

*Proceedings*

# UNCRD

## at UN WCDR 2005

*Activities of UNCRD during  
UN World Conference on  
Disaster Reduction  
18-21 January 2005  
Kobe, Japan*



## EDITORS ●●●●●

Kenji Okazaki  
Eiko Narita  
Bishnu Hari Pandey  
Miki Yoshizumi

## ASSISTANT ●●●●●

Shuya Satsukawa

## DESIGNER ●●●●●

Miki Higashida  
Taeko Hirooka

## NOTE:

---

Opinions expressed in signed contributions are those of the author(s) and do not necessarily reflect those of the United Nations Secretariat or of the United Nations Center for Regional Development.

Designations employed and presentations of material in this publication do not imply the expression of any opinion whatever on the part of the United Nations Secretariat, the United Nations Center for Regional Development, concerning the legal status of any country or territory, city or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.



## ***Proceedings***

# **UNCRD at UN WCDR 2005**

*Activities of UNCRD*

*during the UN World Conference on Disaster Reduction  
18-22 January 2005, Kobe Japan*

**June 2005**

United Nations Centre for Regional Development  
Disaster Management Planning Hyogo Office

# Table of contents



ACKNOWLEDGEMENTS \_\_\_\_\_ i

FOREWORD \_\_\_\_\_ ii

GLOSSARY \_\_\_\_\_ v

BACKGROUND \_\_\_\_\_ vii

## 1. International Symposium

"Building Safer Communities against Disasters" \_\_\_\_\_ 1

1.1. OPENING SESSION \_\_\_\_\_ 2

- 1.1.1. Opening Speech
- 1.1.2. Welcome Remarks
- 1.1.3. Introductory Speech

1.2. Session I. CBDM and Institutionalisation \_\_\_\_\_ 5

- 1.2.1. Opening Dialogue
- 1.2.2. Introduction of Field Application
- 1.2.3. CBDM Filed Application Case Studies:
  - Case Study Mongolia
  - Case Study Viet Nam
- 1.2.4. Interim Dialogue Q/A Session:

1.3. Panel Discussion \_\_\_\_\_ 23

- 1.3.1. Moderator's Remarks
- 1.3.2. Panel Discussion
- 1.3.3. Rappoteur's Note
- 1.3.4. Floor Discussion and Q/A with Panellists

1.4. Session II. Safety of Non-engineered Construction \_\_\_\_\_ 29

- 1.4.1. Opening Speech
- 1.4.2. Lessons for safer houses from Hanshin-Awaji Earthquake:
- 1.4.3. Theme Presentation:
  - Risk Mitigation for Non-engineered Construction
- 1.4.4. Presentation: Integrate community initiatives in local government actions
  - I. Indian experience of safer reconstruction after Gujarat Earthquake
  - II. Project impact: Equipping communities for home retrofit



1.4.5.	Q and A session	
1.5.	Panel Discussion	49
1.5.1.	Moderator's Remarks	
1.5.2.	Panel Discussion	
1.5.3.	Rappoteour's Note	
1.5.4.	Floor Discussion and Q/A with Panellists	
<b>2.</b>	<b>Public Demonstration of Improvised Shaketable Demonstration Test</b>	<b>57</b>
2.1.	Background	58
2.1.1.	Introduction	
2.1.2.	Objectives	
2.1.3.	The Demonstration Method	
2.2.	Concept of improvised shaketable test on vernacular buildings	60
2.3.	Test of Building Models	62
2.3.1.	Welcome Address	
2.3.2.	Opening Remarks	
2.3.3.	Test Demonstration	
	1) Block building model	
	2) Brick building model	
	3) Stone building model	
	4) Wooden building model	
2.3.4.	Historical account on improvised shaketable test demonstration	
2.3.5.	Concept and rationale behind the improvised shaketable test	
2.3.6.	Commentary Note	
2.3.7.	Concluding Remarks	
<b>3.</b>	<b>Panel Cluster 4: Reducing the Underlying Risk Factors</b>	<b>69</b>
<b>4.</b>	<b>UNCRD Session on "Community Based Disaster Management"</b>	<b>73</b>
<b>5.</b>	<b>UNCRD Session on "Policies for Safer Building / Housing"</b>	<b>79</b>



## ACKNOWLEDGEMENT

United Nations Centre for Regional Development (UNCRD) carried out various activities, focusing on Community Based Disaster Management (CBDM), to contribute to the UN World Conference on Disaster Reduction (WCDR) which was held 18 - 22 January 2005 in Kobe. This publication aims to share with the readers around the world the activities of UNCRD for WCDR.

In 2004, UNCRD organised several meetings as a pre-event of WCDR. In February of 2004, UNCRD co-organised an international symposium on "Community Legacy in Disaster Management" with Secretariat for UN International Strategy for Disaster Reduction (UN ISDR), Hyogo Prefecture, and the Yomiuri Shimbun. (The proceedings of the symposium was published). UNCRD organised an international conference on "Partnership Building in Community Based Disaster Management (CBDM) in Asia," 24-26 August 2004, in Delhi, India, with the UN ISDR Secretariat, Sustainable Environment and Ecological Development Society (SEEDS), and Kyoto University Graduate School of Global Environment Studies. The conference was considered as a preparatory meeting for the WCDR with specific focus on CBDM in Asia. The On-Line Forum took place from 13 September to 6 October 2004, in association with World Health Organisation (WHO) and United Nations Environment Programme (UNEP), to continue discussion and collect voices on partnership building in CBDM from around the world over the internet.

In preparation for WCDR, UNCRD acted as one of the lead agencies for Cluster 4 "Reducing Underlying Risk Factors" with WHO and UNEP. The lead agencies developed the discussion papers for the cluster, and co-organised the Panel of Cluster 4. During WCDR, UNCRD organized a Thematic Session on "Community Based Disaster Management (CBDM)" under the cluster 4 on 21st January 2005. Another Thematic Session on "Policies for Safer Building/Housing" was co-organized by UNCRD and Japanese Ministry of Land, Infrastructure and Transport (MLIT) under the same cluster 4 on 19th January. As part of the Public Forum of WCDR, UNCRD organized an international symposium on "Building Safer Communities against Disasters" on 20th January, with Hyogo Prefecture, the Yomiuri Shimbun, and the NGO Collaboration Center, supported by NSET-Nepal, Building Research Institute (BRI), and University of Kobe. UNCRD also conducted public demonstration of "Improvised Shaketable Tests" on vernacular buildings as a special event of WCDR Public Forum, in collaboration with NSET-Nepal and BRI.

We would like to thank these organisations for their support and thank the experts for their participation in these occasions to share their insights and comments on the long-term quest of CBDM. Last, but not least, we acknowledge and thank our volunteers Taeko Hirooka, and Miki Higashida for their assistance.

## FOREWORD



In order to build disaster resilient countries, individual communities need to be first empowered to enable them to develop the capabilities to cope with the effects of natural hazards. We believe this is the most sustainable approach to dealing with the natural disaster risk. UNCRD, through its Disaster Management Planning Hyogo Office is carrying out various programmes to establish disaster prevention as an essential element of sustainable development.

In an attempt to apply the lessons learned from Hyogo Prefecture's experience of the Great Hanshin-Awaji Earthquake in 1995, the UNCRD Hyogo Office was established in 1999 with an overarching mission to formulate and promote fully integrated projects that will help countries and cities alike to achieve sustainable development through disaster management. The Hyogo Office focuses on various disaster management and mitigation initiatives and cooperates with national and international organizations such as government offices, NGOs, research institutions, and civic organizations to execute both extensive and comprehensive activities. Its activities include improvement of safety of core community facilities such as schools, dissemination of best practices in disaster risk management and formulation of integrated programmes for sustainable development through disaster risk management. Emphasis is being given to measures such as cooperation and education to empower communities to carry out mitigation measures on their own.

UNCRD has been focusing on Community Based Disaster Management. CBDM is NOT a new concept. It has been practiced throughout history in various regions, cities, town, and villages worldwide. Communities have been coping with disasters from the dawn of history, and continue to do so. However, it has been only recently that such practice has been recognized in the mainstream practice of disaster management. Moreover, one of the more important issues in CBDM is not only its incorporation into the mainstream practice of disaster management, but also, how it can be applied to the larger framework of government policy.

