipes very complicated and meters in a building. It looked hard work to read meters and maintain them.

Second day, we had courtesy call to Mr. Myint Zaw Than, Head of Department (water supply) in YCDC. He welcomed us and talked friendly. He requested to leave our comment after observing the facilities. There was the precious occasion of a discussion with 4 counterparts on water quality of the project. Among them, Mr. Zaw Win Aung, whom I had met at 2010 JICA training in Tokyo, answered our questions for not only water quality issues but also GIS.

Third day, we went to the second biggest city, Mandalay where a technical cooperation from Kitakyushu City as one of JICA Grass Root Program had been carried out. Mr. Hirata from Kitakyushu was in charge of the project and helped us for arranging courtesy call to director of MCDC and our observation of water facilities. Director, Mr. Soe Aung was also a former JICA trainee in Japan. We had nice and friendly talking. And we could observe facilities smoothly.

Mr. Hirata explained water supply system in Mandalay. Many wells are used for water supply. We observed 2 types of water treatment plant using surface water, rapid sand filtration method and slow sand filtration one. And then we visited distribution reservoir gathered water from wells. Sodium hypochlorite generated by onsite electrolysis method was used as disinfectant. There was a laboratory and we met 3 analysts. They wanted to be trained on the water quality management in Japan. We may meet them in Japan near future.

Through this tour, we had a lot of people. “Thank you for helping WaQuAC-Net Tour”. I think the success of tour is based on the good relationship between Myanmar people and Japanese in the project.

6) For the next study tour

Sugawara Shigeru (JICWELS)

This is Sugawara who participated in last year's Myanmar tour as a banquet attendee for the social gathering only.

By the way, my retirement at JICWELS at the end of July this year, and immigration to Bali island of Indonesia, is approaching in August this year. My local activities after immigration, from

August onwards, I will be doing personal volunteer activities mainly in Bali Province.

First of all, I think that it is easier to put a lever in the Denpasar City Waterworks Company (PDAM Kota Denpasar) where my wife is the manager of the Technical Planning Division of the PDAM.

Also, what is going to happen is currently unknown, but I have told people involved with the Indonesian Water Works Association (PERPAMSI) and the Directorate of Water Supply System Development (DITPSPAM) of Cipta Karya, Ministry of Public Works Indonesia, that any help will be provided.

What I would like to do as a kind of hobby is to organize the remaining duties during my JICA Expert era in Indonesia, to provide local follow-up support through the actual JICA country-focused training course to strengthen PERPAMSI. For that purpose, I'm thinking of helping to translate the related standards, guidelines, and manuals of the Japan Water Works Association into Indonesian language.

I would also like to contribute to measures against water purification problems in water supply facilities caused by algal growth in water sources, which I had previously studied at the National Institute of Public Health, Japan.

In addition, I would like to support DITPSPAM and PERPAMSI, especially for the formulation of facilities development projects, but it seems to be difficult to expect Japanese ODA funding for the facilities development in the public sector. Even so, I would like to try something about it.

Regarding private business, what Japanese companies can do is being done so far, so for those who participate in the Japan Indonesia Study Committee for Water Supply Project in Indonesia (JISCOWAPINDO), those who are ready to take root in the field, I hope to be able to provide various support locally in Bali.
This is the situation at this moment.

If I can calm down after a while, please come to Bali for your next overseas study tour!!!

7) Scenery with Aung San Suu Kyi

Arimura Gensuke
(Water Supply Network News, LLC)

The phrase "tumultuous world" has been a cliche for all times. However, even after the end of the Cold War, various fields such as economy, politics, religion, ethnicity and culture are intertwined and radically transformed, which directly links to daily life. In that sense, the present day is the time whose changes affect greatly even a single person. Domestic and foreign media conveys a large amount of information, but there are many things that cannot be understood without visiting the site. One of them is the situation in Myanmar. It was the top country I would definitely like to visit although I was worried about what and how much I could understand just because of a visit. My interest is Aung San Suu Kyi's position in the country.

No one else has been severely degraded its reputation in such a short time. She received more than 20 different awards and titles as "a symbol of Myanmar's democratization," and even received the Nobel Peace Prize. In a while, she was criticized in "her inaction and silence over Rohingya persecution". The awards were canceled and the titles were stripped one after another, and she was even brought up to the

international court. Those were led by European progressive and democratic groups and knowledge classes. So, what about real situation inside Myanmar? There were more signs of Suu Kyi in Mandalay than Yangon. According to the tour guide, Suu Kyi's supporters are more in "regions than Yangon, and women than men".As you can see in the photo, the scenery expressing supports for Suu Kyi at the front of the bus driver's seat was also interesting.

