WaQuAC-NET Newsletter

Water Quality Asian Cooperation Network

Volume 12, issued on December 31, 2011

For Safe Water, Do Network.

Our Deep Sympathy for Severe Flood in Thailand and Cambodia

We would like to express our sympathy from the bottom of our heart for Thai and Cambodian people damaged from the heavy flood in October, 2011. Moreover, we respect our friends who worked hard in the difficult situation for supplying safe water to people. We received warm support for people from all over the world at the time of Great East Japan Earthquake and Tsunami, March, 2011. We would together cooperate to solve any difficulties through exchanging the information, knowledge and ideas in New Year too. **We wish Happy New Year for all !**

Situation of affected area by the Great East Japan Earthquake

What I thought about the great earthquake. -Take radical re-consideration for measures to obtain information -

Mr. Gensuke ARIMURA

Water Supply Network News

In the afternoon, March 11, Report meeting of Christchurch Earthquake (New Zealand) of Investigation team had been held sponsored by Japan Society of Civil Engineers and others at Convention hall A, Institute of Industrial Science, Komaba Campus, University of Tokyo. All attendants were experts who study earthquake engineering at universities, companies of consultant, manufacture and construction, and the research institutes.

The earthquake occurred during the meeting at which the leading experts attended as mentioned above. Terrible situation of attack of Tsunami was broadcasted in real time via mobile phone screen. The meeting was stopped, and then some of researchers headed to the site immediately. I admire sincerely their vitality.

What drove them to immediate action was importance to grasp information of Big Earthquake and Big Tsunami.

I myself had to wait to collect data on the site until I

E-mail from a participant of JICA training course,

(Mr. S.N. Bangkok December 4, 2011)

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I arrived at Suvarnbhumi Airport on 22 Oct, but couldn't go back home directly due to the difficulty of transportation. I stayed at my mother's condominium for 1 night, and came home on the next day.

As you said, the hard work was waited. We had to do a lot to prevent the water to come into our treatment plant. Because it took more than 3 hours per trip from my home to my plant, so I moved to stay with my mother for 2 weeks. But the situation was getting worse. The water gradually came in to inner zone.

In some area, even though the bus couldn't pass, so I moved to stay at treatment plant for 2 weeks.

After that the situation was better (except some area), so I came home to stay with my family.

Because my house is near Chao Phraya River, until now there is about 50 cm. depth of water around my house area, I still have to use a boat for a short distance for 5 minutes. I am lucky, just waiting for the water level to fall to the normal level, then can return to the usual daily life. But many other people suffered damage; they have to repair their house and change furniture and electrical appliances. I expect the situation will turn to normal one within 2 weeks for my house area.

7th Dec. 2011 The situation is better, so our treated water now, has a good quality as before. Since the level of Chao Praya River decreases very fast, I can drive my car to home, don't need to use the boat anymore.

joined to Mr. Takada's Investigation Team of University of Kobe one month after the earthquake. We stayed in the site for 3 days from April 7. The second time was that I joined the water-supply-related governmental investigation team two month after the earthquake. We stayed in the site for 4 days.

Generator was installed, and then started to supply water at Takegoma water resource in Rikuzentakata City (May 10)

However, at the site, I keenly realized the importance of ensuring information, especially the information at initial stage, and also securing communication tools to receive that.

Although I experienced the biggest aftershock in the site on the night of 7, I cannot imagine the fear which the disaster victims felt both in the stricken area and in not stricken area by Tsunami. Many people were scared of the aftershock emotionally more than the earthquake itself. It means the impact and terror of 3.11 was so big. The next day, 8th, the victims cooperated to the hearing investigation even under the worst situation of “black-out and suspension of water supply in whole city” of the inland areas.

During the inland survey, I heard at Kurihara City Waterworks Bureau that their staffs had not known the Tsunami attack of coast area for 3 days since the earthquake. Even if costal area were stricken by Tsunami, It is difficult to suppose that all of means of communication was cut down instantaneously in inland area, so we could understand their words that they had not known that the tsunami was so big that it destroyed almost all coastal area. And also, it's possible that they were not able to know detailed information after the Tsunami. We need to understand the background of their comment above. Under the repeated big aftershocks, they were busy with grasping information of damage of the city, water supply and sewerage system and dealing them. Furthermore, they could not confirm even safety of their family and friends and damage of their house.

Firstly, any decision cannot be made properly without collection of information. Concretely, delay of restoration of electricity had affected deeply the communication because electricity was needed for operating any communication facilities. I also realized that the capacity of generators were limited. On April 7, Osaki City Hall barely had held the electric power which only can supply for lighting and operation of a few PC. Dusk had been approaching, when a printer was operated, the power failure occurred in the whole city hall immediately. In addition to this, shortage of fuel affected heavily operation of the generator. There is a report that satellite phone functioned effectively, however, detail investigation will be required based on the actual cases such as the problems which happened at the time of the earthquake and as the fewness of circuit of satellite phone.