CBDM is a large-scale concept comprised of a wide variety of actions, from the very top to the bottom. While CBDM encompasses activities at all levels, it is critical that the ownership of these

activities fundamentally belong to the communities themselves. It is important that each community not only initiates CBDM activities but also manages them. Community participation through democratic practice needs to be at the core of the planning and implementation process.


In connection with the UN World Conference on Disaster Reduction (UNWCDR), UNCRD, on different occasions throughout the year, has implemented workshops and conferences on CBDM. More specifically, two international conferences took place as official pre-events to the UNWCDR which gathered more than 150 people from around thirteen nations to discuss some of the crucial aspects of CBDM. Furthermore, the discussion continued over the Internet via the promotion of an On-Line Forum in which more than 100 persons participated, from thirty-five different countries. UNCRD has been promoting methods of sustainable CBDM in various disaster-prone regions, mainly focusing on Asia. From the past experiences gained by implementing CBDM projects, UNCRD developed a "User's Guide" on CBDM that could be applied to various levels of constituents world-wide. The User's Guide is a book of suggestions for both government and nongovernment constituents, describing ways to implement successful and, more importantly, sustainable CBDM. In order to disseminate the findings gained and analysis performed on sustainability in CBDM, UNCRD has published two volumes on CBDM, entitled, "UNCRD Digest" and "UNCRD Tapestry". These publications describe UNCRD efforts on CBDM over the past 3 years. It is hoped that these publications will enable further dissemination of the importance of CBDM and encourage ways for its successful implementation world-wide.

The protection of lives should be the primary aim of disaster risk reduction. It has been repeatedly observed that people are killed in disasters, particularly during earthquake disasters, due to the collapse of their houses. And again, these people are generally the poor who have fragile buildings unable to withstand disasters and, as a result, become victims. We need to clearly plan the actions now as to how the disaster resiliency of these people can be achieved. There are a large number of parameters behind the risk factors to deal with, and attempt to control. However, we can say that building safer houses should constitute the last mile in our efforts to protect people from such disasters.

UNCRD has been pursuing initiatives to promote a culture of safer building practices in developing countries through a community-based approach. The key elements of the approach are development of mechanisms to increase the technological awareness of homeowners; imparting training and confidence-building measures among local masons; encouraging technology transfers through pilot demonstrations and simple, easy-to-use guidelines; and stimulating local governments to initiate the facilitation of such construction.

At the WCDR, UNCRD supported the UN ISDR Secretariat in co-organizing the cluster panel discussion on "Reducing the Underlying Risk" along with the World Health Organization (WHO)





and the United Nations Environment Programme (UNEP). UNCRD organized a session on "Community Based Disaster Management" and co-organized a session on "Policies for Safer Building/Housing" with the Ministry of Land, Infrastructure, and Transportation, Government of Japan. UNCRD also organized an international symposium on "Safer Communities" (on 20 January 2005) as part of the Public Forum. As a special event, an "Improvised Shake-Table Demonstration" was conducted, which aimed to convince people of the importance of appropriate safer technology against earthquake disasters, and to disseminate such an education tool on safer housing for a wider application. UNCRD also participated in the WCDR Exhibition to illustrate the Centre's activities to promote safer communities.

These "Proceedings" are designed to present a detailed summary of the discussions and output of the UNWCDR. It is my hope that, in addition to gaining an appreciation of what took place at this important international conference, readers will also gain a fuller understanding of UNCRD's activities in promoting community-based disaster management and will thereby be assisted in their own efforts to promote safer, more disaster-resilient communities in various regions of the world.



Kazunobu Onogawa  
Director, UNCRD

## GLOSSARY

ADB	Asian Development Bank	DDO	District Development Officer
ADPC	Asian Disaster Preparedness Center	DiPECHO	Disaster Preparedness European Commission Humanitarian Office
AUDMP	Asian Urban Disaster Mitigation Programme	DM	Disaster Mitigation / Disaster Management
BUDMP	Bangladesh Urban Disaster Mitigation Programme	DMC	Disaster Management Centre
BRI	Building Research Institute	DMU	Disaster Management Unit
CACC	Capacity-building for Adaptation to Climate Change	DP	Disaster Preparedness
CBDM	Community Based Disaster Management	DPC	District People's Committee
CBDM	Community Based Disaster Mitigation	DCFSC	District Committee for Flood and Storm Control
CBO	Community Based Organisers	FU	Farmers Union
CCFSC	Central Committee for Flood and Storm Control	GHI	Geo Hazards International
CDERA	Caribbean Disaster Emergency Response Agency	GIS	Geographic Information System
CDP	Centre for Disaster Preparedness	GOLFRE	Global Open Learning Forum for Risk Education
CDRC	Citizens Disaster Response Centre	GTZ	German Agency for Technical Cooperation
CECI	Centre d'étude et de coopération internationale	HRD	Human Resource Development
CERT	Community Emergency Response Team	ICDPP	Integrated Community Disaster Planning Programme
CIDA	Canadian International Development Agency	IDNDR	International Decade for Natural Disaster Reduction
CNDR	Corporate Network for Disaster Response	IDRC	International Development Research Centre
CPP	Cyclone Preparedness Programme	IFRC	International Federation of Red Cross
CPRGS	Comprehensive Poverty Reduction and Growth Strategy	IGNOU	Indira Gandhi National Open University
CSR	Corporate Social Responsibility	INGO	International Non-Government Organization
DARD	Department of Agriculture and Rural Development (Province)	JCI	Junior Chamber International
DDC	District Development Committee	JICA	Japan International Cooperation Agency
DDCC	Disaster Co-ordinating Councils	JPOI	Johannesburg Plan of Implementation
		KVERMP	Kathmandu Valley Earthquake Risk Management Project

MARD	Ministry of Agriculture and Rural Development (National)	UN ISDR	United Nations International Strategy for Disaster Reduction
MDG's	Millennium Development Goals, (aimed to be reached in 2015)	UN MDG	United Nations Millennium Development Goal
NDMO	National Disaster Management Organization	UN WCDR	United Nations World Conference on Disaster Reduction
NDMP	National Disaster Management Programme	USAID	United States Agency for International Development
NDMP	Natural Disaster Mitigation Partnership	US OFDA	United States office for Foreign Disaster Assistance
NGO	Non-Government Organization		
NSET	National Society for Earthquake Technology- (Nepal)	VCA	Vulnerability and Capability Assessment
PCFSC	Provincial Committee for Flood and Storm Control	VH	Village Head
PDMP	Philippines Disaster Management Forum	WHO	World Health Organization
PDMP	Participatory Disaster Management Project	WHO/KC	World Health Organization/ Kobe Centre
PO	People's Organization	WU	Women's Union
PPC	Provincial People's Committee	YU	Youth Union
PPERS	Pre positioned Emergency Rescue Store (Nepal)		
PRA	Participatory Rural Appraisal		
PRSP	Poverty Reduction Strategy Papers		
RCT	Rotary Club of Thamel		
SDC	Swiss Agency for Development and Cooperation		
SEEDS	Sustainable Environment and Ecological Development Society		
UK	United Kingdom		
UNGRD	United Nations Centre for Regional Development		
UNDP	United Nations Development Programme		
UNEP	United Nations Environment Programme		
UNICEF	United Nations Children Fund		

## Background

The "Yokohama Strategy and Plan of Action for a Safer World" was adopted at the World Conference on Natural Disaster Reduction (May 1994), as an outcome of the mid-term review of International Decade for Natural Disaster Reduction (1990-2000). At the end of the Decade, the efforts and intent have been inherited by the United Nations International Strategy for Disaster Reduction (ISDR) and the Inter-Agency Task Force (IATF) has been established to serve as the principal body for the development of disaster reduction policy.

On December 23, 2003, the United Nations General Assembly adopted resolution A/RES/58/214 announcing the convening of a World Conference on Disaster Reduction (WCDR), to be organised by United Nations International Strategy for Disaster Reduction (UN ISDR) and hosted by the Government of Japan at Kobe, from 18 to 22 January 2005. The significance behind this event taking place in Kobe, notwithstanding its purpose as a ten-year review of the Yokohama Strategy, lies in it being in the city that experienced the Great Hanshin Awaji Earthquake ten years ago in 1995.

Since then, UNCRD has implemented various activities to contribute to the WCDR, to bolster the community-based disaster management (CBDM) activities that UNCRD Hyogo Office has been pursuing over the past years. As a pre-event of the WCDR, UNCRD organized, with the ISDR Secretariat, an International Symposium on "Community Legacy in Disaster Management" on 7 February 2004 in Kobe.

