

## CESNED ACTIVITIES

### Building Capacity in Pakistan to Seismically Retrofit Essential Structures (Workshops : Vulnerability Assessment of Buildings subjected to Earthquake)

**Background:**

The ongoing HEC-USAID project has enable American and Pakistani professors and practicing engineers to form professional relationships and work collaboratively to transfer technology; apply advanced earthquake engineering concepts to case study buildings typical of the Pakistani building stock; and establish contacts for international academic exchange programs and collaborative research.

The project has developed Pakistani academic capacity in earthquake engineering by providing curriculum development assistance, course material and instruction in advanced topics, and structural analysis software and training, leading to a group of faculty members at participating institutions who are able to teach both fundamental and cutting-edge courses in earthquake engineering for both students and practicing building professionals.

**Purpose of the Workshops**

This project is designed to transfer knowledge and technology by having Pakistani and American professors work collaboratively to develop a case study of existing buildings, practical courses, and academic courses. Technology and knowledge transfer, relationship building, and collaboration have been achieved through a series of visits to both countries.

After two year the project has already achieved the objectives such as (a) a cadre of university educators in Pakistan who are versed in earthquake engineering, analysis of existing buildings, and have professional relationships with American counterparts; (b) Evaluations for case study buildings; (c) Courses in earthquake engineering and seismic retrofit developed and taught to students and practitioners. The objectives such as training over 100 practicing building professionals who understand earthquake performance and retrofit of existing buildings are already on its way and the arranged workshop is a planned activity and is one of the attempts to complete the projects goals. The workshop is arranged a bit late due to the security reasons but has covered southern part of the country quiet well. The purpose of the workshop was the dissemination of hands on knowledge of assessing the vulnerability of existing essential buildings and developing the process for identification of vulnerable buildings to the participants in larger number.

**Workshop at Videoconference room NEDUET on 12th & 13th August 2009**

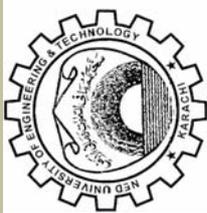
The theme of the workshop was "Vulnerability Assessment of Buildings subjected to Earthquake (VABE), it was held on August 12<sup>th</sup> - 13<sup>th</sup> 2009, at Video Conference room Department of Civil Engineering, NEDUET, Karachi. About twenty four professionals like consulting engineers, builders, officials



Participants of the workshop held in Karachi along with the trainers and the faculty members.



Participants along with Dr. Rafeeqi & Dr. Lodi in shaketable lab



NED UNIVERSITY OF ENGINEERING & TECHNOLOGY  
DEPARTMENT OF CIVIL ENGINEERING

# Cowasjee Earthquake Study Centre NED NEWSLETTER



**EDITORIAL**

The second issue of volume 9 of CESNED NEWS LETTER re-affirm our promise to keep you well informed about earthquake happenings all around the globe along with latest development in earthquake engineering .

**Inside this Issue:**

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CESNED is dedicating this issue to the effectives of October 2005 earthquake which are still facing the difficulties to overcome the losses of lives and property and as well as the mental distress caused by that unforgettable disaster  
—— Editor

# CESNED News

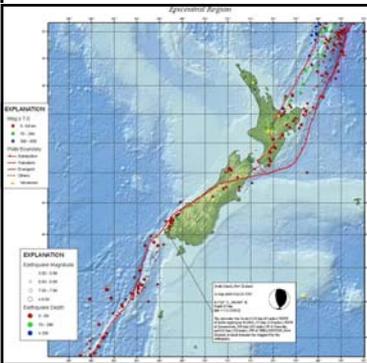
## Several Minor Earthquakes Hit Pakistan (last Six Months)

As per the USGS, some seismic activities have been reported all across the country during the month of October . An earthquake of magnitude 6.2 shook the Hindu Kush region on 22<sup>nd</sup> of October 2009, the epicenter was located at 36.471°N, 70.925°E at the depth of 196.6km and the distances of epicenter was 75 km (50 miles) SSE from Feyzabad, Afghanistan, 115 km (70 miles) NW from Chitral, Pakistan , 130 km (80 miles) SSW from Khorugh, Tajikistan and 270 km (165 miles) NE of KABUL, Afghanistan.

