



Happy New Year 2021

We hope to overcome COVID-19 pandemic.

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Question & Answer Corner

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

Q: I want to know the pump design considerations and parameters. *(U.G, Rwanda)*

Question:

I need to use a pump for distribution in rural area within an existing water network. The proposed suction reservoir site is of 1697m elevation, and the delivery reservoir site is of 1829m elevation. I want to know the pump design considerations and parameters.

Answer: Mr. ONO Yoshinobu
(Yokohama City Waterworks Bureau)

Many pumps are used in water supply facilities, such as raw water intake pumps, pumps used for water treatment in water purification plants,



Mr. Ono

water transmission pumps that send water from water purification plant to water distribution reservoir, and water distribution pumps that distribute water from water distribution reservoir to customers.

In the design of the pump, it is necessary to select an appropriate pump according to its purpose and application of the pump, which satisfies the water demand and pressure. Also, it is important to be able to operate safely and stably.

In this question, I explain the point to keep in mind in the design of a water transmission pump, because you will plan to install a pump to send

water from a distribution reservoir to another distribution reservoir.

1. Plan of pump facilities

We will determine the number of pumps, discharge volume, head, motor output and pump rotation speed to satisfy the planned water volume and required water pressure. We need to select pumps of the most suitable capacity commensurate with current and future water demands.

In addition, depending on the situation of the conduit such as a long watering distance, it is necessary to consider the water hammer pressure. And as a countermeasure, it may be necessary to install a surge tank, etc. to a pipeline.

2. Capacity and number of the pump

Transmission pump requires the capacity and number to operate with constant flow in the point where the pump efficiency is high.

However, if constant flow operation is difficult due to the lack of the capacity of the water distribution reservoir, you set the capacity and the number of pumps that can respond to the hourly change of water demand.

The number of pump is decided in consideration of planned quantity of water (maximum, minimum, average). Furthermore, it is desirable to install a standby pump in consideration of failure or repair.

3. Pump specifications

Total head of the water pump is calculated by summing actual pump head and head loss.

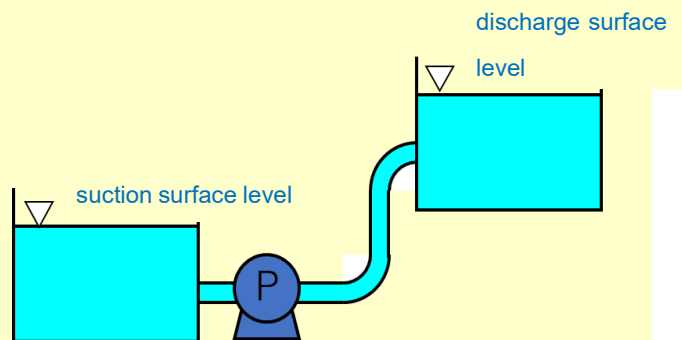
- Actual pump head: Height between a suction surface level and a discharge surface level
- Head loss: Potential energy due to the frictional resistance of the piping system

Please note that the suction surface level shall be set the low-water level (L.W.L.), and the

discharge surface level shall be set the high-water level (H.W.L.). In addition, please note that the head loss shall calculate to the actual situation appropriately.

If total head is set lower than that actual condition, you cannot satisfy water demand. If total head is set higher than that actual condition, you operate the pump with low efficiency, and possible to cause the occurrence of cavitation.

The pump discharge flow rate is decided by plan quantity of water and pump number.



4. Pump efficient operation

It is necessary to design an appropriate control system regarding a motor for a pump. Electricity costs at a pumping station occupy big ratio in an operational expense of water utility. Therefore, it is necessary to examine saving energy such as the adoption of a high efficiency pump and an effective control system. Please note that if you don't install an energy-saving equipment and system, it is difficult to achieve energy saving until a time of renewal.

In the design of a pump, various studies are required as mentioned above. It is important to ask an expert for detailed examination as needed after studying the site situation.



