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**Year 1, Issue 2**

BUET-Japan Institute of  
Disaster Prevention &  
Urban Safety (BUET-JIDPUS)



# NEWSLETTER

Biannual Newsletter of BUET-Japan Institute of  
Disaster Prevention & Urban Safety (BUET-JIDPUS)

## BUET-JIDPUS Monogram

The official monogram of BUET-Japan Institute of Disaster Prevention and Urban Safety has been designed by Prof. Dr. Khandaker Shabbir Ahmed, Head, Department of Architecture. BUET-JIDPUS expresses its sincere gratitude to him for designing a monogram which depicts the unique structural appearance of BUET-JIDPUS building.



## Project: Assessment of Seismic Exposure, Building & Socioeconomic Exposure Assessment and Contingency Planning for Ward 14 of Mymensingh Municipality (April - December, 2017)

BUET-JIDPUS conducted the above titled project funded by UNDP at ward 14 of Mymensingh Municipality. Because of the unabated growth of human settlement and other economic activities, the earthquake risk of the Mymensingh Municipality is growing with every passing moment. Rapid urbanization, sub-standard construction of structures, residential buildings and other infrastructures are the major causes behind this earthquake risk. Considering the earthquake threat of ward 14 of Mymensingh Municipality, the scopes of this project were- (i) Assessment of Seismic Exposure (ii) Assessment of Building Condition (iii) Assessment of



Socio-economic Context. The assessments as mentioned above were superimposed and were the basis in developing a vulnerability map with appropriate ranking of cluster under ward 14. Community participation and awareness helped for the formulation of contingency plan for ward no. 14.

## Shake Table and Actuator Testing of Columns

BUET-JIDPUS is conducting a research project in association with Military Institute of Science and Technology (MIST). The primary objective of this research is to investigate the seismic behavior of hybrid concrete columns reinforced with different configuration of smart longitudinal reinforcing materials under quasi static cyclic loading test and shake table test. The study focuses on further expanding the investigation to compare their performance with that of non-hybrid

square reinforced concrete control columns in terms of force-displacement



relationship, cyclic behavior, curvature and displacement ductility, energy dissipation capacity, residual displacement and residual drift vs maximum column drift.

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## International Conference on Disaster Risk Mitigation, 2017 (ICDRM 2017)

BUET-JIDPUS in association with the Department of Civil Engineering, BUET organized the 1st conference of this institute titled "International Conference on Disaster Risk Mitigation 2017 (ICDRM 2017)". This conference was organized as a component of the HEQEP Sub-Project CP-3140 of BUET-JIDPUS. It had addressed various topics related to natural disasters and techniques or methodology to mitigate the impact of such disasters. There were 13 sessions covering the various topics such as structural engineering, geotechnical engineering, earthquake

inaugural chair; Prof. Dr. Jamilur Reza Choudhury, Honorable Vice-Chancellor, University of Asia Pacific as a keynote speaker; Hitoshi Ara, Senior representative of Japan International Cooperation Agency (JICA) as a special guest; Dr. Ahsanul Kabir, Professor, Dept. of Civil Engineering, BUET as a conference chair; Dr. Tahmeed M. Al-Hussaini, Professor, Dept. of Civil Engineering, BUET as a conference co-chair were present. Addressing the adverse effects of different disasters, Prof. Dr. Gowher Rizvi appreciated the conference, and Prof. Dr. Saiful Islam, Honorable Vice-



engineering, climate change, flood, storms, disaster management and planning etc. More than 80 papers have been accepted for the conference. In the inaugural ceremony, Prof. Dr. Gowher Rizvi, Honorable Adviser to the Prime Minister, International Affairs and Chief of Government Innovation Unit (GIU) as a chief guest; Prof. Dr. Saiful Islam, Honorable Vice-Chancellor, BUET as an

Chancellor, BUET addressed the importance of this kind of conference. Prof. Dr. Jamilur Reza Choudhury, Honorable Vice-Chancellor, University of Asia Pacific presented a lecture addressing different kind of disasters. On 24 September, in concluding ceremony, Prof. A. M. M. Safiullah, Honorable Vice-Chancellor of Ahsanullah University of Science & Technology was present as a chief guest.