On 25th of October another earthquake of magnitude 5.6 hit the western Afghanistan whose epicenter was at 29.541°N, 63.825°E and at the depth of 124.5 km (77.4 miles) . The epicenter was located at 95 km (60 miles) NW of Dalbandin, Pakistan, 280 km (175 miles) WNW of Kalat, Pakistan, 285 km (175 miles) E of Zahedan, Iran and 990 km (620 miles) WSW of ISLAMABAD, Pakistan.

Again the region of Hindu Kush was hit by the earthquake of magnitude 6 on 29th of October 2009, with the epicenter at 36.434°N, 70.731°E , and the depth of 205.6 km (127.8 miles), located at 20.8 kms SSW of Ghowryad Gharemi (Badakhshan), Afghanistan, 43.7 kms SSW of Farghamiru (Badakhshan), 101 kms WNW of Chitral (NWFP), Pakistan,, 363 kms NW of Islamabad , Pakistan,

## South Island, New Zealand moved towards Australian Coast.



Epicenter Region Source: USGS

On 15th July 2009 , an earthquake of magnitude 7.6 hit south island New Zealand. The Epicenter of the earthquake was 45.722° S, 166.643° E and the depth was 35 km. It occurred near the southern tip of South Island in a region known as Fiordland. The epicenter was 150 km of Invercargill, 17 km of Queenstown , 300 km of Dunedin, and 825 km of Wellington. A small tsunami was also triggered by this earthquake. No major damage was reported as the epicenter was far from the population but this activity is marked as a noticeable seismic activity because it moved the New Zealand approximately

close to the Australian coast as per the observations made by scientists. This earthquake was the largest in the world this year and New Zealand' biggest in 80 years. New Zealand was fortunate because this earthquake anywhere else would have caused huge damage. As per GNS scientists this Earthquake occurred in soft rock between Pacific and Australian plate muffling its power and the rocks had lurched rather than snapped, causing a low-frequency rolling rather than high frequency waves. Over the past two decades several large earthquakes have occurred in Fiorland.

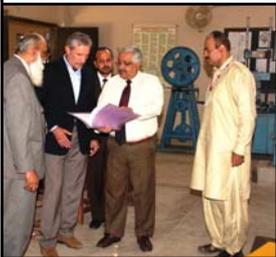
Source: USGS

## NMDA Visit to NED University

On 13th November Gen. Farooq from National Disaster Management Authority (NDMA) visited NED University . He first visited Engr Abul Kalam, Vice Chancellor of NED University ,office along with two CESNED resource persons Dr. Rafeeqi and Dr. Lodi. A



Engr Abul Kalam presenting Memo to Gen Farooq



Gen Farooq along with CESNED team Visiting Seismic Stimulators

memorandum was also presented to Gen. Farooq in VC Office. Afterwards Gen. Farooq along with the CESNED team Visited the Seismic stimulators recently installed in the Department of Civil Engineering. The detailed overview of the installation along with as sample was given to him. He also discussed with CENEES team, the recent developments in the field of the earthquake engineering and the disaster mitigation strategies.

## The builder was at fault !!!!

*I set my aspiration on the soundest rock,  
And chose my building-stone with care:  
No moral clay, no pious wooden block,  
But granite fact, and rigid logic layer on layer.  
I built high towers, not of ivory, but stone;  
Wide rooms for books and serious things  
There was house-room for solid work alone,  
But on the top arose my best imaginings.  
Finished at last, I felt an architectural pride;  
No mind had such house before.  
Then, as I was about to march inside,  
There came a violent shaking and a stunning roar.  
In spite of argument the clashing stones broke free;  
In vain the rock stood firm and sound.  
My towers collapsed in streams of masonry,  
And all my lofty dreams fell crashing to the ground.  
Though not beyond repair, the splendind house was wrecked.  
I cursed, and left it unrestored.  
Puzzled not comprehending my defect,  
I came with my perplexities before the Lord,  
Who, smiling, said, "You are no mason, it appears.  
Return, and make a new assault.  
Use better mortar, and dismiss your fears.  
The rock and stone were good; the builder was at fault."  
Charles Frances Richter, July 2, 1933*