Member Self-Introduction

Mr. Rabindra Pokhrel

(KUKL, Nepal)

Hello Readers, I am **Rabindra Pokhrel** from Nepal, presently working as Deputy Project Director in Project Implementation Directorate (PID) under Kathmandu Upatyaka Khanepani Limited (KUKL). I received my Bachelor's Degree in Civil Engineering and Masters of Science in Civil Engineering from Tribhuvan University, Nepal. I started my career in the field of civil engineering right after completing my bachelor's degree a decade ago. I am experienced in the field of project development and implementation of transport, water supply and sanitation sector. I have joined water utility sector since three years ago and already led planning and monitoring division and project implementation unit under the utility.

I live with my family in Kathmandu. Priti Sapkota is my wife and she works as a Civil Engineer in Municipal Government.

We welcomed our first baby boy just few weeks back and named him as Elios Pokhrel.

Kathmandu Upatyaka Khanepani Limited (KUKL) is the only water utility body to supply drinking water in Kathmandu valley, the capital city of Nepal. Being established in 2008, it operates as a Public Private Partnership Company. The company operates old network that are received from previous utility body (government agency: <http://www.nwsc.gov.np/>) at present where NRW level is very high. Other criticism faced by current system is the failure to meet equitable water supply to its customers.



Mr. Rabindra Pokhrel with his wife



***Son of Rabindra Pokhrel,
born on November 24, 2020***

Looking on the financial side, the company presently bears high operational loss and present operation costs are borne through government loans/subsidy. For further details: <http://kathmanduwater.org>

Project Implementation Directorate (PID) is a dedicated office for planning, design and development of new system (popularly known as Melamchi Project) for KUKL. PID works with support from different development partners (ADB, JICA and others) for the development of new system. Melamchi Project is an ambitious water supply project conceptualized by Nepal

Government in 2000 and its implementation started in 2008. The project involves inter basin water diversion through a transmission tunnel of 27 KM and designed to supply 510,000m³/day water to Kathmandu Valley. Phase-1 of this

project is expected to come into operation in sometime during 2021. For further details:

<http://kuklpid.org.np/>

Following are the comparative operational indicators of KUKL.

Table: The comparative operational indicators of KUKL.

Indicators	Current System	Expected after Melamchi Project (Phase-1)
Production (Dry Season)	95,000 m ³ /day	542,000 m ³ /day (Phase-1: 170,000 m ³ /day)
Production (Wet Season)	196,000 m ³ /day	
Coverage ratio	45%	100%
Supply duration	1~8 hours/day (varies)	24 hours/day
Supply Pressure	Varies	1 bar
Designed Demand	N/A	135 LPCD
Number of Connections	221,649	112,255 + new phases
Network Length	2349 KM	77 KM Bulk Distribution System + 1,125 KM Distribution Network
Network Type	Dead End, Tree structure	District Metered Area based loop type
Pipe Material	CI, GI, DI, PVC, UPVC, HDPE	DI, HDPE
Water Quality	Varies	Confirms standard

I assumed the position of Deputy Project Director after my transfer in 2019. My job responsibility at present includes, managing the projects under development /planned by PID. My team at PID and I are working enthusiastically to operationalize the Melamchi system and bring change to current status of water supply here in Kathmandu. I expect experience sharing on change management from managers of water utility in developing countries and best practices/guidance from experts/engineers of Japan through this WaQuAC-Net. Thank you.

feel free to communicate/comment me through pokhrelrd@gmail.com.

The 2nd WaQuAC-Net ZOOM Webinar

Collaborative research on improvement of water supply in rural communities of Thailand

Lecturer: Dr. ISHIBASHI Yoshinobu

The outline of the webinar is as follows.

○Date and time:

The webinar was held on October 16th, 2020
19:30~21:30

○Lecturer:

Dr. ISHIBASHI Yoshinobu

He is a professor emeritus of Tohoku Gakuin University. In 2016, he was appointed as a visiting professor at Khon Kaen University in Thailand. He was working on the collaboration project to improve local water supply with classes and graduate student guidance. But after returning to Japan temporarily in February 2020, it became difficult to re-enter Thailand by COVID-19 regulations, eventually, he retired from Khon Kaen University in the end of September. The project is continued at site by Thai members, and Dr. ISHIBASHI is supporting from Japan.

