

Natural Hazards and Early-Warning System

2018 was a disastrous year for Japan as it faced a number of extreme weather-related events such as heavy downpours and floods, heatwaves, and typhoons. Kumagaya area in Saitama prefecture experienced a record-breaking temperature of 41.1°C. Following the torrential rains in July, typhoon Jebi, which was the strongest typhoon in the last 25 years in Japan, hit the main island. And, soon after typhoon Jebi, a strong earthquake hit Hokkaido area, triggering several landslides (**Figure 1**). All these extreme events severely affected the human lives and caused a significant damage to infrastructures. The rise in the temperature with every passing year creates new challenges for the scientists and researchers to think new ways to counteract its devastating effects on the human lives and property. Hazard monitoring and early-warning systems are one of the new ways to minimize the severe impacts of the natural disaster on the society. Scientists and researchers are striving hard to develop novel systems that can identify the potential hazards at an appropriate timescale and disseminate the alerts to the society in the best possible communicative way.

In order to accurately monitor the extreme weather events, a Multi-Parameter Phased Array Weather Radar (MP-PAWR) was installed at Saitama University in December 2017 (**Figure 2**). This state-of-the-art system can create a three-dimensional model of precipitation in just over 30 seconds for an area up to 60 kilometers in radius. The system can predict torrential rainfall up to 30 minutes ahead and send alerts. With the combination of radar observations and numerical modelling, this system can predict natural disasters like landslides, floods, tornadoes, torrential rainfalls, etc. and send alerts to the people of concerned area. The radar system started its operation in March 2018 and since July 2018, demonstrative experiments are being carried out.

Understanding the mechanism of natural hazards is one of the key elements to enhance the accuracy of the early-warning system. In this regard, in October 2018, the Geotechnical and Geosphere research group of Saitama University visited Atsuma town in Hokkaido to assess the widespread landslides triggered by successive extreme weather events that resulted in the loss of human lives and caused significant damage to the infrastructures (**Figure 3**).



Figure 1: Earthquake triggered landslides in Hokkaido, 2018
(photo credit: www.standard.co.uk)

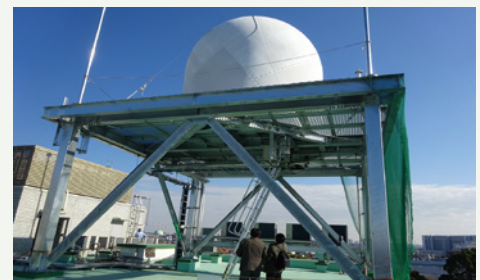


Figure 2: MP-PAWR installed at the roof of the Civil and Environmental Engineering Building No. 3



Figure 3: Problematic volcanic soil: Yellow part highly weathered, Orange part porous and flow like liquid upon remolding

Greetings from the Head of the Foreign Student Office

How are you doing? Time flies and another year has passed. I hope this issue of the FSO Newsletter finds you well. The studies, researches, and various activities on our side have been proceeding smoothly and actively, information on some of which can be found in this newsletter. I would like to thank for the great contribution from staff members and students, and kind and continuing assistance from you all, our alumni members.

Professor Hiroshi Mutsuyoshi, whom all of you know as the leader of our international program for more than 25 years, retired from a full-time professorship in March, 2019. We would like to dedicate this issue of newsletter to him, to express our sincere gratitude and appreciation for his enormous contribution to the program over the decades.

We move on to new challenges. We have started accepting applications for the next batch of program. It is crucial for you and us that we have new talented individuals in our program's community. It would be much appreciated if you could distribute the information about our program and application, which is available at our program's website, to prospective students around you. Also, please keep in touch with us and let us know what and how you are doing. Both will help to develop and strengthen our program's community.

With best regards,



Yasunao Matsumoto

Head of the Foreign Student Office

International Graduate Program on Civil and Environmental Engineering Saitama University

Research Profile Series (23)