When disaster occurs, people and groups should not be discriminated between ones who can get information quickly and the other who cannot get it. Nuclear power plant accident subsequent to the Great Earthquake showed strongly the inequality between two groups.

7 months later, to the stricken areas

Ms. Keiko YAMAMOTO
JICA

I had been thinking that I visit the stricken area and have to see reality by my eyes as soon as possible. At last, I was able to go there on October 18-19. I have started from Chiba City and have run through Kesennuma-City, Minamisanriku-Town and Ishinomaki-City by a car. Total distance was over 1000km. What I saw were the shopping street of Kesennuma City in which the buildings were collapsed or leaned and people were not present, the town of Minamisanriku Cho which was destroyed totally and only concrete foundations of the buildings remained in the town and several volunteers had been picking up the rubbles in the town. Some shovel cars worked at a mountain of rubbles near the sea, the direction map board of temporary houses on the top of the hill, Ishinomaki City Public Hospital which looked like with no damage but was not in use, a pharmacy behind it which was leaned and sank and so on. These areas were tidied up and the roads were improved, compared with just after the heavy disaster. However, it was visible to the situation far from restoration. I really felt that the restoration have not started yet there, although I watched these scenes many times on TV before. And also, I recognized that urgency to support the people damaged by Tsunami was fading in my mind. I decided that I make donation and go there as a volunteer.

Destroyed town (Kesennuma)

Rubble mountain near coast (Minami Sanriku)

Direction map board of Temporary houses (same as left)

JICA Second Executive Forum for Enhancing Urban Water Service in Asian Region

—Dialogue and Collaboration—

The Second Executive Forum was held inviting 9 Asian Countries which were India, Indonesia, Cambodia, Laos, Philippines, China, Pakistan, Thailand and Vietnam. Total participants from overseas were 16 persons. The Forum was conducted from October 1 to 5, 2011 at JICA Research Institute, Tokyo.

The First Forum was held in Yokohama in January, 2010. It was carried out with purpose of " learning

the success cases and sharing the information each other and then achieving sound management for water service providers in Asian region. In the end of the 1st Forum, Yokohama Statement which summarized the discussion results was declared. (see WaQuAc-NET newsletter No.6, p3) According

to the Yokohama Statement, the Second Executive Forum was planned by JICA. The theme was Dialogue and Collaboration. We thought "Collaboration" was one of measures to solve or improve seven problems which were summarized in Yokohama Statement. Several collaborations such as Water Operators Partnership (WOPs), Public Private Partnership (PPP), collaboration between universities or institutes were presented and discussed by participants at the Forum. Mr. White participated from Asian Development Bank (ADB), explained WOPs as collaboration between utilities, and appealed for participation. 14 Japanese Waterworks Bureaus which have cooperated to JICA training courses participated in the Forum and they learned how to collaborate with overseas utilities.

As one of the activities of the program, the participants attended to the International Water Association Asian Pacific Regional (IWA- ASPIRE) Conference which was held in same week. It became a synergy effect for participants in order to be able to get wider information of international water field. On the final day, H.E. Ek Sonn Chan who is General Director of Phnom Penh Water Supply Authority read out "the conclusion of the 2nd Forum" summarized by the forum participants like the First one. And they promised to formulate an improvement plan and monitor its implementation. Moreover, they promised each other to hold the third Forum. (Ms. YAMAMOTO)

Forum Episode 1

Trainees from Laos, new and old
~Cooperation with Saitama City Waterworks Bureau and the Vientiane Capital City Waterworks

Mr. Masahiro SHIMOMURA
Saitama Waterworks Bureau

Since I encountered Laos first, about 20 years has already passed. I visited Laos from 1992 to 1994 as a member of the study team. However, in the first two years, it was only two weeks to stay in each year. At the third year, 1994, I stayed in Vientiane which is capital city of Laos for 6 months as a JICA short term expert. After that, I has cooperated to the logistic support of my colleagues who were dispatched as JICA expert, and helped trainees from Laos who were sent to Japan by our experts. However, I could not work for Laos from 2007 to 2010 because I had been dispatched to Brazil as JICA expert. After my returning to Japan in 2010, I could restart to support trainees officially and privately again because Saitama City Waterworks Bureau accepted 2 trainees last year and this year, respectively. The purpose of the training is to learn techniques and know-how of O&M through actual activities of many kinds of works in my Bureau mainly under OJT. In the last 2 years, we opened new courses such as meter reading, tariff collection and financial and accountant affairs and accepted office staffs.

This year's Trainees from Laos
I am in the left end

The most popular training content of all the past trainees is study tour of the small water supply system in Chichibu City. This is because the small compacted water supply system including operation and maintenance of facility is familiar to Laos' trainees, therefore it is easy for them to understand the system.

Anyway, Know-how or ideas of the training accumulated for many years are flowing in the core of training system in Saitama City Waterworks Bureau now. I am aiming to continue improving training courses through trial and error from now

on.

Finally, I show one episode in my private. Most of Lao people eat Sashimi very often. But they like Wasabi (Japanese mustard) very much more than Sashimi from my close observation. I think this trend is spreading recently in comparatively young generation.