○Moderator :

Ms. YARIUHI Mina (WaQuAC-Net Office)

○Participants: 17 persons totally

Dr. ASAMI, Mr. IGARASHI, Ms. OONO,
Mr. OZAKI, Mr. ODA, Mr. ONO, Mr. KIJI,
Ms. NGUYEN Trang, Mr. SAIKI,
Mr. SASAYAMA, Mr. SEKIMOTO, Mr. TAKEBE,
Mr. NAGASHIO, Mr. FUJITANI, Dr. MORITA, Ms.
YOSHII (JWF), Ms. YAMAMOTO

○Purpose of the Lecture

People working water supply field in Japan

understand the following 2 points.

1. Villagers and municipal staff want safe tap water for their community water supply in Thailand and want to learn the technology seriously (even in the basic way).

It is different from the policy of Japanese government of selling "advanced technology" or "drinkable water".

2. Project members such as universities, branch offices of central government, PWA (Provincial Waterworks Authority) and etc. are working together to teach people of community water supply about water purification theory and appropriate operations of facilities for promoting water supply improvement.

○Contents of the Lecture

Background: Facilities of water supply in rural area of Thailand have been improved so far. O&M, however, is inappropriate. Therefore, customer satisfaction is 56%, which is very low compared to over 80% of urban water supply.

○Project implementation body:

Khon Kaen University, Mahasarakham University, PWA Regional Training Center 2 Khon Kaen, Regional Environmental Office 10, Regional Health Centre 7, Khoksi Tambon Administrative Organization, Nong Toom Sub-district Municipality

○Model cases:

Khokshi community water supply, Nong Toom community water supply.

○Activities:

Site survey, Water quality analysis, Seminar, Questionnaire survey, Training for theory and O&M of water treatment technology and distribution net management, Human resource development for leaders, Research if necessary.

○ **Focusing point:**

This is the first case in Thailand that various organizations work together to improve the community water supply.

- * More detail, please refer to the PPT used in the webinar. It is available at the WaQuAC-Net website: [Activities> Reference> "Water Supply Projects in the World"](#)
- * Related article is on [Newsletter vol.44](#) page 7



Prof. Ishibashi, Ms. Yariuchi and Participants

○ **Result of Questionnaire**

After the webinar, 9 participants answered in questionnaire

Q1: Impression on Theme and Contents

- It was a valuable lecture for me because I could know the present situation of community water supply in rural area of Thailand and the importance of human resource development for the maintenance of water facilities.
- I hope that this project becomes one of solutions because many rural water supplies in the world have similar problems.
- The project in which the government and the university collaborate is very interesting as both of them use their strong points.
- I expect that residents will recognize

correctly the necessity of water supply by the activities of the university.

- It is necessary to improve wastewater treatment facility and water treatment facility as a set, in order to preserve the water quality of the water source.
- I participated for the first time. Thank you to Professor ISHIBASHI for deepening the contents.

Q2: Problems and improvement points for the webinar operation

- For questions, it's better to use an App called Slido instead of Chat on Zoom.
- I was a little confused because I was not used to zoom meetings.
- Moderator, Ms. YARIUCHI was wonderful, and the meeting progress was very good. A lot of questions came up.
- It is more effective to operate the meeting without mercy.

Q3: Comments on the whole

- Local residents may have more opportunities to participate in seminars.
- Online meeting is very good because we can talk while looking at each other's faces.
- Online is easier and I can concentrate on online lecture rather than regular one, but it's a little unsatisfactory.
- Lecturers can talk easily if they know who is listening, so, the self-introduction by participants firstly, or to let them know the profile of participants in advance are preferable.

Q4: Ideas of theme for future webinars

- Lectures by members from various countries,
- Slanted-Soil-Chamber Method
- Current state of small-scale water supply in Japan by Dr. ASAMI.

