WaQuAC-NET Newsletter Water Quality Asian Cooperation Network **Vol.52**

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Report of the 8th Osaka Meeting

"An experience in water service sector of Nepal and future outlook"

Tomohiro Minami
Kagoshima City Hall

The 8th Osaka meeting was held on 28th October, 2021. Unfortunately, this year's meeting was also held on Zoom due to Covid-19 pandemic. We invited three panelists who have experience in Nepal. Twenty-three people attended from Asahikawa in the north to Kagoshima in the south. Contents of the meeting are as follows:

O- **Participants**

Host: Mr. Saiki, Mr. Fujitani (Friendship Party)
Panelists: Mr. Ozaki, Mr. Saiki, Mr. Minami
Attendees: Mr. Okada, Mr. Fujiyama, Mr. Fujii, Mr. Miyauchi, Mr. Yamaguchi, Mr. Inoue, Mr. Ono, Mr. Kagata, Mr. Sasayama, Mr. Kanno, Mr. Kiji, Ms. Seto, Ms.Takano, Mr. Tsuji, Mr. Hirowatari, Ms. Miyashita, Mr. Moriyama, Mr. Yokoyama, Ms. Yamamoto

O-**Presentations**

1: About experience of 2 years in Nepal

・Mr. Tomohiro Minami, Kagoshima City Hall (Former JICA Volunteer of Nepal),

2: Past and Present in Nepal

・Mr. Noboru Ozaki, Sakai City Waterworks and Sewerage Bureau (Former and present JICA Expert of Nepal)

3: Challenges and directions from my experience in Nepal

・Mr. Takashi Saiki, JICA Expert of Cambodia, (Former Expert of Laos/Nepal, former staff of Matsuyama City Public Enterprise Bureau)

Introduction of Mr. Minami

He is a runner likes trail running. During he was working as a JICA volunteer, his activity was mainly to reduce NRW in the Tansen City where is located on a small mountain in western Nepal. He worked mainly in the city's water supply which has difficult water distribution management due to the difference in elevation. I look forward to his continued activities at WaQuAC-Net, like he rushes through the steep mountains of Nepal.

By Mr. Takashi Saiki,
former JICA expert in Nepal

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O-**Outline of presentation**

About Nepal

Nepal is a least developed country with an average income of about $ 1,000 per capita per year. There are many mountains and it looks like a country rich in nature. But it is difficult to secure water resources in terms of topography and climate, and it hasn't changed much even after about 13 years. Possible causes include social conditions and lack of water.
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Situation of Water source and water supply

In many local cities including the capital Kathmandu, water is distributed by intermittent water supply, and even in the capital city, the frequency of water supply is about once a few days to a week (1.5 to 2 h/time). NRW ratio has an average 20% for Nepal as a whole (according to SDGs report published by the Government of Nepal in 2015), but it is estimated that it is about 40% by our perspective.

The quality of grand water is relatively stable, but arsenic was detected in some areas. And E. coli also was detected in the water sources by the sewage flowing nearby.

Water quality management status

We can see many situations where the residual chlorine concentration is not properly managed.
In local cities, devices that inject chlorine into water distribution pipes or transmission pipes are installed near the exits of elevated tanks,
but the staff don't repair after machine malfunction and I saw many cities where they put chlorine directly into the distribution reservoir.

Prospects for future water supply business in Nepal

Since rolling blackout hasn't held at the capital, and the Melamuchi project has been completed, we hope the water quality level will be improved after enough water secure for distributing
As the number of Nepali members is increasing, we expect to be able to tackle to improve the water supply situation in Nepal.

O- **Q&A session・friendship Party**

After the presentations, the attendees discussed actively with the panelists and enjoyed talking and drinking.

O-**Result of questionnaire**

We had 13 replies. It seems that there are many participants who has some connections with Nepal this time. Most of all reviews were favorable and our contents were fitted to their expectations. Major replies are as follows.
It was good opportunity to know current situation of Nepal including water supply.
It is hoped that time will be managed more appropriately.