UNCRD also organized an International Conference on "Partnership in Community Based Disaster Management (CBDM) in Asia" 24-26 August 2004, Delhi, India with the ISDR Secretariat and other organizations. The conference was considered as a preparatory meeting for the WCDR-Kobe with specific focus on CBDM in Asia. It aimed at initiating the partnership formation process. The specific objectives were as follows:

- To discuss the CBDM issues and activities over last 10 years from the perspective of different stakeholders



- To suggest possible ways of partnership of CBDM in Asia, and
- To draft a plan of action of CBDM in Asia for the next 10 years.

Over the ensuing three days in August, the conference dwelt on the themes of 1). CBDM and Governance, 2). CBDM and Civil Society/Corporate Sector, and 3). CBDM and Education. Approximately 75 people participated in the conference from approximately 13 different countries. The participants were representatives from government down to the civilian group level and made for a prolific gathering, worthy of being considered a pre-event for a world conference.

Consequently, the conference deliberations continued through an internet based "On-Line Forum" to enable wider participation and dissemination of the outcomes of the Conference. The On-Line Forum took place 13 September - 6 October, following the International Conference on "Partnership in CBDM in Asia" as a follow-up discussion, focusing on the 3 themes that had been discussed at the conference. Moderated by UNCRD, UNEP, and WHO/KC, discussions took place among various constituents working in the field of disaster management around the world. The comments were selected subsequent to the On-Line Forum and have been incorporated into UNCRD publication of "UNCRD Tapestry: Defining the Past and Building the Future of CBDM" to reflect their "voices". Through such a measure, UNCRD worked to reflect a wider view of ideas on CBDM, which had been collected from around the globe. More than 100 persons from more than 30 countries actively participated in this discussion, covering all continents.

Through its active involvement in preparation phase and during the WCDR that was held on 18-22 January, 2005 in Kobe, Japan, UNCRD contributed in assessing the achievements on disaster risk reduction in past decade; defining the challenges remaining and developing the objectives and course of actions for implementation in future. Specifically, UNCRD carried out following activities:

1. Facilitation of conference process by supporting the conference secretariat, ISDR;
2. Organization of sessions in thematic segment to complement the outcome of the Conference;
3. Organization of a symposium and events and exhibition for information exchange and experience sharing among experts and conference delegates on disaster risk reduction.



As a member of Inter Agency Task Force (IATF) of ISDR, UNCRD provided support to Secretariat in organizing the conference. UNCRD along with UNEP and WHO facilitated discussions under the cluster 4 "Reducing the underlying Risk Factor" and developed discussion paper on the theme for the conference. Arrangement was made to invite the rapporteur and majority of panelists of the cluster 4 for the conference. During the conference, support was provided to conduct and report the cluster 4 panel discussion.



#### **Thematic sessions in the conference**

Thematic session on "Community Based Disaster Management (CBDM)" under cluster 4 was organized at the Conference on 21st January 2005. The session gathered a group of experts in CBDM from various sectors. Panelists in the session contributed towards the theme based on their extensive experiences and researches that had been deployed at the grass-roots level. The underlying premise of this session was on how CBDM can sustain and continue to grow over time. The outcome of the session was provided to intergovernmental plenary session of the conference.

Thematic session on "Policies for Safer Building/Housing" was co-organized with Ministry of Land, Infrastructure and Transport (MLIT), Government of Japan under the same cluster 4 on 19th January 2005. The session was attended by experts from seven countries from around the world representing different regions and expertise on various kinds of housing. The session recommended strategy, course of action and indicators for improving the safety of housing and buildings in case of disaster for next decade to the plenary of the conference.

#### **International Symposium**

An international symposium was organized on "Building Safer Communities against Disasters" in public forum of WCDR on 20th January 2005. The objective of the symposium was to consolidate and disseminate the concept of Community Based Disaster Management (CBDM) and safer construction practice through the conference forum. The one-day symposium reviewed the

achievements of disaster management interventions and evaluates how “community” has been integrated and institutionalised into disaster management. It discussed on the appropriate strategy for establishing culture of prevention through safer housing with proper analyse of challenges and opportunities, the best practices and the lesson learned. More than 10 experts of disaster risk management from around the world actively participated in the symposium. The symposium was live-broadcasted through web for its wider dissemination and greater impact.

### **Improvised Shake Table Demonstration**

UNCRD has conducted public demonstration of “Improvised Shaketable Tests” on vernacular buildings in a public forum as special event at WCDR. The demonstrations were carried out in association with Hyogo Prefecture Government, Building Research Institute, Japan and NSET-Nepal. A total of 5 demonstrations were carried out on Adobe, stone, concrete block masonry and wooden buildings, two sets on 18th and 21st January each and one set on 20th during the International symposium. The objective of the demonstration was to give message to participants of the conference that 1. Simple technological improvements can save our buildings from earthquakes as revealed by the test and; 2. Such kinds of public awareness and technology transfer tool can be carried out in communities of developing countries with modest efforts.

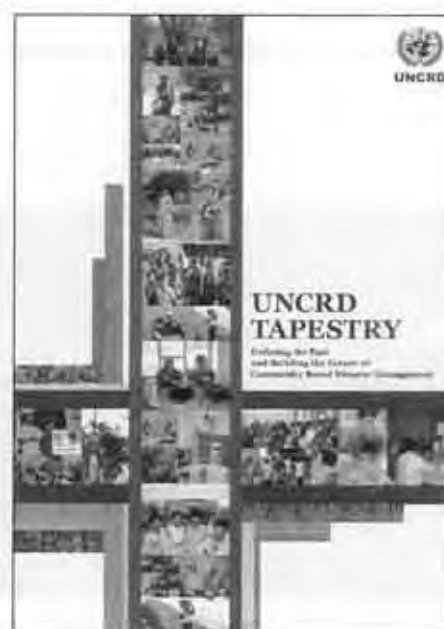
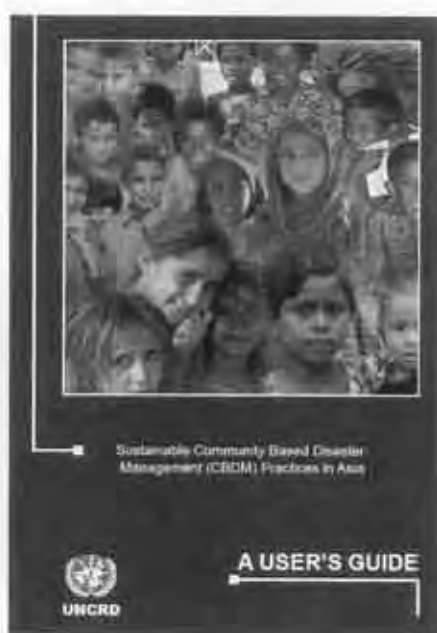
In demonstration, a pair of 1/10th scaled model building were placed on tabletop of an improvised shaketable. Twin building models, look alike, but having differences that one is constructed in a conventional method without using any earthquake resistant elements in construction and another with same material but with simple quake-resistant technology, were given incremental shaking. The shows revealed the weaknesses of the conventional construction models where as it was observed, in same shaking, the mechanism of resistance and the effectiveness of the earthquake resistant features in the other model. Comparing the damages, it was easily understood and convinced on the simple techniques of safer construction.



### Information dissemination

In order to disseminate information on activities of UNCRD as well as to promote CBDM, UNCRD participated in the exhibition as a member of Disaster Reduction Alliance (DRA). As part of the impartation procedures on CBDM, UNCRD Hyogo Office produced a video to reflect the review of CBDM activities. The video production focuses on 2 specific topics of 1. CBDM and 2. Improvised Shakerable Demonstration. The two video files present the activities of UNCRD related to the two issues and try to inform the public about the findings that have been discovered through the project activities deployed in various parts of the world.

For the purpose of dissemination of the CBDM activities deployed by UNCRD for the past 3 years, 2 sets of publication has been planned to be produced. The publications contain the project outcome and analysis on CBDM. The title of the first publication is called "UNCRD Tapestry: Defining the Past and Building the Future of CBDM". In particular, the publication is a CBDM compendium containing comprehensive information on the past 3 years of CBDM activities undertaken by UNCRD, which is the entire project term of the "Sustainability in Community Based Disaster Management (CBDM)". This publication shows the progress on CBDM achieved by UNCRD and how that has been reflected particularly in the Asian region. It also aims to impart CBDM analysis and recommendation that have been acquired over the past 3 years, which are applicable in future CBDM activities. The second is a digest version of publication on the past 3 years of CBDM activities undertaken by UNCRD. The publications have been developed where its distribution largely took place at the UN World Conference on Disaster Reduction (UN WCDR) in January, 2005 for the purpose of dissemination.