## Shake Table Testing of Earthquake Resistant Concrete Frames

BUET-JIDPUS and Bangladesh Network Office for Urban Safety (BNUS), BUET are conducting a research project on Shake Table Testing of Earthquake Resistant Building Frame using Buckling Restrained Brace (BRB). Buckling Restrained Brace (BRB) can play an

important role as a retrofitting technique. The main objective of this project is to investigate the effectiveness of BRB. A paper titled "Performance of Reinforced Concrete Frame Retrofitted with Buckling Restrained Brace (BRB)" was published in ICDRM 2017, Dhaka, Bangladesh.



## Visit to Reconstruction Area at Dolakha, Nepal

A team of four members from BUET (Dr. Raquib Ahsan, Director, BUET-JIDPUS; Dr. Mehedi A. Ansary, Professor, Department of Civil Engineering; Md. Aminul Islam, Lecturer, BUET-JIDPUS; Md. Jasim, Asst. Instrument Engineer, BUET-JIDPUS) visited Nepal from August 20-25, 2017 in different earthquake affected areas to see the stone building construction mechanism. A shake table test of similar construction technology was conducted in Kunming University of Science and Technology, China. The same technology was being implemented at the reconstruction site in Dolakha for the dissemination of information in rural parts of Nepal.

This visit was a part of the project of International Center for Collaboration Research on Disaster Risk Reduction (ICCR-



DRR), jointly implemented by Beijing Normal University (BNU), China and National Society for Earthquake Technology -Nepal (NSET) with the funding support from DFID.



## Training Course on “Non-Destructive and Geophysical Techniques for Geotechnical Site Characterization and Applications to Civil Engineering”

A 3-day Training Course on “Non-Destructive and Geophysical Techniques for Geotechnical Site Characterization and Applications to Civil Engineering”, was held during September 26-28, 2017 at BUET-Japan Institute of Disaster Prevention and Urban Safety (BUET-JIDPUS), organized by BUET-JIDPUS in association with Indian Institute of Science, Bangalore. This training was conducted as an activity under HEQEP Sub-Project CP No. 3140 of University Grants Commission; Government of Bangladesh.

A three-member team led by Prof. Dr. T. G. Sitharam, Professor in Civil Engineering and CiSTUP (founder Chairman) and KSIIDC Chair Professor, Indian Institute of Science, Bangalore conducted the training course. He was assisted by Dr. C. R. Parthasarathy and Dr. Subramanian. They are specialized experts having extensive experience in the field of using advanced testing equipment for geotechnical, geo-physical and non-destructive testing works.

The training was attended by faculty members from CUET, DUET, MIST, AUST, UAP, BUET as well as professionals from

RHD, LGED, GSB, PROSOIL, DCL-FCL and Icon Engineering Services.



During an informal inauguration on Sept. 26, Prof. Dr. Ahsanul Kabir, Head, Dept. of Civil Engg., BUET, Prof. Dr. Md. Zoynul Abedin, Prof. Dr. Raquib Ahsan, Director, BUET-JIDPUS, Prof. Dr. Tahmeed M. Al-Hussaini, SPM, CP-3140 and Prof. Dr. M. A. Ansary were present.

The training program ended on Sept. 28 with a discussion session and certificate distribution. Prof. Dr. Md. Zoynul Abedin distributed certificates among the participants. Prof. Dr. Mashfiquis Salehin, Director, IWFM was also present during final discussions.

## New Faculty Intake at BUET-JIDPUS

Education and research have been considered as two important activities of BUET-JIDPUS since its initiation in 2011. During the academic year of 2017, BUET-JIDPUS is pleased to welcome three new faculty members (Ms. Tasnim Tarannum Isaba, Mr. Ishfaq Aziz and Ms. Shamontee Aziz), who joined the institute as lecturers on 6 December, 2017. Ms. Tasnim Tarannum Isaba has completed her graduation from Department of Urban and Regional Planning, BUET and was working as a Research Associate in Bangladesh Network Office for Urban Safety (BNUS), BUET. Mr. Ishfaq Aziz has completed graduation

from Department of Civil Engineering, BUET with his major in Structural Engineering. Ms. Shamontee Aziz, with her major in Environmental Engineering, also has completed graduation from Department of Civil Engineering, BUET. Prof. Dr. Raquib Ahsan, Director, BUET-JIDPUS cordially welcomed the new faculty members. During an informal meeting regarding the future plans of BUET-JIDPUS, new faculty members expressed their sincere desire to work effectively in the future activities of the institute and contribute in the field of disaster prevention and urban safety of the country.