O-**Impression**

I've attended first time to this meeting. And I'm pleased to have a valuable opportunity to give a presentation of my experience in Nepal and write a report of this meeting. Although it was held on Zoom, the scheduled time wasn't enough because everyone actively discussed and exchanged opinions on the water quality situation and water supply method in Nepal. And lastly the meeting was closed with online Osaka Ondo by Mr. Fujitani.
This time it was held on Zoom, so I think it was easy for people to attend. In the future, even after COVID-19 pandemic, if it's possible to attend in online along with the face-to-face meeting. I find it ease to attend more meetings because I live far away from the capital.
However, I felt that there are still issues when using it in the field of international cooperation. For example, how do we build the relationship with participants on Zoom, we will have to

Participants of the 8th Osaka Meeting

consider time schedule when participants live in different time zone and attend the same meeting From now on, I felt that we need to figure better method out that making good use of face-to-face and online benefits.

Lastly, I deeply appreciate to panelists and attendees. Especially Mr. Saiki took on host despite a presenter, and Mr. Fujitani took on host of friendly party. I hope the 9th Osaka meeting will be held face-to-face.

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WAQUAC-NET 2021 YEAR-END PARTY

23rd December
19:30~21:30

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The 2021 WaQuAC-Net Year-end Party was held by inviting special guests who were international students studying in the master's course of the University of Tokyo and Toyo University.

After the outbreak of COVID19 infection, the friendship parties have been held by the ZOOM method. However, it was pointed out that participants could not talk to each other, so new method, Spatial Chat was used for the Year-end Party. Guests were;

Ms. Mitria Widianingtias（Indonesia）
Ms. May Myat Mon (Myanmar)、
Mr. Sunti Chandaeng (Laos)、
Mr. Uwitonze Desire (Rwanda)
Mr. Christopher Gideon Gitonga Kamuruana （Kenya）

Other participants were as follows,

Ms. Asami, Mr. Igarashi, Mr. Ono, Ms. Kuniyasu, Mr. Sekimoto, Mr. Hirowatari, Mr. Minami, Mr. Morita, Ms. Yariuchi, Ms. Yamamoto

The total number of participants was 15

At the beginning, participants introduced themselves in the SpatialChat. Then, Ms. Yariuchi explained the activities of WaQuAC-Net to the guests. Continuously, she divided the participants into 4 gropes. (Mango, apple, grape, Banana). There were four tables with pictures of fruits on the PC screen of each participant, and under her guidance, the participants moved their face photos to the designated fruit tables. They could hear the voices of people near the same table and had a conversation. But they couldn't hear the voices of other tables at all.

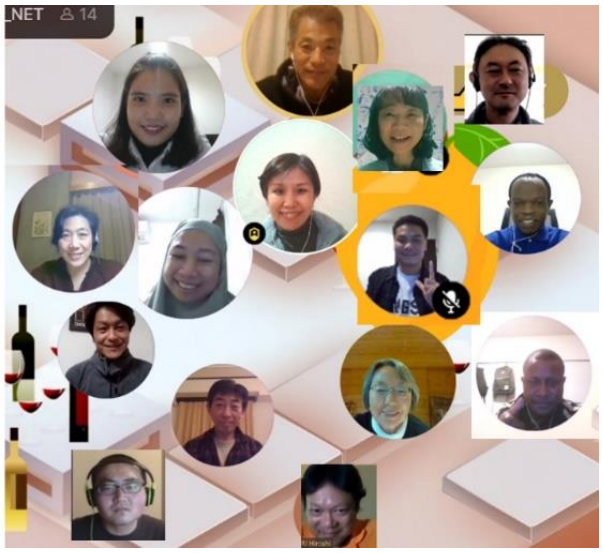
They enjoyed a conversation for 20 minutes.

The next program was a toast. Everyone put on a speaker and called "JUMBO" (African style?) with Mr. Sekimoto, and raised the glass.

After the toast, it was time for the game. The guests played the lottery and each one reached a small gift.