As my individual affairs, I had been able to achieve my desired visit to Myanmar since I canceled it in September 2016 with a high fever of 39 degrees the day before my visit to Myanmar. I would like to thank everyone, including Mr. Yariuchi, who made all the arrangements. ～＊～

Investigation on improvement of community water supply in Thailand -Study meeting notice-

WaQuAC-NET study meeting was planned in March, however, the meeting was postponed due to COVID-19. Lecturer Dr. Ishibashi briefly summarized the contents as a trailer for the study meeting. The study session will be scheduled again according to his temporary return schedule, so please stay tuned! (WaQuAC-NET Office)

Professor Dr. Y. Ishibashi
Khon Kaen University,
Faculty of Public Health

＜ Current state of the community water supply [1-3] ＞

The Thai Ministry of Public Health ordered in 1990 to improve community water supplies. The Decentralization Act was established in 1997, and in 1999 a decentralization law was enacted. Community water supplies were also involved in these. Then, in 2005, village water laws and committee rules were enacted, laying the foundation for community water improvement.

Water supply in Thailand is divided into MWA (Metropolitan Waterworks Authority), PWA (Provincial Waterworks Authority) and Local Government. Local Government manages community water supply and village water supply in the districts and sub-districts of Province. In terms of customer satisfaction with each water supply, MWA is 96.5% and PWA is 80.0%, while Local Government is 56.7%, which is low. Therefore, it is necessary to improve the way of water supply.

The size of the water purification plants in the villages is about the size of a small water supply in Japan. There are three types of water purification plants, each of which has its own water purification facility design guidelines. All are standardized with the same design (Fig. 1, 2). In addition, the water purification plants are

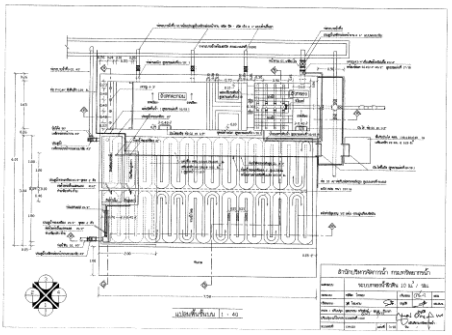


Fig. 1 Design drawing (top view)

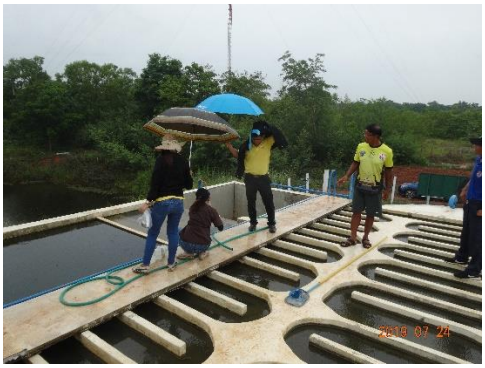


Fig. 2 Actual water purification plant

designed to be able to inject chlorine and backwash, and it is impressive that they are compact and well designed.

However, tap water quality is not good. Based on data from a water purification plant in a village in Khon Kaen Province by REO10 (Provincial environmental office; a branch office combining the Ministry of the Environment and the Ministry of Land and Infrastructure), it was checked whether the water quality met the standards set by Thailand. As a result, there are many inconsistencies in turbidity, color, iron, and manganese in checking for compliance with Thai water quality standards. Extensively, total coliforms bacteria (TCB) and fecal coliform bacteria (FCB) are unsuitable in two-thirds of the 30 surveyed water purification plants. In addition, residual chlorine has not been detected in most water purification plants. Symptoms such as gastrointestinal infections are collectively referred to as acute diarrhea, and there is no indication of disease names such as cholera and typhoid.

Furthermore, the website that distributes information on Khon Kaen Province shows video of villagers' requests and complaints about water supply[4]. In the quality of tap water, 70% of tap water is not appropriate. For example, there are concerns such as yellow color, very high turbidity, and odor of earth. Moreover, there have been reports of dissatisfaction with local governments that villagers will not respond to any petition.

