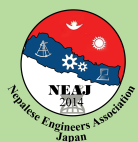
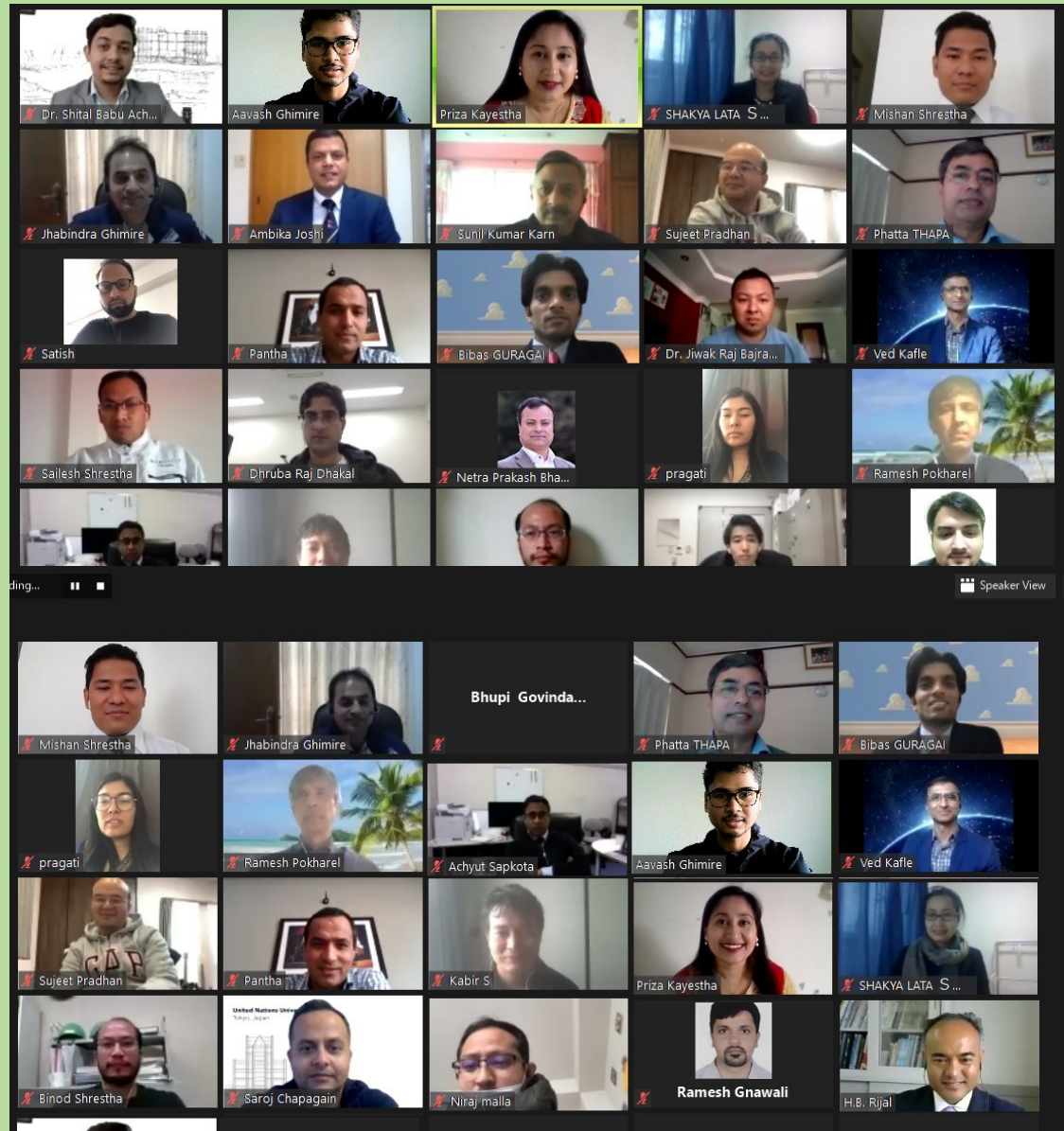


REPORT of the 12th NEAJ Symposium on
“Current and Future Technologies”

12 December 2020, via Zoom



Nepalese Engineers Association Japan (NEAJ)

Report of 12th NEAJ Symposium on "Current and Future Technologies"

12nd December 2020, via Zoom

Edited by

Dr. Lata Shakya,
Dr. Bibas Guragai,
Ar. Shital Babu Acharya

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Dr Bibas Guragai
Dr Shital Babu Acharya
Dr Priza Kayestha
Ar. Pragati Baniya

Online Backend Zoom management
Er. Aavash Ghimire, Tokyo Institute of Technology

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Date of Publication: March 2021

Table of Contents

WELCOME SPEECH	7
INTRODUCTION OF NEAJ	8
INAUGURAL SPEECH	11
ACADEMIC PAPER PRESENTATION	13
PAPER PRESENTATION 1:	13
<i>Status and challenges of ICT based remote learning platforms</i>	13
PAPER PRESENTATION 2	14
<i>Pros and Cons of Virtual Education during COVID-19 pandemic: A Case of Nepal</i>	14
PAPER PRESENTATION 3	16
<i>A field investigation on adaptive thermal comfort in school buildings in temperate climatic region of Nepal</i> .	16
PANEL DISCUSSION ON PERSPECTIVE: ACADEMIC AND PROFESSIONAL ENGINEERING CAREER IN JAPAN	19
KEYNOTE SPEECH 1	19
<i>Water Supply Sector in Nepal-Where It Stands and How NEAJ Can Help,</i>	19
KEYNOTE SPEECH 2	25
<i>"Transmitting electricity through Air" A Political stunt or Scientist's Dream</i>	25
GUEST PRESENTATION	26
<i>An Experience of Knowledge and Technology Transfer from Japan to Nepal by moving work station to Nepal</i>	26
COMMENTS AND FLOOR DISCUSSION	27
PHOTOS	33

SATURDAY, DECEMBER 12, 2020 13:00-16:00 PM (JST), 9:45-12:45 (NPT)

12th NEAJ Symposium on CURRENT and FUTURE TECHNOLOGIES



Academic Paper Presentations (Please refer the attached program)

Panel Discussion on

Perspective: Academic and Professional Engineering Career in Japan



**Water Supply Sector in Nepal-
Where It Stands and How NEAJ
Can Help**

Dr. Phatta Bahadur Thapa
(Tokyo Engineering Consultants
International)



**"Transmitting electricity through
Air" A Political stunt or Scientist's
Dream**

Prof. Dr. Ramesh Pokharel
(Kyushu University)



**An Experience of Knowledge and
Technology Transfer from Japan
to Nepal**

Dr. Jhabindra Prasad Ghimire
(Asha Consulting Group Pvt. Ltd.)

Commentators

Dr. Bhoj Raj Pantha (Katahira & Engineers International)
Dr. Ved Prasad Kafle (National Institute of Information and
Communications Technology)

Prof. Dr. Hom Bahadur Rijal, Tokyo City University
Prof. Dr. Netra Prakash Bhandary, Ehime University
Prof. Dr. Sujeet Pradhan, Kurashiki University of Science and the Arts

Moderator

Dr. Bibas Guragai
Vice President-NEAJ
(Tokyo Engineering Consultants
International)

Registration <https://bit.ly/36Rrmlw> | **Zoom link** <https://bit.ly/2VN8wFS> | **Organized by** Nepalese Engineers Association Japan (NEAJ), neaj.office@gmail.com | **Detail** <http://www.neajc.org/>

Program:

Welcome Speech- Assoc. Prof. Dr Lata Shakya, President-NEAJ
(*Ritsumeikan University*)

Introduction of NEAJ - Dr Shital Babu Acharya, General Secretary-NEAJ
(*Tokyo Institute of Technology*)

Inaugural speech- Mr. Ambika Joshi, Deputy Chief of Mission,
(*Embassy of Nepal in Japan*)

Academic Paper Presentation
Host: *Dr. Priza Kayastha, EXCOM member- NEAJ*
(*Willis Towers Watson*)

Status and challenges of ICT based remote learning platforms,
Hiromasa Ogawa and Dr. Achyut Sapkota,
(*National Institute of Technology, Kisarazu College*)

Pros and Cons of Virtual Education during COVID-19 pandemic: A Case of Nepal,
Dr. Jiwak Raj Bajracharya,
(*Kathmandu University*)

A field investigation on adaptive thermal comfort in school buildings in temperate climatic region of Nepal,
Mishan Shrestha, Dr. H.B. Rijal,
(*Tokyo City University*)

Panel Discussion on
Perspective: Academic and Professional Engineering Career in Japan
Moderator: *Dr. Bibas Guragai, Vice President-NEAJ*
(*Tokyo Engineering Consultants International*)

Keynote Speech 1
Water Supply Sector in Nepal-Where It Stands and How NEAJ Can Help,
Dr. Phatta Bahadur Thapa,
(*Tokyo Engineering Consultants International*)

Keynote Speech 2
"Transmitting electricity through Air" A Political stunt or Scientist's Dream
Prof. Dr. Ramesh Pokharel,
(*Kyushu University*)

Guest Presentation
An Experience of Knowledge and Technology Transfer from Japan to Nepal by moving work station to Nepal
Dr. Jhabindra Prasad Ghimire, President, (Asha Consulting Group Pvt. Ltd.)