# 1. International Symposium

## "Building Safer Communities against Disasters"

*Linking the World to Kobe/Kobe to the World*

### PROGRAM

- |  |   |
|--|---|
| <p>09:30- 9:45 Opening Address<br/>           Opening Speech:<br/>           - <i>K. Onogawa, Director of UNCRD</i><br/>           Welcome Remarks:<br/>           - <i>T. Ido, Governor of Hyogo Prefecture</i><br/>           Introductory Speech:<br/>           - <i>Y. Itagaki, President of The Yomiuri Shimbun</i></p>  | <p>14:00-14:10 Opening Speech:<br/>           - <i>K. Okazaki (UNCRD) Japan</i><br/>           14:10-14:25 Lessons for safer houses from Hanshin-Awaji Earthquake:<br/>           - <i>Y. Muraaki (NRI) Japan</i><br/>           14:25-14:45 Theme Presentation: Risk Mitigation for Non-engineered Construction:<br/>           - <i>A. Dixit (NSET-Nepal) Nepal</i><br/>           14:45-15:15 Presentation: Integrate community initiatives in local government actions<br/>           I. Indian experience of safer reconstruction after Gujarat Earthquake:<br/>           - <i>V. Thirupugazh (GSDMA) India</i><br/>           II. Project Impact: Equipping communities for home retrofit:<br/>           - <i>I. Pearce (City of Seattle) USA</i></p> |
| <p>09:45-10:25 CBDM and Institutionalisation<br/>           Opening Dialogue:<br/>           - <i>K. Yamaguchi (HICE) Japan</i><br/>           - <i>M. Hirai, K. Sugita, and N. Hattawara (Mariko High School) Japan</i></p>   | <p>15:15-15:30 Q and A session in Panel<br/>           Panellist: <i>V. Thirupugazh and I. Pearce</i><br/>           15:30-15:40 Tea Break<br/>           15:40-16:30 Panel Discussion<br/>           Moderator:<br/>           - <i>C. Villacis (Consultant) USA</i><br/>           Rapporteur:<br/>           - <i>B. Pandey (UNCRD) Japan</i><br/>           Panellist:<br/>           - <i>T. Boen (WSSI) Indonesia</i><br/>           - <i>K. Meguro (University of Tokyo) Japan</i><br/>           - <i>R. Shou (Kyoto University) Japan</i><br/>           - <i>M.A. Korimi (Kerman Governor's Office) Iran</i></p>  |
| <p>10:25-11:05 Introduction of Field Application:<br/>           - <i>E. Narita (UNCRD) Japan</i><br/>           CBDM Field Application Case Studies:<br/>           Case Study Presentation I:<br/>           - <i>B. Borkluun (MNEM) Mongolia</i><br/>           Case Study Presentation II:<br/>           - <i>S. Khan (CECI) Viet Nam</i></p>   | <p>16:30-16:50 Floor Discussion and Q/A<br/>           16:50-17:20 Improvised Shakerable Demonstration<br/>           17:20-17:25 Rapporteur's Delivery<br/>           17:25-17:30 Closing Remarks</p>  |
| <p>11:05-11:25 Interim Dialogue Q/A Session<br/>           11:25-11:35 Coffee Break<br/>           11:35-12:30 Panel Discussion<br/>           Moderator:<br/>           - <i>Ian Davis (Cranfield Univ.) U.K.</i><br/>           Rapporteur:<br/>           - <i>Ines Pearce (City of Seattle) USA</i><br/>           Panellist:<br/>           - <i>Z. Delica (CDP) Philippine</i><br/>           - <i>M. Kobayashi (Kyoto Univ.) Japan</i><br/>           - <i>M. Labino-Bissante (MSDC) Guadeloupe</i><br/>           - <i>J. Mahmood (ADRRN) Malaysia</i></p> |   |
| <p>12:30-14:00 Lunch</p>   |   |

## 1.1 OPENING SESSION

### Opening Speech

*Kazunobu Onogawa, Director, UNCRD*



**Kazunobu Onogawa**  
- Director,  
United Nations  
Centre for Regional  
Development  
(UNCRD), Japan

Mr. Onogawa joined UNCRD, with wealth of experiences in other UN organizations and governmental offices. Seconded by the Ministry of Environment, the Government of Japan. Mr. Onogawa has held positions with United Nations Environment Programme, International Institute for Applied Systems Analysis and others alike. At UNCRD he strives to apply these experiences within UNCRD such as Human Security and Environment.

Good morning ladies and gentleman, it is my great pleasure to open this symposium, coorganised by UNCRD, Hyogo prefecture, and Yomiuri Newspaper.

As you are aware, we have been discussing, at this UN World Conference on Disaster Reduction, how to disseminate appropriate information on disaster risk management, and promote community based disaster management, involving community people. It is not so easy to develop the disaster management activities involving the community residents. As the first step, we should build up the plans developed by the local people, based on the local conditions.

UNCRD has been implementing various projects to promote disaster management at local level with the concept of Community Based Disaster Management (CBDM). The outcome of the past CBDM projects by UNCRD has been published in trilogy, namely, UNCRD Tapestry, its Digest and User's guide, which are distributed to the participants. As the Digest contains a brief summary translated in Japanese, I would like all the Japanese audience here to go through it.

Today, we will have one day symposium. In the morning session, we would like to focus on as to how specifically we can promote CBDM. In the afternoon, we would like to focus on the safer construction through retrofitting of houses. It is known in Asia and other regions that many victims are killed by collapse of their own houses in the case of earthquakes. Therefore, it is expected that various activities and proposals will be discussed to promote safer houses with affordable technologies. We hope your active participation from the floor into the discussion. Thank you for your attention.



# Welcome Remarks

## Toshizo Ido, Governor, Hyogo Prefecture

Good morning, we have this symposium titled “Building Safer Communities against Disasters” today. I would like to review the lessons of from Hanshin-Awaji Earthquake which took place 10 years ago. First, out of more than 6400 casualties, about 80% were killed by the collapsed buildings and houses. It means that most of the victims died instantly after the tremor. Moreover, 10% of the victims died due to the disrupted blood circulation caused by the pressure from the collapsed houses. Considering the people who were rescued from under the collapsed houses, about 70% to 80% of the survivors were rescued by the neighbors in their communities, not by the official organizations like police, firefighters or those who were directly in charge of the disaster management. This is what we learned from the Hanshin-Awaji Earthquake. Therefore, we have focused on two important aspects in the process of reconstruction. One of them is that we have made efforts to make the houses safer against earthquakes, and in case houses are damaged, to quickly reconstruct the houses to restore their life as soon as possible. However, it is quite difficult to promote the first policy to make the houses safer through the seismic diagnosis and retrofitting. Renovation of the houses cannot be realised only for improving the structural resistance against earthquakes. Usually, retrofitting houses is carried out when the houses owners renovate their houses for better environments. Therefore, retrofitting of vulnerable houses is a big task for future.

Concerning the reconstruction of the damaged houses, the government finally institutionalized a policy to offer the financial support at national level in April last year. However, the national support can cover only 10% of the cost required to rebuild the houses. We understand that at least 50% of the reconstruction cost must be given to the afflicted people. Thus, what Hyogo prefecture is preparing is to start a mutual aid or fund pooling system from July this year. Eventually, we will have policies consisting three major elements for disaster management, namely, public help, mutual help, and self help. It is also really important to develop community based disaster management. Only about the 20% of the communities at the time of the earthquake had a voluntary disaster relief organisation. Today, almost 100% of communities have developed the voluntary organisation for the disaster management. Yet, establishing this kind of voluntary organization is not enough. The issue is how effectively the organization can function and how effectively people can ensure safe evacuation and carry out rescue operations. Therefore, we must develop the partnership for disaster management among the local governments, NPOs, and community people.