Many of our water treatment plants were dirty during our inspections (Fig. 3). In operation, for example, raw water is directly added to the flocculant, and the solution is poured into the flocculation basin (Fig. 4). It is said that this method had been used before 1990, but the managers of water purification plants do not have a concept of the optimal injection amount. Ammonium aluminum sulfate is frequently used as a coagulant.

It is strange that flocks are formed in the manner described above. Is this flocculant considered to have a wide flocculable range? In other words, the managers who should properly manage the water purification plants in the villages are currently purifying water without knowing the purification theory and the proper operations. Against this background, we are keenly aware of the need for managers to know the correct water purification theory and to train proper operations. This has been a major motivation and objective for the project. If this goal is achieved, we believe that safe tap water can control the diseases before the villagers visit the medical institution, and that it will provide the villagers with a well-being life.

Fig. 3 Water purification plant full of garbage

Fig. 4 Flocculation in reality

On the other hand, water source has to be careful. The water source of Khoksi, the model district of the project, is Loeng Lake. Cattle, buffaloes, horses, etc. are grazed on the lake

shore, and the pollution load of nutrients with rainfall is immeasurable. There are also pig houses and chicken houses nearby. The wastewater from these livestock barn is treated and is said not to flow directly into the lake. But, we need to confirm the facts. In the lake, *Cylindrospermopsis raciborskii* is abnormally grown. However, no significant eutrophication has occurred since 2012. On the other hand, the water source of Nong Toom is a river (canal), and the turbidity is said to fluctuate greatly.

＜Set up of the project＞

Set up of the project was an unexpected encounter. Ms. Keiko Yamamoto, Mr. Shinichi Sasaki and former MWA Ms. Siwilai Kitpitak held “Trip to Thailand and Cambodia for deepening membership” in 2018. On that occasion, I asked them lectures at Khon Kaen University, Faculty of Public Health (PH-KKU). At the Khon Kaen Airport for pick-up, the accidental meeting of Mr. Yamamoto's group and Ms. Wasana Watanakol, director of RTC2 (Regional Training Center 2 Khon Kaen of PWA), triggered the project setup. Ms. Wasana was involved with Mr. Sasaki and Ms. Siwilai at NWTTI.

The background of the encounter is described in detail in WaQuAC-NET Newsletter, Vol. 37. Ms. Wasana is also mentioned in WaQuAC-NET Newsletter, Vol.37. I myself also wanted an opportunity to contact RTC2. However, until then, there was no exchange between PH-KKU and RTC2, and this meeting triggered the relationship between the two.

Then for a year, at a seminar at RTC2, I complained about the plight of the village water supply and prepared with Ms. Wasana. In February 2019, a MOU was finally signed between PH-KKU, RTC2 and REO10. Furthermore, in May of the same year, a project “Collaborative research on improvement of water supply in rural communities of Thailand: Khoksi and Nong Toom Sub-district, Khon Kaen Province” has started. After that, Mahasarakham University (MSU) Faculty of Environmental and Resource Studies of the neighboring prefecture, Regional Health Center 7 (a branch agency of the Ministry of Health in Thailand), and Khoksi Tambon Administrative Organization and Nong Toom Subdistrict municipality as local governments were joined, the project was organized. In addition, KKU and MSU students also assisted with questionnaires and experiments.

The project members met once a month to explore the activities and methodology. Moreover, Khoksi and Nong Toom above, which are about 20 km from Khon Kaen, were selected as model districts, and the members have repeatedly visited for inspections. Meanwhile, students have begun research and experiments to improve water supply.

＜Contents of the project＞

The contents to be implemented have been set for the execution of the project. The items are shown below.

Items to be implemented

1.1 Items as research / survey

－Understanding the quality of raw water and finished water

－Search for appropriate water purification operations

－Economics and management

－Questionnaire survey

－Create a manual for proper operations and management

－Evaluations of improved water supply

－Establishment of a method to spread water supply improvement method

1.2 Items related to training

－ Acquisition of water purification theory and

appropriate operations
- Aftercare

1.3 Holding workshops and seminars

The project is not limited to the operation inside the water purification plant, but rather the whole water system. Therefore, water distribution systems, leaks, and costs are also being considered. On the other hand, the questionnaire interviews villagers' opinions on water supply and their thoughts for improving their lives.

One year has passed since the conclusion of the MOU, and project members are now able to train village water purification plant leaders. The first attempt will take half a year from now.

RTC2 said that the number of managers should be around several, considering the labor of the staff in charge. However, there are already 14-15 leaders in the model district who want to participate.

