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## Question & Answer Corner

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

**Q:** I live in a city of India. I am thinking of using rainwater because the water supply is insufficient. I heard that rainwater has been used in Japanese big cities. Please let me know a good example of using rainwater.  
(Ms. N.S, India,)

**A:** Rainwater is an accessible water resource that can be used, and it also has the effect of controlling runoff (inundation and flood prevention) by storing rainwater. It is necessary to further promote the use of rainwater as one of the methods for effective use of water resources. (Quotes from "Let's start using rainwater!" by Fukuoka Prefecture)

Mr. Hiroto Oda, who contributed to the water shortage countermeasures at the Fukuoka City Waterworks Bureau, answered on the use of rainwater in Fukuoka City. (Yamamoto)

### 1. Use of Rainwater in Fukuoka City

#### 1) Background

Fukuoka City experienced an unprecedented drought in 1978. As a result of the abnormal drought, the 287-day water supply restriction reminded citizens and governments of the value of water and the harshness of water conditions.

Based on the lessons learned from this drought,

Fukuoka City established "the Outline of Measures for Economical Water Use in Fukuoka City" in 1979. And for "stable water supply", water source development and efficient water operation management have been strengthened. In addition, we have promoted the development of water-saving city (1, effective use of water, 2, water-saving measures). As one of the effective uses of water, we have been promoting and spreading "non-portable water supply system<sup>\*1</sup>" through water cycle and reuse of treated sewage water (including complementary rainwater utilization) for large buildings, etc. However, considering the unstable rainfall situation and the increasing population, it was necessary to further promote "water-saving city development".

Therefore, we reviewed the guideline and enforced the "Fukuoka City Water Saving Promotion Ordinance" for the first time in Japan in 2003. We are working on all measures for "effective and

rational use of water with the understanding and cooperation of the citizens about "use water wisely" and "water resources are limited".

2) Outline of rainwater use in Fukuoka City

The aforementioned "**Fukuoka City Water Saving Promotion Ordinance**" obliges the installation of "non-portable water supply system" in the target buildings with a total water saving areas\*2 of 5,000 m<sup>2</sup> or more.

As of the end of 2017, rainwater and groundwater are used as non-portable water supply system in combination with reclaimed wastewater in Fukuoka City. There are 323 individual circulation type facilities and 443 wide area circulation type facilities, and the latter receives part or all of reclaimed wastewater from the "Fukuoka City Reclaimed Water Project".

Facilities that use rainwater in Fukuoka City are schools, corporate / commercial buildings (Canal City Hakata, etc.), civic centers, hospitals, baseball stadium (Fukuoka PayPay Dome), station buildings, etc. There are 51 public facilities, 113 private facilities and total 164 facilities. The total capacity of water storage tank is 42,071m<sup>3</sup>.

In addition, Fukuoka City has a subsidy system for the installation of rainwater storage tank in each house in order to use rainwater effectively and control outflow.

(Answerer: Mr. Hiroto Oda, former Fukuoka City Waterworks Bureau)

Notes

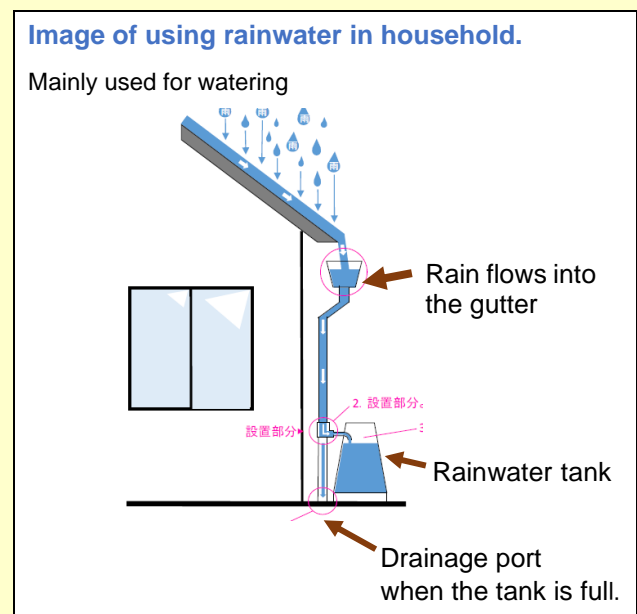
\*1 Non-portable water supply system: A facility that supplies reclaimed wastewater and/or rainwater for flushing toilets other than beverages, watering parks and plants, cleaning buildings, etc., and is supplied with lower water quality than water supply.