## Training Course on “Introduction to Remote Sensing and its Application in Natural Hazard”

A 3-day Training Course on “Introduction to Remote Sensing and its Application in Natural Hazard” was held during December 13-15, 2017 at BUET-Japan Institute of Disaster Prevention and Urban Safety (BUET-JIDPUS), organized by BUET-JIDPUS. Md. Shahinoor Rahman, Assistant Professor (On leave), BUET-JIDPUS, who is currently pursuing his Ph.D. on Earth System and Geoinformation Science at George Mason University, USA conducted the course.

The training course covered the basic concepts and technologies of remote sensing and its application in hazard identification, vulnerability assessment and natural hazard assessment. Primary emphasis of the course was satellite remote sensing applications in hazard studies, such as flood, drought, tornado, earthquake, fire and landslide. The course was designed into 12 sessions covering the following topics: Fundamental of Remote Sensing



(Electromagnetic spectrum, energy flow and interaction, resolution, image interpretation principles), Multispectral Systems (Sensor and Platform), Brief Introduction RADAR, LiDAR and Thermal Remote Sensing Systems, Introduction to Image Archive System and Accessibility, Image

Enhancement, Thematic Information Extraction (Supervised and Unsupervised Classification), Accuracy Assessment, Change Detection, Fundamentals of Hazard and Risk; Overview of Global Disaster Alert Systems, Remote Sensing in Hydro Meteorological Disasters (Flood, Drought, Storms), Remote Sensing in Hydro Meteorological Disasters (Flood, Drought, Storms), Remote Sensing Application in Geohazard (Earthquake /Landslide). The training course was attended by participations from different fields, including faculty members from DU, DUET, BUP, MIST, IUB, BAU, BUET as well as professionals from RAJUK and IWFM. With 12 sessions and 10 computer exercises, participants learned the use of remote sensing software and

multi-temporal images for change detection in natural hazards.

The training program ended with a closing ceremony held on 15 December, 2017 at BUET-JIDPUS. Prof. Dr. Farida Nilufar, Dean, Faculty of Architecture and Planning, was present as the chief guest of the ceremony. Prof. Dr. M.A. Ansary, Founder Director of BUET-JIDPUS, were also present. During their speech, the guests appreciated the training course and addressed the importance of remote sensing technologies in the context of Bangladesh. The ceremony ended with the distribution of certificates among the participants.

### Workshop on “Focus Group Discussion for Contingency Planning of Ward 14, Mymensingh Municipality”

A workshop titled “Focus Group Discussion for contingency planning of ward 14, Mymensingh Municipality” was held on 17 December, 2017 at Mymensingh Municipality, Mymensingh. There were three groups in the workshop to discuss about health facilities, shelters and open spaces of ward 14 in order to ensure community participation in the preparation of the contingency plan. The participants identified Emergency Operation Centers (EOC) within the community to

effectively handle emergency situations. People from different levels of the community, including Imams, teachers, political personnel and municipality officers, attended the workshop to share their opinions and views regarding the contingency plan. A. K. M. Tariquul Alam, Chief Executive Officer of Mymensingh Municipality was present in the workshop. He addressed the importance of this type of planning to successfully respond to and mitigate the adverse consequences of disasters like earthquake.



### Training Course on “Introduction to GIS Programming and Algorithm” (December 22-23, 2017)

A 2-day Training Course on “Introduction to GIS Programming and Algorithm” was held during December 22-23, 2017 at BUET-Japan Institute of Disaster Prevention and Urban Safety (BUET-JIDPUS), organized by BUET-JIDPUS. The training course was conducted by Md. Shahinoor Rahman, Assistant Professor (On leave), BUET-JIDPUS, Ph.D. Student at George Mason University, USA. Multi-disciplinary participations attended the course, including faculty members from DU, DUET, BUP, MIST, IUB, Sonargaon University, BAU, BUET as well as professionals from RAJUK and IWFM.