＜Future challenges＞

The project was set up with the aim of providing "safe tap water" to the villagers, rather than the water supply in the metropolitan area and local big cities. Universities, PWAs, branch offices and local governments worked together to find out the basics and methods, and the project members have now trained the village water purification plant managers.

On the other hand, the questionnaire survey for better water supply management in villages, improvement of living environment of water supply villagers and enlightenment of hygiene concept has already been completed, and the results of analysis are awaited. We have also begun training and preparing manuals for proper water purification operations.

There are currently two model districts close to the university. If this method (KKU method) improves the water supply in villages, we hope to spread it from Khon Kaen province to the Tohoku region (Isan region) and all over Thailand in the future.

After the COVID-19 Pandemic has subsided, and at the upcoming WaQuAC-Net workshop, I will be able to make a concrete report based on the training results. However, training has also been postponed.

Training does not end in six months or once, but will take a long time to improve over time. Aftercare is also important.

Meanwhile, Saitama Prefectural Corporate Bureau concluded an agreement in December 2019 with PWA in Thailand and Laos with appropriate operations and management of water supply facilities.

PWA, which plays a part in our project, is involved in this conclusion. Therefore, I am watching JICA's business with interest.

References

1) Determining Plans and Process of Decentralization to Local Government Organization Act B.E. 2542 (1999), http://thailaws.com/law/t_laws/tlaw0070_6.pdf, Dec. 2019
2) Water supply in Provincial Area of Thailand, http://www.jwwa.or.jp/jigyou/seminar_file/forum_02_05.pdf, Dec. 2019
3) Warintorn Manoworn, Yanyong Inmuong and Uraiwan Inmuong: Assessment of Water Quality at Water Supply Plant in Sawathee Sub-district, Khon Kaen Province , KKU Journal for Public Health Research ,6 ,181-190 , 2013 (in Thai language)
4) Khon Kaen Link: www.khonkaenlink.info/home/news/8906.html#.XVO0hKf5VXU.facebook, Sept. 2019

～～～～～～～～～～♪♪♪♪

Interview with Mr. Innocent (Rwanda)

～～～～～～～～～～♪♪♪♪

Mr. Innocent Kayinamura, a counterpart of "Project for strengthening operation and maintenance of rural water supply systems in Rwanda", visited Japan to participate in JICA Group Training Course (Oct-Nov.2019). He works closely with Mr. Igarashi, who is a member of the Project as well as WaQuAC member. Since the training was conducted in JICA Kyushu (in Kitakyushu City), Mr. Igarashi visited Kitakyushu, and together with Mr. Kagata, WaQuAC member in Kitakyushu, interviewed with Mr. Innocent, . (WaQuAC-NET Office)

Mr. Innocent Kayinamura works as District Water and Sanitation Support Engineer in WASAC (Water and Sanitation Corporation). We interviewed him 2 times about JICA training and life in Japan at the middle and end of training.

Q1: What kind of work are you doing at WASAC?

I am engineer, in charge of water and sanitation in rural area, especially in Gatsibo District, one of the District in Eastern province. Water supply systems in rural area are managed by private operators, WASAC is supporting Districts and private operators in rural area. But water supply systems in urban area are managed by WASAC itself. I support district authority and staff to do management, planning, designing and supervision, also monitoring the project. First of all, I conducted mapping water supply systems for those purposes since July 2018.

Q2: What do you expect from the training?

I have expected that I could learn how to manage waterworks in Japan, what kind of technology they use, how to manage waste water and solid waste. I'd like to share the experiences with other countries trainee participated in this training.

Q3: What is the most useful or interesting training so far?

I am interested in Japanese water purification technology. I learned about BCF (Biological Contact Filtration) that removes impurities in raw water by contacting microorganisms and raw water. It was surprising that the granular activated carbon used in BCF can be used semi-permanently if it is properly cleaned regularly.

And I also learned about slow sand filtration. I thought these BCF and slow sand filtration method could be applied in Rwanda. In others, I learned;

- Technology for shallow and deep well water and the purification method of ground water.
- How to do maintenance of borehole in case of broken and rehabilitation.
- How to design small scaled water system. First of all, I have to know size of population, then to know raw water quality, to choose the best purification method.
- How to treat sea water (Salinity)

Q4: How is your life in Japan?

