



SAARC Training Programme
on

“Earthquake Risk Mitigation
in 
South Asia”

June 06-17, 2011

Organized by
SAARC Disaster Management Centre (SDMC),
New Delhi (India)

In collaboration with
Centre of Excellence in Disaster Mitigation and
Management & Department of Earthquake Engineering
Indian Institute of Technology Roorkee (IIT-R)
Roorkee, (India)

 Training venue (GNEC, Delhi)

TRAINING COMPLETION REPORT

Prepared
by
SAARC Disaster Management Centre, New Delhi

2011

BACKGROUND

South Asia is highly vulnerable to earthquakes due to presence of active seismic source regions of world. Out of eight SAARC countries, six are located in this active belt (Afghanistan, Bangladesh, Bhutan, India, Nepal and Pakistan). Many of the important and densely populated cities of these countries including the capital cities of Kabul, Dhaka, Thimphu, Delhi, Kathmandu and Islamabad are located in moderate to severe seismic hazard zones. Liquefaction and seismically induced landslides further add to the seismic hazard of the region. Many of the prevalent construction practices and building typology result in dwelling units that are extremely vulnerable to earthquake hazards. Therefore, in the past SAARC countries have experienced severe losses in terms of human casualty and property; most notable are the Bhuj earthquake of 26 January, 2001; Sumatra Earthquake of December 26, 2004 leading to Tsunami and Kashmir earthquake of 8 October 2005. Most of the casualties were due to collapse of poorly constructed buildings in geologically vulnerable regions. Earthquakes do not kill people but poorly designed or constructed buildings do. The devastation during past earthquake have clearly brought out the need to have comprehensive strategy for earthquake mitigation which should include proper assessment of seismic hazard and planning, design and construction of earthquake resistant buildings through strict compliance of code provisions. As of today, it is unfortunate that in spite of having all the scientific know-how in the field of earthquake engineering and the Code provisions for construction in seismic areas we continue to find that our engineers and builders are not following these either due to ignorance or fear of added cost. Common people are not aware of many aspects of earthquake disaster and better building practices in seismic high hazard zones of the South Asia. The problem is further aggravated by inappropriate land use planning due to lack of knowledge on geology and geotechnical condition of the region.

Therefore, it is proposed to organize a two week short term training program at IIT Roorkee Greater NOIDA Extension Centre, Greater NOIDA so as to train Architects, Town Planners, Structural Engineers and all stakeholders of SAARC countries to acquaint them about the current practices of hazard assessment, safe construction, code provisions etc. This will also provide an opportunity to all stakeholders to share experiences on this important issue of earthquake hazard assessment, mitigation methods, relief and rehabilitation measures undertaken in recent times.

ORGANISERS

SAARC Disaster Management Centre (SDMC), New Delhi, India

SAARC Disaster Management Centre (SDMC) was set up in October 2006 at the premises of National Institute of Disaster Management in New Delhi. The Centre has the mandate to serve

eight Member Countries of South Asia Association of Regional Cooperation (SAARC) - Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka - by providing policy advice and facilitating capacity building services including strategic learning, research, training, system development and exchange of information for effective disaster risk reduction and management in South Asia. It carries out studies, research, organizes workshops and training programmes, publishes reports, documents and provides various policy advisory services to the Member Countries.

The Centre has the Vision to be recognized as a vibrant Centre of Excellence for knowledge, research and capacity building on disaster management in South Asia and in the rest of the world. Towards this, SDMC is working on various dimensions of disaster risk reduction and management in South Asia. The Centre has networked through the National Focal Points of the Member Countries with the various Ministries, Departments and Scientific, Technical, Research and Academic institutions within and outside the Government working on various aspects of disaster risk reduction and management.

The centre of Excellence in Disaster Mitigation and Management, IIT-Roorkee

A Centre of Excellence in Disaster Mitigation and Management was established at IIT Roorkee in March 2006 for national capacity building in Disaster Mitigation and Management. The Centre has the following objectives.