\*2 Water-saving areas: excluding apartment houses, dormitories, warehouses, parking lots, etc.

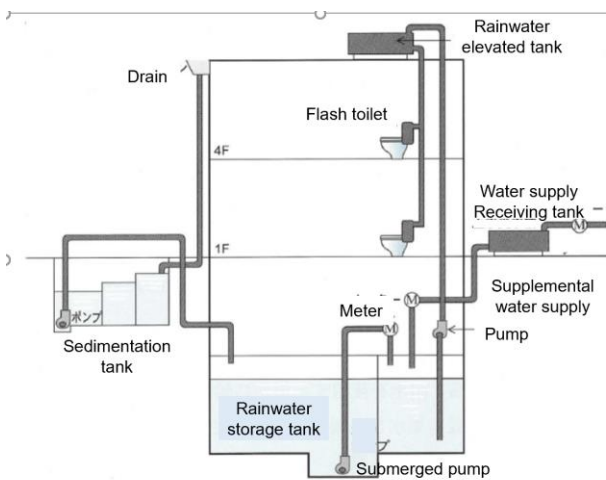
**2. Examples of rainwater use in Fukuoka City**

(References provided by Mr. Oda)

Fukuoka Prefecture has published a booklet collecting the cases of rainwater use called "Let's start using rainwater". The followings are extracted from it.



**Image of facility using rainwater in the building.**



\* In order to prevent cross-connection with other pipes, pipes for non-portable-water should be taken necessary measures to be distinguished from pipes for other purposes such as water supply pipes.

**○ Fukuoka PayPay Dome**



A multi-purpose dome that can be used for various events such as concerts and exhibitions in addition to baseball. A

single event can have 40,000 to 50,000 people.

Opening: April 1993

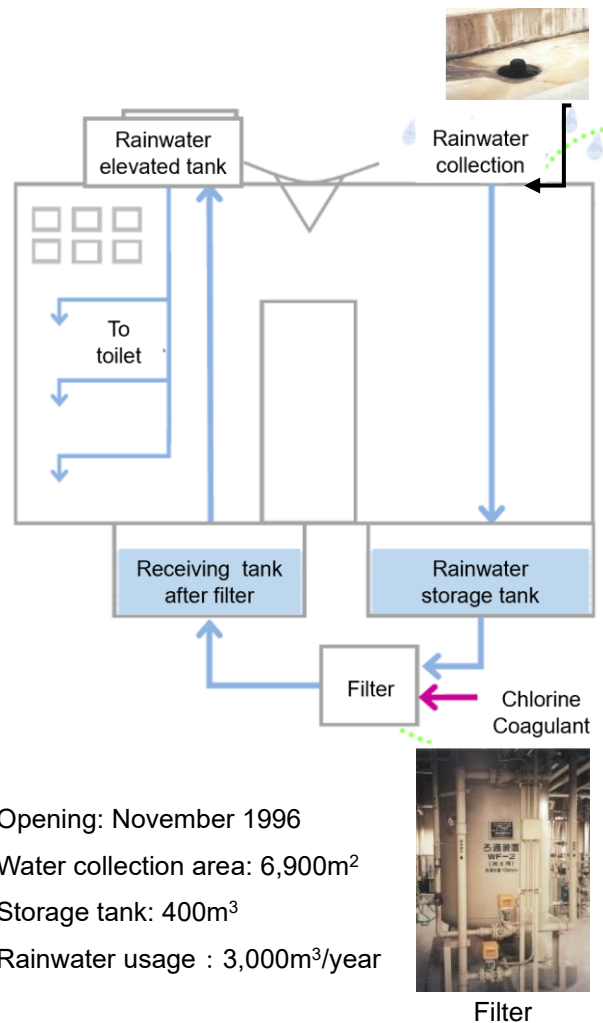
Water collection area (dome roof): 32,000 m<sup>2</sup>.