## CESNED Participations

### Workshop on Preparedness for Tsunami and Coastal Hazard Risk Reduction

After the catastrophic tsunami that resulted from the Sumatra earthquake in 2004 and the devastation of North-West Frontier Province and the Pakistan Administered State of Azad Jammu and Kashmir by the earthquake in 2005, the Government of Pakistan, have expressed its concern on the need to establish effective early warning systems as part of preparedness for possible disasters. As tsunami and cyclone are identified as two key hazards among many in the National Disaster Risk Management Framework of the Government of Pakistan, the project



*Dr. Lodi delivering his lecture.*

“Strengthening Tsunami Early Warning System in Pakistan” aims to assist the Government of Pakistan in strengthening its national tsunami and other ocean-related hazards warning system as well as the associated preparedness for disaster risks of the most vulnerable coastal communities of Pakistan. The UNDP component under the project will focus on “Tsunami and Coastal Disaster Risk Reduction and Preparedness at Community and Local Level” in coastal areas of District Gwadar. With this view, UNDP in collaboration of National Disaster Management Authority (NDMA) organized a two days training workshop “orientation Workshop on Preparedness for Tsunami and Coastal Hazard Risk Reduction” from August 17<sup>th</sup> -18<sup>th</sup>, 2009. Dr. Lodi was invited as a key speaker and panelist in the workshop. He discussed about the Potential coastal hazard, vulnerability assessment in coastal erosion, cyclone, Earthquake,



*Dr. Lodi among the Panelists responding to the queries during workshop.*

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### SAARC Workshop on Earthquake Risk Mitigation & Management in South Asia

The 2005 Kashmir earthquake was responsible for about 73,000 lives lost, nearly 70,000 injured and about 2.5 million rendered homeless. The October 8, 2005 Kashmir earthquake illustrated that both the earthquake hazard as well as the vulnerability of typical buildings and infrastructure to strong shaking is present in many parts of Pakistan because the moderate to high levels of seismic hazard are present throughout Pakistan, and the numerous building collapses caused by the 2005 Kashmir earthquake verified the seismic vulnerability of building types present throughout the country. So, In the memory of such a disaster SAARC Disaster Management Center. New Delhi organized a workshop on “Earthquake Risk Mitigation & Management in South Asia” (8 – 9 October 2009), Islamabad in collaboration with the National Disaster Management Authority (NDMA). The presenters from all across the country attended this workshop and delivered the lectures regarding their



*Discussion on the first day of the workshop.*



*Dr. Lodi in discussion with Dr. Tahir and Mr. Shaukat*

works in the field of Earthquake Engineering. Dr. Sarosh also participated in the workshop and delivered a lecture on “Characterization of Active Faults in South Asia: Issues of Regional Cooperation Pakistan Reduction”, discussing about the tectonic activities in region and emphasized on the regional cooperation to investigate the plate movements so that the hazard maps can be improved.

### Disaster Risk Management Course

National Disaster Management Authority is continuously working as strategic planning authority to minimize the threats due to ongoing tectonic processes that could produce damaging earthquakes at any time in large parts of Pakistan. In this regard, NDMA organized a 5 day course in Karachi from 13<sup>th</sup>-18<sup>th</sup> July 2009. Prof. Sarosh H Lodi delivered in the course and discussed about “Earthquake risk Reduction”. In his part of the course, he discussed about the seismotectonic settings of Pakistan and the active and probable active faults in North and south region. He also pointed out some of the historical seismic activities in the region. In the later part of his discussion he discussed some of the basic structural problems and vulnerabilities and the procedure to evaluate the condition and response of the building during any earthquake. Risk reduction measures at the district and community level which must be taken to avoid the disasters like an earthquake were also identified.