- National capacity building in Disaster Mitigation through Human Resource Development
- Dissemination of technical know-how by conducting short term courses in Disaster Mitigation & Management
- Dissemination of technical know-how to meet the challenges arising of disasters through consultancy services
- Minimize the impact of natural disasters through R & D and extension activities by providing engineering solutions in the area of Disaster Mitigation
- Evolving strategies for mitigation and management of disasters and establishment of national technical data base for rapid dissemination of information and knowledge
- Conduct research in related areas leading to Ph.D. degree in Disaster Mitigation and Management

The major participating Departments in the Centre are: (i) Department of Earthquake Engineering; (ii) Department of Civil Engineering; (iii) Department of Earth Sciences; (iv) Department of Hydrology

The Department of Earthquake Engineering, IIT-Roorkee

The Department of Earthquake Engineering, established in 1960 as School of Research and Training in Earthquake Engineering. The Department has provided yeomen service in teaching,

research, training and rendered advice in the field of Earthquake Engineering for the last 50 years (1960-2010). The Department has four main sections, (i) Seismic Instrumentation, (ii) Engineering Seismology and Seismotectonics, (iii) Soil Dynamics and (iv) Structural Dynamics. It runs two M. Tech programs in Earthquake Engineering with specialization in Structural Dynamics and Soil Dynamics. This SAARC training course is a part of our *Golden Jubilee Celebration* of the Department of Earthquake Engineering.

PARTICIPATION

There were 43 participants out of which 27 representing all the SAARC member countries except Maldives & Sri Lanka. The trainees were selected after rigorous scrutiny of the applications received. Professionals working in related fields of civil engineering, architects, town planners, disaster management and other geo scientific fields were selected for the training. The participants included 3 from Afghanistan, 4 from Bangladesh, 2 from Bhutan, 7 from India, 7 from Nepal and 4 from Pakistan.



Sitting 1st Row from L to R : Santosh Nepal, Samjhana Sharma, Abha Acharya, D.K. Paul (Course Co-ordinator), H.R. Wason, Ashok Kumar, Yogendra Singh (Course Co-ordinator), Niroj Kumar Sarkar, Mohammad Sufyan, Putul Haldar, Tania Taher Lata, Nidhi Shukla

Standing 2nd Row from L to R : Manjeet Singh, Vijay Khose, Anshu Tomar, R. Balaji, Abhinandan Srivastav, S.R. Mohapatra, Jamaluddin Dardley, Sayed Sar Woddin Saifi, Ram Krishna Mazumder, Prajan Hada, Hari Das Sharma, Syed Ali Turab, Tabassum Zarin, Sadia Subrina, Karma Tshering, Sonam

Standing 3rd Row from L to R : Dharam Vir, Tahir Husain, Parikshit Kadariya, Pradeep Kumar Singh, Yaser Mushtaq, Saroj Kumar Goit, Rahmatullaah Rahmat, Ahmad Hammad Khaliq, Pawan Saini, Harshwardhan Singh, Govardhan, Atanu Bhattacharya, Jeevan Parsad Sharma

COURSE OBJECTIVE

The main objective of the training course is to train stakeholders (particularly dealing with geology/geophysics, construction/ engineering, disaster management) from SAARC countries

about assessment of earthquake hazard and vulnerability of buildings and immediate need to adopt different mitigation measures, exchange of knowledge and sharing of best practices on earthquake resistant design, construction and other mitigation measures.