Wastewater treatment using low-cost adsorbents

The rise in urbanization and industrialization has led to the production of millions of tons of construction and demolition waste (CDW) and industrial by-products (IBPs) per year by countries around the globe. In developing countries, the typical treatment methods of such waste materials are landfilling or open dumping, exerting massive pressure on the environment. Investigation on the efficient usage and understanding the added values of these abundantly available materials in innovative ways are the demands of the current time. On the other hand, inadequate treatment of wastewater generated from industries causes serious deterioration of water quality all over the world. Particularly, heavy metals from industrial wastewater are the most challenging pollutants that affect the biological function of organisms, leading to a rise in the concentration of heavy metals in the food chain. Numerous approaches for the development of cheaper and effective technologies to improve the quality of treated effluent have been proposed over the years. Among these methods, adsorption by low-cost adsorbents has received a great deal of attention due to its high efficiency and easy operating conditions. Consequently, small scale industries in developing countries are keen to use such adsorption technology. However, previous studies have shown that the low-cost adsorbents, especially geo and bio sorbents, are unable to remove heavy metals from the wastewater, simultaneously. But, the simultaneous removal process is crucial considering that the real wastewater, in almost all the cases, comprises of a mixture of various heavy metals. Thus, it is necessary to find low-cost adsorbents that are potential for the simultaneous removal process. The main objectives of our study are: (i) to set added value for the CDW and IBPs as low-cost adsorbents and (ii) to investigate the simultaneous removal of heavy metals from wastewater using selected CDW and IBPs materials.

Several types of CDW and IBPs such as autoclaved aerated concrete (AAC), recycle concrete, steel slag (SS), etc. were tested under different experimental conditions (batch adsorption). Results suggest that AAC and SS have high affinity with Pb and Cd, respectively. But, both the adsorbents were unable to remove these metals, simultaneously. Therefore, further experiments were carried out with different mixtures of AAC and SS. Noticeably, AAC+SS [1:1] mixture is observed as the potential low-cost adsorbent for simultaneous removal of all tested heavy metals (Cd, Pb, Cu, Ni, and Zn) from wastewater, indicating real advancement of adsorption technology by the low-cost adsorbents. As of current, performance evaluation of AAC+SS [1:1] mixture under continuous flows conditions (column study) is being experimentally studied. These experimental results will be useful for real field applications in the future.

I am conducting my research under the supervision of Prof. Ken Kawamoto. The current study is supported by the Science and Technology Research Partnership for Sustainable Development (SATREPS) of the Japan Science and Technology Agency (JST) and Japan International Cooperation Agency (JICA).

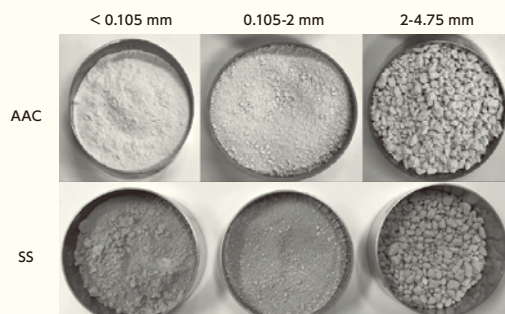


Fig. 1: Tested three particle sizes of AAC and SS

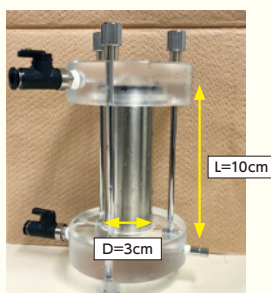


Fig. 2: Column study apparatus.

(Written by - Mr. Pradeep Gajanayake)

Graduation Time Congratulations

(Name-Country-Title-Supervisor)

September 2018

(Ph. D degree)

Mr. Md. Shahnewaz Islam Choudhury (Bangladesh) "Estimation of scour depth for a balanced cantilever bridge with central hinge based of natural frequencies" Prof. Y. Matsumoto

Mr. Ali Murtaza Rasool (Pakistan) "Mechanical behavior and instability of unsaturated soil under infiltration conditions" Prof. J. Kuwano

Mr. Aung Aung Soe (Myanmar) "Study on the behavior of geogrid-reinforced soil layer system for the pavement" Prof. J. Kuwano

Ms. Kumarasinghe Pubudu Priya (Sri Lanka) "Identification of groundwater contamination and development of site-specific permeable reactive barrier system for environmental pollution control of open solid waste dumpsites in Sri Lanka" Prof. K. Kawamoto

Mr. Nguyen Trong Lam (Vietnam) "Microstructure and length change characteristics of Autoclaved Aerated Concrete (AAC) – A comparison between Japanese and Vietnamese AACs". Associate Prof. S. Asamoto

Mr. Pornraht Pongprasert (Thailand) "A study on travel mode choices of station-area residents to encourage sustainable Transit-Oriented Development (TOD) in Bangkok" Prof. H. Kubota

(Master's degree)

Mr. Ejaz Ali (Pakistan) "A study of estimation of modal characteristics from ambient vibrations using continuous wavelet transform & factors affecting them" Prof. Y. Matsumoto

Ms. Thiri Shun Lae Thu (Myanmar) "Analyzing the probability of PDO accident and injured accident compared to fatal accident to predict affective factors of vehicle crashes: A case study of Yangon-Mandalay Expressway in Myanmar" Prof. H. Kubota

