

Nepal Engineers' Day 2012: Golden Jubilee Celebration

Nepal Engineers' Association Japan Center (NEA-JC)

One-day Symposium on

Engineers for Entrepreneurship and Development in Nepalese Context

The University of Tokyo, Komaba Research Campus, 4-6-1 Komaba, Meguro-ku, Tokyo

21 July 2012 (Saturday)

Summary Report

To commemorate 50 years of establishment of Nepal Engineers Association (NEA), the Japan Center of Nepal Engineers' Association (NEA-JC) celebrated Golden Jubilee of NEA by holding a one-day symposium on "Engineers for Entrepreneurship and Development in Nepalese Context" in Tokyo and Kyoto on July 21, 2012 (Saturday). The program in TOKYO witnessed an enthusiastic participation of about three dozens of Nepalese academics, researchers, experts and students from engineering, natural science and social science disciplines. The details of the program are as follows.

TOKYO PROGRAM

10:30~11:25	Opening Plenary (MC: Er. Satya Narayan Sharma)
10:30~10:40	Welcome and opening address including a brief introduction of NEA by <i>Er. Dr. Netra Prakash Bhandary</i> , President, NEA-JC
10:40~10:50	Inaugural address by the Chief Guest <i>H. E. Dr. Madan Kumar Bhattarai</i> , Ambassador of Nepal to Japan
10:50~10:55	Remarks by Guest <i>Dr. Rajendra Prasad Parajuli</i> , General Secretary, Non-Resident Nepali Association (NRNA) Japan
10:55~11:00	Remarks by Guest <i>Er. Rajan Bhattarai</i> , Executive Secretary, Nepalese Students' Association Japan (NESAJ)
11:00~11:05	Remarks by Guest <i>Dr. Prakash Shaky</i> a, Treasurer, The University of Tokyo Nepalese Forum (TUNeF)
11:05~11:10	Letter of Appreciation by <i>H. E. Dr. Madan Kumar Bhattarai</i> on behalf of NEA-JC
11:10~11:25	Invited Special Talk, "State Restructuring: Asking a right question" by <i>Er. Dr. Surya Raj Acharya</i> , Senior Research Fellow, Institute for Transport Policy Studies (ITPS)
11:25~11:40	Break
11:40~12:50	Keynote Session (Chair: Er. Dr. Surya Raj Acharya)
11:40 – 12:10	Speaker: <i>Er. Dr. Ved Prasad Kafle</i> , Senior Researcher, NICT Title: Internet and Mobile Communication – History, Current Status and Future Direction
12:10 – 12:20	Q&A
12:20 – 12:40	Speaker: <i>Er. Dr. Netra Prakash Bhandary</i> , Assistant Professor, Ehime University Title: Preliminary Understanding of the 1255 Seti River Debris-Flood in Pokhara, Nepal
12:40 – 12:50	Q&A
12:50~14:30	Lunch Break
14:30~15:50	General Presentation Session (Chair: Er. Dr. Jhabindra Ghimire)
14:30 – 14:45	Speaker: <i>Er. Ramesh Guragain</i> , Deputy Executive Director, NSET Title: Development of Fragility Functions for Low Strength Masonry Buildings in Nepal using Applied Element Method

14:45 – 14:50	Q&A
14:50 – 15:05	Speaker: <i>Mr. Buddha Ratna Shrestha</i> , PhD Candidate, Tokyo Institute of Technology Title: Polymer electrolyte fuel cell and platinum dissolution
15:05 – 15:10	Q&A
15:10 – 15:25	Speaker: <i>Er. Prem Prakash Khatri</i> , M.Eng. Student, The University of Tokyo Title: Extracting Gravity Anomaly Data from the Noisy Data obtained by Ship-borne Gravimeter to Achieve the Mobility of Gravity Method
15:25 – 15:30	Q&A
15:30 – 15:45	Speaker: <i>Er. Ramesh Pokharel</i> , M.Eng. Student, The University of Tokyo Title: Evaluation of road network from reliability perspective: An accessibility importance and network closure vulnerability approach
15:45 – 15:50	Q&A
15:50~16:10	Coffee Break
16:40~17:40	Panel Discussion (<i>Moderator: Er. Dr. Netra Prakash Bhandary</i>) Title: 50 Years of Nepal Engineers' Association and Engineering Profession in Nepal Panelists: <i>Er. Dr. Surya Raj Acharya</i> <i>Er. Dr. Ved Prasad Kafle</i> <i>Er. Ramesh Guragain</i>
17:40~17:50	Concluding Remarks and Vote of Thanks (<i>Er. Dhruba Panthi, Coordinator, Organizing Committee and Event Management Committee, NEA-JC</i>)