COURSE CONTENT

The course content was meticulously designed by a group of experts in the related field from SDMC and IIT Roorkee. The course was designed to cover various aspects of earthquake engineering and mitigation such as:

- **Seismic Hazard, Risk and Vulnerability Assessment:**
 - a. Engineering Seismology, Seismotectonics and Seismic Hazard in South Asia
 - b. Concept of Seismic Zones, Risk and Vulnerability assessment
 - c. Seismic Microzonation
- **Secondary Seismic Hazards**
 - a. Geotechnical Earthquake Engineering
 - b. Seismically Induced Landslide Hazard Analysis
 - c. Liquefaction Susceptibility Studies
- **Earthquake- Resistant Design and Construction**
 - a. Performance of Masonry & RC Buildings during Earthquakes
 - b. Dynamics of Vibrating Structures
 - c. Earthquake Resistant Design and Construction
 - d. Earthquake Resistance Measures in Masonry Buildings
 - e. Pushover Analysis of RC Frame Buildings
 - f. Ductility Provision for Better Seismic Performance
 - g. Seismic Vulnerability Assessment & Retrofitting
 - h. Performance Based Design
- GIS based studies
- Techno-legal Aspects: Codes & Building Bye-Laws
- Earthquake Response, Recovery, Rehabilitation – Case Studies
- Field visits to demonstrate activities related to retrofitting/Earthquake Resistant Structure
- Solution of a Practical Problem

Tutorials and practical were an integral part of the course to expose the trainees to the application of the theoretical aspects of earthquake engineering and mitigation practices. Two sessions were earmarked for country presentations for the participants to showcase the building practices in their countries. An educational trip was part of the training course. The last phase of the training included an evaluation test to assess how much the trainees had benefitted from the training.

METHODOLOGY ADOPTED

The training schedule was formulated in a manner to impart gradual and systematic lessons to the trainees. Due care was taken to organize the series of lectures to maintain continuity of the subject and facilitate easy understanding of the topics by the trainees. The training included a 5-tier methodology for the course:

- Lectures
- Tutorials
- Practicals
- Educational tour
- Panel discussion

TRAINING INSTRUCTORS AND FACILITIES

The training was provided by experts from Indian Institute of Technology (IIT), Roorkee, and SAARC Disaster Management Centre (SDMC). Most of the lectures were delivered by the faculty from IIT Roorkee while some specialized lectures were delivered by guest faculty invited from SDMC and Department of Geology, University of Dhaka.

The lectures were held in the lecture hall of the Greater NOIDA Extension Centre (GNEC) of IIT Roorkee which is equipped with state-of-the-art facilities conforming to the international standards of presentation. The lecture halls were also the venue for the tutorial and practical demonstrations. The Centre had the facilities for internet access and Wi-Fi network which was very helpful for the trainees to prepare their country presentations, accessing scientific information and communicating with their organizations. The trainees were put up at GNEC Guest House on single and twin sharing basis.

COURSE SCHEDULE

The entire training course was distributed into lectures, tutorials and practical demonstrations of 1 hour 30 minutes. One session for similar duration was kept for the visit to various laboratories by the trainees. Two sessions were allotted for country presentation. The course schedule for the training is given below in Table 1.

Table 1. Time table for training on “Earthquake Risk Mitigation”

