The 5th NEA-JC Workshop
On
"Current and Future Technologies"

SUMMARY OF PROCEEDINGS

Organized at:
The University of Tokyo (Hongo Campus), Tokyo

Prepared by:

NEA-JC 6th Ex-Com
Event Management Committee
20 Nov, 2011

SUMMARY

As an annual event of Nepal Engineers' Association – Japan Center (NEA-JC), the Event Management Committee (EMC) of NEA-JC 6th executive committee organized a one-day workshop on "Current and Future Technologies" in Tokyo on 20 November, 2011. Nepalese and non-Nepalese academics, researchers, experts and students from various engineering, natural science and social science disciplines presented their papers, and shared their experiences/ views about development and utilization of current and future technologies for the development of Nepal.

The participants of the program were researchers, students, experts and planners from various engineering, architecture, agricultural, environmental and social science field. Twenty three participants representing thirteen organizations/institutions participated in the workshop.

Organizing committee and program committee were formed to conduct the program successfully. The organizing committee and program committee are detailed in APPENDIX - I.

The summaries of presentations/discussions made are detailed in the subsequent sections. Detail program schedules with presentation summaries and speaker profiles are attached as APPENDIX – II. List of participant in workshop are attached as APPENDIX- III.

INTRODUCTION

The program was conducted in four stages: opening plenary, keynote session, technical session and integrated discussion session. Dr. Vishnu Prasad Pandey (President of NEA-JC 6th EXCOM) delivered a short welcome and opening address. Mr. Ramesh Pokharel from TUNEF expressed their best wishes for the success of the program. Finally, Mr. Shaphal Subedi (Coordinator EMC of NEA-JC 6th EXCOM) expressed vote of thanks to all the participants. The program was conducted by Er. Keshab Sharma.

SUMMARY OF PRESENTATIONS

There were 7 presentations in total, including two keynote lectures. Assoc. Prof. Shinya Hanaoka, from Tokyo Institute of Technology (Tokyo Tech), who has contributed a lot in dealing with transportation issues in landlocked countries, delivered first an inspirational key note lecture. Secondly, Dr. Shobhakar Dhakal delivered encouraging lecture on climate change and its impact on environment. The topics of presentation were very relevant to the present and future context, and include space technology application, emerging energy technology, development of hydrophobic capping layer, effect of earthquake and slacking effect of crushed mud stone. Brief summary of each of the presentations is given below in the order of presentation.

1. Cross border transport in landlocked countries (Keynote Lecture)

Dr. Shinya Hanaoka (Asso. Prof., Tokyo Institute of Technology)

Assoc. Prof Hanaoka is very much familiar with the context of Asia through his continuous involvement in transport development specially air transport development and transport infrastructure management. He discussed about the issues on freight transport in landlocked developing countries. Moreover, he presented the survey of freight transport in central Asia. He discussed about the difficulty in international trade in landlocked countries (LLCs) due to unavailability of own seaport. He also showed the statistical analysis of freight transport in landlocked countries. In this presentation he identified the characteristics of international freight transport of LLCs.

2. Global climate change and climate vulnerability of Nepal (Keynote Lecture)

Dr. Shobhakar Dhakal (Director, Global Carbon Project, NIES)

Dr. Dhakal is an expert in urban carbon modeling and management but covers a broad portfolio of activities in the area of carbon cycle, climate change mitigation and urban system. He discussed about serious consequences due to global climate change and an overview of global climate change impacts. He explained about the global issues of greenhouse gas emission and its impact on climate change. In the context of climate change, knowledge gaps in Nepal were identified and the vulnerability of Nepal to climate change and its regional variations were discussed based on the published studies.

3. Bridging the Technological Development between Nepal and Japan in the field of Space Technology Applications and Research (STAR)

Dr. Dinesh Manandhar (Visiting Researcher, The University of Tokyo)

Dr. Manandhar discussed the use of satellites in collecting the information about disaster prevention,

management, early warning systems, weather forecasting and navigation. He explained about the applications of using cheaper (or even free) satellite signals due to possibility of launching micro-satellites and increased global coverage. Moreover, he explained about approaches for technological development between Nepal and Japan in the field of Global Navigation Satellite System (GNSS) by conducting joint R&D projects, capacity building and conducting web-based courses.