Rainwater storage tank (underground): 2,900 m<sup>3</sup>

Rainwater usage (flush water for toilet and planting): 30,000 m<sup>3</sup> /year.

**○Clover Plaza (Kasuga City)**

A complex facility in Fukuoka Prefecture that has many functions such as a multipurpose hall, training rooms, and a fitness room. Rainwater that has fallen on the roof is stored in an underground storage tank, and after treatment, it is once pumped up to the rooftop rainwater elevated tank, and from there it is used as flush water for toilets on each floor by gravity.



Opening: November 1996

Water collection area: 6,900m<sup>2</sup>

Storage tank: 400m<sup>3</sup>

Rainwater usage : 3,000m<sup>3</sup>/year

**3. Drinking water use of rainwater in Japan**

The use of rainwater is increasing in Japan. But most of them are used for flushing toilets (equivalent to about 25% of household water usage) and watering to garden, for reducing the use of tap water and save money.

However, the number of condominiums installed a purification equipment for drinking water is

increasing for preparing water suspension in the disasters such as typhoons and earthquakes which occurred frequently in recent years. Rainwater is used for toilet and watering with a simple treatment in normal times, and in an emergency, it is used for drinking water for residents using purification equipment.

Generally, rainwater has good quality, but at the beginning of the rain fall, it contains a lot of impurities such as dust, dirt, and etc. in the air and on the water collecting surface (roof, rooftop floor). It is better to store rainwater except for the rain at the beginning of rain.

difference in rainfall depending on the season. In some countries, there are two seasons, the dry season and rainy season in a year. Dry season has no rain, in some case, it does not rain for half of the year. In addition, the amount of rainfall changes from year to year, and the change has become remarkable especially in recent years because of the effects of global warming. Such instability of water intake can be said to be the big weak point as a water source for domestic water. Therefore, in the case of Japan, because there are several other water sources, it can be said that direct use of rainwater is only used as a supplemental water source so far.

(WaQuAC-Net Office: Yamamoto)

The problem with rainwater is that there is a

### Report of 4th Webinar “Chlorine Next” The innovation project of MWA, Thailand

Date & time: 17:00 to 18:00 Japan, 15:00 to 16:00 Thailand, Cambodia, Laos, 14:30 to 15:30 Myanmar (online)

Presenter: Chlorine Next developing team of MWA (Metropolitan Waterworks Authority), Thailand

MC: Ms. Mina Yariuchi, WaQuAC-Net Office

This was the second webinar operated in English. The subject “Chlorine Nest”, introduced in [the newsletter Vol.46](#), is a mobile application developed by MWA. It is used to control residual chlorine in their distribution network. Some members of WaQuAC-Net were interested the topic in the newsletter and requested more information about it. Then the webinar was held with cooperation of MWA.

#### 1. Participants: 26persons from 6 countries

Ms. Nisapas Wongpat, Ms. Chaweepan Suangkiattikun, Ms. Weesuda Chaloeythit (MWA), Ms. Oranuch Tuntisitthikorn, Ms. Chonlathorn Teschim, Mr. Nithi Sainui, Mr. Tanut Chaiwisen, Mr. Piphat Boribannukul, Mr. Pathomphong Phannurat, Mr. Anusorn Kanchanangkun, Ms. Siriporn Sutipunya, Mr. Supawoot Tripasai (all are from Chlorine Next Developing team, MWA), Ms. THOR Kounthy (Cambodia), Phaimany SENGPHOUVONG (Laos), Ms. Ei Khaing Mon (Myanmar), Ms. Nwe Nwe Zin (University of Tokyo, Myanmar), Ms. Arati Shreshtha (University of Tokyo, Nepal), Mr. Hiroshi Hirowatari, Mari Asami, Mr. JIn Igarashi, Mr. Nozomu Hirai, Mr. Yoshinobu Ono, Mr. Kenji Nakanosono, Mr. Hiroshi Sasayama, Ms. Keiko Yamamoto, Ms. Mina Yariuchi (Japan)

#### 2. Opening remark by Ms. Nisapas Wongpat, Assistant Governor, MWA

She told that WaQuAC-Net is a good network to share experience and knowledge among waterworks engineers and “Chlorine Next” is an innovative mobile application to control and

monitor residual chlorine. She hoped that the information shown in the webinar could be useful to improve water quality of supplied water in many countries. After her speech, all the participants introduced themselves one by one.