The training course consisted of eight 1.45-hour long sessions to cover fundamentals of Python programming language, basic GIS data operations and geometric

algorithms. Emergency management in recent days is highly dependent on information technologies with faster data gathering and analytics. Geospatial information is playing a vital role in emergency situations. Therefore, skills to handle geospatial information management might be helpful in managing disasters. The training session was designed into 8 sessions covering the following topics- Introduction of computer programming and Python IDEs, Fundamentals of Python (variables, data type and structures, operators and expressions, control flow, functions, input-output, error, exception handling), Introduction to object-oriented paradigm and Arcpy package, working with raster and vector spatial data, introduction and working with algorithms.



The training program ended on December 23 with a certificate awarding and closing ceremony. Prof. Dr. Sk. Sekender Ali, Dean, Faculty of Civil Engineering was present on the ceremony as the chief guest. He distributed certificates among the participants and recognized the significance of the training course to effectively deal with emergent disaster-related challenges of the country. Later at the ceremony, participants shared their valuable feedback regarding the course and encouraged future occurrences of such initiatives. Prof. Dr. Raquib Ahsan, Director, BUET-JIDPUS; Md. Shahinoor Rahman, as well as other faculty members of BUET-JIDPUS were also present.



### **Completion of “Development of Post-Graduate Research and Degree Programs in Disaster Risk Reduction at New Institute on Disaster Prevention and Urban Safety” Project (October, 2014 - November, 2017)**

In October 2014, BUET-JIDPUS in association with Department of Civil Engineering, started the research project titled “Development of Post-Graduate Research and Degree Programs in Disaster Risk Reduction at New Institute on Disaster Prevention and Urban Safety” under Higher Education Quality Enhancement Project (HEQEP) of University Grants Commission (UGC), Bangladesh with funding from the World Bank. Through this project, BUET-JIDPUS has been developing its computational and simulation laboratory as well as improving its testing facilities through collaboration with several national and international institutions.

#### **Objectives**

- Develop course curriculum for post-graduate degree (Masters/Ph.D./Diploma) programs related to Disaster Reduction.
- Specific research tasks on disaster risk assessment topics will be undertaken with technical assistance of relevant experts from renowned institutions.

- Use available testing facilities of the institute, funding from project, to purchase accessories, build models and conduct experiments.
- To improve analytical capabilities of the faculty by procuring advanced software and licences.

Research reports and other publications were prepared as outcome of following research activities:

1. Develop earth model for deterministic seismic hazard assessment studies of Bangladesh.
2. Developing expertise on the use of various geophysical and geotechnical investigation techniques
3. Improve procedures for health/vulnerability assessment of existing civil infrastructures
4. Develop risk assessment procedures for different disasters
5. Research related to human response during and the immediate aftermath of a disaster

### **Visit of the Director to Kunming University on November 3, 2017**

Prof. Dr. Raquib Ahsan, Director, BUET-JIDPUS and Dr. Mehedi A. Ansary, Professor, Department of Civil Engineering visited Kunming University from Nov 3, 2017 to Nov 6, 2017 to observe shaking table tests on brick and stone masonry houses under a joint research program with Beijing Normal University, Kunming University and Nepal Society of Earthquake Technology.





## BUET-JIDPUS Research Fellow on Safety Science Visits Bangladesh

Dr. J. W. F. Erik Wiersma from Netherlands, who is currently working as an Editor of Fire Safety Journal and Research Fellow at BUET-JIDPUS, visited Bangladesh twice during October and December, 2017. During his visits, he met Prof. Dr. Raquib Ahsan, Director, BUET-JIDPUS and Prof. Dr. Mehedi Ahmed Ansary, Department of Civil Engineering to discuss about the future actions of BUET-JIDPUS regarding safety management of Bangladesh. He also visited

Department of Inspection of Factories and Establishments (DIFE), Bangladesh Institute of Labor Studies (BILS) and Center for Policy Dialogue (CPD) for the purpose of safety research. On December 27, 2017, he inspected two RMG factories- Creative Wool Wear and Mark Designers Ltd. located at Mirpur, Dhaka in order to investigate the fire safety compliance issues of RMG sector of Bangladesh.