Comments and Floor Discussion

Dr. Bhoj Raj Pantha,

(Katahira & Engineers International)

Prof. Dr. Hom Bahadur Rijal,

(Tokyo City University)

Prof. Dr. Netra Prakash Bhandary,

(Ehime University)

Prof. Dr. Sujeet Pradhan,

(Kurashiki University of Science and the Arts)

Dr. Ved Prasad Kafle,

(National Institute of Information and Communications Technology)

(sorted by alphabetic order)

Closing Remarks & Kanpai (Virtual Nomikai)

Assoc. Prof. Dr. Achyut Sapkota, Former NEAJ President

(National Institute of Technology, Kisarazu College)

Welcome Speech

Assoc. Prof. Dr Lata Shakya, President-NEAJ

(Ritsumeikan University)

Good afternoon, distinguished guest, participants, ladies and gentlemen

Namaste.

Thank you for being today.

I am very pleased to extend a warm welcome you all to the 12th NEAJ Symposium on Current and Future Technologies. This is our twelfth NEAJ Symposium, devoted to current research work and professional activities of our NEAJ colleagues. It will give all of us a platform to exchange ideas, discover novel opportunities, reacquaint with colleagues, meet new friends.

The theme of the 12th NEAJ Symposium is the continuation of our core theme “current and future technologies “. We will have three research paper presentation followed by the panel discussion “Perspective: Academic and Professional Engineering Career in Japan”. Research papers are from different field and unique. I am looking forward to hear the presentations and lively discussion related to technologies for development of Nepal.

The organizing committee in collaboration with our senior NEAJ colleagues and NEAJ alumni build up a stimulating panel discussion program. We are pleased to have Dr. Phatta Bahadur Thapa (Tokyo Engineering Consultants International) and Prof. Dr. Ramesh Pokharel (Kyushu University) as a keynote speakers and Dr. Jhabindra Prasad Ghimire (former NEAJ President, Asha Consulting Group Pvt. Ltd) as a guest speaker. We will learn their working experience in Japan and from Dr. Jhabindra we will learn his effort to transfer knowledge from Japan to Nepal. We are also pleased to have Dr. Bhoj Raj Pantha (Katahira & Engineers International), Prof. Dr. Hom Bahadur Rijal (Tokyo City University), Prof. Dr. Netra Prakash Bhandary (Ehime University), Prof. Dr. Sujeet Pradhan (Kurashiki University of Science and the Arts), Dr. Ved Prasad Kafle (National Institute of Information and Communications Technology) as a commentator.

I am sure this program will trigger lively discussion and will project us to new developments.


Current NEAJ ExCom had organized a seminar ““Post-disaster Heritage Reconstruction and Resilient Society” -Perception of Japanese experts/contributors” in November 2019 at Tokyo City University inviting Japanese experts which was very successful. Today, we are organizing this symposium via zoon (online) due to COVID 19 pandemic, and it is really nice to have participants from various places of Japan as well as Nepal.

I sincerely hope you will enjoy today’s thematic presentation, panel discussion and virtual nomikai. Thank you for your participation.

Introduction of NEAJ

Dr Shital Babu Acharya, General Secretary-NEAJ

(Tokyo Institute of Technology)




A brief Introduction to NEAJ and newly created approach of MEMBERS' CLUSTER

Dr Shital Babu Acharya
Secretary
Ex-Com 2019
NEAJ

Timeline of NEAJ

- March 19, 2003: Nepal Engineers Association-Head Office Nepal authorized NEAJ (Japan Chapter) led by Dr. Prof. Madan Bdr. Karkee with 55 members
- May 2005: Ad-hoc Committee led by Dr. Netra Prakash Bhandary drafted the statute of NEAJ-JC
- 25 June 2014: NEAJ-JC was restructured as Nepal Engineers Association Japan (NEAJ)
- Since August 2019: 4th Executive Committee Led By Dr. Lata Shakya-Ongoing



OBJECTIVE OF NEAJ

- Act for the development of professional knowledge & skill via seminars, workshops, interaction and collaborations
- Establish relationship of NEAJ with other national and international professional society
- Facilitate mutual cooperation and support for the professional welfare and development of Nepalese engineers residing in Japan
- To effectively contribute and play the role of Engineering community for the development of Nepal

MAJOR ACTIVITIES of NEAJ

1st NEAJ-JC Seminar



Newsletter
Year 5 Issue 1

- Contents: Activity Report, Research Papers, Commentaries, News, Member's Waiver

Invited Lectures - Japanese Experts



Research papers

- ENVIRONMENTAL IMPROVEMENT BY ENLARGING NATURAL DRAIN FLOW BY THE RIVER CHANNELS: 13
- RESEARCH ON "SUSTAINABLE DEVELOPMENT" CONCEPT UNDER CLIMATE CHANGE: 14
- ENVIRONMENTAL IMPROVEMENT THROUGH "SUSTAINABLE DEVELOPMENT" CONCEPT UNDER CLIMATE CHANGE: 15
- ENVIRONMENTAL IMPROVEMENT THROUGH "SUSTAINABLE DEVELOPMENT" CONCEPT UNDER CLIMATE CHANGE: 16
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- ENVIRONMENTAL IMPROVEMENT THROUGH "SUSTAINABLE DEVELOPMENT" CONCEPT UNDER CLIMATE CHANGE: 29
- ENVIRONMENTAL IMPROVEMENT THROUGH "SUSTAINABLE DEVELOPMENT" CONCEPT UNDER CLIMATE CHANGE: 30

4th Executive Committee - 2019

Major Activities:

- Membership renew and application
- Membership fee
- Members cluster and publication in the website
- Seminar
- Annual Symposium



President
Dr. Dr. Lata Shakya
Tokyo City University



Vice President
Dr. Dr. Mani Koirala
Tokyo Engineering University International



General Secretary
Dr. Dr. Lata Shakya
Tokyo Institute of Technology



Treasurer
Dr. Dr. Prasad Sharma
Sakuma University



Member
Dr. Dr. Prasad Sharma
Sakuma University



Member
Dr. Dr. Prasad Sharma
Sakuma University



Member
Dr. Dr. Prasad Sharma
Sakuma University

Information on NEAJ Website

www.neajc.org

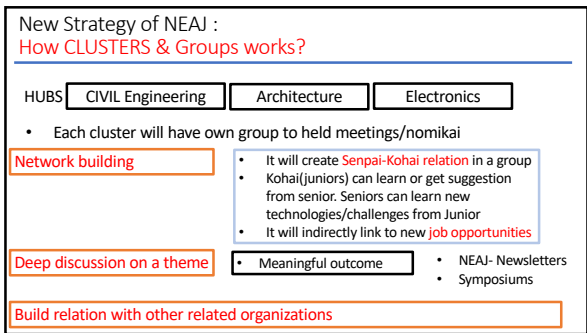
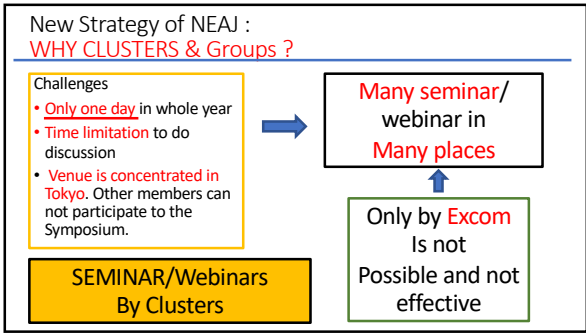
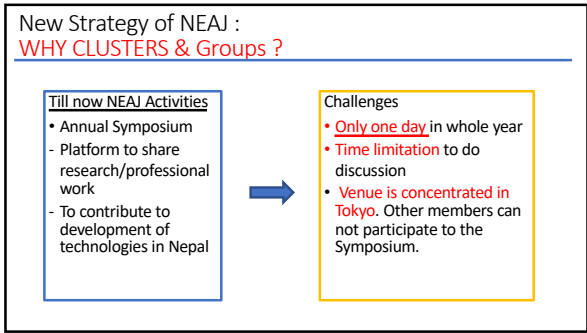
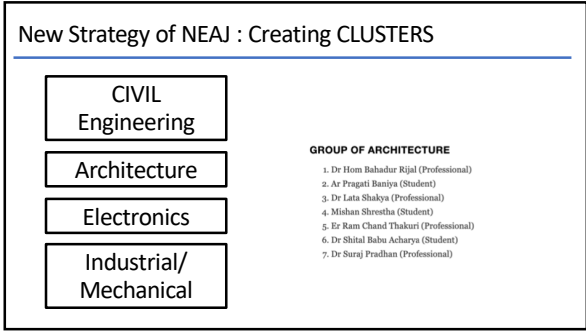
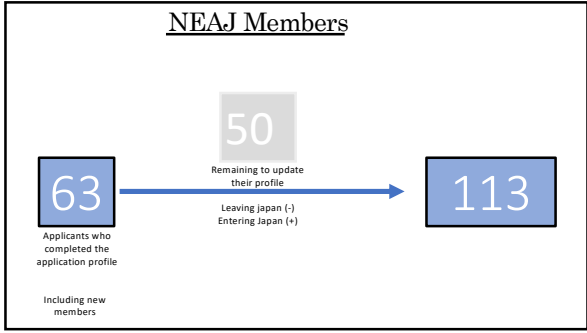
Nepalese Engineers Association, Japan



A updated website with all the information since its establishment

+

Now we are going to add the members list together by their field of expertise.