From 5 to 6 years ago, it has become an established custom that trainees buy so many Wasabi tubes and bring them to their country as souvenir.

Forum Episode 2

~Cooperation with Yokohama City and Vietnam~

Mr. Yoshiharu WADA
Yokohama City
Waterworks Bureau

◎Famous person?

Mr. TRAN Tho Van, Deputy General Director of Thua Thien Hue Construction and Water Supply State-One Member Company Limited (HueWACO) gave a presentation of the success case at the forum.

The success case of Hue WACO is based on Safe Water Declaration which was issued in the 100th anniversary of HueWACO, 2009. Since the HueWACO's success case was introduced, experts from Yokohama have used the photo very often that elder person (I do not know the person is he or she) is drinking water at a public tap in the park. There are many public taps in parks which are scattered in the city. For example, a park which is located riverside of Huong River, around the palace in Hue City. The photo was taken by chance when a tourist was drinking the tap water at the park in front of the palace.

This photo was used not only at a lot of oral presentations but also at an article of a magazine. In August of this year, it was used in TV program of NHK (Japan public TV channel) which introduced the international cooperation of Yokohama City. Therefore many people in Japan had a chance to see this photo. And also, this photo was used for an paper of Yokohama City Waterworks Bureau applying to IWA (International Water Association), PIAD (Project Innovation Award Development). The international debut of the photo following domestic debut was expected highly, however, it was not accepted in the selection of IWA, PIAD. Although the expected international debut of the photo could not be achieved, I think that the person in the photo should be appreciated by a lot of contribution to the project.

Forum Episode 3

～The party night in Memories Ally by ***the Ashigaru***~

Mr. Shinichi SASAKI
Yokohama City Waterworks Bureau

On Oct 1 2011, after finishing the first day's program of the Second Executive Forum for Enhancing Sustainability of Urban Water Service in Asian Region, the members of "*the Ashigaru*" got together at a bar "Fukuhachi" in Omoide Alley near Sinjuku Station. What is Ashigaru? So-- let's say, January of last year, when H.E. Ek Sonn Chan (ESC) (General Director, the Phnom Penh Water Supply Authority) and Mr. Sovithia (Director, the Planning Department) came to Japan and participated the First Executive Forum as a lecturers, .a reunion party of the JICA cooperation project in Cambodia was held at small Japanese style bar-restaurant in Yokohama. Members of the party were two Cambodian mentioned above, *three beauties* (Ms. Yamamoto, Ms. Kamegai and

Ms. Yariuchi), Mr. Kiyama (Kita-Kyushu City Waterworks Bureau) and I. The drinking party was so warm up and we enjoyed renewing old friendships. When Mr. Sovithia and I talked about Shogun, Samurai and Ninja, ESC asked me "which is your family' origin?". As pinched, I answered "my origin is a Ashigaru!". Ashigaru means a foot soldier in Japanese; was quite mobile so as to run around the battle field, the lowest class of a troop and always in the front line to make attack. They could do great when the troop wins, but in a losing battle they might run away hastily because they were so opportunists. These answers gave ESC a big laugh. Since then, ESC has called me "Ashigaru!" whenever we met. "Then, let's call us *the Ashigaru*" Ms. Yamamoto murmured, and the others accepted. That's the story of naming "the Ashigaru", thank you for your attention!

Next I explain "Omoide Yokocho (Memories Ally)". After World War II, many bars and diners were rapidly built by barrack structure at the burned area by an air raid near Shinjuku Station. This area is still left even at the foot of the skyscrapers and loved by drinkers. Fukuhachi is one of them and meet our criteria of good diner; "small, dark and dirty" (Info; Fukuhachi has hospitality and warmth)

The night, we have Mr. Haga (ex-chief advisor of the water supply Project in Thailand), Mr. Nakajima (CEO, Nakami Japan Co., ltd.), Mr. Takebe (CEO, Fuyo Consultant Co., ltd.), and from Cambodia, ESC, Dr. Visoth (Advisor to the general director, Phnom Penh Water Supply Authority), Mr. Som Sethy (Vice Director, Ministry of Industry, Mines and Energy), Mr. Yi Monirath (Director, Siem Riap Water Supply Authority), and Ms. Yamamoto (JICA), Mr. Mitake (JWWA), Mr. Sugawara (JICWELS), Mr. Takeda (Kita-Kyusyu City Waterworks) and me, 12 attendants in total. Wow! It must be too many to seat in Fukuhachi. Mr. Mitake took 5 members the bar in opposite side. Soon after seating, Mr. Haga introduced his episode that when he made self introduction with his name card to a German, the German called him "Mr. Hage" instead of "Mr. Haga" - *hage* means a bald man in Japanese- (See the picture). We busted into laugh. I also told "Mr. Haga called down me whenever I met him during my three months-working in the Thai Project, so still now I'm so afraid of Mr. Haga even sitting next to him". "It's not. Everyone called me a mild leader in the Project", Mr. Haga replied. Then ESC concluded "I got it. You have always been a trouble-maker". Oops! I messed up!