(Report by Ms. Yamamoto, WaQuAC-Net Office)

The 3rd WaQuAC-Net ZOOM Webinar

A cheap and easy way to utilize GIS for effective management of water utility
-using Mapbox Vector Tiles-

Lecturer: Mr. IGARASHI Jin
GIS Software Developer,

The 3rd webinar was the first English webinar hosted by WaQuAC-Net. Its targeted participants were members from Asian countries included Japan. The main contents of webinar were about mapping and design of GIS system. It was a little bit technical, however, the webinar had 22 participants, and we extended the time to discuss a lot of questions.

@ Date and Time:

Participants came from all over the world like East Africa, South Asia, South East Asia and Japan. We held it at different time zone on Friday, October 28th, 2020 as follows.

- Japan: at 17:30 – 18:30
- Myanmar: at 15:00 – 16:00
- Thailand, Cambodia: at 15:30 – 16:30
- Nepal: at 14:15- 15:15
- India: 13:00 – 15:00
- Rwanda: 10:30 – 11:30

@ Lecturer: Mr. IGARASHI Jin

He worked as a system engineer of JOCV (Japan Overseas Cooperation Volunteers) at Narok Town in Kenya. Then he went to **Mr. Igarashi** Rwanda and developed GIS applications for water management in rural area as a consultant. He conducted this webinar in order to introduce



his experience to small water utilities in other Asian countries.

@ Moderator:

Ms. YARIUCHI Mina, WaQuAC-Net Office

@ Participants: 22 members totally

Cambodia (6): Mr. CHENDA Pharith, Ms. Hak Nalin,

Ms. MA Laty, Ms. THOR Kounthy,

Mr. Nguon Chhaya, Mr. San Mayarin

Nepal (2): Mr. Bina Maharjan, Mr. Rabindra Pokhrel

Thailand (1): Mr. Supawoot tripasai

India(1):Mr. SANDEEP Pandharkar

Rwanda(1): Mr. KAYINAMURA Innocent

Japan (11): Dr. ISHIBASHI Yoshinobu,

Mr. ONO Yoshinobu, Mr. OZAKI Noboru,

Dr. KAMEGAI Yasuko, Mr. KUBOTA Hiroshi,

Dr. GURAGAI Bibas, Dr. TAPA Phatta,

Mr. SASAYAMA Hiroshi, Mr. SATO Hirotaka,

Mr. HAYASHI Kenta, Ms. YAMAMOTO Keiko

@ Outline of presentation

The need for GIS data is being recognized by water utilities around the world, and many of them have already started collecting data. However, many water utilities are facing the following issues when utilizing the collected data.

- Limited access to GIS data
- GIS requires relatively advanced skills, making it difficult to utilize.
- Proprietary products are difficult to disseminate within a business due to the high cost of software license and training.
- Poor Internet connection makes it difficult to utilize and share the data.

In order to solve the above issues, Mr. IGARASHI recommends using vector tiles with both open source and open data. This allows users to operate GIS data more sustainably and at lower cost.

@ Contents of the webinar

- The recent state of GIS utilization in water utilities
- What is Vector Tiles
- Comparison between proprietary and open source software.
- Advantages of using Vector Tiles for water utilities.
- Introduction of open source tools to create Vector Tiles easily.

Note: Please have a look of the webinar slides on WaQuAC-Net website: go to “Reference” > “[GIS & ICT technologies](#)”.



Participants of the 3rd webinar

@ Comments from questionnaire after webinar

There were answers from 6 participants.

Q1: Opinions/comments on the contents.

- I was very interested in how to create a mapping system using free materials without spending a lot of costs.
- It is very good concept that water utility can introduce GIS system with free software.
- The contents were slightly heavy for the water supply expert. Nevertheless, it was a new topic and interesting.
- I could understand how to use it in the waterworks business.

- The data seemed light, and I can take it to the field with my tablet.

Q2: Suggestions to improve online event

- Everything was OK.
- The event was well arranged especially the video introduction of members and the online Q&A was well thought.
- It is better for all participants to use English any time even before stating the webinar.
- The participants should be muted during the lecturer's presentation.
- I wanted to see the slides more slowly.

Q3: Your impressions on this event.