<i>Day/Date</i>	<i>8.00-9.30</i>	<i>10.00-11.30</i>	<i>12.00-13.30</i>	<i>15.00-16.30</i>	<i>17.00-18.30</i>
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Monday June 6, 2011	Registration (8.30) Inauguration (10.30-11.30) Inaugural Lecture by Chief Guest A.S. Arya: ERD in SAARC Countries-Problems and Perspective for Regional Cooperation		L- Elements of Engg. Seismology (Terminology, Causes of Earthquakes, Seismic Waves) - HRW	Rapid Visual Screening of Buildings - ASA	L- Ground Failures, Earthquake Effects on Buildings - DKP
Tuesday June 7, 2011	L-Structural Systems / Building Typologies -YS	L- ERD of masonry Buildings -PA	L- National Strong Motion Network and Processing of Earthquake data - AKM	L-Codal Provisions in Seismic Design of Masonry Buildings - PA	Experimental Investigation on Masonry Buildings - PA
Wednesday June 8, 2011	Site Characterisation for seismic microzonation - Kamal	L- Dynamics of Vibrating Systems - DKP	Role of 3D Seismic Tomography in Earthquake Risk Mitigation Plan - OPM	L - Seismic Safety of Non Structural Components - DKP	L-Seismic Hazard Assessment using Satellite Imaginary - AKS
Thursday June 9, 2011	L-Philopshy and Principles of ERD IS: 1893-2002 - DKP	L – Geotechnical Failures & Earthquake Resistant Design of Foundations - BKM	L- Response Spectra & Estimation of Earthquake Forces - DKP	L- Stone, Brick, Block Masonrybuilding testing - RND	Estimation of Liquefaction - BKM
Friday June 10, 2011	Visit to Roorkee (Department of Earthquake Engineering Labs and Observatories, IIT Roorkee Campus) & Course Participants & Faculty Photographs				
Saturday June 11, 2011	Field visit (New Delhi)				
Sunday June 12, 2011	Field visit (Agra)				
Monday June 13, 2011	L- Estimation of Earthquake Hazard & Seismic Microzonation - MLS	L - Remote Sensing in Earthquake Studies - MA	Seismic Hazard in SAARC Countries - MLS	GIS Technologies in Earthquake Studies - MA	Hazard Estimation - MLS
Tuesday June 14, 2011	L-Effect of foundation discontinuity on dam response -SP	L- GIS applications in risk studies - MM	Seismic Base Isolation and Supplemental Energy Dissipation - SDS	Hands on STAAD/SAP2000 & Numerical Analysis of Building - PTL/AT/VK/GOV Hands on GIS - ATANU	Hands on STAAD/SAP2000 & Numerical Analysis of Building - PTL/AT/VK/GOV Hands on GIS - ATANU
Wednesday June 15, 2011	L-Cyclone/ Wind Resistant Design of Buildings - PK	L-Vulnerability Assessment of Buildings - YS	L- Seismic Retrofitting of Masonry Buildings & Retrofitting Materials - YS	Country Presentation: Afghanistan; Bangladesh; Bhutan; India - DKP/YS	Hands on STAAD/SAP2000 & Numerical Analysis of Building - PTL/AT/VK/GOV Hands on GIS - ATANU
Thursday June 16, 2011	L- Seismic Microzonaton - AAK	L- Earthquake Risk Assessment - YS	L - Response of Soil Under Earthquakes & Liquefaction of Soils - CG	Country Presentation: Nepal, Pakistan, Sri Lanka - DKP/ YS	Hands on SAP2000 for Analysis of RC Frame Buildings - PTL/AT/VK/GOV Hands on GIS - ATANU
Friday June 17, 2011	Course Test - DKP/YS	PD- Panel Discussion - DKP/ YS	Valedictory function - DKP/YS		

***L - Lecture, PD- Panel Discussion**

Note: 11.30 to 12.00 hrs tea break, 13.30 to 15.00 lunch break

PK-	Dr. Prem Krishna, Hon. Prof., CED	ASA -	Dr. A.S. Arya, Professor Emeritus, IIT Roorkee
HRW -	Dr. H.R. Wason, Professor and Head, DEQ	OPM -	Dr. O.P. Mishra, Head, SAARC DMC, New Delhi
AK-	Dr. Ashwini Kumar, Professor, DEQ	DKP -	Dr. D.K. Paul, Head, CoE_DMM and Professor, DEQ
AKS -	Dr. A.K. Saraf, Prof. Earth Sc. Dept.	MLS -	Dr. M.L. Sharma, Prof., DEQ
BKM -	Dr. B.K. Maheshwari, Assoc., Prof., DEQ	AKM -	Dr. A.K. Mathur, Prof. DEQ
MLS-	Dr. M.L. Sharma, Assoc. Prof., DEQ	MA -	Dr. Manoj Arora, Prof., DEQ
PA -	Dr. Pankaj Agrawal, Assoc., Prof., DEQ	YS -	Dr. Yogendra Singh, Assoc. Professor, DEQ
Kamal	Dr. Kamal, earth Science Department	ATANU -	Mr. Atanu, Research Scholar, CoE_DMM
RND –	Er. R. N. . Dube, DEQ	PTL -	Ms. Putual Haldar, Research Scholar, CoE_DMM
SDS -	Mr. Sandeep Donald Shah, Taylor Devices	AT -	Mr. Anshu Tomar, Research Scholar, DEQ
VK -	Mr. Vijay Khose, Research Scholar, DEQ	GOV –	Mr. Goverdhan, Research Scholar, DEQ
SP –	Dr. Shipa Pal, Asstt. Professor, GBU	MM –	Dr. Manoj Mishra
CG-	Prof. Chandan Gosh, NIDM	AAK -	Prof. Aftab Alam Khan, Bangladesh