PARTICIPANTS

SN	Name	Affiliation
1	Er. Dr. Achyut Sapkota	Chiba University
2	Er. Alina Shrestha	Saitama University
3	Mr. Alok Chalise	--
4	Er. Amit Regmi	E&T Japan
5	Ms. Anjila Bhadel	--
6	Mr. Bishwa Raj Sapkota	The University of Tokyo
7	Mr. Buddha Ratna Shrestha	Tokyo Institute of Technology
8	Er. Dhruva Panthi	The University of Tokyo
9	Er. Dr. Jhabindra Ghimire	Commonwealth Engineers
10	Er. Dr. Kabir Shakya	Tokyo Institute of Technology
11	Er. Keshab Gyawali	The University of Tokyo
12	Er. Keshab Sharma	The University of Tokyo
13	Er. Laxmi Prasad Suwal	The University of Tokyo
14	H. E. Dr. Madan Kumar Bhattarai, <i>Chief Guest</i>	Embassy of Nepal, Tokyo
15	Er. Mahadev Thapa	Saitama University
16	Er. Naba Raj Shrestha	Saitama University
17	Er. Dr. Netra Prakash Bhandary	Ehime University
18	Er. Pashupati Dhakal	E&T Japan
19	Mr. Pradeep Giri	--
20	Dr. Prakash Shakya, <i>Guest (TUNeF)</i>	The University of Tokyo
21	Er. Prem Prakash Khatri	The University of Tokyo
22	Er. Rajan Bhattarai, <i>Guest (NESAJ)</i>	The University of Tokyo
23	Er. Rajan Paudel	E&T Japan
24	Dr. Rajendra Parajuli, <i>Guest</i>	NRN Japan
25	Mr. Raju Guragai	--
26	Er. Ramesh Guragain	NSET
27	Er. Ramesh Pokharel	The University of Tokyo
28	Er. Sapana Poudel	--
29	Er. Sashi Bhandari	E&T Japan
30	Er. Satya Narayan Sharma	Saitama University
31	Er. Dr. Subas Chhatkuli	PASCO, Tokyo
32	Er. Dr. Surya Raj Acharya	ITPS, Tokyo
33	Er. Dr. Ved Prasad Kafle	NICT, Tokyo

SOME GLIMPSES OF THE PROGRAM



NEA-JC President Er. Dr. Bhandary delivering the opening address



Chief Guest H. E. Ambassador Dr. Bhattarai delivering his speech



Chief Guest felicitating Er. Dr. Surya Raj Acharya with the Letter of Appreciation



Group photo taken after the conclusion of the program

APPENDIX 1

PRESENTATION ABSTRACTS AND SPEAKERS' PROFILES

Invited Special Talk: State Restructuring: Asking a right question

Speaker: Er. Dr. Surya Raj Acharya

Abstract: In an effort of restructuring the nation, this talk highlights the role of engineering communities in the state restructuring debate.

Speaker's Profile (education and career): A senior member of Nepal Engineers' Association as well as its Japan Center, Er. Dr. Surya Raj Acharya holds a PhD from the University of Tokyo. The education and career details of Er. Dr. Acharya are as follows.

2004-present Senior Research Fellow, Institute for Transport Policy Studies (ITPS)

2001-2004 Researcher, Institute for Transport Policy Studies (ITPS)

1999-2001 Post-doctoral Fellow, Department of Civil Engineering, University of Tokyo

1999 Ph.D., University of Tokyo

1994-1996 In-house Consultant, United Nations-ESCAP, Bangkok

1994 M.Eng., Asian Institute of Technology, Bangkok, Thailand

1992 B.A. (Economics), Tribhuvan University, Nepal

1991-1992 Program Officer, IUCN-The World Conservation Union/National Planning Commission, Nepal

1988-1991 Infrastructure Engineer/planner, Government of Nepal

1987 B.Sc.Engg (Civil), National Institute of Technology, Jamshedpur, India

Title: Internet and Mobile Communication – History, Current Status and Future Direction

Speaker: Er. Dr. Ved Prasad Kafle

Abstract: The Internet and mobile communications have recently become indispensable parts of our daily life. We need them for our business, family and social interaction, entertainment, welfare, and education. This short presentation will cover the history, current status and future aspects of these communication infrastructures and services.