4. **Emerging trends and the future of energy technologies**
   Dhruba Panthi (PhD Student, The University of Tokyo)

Mr. Panthi discussed about growing global environmental problems due to depletion fossil-based conventional energy resources. Moreover, he gave an overview of recent trends along with insights on the future of the energy industry mainly from a perspective of electrochemical energy conversion and storage. Finally, he discussed about the significance of novel developments in energy technologies in Nepalese context.

5. **Development of hydrophobic capillary barrier system for solid waste landfill capping**
   Shaphal Subedi (PhD Student, Saitama University)

Mr. Subedi discussed about the use of alternative earthen capping system such as capillary barriers and evapotranspirative covers over the conventional capping system. He focused on development of possible concept of "hydrophobic capillary barriers", the development technique to enhance the impermeable properties of capillary barriers, which consists of turning the coarse grain surface of subsoil water repellent by mixing it with low-cost and locally available hydrophobic material such as oleic acid and stearic acid. He explained water repellency (WR) characteristics for hydrophobized sand samples with different hydrophobic contents using water drop penetration test, molarity of ethanol droplet test and sessile drop method.

6. **Preliminary investigation of the damaged buildings in Bhaktapur and Eastern Nepal due to Nepal-Sikkim earthquake of September 18, 2011**
   Kabir Shakya (PhD Student, Tokyo Institute of Technology)

Mr. Shakya discussed about preliminary investigation done upon the latest damage in bhaktapur and eastern Nepal due to massive earthquake of September 18, 2011. He explained that the epicenter was located at Nepal-India border (27.72°N, 88.06°E) (Taplejung District of Nepal) and the focal depth was 19.7 km. Moreover, he discussed about the casualties in Nepal and India due to earthquake.

7. **Effect of initial water content on the slaking of crushed mudstones**
   Keshab Sharma (Master Student, The University of Tokyo)

Mr. Sharma discussed about the cause landslides even due to moderate rainfall followed by drought. He explained about causes, mechanism and ultimately impact of slaking on soft rock i.e. sedimentary rock. He explained shear strength and creep deformation of crushed mudstones having varying initial water content. Finally, he showed a significant creep deformation, reduction in the peak shear strength and particles crushing of mudstones after saturation for those samples having lower water content.

SUMMARY OF INTEGRATED DISCUSSION

In the beginning of the "Integrated Discussion" session, Dr. Vishnu Prasad Pandey posed three sets of inter-related issues to the panelists on behalf of the organizer and passed the floor to Dr. Ved Prasad Kafle, the session moderator. The questions were;

- What could be technology/resource needs of Nepal in the area of your expertise?
- What technologies/resources in Japan (or other countries) could be useful and affordable in Nepal?
- What could be the practical difficulties associated with transfer/export of the technologies/resources to Nepal and ways to overcome them?

Three panelists representing different fields, namely, *Dr. Shobhakar Dhakal* (from climate change and energy), *Dr. Akhilesh Kumar Karna* (from disaster prevention and management), and *Dr. Dinesh Manandhar* (from space technology application), put their viewpoints on the issues. Number of participants raised several issues as well as proposed ideas in regards to assessment of technological need of Nepal, identification of appropriate and affordable technologies, and practical problems to implement technology transfer. The session lasted for nearly an hour. Some of the main points of the discussion are listed hereunder;

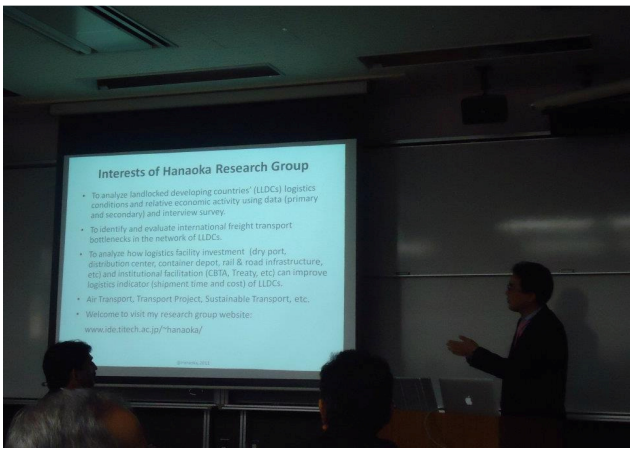
- Nepal should be able to take advantage of freely available satellite-based signals to acquire and/or better equip with data/knowledge/information infrastructure. There are some legal and static-mindset kinds of hurdles; they could be overcome through firm commitment of the government though formulating favorable policies. However, another practical difficulty is to make the people at higher levels understand the usefulness of space technologies application and remove the fair of misuse of the information. A special program should be designed to convince upper-echelon people in the government about the need, usefulness and affordability of the technologies.
- Collaborative research between scholars living abroad and those living in Nepal through institute level collaboration helps to carryout need-based research, to assess technological need, and to transfer technology in home country.
- If a profile of research and technology need is prepared in each sector by related government agencies, the need could be fulfilled at very minimum cost using graduate students a 'valuable resources' by coordinating to academic institutions/universities within and outside the country.
- The scholars willing to contribute to Nepal from abroad should also try to see from 'outside the box' with due consideration of ground reality back to Nepal. There are several limitations. However, everyone should try to do whatever he or she can do from his or her respective capacity.
- We should explore the indigenous knowledge and technologies, document them properly exploring scientific aspects, promote and disseminate at respective local areas. Some key findings shared by Er. Kabir Shakya in his presentation was taken as examples for distributing the good points of indigenous knowledge rather than going for high technology. For example, even stone masonry buildings can be safer from earthquake point of view if wooden frames are provided; *centiberra* (use of bamboo) could be used instead of expensive tor steels to strength the structures; etc.