Moreover, drills for disaster management should be conducted by each stakeholder taking into consideration existing risk of the communities. It is said that we do not have much concerns when we are prepared. In addition to the physical preparedness at the communities, it is quite important to develop the partnership among different stakeholders so that people can take proper actions at the time of the disaster. This is what we learned from the Hanshin-Awaji Earthquake and this is what we try to make possible in the future.

We do hope that today's symposium will help communities improve their capacity to cope with disasters in the future through discussion over good examples from other countries. I do wish to have wonderful outcome from this symposium. Thank you.



**Toshizo Ido**  
- Governor,  
Hyogo Prefecture,  
Japan

As the 48th governor of Hyogo Prefecture, Mr. Ido has served Hyogo since 2001. Furthermore, prior to his position as a governor, he held position as the lieutenant governor of Hyogo Prefecture. Having served in various national ministries from Former Ministry of Construction to the Ministry of Finance, Mr. Ido aims to use this experience in providing safety and security by encouraging citizen participation and cooperation.

# Introductory Speech

*Yasuo Itagaki, President, Yomiuri Simbun*

I am Itagaki representing Yomiuri Shimbun Osaka. It has been ten years since the Hanshin-Awaji Earthquake. Yomiuri Shimbun has reported, in the articles, special features and editorials from various angles, about the living environments and the feeling of the suffered people in affected areas. It is our responsibility to have interviews with the people who afflicted from the earthquake, as many as possible, and to report continuously about the experiences of the disaster. It would be the best way to build safer communities. Three days after the earthquake, we started the special column to report the situation of the damaged areas. Even though there were a lot of confusions about information in those days, we tried as much as possible to report some important information such as food supply, clinics which are open, and volunteer activities which are crucial for the affected people. More than 15,000 encouraging messages with of useful information were sent to the column from all over Japan in half a year. We continued this reporting activity every day for 1 year after the event.

In the last October, when Niigata Earthquake took place, we also set up the special column to report the situation in Niigata prefecture. Some of our journalists who experienced Hanshin-Awaji Earthquake visited Niigata and Tokyo to help them edit the newspapers. We heard that a lot of advices and suggestions from Kobe encouraged Niigata people very much to recover from damage. This fact tells us the importance of delivering the real voice and useful information.

We have been co-organising this international symposium with UNCRD Hyogo office and Hyogo Prefecture every year since 2001, to make use of the past experience to send messages to other countries in the world about the disaster reduction and disaster management. In the last year's Sumatra earthquake, there was a little knowledge about Tsunami in some countries, which caused so many casualties. At this second WCDR in Kobe, we are discussing how international communities can collaborate in the effort to minimize the damage by natural disasters.

This international symposium is held as an association as a part of Public Forum of WCDR, collecting many participants from Asia and America, particularly the people who have been involved in the disaster management programs. From Hyogo, we have the students from Maiko high school who have been studying about the disaster management.

The theme of this symposium is "Building Safer Communities". We will discuss various issues relevant for safer communities, such as good examples of CBDM in other countries, technologies for safer houses against earthquakes and building regulations for safer buildings. If we could send a strong message about the importance of CBDM, this symposium would be successful.

We can learn a lot from the past experience to reduce the damage from disasters. During past several years, we have experienced big earthquakes in Turkey, Taiwan, Afghanistan, and Iran. For preparing against future disasters, we need to share our experience and send messages as many people as possible to let them know about the effect of the disaster management before the next natural disaster. I hope that the discussion of this symposium will help to reduce tragedies by disasters. At last, I would like to thank UNCRD, Hyogo Prefecture and other people involved to organize this international symposium. I would like to also extend my appreciation to the panelists who will join the discussion later. Thank you.



**Yasuo Itagaki**  
- President,  
The Yomiuri Shimbun-  
Osaka, Japan

Mr. Itagaki oversees the major media company that has been serving the Japanese public for over 50 years. The firm has informed the public not only the devastating effects of the Great Hanshin-Awaji Earthquake but also the importance of awareness and public preparedness. Mr. Itagaki anticipates that the company continues to strive towards enhancing society by creating, collecting and distributing high-quality news, information and entertainment.

1.2 Session I.

CBDM and Institutionalisation



## Opening Dialogue

**Yamaguchi:** Good morning. We would like to focus on the community-based disaster management as well as institutionalization for the community based disaster management in the first session of the symposium. At the Great Hanshin-Awaji Earthquake, 80 percent of people buried under collapsed houses were rescued by their neighbours. Injured people were also carried by cars of the neighbours. It is said that communities in megacities like Kobe have broken up, but the fact in Kobe that people helped each other after the earthquake proves that communities can exist in urban areas. One of the most important lessons from the earthquake is that when the relationship with neighbours is strong, people help each other. The community is the foundation for our lives. It has been recognized that the community is helpful in a times of disaster as well as in our daily lives, and various community-based actions have been carried out. Today, we hear about community based disaster management through experiences of three panellists, Ms. Hirai, Ms. Sugita, and Ms. Hattawara, who are studying disaster management at Maiko High School which has a special course of environment and disaster management.

Firstly, please introduce yourself.

**Hirai:** Today, I am joining this symposium to learn disaster management from over the world. I have studied the Great Hanshin-Awaji Earthquake for three years at the Environmental and Disaster management course at Maiko High School. In particular, I have learned the importance of saving lives. With my background, I want to become a kindergarten teacher in the future and protect kindergarten children from disasters. I created a picture book about disaster management for kindergarten children as my graduation research project, and I want to teach disaster management to them with through this picture book.

**Sugita:** During the Great Hanshin-Awaji Earthquake, the house of my grandmother was completely destroyed, and my grandmother was killed. I have learned that earthquakes can instantly claim hundreds of lives. With such knowledge, I entered the environmental and disaster management course of Maiko High School. I have studied disaster management for three years, and I want to work on disaster management in the future, especially involved with work to reduce disaster damage by environmental management.

**Hattawara:** The reason why I chose the environmental and disaster management course at Maiko High School, is because I want to work internationally and study environmental issues and disaster management with an international perspective. I learned how the communities can play important roles against disasters in Japan and I have been interested in disaster management. I participated in volunteer activities for disaster management and talked about disaster management to elementary school students and junior high school students. In the future, I want to become a junior high school teacher and teach my students disaster management.



**Kazufumi Yamaguchi**  
- Director,  
Hyogo Institution of  
Community  
Empowerment(HICE),  
Japan

Born in Kobe, Mr. Yamaguchi's activities have been consistently based in Kobe. He obtained his university degree from Kobe University. Subsequently, he worked for Kobe Shimbun as a business editor, editorialist, as well as serve as a general manager of Institute of Information and Technology. He became the director of Kobe Shimbun Cultural Foundation in 1996 and president of Radio Kansai in 1999. Since 2003, he has been the director of HICE since 2003.

**Yamaguchi:** I think that you were students in the second or third year at elementary schools, when the Great Hanshin-Awaji Earthquake occurred. If the same scale of a earthquake occurs, whom do you want to rush to rescue you, help you and keep you family together?

**Hirai:** I will be worried about my family and friends and want to help people close to me. In the future, I will be worried about kindergarten children at first, when I am a kindergarten teacher.

**Sugita:** I will be also worried about my family and friends. In particular, I will be more worried about my parents because they work outside of our home and are at different places. Nowadays, an effective information system has been established in Japan, and we can use the system such as telephone for confirmation of the safety. However, we cannot confirm the safety immediately by using the system. After the confirmation of the safety of my family, I want to help the neighbours. At the Great Hanshin-Awaji Earthquake, my neighbours helped me. They called to me and I felt their kindness and have a feeling of security. I want to repay the favour.

**Yamaguchi:** How did your neighbours help you during the earthquake?

**Sugita:** I was in the second grade at the elementary school, and my young brother was a kindergartener at the time of the earthquake. My parents were very busy at my grandmother's destroyed house, and my young brother and I were left alone. As some aftershocks occurred and buildings were still unsafe, the neighbours called us into their cars for our safety.

**Yamaguchi:** They tried to protect you from earthquakes and provide you with a feeling of safety, did not they?

**Hattawara:** I want to help the neighbours as well as my family and friends, because I was relieved to talk with them during the earthquake. Many elderly people live in the neighbourhood, so I want to be able to help them. In particular, I want to help foreign citizens and visitors from abroad. They can obtain English information from TV and radio programmes, but there is little English information in evacuation centres, therefore I want to help them by providing English information.