Speaker's Profile: Er. Dr. Ved P. Kafle is a senior researcher at the National Institute of Information and Communications Technology (NICT), Tokyo. He is involved in the design, implementation, evaluation, and optimization of algorithms, protocols, and architectures of new generation networks or the future Internet. In particular, his current research interests include new naming and addressing schemes, ID/locator separation architectures, name or ID resolution systems, ID-based scalable routing, integration of heterogeneous network layer protocols, integration of resource-constrained sensor networks into the Internet for ubiquitous sensing and computing, distributed mobility management, and privacy, security and trust in communication networks. Recently, he is also interested in R&D of disaster resilient networks that can be utilized for rescue and relief of victims. Dr. Kafle is active in standardization activities, especially in the International Telecommunications Union - Telecommunications Standardisation Sector (ITU-T) and the Internet Engineering Task Force (IETF). He has been an editor of several ITU-T Recommendations on the Next Generation Network (NGN) and Future Networks. Dr. Kafle received a Ph.D. in informatics from the Graduate University for Advanced Studies, Japan. He holds an M.S. in computer science and engineering from Seoul National University, South Korea, and a B.E. in electronics and electrical communications from Punjab Engineering College (now PEC University of Technology), Chandigarh, India.

Title: Preliminary Understanding of the 1255 Seti River Debris-Flood in Pokhara, Nepal

Speaker: Er. Dr. Netra Prakash Bhandary

Abstract: On 5 May 2012, Pokhara witnessed a massive debris-flood, initially rumored and understood as a glacier lake outburst flood (GLOF), later interpreted as a landslide dam outburst flood (LDOF), and finally understood as a debris-flood disaster primarily induced by a massive rock slope failure on the southwest flank of Annapurna IV. This

disaster has puzzled many national and international researchers in terms of understanding the mechanism of failure of a huge rock mass and its role in inducing catastrophic debris in the upstream and heavy flood in the downstream of Seti River (Seti Khola). Different speculations were made in the beginning so as to understand the mechanism, but finally, most researchers seem to have agreed that the primary cause of the debris-flood disaster was rock mass failure of as big as 20 million cubic meter of volume and as high as 1,500 meters of fallen height. Mainly because of the accessibility-related difficulties, many things still remain to be understood fully, but seismic signal tracing, satellite image interpretation, aerial survey of the source point, etc. have already revealed the primary cause, while the secondary mechanism, i.e., what really made so much debris and water to flow through the river is still speculated. The upstream flow of water in Seti River, much closer to the source is somewhere at 10 cubic meters per second, which cannot be considered to have transported all that debris that flowed in the Seti River on the day of disaster. This presentation outlines the debris-flood disasters of Seti River and raises a few scientific issues for the future reference and research.

Speaker's Profile: Er. Dr. Netra Prakash Bhandary is a life member of NEA. He also is a regular member of Nepal Geotechnical Society (Currently, Vice President), Japan Society of Civil Engineers, the Japanese Geotechnical Society, International Society of Soil Mechanics and Geotechnical Engineering, and an associate member of American Society of Civil Engineers. He holds a PhD (2003) in Engineering (Geotechnical Engineering and Landslides) as well as an MSc. (2000) in Geotechnical Engineering from Ehime University, Japan, and a B.Sc. degree (1994) in Civil Engineering from Aligarh Muslim University, India. He is presently an Assistant Professor of Civil Engineering at the Graduate School of Science and Engineering of Ehime University, Japan, and his research interests are earthquake and landslide disasters.

Title: Development of Fragility Functions for Low Strength Masonry Buildings in Nepal using Applied Element Method

Speaker: Er. Ramesh Guragain

Abstract: Earthquake risk assessment and preparation of earthquake risk scenario is a strong awareness raising and planning tool for implementing earthquake risk management activities. Use of appropriate fragility functions is one the most critical parameters for the accuracy of earthquake risk assessment. This study computed fragility functions for non-engineered low earthquake resistant masonry buildings in Nepal through non-linear analysis using Applied Element Method (AEM). Key parameters required for analysis were obtained through field test in actual field condition. Results obtained from AEM were compared with shaking table experiment and a good agreement was found. Buildings with different configuration, material strength, the number of stories and mortar type were subjected to numerical simulation and probability of damage exceeding a certain level of damage state is calculated for peak ground acceleration (PGA) starting from 0.05g to 1.0g. Fragility functions for low earthquake resistant masonry buildings for different state of damage are plotted based on numerical simulation results.