Ms. Hsu Mon Khin (Myanmar) "Parametric study on cable safety of extradosed bridges" Prof. H. Mutsuyoshi

Mr. Madilson Maria De Pina Arafa (Guinea Bissau) "Recycled construction and demolition materials and industrial byproducts in permeable pavement systems: Geotechnical, hydraulic, and water retention characteristics" Prof. K. Kawamoto

Mr. Kintu Joel Munabangogo (Uganda) "Performance evaluation of bus priority lane in Shizuoka city" Prof. H. Kubota

Mr. Tran Duc Minh Hai (Vietnam) "Heavy metal removal from wastewater by utilizing low-cost adsorbents from construction and demolition waste in Vietnam" Prof. K. Kawamoto

March 2019

(Ph. D degree)

Mr. Mahmudur Rahman (Bangladesh) "Reliability-based design for buckling strength of stiffened steel plates: ultimate and serviceability limit states" Prof. Y. Okui

Mr. Ashish Shrestha (Nepal) "Smart device based autonomous and low-cost structural measurement and monitoring system" Prof. Y. Okui

(Master's degree)

Ms. Sharkia Shaika (Bangladesh) "Dynamic response of steel pipe sheet pile foundations subjected to inertial loadings" Prof. M. Saitoh

Mr. Nguyen Quang Thinh (Vietnam) "Mechanical behavior of precast concrete members using loop joint of steel bars" Prof. H. Mutsuyoshi

Ms. Raquel Omandam Masalig (Philippines) "Assessment of rainfall intensity corresponding to turbidity threshold indicating slope failure" Prof. M. Osada

Ms. Tulaja Gurung (Nepal) "Estimation method for finding biological mixing depth using dissolved oxygen and Thorpe length scale for reservoir water management" Associate Prof. C. Oguchi

Mr. Kayani Junaid Qayyum (Pakistan) "Feasibility for use of graded recycled concrete aggregate and crushed autoclaved lightweight concrete (ALC) in permeable pavement system" Associate Prof. T. Uchimura

Mr. Ghan Shyam Ghimire (Nepal) "Evaluation of load carrying capacity of deteriorated reinforced concrete slab of highway bridge" Prof. T. Maki

Mr. Ali Arshad (Pakistan) "Experimental study on the investigation of scouring downstream of coastal vegetation in an inundating tsunami current" Prof. N. Tanaka

Mr. Nikesh Maharjan (Nepal) "Bridge seismic damage recognition from structural response data using machine learning" Assistant Prof. J. Dang

Mr. Albano Acacio Ajuda (Mozambique) "Stability of reinforced soil wall under earthquake loading" Prof. J. Kuwano

Ms. Sonam Lhamo (Bhutan) "An investigation into the effects of damages on vibrational characteristics of reinforced concrete deck slab" Prof. Y. Matsumoto

News

Faculty on Move

Prof. Hiroshi Mutsuyoshi of Structural Engineering, Mechanics and Materials Group retired from Saitama University in March 2019. He is currently appointed as Prof. Emeritus and a visiting Prof. of Saitama Univ. from April 1, 2019.

Associate Prof. Tadashi Yamabe of Geotechnical and Geosphere Research Group retired from Saitama University in March 2019.

Alumni Information

Dr. T.M.W.R.M.B. Samarakoon, a 2011 doctoral graduate of Saitama University, was appointed the position of Dean of the Faculty of Engineering, General Sir John Kotelawala Defence University, Sri Lanka on April 1, 2019.

Awards

Prof. Emeritus Atsuhiko Machida was awarded The Order of the Sacred Treasure, Gold Rays with Neck Ribbon from the Cabinet Office, Government of Japan in May 2019.

Prof. Hiroshi Mutsuyoshi was awarded the JSCE (Japan Society of Civil Engineers) Yoshida Research Achievement Prize (the highest prize in concrete engineering in Japan) and Tanaka Thesis Prize (the highest prize in bridge engineering in Japan), together with Mr. Toshihiro Yokota and Mr. Isuru Wijayawardane for the paper "Study on load carrying capacity and analytical performance evaluation method of PC beam with corroded PC tendon".

Prof. Norio Tanaka received the Best Paper Award together with his PhD candidate, Mr. Yoshiya Igarashi, at the 21st IAHR-APD Congress 2018 for the paper "The effect of a hybrid defense system by a forest and/or moat against a tsunami run-up along a river".

Associate Prof. Taro Uchimura et al. received the best paper award from the Japanese Geotechnical Society on June 2018, for the paper "Precaution and early warning of surface failure of slopes using tilt sensors".