From then on, everyone talked up and got red-faced, and came and went between Fukuhachi and the bar in the opposition. We had so many things to talk as the first night of the Second Forum went on.

Oh! I have forgotten to tell you that Fukuhachi is a very nice grilled chicken diner. Please drop in if you are passing by.

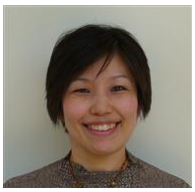
"Memories Ally" in Shinjyuku

(from Left) H.E. Ek Sonn Chan, Mr. Haga, Mr. Sasaki

【Overseas Report】 from Vietnam Project

Training Course has started

Mina YARIUCHI
Project on Capacity Development for Urban Water Supply Utilities in the Central Region in Vietnam



The project started in June 2010; it has past a half of the project period. We had worked to prepare for training courses in the Training Center for Water Sector in the Central Region (the Training Center) and workshops for helping water supply companies to make their operational manuals for the first year, and we have been conducting training courses and workshops since this June. Here I would like to focus on these training courses.

As one of the project activities, the project has worked with establishment of training courses targeting staff of water supply companies in the Central Region in Vietnam. We conducted training courses on "Customer Service" in July, "Operation and maintenance of equipment" in October. Moreover, we plan to conduct training course on "water treatment" and "Reduction of non revenue water" in this year.

Since targeting experienced staff of the company, training courses should be applicable and suitable for them. Therefore, we conducted site survey to grasp actual situation of companies in the last year, and based on that, theses training courses were planed.

Lecturer advised to a group

Also we try to not be one-way lecturing style, and to be take longer time for group discussions. For example, a lecturer raised a question "how should this kind of pump be maintained?", and the trainees discussed the answers in group and summarized on big paper to make presentation.

Presentation on contents of group discussion by trainees

Exchange of opinions and experiences of each trainee other than explanations by lecturers can stimulate trainees a lot and effective to make trainees absorb new knowledge. And also a lecturer would give question matching their situation such as "what is difficulties on maintenance of facilities in your company?" and let them discuss their possible solutions, which worked very well to collect many opinions proactively by well-experienced trainees or trainees from a company with different characteristics. Although lecture is quite popular style for training in Vietnam, training with discussion style is highly appreciated by participants, which can help trainees to participate proactively, feel solidarity of the class, and to acquire useful and applicable knowledge through the training course.

We will work to examine contents of the training courses and to develop capacity of lectures so that the training center can provide effective and practical training matching actual situation of water supply companies.

Report of meeting in Kyushu branch

Eiji NAKASHIMA
Nakami Japan Co., ltd

The General meeting of Kyushu Branch of WaQuAC-Net was held in Fukuoka City on July 30. Participants are totally 8 including Ms. Yamamoto and Mr. Mori from Tokyo and Mr. Yokoyama of Hy Concrete Technology Office Inc., ltd. from Gifu Pref.

The main agenda of the meeting was the monitoring reports of the activities "Let's go to see sites in overseas" which we discussed in the last meeting. Mr. Mori, Mr. Akaishi and Mr. Yokoyama made report of site visit and proposals for future activities. Through very active discussions we found importance to work closely each other as a group. We also agreed to arrange our schedule to visit sites in overseas together so that we could know the situations, find local cooperative companies and make discussions on detail businesses. I feel we are moving ahead steadily even though slowly.

---Member Interview---

Former Expert in Myanmar
Mr. Daiji NAGASHIO

On July 29, I visited Hanshin Water Supply Authority for interviewing Mr. Daiji NAGASHIO and observing Amagasaki Water Treatment Plant (WTP) which has several advanced treatment facilities.

Mr. NAGASHIO was dispatched to Myanmar as the first JICA expert in water field. He worked for Department of Water Supply and Sanitation actively as an adviser of water supply planning of Yangon City from September 2002 to September 2004.

Interview

Why and how did you become a JICA expert?

✧ I had heard about the situation of developing countries from OBs of JICA expert who had been working in waterworks bureaus of Kansai Area. And my boss had participated in international conferences eagerly. He recommended that I gave a presentation on operation of ozonation at the ASPAC Conference held in Chiang Mai, Thailand. When the Japan- U.S. Conference of the water quality management was held in Osaka, I worked for logistics of the conference and observation of the Inakawa WTP as a member of secretariat. Through these experiences I got interested in overseas and wanted to live and work in foreign countries someday. In 2001, Dr. Kunikane who was a director of water supply engineering department, National Institute of Public Health at that time (now he is a professor of University of Shizuoka) recommended me to become a JICA expert in Myanmar. It was very good timing for me because I had just finished my tasks which were the construction of Amagasaki WTP and the commencement of the WTP. My wife said positively that she would go there, if I wanted to go. Our worry was only that my child was a baby.

Final seminar

What kind of work did you do in Yangon ?

✧ At that time, JICA Myanmar Office had two projects and 15 experts. My counterparts were a deputy chief engineer of Water Supply and Sanitation Department and two staff members. One

of them was a JICA trainee in Nagoya JICA Center. We became good friend soon. He was an excellent person.