ACKNOWLEDGEMENTS

Thanks to The University of Tokyo for the venue and Mr. Ramesh Pokharel for managing the venue. Sincere thanks are also extended to the following NEA-JC members for their generous contribution (@ 1,000 yen/person) to sponsor the cost of the event: Dr. Achyut Sapkota, Dr. Akhilesh K. Karna, Dr. Binaya Kumar Mishra, Er. Chandi Subedi, Dr. Dinesh Manandhar, Dr. Hari Ram Parajuli, Er. Kumar Simkhada, Dr. Shobhakar Dhakal, Dr. Ved Prasad Kafle, and Dr. Vishnu Prasad Pandey

GLIMPSE OF THE PROGRAM

Dr. Vishnu P. Pandey (President, NEA-JC 6th Excom)

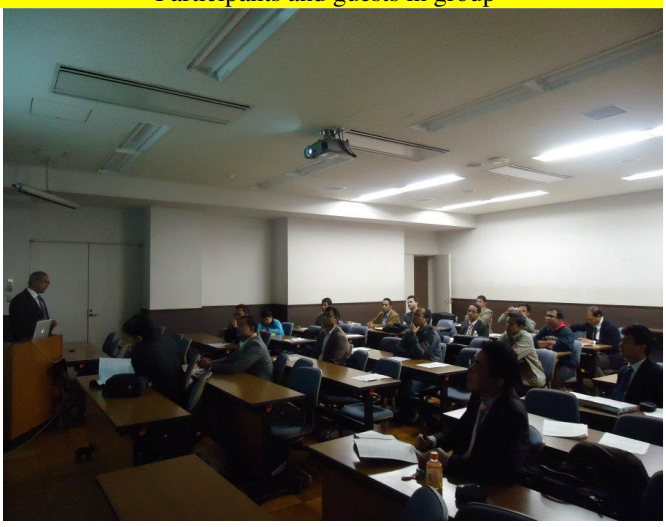


Asso. Prof. Shinya Hanaoka from Tokyo Tech, Japan

Ramesh Pokherel, TUNEF, Japan

Participants and guests in group

Enjoying Lunch during workshop



Participants in the seminar hall

APPENDIX – I

ORGANIZING COMMITTEE & PROGRAM COMMITTEE

Program Committee

Dr. Vishnu Prasad Pandey
University of Yamanashi
(**Coordinator**)

Dr. Achyut Sapkota, Chiba University
Dr. Akhilesh Kumar Karna, Nippon Koei
Dr. Badri Bhakta Shrestha, Kyoto University
Dr. Bhoj Raj Pantha, KEI, Ginza, Tokyo
Dr. Bhubaneshwor Shah, PASCO Corporation, Tokyo
Dr. Dinesh Manandhar, The University of Tokyo
Dr. Hari Ram Parajuli, Ritsumeikan University, Kyoto
Dr. Jhabindra Ghimire, Common wealth Engineers Co. Ltd., Tokyo
Dr. Madhusudan Kayastha, Chubu University
Dr. Netra Prakash Bhandary, Ehime University, Matsuyama
Dr. Phatta Bahadur Thapa, Tokyo Engineering Consultants Co. Ltd
Dr. Rabindra Raj Giri, Osaka Sangyo University
Dr. Rabindra Osti, ICHARM, Tsukuba
Dr. Sanat Wagle, Osaka University
Dr. Shobhakar Dhakal, NIES, Tsukuba
Dr. Sudip Adhikari, Chubu University
Dr. Sunil Kumar Karna, Tokyo Engineering Consultants Co. Ltd
Dr. Surya Raj Acharya, Institute of Transport Policies Studies, Tokyo
Dr. Tara Nidhi Lohani, GeoResearch Institute Kobe
Dr. Ved Prasad Kafle, NICT, Tokyo