PROCEEDINGS OF THE TRAINING PROGRAMME

Day 1 (06.06.2011)

The training was inaugurated by Padmashree Dr. A.S. Arya, Former National Seismic Advisor, Government of India. In the inaugural address Dr. Arya gave an overview of the seismotectonics of the South Asia. Dr. S.C. Saxena, Director, IIT Roorkee welcomed the participants and apprised them about the glorious history of Earthquake Engineering at the institute. In his address Dr. O.P. Mishra, Officer-in-charge, SDMC Head, Geological Disasters Division, SDMC elaborated on the history and genesis of SDMC, its vision and missions, various training programmes conducted and importance and application of trainings being organized by SDMC. Dr. Yogendra Singh, Associate Professor, Department of Earthquake Engineering proposed the vote of thanks.



Day-1 (06-06-2011)

Lecture –1: Elements of Engineering Seismology (Terminology, Causes of Earthquakes, Seismic Waves) – Dr. Dr. H.R. Wason

Lecture –2: Rapid Visual Screening of Buildings – Dr. A.S. Arya

Lecture –3: Ground Failures, Earthquake Effects on Buildings – Dr. D. P. Paul

Day-2 (07-06-2011)

Lecture –4: Structural Systems/Building Typologies- Dr. Yogendra Singh

Lecture –5: ERD of masonry Buildings- Dr. Pankaj Agrawal

Lecture –6: National Strong Motion Network and Processing of Earthquake data- Dr. A.K. Mathur

Lecture –7: Codal Provisions in Seismic Design of Masonry Buildings- Dr. Pankaj Agrawal

Lecture –8: Experimental Investigation on Masonry Buildings- Dr. Pankaj Agrawal

Day-3 (08-06-2011)

Lecture –9: Site characterisation for seismic microzonation- Kamal

Lecture –10: Dynamics of Vibrating Systems- Dr. D. P. Paul

Lecture –11: Role of 3D Seismic Tomography in Earthquake Risk Mitigation Plan- Dr. O. P. Mishra

Lecture –12: Seismic Safety of Non Structural Components- Dr. D. P. Paul

Lecture –13: Seismic Hazard Assessment using Satellite Imaginary- Dr. A.K. Saraf

Day-4 (09-06-2011)

Lecture –14: Philosophy and Principles of ERD IS: 1893-2002- Dr. D. P. Paul

Lecture –15: Geotechnical Failures & Earthquake Resistant Design of Foundations - Dr. B. K. Maheshwari

Lecture –16: Response Spectra & Estimation of Earthquake Forces- Dr. D. P. Paul

Lecture –17: Stone, Brick, Block Masonry building testing- Er. R. N. Dube

Lecture –18: Estimation of Liquefaction - Dr. B. K. Maheshwari

Day-5 (10-06-2011)

Visit to Roorkee (Department of Earthquake Engineering Labs and Observatories, IIT Roorkee Campus) & Course Participants & Faculty Photographs

Day-6 (11-06-2011)

Field visit (New Delhi)

Day-7 (12-06-2011)

Field visit (Agra)

Day-8 (13-06-2011)

Lecture –19: Estimation of Earthquake Hazard & Seismic Microzonation- Dr. M. L. Sharma