- Volunteer activities for improving water supply system is great.
- It was impressive to see the participants from so many different countries.
- It works well. Please continue webinar for interesting topics.
- For the technical topics, it is better to have a facilitator who understands contents well to support the moderator.
- It was good for me to meet other Asian members and to learn new topic in the water sector
- For English seminars, it is important that a moderator can understand various kinds of English.

Q4: Your ideas on topics for future events.

- Webinars in English would be good.
- Sharing the status of COVID-19 in each country.
- Young members of WaQuAC-Net present their research/work experience/innovations and senior members provide their comments.

(Report by Ms.Yamamoto, WaQuAC-Net Office)

Report of the 7th Osaka Meeting

Online Panel Discussion
“International Cooperation by Remote Access”

Mr. OZAKI Noboru
Sakai City Waterworks and Sewerage Bureau

The 7th WaQuAC-NET Osaka meeting was held on November 13th, 2020. Under the COVID-19 pandemic, the meeting was held on ZOOM.



Mr. Ozaki

We invited 4 panelists and 13 attendees listened to their presentations. Contents of the meeting are as follows:

1. MCs: Mr. FUJITANI Mitsuhiro
 Mr. OZAKI Noboru
2. Opening Address: Ms. YAMAMOTO Keiko,
 Representative of WaQuAC-Net
3. Self-introduction of attendees
4. The theme: “International Cooperation by Remote Access”
5. 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
6. Q&A session
7. Online friendship party

Although it was through the screen, we were glad to meet together, listened to the latest topic of international cooperation and discussed. The meeting ended successfully and followed by a

friendship party led by MC, Mr. FUJITANI. We enjoyed flank talking.

■ Attendees

Mr. IWAO, Mr. OKADA, Mr. OGURA, Mr. SAIKI, Mr. TAKINO, Mr. NAGASHIO, Mr. FUJII, Mr. FUJIYAMA, Mr. MIYAUCHI, Mr. ONO, Mr. SASAYAMA, Mr. MIYAGAKI
 Ms. YAMAMOTO

■ Troubles

Just few minutes before the opening, we were noticed that Ms. Yamamoto had not connected yet. We changed the order and started self-introduction. Then Ms. Yamamoto was able to join the meeting and made the address.

Other attendees also met the trouble of connection. Someone reset his/her account, someone could not use camera and unfortunately someone gave up joining the meeting. I felt difficulty of online meeting. This time, Ms. YARIUCHI solved troubles. I think I have to learn about ZOOM application and become a trouble shooter.

Lecturers



Mr. Hirowatari, Mr. Matsubara, Ms. Yariuchi, Dr. Kamegai



Attendees in the ZOOM Osaka Meeting, KANPAI (Cheers)!

■ Questionnaire

After the meeting, we sent questionnaires to attendees and we got 8 replies. Most of all replies were favorable. Major opinions are as follows.

Good marks

- It was a good opportunity to listen the latest topic of international cooperation.
- It was a good opportunity to listen the case of struggling or trying something against the COVID-19 pandemic.

Low marks

- Presentation time was too short.
- The timing to ask a question was difficult.

■ Impression

I think that “The balance between remote and face-to -face” was the theme of this meeting. Now we are required remote technical cooperation, like online meeting or online training. Now we found that it was hard to implement technical cooperation without face-to -face communication. But I guess we have to continue the remote technical cooperation even after the pandemic is over. Topics of this meeting are big issues of future technical cooperation. We have to keep considering about “the balance between remote and face-to -face” for a while. Usually, we invited 1 or 2 lecturers in this Osaka meeting, but this time we could invite 4 panelists because of online meeting. This is a strong point of online. If a training program is implemented in 2 parts, remote and face- to- face, the remote part will be able to open for a large number of trainees. Of course, the pandemic brings bad effects, but I believe it also brings the opportunity of innovations.

I would like to express gratitude to the panelists and attendees. Especially I am deeply grateful to Mr. HAYASHI who had managed the precious Osaka meeting for 6 times until last year, Ms. YARIUCHI who mainly arranged this meeting and Mr. FUJITANI who accepted the MC of the friendship party. I hope the next Osaka meeting will be held as a “face- to -face”. (by Mr. Ozaki)

The Final Report Session of Scholarship participants of Univ. of Tokyo
23/Sep./2020

The Final Report Session by first graduate students of “Water Engineering and Utility Management for Future Leaders Training Program” (Cooperation program between University of Tokyo and JICA) was held via online, in which these four students made presentations.