Assistant Prof. Yota Togashi received the young scientist award in the 31st fiscal year of the science and technology field on April 17, 2018, from the Ministry of Education, Culture, Sports, Science and Technology.

Assistant Prof. Yota Togashi received the research encouragement award from the Japanese Geotechnical Society on June 2018, for the paper "Development and its verification of a method of determining deformation anisotropy of geomaterial with high efficiency and accuracy".

Associate Prof. Nakhorn Poovarodom, a 1996 doctoral graduate, currently at Structural Mechanics and Structural Dynamics Group, Department of Civil Engineering, Thammasat University, received the International Activity Cooperation Award from the Japan Society of Civil Engineers (JSCE) to honor his long and continuous contribution to international activity with Japan.

Mr. Saufi, M.R.M. received the best paper award at the 8th International Conference on Geotechnique, Construction Materials and Environment (GEOMATE 2018), held in Kuala Lumpur, Malaysia in November

Welcome New Students

October 2018



Shah Syed Kamran Hussain
Pakistan, Doctor



Joshi Nirmal Raj
Nepal, Doctor



Arachchillage Buddhika Priyadarshani Bandara
Sri Lanka, Doctor



Anjum Naveed
Pakistan, Doctor



Rahman Abdur
Bangladesh, Doctor



Rahman Md Abedur
Bangladesh, Doctor



Yang Liuqing
China, Master



Regmi Kamal Prasad
Nepal, Master



Lai Lai Hlaing
Myanmar, Master



Naing Zar Le Tun Myint
Myanmar, Master



Vuong Dinh Tung
Vietnam, Master



Shi Jiyuan
China, Master



Vo Thanh Toan
Vietnam, Master



Nguyen Trung Kien
Vietnam, Master



Tran Viet Cuong
Vietnam, Master



Vu Van Huy
Vietnam, Master



Hemat Sherzai Javedullah
Afghanistan, Master

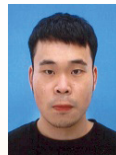
April 2019



Ajuda Albano Acacio
Mozambique, Doctor



Hao Ningning
China, Master



Cheng Li Lu
China, Master



Saleem Muhammad Azhar
Pakistan, Master



Upul Kumarage Chamara Sandaruwan
Sri Lanka, Master



Wickramasinghe Arachchige Prabhath Romitha Wickramasinghe
Sri Lanka, Master



Billah Md Masum
Bangladesh, Master



Parvin Fahmida
Bangladesh, Master



Betzy Nella Redinovia
Indonesia, Master



Shrestha Dipak Raj
Nepal, Master



Zafar Muhammad Junaid
Pakistan, Master



Li Xi
China, Master

2018, for the paper "Water retention, gas transport parameters, and thermal properties for roadbed materials utilizing construction demolition waste and industrial byproducts".

Mr. Mahmudur Rahman received the excellent presentation award at the 73rd JSCE Annual Meeting, held in Hokkaido in August 2018, for the paper "Probabilistic column-like buckling strength for stiffened steel plates under uniaxial compression".

Mr. Pradeep Pokhrel and Prof. Jiro Kuwano received the excellent presentation award at the 53rd Japan National Conference on Geotechnical Engineering, held in Takamatsu, Japan in July 2018 for the paper "Effect of flow velocity on contact erosion between fine and coarse sand layer".

Prof. Hiroshi Mutsuyoshi's Retirement: Farewell Notes

Wishing further development of the International Graduate Program in the future

I am very happy to see the big growth of the International Graduate Program on Civil and Environmental Engineering since it was established in 1994. The program has produced more than five hundred graduates till date, many of whom are working actively all over the world. I thank all the graduates for supporting Saitama University. I have just retired from the university last March. I am still working for Saitama University as a visiting professor and some companies as an adviser. Additionally, I am also a visiting professor to SIIT (Sirindhorn International Institute of Technology) in Thailand and Dalian University of Technology in China.



Prof. Emeritus and Visiting Prof.
Hiroshi Mutsuyoshi

Looking forward to seeing you someday and wishing you all the happiness and success.

Prof. Emeritus and Visiting Prof. Hiroshi Mutsuyoshi (former head of the FSO)

(Prof. Emeritus and Visiting Prof. Hiroshi Mutsuyoshi has made every exertion for the foundation of the International Graduate Program and has greatly contributed to the program as the head of the Foreign Student Office for more than twenty years.)