### 3. Outline of presentation

Mr. Nithi Sainui, a member of Chlorine Next developing team of MWA, presented with the [slideshow](#).

MWA is a water utility belong to the national government, supplying water of 6 million m<sup>3</sup> /day to about 12 million people in the capital and neighboring provinces. It had a problem to control residual chlorine in 2,450 km<sup>2</sup> of their service area with only three treatment plants. Then, controlling chlorine concentration with boosting chlorine at 9 pumping stations via water quality integrated center and SCADA system had been begun. Residual chlorine at each pumping station was controlled in the range of 0.5 to 1.2mg/L of concentration to ensure more than 0.2mg/L of residual chlorine at any tap responding to WHO guidelines.

In 2018, MWA decided to introduce the mobile application of controlling residual chlorine with more frequent and faster determination of dosage. First, problems and users' requests were confirmed. Second, performance and security of MWA's network were investigated. Then the system was developed, tested, improved and applied in 7 months from 19 October 2018 to 18 May 2019.

This mobile application is a one-stop service including

all function to manage residual chlorine, into which residual chlorine concentrations and water treatment parameters are input. Water quality in distribution system is predicted and appropriate boosting chlorine dosage at pumping stations are calculated automatically. Then the dosage of boosting chlorine is decided, and the boosting pump is started. The report of dosing and water quality can be obtained from the system. These processes are operated with internet and MWA intranet.

[A movie](#) which introduces what "Chlorine Next" can do to customers was shown with English subtitle. An operator of a pumping station can set the chlorine dosage and start the feeding pump with a smartphone or a tablet. When chlorine boosting is started or dosage is changed, relevant staff receive a notification through LINE application. Water quality staff or managers can receive the report of boosting and water quality easily. Customers can see water quality information including residual chlorine at each monitoring point on the map of the service area.

Such decision and action took 1 hour with the old system and only 2 times of boosting was done a day. It is done immediately with the new application



and boosting chlorine can be done any times even in the night. As the result, frequency of lower chlorine concentration than the guideline value has been extremely improved from 8% to 3.1% in daytime and from 15% to 3.9% in the night time. More than 95% of one day ensure the guideline. The residual chlorine map before and after shows the great decreasing of area where average residual chlorine is less than the guideline.

Fruits of introducing this application:

- Innovation of residual chlorine control in distribution network
- Reduction of time to change boosting chlorine dosage from 30 min. to 2 min.
- Cutting 1.8 million Thai Bahts, about 58.4 thousand USD, of expense by decreasing overtimes of operators.

#### 4. Q&A

Q: Do you have English version of the application?

A: Sorry, only Thai version. It is distributed at Google Play Store now. We are developing another version for IOS.

Q: Can it be applied to other distribution network?

A: No. It is adopted to SCADA system of MWA and cannot work with different system.

Q: Boosting chlorine is set and started by an operator. Did you consider automatic setting and starting?

A: No. Only manual operation now.

Q: What relationship between SCADA system, which control dosing chlorine, and "Chlorine Next" application?

A: They are already integrated to one system.

Q: Can customers operate chlorine boosting by themselves?

A: No, only MWA staff can do it. Controlling log in is restricted with account and password. Customers can see water chlorine on line data and water quality prediction during drought.

Q: Is your system is related with GIS application?

A: Not yet. We are considering the linkage with GIS application in the future.

Q: Are there any facilities or equipment newly added for "Chlorine Next" system? If so, how much expense for them?

A: Nothing was added but only software development. So, no additional cost.

Q: The application is excellent including display images. Have team members developed all of the application?

A: Yes, team members from IT department have developed all.

Q: One year has already passed after the beginning of using the application. Do you have any improving points?

A: We'll consider more automated system with deep learning AI.

Q: When other countries' water utilities want to develop "Chlorine Next" like system, do you want to work with them?