**Yamaguchi:** They mentioned that first of all, they want to help their family and close friends. After the confirmation of the safety, they want to support people who live in their neighbourhoods, although the concerns are different from person to person. After the Great Hanshin-Awaji Earthquake, the importance of community has been clearly recognized. What kind of community do you think is ideal?

**Hirai:** I have learned at school that communities should be built up by residents and there are



**Misa Hirai**  
- Student,  
Maiko High School,  
Japan

Ms. Hirai is a high school student who wants to be a kindergarten teacher and teach the importance of life and accurate response mechanism when disaster happens.

various kinds of communities. I think that a good community is established through the cooperation of all people in each area. If a person does not join in his/her community, the neighbours do not know him/her, and he/she may not be rescued when a disaster occurs. If the neighbours usually communicate with each other, when disaster occurs, they can help each other. I think that it is important for each person in a community to have a thought for other people in the community.

**Sugita:** I think that communities which can help people in trouble are important. I hope that there are communities in which we think of our neighbours as our family. The community in which I live is not such a community, therefore I want to contribute to building such a community.

**Hattawara:** I think that communication is important. This is not what I learned at school, but I have learned it from my neighbours. During the Great Hanshin-Awaji Earthquake, our family did not have any food and our neighbours gave us some foods. They gave us food, because we were getting along well with them. Therefore, I think that it is important to keep communicating with our neighbours in daily life.



**Kanae Sugita**  
- Student,  
Maiko High School,  
Japan

Ms. Sugita takes interest in environmental issues; therefore, she wants to contribute to solve world's environmental problem in the future.



**Yamaguchi:** I think that their stories have one thing in common that it is important to communicate with the neighbours and have relationships with them as if they were family. Then, what should you do in order to establish such a community?

**Hirai:** This is what I learned from classes at our school. I went to an elementary school and in a class for an exchange project we created a hazard map for an area with elementary students. I think that this method is useful for communities as well as for elementary schools. My community has not created a hazard map for my area yet. So I want to propose this method to my community. We are not interested in a hazard map created by nonresidents. Sometimes we find hazard maps in the newspapers and other advertisements, where we do not know who created them, but we cannot pay attention to these. However, we are interested in hazard maps created by ourselves which we will keep in our minds. Moreover I want to propose creating hazard maps for communities, because it can promote the raising of public awareness of the importance of disaster management and the information will remain in the form of a map.

**Sugita:** I agree with Ms. Hirai's proposal, creating hazard maps. People are more interested in



the information learned through considering and checking issues by themselves than only hearing from other people. People who have some spare time, such as the elderly, can participate in creating hazard maps, but I think that we should give younger people a chance to participate in this activity.

**Hattawara:** What I learned from my experience when I visited a school in Nepal on a disaster management exchange is that not only students but also local residents can learn disaster management, when disaster drills are conducted in schools which are the centres of communities. In addition, local residents can know each other through such disaster drills. Therefore, I think that it will be good to conduct disaster management drills with a focus on schools.

**Yamaguchi:** What do you think of Ms. Hattawara's opinion that schools should become the centre of disaster management?

**Hirai:** I agree with her. I have come to be interested in disaster management after I entered the environmental and disaster management course. There is only one school with such a course in Japan. I think that it will be good to increase schools with environmental and disaster management courses in Japan and Nepal. It will be good to provide knowledge of disaster management to adults from young people.

**Sugita:** I think that it is good for young people to take initiatives to promote disaster management, because young people have the power to help others when a disaster occurs. As it is said that 80 per cent of people were rescued from destroyed houses by local residents, and young people should take the initiatives to rescue them. We should learn disaster management at schools and the number of schools with environmental and disaster management courses should be increased so that we have knowledge of disaster management as part of our common sense.

**Hattawara:** I think that the young people such as high school students should plan an event with involving disaster management for communities. Students cannot put everything into practice, so it will be good to carry out events in partnership with various people in various communities.




**Yamaguchi:** Are you joining in community activities in your own areas?

**Hattawara:** I asked an elementary school and a junior high school if I could talk about my experience of the Great Hanshin-Awaji Earthquake for students.




**Nanae Hattawara**  
- Student,  
Maiko High School,  
Japan

Ms. Hattawara chose Maiko High School due to her experience of Great Hanshin-Awaji Earthquake. In future, she wants to be a junior high school teacher and teach disaster management and go to developing countries for volunteer work.



**Sugita:** I was asked by the junior high school which I graduated from to talk about disaster management. My community has a local festival once every two months, and I can communicate with local children at those times.


**Hirai:** My community has evacuation drills, but I do not often participate in them. But I make advertisements about disaster management before each 1st September which is the day of disaster management for my community. In addition, I also go to a kindergarten and a junior high school to talk about the earthquake and have asked kindergarten teachers about disaster management there. The junior high school students listened to my presentation and raised many questions. For example, a student asked me how I was affected by the earthquake and what was essential for voluntary activities.



**Sugita:** I thought that junior high school students would not be interested in disaster management, but they listened to my presentation seriously.

**Yamaguchi:** Sometimes, high school students feel embarrassed about joining in community activities, and many of them do not want to do that. Some students do not even greet local residents. Do you feel that you are involved in your community?

**Sugita:** I moved recently to the place where I live now. In the beginning, it was hard for me to talk with the neighbours, but I have tried to be the first to communicate with them, after I studied about the community based disaster management in our school.



**Yamaguchi:** Do you often talk with your neighbours?

**Hattawara:** I have lived in the same place since I was born. Our neighbours get along well. When I go home from school, I meet women in my neighbourhood talking with others on the street. Sometimes I join in their conversation and some women give me snacks or sweets.

**Yamaguchi:** When you have such relationships, it seems easier for you to ask the neighbours to help create your own hazard maps, isn't it?

**Hattawara:** In particular, I think they are more interested in creating safety maps to protect against crimes.

**Sugita:** I do not have long enough time to talk with my neighbours, but I have tried to be the first to communicate with them. If a disaster occurs, I am concerned if my neighbours would help me or not.

**Hirai:** I often have more conversation with my neighbours than other students and try to be the first to greet them. Nowadays, the young people do not participate in the evacuation drills very much and only the elderly join them. In the current situation, it is difficult for us to ask them to create a hazard map. But I want to make a suggestion to create hazard maps by ourselves for the coming Great Tokai earthquake.

**Yamaguchi:** In order to promote community based disaster management, what do you think residents, the private sector, and local and national governments should do? Do you have some ideas about their roles for disaster management or any suggestions?

**Sugita:** I hope that governments should help local residents to make hazard maps and promote this. In addition, I hope that some experts should join in creating the maps and provide technical information to local residents who do not have it, and promote community based disaster management.

**Hattawara:** Local residents should give some ideas such as the evacuation drills, and governments should provide a room to discuss and financial resources to implement events in partnership with local residents.

**Hirai:** Governments should learn about each neighbourhood in more depth. There are various neighbourhoods from big to small. Governments should not only pay attention to well-known areas as disaster-prone areas, but also little-known areas, and provide an opportunities for local residents to initiate disaster management.

**Yamaguchi:** I think that there are some important points in promoting the community based disaster management. Firstly, a resilient community must be built through usual communication of residents. The second is that it is necessary to establish methods to assist vulnerable people, such as the elderly, young children and the handicapped people. The third is the point that, in Japan, local activities, in which only leaders of residents' association and women's association participate, are often conducted without participation of young people. But even high school students can play a role in addressing and promoting disaster management. The young people should join in local activities of the community based disaster management. The fourth is the relationship between residents, governments and other sectors. For example, in regards to creating hazard maps, local residents should create the maps by themselves, but governments should support them and provide the financial resources to print them. Although nobody talked about, neighbourhoods with crowded wooden houses, they would really be hit by a disaster when a fire occurs. They cannot make some residents move to other places, or reconstruct fire-resistant buildings, and cannot take every responsibility. Therefore, institutionalization supported by governments is essential.



# Introduction of Field Application

*Eiko Narita, Researcher, UNCRD*

I am a researcher with the United Nations Centre for Regional Development. I want to start out by saying "wow" to all the high school students who came here today. It is truly telling how talented some of these young people are. It is always a pleasure to hear the experts such as Mr. Yamaguchi to give us deeper thoughts, to let us think. But these high school students give us the inspiration today. I think you would all agree that we cannot underestimate them. They really carry with them a great thought and inspiration as well as goodness from deep bottom of their heart. They really care about the place they live in. I am quite stunned and don't know how to start from here, but I will try to do my best.