At the Final Report Session, they presented their master's thesis research results after a briefing of the program by JICA. The research topics are as follows. The outline of each presentation is referred to the JICA website.

Ms. Thor Kounthy (from Ministry of Industry, Science, Technology and Innovation, Cambodia) “Performance Assessment of Private Water Supply Operators in Peri-urban Areas of Cambodia” described the actual situation that many private water supply operators have caused inefficient operation and frequent malfunctions due to improper design.

Ms. Phaimany Sengphouvong (from Vientiane Capital Water Supply State Enterprise, Laos), “Factors affecting the workforce efficiency in Vientiane Capital Water Supply State Enterprise, Lao PDR” clarified the reasons why work efficiency did not improve, such as lack of human resource development opportunities and uncertainties in business responsibilities by analyzing interviews with the staff.

Ms. Ei Khaing Mon (from Yangon City Development Committee, Myanmar) “Estimation of Groundwater Pollution Sources in the Western District of Yangon City, Myanmar” clarified that both groundwater sources and surface water sources were contaminated with E-coli and

ammonium nitrogen and pointed out that further analysis of domestic wastewater and pollution sources of each water source was necessary.

Ms. Khaing Khaing Soe (from Yangon City Development Committee, Myanmar) "Assessment of Revenue Loss due to Damaged Meters in Different housing Types of Yangon City" revealed that replacing damaged water meters and shifting from fixed rates to pay-as-used system could increase revenues and recover water meter replacement costs in 1 to 2.5 years.

At the end of the Final Report, Prof. Koizumi of Tokyo Metropolitan University and Mr. Sato, Director of the Water Supply Planning Guidance Office of the Ministry of Health, Labor and Welfare, expressed their expectations for this program.

Since the four students came to Japan in September 2018, WaQuAC-NET has held a welcome party, interacted with members at the year-end party, interviewed individually and posted it in the newsletter. We have made many communications with them.

Unfortunately, the Final Report did not include questions or comments from audience, but after listening to the presentation, I found that all four students successfully gain the methods to gather

and analyze the information necessary for them to solve their own workplace issues. I would like to greatly celebrate their efforts over the past two years.

Celebration & Farewell party for 4 students

On Sep 19, the day before the university's graduation ceremony, a farewell party was held for four students. Unfortunately, it was held online, so we decided to invite a limited number of members, who have had relationships with four students. Besides of the four students, Mr. SASAYAMA, Dr. KAMEGAI, Dr. MORITA, Mr. IGARASHI, Ms. YAMAMOTO, Ms. YARIUCHI participated. They talked a lot about how they were affected by COVID-19. In this March, after the four returned to their own countries to collect the data of the research, the travel ban to Japan started. Since then, the research guidance was carried out online. Although they returned to Japan from July separately, there is no opportunity to get a gather of the four students. Even after submission of master thesis, they had to give up their plan to travel around Japan. During their two-year stay in Japan, it seemed that their personal lives fulfilled, such as being kind by Japanese people and having fun walking

around the suburbs of Tokyo. The words given by the Japanese attendees were put together on a message card and sent to four students. At the end, everyone sang a Japanese song "Sukiyaki" in English together. Later, we sent them cloth masks made in Japan as a souvenir.

(Report by Ms. Yariuchi, WaQuAC-NET Office)



Message card including picture of the party

Introduction of new members

- Mr. Hayashi Kenta (Japan)
- Mr. Ashan Lakmal Pathirane (Sri Lanka)

We welcome new members anytime

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WaQuAC-Net Office

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(Yariuchi, Yamamoto)

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

Next Activity

- | | |
|------------|-------------------------------|
| January 20 | ZOOM New Year Party |
| February 5 | ZOOM 2021General meeting |
| March 15 | Newsletter vol.48 in Japanese |
| April 15 | Newsletter vol.48 in English |