Rwanda has a maximum temperature of 32.8 °C, and when it is cool, it is around 11.1°C. Climate in Japan now is similar to cool season in Rwanda, so I feel now it is neither hot nor cold and comfortable.

Japanese life is very comfortable, and the food is delicious. Japan has the same food as Rwanda. The way of cooking is different from Rwanda, but chicken, fish, rice are delicious. But I can't eat raw fish sashimi. About the fruits, apples are especially delicious.

I also stayed some time in Tokyo. Tokyo people is very busy compare to Kitakyushu, Kitakyushu people is more socially. But Tokyo is a capital

city, it has many things for shopping, especially, electronic products are cheaper.

Q5: What is your favorite thing in Japan? And what is the most impressive thing?

First day I was very surprised that tap water is drinkable. Garbage disposal system in Japan which is sorted by type such as paper, cans and bottles, is very interesting. It is also impressive that how they care the people, Japanese culture and architecture like shrine. When sleepy, Japanese music is very comfortable, can relax it's like cradle song

It is impressive that the Kanmon Strait has two routes for motor vehicle of bridges and a submarine tunnel. The tunnel has a two stories structure, the lower part is a walkway for pedestrians. We walked to Shimonoseki Honshu through the tunnel. It was very impressive to walk under the sea.

Q6: Now training is almost ending. Can you explain about your action plan?

My action plan's target is strengthening of operation and maintenance of borehole in Gatsibo district. My plan's duration is 2 years. First, an expert shows how to repair borehole to the communities, then let communities practice to repair borehole. Engineers should also come and check boreholes at least twice a year to maintain and replace parts. Every district should have a supplier.

I also have some challenges. It is quite difficult to find spare parts sometimes. There is also lack of expertise for O&M work – repair, rehabilitation. We have no enough information for borehole. I already mapped piped water systems, but I also need to survey inventory data of borehole for proper planning. My biggest challenge is financial issue. My action plan does not include financial situation, I will include budget after discussion with my organization. First of all, I need to present my action plan to management of WASAC and district to get approval.

(Written by Mr. Igarashi)

After dinner (from left, Mr. Innocent, Mr. Igarashi and Mr. Kagata)

New member!

Kimura Ryota

Nice to meet you. I am Ryota Kimura, a member of Earth System Science Co, LTD. I am currently working in Sudan as a member of Project for Strengthening Capacity of Institutional Management, Operation and Maintenance in State Water Corporations. My encounter with the water sector was Japan Overseas Cooperation Volunteers (JOCV), in which I participated in 2017. Before that I worked in beverage sales. I think that my previous job is connected to the present in the sense that I have been involved in water, which is essential for life and health. At the time of JOCV, I worked at White Nile State Water Corporation (SWC) in Sudan as a member of Community Development, Water Security Action Team (W-SAT). My main activities were Training management support for SWC staff at the Training Center, support to enhance communication between SWC and customers in Public Relations Unit and support from SWC in cooperation with JICA technical support project. In my activities, I always valued the initiative of SWC and I was aware of activities that only the SWC staff could work on even after my term was over. Due to the worsening political situation in

Sudan, I had to return Japan in April 2019, about six months remaining term. I was disappointed with this, but I am glad that I returned to Sudan again as a project member and had the opportunity to contribute to Sudan's water.

Currently, as a project member, I am keenly aware of the lack of knowledge and experience. I want to learn a lot from the knowledgeable and experienced people at WaQuAC-NET, and I would like to actively participate in the event. I look forward to seeing you all.

JOCV activities in Sudan

General meeting 2020

The 2020 Generall Meeting of WaQuAC-NET was held on Feb 5, 2020 in Tokyo with the participation of Mr. Arimura, Mr. Igarashi, Ms. Ohno, Mr. Kagata, Ms. Kamegai, Mr. Kuroda, Mr. Sasayama, Ms. Yamamoto, 8 members in total.

1. 2019 activity report : In 2019, 16 events were implemented, in which 130 members participated from overseas and Japan in accumulated. As a main event among them, mini-lectures were conducted 2 times in April and October with topics of "GIS in water supply" and "comparison of capacity development project in Cambodia and Sudan" respectively. In June, we finally realized site visit to Ishinomaki City, affected by the Great East Japan Earthquake, to understand the situation of reconstruction; with participation of five members, three from Tokyo area, one from Sendai and the other from Ishinomaki. We realized the difficulty of reconstruction in a new town that was shielded from sea by a tide embankments as high as 10m, and the reality that the residents did not return easily. In September, we discussed the future technical cooperation with MWA, Thailand and received a donation of USD 10,000 to confirm the strength of the cooperation with the MWA for 10 years. In December, WaQuAC-Net organized a Myanmar tour for the first time with 12 participants, visiting water facilities in Yangon and Mandalay and having talks with the staff.