A: Then our IT department will be consultants for such development.

The webinar was successfully finished with many questions and answers and some comments.

(Reported by Mr. Sasayama, GLP Auditor)

#### NOTICE

### 6<sup>th</sup> WaQuAC-NET Webinar "Introduction of Anti Salinity Tools "ANSAT" of MWA"

Date & Time: 28 April 2021 Wednesday

15:00 – 16:00 (in Thailand),

17:00-18:00 (in Japan)

We look forward to your participation in the webinar collaborating with MWA, Thailand!!

**The 5th Webinar  
“International Cooperation by  
Remote Access”**

The 5th WaQuAC-NET Webinar was held on 26<sup>th</sup> February 2021. The theme of Webinar was similar at the 7<sup>th</sup> Osaka meeting held in November 2020, but this time the target participants were expanded to all Japanese WaQuAC-NET members because this information was very useful for all.

The purpose of this webinar was to learn how to proceed the international cooperation under the COVID-19 pandemic through sharing some latest activities including problems, inventive ideas and lessons.

We invited 4 panelists who were involved in a technical cooperation by remote access, and 16 members participated in the webinar.

**■ Panelists (name, affiliation, target country)**

- Mr. HIROWATARI Hiroshi, Kitakyushu City Water and Sewer Bureau, Cambodia
- Mr. MATSUBARA Koichi, Nihon Suido Consultants Co., Ltd., Rwanda
- Ms. YARIUCHI Mina, JICA Expert, Myanmar
- Dr. KAMEGAI Yasuko, CTI Engineering International Co., Ltd. Sri Lanka

MC: Mr. ONO Yoshinobu

**■ Attendees**

Dr. ASAMI, Mr. OZAKI, Mr. IGARASHI, Mr. MORIYAMA, Mr. TSUJI, Mr. KIMURA, Mr. HAYASHI, Ms. KUNIYASU, Ms. OHNO, Mr. SAIKI, Ms. YAMAMOTO.

**■ Contents**

- Opening Address: YAMAMOTO Keiko
- Self-introduction of attendees

- Presentation from Panelists
- Q&A session
- Closing Address: YAMAMOTO Keiko

We hold a fruitful discussion after four presentations by panelists. The contents of the presentations are almost same as 7<sup>th</sup> Osaka Meeting, so please refer to [Newsletter Vol. 47](#) for the detail report of the presentation contents.

**■ Summary of Discussion**

It was confirmed that some overseas technical assistance could be carried out by remote, but some could be conducted only by face-to-face. there are several critical points to produce outputs with remote activities.

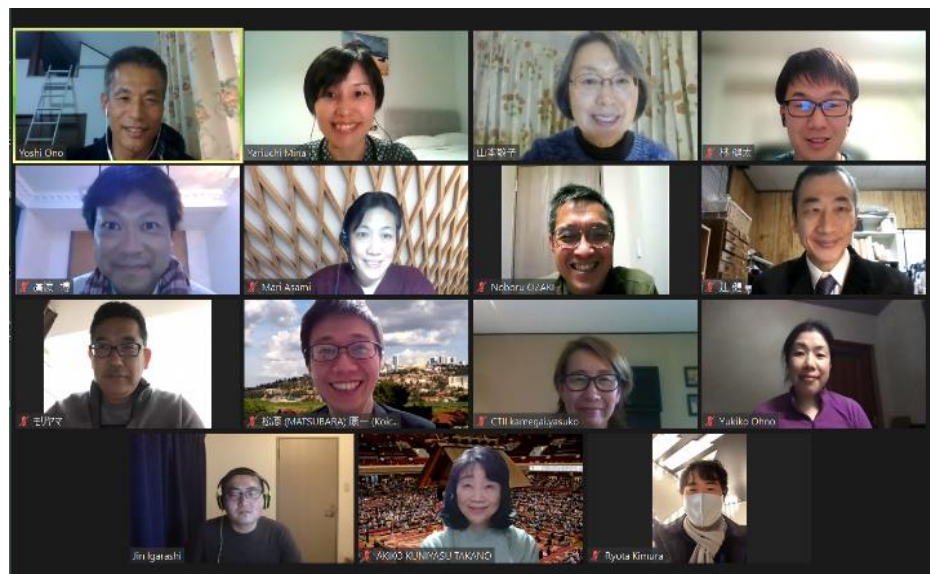
**1. Conditions of success**

Conditions to success of remote activities were summarized as follows.