**Eiko Narita**  
- Researcher,  
UNCRD Disaster  
Management Planning  
Hyogo Office, Japan

I want to give you an introduction about our CBDM activity. But before going a little bit further into that, I want to give you our context of how UNCRD came to this point, by briefing you on our basic facts. UNCRD is under the department of DESA, under the Secretariat in NY. UNCRD first was founded in 1971, which incorporated these 3 points as gist of our mandates. It wasn't until 1985 that Disaster Management programme was established within the UNCRD organisation. And what is more, it was not until 1999 that DMPO Hyogo Office was established here in Kobe. I think all of you are aware that ten years ago the Great Hanshin Awaji Earthquake took place. I think all of us including many people in Japan can relate to the great effects of disasters but at the same time, as these students have attested to, is the great strength in people, at the community level. And that spirit encompasses the gist of our mandates, "to enhance the capacity of local people as well as the governments."

It was in 2002 that our office decided to implement this CBDM project entitled, "Sustainability in CBDM" that focused on the grass-root initiatives in disaster management. What is really CBDM? Now, this is going into a very tough question because I am sure that people at the conference and can relate with me that there are thousands of ways to define CBDM. But I think you can also relate that rather than trying to find the perfect definition, we think that CBDM in a nutshell tries to empower communities in coping mechanism for disasters, respect for traditional disaster management ways, and reinforce the community bond that is sort of the "mover" of CBDM. Just to give you another thought, one of the major causal factors in inspiring UNCRD, to implement this project was the Gujarat Earthquake that took place in 2001. I am sure all of you are very aware of, it was a devastating earthquake that took place in the western part of India where tens of thousands of people were killed and many more whose livelihood was damaged. I think what we saw was the tremendous mobilization of international efforts in the aftermath of the earthquake from UN organisations, NGOs and I-NGOs, in assisting this grass-root recovery process and really much of the efforts were done at the grass roots level. But after the influx of the outside help, I think we had to stop and ask ourselves, "What happens when the outside help is over, meaning what happens after funding has been terminated and the project has been completed?" Then, that was another hurdle we had to overcome. We had to keep asking that, so eventually, our project on sustainability in CBDM was a quest from that question.

Ms. Narita served in the Division of Capital Asset Management of the State of Massachusetts and in Town of Needham, Planning department as a planner. Since 2003, she has been engaged in the research on disaster management planning. She obtained a B.S. in City and Regional Planning from Cornell University and M.A. in Urban Planning from Harvard University.



Just to give you briefing on our 3 year project of “Sustainability in CBDM.” Year 1 was the development of project framework, collecting of information which took place in the 6 countries. Year 2 was the development of guidelines called the “Users Guide” which was developed from the previous year’s work of research and analysis. From Year 1 and Year2, our finding for sustaining CBDM was to get it institutionalised, meaning it has to be a mainstream activity, accepted by the government, accepted by the people. And that year 3 activity took place in Mongolia and Viet Nam and this is the presentation that is coming up after my introduction. I want to give you a bit more of the briefing on that activity, because I think that the basic facts ought to be outlined for you before they give you their findings. Basically Year 3, what we did, was we used the Users Guide that was established through our research. We tried to apply it in Mongolia and Viet Nam to explore and address the issue of “how can CBDM be institutionalised?” How can it be mainstreamed, how can it be put out in the “market” so that it’s not just grass-roots, mom and pop activity, but that big guys can also get involved and support. Get involved means positive support. So we used our CBDM guidelines, translating it into their local language and context. We provided community surveys and did community training, which we involved the community and the government at the local and national level so that they can think. We did not go to give answers, because that is a huge task, but to get them to think about how CBDM can be institutionalised.

I believe that the presentations following mine, from Mongolia and Viet Nam can give you the details. I want to end with this small quote, but actually a huge quote by very famous Henry David Thoreau who says, “Things don’t change, we change.” I think this is a huge inspiration for us, because things just don’t happen. When you want a movement, initiate something you can’t wait for it to happen, the least of all is CBDM. I think we have to change our actions, our thoughts from the grass-roots level to the top. I think that the dialogue before mine gave you that thought, too, that there is a role that everyone can play within this huge concept of CBDM. CBDM tends to be a grass-roots, mom-and-pop activity, but it’s not really. If you want it to sustain, it has to be institutionalised, it has to be given a systematic framework in which people can comfortably initiate these activities. I think we all have to be the change agent and that really includes the top to the bottom. I want to thank you for your time for this introduction and I want to pass the floor to the next presentation from Mongolia.



# Institutionalisation of CBDM in Mongolia

*Bolormaa Borkhuu, Officer, MNEW*

Good morning all of you. I am working with the Ministry of Nature and Environment of Mongolia.

My presentation is "CBDM Institutionalisation Efforts in Mongolia." Mongolia is located in the central part of Asia between Russian Federation and China. Land area is very large, 1.5 million sq. kilometres. For example, share of agricultural land in the total territory is 83.5%, which means it is essential for Mongolia to focus national strategy on disaster management in the agricultural sector.

These slides show the comparative temperature in July. Mongolia has cold climate and Ulanbaatar is the capital of Mongolia, where its average temperature in January is -20C and it reaches 30.5 C in July. Average rainfall worldwide is 977mm in a year, where as for Mongolia it is 222mm per year. It means that this country is prone to disasters such as drought, dzud, and forest steppe fires. Population of Mongolia is very small with 2.5 millions, and rural population is 41% of the total population. Share of household with private livestock is 40.3%. So, my country has very low population density, one of the lowest in the world. Share of agriculture sector in GDP is 20% and 41.8% in the labour.



**Bolormaa Borkhuu**

- Officer,

Ministry of Nature and  
Environment of  
Mongolia(MNEM),  
Mongolia

Ms. Bolormaa was born in Ulaanbaatar, Mongolia and has served for MNEM since 1998. Currently, she works as an officer of Department of Finance and Budget of MNEM. She is also an economist and a fluent speaker of Russian as well as Mongolian and English. She obtained diploma in Economics for labour from Irkutsk Institute of National Economy in Russia.



The total animal losses caused by disasters are 12.5 million heads in 2000 and 2003. For example, in 2003, 25.4 million heads of livestock were counted in Mongolia. The number of households lived without livestock was 90.8 thousands in 2003. Therefore, livestock is the main source of income for herders. Also, the number of herders reduced by 43 thousands between 2000-2003, share of agriculture in the GDP reduced from 39 % in 2002 to 20% in 2003 due to drought and dzud disasters.

Dzud is a specific winter disaster high frequency in Mongolia. This disaster is accumulation of following damaging phenomenon. Dzud would mean unusual cold winter (-40C), deep snow (more than 70+cm), ice layer on the land and low nutrient content in grass. Other disasters are steppe fires and drought.

Our Field Application activities for CBDM were local workshops on CBDM, a training programme of CBDM activities, translation of User's Guide, series of community training and forum PRA,

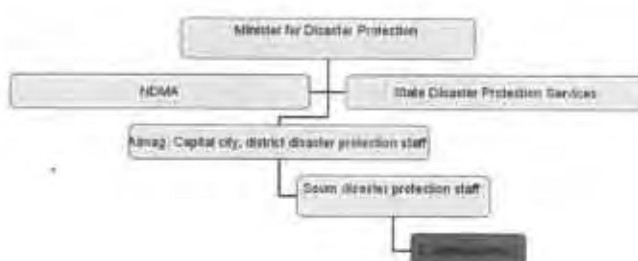
questions and survey for the Users Guide, and a national workshop on UNCRD's User's Guide on CBDM. We met with relevant government agencies to strategize the adoption of CBDM. Also, we met with international organisations such as UNDP, and JCS to promote CBDM.

I want to introduce you the series of community forums that were implemented using PRA method and contents, mapping of the location of the selected communities, types of disasters and their causes, their duration, occurrences of disasters. We tried to map the most accessible and helpful during disasters, and who should be the stakeholders of disaster management. This is the current disaster management structure of Mongolia. Minister for Disaster Protection, National Disaster Management Agency, State Disaster Protection Services include relevant ministries and agencies, aimag (capital city) disaster management protection staff, and soum disaster management protection staff, and communities could be the primary units to deal with disaster issues at the grass-roots level.