New Strategy of NEAJ : How CLUSTERS & Groups works?

NEAJ Seminar: Heritage Reconstruction and Resilient Society in Nepal

Individual cluster group can organize symposium related to their field in association with NEAJ.

Organized by: NEAJ, Nepal Engineering Association, Nepal Architecture Association, Nepal Electronics Association, Nepal Industrial and Mechanical Association.

Co-organizers: Nepal Engineering Council, Nepal Architecture Council, Nepal Electronics Council, Nepal Industrial and Mechanical Council.

Hosts: Nepal Engineering Council, Nepal Architecture Council, Nepal Electronics Council, Nepal Industrial and Mechanical Council.

Guests: Prof. Ravi HANSA, Director of International Studies, The University of Tokyo; Prof. Ravi HANSA, Director of International Studies, The University of Tokyo; Prof. Ravi HANSA, Director of International Studies, The University of Tokyo.

New Strategy of NEAJ :
How CLUSTERS & Groups works?



REPORT of the NEAJ seminar on
"Post-disaster Heritage Reconstruction
and Resilient Society"
Participation of Japanese experts/Contributors
2 December 2015, Nara National Institute of Advanced Industrial Science and Technology



Japanese Engineers Association Japan (NEAJ)

New Strategy of NEAJ :
How CLUSTERS & Groups works?



REPORT of the NEAJ seminar on
"Post-disaster Heritage Reconstruction
and Resilient Society"
Participation of Japanese experts/Contributors
2 December 2015, Nara National Institute of Advanced Industrial Science and Technology



Japanese Engineers Association Japan (NEAJ)

New Strategy of NEAJ :
How CLUSTERS & Groups works?



REPORT of the NEAJ seminar on
"Post-disaster Heritage Reconstruction
and Resilient Society"
Participation of Japanese experts/Contributors
2 December 2015, Nara National Institute of Advanced Industrial Science and Technology



Japanese Engineers Association Japan (NEAJ)

Discussions and Research Meeting

Upcoming Event:
On January,

Organizer: Cluster of civil engineering (initiated by TOKODAI)
Program: A discussions and research meeting.

NEAJ will facilitate

Thank you

Inaugural speech

Mr. Ambika Joshi, Deputy Chief of Mission

(Embassy of Nepal in Japan)



१२ डिसेम्बर २०२०

नेपाल इन्जिनियर्स एशोसिएसन, जापानका अध्यक्ष डा. लता शाक्यज्यू

एशोसिएसनका महासचिव डा. शितल बाबु आचार्यज्यू

सिम्पोजियमका विभिन्न सत्रमा कार्यपत्र प्रस्तुतकर्ता, सहजकर्ता तथा टिप्पणीकर्ताज्यूहरू

साथै कार्यक्रममा सहभागी सम्पूर्ण दिदी बहिनी तथा दाजुभाइहरू,

नमस्कार !

सर्वप्रथम महामहिम राजदूत प्रतिभा राणा, नेपाली राजदूतावास, जापान परिवार र मेरो व्यक्तिगत तर्फबाट नेपाल इन्जिनियर्स एशोसिएसन जापानले आयोजना गरेको यस 12th Symposium on Current and Future Technologies को सफलताको शुभकामना व्यक्त गर्न चाहन्छु। जापानमा रहनुभएका नेपाली इन्जिनियरहरूको यस प्रकारको रचनात्मक क्रियाशीलताको राजदूतावास सराहना गर्दछ। कोभिड-१९ को महामारीको विषम परिस्थितिमा पनि सिम्पोजियमका माध्यमबाट आफूसँग भएको ज्ञान र अनुभवलाई साटासाट गर्ने र नवीन संभावनाहरूको खोजी कार्य जारी राख्ने यो प्रयास प्रशंसनीय छ।

आजको सिम्पोजियममा प्रस्तुत हुने कार्यपत्रहरू तथा कार्यपत्रमाथिको बौद्धिक छलफलबाट कुनै महत्वपूर्ण निचोड निस्कने कुरामा हामी विश्वस्त छौं। नेपाललाई केन्द्र विन्दुमा राखेर प्रस्तुत हुन लागेका यी कार्यपत्रहरूमाथिको बौद्धिक बहसबाट प्राप्त ज्ञान नेपालको विकासका लागि पनि अवश्य नै उपयोगी हुनेछन्।

कुनै पनि राष्ट्रको सर्वाङ्गीण विकासका लागि सक्षम जनशक्ति अपरिहार्य छ। विकासको सूचकांकमा नेपाल अझै पनि पुछारतिरै रहनुमा यस प्रकारको जनशक्तिको कमी पनि प्रमुख कारक रहेको छ। तर पछिल्लो समयमा उज्याला संकेतहरू देखिएका छन। स्वदेशमै पनि सक्षम जनशक्तिको उत्पादन बढिरहेको छ भने यस्तो जनशक्तिको एक ठूलो हिस्सा विदेशमा रहेको छ। विभिन्न कारणले विदेशमा रहनु परेता पनि उहाँहरू सबैमा राष्ट्र विकासको हुटुहुटी प्रष्ट देख्न सकिन्छ। आजको यो कार्यक्रम र प्रस्तुत हुने कार्यपत्रहरू पनि यसको ज्वलन्त उदाहरण हुन्। यसरी विदेशमा रहनुभएका विज्ञहरूको ज्ञान तथा सीपलाई देश विकासमा उच्चतम सदुपयोग गर्नु आजको आवश्यकता हो।

यस आवश्यकतालाई हृदयंगम गर्दै माननीय परराष्ट्रमन्त्रीज्यूको अगुवाइमा Brain Gain Center को स्थापना भएको छ। यसको मुख्य उद्देश्य विभिन्न मुलुकहरूमा रही विभिन्न क्षेत्रमा विज्ञता हासिल गरेका नेपालीहरूलाई नेपालको विकासको हिस्सेदार बनाउनु हो। तपाईंहरूलाई पनि उक्त Center मा जोडिन म अनुरोध गर्दछु। परराष्ट्र मन्त्रालयको एक इकाइका रूपमा रहेको उक्त center का बारेमा बिस्तृत जानकारीका लागि मन्त्रालयको वेबसाइट www.mofa.gov.np मा गई BGC मा Click गर्नुपर्ने छ। यस केन्द्रको उद्देश्यपूर्तिका लागि यहाँहरूको सहयोग, सुझाव तथा सल्लाहको हामी स्वागत गर्दछौं। यसका लागि राजदूतावासमा सम्पर्क गर्नसक्नुहुनेछ। तपाईंहरूको सुझाव र सल्लाह सम्बन्धित निकायसम्म पुर्याउने प्रतिबद्धता व्यक्त गर्न चाहन्छु।

व्यक्तिगत रूपमा यस कार्यक्रमले मलाई जापानमा रहनुभएका इन्जिनियरिङ क्षेत्रमा कार्यरत नेपालका विशिष्ट व्यक्तित्वहरूसँग परिचित हुने अवसर समेत प्रदान गरेको छ। यो मेरा लागि अत्यन्त खुशीको कुरा हो। त्यसका लागि म एशोसियसनका अध्यक्ष डा. लता शाक्य लगायत सम्पूर्ण आयोजक टीमलाई धन्यवाद दिन चाहन्छु। एशोसियसनले गर्ने सबै प्रकारका रचनात्मक कार्यहरूमा राजदूतावासको पूर्ण सहयोग रहने कुरामा विश्वास दिलाउन चाहन्छु।