I went on with the planning work together with counterparts. The society as a whole of Myanmar was very poor, and the government official's salary was equivalent to 500 yen to 1000 yen per month. They had a regular department meeting on every Monday. The participants were around 60 staff. I attended there and gave a presentation sometimes. Moreover, the workshop was also carried out to the Yangon personnel or university staff. Because there were no data of water supply planning, I and my counterparts planned to collect some basic data and made a data sheet for hearing to consumers. And we asked tariff collection staff to collect data. It took 6 months to collect data and summarize them. It was difficult to collect reliable data in Myanmar. However, I didn't have any special restrictions to my activities as JICA expert and didn't feel inconvenient.

How did you transfer the technology?

✧ I had experience of practical water supply technology for 15 years at that time. Especially, I had worked for study, design and O&M of water treatment plant including advanced treatment process. Therefore, I could have the capability to apply or modify Japanese technology to the developing countries through the experience of Japan. Moreover, since I had a network among persons of other waterworks bureaus, manufacturers, consultants and so on, I was able to get necessary information.

How did you and your family live in Myanmar?

✧ I worried about care of my child before going to Myanmar. But the child-care in Myanmar was easier than in Japan because I could employ a babysitter. I and my wife were careful to keep hygiene and took bottled water and didn't eat raw food.

However, since my child started the asthma attack, I was accompanied by him and ran into the hospital.

Intake tower in reservoir, Yangon

And sometimes he had a high fever which we didn't find a cause. Fortunately, these didn't become serious. Since we had a child, our association with Japanese families expanded and we enjoyed more our life with them through summer festival, Bon-festival dance, year-end party and so on. My wife went to many different places alone and had a lot of information. I went to the bank in Thailand to get my salary every four month. Now my son is six grade in an elementary school and we still have a good relationship with the families which we met in Myanmar.

Is expert experience useful for work in Japan?

✧ In some cases, if we are watching for Japan only, it may be difficult to solve the problem. It is not so easy for us to find the purpose which works for waterworks bureau in Japan. And we also cannot feel satisfaction so much. However, if we work for the developing country, we feel really the importance of water supply and understand the whole of water supply. And we can consider the base of water supply. If we are pursuing only efficiency in Japan, our work tends to become as a stopgap and tends to shrink. Therefore, experience in the developing country is a good opportunity for us to be able to consider from various angles although it seems useless. I think the water utility should develop a good relationship with developing countries through promoting the international cooperation.

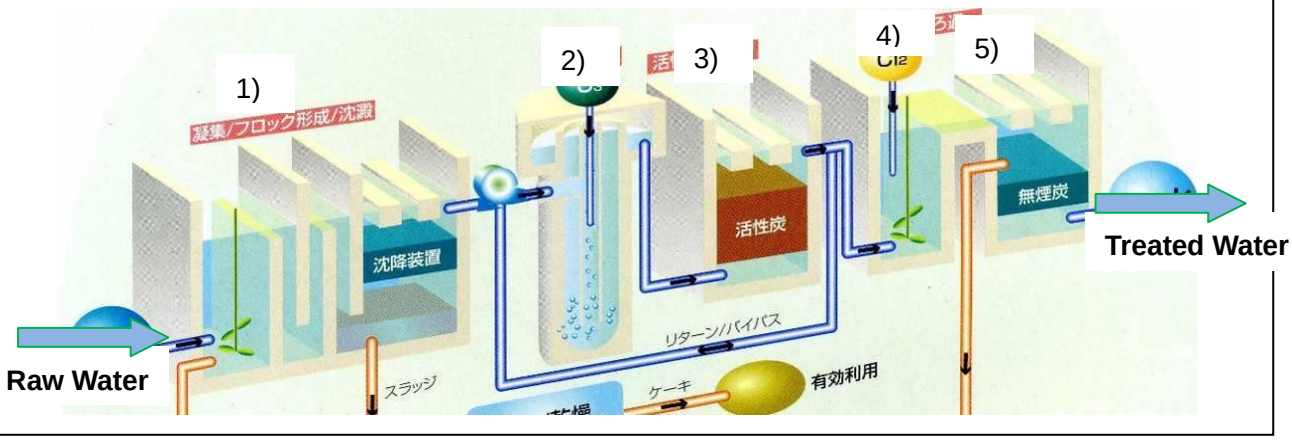
Now Mr. NAGASHIO supports several trainees from developing countries which come to observe

Amagasaki WTP sometimes. Although it is the only opportunity for him to meet the developing countries people, he said that he wants to go to Myanmar with his wife again after his retirement as senior volunteer and so on. I hope that he will be able to do so really.