Organizing Committee

Er. Shaphal Subedi
Saitama University (**Coordinator**)

Er. Deepak Raj Bhat, Ehime University
Er. Deepak Raj Pant, Tokyo Institute of Technology
Er. Hari B. Pahari, Fuji Electric E & C Co. Ltd.
Er. Keshab Sharma, The University of Tokyo
Dr. Kshitiz Charan Shrestha, Kyoto University
Er. Kumar Shimkhada, KDDI
Er. Kabir Shakya, Tokyo Institute of Technology
Er. Laxmi Prasad Suwal, The University of Tokyo
Er. Maheswor Shrestha, The University of Tokyo
Er. Mukta Sapkota, Kyoto University
Er. Priza Kayestha, Tokyo Institute of Technology
Er. Rajesh Shapkota, HITACHI
Er. Ram Krishna Regmi, Kyoto University
Er. Satya Narayan Sharma, Saitama University

APPENDIX – II

DETAIL PROGRAM SCHEDULE AND SPEAKERS' PROFILE

10:15 - 10:20 Opening Plenary; MC: Keshab Sharma

10:20 - 10:25 Welcome and opening address by Dr. Vishnu PrasadPandey, President, NEA-JC
10:25 - 10:30 Remarks by Ramesh Pokharel, Treasurer, TUNEF
10.30 – 10.35 Vote of thanks by Shaphal Subedi, Coordinator, Workshop Organizing Committee

10:35 – 11:55 Keynote Session; Chair: Dr. Surya Raj Acharya

10:35 - 11:05 Keynote Speaker: Dr. Shinya Hanaoka (Asso. Prof., Tokyo Institute of Technology)
Title: Cross border transport in landlocked countries
11:05 - 11:15 Q&A

11:15 - 11:45 Keynote Speaker: Dr. Shobhakar Dhakal (Director, Global Carbon Project, NIES)
Title: Global climate change and climate vulnerability of Nepal
11:45 – 11:55 Q & A

11.55 - 2.40 Lunch Break

2:40 - 4:35 Technical Presentations Session; Chair: Dr. Hari Ram Parajuli

2:40 - 3:00 Speaker: Dr. Dinesh Manandhar (Visiting Researcher, The University of Tokyo)
Title: Bridging the Technological Development between Nepal and Japan in the field of Space Technology Applications and Research (STAR)
3:00 - 3:05 Q&A

3:05 - 3:25 Speaker: Dhruba Panthi (PhD Student, The University of Tokyo)
Title: Emerging trends and the future of energy technologies
3:25 - 3:30 Q&A

3:30 - 3:45 Speaker: Shaphal Subedi (PhD Student, Saitama University)
Title: Development of hydrophobic capillary barrier system for solid waste landfill capping
3:45 - 3:50 Q&A

3:50 - 4:10 Speaker: Kabir Shakya (PhD Student, Tokyo Institute of Technology)
Title: Preliminary investigation of the damaged buildings in Bhaktapur and Eastern Nepal due to Nepal-Sikkim earthquake of September 18, 2011
4:10 - 4:15 Q&A

4:15 - 4:30 Speaker: Keshab Sharma (Master Student, The University of Tokyo)
Title: Slacking effect on shear strength and creep deformation of crushed mud stone
4:30 - 4:35 Q&A

4:35 – 4:50 Break

4:50 – 5:50 Integrated discussion on the theme of the workshop;

Panelists: Dr. Shobhakar Dhakal (NIES, Japan)
Dr. Dinesh Manandhar (The University of Tokyo, Japan)
Dr. Akhilesh Kumar Karna (Nippon Koei Company Ltd., Japan)
Dr. Ved Prasad Kafle (NIICT, Japan) <<< Moderator >>>