Speaker's Profile: Er. Ramesh Guragain, working as a Deputy Executive Director at National Society for Earthquake Technology-Nepal (NSET) has M.Sc. on Earthquake Engineering from The University of Tokyo. He joined NSET in 1999 and working in the field of earthquake risk management since then. The countries of working experience are mainly in Nepal, India, Pakistan, Bangladesh, Bhutan, Iran, Afghanistan and shortly in other countries in South/south-east Asia. Earthquake risk assessment of buildings, infrastructures and urban/rural settlements in Nepal and the south Asian region is one of the major program areas that Er. Guragain is leading from NSET in recent years. Seismic vulnerability assessment of public school buildings in Kathmandu Valley; 20 major hospitals in Nepal; more than 100 office and private residences in Nepal; water supply system of Kathmandu valley; selected public and private buildings in Bhutan; development of fragility functions for non-engineered buildings in Bangladesh; earthquake risk assessment of five different cities in Nepal; three cities in Pakistan, and nine cities in Bangladesh are some of the major activities related to this area that NSET implemented in his leadership. Currently, Er. Guragain is doing PhD under JSPS/ROKPAKU program from the University of Tokyo and doing research in Nepal with 3-months yearly visit to the University in Japan.

Title: Polymer electrolyte fuel cell and platinum dissolution

Speaker: Mr. Buddha Ratna Shrestha

Abstract: Carbon dioxide, a major contributor of the green house gases, has become a great problem to humans due to which today's world is compelled to find newer devices capable of energy conversion with zero carbon dioxide emissions. Polymer electrolyte fuel cell is one of them. In PEFC, hydrogen is oxidized at anode and oxygen is reduced at cathode during which potential of 1.23V is produced thermodynamically. Since the product is water, PEFC is considered as an alternative and clean form of energy. It attracted the world's attention in around the millennium. It was targeted that the hydrogen powered fuel cells would be commercialized from 2010 and the date is been shifted to 2015. The main

challenges for the commercialization of PEFC are the high cost and performance loss with the time of usage. My work focuses on the performance loss. Platinum atom/nanoparticles dissolution during fuel cell operation is found to be one of the major causes of performance loss by some ex-situ methods. We, however, lack the instantaneous dissolution behavior and dissolution mechanism of platinum atom/nanoparticles. Thus, study on dissolution behavior of platinum was conducted and dissolution mechanism was clarified.

Speaker's Profile: Mr. Buddha Ratna Shrestha is currently a graduate student pursuing doctoral degree at Tokyo Institute of Technology and had his master's from Central Department of Chemistry, Tribhuvan University with major in Physical Chemistry.

Title: Extracting Gravity Anomaly Data from the Noisy Data obtained by Ship-borne Gravimeter to Achieve the Mobility of Gravity Method

Speaker: Er. Prem Prakash Khatri

Abstract: To know the sub-surface rock structure is essential for evaluation of earthquake ground motion. The sub-surface geo-exploration can be done by various methods and one of them is Gravity method. It involves the observation of gravity anomaly data using gravimeters. Gravity anomaly is nothing but the subtle variation in acceleration due to gravity 'g' along the earth's surface. Since the sub-surface rock density has positive correlation with the acceleration due to gravity, the gravity anomaly data can be used to determine the lateral variation in density of sub-surface rock. So far, a spring-type relative gravimeter has been used for gravity survey. Although this type of gravimeter can provide very accurate data, it takes a long time to obtain the data at a site on land area, and for airborne or seaborne case, it requires a large plane or ship for stability. Since we require a dense set of data along the earth surface to cover a large area, the conventional gravimeter can turn to be very expensive and difficult to handle. A compact, lightweight airborne or ship borne gravimeter is required instead. Further, the minimum resolution requirement is 100 micro Gal (=10⁻⁴ cms⁻²) for the estimation of earthquake ground motions. In order to meet such requirement, we have developed a new force-balanced type accelerometer, which is not only inexpensive and easy in operation, but also gives a high resolution data that is enough for our purpose i.e., at around 10 micro Gals (=10⁻⁵ cms⁻²). However, the data observation made on a mobile carrier using such gravimeter is associated with severe noise with its amplitude varying up to 100,000 times larger than that of gravity anomaly. The sources of noise are basically the engine vibration, wind, temperature drift, tidal waves etc. In this context, our objective is to extract the true gravity anomaly data by de-noising the observed data using advanced blind signal separation technique known as Independent component analysis (ICA). The observed data is supposed to be linearly mixed. ICA separates the source and noise by assuming the statistical independence among source data and the noises. The survey site is located at Toyama bay of Toyama prefecture, Japan. The government of Japan has provided the gravity contour map for the same place and that is used to obtain the reference data. The data separated by ICA when compared with reference data for the same place shows good resemblance with each other at most of the important regions. More tests should be done before reaching to an exciting conclusion, but the result so far shows positive signs for succeeding to extract the subtle gravity anomaly data by coping up with the severe degree of noise in the observed data and eventually achieving the mobility of gravity method. The final goal is to be able to use such gravimeter in an un-manned helicopter so that the useful gravity anomaly data can be obtained conveniently at all kind of places. This could be an inexpensive and very convenient method in the countries like Nepal where most of the regions are mountainous and tough to access by land transportation. The dense gravity data obtained by this method when combined with other geophysical survey methods can be useful in estimation of accurate sub-surface rock structure. The knowledge of accurate sub-surface structure can be used for accurate earthquake ground motion evaluation and that is essential for reliable seismic design.