Observation

Hanshin Water Supply Authority is a bulk water supply utility. Maximum daily supply is 1,128,000m3/d. The supplying city waterworks bureaus (CWB) are Kobe CWB, Amagasaki CWB, Nishinomiya CWB and Ashiya CWB. Water source is downstream of Yodo river. The water is treated to distribute by advanced treatment process which has been installed as countermeasure against musty odor or by-product of disinfection since 1993. The facilities consist of two intakes, two WTPs, one laboratory, two booster pump stations and regulating reservoir. Total length of conveyance, transmission and distribution pipes is 187,046m. Models of advanced facilities and video for observers are excellent. (see below left). Mr. Takuya INOUE who is a newcomer expected guided me around WTP together with Mr. NAGASHIO. (see below right)

Amagasaki WTP：production capacity is 373,000m3/d.
Treatment process ：**1)** Coagulation/Sedimentation, 2) Ozonation plant using oxygen, **3)**Upward flow fluidized bed method of biological activated carbon adsorption basin, 4) Re-coagulation mixing basin dosing sodium hypochlorite for breakpoint chlorination, **5)** Anthracite one layer filtration.
(Figure below is reprinted and modified from the brochure of Amagasaki WTP)



(Interviewed and written by Keiko YAMAMOTO)

New Member Interview:
Ms.Nirmala Hailinawati (Indonesia)

Now, Ms.Nirmala is researching thesis at Prof. Abe Research Group in Tokyo Institute of Technology. And she is in the second year of master course. She is from Indonesia. The title of thesis is “Performance of Water Utility under Private Management in Southeast Asia”. She attended meeting (November 2010) featured in “Water Leakage Control and Safe Water Supply”. This time I interviewed her about her thesis and the reason to come to Japan etc.

Q: What did you do before coming to Japan?

After graduating from civil engineering of Gadjah Mada University, I entered a water supply company. I have worked in "water for all" project for six moths and department of distribution network construction for one year. After that, I came to Japan and enrolled the Graduate School of Tokyo Institute of Technology in 2010.

Q: Why did you want to research in Prof. Abe research group?

When I studied in Indonesia, I was interested in engineering economics. Moreover, I wanted to make researches about "Performance of Water Utility under Private Management in Southeast Asia"

I decided to make researches in Tokyo Institute of Technology, because I really wanted to learn from Professor ABE. The overview of the thesis is as follow. This thesis is to evaluate waterworks management ability from the aspect of human resources, technology and facility etc, because operation and management capacity is different from each water supply company. About ten years ago, the water utilities were privatized in Jakarta, Manila, Johor, Batam in Southeast Asia. I am researching thesis by trial and error every day. I will graduate September 2012, so I want to write good paper and get a master degree. It is a little hard for me to collect data of countries other than Indonesia.

Q: How is the life in Japan?

I have been living in Japan for one year. Japanese people are kind for me. And I was impressed that the city is clean and well-ordered. Every day, I am surprised something. Now I am living with my husband who is also a student from Indonesia. He is studying about Geo-engineering in graduated school of University of Tokyo. We live a full life. I have not traveled Japanese tourist areas so much. But when I visited Kyoto, I was so impressed by seeing a lot of traditional temples.

Q: What would you like to do after graduation?

It has not yet been decided. But I will be able to work for the previous company. If possible, I would like to challenge to Japanese water purification or consultant company.

(Interviewer: Mr. Toshiki HORIE)

Three Bolivians in Water project visited

From Oct.15 to 29 three Bolivians who work in ASVI (Agua es Salud y Vida Fase 2 :Water is health and life Phase2) of JICA technical cooperation project came to Japan and participated in JICA training course for three weeks. They learned drilling engineering system and visit some water treatment plants. One of them is Mr. Luis Antunez who was my former co-worker, because I worked in Bolivia as a JICA volunteer.I met him for the first time in these three years. Ms. Yamamoto and I had a welcome party at Italian restaurant in Ichigaya, Tokyo.

Mr. Luis was surprised at penguins

Later, we went to an aquarium in Shinagawa. Especially, Mr. Luis was so excited at looking at penguins and dolphins. I felt good to see them enjoying. They were so surprised at accuracy of train schedule and Japanese courtesy. So I believed they could learn a lot of things.

(Mr. HORIE)

WaQuAC Net　Business Card

A small editorial meeting was held in August 2011. We talked about Waquac-net business card that would be convenient to introduce our activities to our friends and coworkers. Therefore, I made a prototype of business card.

I tried to show the concept of Waquac-net, the background of the establishment and image of water in the business card. From now, I would like to improve this business card with reflecting your opinions. So please don't hesitate to say your idea. By the way, this picture of fish was deseigned by Mr. Sasaki. And this business card was printed in Vietnam by Ms Yariuchi who is working in a project in Vietnam. I would like to report how to distribute business card next time. (Mr. HORIE)

Photo of editorial meeting

Question & Answer Corner

We welcome any Opinions and questions to this Q&A corner!

Q：I live in Negros Island, Philippines. In the mountain, the white and weak stones which have a lot of dents in the surface, considered to be coral reefs, are rolling. Water supply uses spring water of mountain and is disinfected by chlorine. After I boil the water, then pour it into a bowl and cool it, white matters are settled in the bottom of the bowl. I asked the laboratory of water quality about white sediments. They said it was lime. I am considering using a lime removal equipment now. Could you tell me how to remove lime? ***(N. K. Philippines)***

A1：Household measure

The water which Mr. N.K. uses contains high concentration of calcium carbonate and/or magnesium carbonate, and it is called hard water. Boiling process of the hard water may generate the white precipitation of calcium carbonate. It is natural phenomenon for hard water, and not harmful for human's health. If you boil a bottled mineral water, you observe the same thing. High hardness disturbs foaming of soap, and generates scale (white colored precipitation), but it doesn't cause any health problem.