झण्डै एक वर्षदेखि हामी कोभिड-१९ को महामारीसँग जुधिरहेका छौं। पछिल्लो समयमा जापानमा पनि यसको संक्रमण बढिरहेको छ। यसबाट जोगिन यहाँहरू सबैले सुरक्षाका आवश्यक उपायहरू अवलम्बन गरिरहनुभएको छ भन्नेमा हामी विश्वस्त छौं। शुरुवाती दिनदेखि नै राजदूतावासले जापानमा रहेको नेपाली समुदायलाई यस सम्बन्धमा सुसूचित गर्दै आवश्यक सावधानी अपनाउन अनुरोध गर्दै आएको छ। आ-आफ्नो सम्पर्कमा रहनुभएका जापानमा बसोवास गर्ने नेपाली दाजुभाइ तथा दिदीबहिनीहरूबीच यस सम्बन्धमा आवश्यक सचेतना फैलाउन र जापान सरकारले जारी गरेको स्वास्थ्य सम्बन्धी मापदण्डको पूर्ण पालनाका लागि आग्रह गरिदिन म यहाँहरूलाई पनि अनुरोध गर्न चाहन्छु।

अन्त्यमा, यस्तो महत्वपूर्ण कार्यक्रमको आयोजक, कार्यपत्र प्रस्तुतकर्ता विज्ञहरू लगायत कार्यक्रममा सहभागी सबै विशिष्ट महानुभावहरूलाई धन्यवाद दिँदै पुनः कार्यक्रमको पूर्ण सफलताको शुभकामना व्यक्त गर्न चाहन्छु।

यहाँहरू सबैको दिन शुभ रहोस्।

धन्यवाद ।

अम्बिका जोशी

Academic Paper Presentation

Host: Dr. Priza Kayastha, EXCOM member- NEAJ

(Willis Towers Watson)

Paper Presentation 1:

Status and challenges of ICT based remote learning platforms

Hiromasa Ogawa and Achyut Sapkota

Advanced Control and Information Engineering Course,

National Institute of Technology, Kisarazu College, Kisarazu, Chiba, Japan

Email: hiromasaogawaa@gmail.com, sapkota@j.kisarazu.ac.jp

Abstract

Due to COVID-19, there are many schools around the world that are unable to give traditional face-to-face classes. In this situation, various ICT based platform are being for online classes. Learning based on real-time video calling are considered effective. However, there are several disadvantages in this method of remote learning. It takes many data traffic and it isn't possible to take classes stably in areas where the internet connection is not good. Some schools and students don't have a good internet connection, so real time video calls cannot be used. Therefore, these schools are forced to use a combination of text and image materials to conduct classes without interactive media. The purpose of this study is to work for potential solutions and evaluate their effectiveness in remote learning classes while using optimal data traffic.

Profile:

Hiromasa Ogawa is final year student of Control and Information Engineering at National institute of Technology, Kisarazu College. He is working for his graduation research in Sapkota Laboratory. His research theme is development of real-class environment over the internet (next generation virtual teaching platforms).

Pros and Cons of Virtual Education during COVID-19 pandemic: A Case of Nepal

Jiwak Raj Bajracharya, PhD
Assistant Professor | Program Coordinator-Master in TVET
School of Education, Kathmandu University
Email: jiwak@kusoed.edu.np

Abstract:

In the Education sector, the Nepalese government had already invested 70 million rupees for developing and implementing virtual teaching and learning to cope with COVID-19. However, there is an urgent need for a study to explore the effects of virtual education in Nepal. Thus, this study was carried out to investigate the pros and cons of the current virtual education status in Nepal. To achieve the purpose of the study, qualitative research was used by accomplishing a series of interviews with teacher educators, head teachers, and teachers, where individual interviews and focus group discussions were carried out. In the findings, there were numerous pros and cons of the current practice of virtual education in Nepal. However, the study highlighted that innovative instructional strategies could be carried out to enhance the quality of virtual education in Nepalese educational institutions. Similarly, this was also an opportunity for Nepalese teachers and educational institutions to excel in their current educational practices by offering the validated blueprints for achieving purposeful educational outcomes.

Keywords: COVID-19; Innovative Practices; Instructional Strategies; Virtual Education

Profile:

Dr. Jiwak Raj Bajracharya has been an Assistant Professor at the Kathmandu University School of Education and also serving as core Editorial member of Journal of Education and Research, since 2019. He has been also serving as Program Coordinator for Master in Technical and Vocational Education and Training program since August 2019, which is a new and innovative graduate program at KUSOED. Dr. Bajracharya holds a Ph.D. and a Master's degree in Education from the International

Christian University (ICU), Japan, and a Bachelor's degree in Digital Information Design from Shizuoka Sangyo University, Japan

Dr. Bajracharya has been also providing training to school as well as college teachers to enhance their competencies regarding pedagogy and instructional strategies, need assessment, technology integration, psychological approaches, instructional system design and also wide range of digital leadership too.

A field investigation on adaptive thermal comfort in school buildings in temperate climatic region of Nepal

Mishan Shrestha, H.B. Rijal

Graduate School of Environmental and Information Studies, Tokyo City University,
3-3-1 Ushikubo-nishi, Tsuzuki-ku, Yokohama, Kanagawa, 224-8551, Japan

Abstract:

Thermal comfort, which is defined as the state of mind that expresses satisfaction with the thermal environment, is one of the environmental quantities. There are six factors that affect thermal comfort of students: air temperature, radiant temperature, air velocity, humidity, clothing insulation and activity of the students. A thermally comfortable classroom is essential for students to be healthy and have better performance in schools. The students spend approximately 30% of their daily lives in schools for their educational activities. Therefore, the indoor environmental factors should be maintained as required. Extreme thermal environmental conditions such as too hot and too cold is harder for students to focus and concentrate on their educational activities. These are caused because of the poor infrastructure of the buildings or inappropriate clothing insulation of the students. Most of the Nepalese school buildings in urban as well as in rural areas are poor in passive design such as thermal insulation of walls and roofs and also solar control over windows, they also do not have mechanical heating and cooling systems. They have so far been designed just to accommodate the students and teachers providing merely with a certain amount of space without considering the effect of outdoor thermal environmental condition including solar radiation and wind. The Nepalese Department of Education implements the strategies to construct school buildings without the assessment of thermal environment. According to the current School Sector Development Plan implemented by the Government of Nepal, the Minister of Education does not mention the indoor thermal environment and thermal comfort of students in classrooms.

Therefore, this study investigated the thermal comfort of the students in naturally ventilated secondary schools during the autumn and summer of 2017 and 2019, respectively all of which are in the temperate climatic region of Nepal. The major objectives of this study are to investigate the perception of students on

thermal comfort, to determine the comfort temperature and its zone based on their perception and to analyze how their clothing insulation affects their thermal comfort.

A series of field study were conducted in three areas Dhading, Kathmandu and Nuwakot districts. The survey was carried out in 29 classrooms of 9 school buildings under the condition of natural ventilation. This study included three private (231 students) and six public schools (833 students). Altogether 1064 students aged 12-18 years have participated in the survey. With the permission of school administrators, environmental measurement, and the thermal comfort survey (questionnaire) was conducted during regular class. The questionnaire sheets were distributed to the students at the beginning of the class and the purpose of the survey, how to fill out the questionnaire sheets were explained. Environmental quantities such as air temperature, relative humidity, globe temperature and air velocity are measured using the digital instruments. All instruments were placed in the center of the classrooms at the height of around 1.1m above the floor level. Thermal sensation (Fig. 1) was asked to the students at sedentary conditions without intervening the regular class. The comfort temperature was estimated by Griffiths method as given below.

$$T_c = T_g + (4 - TSV) / a \quad (1)$$

where T_c : comfort temperature (°C), T_g : indoor globe temperature during voting time (°C), TSV : thermal sensation vote and a : regression coefficient to be assumed constant (a being 0.50 implying a change of one subjective category scale corresponding to 2°C change in indoor globe temperature).

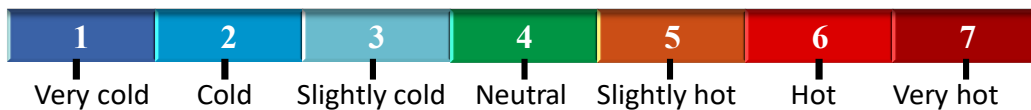


Fig. 1 Scale used for thermal sensation

The students were guided to answer the levels of their dresses that they were wearing referring to the checklist of clothing given on the questionnaire sheets. What they wore were converted into respective clothing insulation units for statistical analysis. Clothing insulation of the students was calculated using the following formula:

$$I_{(clo, total)} = \sum I_{(cl, i)} \quad (2)$$

where $I_{(clo, total)}$ is the total clothing insulation (clo) and $I_{(cl, i)}$ is respective clothing insulation (clo) value of garment component, i .