Lecture –20: Remote Sensing in Earthquake Studies- Dr. Manoj Arora

Lecture –21: Seismic Hazard in SAARC Countries- Dr. M. L. Sharma

Lecture –22: GIS Technologies in Earthquake Studies - Dr. Manoj Arora

Lecture –23: Hazard Estimation - Dr. M. L. Sharma

Day-9 (14-06-2011)

Lecture –24: Effect of foundation discontinuity on dam response –Dr. Shipa Pal

Lecture –25: GIS applications in risk studies- Dr. Manoj Mishra

Lecture –26: Seismic Base Isolation and Supplemental Energy Dissipation- SDS

Practical-1 & 2: Hands on STAAD/ SAP2000 & Numerical Analysis of Building and Hand on GIS- Ms. Putual Haldar, Mr. Anshu Tomar, Mr. Vijay Khose & Mr. Goverdhan

Day-10 (15-06-2011)

Lecture –27: Cyclone/Wind Resistant Design of Buildings- Dr. Prem Krishna

Lecture –28: Vulnerability Assessment of Buildings- Dr. Yogendra Singh

Lecture –29: Seismic Retrofitting of Masonry Buildings & Retrofitting Materials- Dr. Yogendra Singh

Country Presentations of Afghanistan, Bangladesh & Bhutan- Dr. D. K. Paul, Dr. Yogendra Singh & Prof. A. A. Khan

Practical-3: Hands on STAAD/ SAP2000 & Numerical Analysis of Building and Hand on GIS- Ms. Putual Haldar, Mr. Anshu Tomar, Mr. Vijay Khose & Mr. Goverdhan

Day-11 (16-06-2011)

Lecture –30: Seismic Microzonation: Prof. Aftab Alam Khan

Lecture –31: Earthquake Risk Assessment: Dr. Yogendra Singh

Lecture –32: Response of Soil Under Earthquakes & Liquefaction of Soils- Prof. Chandan Ghosh

Country Presentations of India, Nepal & Pakistan- Dr. D. K. Paul, Dr. Yogendra Singh & Prof. A. A. Khan

Panel Discussion-4: Hands on STAAD/ SAP2000 & Numerical Analysis of Building and Hand on GIS- Ms. Putual Haldar, Mr. Anshu Tomar, Mr. Vijay Khose & Mr. Goverdhan

Day-12 (17-06-2011)

Course Test- Dr. D. K. Paul, Dr. Yogendra Singh & Prof. A. A. Khan

Panel Discussion: Dr. D. K. Paul, Dr. Yogendra Singh & Prof. A. A. Khan

The last session of the training was allotted for the valedictory function in which Dr. O. P. Mishra, Officer-in-charge/Director SDMC was the chief guest. Dr. Mishra distributed the

certificates to the participants. In his address he elaborated on the background of SDMC and its efforts in the rapidly evolving field of disaster mitigation and management. He stressed upon the need to arrive at development and implementation of common methodologies of earthquake resistant building practices in South Asia. Dr. D.K. Paul, Professor, Department of Earthquake Engineering and coordinator of the course presented the course report. Several participants shared their learning experiences of the training and provided with constructive suggestions for improvement of the training course in the future. The valedictory session ended with vote of thanks by Dr. Yogendra Singh.



COURSE EVALUATION

A specially designed feedback form was circulated among the trainees at the end of the training programme for them to evaluate various aspects of the training (Sample feedback form is enclosed. These included technical aspects of the course, relevance of the course contents, quality of lectures, hostel facilities, quality of food, help and cooperation from faculty and help and cooperation from non teaching staff. A summary of the feedback received from the trainees on these aspects is given below:

Feedback from the trainees

		Excellent	Very Good	Good	Satisfactory
1.	Technical contents of the course	12	10	3	2
2.	Relevance of contents of course	15	4	6	2
3.	Quality of lectures	16	9	2	0
4.	Hostel facilities	6	13	7	1
5.	Quality of messing (Food)	4	3	12	8
6.	Help and cooperation from Faculty	20	7	0	0
7.	Help and cooperation from non teaching staff	14	7	6	0

The observations emerging from the feedback of the trainees are summarized below.