4:50 – 4:55 Concluding Remarks: by Dr. Vishnu Prasad Pandey, President, NEA-JC

SPEAKERS' PROFILE

Dr. Shinya Hanaoka: Dr. Hanaoka is an Assoc./Prof. (2007~now) at Department of International Development Engineering, Graduate School of Science and Engineering in Tokyo Institute of Technology (Tokyo Tech). Before joining Tokyo Tech, he worked as a Visiting Lecturer (2003-2004) and as an Asst. Prof. (2004-2007) in Asian Institute of Technology (Thailand), as a Researcher (1999-2003) and Senior Researcher (Apr-Jul, 2003) in Institute for Transport Policy Studies (Tokyo, Japan). He has visiting positions at several other institutes and universities in Japan, Thailand and UK as well. His research areas include transport development studies, air transport, transport logistics, transport infrastructure management, among others. He has authored/co-authored nearly 20 referred international journal articles and more than 15 referred national journal articles.

Dr. Shobhakar Dhakal: Dr. Dhakal is one of the two executive directors of the Global Carbon Project, an international scientific program hosted by CSIRO Canberra (Australia) and NIES Tsukuba (Japan). His core expertise is on urban carbon modeling and management but covers a broad portfolio of activities in the area of carbon cycle, climate change mitigation and urban system. He is also a visiting Associate Professor of the Graduate School of Environmental Studies of Nagoya University Japan and a guest research scholar of International Institute for Applied System Analyses in Austria. Dr. Dhakal serves as Coordinating Lead Author to the Working Group III of IPCC's 5th Assessment Report and contributes to UNEP's Global Environment Outlook (GEO-5) as Principle Scientific Reviewer. He has published over forty papers, several book chapters, edited two books, co-edited four journal special issues and others. He is currently a senior editor to carbon Management Journal, associate editor to Journal of Industrial Ecology and a member of editorial advisory board of International Energy Journal. His co-edited book "Low Carbon Transport in Asia" will be available in a month from Francis and Taylor (UK).

Dr. Dinesh Manandhar: Dr. Manandhar is a visiting researcher at the University of Tokyo. He received Ph. D. from the University of Tokyo, Japan in 2001. He is involved in Signal Design and Applications Development in the field of Global Navigation Satellite System especially MICHIBIKI satellite (Japanese Quasi-Zenith Satellite System for Navigation and Positioning).

Dhruba Panthi: Mr. Panthi is currently pursuing his doctoral study in mechanical engineering at the University of Tokyo. He completed bachelor's degree in mechanical engineering from Tribhuvan University in 2006 and master's degree in the same stream from the University of Tokyo in last September. Before coming to Japan, he worked as production engineer for Alcoa CSI Nepal, a subsidiary of Alcoa Inc., for almost two years and was also briefly involved in instructing undergraduate students at Pulchowk Campus, Tribhuvan University. His current research is primarily focused on electrochemical energy conversion and energy system engineering.

Shaphal Subedi: Mr. Subedi is a Ph.D. student in Saitama University at the Graduate School of Science and Engineering. His majors are Geoenvionmental Engineering and Wastewater Engineering. Current research interests are pollution control and environmental risk assessment at waste disposal landfill sites.

Kabir Shakya: Mr. Shakya is currently a PhD. Student at Department of Civil Engineering, Tokyo Institute of Technology, O-okayama Campus. He completed his Diploma and Bachelor in Civil Engineering from Institute of Engineering, Pulchowk Campus, Tribhuvan University, Nepal in 1998 and 2004, respectively. He obtained Master of Engineering in Civil Engineering from Tokyo Institute of Technology, Tokyo, Japan. He has also engaged in design, construction and supervision of numerous residential, commercial buildings, hospital buildings and institutional buildings during 1998 to 2006. He is interested in analysis and design of earthquake resistant structures particularly RC buildings and bridges. He is currently involved in research work for the optimization of reinforcements at beam-column joints of bridges by using steel fiber reinforced concrete.

Keshab Sharma: Mr. Sharma is currently pursuing his Master degree in Civil Engineering at The University of Tokyo. He completed bachelor's degree in Civil Engineering from Pulchowk Campus, Institute of Engineering, Tribhuvan University in 2007. Before coming to Japan, he involved in rural infrastructure development. He had experience of designing more than thirty trail bridges, micro-hydro and rural roads. He worked as a full time lecturer at Kathmandu Engineering College and also as a part time lecturer at many Engineering Colleges in Kathmandu. His current research is primarily focused on earthquake induced Geo-disaster, slaking of mudstones and slope failure etc.

APPENDIX –III

LIST OF PARTICIPANTS

	Name	*Affiliation*	*Contact number*	*Email-ID*
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