Under the condition of natural ventilation and similar indoor and outdoor thermal environment, more than 70% of the student perceive the indoor thermal environment as comfortable. The range of indoor globe temperature was found from 24 °C to 30 °C, over which 70% students are likely to accept their classroom thermal environment with the mean comfort temperature 27 °C as shown in Figure 2. The comfort temperature of the students was beyond the temperature limits in ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) standard. This showed that the students have higher adaptive ability to the thermal environment. The clothing adaptive behaviour were weakly seen up to 30 °C and more responsive above 30 °C of outdoor air temperature. This study provides more attention to thermal comfort of the students to create a comfortable learning environment and contributes to developing the thermal comfort guideline for Nepalese school buildings in the future.

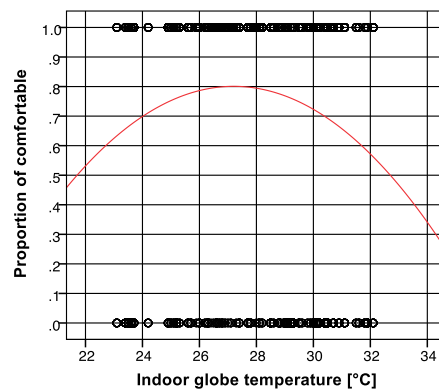


Fig.2 Proportion of comfortable

Keywords

Thermal comfort, Naturally ventilated Schools, Thermal sensation, Comfort temperature, Clothing

Profile:

My name is Mishan Shrestha and I am a PhD student at Tokyo City University. After completing master course majored in Environmental and Information studies, I enrolled in the same university for the Ph.D. course this year. I am appointed as a research assistant at this university for this year.

Panel Discussion on Perspective: Academic and Professional Engineering Career in Japan

Keynote Speech 1

Water Supply Sector in Nepal-Where It Stands and How NEAJ Can Help,
Dr. Phatta Bahadur Thapa,

(Tokyo Engineering Consultants International)



Contents of Presentation

- My Introduction
- Global Status of Water Supply
- Status of Water Supply in Nepal
- Major Challenges in the Sector
- Digitization and Advances in Water Supply System
- How NEAJ can help
- Concluding Remarks

Overview of Global Water Supply System

Access to Water (as of 2017)

- 5.3 billion people used **safely managed** services.
- An additional 1.4 billion used at **least basic** services.
- 206 million people used **limited** services, 435 million used **unimproved** sources, and 144 million still used **surface** water.
- Eight out of ten** people still **lacking even basic** services lived in **rural areas**. Nearly half lived in Least Developed Countries.

Seven out of ten people used safely managed drinking water services in 2017

Fig. : Global drinking water coverage 2000-2017 (%) (Source: WHO-UNICEF Joint Monitoring Program)

Situation of Water Supply System in Nepal

Access to Water (as of 2017)

- 3.5 million do not have access to basic water services
- Functional status of water sources and water quality are the main problems, only 25% of water supply system are fully functional
- 71% of all sources are contaminated with E-coli (Source: Unicef, Nepal)

Type of Services

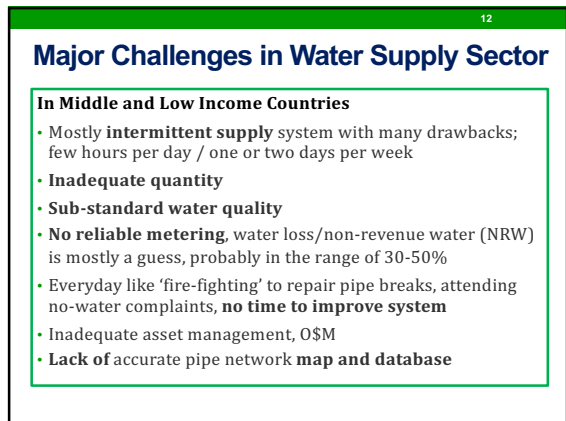
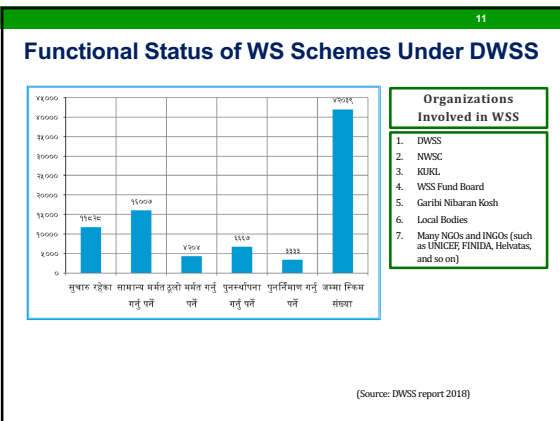
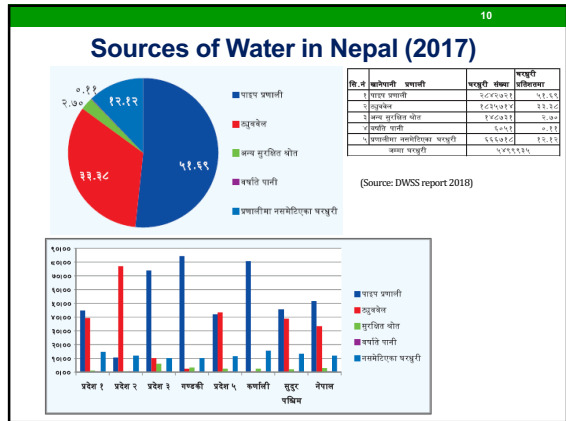
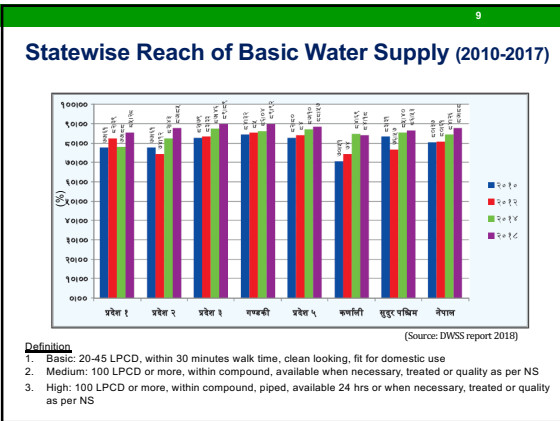
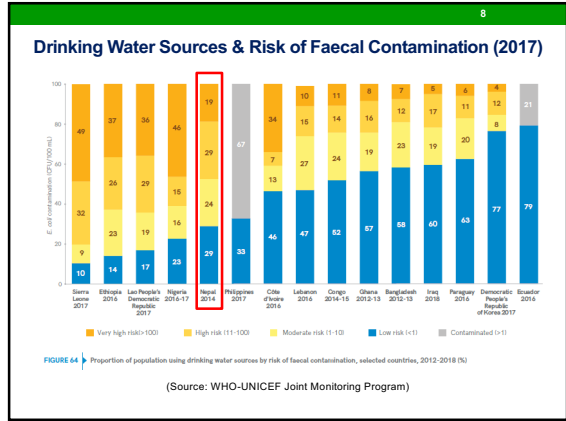
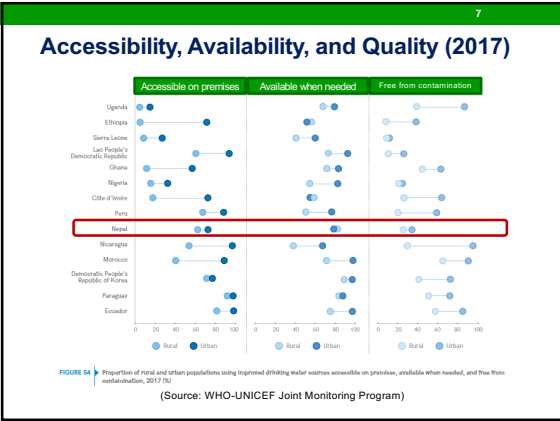
COUNTRY AREA OR TERRITORY	Year	Population (thousands)	NATIONAL					RURAL					URBAN				
			At least basic	At least basic (excl. unimproved)	Unimproved	Surface water	Surface water (excl. unimproved)	At least basic	At least basic (excl. unimproved)	Unimproved	Surface water	Surface water (excl. unimproved)	At least basic	At least basic (excl. unimproved)	Unimproved	Surface water	Surface water (excl. unimproved)
Nepal	2000	23,141	13	80	1	12	1	78	1	17	3	1	95	41	5	1	0
	2017	29,295	15	85	2	11	1	80	1	4	4	3	89	33	7	1	0

(Source: WHO-UNICEF Joint Monitoring Program)

Accessibility (2000 and 2017)