- ✓ The technical contents of the training course were appreciated by the trainees.
- ✓ The trainees found the contents of the training course very relevant to the objectives of the training.
- ✓ The overall quality of the lectures was very good.
- ✓ The hostel facilities provided to the trainees has scope for improvement.
- ✓ Many trainees were of the opinion that the quality of food needed improvement.
- ✓ The help and cooperation extended to the trainees by the center was very highly acknowledged.
- ✓ The non teaching staff of the centre also extended the necessary assistance to the trainees.

Suggestions from the participants

The trainees has request for conduct two types of course one week for all and the second week for specifying classes.

CONCLUSIONS AND RECOMMENDATIONS

The training programme on ‘Earthquake Risk Mitigation’ was very beneficial for the participants. It was helpful in orienting them to the advanced practices of earthquake engineering and risk mitigation.

The training on ‘Earthquake Risk Mitigation’ conducted by SDMC in collaboration with IIT Roorkee has generated very positive response and according to the opinions of the trainees is very useful for them. In view of this positive response, it is recommended that this training may be continued. It is suggested that after the practical’s a separate module may be kept in which the trainees carry out some project work based on their own data set or data provided to them for the exercise.

ANNEXURE-I: LIST OF PARTICIPANTS

List of Participants of SAARC Training Programme on Earthquake Risk Mitigation at IIT, Greater NOIDA Extension Centre, IIT Roorkee (India) from 06-17 June 2011					
Afghanistan					
Sl. No	Name	Organisation Name & Address	Telephone/FAX No	Passport No. & Details	e-mail address
1	Sayed Sar Woddin “Saifi” (Construction Engineer)	Shah Mahmood Ghazi Watt, Opposite of MoFA, Kabul – Afghanistan	0093-777224522 (M) 0093-(0)202104720	SE 047148, Kabul DOI-16/10/2007	saiftaha@yahoo.com
2	Jamaluddin Derdley	Shah Mahmood Ghazi Watt, Opposite of MoFA, Kabul – Afghanistan	0093-786719573	SE 073452, Kabul DOI-31/05/2011	j.derdley@yahoo.com
3	Rahmatullah Rahmat	Shah Mahmood Ghazi Watt, Opposite of MoFA, Kabul – Afghanistan	0093 784 115 399	SE 073453, Kabul DOI-31/05/2011	andmakz@yahoo.com
Bangladesh					
4	Ram Krishna Mazumder	Structural Health Monitoring for RC Bridges in Bangladesh, Bangladesh University of Engineering and Technology, 660, 5th Floor, Civil Engineering Building, BUET, Dhaka -1000, Bangladesh	0088 01712 862281, 0088 01912 545119	C 0600933, Jhenidah DOI- 11/02/2010 DOE- 10/02/2015	rkmazumder@gmail.com
5	Ms. Tania Taher Lata	Department of Architecture, State University of Bangladesh (SUB),	(M) 0088-01711377543, +8808151783 8123296 (Fax)	D 0010564, Dhaka DOI-28/01/2009 DOE-27/01/2019	lata_0297@yahoo.com