- A good relationship with C/Ps has been already built.
- The person who is support side understands the local situation.
- There is a key person such as an expert or a local staff who is working at local site.

Panelists shared their experiences as follows.

- I was able to cope with even remote work because a relationship with C/P has been



already built due to end of the project.

- I was able to carry it out with remote because I finished investigation and understood the local site.
- One long term expert stays at site, and his follow-up to whole activities were effective.

**2. Examples of activity by remote access**

Panelists shared their experience of international cooperation by remote access. The specific examples are as follows.

- Regular and monthly meeting
- Investigation and design work
- Online training, etc.

**3. Disadvantage of remote access**

In spite of making a big effort, some disadvantages regarding activities by remote access are identified. The specific examples are as follows.

- It is difficult to conduct a technology and skill transfer through using the five senses by remote access.
- The technical cooperation cannot proceed only by remote access.
- It is difficult to keep motivation of C/P only by remote access.
- Contacts with C/P who is a management in particular are decreased.

**■ Conclusion of the webinar**

We confirmed that remote activities for international cooperation have some advantages even though there are various limitations. Under COVID-19 pandemic we started to carry out remote activities while making trial and error. We think that it is possible to achieve a higher effect by combining remote and local activities. Moreover, we think a remote activity is very useful especially for an occasional follow-up in addition to a local activity. As a conclusion we can partially do international cooperation remotely, but we actually want to meet C/Ps and work together.

You can see those presentation materials in Japanese on WaQuAC-NET website.

[http://www.waquac.net/pdf/data/international\\_cooperation\\_05\\_2.pdf](http://www.waquac.net/pdf/data/international_cooperation_05_2.pdf)

**H.E. Ek Sonn Chan,  
awarded by Japanese Government**

H.E. Ek Sonn Chan, former Director General of Phnom Penh Water Supply Authority, former Secretary of States of Ministry of Industry and Handicrafts, and current Minister Delegate Attached to Prime Minister/Vice-Chairman of CARD, Cambodia, was awarded the Order of the Rising Sun, Gold Rays with Neck Ribbon by the Japanese government in the Spring 2020 decoration for his longtime contribution to the development of water supply sector of Cambodia. As visiting to Japan for the ceremony was unable due to COVID-19, the ceremony will be held at the Embassy of Japan in Cambodia.



*(Picture; Government of Japan)*



*April 5, 2021, at Phnom Penh  
(Left) H.E. Ek Sonn Chan  
(Right) Ms. Mina Yariuchi*



**New Year's Party of  
WaQuAC-Net 2021**

A New Year's party took place online on January 20th. The participants were comprised of 12 international students staying in Japan, University of Tokyo and Toyo University, and 13 Japanese members from private companies and local governments, totaling 25 altogether. (Refer to the pictures below.)

**Opening**

Ms. Yamamoto, WaQuAC-Net Office, addressed the welcoming and opening of the party and explained the backgrounds, purposes, members and activities of WaQuAC-Net. Moreover, she hoped the guests enjoy the party and would be able to relax and interact with each other.

**Introduction**

The participants introduced their work and updates. We talked about our hope of meeting in person again after the pandemic. Moreover, Mr. Sugawara, living in Bali, gave the toast speech in which he wished for a better year with the coronavirus