As of Feb. the number of our members came to 166 members in total by an increase of 21 members from last year; 93 overseas and 73 Japanese members.

2. 2019 Financial Report: We asked Mr. Sasayama to be a financial auditor, and had a comment that we should not expense travel support allowance of site observation to each participant because those are an individual study opportunity for them while we pay it for a lecturer or attendee of meeting. Based on this comment, we decided to follow this policy in principle from this year.

3. 2020 Activity Plan: As for study meetings and gatherings, in addition to the regular Kyushu branch general meeting and Osaka gatherings, project report from Dr. Ishibashi, who is appointed to Khon Kaen University in Thailand,

(From left) Arimura, Kamegai, Ohno, Sasayama, Yamamoto, Kuroda, Kagata, Igarashi

jointly implements technical assistant project for local water facilities in Khon Kaen with PWA Khon Kaen (scheduled for March, but postponed due to signs of COVID-19 epidemic; instead, see summary on page 7 of this newsletter), report session of expert returning from Nepal, and report session of expert returning from Myanmar. We plan a mini-talk study meeting "About Water Charges". Moreover, expert will be dispatched to Thailand MWA and Khon Kaen in November. We continue support for overseas members staying in Japan; the former Kanagawa Overseas Technical Trainee's presentation at the Japan Society on Water Environment (cancelled due to new coronavirus). We plan to support trainees in Kanagawa prefecture, and JICA-Tokyo Univ collaboration program international students and JSD international students.

After the meeting, participants had a report about the Myanmar tour while drinking and eating as a New Year's party, and had discussion about rural water supply. This time was a serious New Year's party like never before. For details of the Myanmar tour, see page 1.

(Yamamoto, WaQuAC-NET Office)

Year-end party 2019

On December 24, a year-end party was held at a Japanese restaurant in Tokyo. There were 22 participants; which is the most participants other than the Osaka meeting since the beginning of WaQuAC-Net. At the venue, tables were lined up in a very narrow room. I couldn't see who was on the edge, but time passed so fast while everyone found the people their wanted to talk each other and exchanged information.

The participants includes 10 guests from 6 countries; Ms. Be (Thailand) of Kanagawa Overseas Technical Trainee, Mr. Chenda (Cambodia) of JDS Scholarship student in Toyo Univ., and 8 students of Tokyo Univ. scholarship program; Ms. Ei, Ms. Khaing and Ms. Nwe (Myanmar), Ms. Kai (Laos), Ms. Kounthy (Cambodia), Ms. Tiasti and Ms. Indrastuti (Indonesia), and Ms. Arati (Nepal). Japanese members are 12; Mr. Igarashi, Mr. Uemura, Ms. Ohno, Ms. Kamegai, Mr. Konno, Ms. Kuniyasu, Mr. Sasayama, Mr. Saiki, Mr. Shichijo, Mr. Nakanosono, Mr. Matsumoto, and Ms. Yamamoto. Participants are also nice balance in the gender; 13 females and 9 males. I was released

I'm glad we all arrived. Let's do this again! It's difficult to get everyone in one photo, so find yourself somewhere in the three photos.

(Yamamoto, WaQuAC-NET Office)

Question & Answer Corner

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

Q: Recently, water level of the river has dropped, because of no rain, and seawater has risen up the river and reached to the intake. Consumers complain that the tap water is salty. What measures against above problem has been taken in Japan? (N.M. Thailand)

A: In Japan, many big cities near the coast prevent seawater from going up a river by the construction of estuaries dams. However, when the river is used to transport various objects and people, it is difficult to build an estuaries dam. Another measure is to relocate the intake point to upstream where salt water does not influence. However, it can be also difficult in some cases, so I introduce three cases implemented in Japan for reference.

Construction work of the temporary soil dike in Kuji River

1. Example of constructing a temporary soil dike only during drought

The water utility in Hitachi City takes water from two sources, the Kuji River and the Juo River, and treats them separately. The intake point of the Kuji River is 4.3km upstream from the river mouth. Under the influence of recent abnormal weather, the river water level drops during low rainfall and seawater goes up and reaches the intake. In that case, the water utility stops water intake temporary. If such a situation is prolonged, they construct a temporary dike on the downstream side of the intake to narrow the river width for strengthening the flow from the upstream and prevent seawater from running up. Furthermore, stable water supply is ensured by partially utilizing water from the Juo River system.