6	Ms. Sadia Subrina	77 Satmasjid Road, Dhanmondi, Dhaka – 1205, Bangladesh	(M) 008801715021944, 01715021944, 8123296 (FAX)	V 0086260, Dhaka DOI-03/07/2003 DOE-02/07/2013	sadiasubrina@yahoo.com
7	Ms. Tabassum Zarin		(M) 0088-01714119054, 9670022	Z0981408, Dhaka DOI-04/10/2006 DOE-03/10/2016	tabassumbuet@gmail.com
Bhutan					
8	Karma Tshering	Development Control Division, Thimphu City Corporation, Post Bag No. 215, Thimphu, Bhutan	Phone (office) +975-2323662 Mobile +975-77105572	G005773, Thimphu DOI- 23/02/2007 DOE-24/02/2012	Karma_k_2002@hotmail.com penta_jolly@yahoo.com
9	Sonam		Phone (office) +975-2324915, 2334252, Mobile +97517557330	Z001268, Thimphu DOI- 15/06/2007 DOE-14/06/2012	sonampunap@rocketmail.com s.sonam40@yahoo.com
India					
10	Pawan Kumar	Ch. Charan Singh Educational Society	0091-9717522590, 011-27781072	NA	ncitindia@gmail.com
11	Harshwardhan Singh	Institute of Management Studies, Devi Ahilya University, Indore.	0091- 7879513201	NA	harshwardhan-singh@in.com
12	Niroj Kumar Sarkar (Senior Geologist)	Monitoring Division, PSS-P&M, Geological Survey of India , 27 J.L. Nehru Road, Kolkata- 16	033-22861641 Extn-1209, M- 09432352267 Fax. No.: 22861770	NA	n.sarkar@gsi.gov.in niroj4@gmail.com
13	R. Balaji	Earthquake Geology Division, Geological Survey of India, Southern Region, Hyderabad	M- 09490944504 +91-40-24220875 +91-40-24220958 Fax	NA	bala_50091@yahoo.com
14	Abhinandan Srivastava	Earthquake Geology Division, Geological Survey of India, Northern Region, Lucknow	M-09452213941, 05222327056, 05222336079 Fax	NA	ndansri@rediffmail.com abhinandansri@rediffmail.com
15	Ms. Nidhi Shukla	Shri R.N Shukla. 52, Jawahar Ganj, Rameshwar Road, Khandwa, Madhya Pradesh	Mob-9406655465 9827684164	NA	shuklanidhi07@gmail.com
16	Saumya Ranjan Mohapatra	Earthquake Geology Division, Geological Survey of India, Eastern Region, Kolkata	09681574748	NA	mohapatra_saumya@yahoo.com
Nepal					
17	Ms. Abha	Creative Circle	00977-9841734472,	4013505,	acharya.ava@gmail.com

	Acharya	Consultants, Architects and Planners Hattigauda Marga, Old Baneshwor, Kathmandu, Nepal	00977-01-4489138	Kathmandu DOI- 11/03/2008 DOE- 10/00/2018	
18	Ms. Smjhana Sharma		00977-9841562567, 00977-01-4489138	4672865, Kathmandu DOI- 23/10/2009 DOE- 22/10/2019	samihanasharmag@gmail.com
19	Prajan Hada	Shova Bhagbati Hosing Co. Pvt. Ltd, Katunje Ward No.1, Bhaktapur, Nepal	00977-6612539, 00977 - 9841790654 Cell: 00977-9841543736	2931579 Bhaktapur DOI- 22/02/2006 DOE- 21/01/2016	hprajan2000@yahoo.com
20	Santosh Nepal	Mercy Corps Nepal Dhangadi-5, Kailali, Nepal	00977-91-521415 M-9841581572	NA	snepal@np.mercycorps.org
21	Er. Saroj Kumar Goit	Ministry of Physical Planning & Work, Department of Urban Development & Urban Construction, Singhdurbar, Kathmandu, Nepal	00977-9743000532 (M) 00977-1-4211720 (Fax)	NA	
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ANNEXURE II: SAMPLE FEEDBACK FORM

**Training Programme on
Earthquake Risk Mitigation
June 6 - 17, 2011**

FEEDBACK FORM

	Excellent	V. Good	Good	Satisfactory
1. Technical contents of the course	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Relevance of contents of Course	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Quality of lectures	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Hostel facilities	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Quality of messing (Food)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6. Help and cooperation from Faculty	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Help and cooperation from non teaching staff	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(B) Any other comments

(C) Your suggestion to improve the contents of the course

Signature with date Harshwardhan Singh Singh
 Name _____
 Email ID : harshwardhan-singh@in.com 17/06