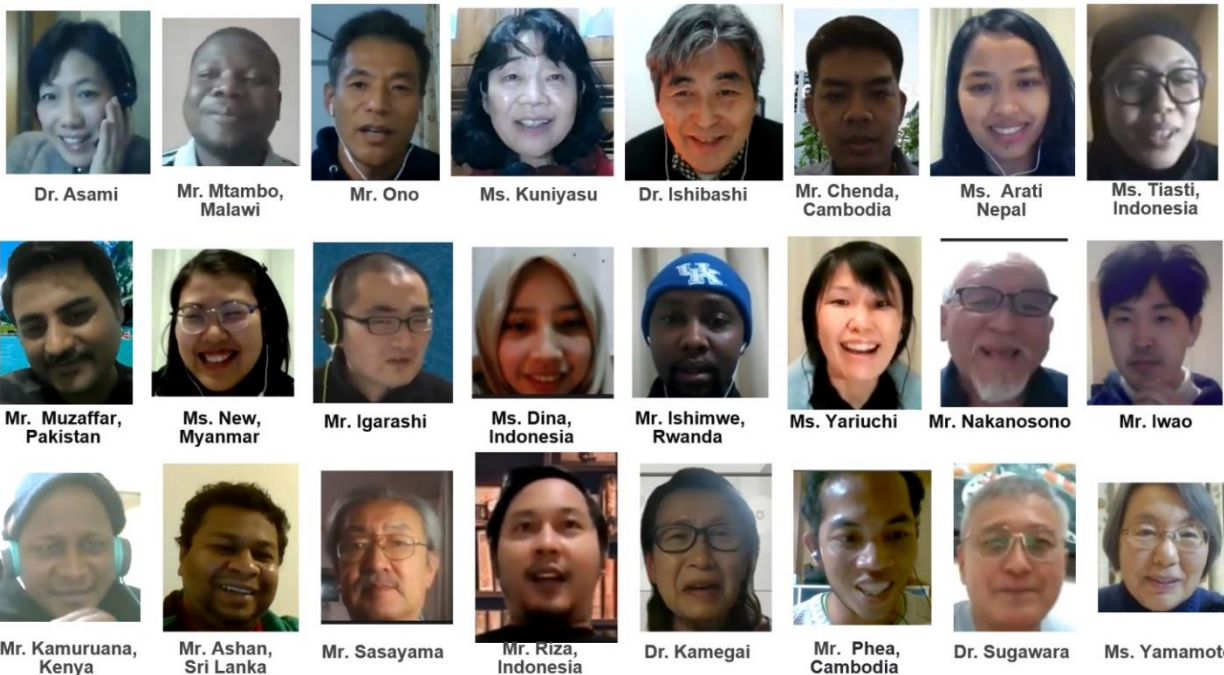
situation settling in, and for the happiness and health of the members. I felt the online meeting to be beneficial in that it enabled us to connect with each other no matter physical distance apart. Also, the names being displayed beneath their face is a helpful way to recognize them when we can meet in person.

**Quiz**

There were four rounds of quiz and the members, divided in 5 teams, enjoyed the challenge. The first question was the capital of Rwanda. All teams answered correctly, especially Mr. Ishimue who answered with particular ease, being the country where he lives surprisingly. The second was to choose the largest African country. The participants including those from Africa could not answer promptly and had differing answers. Thirdly, they had to name 7 fruits from the pictures. Some were unfamiliar and people were surprised to hear the answers. The final question was which country had the highest number of infected people with the coronavirus. We really had fun doing the quiz.

**Closing**

After the quiz, an active discussion began with an introduction of the GIS system by Mr. Igarashi,



talks on research by the international students and information of the water problems in each country. Finally, Mr. Sasayama called on the participants to clap their hands, so-called Ipponjime, and which was a fun closing to the party. Altogether, we enjoyed this great opportunity to get to know one another through the challenging quiz, while enjoying to eat and drink what we had each prepared for ourselves.

(Reported by Mr. Iwao Natsuki, Kyoto City Water Supply and Sewerage Bureau)

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**General meeting of WaQuAC-Net 2021**  
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This year's WaQuAC-NET General meeting was held online on February 5, 2021. There were 8 participants: Mr. Arimura, Mr. Sasayama, Mr. Ono, Mr. Saiki, Mr. Igarashi, Mr. Umeyama, Ms. Yamamoto, and Ms. Yariuchi. Documents for the general meeting can be found on our website.

<https://www.waquac.net/about.html> (see 3. Activity plan for this year, and 4. Activity and financial reports, available only in Japanese).

**2020 Activity Report:** The last face-to-face activity was a small farewell party for MWA trainees in March, and all activities have been online since then.