The training materials which were distributed among the participants were developed by the Pakistani team which has already received the training through several video conferences and the visit to USA by the US participants. The teams worked rigorously for few months on several case studies buildings. Their evaluations are also presented in the training handouts.

The morning session of the first day was basically an inaugural session comprising of an opening speech by Dr. S.F.A.Rafeeqi (Dean CEA, NEDUET), Mr. Shaikh Muhammad Ali (HRD ,HEC) and Dr Shamsul Haq(PVC,NEDUET) after which a tour to the dynamics and material labs of the department was made. After the tea, in the second session , the first technical presentation was given by Dr. S.H.Lodi on Level of Earthquake Risk, the presentation was about the basic knowledge of earthquake, historical earthquakes and the seismicity of the Sindh. After wards a presentation on National Disaster Risk Management System was given by Mr. Jiwan Das from National Disaster Management Authority. A detailed presentation about the Vulnerabilities and Deficiencies– Assessment and Mitigation was then presented by Dr. S.F.A.Rafeeqi, which was last presentation before lunch, in this presentation dr. Rafeeqi elaborated the whole procedure of the assessment process. The session after lunch was typically about the evaluation of the four different case study buildings which were presented by Anis Bilal(Mustaq & Bilal) , Nighat Fatima (NESPAK), Tehmina Ayub (NEDUET) and Najmus Sahar (NEDUET).The second day was consisted of the tour to the sample building and its evaluation. All the participants were divided in groups of 4 and were given a task to complete the evaluation and present it. Each group had a one resource person and one coordinator to instruct and guide the them during the whole process.

### Workshop at Hotel Green Retreat Nathiagali on 12th & 13th October 2009

The theme of the second workshop was same as of first one "Vulnerability Assessment of Buildings subjected to Earthquake (VABE), it was held on October 12<sup>th</sup> - 13<sup>th</sup>, 2009, at Hotel Green Retreat, Nathiagali. Twenty one participants from different professionals like consulting engineers, builders, officials of civic agencies, academics, owners and architects participated. The idea behind organizing a workshop in Nathia Gali was to train and guide participants both from Punjab and NWFP province in a single workshop, which have not yet been trained in any capacity building exercise under this project. The venue had also been suggested keeping in mind the financial restrictions as well as the travel distances from both the provinces.

The morning session of the first day was basically an inaugural session comprising of an opening speech by Dr. S.F.A.Rafeeqi (Professor & Dean CEA, NEDUET) and introduction of the project by Dr. Sarosh Hashmat Lodi (Professor & Chairman, Department of Civil Engineering, NEDUET)



*Participants evaluating the sample building in Bhurban.*



*Participants of the workshop held in Nathiagali along with the trainers .  
(Pakistan Academy of Sciences, Islamabad)*

After the tea, in the second session, the first technical presentation was given by Dr. M. Asif Khan<sup>TI</sup>. (Professor & Director (National Centre of Excellence in Geology, University of Peshawar) on Seismic Hazards, Pakistan, A Review, the presentation was about the basic knowledge of earthquake, historical earthquakes and the seismicity of the Northern Pakistan. After wards a presentation on National Disaster Risk Management System was given by Dr. S.H.Lodi in which the National, Provincial and District level disaster risk management systems were discussed in detail. A detailed presentation about the Vulnerabilities and Deficiencies– Assessment and Mitigation was then presented by Dr. S.F.A.Rafeeqi, which was last presentation before lunch, in this presentation Dr. Rafeeqi elaborated the whole procedure of the assessment process. The session after lunch was typically about the evaluation of the four different case study buildings which were presented by Tehmina Ayub (NEDUET) and Najmus Sahar (NEDUET).

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The second day was consisted of the tour to the sample building and its evaluation. The building was located in Bhurban so the whole teams of participants were first taken to the building and then to the Pakistan Academy of Sciences, Islamabad for the rest of the exercise. All the participants were divided in groups of 6 and were given a task to complete the evaluation and present it. Each group had a one resource person to instruct and guide the them during the whole process.

#### RESOURCE PERSONS:

- Prof. Dr. S. F. A. Rafeeqi
- Prof. S. H. Lodi

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