Usual processes of removal of hardness are reverse osmosis and ion exchange in waterworks. Softening equipment is a commercial product for domestic use, which is application of ion exchange. The mechanism of hardness removal by ion exchange is that calcium ion and magnesium ion are replaced by sodium ion. That means usage of the softener can decrease the

hardness but increase concentration of sodium. For this reason use of softener is not recommended to a patient of hypertension, or disease caused by sodium intake. An ion exchange resin in softener should be regenerated regularly to work properly.

Is it necessary for you to remove hardness?

You can reduce the hardness by boiling for drinking purpose, after boil, wait until the precipitation could be settled.

Q-2 If I take a shower with tap water about two weeks, I feel itchiness for the back, legs, hands, arms, etc., and worry about dry rough skin. Itchiness is eliminated if I wash the body with mineral water for drinks.(N.K.)

A2：Dry rough skin

In the case that you have rough dry skin by hard water, the use of softener is recommended. There are many sufferers of dry skin by hard water. ***(Ms. Yasuko KAMEGAI)***

A3：Softening of hardness water

Hard water contains both of temporary hardness and permanent hardness.

1) Temporary hardness consists of $Ca(HCO_3)_2$、$Mg(HCO_3)_2$. By boiling the water, calcium carbonate ($CaCO_3$) and magnesium hydroxide ($Mg(OH)_2$) is precipitated.

2) Permanent hardness consists of $CaSO_4$, $MgSO_4$ (non-carbonate hardness). There is no precipitation by boiling the water.

Water treatment method is as follows.

1) Ion exchange method

Softener is commonly-marketed for family use. Hardness including Ca, Mg -not only temporary hardness but also permanent hardness- is removed by ion exchange resin

2) Water softening process method by combination use of lime hydrate $Ca(OH)_2$ and sodium carbonate Na_2CO_3

This process can soften temporary hardness and permanent hardness.

$$MgSO_4 + Ca(OH)_2 \longrightarrow \underset{\text{Precipitation}}{Mg(OH)_2} + CaSO_4$$

$$CaSO_4 + Na_2CO_3 \longrightarrow \underset{\text{Precipitation}}{CaCO_3} + 2Na^+ + SO_4^{2-}$$

However, Sodium ions remain in the water as evaporation residue. Depend on the utilization purpose, I suggest 2) method that can considerably reduce total hardness. Moreover, treated water of this 2) method contains micro-particle of the calcium carbonate. Therefore, filtration process and pH control (PH7-8) is needed after this treatment.

3) Treatment by lime hydrate $Ca(OH)_2$

This method can remove only temporary hardness, but evaporation residue of the hardness is less. If total hardness of your water can be reduced to less than 100mg/L by removal of temporary hardness, I recommend this method. The following treatment processes are similar to 2) method.

$$Ca(HCO_3)_2 + Ca(OH)_2 \longrightarrow 2CaCO_3 + 2H_2O$$

(Mr. ShigeruTAKEBE)

A4: An example of treatment by lime hydrate at the household level.

Batch process is better when you treat hard water by yourself at home. It is possible to improve situation by reducing the temporary hardness. Therefore, method of treatment by lime hydrate would be explained. It is relatively easy way. Both Mr.Takebe's suggestion and Mr Sasayama's one are same. But they are slightly different. So, two cases are written below.

They have recommended to experiment using actual water by both of the methods.

Takebe's way

1) Decide injection volume of lime hydrate. Inject lime hydrate into 3 bottles which same source water is filled.

And make lime hydrate solution of different concentration of 100mg/L, 150 mg/L, and 200mg/L.

Then, take their supernatant water to 3 new bottles respectively and boil them. And compare the scales (white precipitation) in 3 new bottles. .Select one bottle with the least amount of precipitation. It is optimal injection rate.

2) Stir for 10-15 minutes to end the reaction of softening if the water temperature is 15 to 20 degree centigrade. But if the water temperature is lower, it takes longer. Drain produced sludge. It is better to leave one fourth or one fifth of sludge in the tank in order for effective sedimentation in the next process.

3) After reaction of the softening, put to stand and leave it for solid-liquid separation. Take supernatant liquid out. And then control PH.

4) If the injection volume of lime hydrate increase, PH also rise. Although it depends on source water, I think it is possible to treat under the condition of PH 9. However, you need to verify it. It is necessary to neutralize by acid to pH 7 to 8. It would be good to use litmus paper for checking pH value.

5) The produced sludge has good dewatering ability. It is easy to handle once sludge is dried to a powdery state. Since the ingredient is calcium carbonate, there is no problem even if to mix soil. But, please consider the environment. It is said that sludge may harden depending on how to handle it. So please be careful.