### Testing and Consultancy Services

During the last six months BUET-JIDPUS has been engaged in conducting different types of Structural and

Geotechnical tests. Alongside it rendered various services some of which are depicted below.



CPT (Cone Penetration Test) test at Chittagong Power Plant



Core cutting at Opex and Sinha Textile Group



Core cutting test at Daffodil International University



Microtremor test at Mega Yarn Dyeing Mills Ltd, Joydebpur Gazipur



UPV test at Opex and Sinha Textile Group



FerroScan at Opex and Sinha Textile Group



Foundation Thickness check at CitiBank



## List of Publications

Ahsan, R. and Zahura, F. (2017), "Numerical study on effect of integrity reinforcement on punching shear of flat plate", Computers and Concrete, Techno-press, Vol. 20, No. 6.

Tarannum, T., Tabassum, N., Majumder, T.A., Riyadh, A.M., Islam, I., Haque, A., Sharmeen, N. (2017), "A Temporal Study on Hatirjheel- Begunbari Project Area from Spatial and Socio-Economic Prospects", Nagar Shoilee, Vol. 8, p. 1-9 (ISBN: 978-984-34-2625-3).

Tarannum, T., Islam, I., and Zaman, T. (2017), "National Budget for Housing in the Context of Global and National Commitments of Bangladesh", Seminar Publication of Urban Development Directorate (UDD), Ministry of Housing and Public Works, Dhaka, Bangladesh.

Aziz, S., Jahin, A., Tasnim, Z., and Ali M. A., "Effect of Bicarbonate on Arsenic Removal by Coagulation", Civil and Water Resources Engineering Conference, 3-4 November 2017, Dhaka, Bangladesh (ISBN: 978-1-925488-52-4).

I. Ibrahim, M. S. Rahman, K. Islam, T. C. Roy and R. Ahsan, "Numerical Simulation Of Cfst Columns Subjected To Concentric And Eccentric Loading", International Conference on Disaster Risk Mitigation, Dhaka, Bangladesh, September 23 - 24, 2017.

M. A. Islam, M. A. Ansary and R. Ahsan, "Performance Of Reinforced Concrete Frame Retrofitted With Buckling Restrained Brace (BRB)", International Conference on Disaster Risk Mitigation, Dhaka, Bangladesh, September 23 - 24, 2017.

M. M. Ali, M. Z. Alam, M. M. Asif, S. Purkayastha and R. Ahsan, "Damage Assessment Of Rural Infrastructure Due To Cyclone In Bangladesh", International Conference on Disaster Risk Mitigation, Dhaka, Bangladesh, September 23 - 24, 2017.

M. M. Asif, M. Z. Alam and R. Ahsan, "Cyclic Load Test On Ferrocement Retrofitted Masonry Wall Units", International Conference on Disaster Risk Mitigation, Dhaka, Bangladesh, September 23-24, 2017.

F. F. Huq, S. Biswas, and T. A. Hussaini, "Exploring The Social Vulnerability And Risks Of Landslide Disaster In Bedbedi And West Muslim Para Communities Of Rangamati City Of Bangladesh", International Conference on Disaster Risk Mitigation, Dhaka, Bangladesh, September 23 - 24, 2017.

N. Hossain, I. Islam and T. M. Al-Hussaini, "Nature And Scope Of Community Involvement In Earthquake Preparedness Of Dhaka City: A Review Of Relevant Act, Plan And Policies", International Conference on Disaster Risk Mitigation, Dhaka, Bangladesh, September 23-24, 2017.

N. Hossain, T. M. Al-Hussaini and I. Islam, "A Participatory Approach Towards Understanding The Institutional Mechanism At Community Level For Reducing Earthquake Vulnerability Of Dhaka City", International Conference on Disaster Risk Mitigation, Dhaka, Bangladesh, September 23 - 24, 2017.