Speaker's Profile: Er. Prem Prakash Khatri is currently pursuing his Master course in Civil Engineering at The University of Tokyo. He completed bachelor degree in Civil Engineering from Institute Of Engineering, Tribhuvan University in 2005. He has been working as a permanent engineer in Department of Roads, Nepal since Dec 2006. Before coming to University of Tokyo, he worked for 4 years being engaged in construction, maintenance and contract management of highways, bridges and district road projects at mid-western part of Nepal. His current research is relevant to the Geophysical exploration, Earthquake engineering , Signal Processing and Structural dynamics primarily based upon computer programming and numerical simulations.

Title: Evaluation of road network from reliability perspective: An accessibility importance and network closure vulnerability approach

Speaker: Er. Ramesh Pokharel

Abstract: Road network sections are closed due to natural disaster or human made events. A devastating earthquake and tsunami on 11th March 2011 caused the numerous sections of National highway and expressway network to be closed in Tohoku region of Japan. Most of the rural road network sections in Nepal are closed in rainy season due to riverflooding, soil erosion in mountainous area, earthen condition of pavement and unavailability of bridge. Due to closure of the road network many village /town and city are isolated; their connection to the major service center fails. This paper suggests a methodology to prioritize the possible closed road network section for the improvement project against disaster and upgrading project from dry weathered road to all weather roads. The methodology evaluates the socioeconomic impact of network upgrading by calculating an accessibility index of a village/city or town. Important road sections are identified in two steps. First step prioritizes the sections which can provide higher accessibility to the isolated area during emergency situation. Second step gives the ranking of road network section to increase the road network performance. Finally paper shows the application result of the methodology in both Japanese and Nepalese case.

Speaker's Profile: Er. Ramesh Pokharel is currently pursuing his master degree in Civil Engineering at The University of Tokyo. He completed bachelor degree in Civil Engineering from Tribhuvan University in 2006. Before coming to Japan, he involved in various infrastructure development sector in Nepal such as rural water supply and sanitation projects, rural roads, and a resort hotel construction project in Lake Side Pokhara. He has a 3 years teaching experience in the Tribhuvan University. His current research is focused on the evaluation of road network from the reliability perspective.

APPENDIX 2

ORGANIZING COMMITTEE

Er. Dhruva Panthi, The University of Tokyo (**Coordinator**)
Er. Chandi Subedi, Softbank Corporation
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Er. Hari B. Pahari, Fuji Electric E & C Co. Ltd.
Er. Justin Shrestha, Hokkaido University
Er. Kamal Kumar Adhikari, Saitama University
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Er. Nabaraj Shrestha, Saitama University
Er. Priza Kayestha, Tokyo Institute of Technology
Er. Rajan Bhattarai, The University of Tokyo
Er. Rajesh Sapkota, HITACHI
Er. Ram Prasad Dhungana, KB Software Corporation
Er. Ramesh Pokharel, The University of Tokyo
Er. Rishi Ram Parajuli, Kyoto University
Er. Satya Narayan Sharma, Saitama University
Er. Shaphal Subedi, Saitama University

PROGRAM COMMITTEE

Er. Dr. Netra Prakash Bhandary, Ehime University (**Coordinator**)
Er. Dr. Achyut Sapkota, Chiba University
Er. Dr. Akhilesh Kumar Karna, Nippon Koei
Er. Dr. Badri Bhakta Shrestha, ICHARM, Tsukuba
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