COUNTRY AREA OR TERRITORY	Year	National					Rural					Urban					
		At least basic	At least basic (excl. unimproved)	Unimproved	Surface water	Surface water (excl. unimproved)	At least basic	At least basic (excl. unimproved)	Unimproved	Surface water	Surface water (excl. unimproved)	At least basic	At least basic (excl. unimproved)	Unimproved	Surface water	Surface water (excl. unimproved)	
Nepal	2000	24	43	24	46	36	22	38	73	22	43	3	76	79	35	63	31
	2017	29	65	62	27	47	44	28	43	82	28	46	4	72	79	34	55

(Source: WHO-UNICEF Joint Monitoring Program)



Focus of Developed Countries

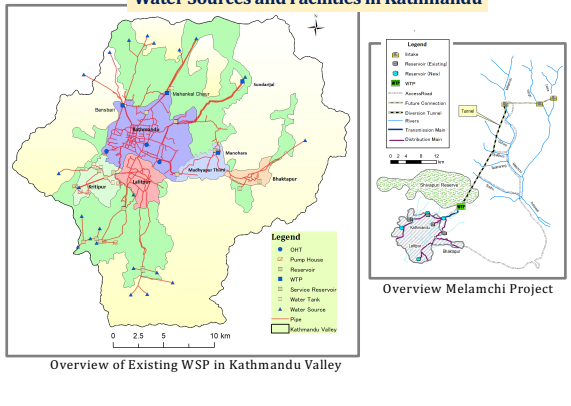
Focus of Developed (High Income) Countries

- Advance treatment, removal of known unknown pollutants
- Reduction in water loss
- Reduction in per capita consumption
- Optimization of system efficiency, energy use
- System automation
- Smart metering
- Smart distribution system
- Digitalization

Our Systems

- We are all too familiar with the situation in **Kathmandu**
- **Pokhara** should have been better but not
- **Hetauda and Bharatpur** have managed relatively well
- Situations in **Tarai towns** like Janakpur and Birgunj are not good either
- Situation in **small towns** is relatively better
- Situation in **villages** depends on source and how active is the user's committee
- Asset management and regular maintenance activities are inadequate

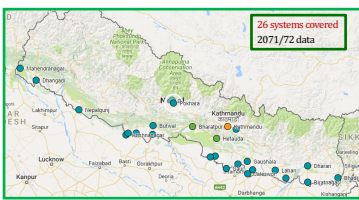
Water Sources and Facilities in Kathmandu



WTPs in Kathmandu



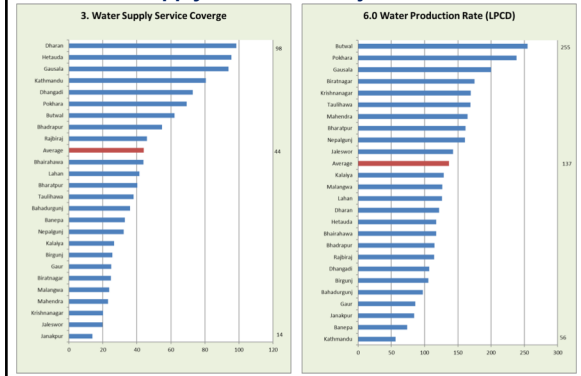
Water Supply Situation in Major Cities/Towns

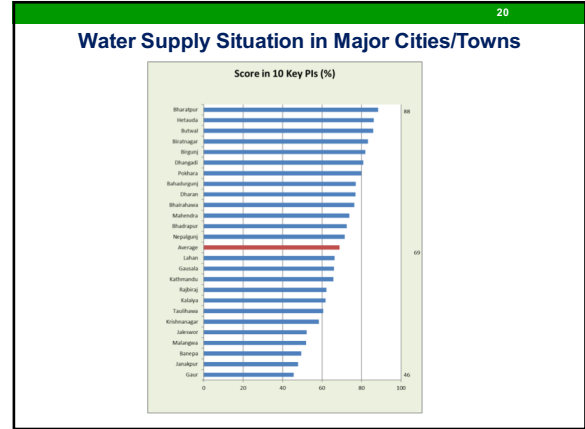
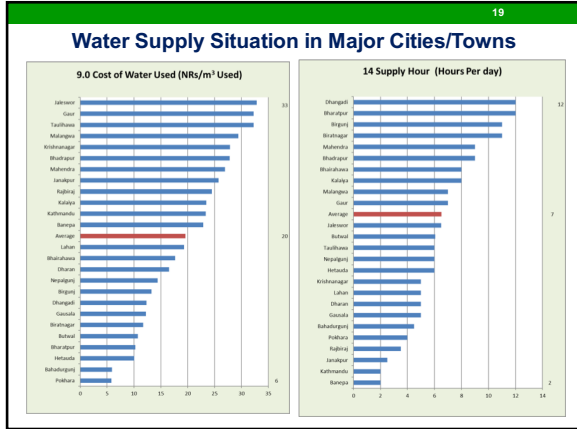


Definition
Operating ratio: Annual operational cost/ Annual Sales revenue (Billing)
Collection ratio: Annual tariff collection/ Annual Billing
 Source: JICA Nepal

SN	Type	Indicators	Units	Average	Min	Max	Goal (expected)
1	Staff	Staff Ratio (000)	No/Taps	8.3	2.8	15.3	5
2	Coverage	Coverage by water supply	%	45.6	13.8	98.4	100
3	Coverage	Metered connections	%	96.2	84.0	100.0	100
4	Production	NRW	%	37.6	12.3	64.9	10-15
5	Production	Water production rate	LPCD	136.7	61.5	254.7	~120
6	Revenue & Exp	Production cost	NRs/m ³	12.4	2.5	23.6	10
7	Revenue & Exp	Collection Ratio	Unit less	0.9	0.7	1.0	1.0
8	Revenue & Exp	Operating Ratio	Unit less	1.3	0.24	2.8	0.5
9	Service	Supply hours	Hour	6.5	2.0	12.0	24
10	WQ	Sample meeting WQ (Avg)	%	42.7	0.0	100.0	100

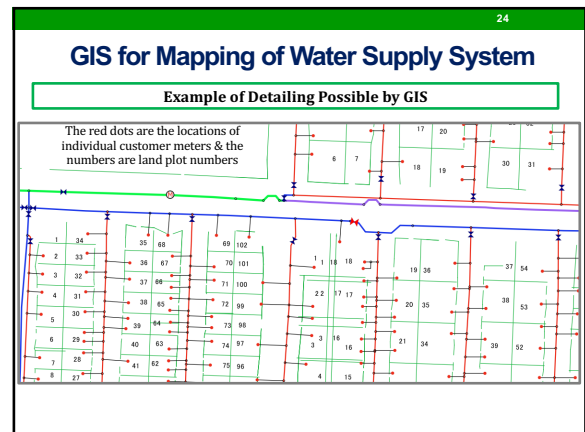
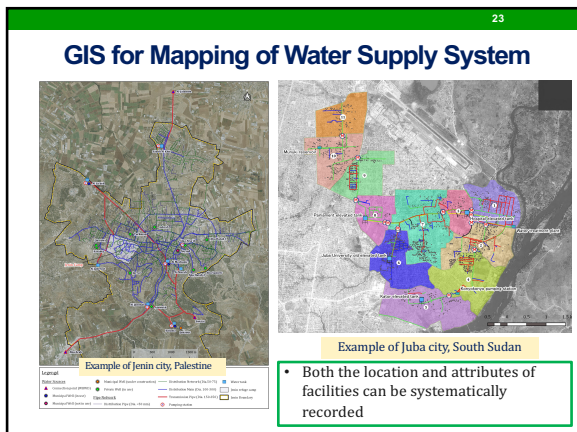
Water Supply Situation in Major Cities/Towns