As the participants got used to it, the second group conversation was time that the participants could move freely around the four tables and talk to the person they wanted to talk. At the end, they took a commemorative photo, and watched and listened to a video of the Christmas song. By the way, "Santa Claus" seems to have delivered the lottery presents to 5 guests on December 25th.

（By Ms. Yamamoto, WaQuAC-Net Office）



All participants gathered at the mango table.

The 9th WaQuAC-Net Webinar,
Panel Discussion
Target Level of Water Quality Analysis Center in Developing Countries.

15th January, 2022

The 9th webinar was held on 15thJanuary, 2022. The theme was "Target level of water quality analysis center (laboratory or lab) for water utility in developing countries". It was conducted in a panel discussion with three panelists and a moderator, who have a lot of experience in water supply management, water quality analysis and international cooperation.

1. Introduction of the moderator and three panelists

Moderator

Mr. Daiji Nagashio

- Technical administrator of waterworks , Hanshin Water Supply Authority
- Specialty: Business management of water supply utility, Water treatment engineering
- Experience of international activity: JICA expert in Myanmar

Panelists:

Mr. Hiroshi Sasayama

- Former affiliation: Japan Water Works Association (JWWA), Yokohama City Waterworks Bureau (YWWB)
- Specialty: Water quality analysis, Water quality management, GLP Auditor
- Experience of international activity: Accepting trainees from overseas at YWWB,
- Support of water quality management and strengthening of laboratory at JICA projects in Thailand, Cambodia and Vietnam.

Dr. Yasuko Kamegai

- Occupation: Consultant, CTI Engineering International Co., Ltd.
- Expertise: Water supply management, water quality management, environmental protection
- Work experience in foreign countries related to water quality: Cambodia, Bangladesh, Panama, Serbia, Laos, Syria, etc. for lab construction, capacity development, survey, etc. not only for water supply but metrology, mining, environment.

Dr. Yasuhiko MORITA

- Occupation：TEC International Co., Ltd
- Expertise: Water quality analysis, Water quality management,
- Main activities in developing countries: engaged technical assistance projects in Myanmar, South Sudan, Nepal, and Palestine for setting up the water quality analysis laboratories, capacity enhancement, and supporting procurement.

2.Presentations and Panel discussion

Three panelists presented their experiences in developing countries using power points.
After three presentations, the discussion started with the lead of the moderator, Mr. Nagashio. There was a lively exchange of opinions with the three panelists based on the issues pointed out by the moderator. Since the discussions were held from a wide range of perspectives, the following is a summary of the presentations and discussions arranged by issues.

1) Water quality management and drinkable water

(Dr. Kamegai)： I have a very simple question whether supply water should drinkable. When I visited suburban area in Myanmar, I was shocked to hear that "we don't want to have

drinkable water with higher price because we buy the bottled water." Actually, it was commonsense in that area. It was not only in Myanmar; I have heard similar opinions in many places.

（Mr. Nagashio）: I also have experience in Myanmar, so I understand it well, but, if the water utility supplies water that people do not drink, what does it mean for the lab to check it?

(Mr. SASAYAMA): I think that tap water should be drinkable, in other words, it should be hygienic. Tap water is used not for only drinking or cooking food but also washing hands and shower. Tap water should be safe for such use too. Its safety can be guaranteed by its hygienic condition. The word "drinkable" is good to show such condition. If people get diseases, especially water borne diseases, from tap water, they never use tap water anymore. Then the water utility cannot manage its business well. Good quality is one of fundamental parameter for water supply management.

（Dr. Morita）: In the case of South Sudan, SSUWC (South Sudan Urban Water Corporation) has a highly attention to disinfection because cholera outbreaks had happened frequently around Juba City (the capital). However, consumers seem to be less concerned about water quality, because they have not had access to clean tap water in the past. Rather, consumers have concern about insufficient water supply and intermitted water supply.

The case of Myanmar is similar to South Sudan. Many of the water is supplied from a reservoir without any treatment process and is therefore not suitable for drinking. The staff of YCDC (Yangon City Development Committee) understands the importance of water quality management. However, concern of consumers is insufficient water pressure or intermitted water supply, and water quality improvement seems to be enshrouded by these issues.