First of all, in April, we conducted a questionnaire survey targeting all members to collect information on the impact of COVID-19 and the member's expectations for WaQuAC-NET. Since there were many requests for online seminars, we made preparations and held 4 webinars and 2 regional meetings (Osaka and Kyushu) by December. The first webinar was "COVID-19 countermeasures of Japanese waterworks" (August), the second was "collaborative research on improvement of water supply in rural communities of Thailand" (October), and the third was "a cheap and easy way to utilize GIS for effective management of water utility"

(October), the Osaka meeting online lecture "international cooperation by remote" (November), and the 4th "Chlorine Next," an innovation project of MWA in Thailand (December). In addition, we held the Kyushu Branch general meeting, and a celebration for the completion of master's degree for international students from the University of Tokyo in September.

In addition to issuing the regular newsletter quarterly in Japanese and English, we published a special issue of COVID-19 Pandemic in Japanese and English, which summarized the results of the above questionnaire, for a total of five issues, focusing on timely information dissemination.

Although the activities were mainly conducted online, many participants appreciated the fact that the greatest strength of our network was apparently realized, that members could participate wherever they lived, they could see the faces of overseas members, and that they could easily participate.

**2020 Financial Report:** Planned overseas activities and dispatch of experts have been cancelled. The main expenses were the purchase of farewell parties and souvenirs for returning students, and the Zoom subscription for online activities. Membership fee payments were lower than in previous years.

**Activity Plan for 2021:** Online activities are predicted to continue. In addition to publishing the newsletter quarterly, and conducting regular activities such as the General Assembly, Osaka Meeting, and Kyushu Branch General Assembly, we will continue to hold online webinars and panel



discussions until the pandemic calms down. A total of about six webinars are planned for this year. We are looking for ideas and requests for member's

contribution to it, as well as help in organizing them, so please cooperate with us.

(Reported by Yariuchi Mina, WaQuAC-NET)

### **Special message**

#### **What can we do for our friends in Myanmar?**

On February 1, 2021, in Myanmar, the national military detained democratically elected Ms. Aung San Suu Kyi and other cabinet members and used military force to unilaterally establish a "government". In response, many people who oppose the military government have taken actions such as demonstrations and rallies every day throughout the country.

The military is shooting civilians to quell the action. This kind of use of force is unacceptable with any reasons.

WaQuAC-Net has Myanmar members and some of Japanese members have worked in Myanmar. In December 2019, we conducted Myanmar study tour and visited water supply utilities in Yangon and Mandalay. It is still a fresh and enjoyable memory for us to have interacted closely with the staff.

Watching the news of the military's atrocities against peacefully demonstrating people every day, we feel very sad and consider what we can do for the people. What kind of actions by which we can support them who won't stop protesting, even though many people have been killed by guns?

As a first step, we want to induct some activities against Myanmar "military" as follows. We also welcome your opinions and information about possible actions for them.

1) International NGO "Human Rights Now" is presenting a video message from Mr. SHIBUYA Zarny. <https://hrn.or.jp/activity/19765/>

2) "Group of Myanmar news now" is collecting the messages with photo and sending them to Myanmar people for showing our supports.

<https://www.facebook.com/groups/3842886239104820/permalink/3920987171294726/>

We hope that the situation in Myanmar will settle down as soon as possible and the citizens will return to their peaceful daily lives.

(WaQuAC-Net Office, Yamamoto, Yariuchi)

### **Introduction of new members**

- Ms. Khodseewong Sirapat (Thailand)
- Mr. Hirai Noaomu (Japan)
- Mr. Moriyama Tadahiro (Japan)
- Mr. Tsuji Takeshi (Japan)

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

### **WaQuAC-NET Newsletter Vol.48**

Issued on April 15, 2021, WaQuAC-Net Office

E-Mail; [waquac\\_net@yahoo.co.jp](mailto:waquac_net@yahoo.co.jp)

(Yariuchi, Yamamoto)

URL: <https://www.waquac.net/english/index.html>

#### **Next Activity**

April 28, Webinar "MWA Introduction of Anti Salinity Tools"

May21, Online panel discussion "Current situation of small-scale water supply in 3 countries"

June 15, Newsletter vol 49 in Japanese

July 15, Newsletter vol 49 in English