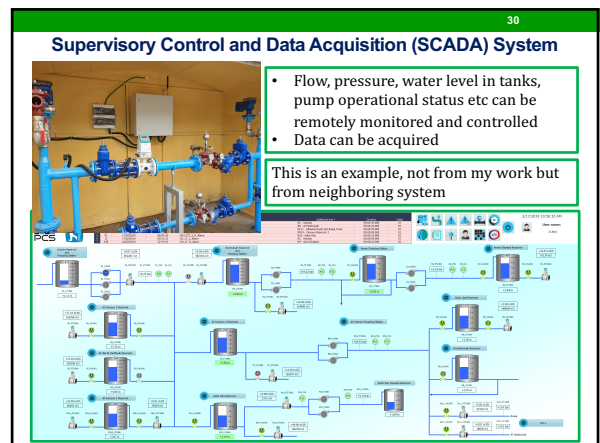
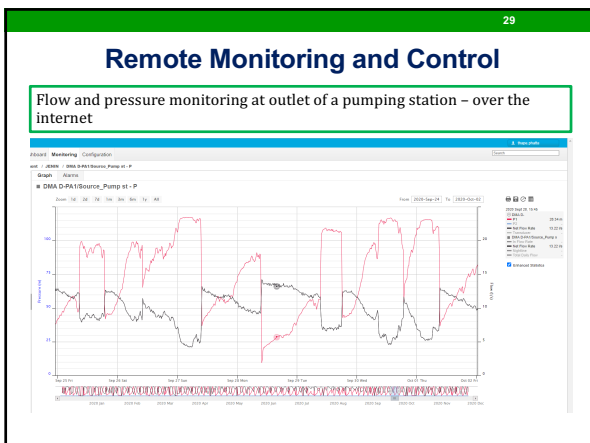
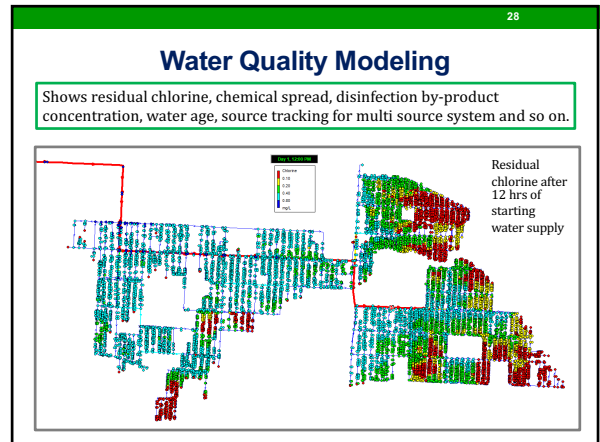
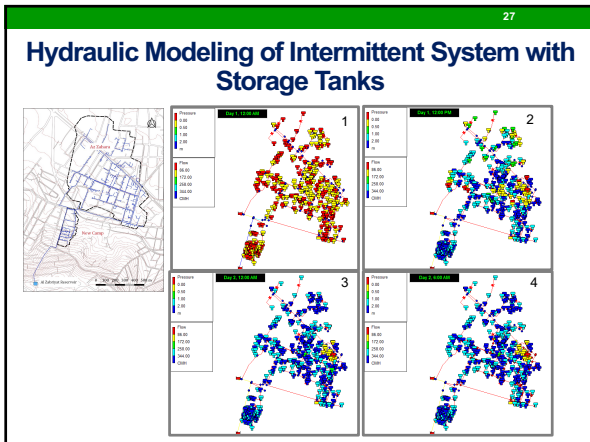
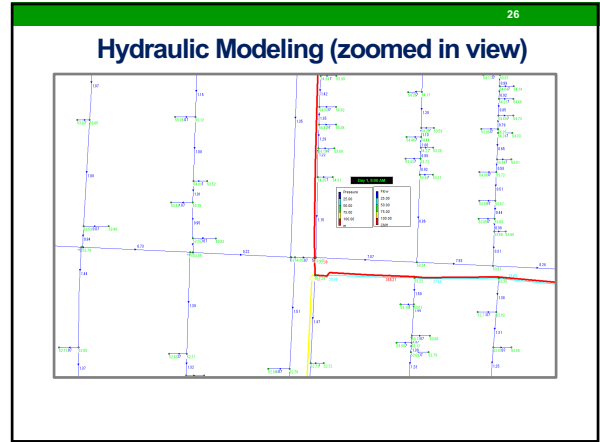
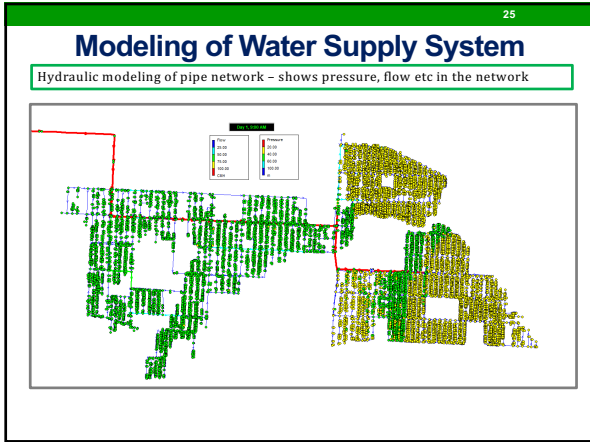




- 21
- ### Trends and Future Direction of WS in Nepal
- **Melamchi**, Phase 1, 2, and 3 (510 million liter per day; (about 100 L/person/day for 5 million people)
 - **East-West trunk main**
 - **Impounding reservoir** systems
 - **Self-sustained smaller systems** through water users' committees
 - **Downward movement of settlements**, easier access to water sources
 - **Increasing forest cover**, hopefully positive effect on water sources
 - **Availability of electric power** to pump up water when required
 - Small scale WTPs and disinfection of community supplies


- 22
- ### Digitalization & Advances in Water Supply
- Helps operate with more **efficiency**
 - Required for **automation**
 - Helps make **informed decisions**
 - **Mapping of pipe network** with accurate location and pipe size, material, laying depth is **crucial** for development of system
 - **GIS** is one of the most used tools to map water supply system






31

Smart Metering



Pre-paid type smart meter



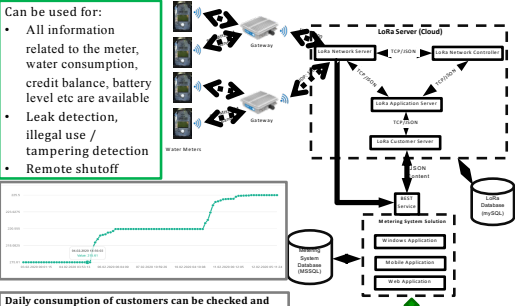
IoT (LoRa) based communication via gateway

32

Communication System through Gateway

Can be used for:

- All information related to the meter, water consumption, credit balance, battery level etc are available
- Leak detection, illegal use / tampering detection
- Remote shutoff



Daily consumption of customers can be checked and monitored online

Data acquisition and analysis

33

Smart Water System

Further research and works are advancing

- The system will have **sensors and communication tools** at appropriate locations in the pipe network
- Pressure** is adjusted automatically
- Any **fault** in the system will be **automatically detected** and alarm will be generated and sent to relevant person
- If a **pipe break** occurs in a system, it will **identify where** the break occurred, **identify the valves to be closed**, close the valves, and send details to relevant persons for prompt pipe repair
- And so on.

34

How NEAJ Can Help?

- Mapping** of water supply assets (pipe network, valve, tanks, pumps etc) is crucial for optimal O&M and further development of system. Only a few of our systems have such maps, that too only primitive
- Open source** (free) GIS program (such as QGIS) can be used
- Any computer literate person (preferably an engineer or senior technician) from each water utility can be provided a short **training** (about 12 hrs course) on how to use QGIS and prepare pipe network map
- Basemap** of each area can be prepared and sent to them to work **offline** for places where internet availability is an issue
- Hydraulic **modeling** of simpler systems using free program such as EPANET can be taught to engineer or overseer (junior engineer?) level staff

35

Concluding Remarks

- Nepal is **lagging far behind** in water supply sector in all respects; water accessibility, quantity, quality, digitization and so on
- Free and simple tools** can be used to start updating our schemes in preparation for future
- NEAJ can play a role by **providing training** (remotely or onsite when the Corona situation allows site visit) to local water utility officials
- If we do not do any thing, we will not have any future. We will be lagging even farther behind.

36

Thank You for Listening Patiently!

“Transmitting electricity through Air” A Political stunt or Scientist's Dream

Prof. Dr. Ramesh Pokharel

(Kyushu University)



KYUSHU UNIVERSITY

Transmitting Electricity through the Air: A Political Stunt or Scientist's Dream

Ramesh Pokharel

Faculty of Information Science and Electrical Engineering,
Kyushu University, Fukuoka, Japan

<http://rfic.ed.kyushu-u.ac.jp/>



九州大学

Guest Presentation

An Experience of Knowledge and Technology Transfer from Japan to Nepal by
moving work station to Nepal

Dr. Jhabindra Prasad Ghimire,

(President, Asha Consulting Group Pvt. Ltd.)

An Experience of Knowledge and Technology Transfer from Japan to Nepal by Moving Work Station to Nepal

Jhabindra Prasad Ghimire, PhD

President

Asha Consulting Group Pvt. Ltd.

Pulchowk-3, Lalitpur, Nepal

Ph: +977-1-5521837



Outline of the Presentation

- ▶ Background of the Company
- ▶ Area of Services
- ▶ Collaboration with Japanese Companies
- ▶ Different Software and Numerical Tool we use
- ▶ Some Projects done in the past
- ▶ Some current International as well as Domestic Projects
- ▶ Effective way of Knowledge and Technology Transfer
- ▶ Working Environment in Nepal as of Today
- ▶ Opportunities and Challenges to work from Nepal in Projects Abroad
- ▶ Summary

Comments and Floor Discussion

Dr. Bhoj Raj Pantha,

(Katahira & Engineers International)

Prof. Dr. Hom Bahadur Rijal,

(Tokyo City University)

Prof. Dr. Netra Prakash Bhandary,

(Ehime University)

Prof. Dr. Sujeet Pradhan,

(Kurashiki University of Science and the Arts)

Dr. Ved Prasad Kafle,

(National Institute of Information and Communications Technology)

Dr. Guragai: Thank you to all the panelists. Now, I would like to start the panel discussion. First, I would like to request comments and questions from our panelists.