In many developing countries, the implementation of stable water supply is an imperative. However, I think it is also necessary to educate consumers about the improvement of water quality and the benefits it brings.

（Dr.Asami）: I remember there was an idea to reduce the infant mortality rate by supplying safe water, to have a solid family plan, to develop and stabilize the economy.

2) Does a safe water supply increase demand?

(Mr. Tsuji): Will the demand increase if water is safe?

(Mr. SASAYAMA): I think it depends on how the residents use tap water.

In Vietnam, water quality analysis has become important because it cannot be sold unless the water quality is acceptable to the users.

（Dr. Morita）: In South Sudan, the income of the water works (SSUWC) is insufficient to maintain their business.

In this country, implementing a stable water supply through the development and maintenance of water distribution network is a priority issue, and tap water quality is also being improved to increase the number of customers who pay to use tap water.

(Mr. Nagashio): In Japan, tap water quality got worse in term of odor in some cities. For such cases, some people thought that water demand became lower than before.

(Mr. Ono): In some areas of Pakistan, the quality of tap water is poor and residents do not pay. If the water quality is improved, customers' trust of the water supply will increase, and it is expected that the water tariff collection rate will go up.

3) Quality control of water services

(Mr. Nagashio): Water utilities usually have their laboratory to guarantee the product quality by itself. They are responsible for explaining their management and water quality.

(Mr. SASAYAMA): Significance of water quality analysis is to show the customers enough value of tap water for their money.

(Dr. Kamegai): 1) Laboratory has an obligation to report the accurate result of analysis, so that the lab must bear the necessary cost and assign the necessary staff members and train them.

2) Management of water quality analysis is essential in lab activities. Lab should refer to the reference/ standard material in analysis and check the accuracy for securing quality. It is not a problem that lab uses HACH machine or other simple method when lab ensures the quality management.

（Dr. Morita）: In case of South Sudan and Yangon, the first step of water quality management is to ensure the safety of distributed water by disinfection.

（Mr. Hirowatari）: I think that there may be differences in the water quality required by customers in each country, and I think that tailor-made water quality management is necessary.

4) Validity of water quality standards

（Dr. Morita）For economic reasons, SSUWC in South Sudan analyzes four parameters (pH, EC, turbidity, and residual chlorine) that require only calibration reagents. This is also because these four parameters are the minimum required parameters for the operation management of water treatment plant and to ensure tap water quality.

（Dr.Kamegai）In many countries, the drinking water quality standards (DWQS) are determined based on WHO Guidelines for Drinking Water Quality. In some countries, they have their own DWQS, but they have no lab to measure all parameters.

Lab and management should consider the limit and capacity, then determine the monitoring parameters in their own lab. Outsourcing is one of options.

(Mr. SASAYAMA): The least parameters to be analyzed at the center laboratory must be parameters which can be controlled by treatment process, such as turbidity, TOC or organic matters, iron, etc. And harmful substances contained in raw water should be analyzed if possible.

（Dr. Morita）: Under the limited conditions, such as budget limitations, the minimum and realistic target of water quality laboratory is to ensure the water quality of disinfected "safe tap water".

(Mr. SASAYAMA): In Cambodia, water quality staff had little awareness of what the water quality inspection was for. If they just mechanically inspect the water quality, the significance of the laboratory's existence will be lost.

（Ms. Miyashita）: In Samoa, the water quality standards were determined by the officials of Ministry of Health (MOH). But they didn't know about the water supply conditions in Samoa at all. There are parameters of agrichemicals in the standards, but some of them were not used in Samoa. The capacity development of the MOH or whatever the organization to determine the standards is also essential.

（Dr.Asami）There were discussions in WHO about possibility to determine "Primary Water Quality Standard" with prioritizing the monitoring parameters in developing countries. But finally, it was denied because such an idea violates the policy of fairness in safe water accessibility.