6) It might be possible to stir it by hands if water volume in one process is 100L to 150L

7) It is possible to use caustic soda instead of lime hydrate. However, sodium remains in water.

Sasayama's way

Controlling pH is important to soften water with lime. You have to control pH of treated water as not so high because higher pH is harmful to human. You can control injection amount of lime by monitoring pH but not so easy. It is better that the operator get training of handling lime and monitoring pH.

You have to choose good filtering material. For the case of using sand, you have to wash sand well with clean water. Bacteria or worms can grow easily in the sand if washing is not enough. The best way is sterilizing sand before use.

If fiber or leaf of palm is available as filter material, frequent exchanging material is better for sanitary use. I show a model of softening facility with using lime. It is just a model to design an actual one. (see the diagram in the next page)

1. Material

- A tank or large bucket for preparation of lime slurry
- Settling tank for reaction between lime and source water
- Filter tank to remove small particle of calcium carbonate
- Water tank to store filtered water

2. Treatment procedure

a. Source water is stored in the settling tank.

b. Lime slurry is prepared with powder lime and water in lime slurry tank.

c. Lime slurry is poured into settling tank little by little, with mixing the water.

d. Step c. is repeated till pH is coming to 8

e. Slurry is no more added when pH reach to 8

f. Produced calcium carbonate is settled for about 1 hour.

g. Supernatant of settling tank is slowly flown into the filter tank and filtered water is stored in the water tank.

h. Sediment in the settling tank is drained.

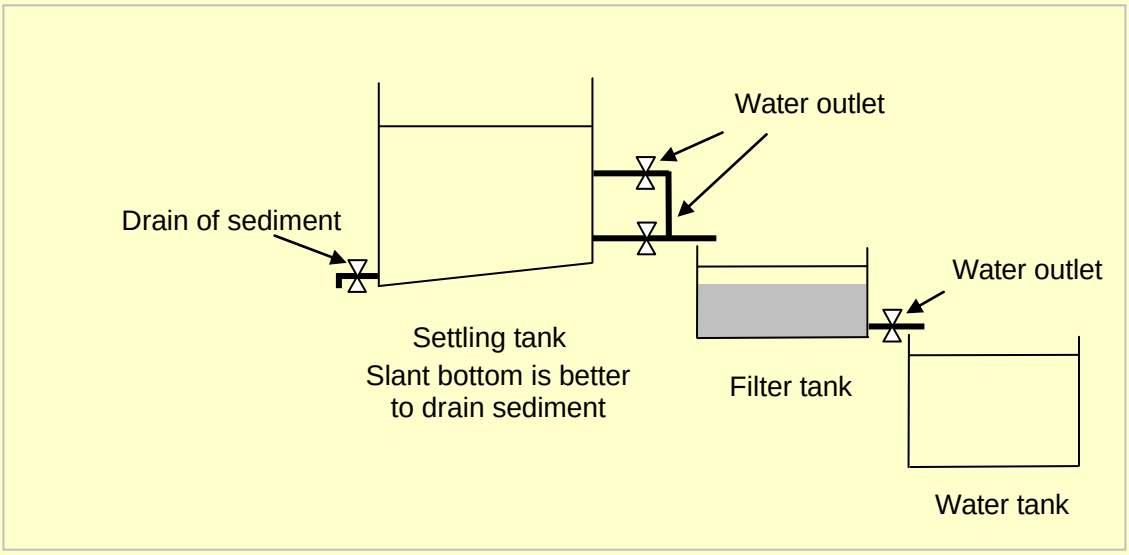


Diagram of softening facility under batch operation

3. Note

a. Be careful not to exceed pH 8 in the settling tank.

b. Necessary amount of lime will be known after several trials. Then prepare lime slurry as just necessary amount.

c. Sediment is calcium carbonate. Please consider the place for wasting

d. Treated water may lose disinfection effect even the source water is well disinfected.

e. Try popular material as filter. Material should be washed well before use.

f. Replace the filter material to new one when filter is clogged

g. The valves for outlet water should be able to adjust water flow.

h. Diameter of pipe for sediment drain is larger than 20mm to drain easily.

<Comment to Mr.Takebe's way>

Hydrochloric acid is rather safe to use to decrease pH. It is easier to use diluted acid for adjustment of pH because diluted acid can change pH value fewer with same amount of dosing comparing with concentrated acid. I recommend trying experiment of controlling pH with plastic buckets before building facility.

(Mr. Hiroshi SASAYAMA)

Introduction of New Members

- Mr. KOJIMA TAKASHI (Japan)
- Mr. TATE Yuki (Japan)
- Mr. Chea Visoth (Cambodia)

We welcome new member any time.
Please contact us

WaQuAC-NET Newsletter No.12
Issued in December 31, 2011
Topic: Situation of affected area by the Great East Japan Earthquake

WaQuAC-Net Office
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Next Activity
Feb. 2012 Newsletter No. 13 (Japanese)
March 2012 Newsletter No.13 (English)