Dr. Bhoj Raj Pantha (Katahira & Engineers International)

The presentations were very interesting. I have a few questions. First, to Dr. Thapa, there are many water supply projects in Nepal, however a substantial number of them are nonfunctional (25%). Is it due to an improper institutional organization or the lack or lapse in including water user's community approach?

My next question to Dr. Pokharel: Is there any additional risk assessment system besides transmission? Is it safe for anyone/anything to be within the electric field?

Finally, regarding third presentation by Dr. Ghimire: I also sometimes think of returning to Nepal. However, I am worried if it is difficult to work with the government clients.

Prof. Dr. Hom Bahadur Rijal (Tokyo City University)

To Dr. Thapa: Melamchi Water Supply project initiated 2 decades ago has not yet completed citing government lapse or no water as the main problem. Water problem also brings in sewage and river pollution problems and less has been researched in

this topic. Under water scarce conditions, people store water in rooftop tanks. My concern/question is related to the safety of water stored in roof top tanks. In the UK, people pay at least 3 months of their water bills in advance. This reduces the meter reader visits and the associated costs.

To Dr. Pokharel: Is ICT, which is moving towards making cities smart, also making negative impact on health?

To Dr. Ghimire: I highly appreciate Dr. Jhabindra's return to Nepal. I also have a suggestion: If we want to ensure everything is perfect at the end, then the Japanese culture of taking note of small details would be very helpful. I also recommend recommended a research division in Dr. Ghimire's company to further his company's growth.

Prof. Dr. Sujeet Pradhan (Kurashiki University of Science and the Arts)

To Dr. Thapa: Although water may be a never-ending problem, it is good to know Nepal's progress in water sector is satisfactory.

To Dr. Pokharel: What are the technical hurdles to making Dr. Pokharel's dream a real?

To Dr. Ghimire: I am glad to know that Dr. Ghimire also completed his engineering from Jaipur (same as me). I hope to meet him in future symposiums.

Dr. Ved Prasad Kafle (National Institute of Information and Communications Technology)

To Dr. Thapa: In the present context, water issues are not a concern only for civil/environmental engineers. In fact, water issues should be dealt from a multidisciplinary approach. A collaborative approach is needed to solve future water problems. Especially, the use of ICT, SCADA in distribution monitoring is being used in new water projects. I am wondering if SCADA is also used in Nepal's water sector especially in the Melamchi project. I have also some experiences preparing monitoring devices for water and irrigation sector.

To Dr. Pokharel: Today's society is all about ICT, AI, distance education and society cannot survive without this. Electron management is necessary to transfer data. However, there is a concern on how to continuously feed power to batteries. Also, health concern should also be equally researched based on world class regulations.

Back in 2019, in Nepal, I proposed using a Japanese practice where a school kid relays information to 4-5 of his friends. Those informed further inform other 4-5 kids. This proposal was accepted in rural hilly Nepal where informing every student's is a daunting task.

To Dr. Ghimire: You are a source of inspiration. The way Dr. Ghimire is trying to implement Japanese designs such as the small park concept is very good for the Nepalese society and I hope he will be able to persuade government and local officials. I also agree that our aim should be returning to Nepal.

Dr. Guragai: Thank you for your comments and questions. Next, I would like to take questions from the floor too.

Dr. Jhabindra Ghimire: Many cities in Nepal are located in higher altitudes. Is it feasible to lift water from low level grounds/rivers to supply to cities/towns in higher altitudes?

Dr. Jiwak Bajracharya: From the layman concept, can we implement the law of WIFI to have wireless electricity? Also, what sort of feasible strategies could be there to introduce cost-effective to us IOT?

Dr. Guragai: I would like to request Dr. Thapa to respond to the comments and questions from the panelists and the floor.

B. RESPONSES BY SPEAKERS

Dr. Thapa, Senior Consultant, TEC International Co. Ltd

(Presentation: Water Supply Sector in Nepal-Where it Stands and How NEAJ can help)

Thank you to all the commentators and Jhabindra ji for your comments and questions.

Nepal has initiated use of SCADA in Melamchi project for treatment monitoring purposes. Other treatment plants in Bansbari, Bode and Mahankalchaur do not have SCADA technology and still rely on conventional technologies. Currently per capita daily water demand in Kathmandu is 56 liters, so Melamchi could be sufficient for the residents of Kathmandu.

Water user's community (WUC) approach is a matured concept and widely accepted throughout the developing world. These WUC were trained on operation and maintenance trainings. If such WUCs are active the system is sustainable. However,

sources have dried, and pipes have not been properly laid which causes water supply systems to fail. In cities such as Kathmandu and Pokhara there are no WUC.

Regarding smart meters, there are two types of such smart meters. One is the pay once for a while type while the other is pay before you use type. In African countries, customers do not care about the utility's bills, and no one can hold them responsible. Thus, the system is being changed to prepaid water meters. A card/token is given to them which is to be recharged once the credit expires. However, there are also issues of financially weak households not being able to pay for water beforehand. Subsidies have also been discussed by the utilities and the government. Recently JICA has started a new study about prepaid water meter worldwide. Dr. Bibas and I are involved in that project.

Dr. Guragai: My PhD research was also related to Kathmandu's Water Supply System. In my research I calculated per capita daily water demand for Kathmandu to be approx. 60 liters, so hopefully Melamchi (1st and 2nd phase combined) will meet all the water demand of the Kathmandu Valley)

Dr. Thapa: I welcome Dr. Kafle's call for working together with the ICT engineers for solving water related problems.

Dr. Kafle: (in a funny way) ICT engineers are like a potato in Nepalese dish. They fit in any sectors.

Dr. Ghimire: Many cities in Nepal are located in higher altitudes. Is it feasible to lift water from low level grounds/rivers to supply to cities/towns in higher altitudes?

Dr. Thapa: As electricity production is increasing in Nepal, lift pumps can be a good option to supply water to cities/towns in higher levels. However, the pumps also needed to be genuine and should have longer life (12-15 years).

Dr. Guragai: Now I would like to request Dr. Pokharel to respond to the comments and questions from the panelists and the floor.

Dr. Pokharel, Professor, Kyushu University

(Presentation: Transmitting Electricity through the Air: A Political Stunt or Scientist's Dream)

Regarding the power transfer, WHO standard has guidelines for SAAG. Pacemaker does not need much power. If it is within standard it is of no concern, however, even the standards need to be checked.

Whatever technology it is, we should be able to make it radiation free. Otherwise, there might be some cross effect. Safety in transmission is an issue. In high hilly areas VSAT communicates with satellite and the KTM and hilly areas can receive the signal. In this context, New Zealand launched the world's first long range wireless power transmission.

Efficiency depends on K and Q. Efficiency (U) = K x Q. The main concern is that it is difficult to improve U.

I hope that this generation shall certainly see wireless transmission of power.

Dr. Guragai: Now I would like to request Dr. Ghimire to respond to the comments and questions from the panelists and the floor.

Dr. Jhabindra Ghimire, Director, Aasha Consulting Co. Ltd.

(Presentation title: An Experience of Knowledge and Technology Transfer from Japan to Nepal by moving workstation to Nepal)

I am in the early stages of having returned to Nepal and have no clashes (professional) with government officials yet. However, one should not return to Nepal hoping only to deal with government sector. We need to work with private sectors also. There is a thin line between government and private sector. Something needs to be changed.

I am worried about the quality maintenance of the government counterparts in Nepal. Reports are kept in the closet with no referencing or archive systems.

Being underpaid is also another issue. However, private sector does not have enough projects and government sector might not always be helpful. Private sector is also growing in Nepal especially in the hydropower and industrial sector. Yet, major infrastructure is from the government. So, one must try to make balance between the government and private sectors.

For my concept of small park, a Mayor accepted it, but other engineers were not positive. There is no easy answer to if one should return to Nepal. Hard work and continuous learning should be the main target. Hopefully, a good Managing Director or a CEO can show interest in our projects.

Since it is just the beginning of my career in Nepal, I will certainly try to have research collaborations with Japanese company in the future. Some companies have expressed good response and I shall look from that angle.

Finally, if we have good eyes, we see everything is good around us. One should be totally frustrated. Instead, a better preparation is necessary. In my 2 years of returning to Nepal, I have been mostly satisfied and I would like to share with everyone that one should not lose hope.

Photos