5) Cost of water quality analysis center and its related problems

Participants of the 9th Webinar

(Mr. Nagashio): Income of water utility is decided from its supplied amount of water. So, raising the level of water quality management will cost more than lower level. Actually, cost for water quality is not so much in the whole cost of the business. But the cost often seems higher than other section because its effect for income is not clear. Then, the cost of water quality management is often target of budget reduction.

Previously, there was a plan to set up a joint laboratory for several nearby water utilities to reduce the costs of analytical instruments and staff. As a result of discussions among the engineers in charge, when considering who would guarantee the quality of the water which supplied to the customers, the Joint Laboratory did not proceed from the viewpoint of accountability.

On the other hand, looking at the water supply management as a whole, most of the costs are distribution pipelines, which account for about 70% of the total assets. The lab does not have a large initial investment as a whole.

(Mr. Sasayama): It must be considered that supply of gases and reagents is restricted in some regions and the cost of instruments and their maintenance. Human resource is also important subject.

(Dr. Kamegai): Lab has an obligation to report the accurate result of analysis, so that the lab must bear the necessary cost and assign the necessary staff members and training.

All lab chiefs I have met complained of lack of money and manpower. This is the reality in labs.

(Mr. Kiji): In Bangladesh, a Japanese NPO, Asia Arsenic Network, brought in arsenic analysis equipment and analyzed it with good results. Regarding analysis, I think water utilities in developing countries can collaborate with NGOs and NPOs.

(Dr. Asami): There was a case that Tokyo Metropolitan Government granted the unused instruments to Bangladesh. It could be possible in universities, waterworks, etc. in Japan.

(Mr. Nagashio): There is a service to procure the expired equipment and utilize it in other entities. A similar business will be possible for developing countries.

(Dr. Kamegai): My suggestion on the lab strengthening

(1) Waterworks shall manage water quality. But it must be considered which parameters shall be measured by own lab.

(2) Outsourcing is one option

(3) Wider area cooperating system will be effective in betterment, i.e., cooperation of inter laboratories, inter countries, to exchange knowledge, sometimes lending equipment/ reagent, etc.

(4) Information sharing is important from supporting experts. Experts can provide information on new analytical method/equipment, quality control procedures, lab accreditation, proficiency test scheme, etc.

(5) Importance of lab waste management

Toxic laboratory waste is going to be big issue.

3. Setting the stepwise target level of water quality analysis center

Developing countries have different economic and technological levels, as well as the mindset of water utilities leaders, and the lifestyles of residents.

Therefore, for improving the water quality analysis center (lab) in the water utility, it is realistic to set the stepwise targets while considering the real situation. Based on the opinions of the panelists and discussions with the moderator and the participants, it is summarized into three target levels, as shown in the following table.

Stepwise target levels of water quality analysis center in developing country

LevelⅢ WHO Guideline*
Water quality can be drinkable. Water quality parameters include carcinogens and disinfection by-products, and etc.
LevelⅡ **Hygienic water quality management ability to ensure the safety of life*.**
Safe water for hand washing and bathing, Consider local water use, awareness of water, measures against water-related diseases, etc., Consider outsourcing for items that cannot be analyzed
Level Ⅰ Analytical ability of parameters to judge the effect of water purification system*
Ability required to analyze parameters that can judge the effect of water purification system and the effect of maintenance for distribution networks

LevelⅢ＊ Most parameters are analyzed in their own lab.

LevelⅡ＊Required parameters, coliform bacteria, fecal coliforms, nitrate, nitrite, Iron, manganese, etc.

Level Ⅰ ＊Turbidity, temperature, pH, alkalinity, EC, Residual chlorine, etc.

Responsibility：WaQuAC-Net Office
（Yamamoto, Yariuchi）

Introduction of new members

○ Junko Uno（Japan）

We welcome new members anytime. Please contact us!

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(Yariuchi, Yamamoto)

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Next Activity

February: The 10th Webinar
April 15: Newsletter vol.53 (in Japanese)
April: The 11th Webinar
May15: Newsletter vol. 53 (in English)