- * It is my privilege to write a message for Prof. Hiroshi Mutsuyoshi, who has recently superannuated from Dept. of Civil and Environmental Engineering, Saitama University, Japan. As an alumni of his department, I find Prof. Mutsuyoshi a Very Humble Person, a Great Academician, an Outstanding Researcher and moreover a Perfect Gentleman. His research work on Structure-Piles-Soil Interaction is Excellent. (Doctor 1997, B.K. Maheshwari, Prof. of the Dept. of Earthquake Engineering, IIT Roorkee, India)
- * It was a privilege and honour to have Prof. Hiroshi Mutsuyoshi as my supervisor for Masters and Doctoral studies at Saitama University during 1994-1999. He was one of the pioneers who established the International Graduate Program on Civil and Environmental Engineering that commenced in 1992 that has successfully graduated over 500 international students. Thank you 'Sensei' for your research and education leadership at 'Saidai' and wish you all the very best! (Doctor 1999, Thiru Aravinthan, Prof. of Structural Engineering, School of Engineering and Surveying, Associate Dean (Research), Faculty of Health, Engineering and Sciences, University of Southern Queensland, Australia)
- * It was my honour to be a student of Prof Mutsuyoshi. The genuine care and guidance that he provided on our overall professional excellence, above and beyond research, have been pivotal in defining our own leadership journeys. I will remain forever indebted to his unparalleled mentorship. Even though Prof Mutsuyoshi is retiring from Saitama University, I am confident that the engineering industry in Japan and overseas will continue to benefit from his decades of outstanding research excellence. I wish him all the best for his post-retirement endeavours. (Doctor 2004, Govinda Pandey, CEO, Rockfield Technologies Australia, Adjunct Assoc. Prof. at James Cook University, Australia)
- * Everybody has a professor who makes them realize that they have a passion for something different. For me, and many Saitama University students, professor Mutsuyoshi is the best mentor that we will all remember and cherish. He always knows how to motivate his students to work harder, patiently listen to every challenge and inspire us toward greatness in life. It would be honor to say, professor Mutsuyoshi has made me who I am today and I am forever thankful for it. (Doctor 2005, Ha Minh, Chief, Executive Officer (CEO), Consultant and Inspection Joint Stock Company of Construction Technology and Equipment (CONINCO, JSC), Vietnam)
- * Mutsuyoshi sensei has always encouraged his students to develop their overall personality apart from strong academic capabilities. I am always very thankful to Mutsuyoshi sensei for the lifelong lessons that he imparted during my work under him as a PhD student and later as a JSPS fellow. I wish him all the best on his retirement. (Doctor 2006, Rabin Tuladhar, Assoc. Prof. (Civil Engineering), Director of Undergraduate and Postgraduate Studies (Engineering), College of Science and Engineering, James Cook Univ., Australia)
- * I learned so much from Professor Hiroshi Mutsuyoshi. His continuous guidance and support even after the completion of my Master's studies from Saitama University is truly a great inspiration for me. The experiences and knowledge I learned from him have been very important part of my professional career, which I am now imparting to my postgraduate research students. (Master 2008, Allan Manalo, Assoc. Prof. at University of Southern Queensland, Australia)
- * Prof. Mutsuyoshi is an incredible professor. Long after graduation, I'm still so thankful for treasured knowledge and invaluable skills he had warmly taught and encouraged me, with the inspiration of beyond limits. He helped me soar. I'm always proud of being his student, he is the best teacher on Earth. Thank you, Sensei! (Master 2018, Mai Thi Nguyen, Indochine Engineering Vietnam JSC)
- * Dear Mutsuyoshi sensei, Congratulations on your retirement. It has been a privilege to have a mentor like you. Thank you for your endless kindness, patience and the knowledge you've imparted on me. What we are today is because of your guidance. Happy retirement life, sir! (Master 2018, Hsu Mon Khin, Ministry of Construction, Myanmar)

Message from the Foreign Student Office

Warm greetings from the Foreign Student Office!

We are pleased to send you this current issue, Issue No. 24, of our Newsletter.

We are happy to inform you that an informational video on the International Graduate Program on Civil and Environmental Engineering was created recently and is available on our Foreign Student Office (FSO) website since April, 2019. If you have not seen the video yet, you can check it at the following link:

<http://intl.civil.saitama-u.ac.jp/>

The same video can also be found on our FSO Facebook page at the following link:

<https://www.facebook.com/SUnivFSO>

We hope you can take a look at the video and help us spread our program's information to the prospective students.

Another good news is that after 1 year of construction, the 2nd building of

the Department of Civil and Environmental Engineering was renewed this April with bigger and brighter rooms and with better resistance against earthquakes. It became a more comfortable place to study for the students. If you remember, this is the same building where our FSO office was located on the 4th floor. The FSO office now is located on the 2nd floor of the 1st building.

Thank you always for your continuous support. We are always looking forward to hearing from you!

The Foreign Student Office (FSO)

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