(*Quoted from Hitachi City Water and Sewerage Business Management Strategy 2018)

2. Example of using electrodialysis*1 (ED)/ electrodialysis reversal*2 (EDR) method

In the case that people have to use salty groundwater (brine) for drinking, because of no other water source, electro dialysis (ED) method are used in small islands in Japan. According to the reference (2013) of Ministry of Land, Infrastructure, Transport and Tourism (MLIT), ED has been used at 8 water supply facilities (100m^3/d and more) to lower high concentration of chloride ion, hardness, nitrate/nitrite nitrogen in groundwater. Their sizes are small, ranges from 125 m^3 /d to 3,300 m^3 /d.

Oshima-Town (Island), Tokyo has used relatively large-scale ED facilities in Kitanoyama WTP (ED capacity was 2,780m^3/d, installed in 1988) and in Nambu WTP (ED capacity was 1,640m^3/d, installed in 1993). However, due to the elapse of the service life, the two facilities have been replaced with electrodialysis reversal (EDR) which was an improved system of ED in 2011.

Water treated by EDR has been mixed with other well water and distributed.

3. Example of using reverse osmosis (RO) membrane method

According to the reference (2013) of MLIT, there are 40 water facilities (100 m^3/d or more, since 1989) which treat seawater and brine water by RO membranes in Japan. And 80% of them have production capacity of less than 1000 m^3/d and 8 facilities exceed 1,000 m^3/d. The Chatan Water Treatment Plant in Okinawa Prefecture and the Fukuoka District Water Treatment Plant in Fukuoka Prefecture desalinate seawater. The capacity is 40,000m3/d and 50,000m^3/d respectively. Both capacities are the largest class in Japan.

1） Desalination case of brine groundwater

In Irabu Island, Okinawa Prefecture, Irabu WTP treated 10 groundwater wells by two methods. One method was slow sand filtration + chlorination and another was slow sand filtration + low pressure reverse osmosis membrane + chlorination, since some of 10 groundwater wells had high concentration of chloride ions and evaporation residues. And treated water by two methods are mixed and 3600m3/d treated water in total was supplied to people from 2000. However, in 2015, when the Irabu Bridge was newly constructed between Irabu Island and Miyako Island, the water distribution pipe was attached to the bridge. Water treated in Miyako Island has been sent to Irabu Island. Now, the RO membrane facility is not used but kept for future use.

**Quoted from 2010 Outline of water supply in Okinawa Prefecture, Miyako Mainihi newspaper H.P.*
2015 (website)

2) Desalination case of seawater

The desalination facility in Fukuoka City started operation in 2005 as a measure against drought. The water intake is 640m off the Genkai Nada Bay, and the seawater is filtered by the sand and gravel filtration facility constructed at the bottom of the sea. The filtered seawater is sent to WTP and the microorganisms and ultrafine particles are removed by pretreatment (UF membrane). Then the pretreated seawater is desalinated by the high-pressure RO membrane. The boron concentration in some of the desalinated water is reduced by the low-pressure RO membrane. Then all desalinated water is added with minerals and mixed with safe water which treated the river water.

The wastewater of the high-pressure RO membrane is discharged into the sea together with the sewage treatment water to reduce the salt concentration, and the wastewater of the low-pressure RO membrane is returned to the UF membrane facility.

**Quoted from Seawater Desalination Plant in Fukuoka Area, Mr. Mutsuro Yuji (web site)*

(Information by Mr. Arimura, quoted and edit by Yamamoto)

Introduction of new members

- Mr. Kimura Ryota (Japan)
- MUGWANEZA Vincent de Paul (Rwanda)
- Nwe Nwe Zin （Myanmar）
- UMUHOZA Marie Grace (Rwanda)

We welcome new members anytime
Please contact us

WaQuAC-NET Newsletter Vol.44
Issued on April 15, 2020
WaQuAC-Net Office
E-Mail; waquac_net@yahoo.co.jp
(Yariuchi, Yamamoto)
URL: http:/www.waquac.net/english/index.html

Next Activity

June 15	Newsletter vol.45 in Japanese
July 15	Newsletter vol.45 in English