S. Sajjad, A. A. Yakiny, N. Islam and T. M. Al-Hussaini, "Numerical Investigation For Stability Analyses Of An Existing Road Embankment Over Soft Soil Deposits", International Conference on Disaster Risk Mitigation, Dhaka, Bangladesh, September 23 - 24, 2017.

Anik Saha, and Dr. T.M. Al-Hussaini, "Geotechnical And Hydraulic Reasons Of Submersible Embankment Failure And Impact Of Climate Change On Sustainability Of Submersible Embankment Concept In Haor Areas", International Conference on Disaster Risk Mitigation, Dhaka, Bangladesh, September 23 - 24, 2017.

N. Islam, K. Islam, M. M. Rahman and T. M. Al-Hussaini, "Seismic Vulnerability Assessment Of Reinforced Concrete School Buildings In Chittagong City Corporation", International Conference on Disaster Risk Mitigation, Dhaka, Bangladesh, September 23-24, 2017.

T.M. Al-Hussaini, S. Chakraborty, I.N. Chowdhury, F. Vaccari, F. Romanelli, A. Magrin and G.F. Panza, "Neo-Deterministic Seismic Hazard Assessment Research Programs For Bangladesh", International Conference on Disaster Risk Mitigation, Dhaka, Bangladesh, September 23-24, 2017.

Billah, M., Tarannum, T., and Ansary, M.A., "Risk Assessment of Displaced Inhabitants due to River Erosion and Looking for Relocation as a Sustainable Solution in Lebukhali Union, Patuakhali, Bangladesh", International Conference on Disaster Risk Mitigation, Dhaka, Bangladesh, September 23 - 24, 2017.

## Third Workshop for University Collaboration and Networking on Higher Education (2 August, 2017)

This workshop was a part of the JICA JST SATREP Project titled "Research on Disaster Prevention/Mitigation Measures against Flood and Storm Surges in Bangladesh". Previously two workshops have been arranged under this project. The 3rd workshop was arranged at BUET-JIDPUS. The workshop aimed at discussing 5 training modules, which were developed by the component 5 members. These modules were:

1. Overview of Flood Management Actions and Policy Planning in Bangladesh
2. Comprehensive flood resilience and community mapping in Bangladesh
3. Role of non-government organizations in flood risk reduction in Bangladesh
4. Social issues related to river bank erosion
5. Social issues related to flash flood

The project is implemented jointly by Kyoto University and BUET along with the association of several universities and organizations in Bangladesh and Japan. The project aims to develop integrated training programs on research innovations of flood disaster risk reduction. The project focuses on four types of floods: coastal flood, river flood, flash flood and urban flood. One of the key targets of the training program was to include the research outputs into university curriculum. Moreover, it included understanding the current status, contents and gaps in the current courses related to flood risk reduction in the universities, identifying flood related course materials and developing research collaborations among different universities.

## Upcoming Events

### Training course on “Fundamentals of Earthquake Resistant Design and Retrofitting of Reinforced Concrete Buildings”

BUET-JIDPUS is going to arrange a three-week training course on “Fundamentals of Earthquake Resistant Design and Retrofitting of Reinforced Concrete Buildings” from February 15 to March 3, 2018. The objective of the training course is to provide fundamental understanding and basic training to civil engineers working in earthquake engineering topics varying from engineering seismology to Earthquake Resistant Design (ERD) of Reinforced Concrete (RC) buildings to computational models and retrofitting. The course will cover the following topics: Seismic Hazard and Geophysical Investigation, Fundamentals of Earthquake Load and Computer Applications, Introduction to Geotechnical Earthquake Engineering, Fundamentals of Structural Dynamics, Fundamentals of Earthquake Resistant Design and Computer Applications, Seismic Vulnerability Assessment, Fundamentals of Retrofitting of RC Structures and Software Application of Seismic Design and Retrofitting.

### Monogram Unveiling Ceremony

The monogram of BUET-JIDPUS will be unveiled during a ceremony in the month of February, 2018.

### Training Course on

### Fundamentals of Earthquake Resistant Design and Retrofitting of Reinforced Concrete Buildings

**February 15 - March 3, 2018**



**BUET-Japan Institute of Disaster Prevention & Urban Safety (BUET-JIDPUS)**

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