As for CBDM institutionalisation efforts in Mongolia, I am glad to inform you that the concept has been incorporated in the National Priorities Economic and Social Development Action Programme by the government and approved by the Mongolian Parliament. It means CBDM has been institutionalised at the policy level in Mongolia. The recommendations on CBDM have been reflected on the state policy on disaster protection, the User's Guide has been disseminated to the local governments. Some international organisations such as ADB funded agriculture sector development programme and JCS is interested in introducing User's Guide for disaster mitigation in rural areas. This proves that the guidelines are suitable and applicable in the Mongolian context. Implementation of bottom-up, participatory approach for disaster management will be one of the objectives of the second phase of the UNDP project "Strengthening the Disaster Mitigation and Management in Mongolia." Recently the second phase has been approved, and one of the outputs of this second phase is to develop and implement CBDM training in the selected areas.

I mentioned earlier that community groups could be the primary source for disaster management issues at the grass-roots level. Findings of local surveys, result of the national workshop show that CBDM is efficient in the Mongolian context as well. Active participation of rural communities in disaster management is right for reducing risks of most frequent, continues, and economically damaging disasters such as drought, dzud, and forest steppe fires. Therefore, disaster management reforms will be directed under the guidance of CBDM.

Current structure of Disaster Management



# Institutionalisation of CBDM in Viet Nam

*Sohel Khan, Project Team Leader, CECI*

I would like to talk about Field Application of UNCRD Guidelines and Tools which we did in Viet Nam in collaboration with UNCRD. But I would like to first thank the school students who really had a fantastic discussion this morning on CBDM from which I learned a lot.

We implemented the Field Application in Viet Nam from June to November. We did it in different phases. The objectives were already introduced by Narita san, to assess the institutionalisation of CBDM by applying guidelines and tools, to study the applicability of the guidelines that was established over the past two years. How we did it. First we translated the CBDM documents into Vietnamese and then we discussed the whole strategy of the Field Application and distributed the documents to the various stakeholders, particularly at the central and national government, provincial governments and international organisations such as INGOs. The district and commune level which is really the field, the commune, the NGOs for the review and incorporation. That was the process that we followed in the field. Finally, we collected the feedback. We did the feedback collection through the questionnaire and interviews, in-house workshop, focus group discussion, and national workshop. This is one of the pictures of our partners discussing at the district level.



**Sohel Khan**

- Project Team Leader,  
Canadian Centre for  
International Studies  
(CECI) , Vietnam

Mr. Khan works as Project Team Leader of CIDA funded Climate Change adaptation and Disaster Mitigation project in Vietnam under the Canadian Centre for International Studies and Cooperation. Mr. Khan has approximately 14 years of experience in community development and disaster mitigation in South and Southeast Asia specializing in, amongst many things, disaster preparedness and mitigation, and risk mapping as well as Community Based Disaster Management (CBDM). Mr. Khan holds a MBM, MSc, in Development Studies.

## PARTICIPATING GROUPS/ ORGANIZATIONS

Province/District/Commune	National level
Province: CCFSC, Red Cross, CECI CBDM team, Quang Ngai NDM Project	Central Government: ODMFSC, DMC, NDMP,
District: DM Committee of Quang Dien district, DMC members, Red Cross trainers.	UNO: UNDP, WHO
Commune: CBDM Trainers, Red Cross trainers, Commune/village level mass organization ( VH FUs, WUs, YUs) Commune/village level CBDM Trainer	INGOs: CRS, World Vision, CARE, CECI

Who participated in this process? It's a long list of organisations. We did it at the central level, provincial government, district and commune level and with UN organisations. They all participated in the Field Application in a different way.

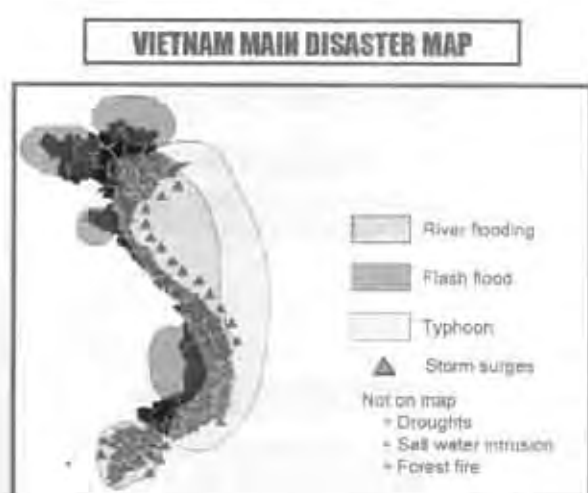
Now, I would like to give you some brief introduction on Viet Nam, before going to the Field Application findings. Viet Nam is situated in the tropical monsoon zone, and one of the most hazard prone countries in the world. 70% of the total 73 million population live in the hazard prone areas, flood and typhoon prone areas. And this is the Viet Nam map, which is located next to the South China Sea and behind is Laos and Cambodia. It has 3,000 kilometre of coast. The natural disasters in north Viet Nam are flush floods, earthquakes, and landslides. In the central part, they are typhoons, flush floods, droughts, and salt water intrusion. In the South, the Mekong River region, river flooding is most prominent. This is the Viet Nam disaster map, which indicate the drought areas and flood areas, mostly flush floods.



Here is another Viet Nam map, which looks like a flower, but actually not a flower. It indicates the different disasters in different regions. Look at this Viet Nam map, the whole green areas are river flooding areas and pink colour indicates typhoons and flash floods. The whole of Viet Nam is located in the disaster prone areas. Next is the disaster vulnerabilities. Through different research what we have been informed is that flood related disasters will increase gradually and large agricultural land areas will be regularly flooded and salinated. Mangrove forests will be flooded and lost. Loss in agricultural productivity from droughts and intense flooding will be greater and water supply consumption potentiality will be reduced. And the indication has already started. Now, this is a picture of disaster loss in Viet Nam, but I don't want to go in detail for the discussion. If you see the trend, you will see the loss of human lives and the economic loss is getting larger, which is one of the long term trend in Viet Nam.

What the governments did in Viet Nam. In fact, the government in recent days is very aware about disaster situation and mitigation issues. They developed a national strategy for disaster mitigation from 2001 to 2020, and also established a natural disaster mitigation partnership to ensure disaster mitigation programme in Viet Nam for better coordination. One of the major strategies of the Viet Nam government is, for Northern Viet Nam, to protect dikes. Central Viet Nam is optimised with non-structural and structural measures, and Southern Viet Nam is living with flood, or living with disasters.

As for Field Application findings, the communes, in terms of usefulness, appreciated the guidelines and tools and they said that it was very important to implement and have a uniform CBDM practice in Viet Nam. It is useful for the strategic planning. It ensures stakeholders involvement in CBDM practice. It enhances the knowledge of project implementers and policy makers on sustainable CBDM. It increases the understanding of the approaches that have been successful in other countries. It makes CBDM successful in reducing project cost and donor dependency. It could be useful for disaster managers to do CBDM in more organised and effective manner.



What communities achieved through CBDM process. If we see the four areas, we really want to have the communities understand the four areas, which is realistic disaster preparedness and mitigation planning, effective use of resource high level of awareness and enhance coping capacity. Now, community participation through CBDM, and then community capacity building, and disaster risks and loss reduction. This is the way that if we practice CBDM, we can ensure community participation. Community participation can also be held in these four areas, which can then ultimately achieve community capacity building for disaster mitigation, which can help to reduce disaster loss and risks.

Applicability of CBDM guidelines, all stakeholders mentioned clearly that it was applicable in Viet Nam. Grass-roots level approach in Viet Nam is gaining favour. All the participants felt that it is very important that we have a standard guideline and tools. The government policy on disaster management also focuses on local participation. CBDM processes are highly applicable to mitigate the impacts of disasters.

Now, the definition of different users. We tried to identify, through this application process, the users, and what are the definitions in the Viet Nam context. I tried to give some idea from the field application that in Viet Nam the situation is different. The whole CBDM community participation, this issue is new, considering the new political socio political situation. It is now gaining favour as I mentioned. The users in that context are still the policy makers or the people's counsels, which is top forum and then, broader decision-making bodies, by different ministries, but ultimately the people's party which comes from the Communist party. And the national government parliament and the national managers and local managers, central and provincial level disaster managers are the members of this area, particularly the Red Cross, police, relevant parties, army all are involved in the disaster mitigation in Viet Nam. Local trainers and community workers and members of the mass organisations, (it is very important to know that in Viet Nam there is a mass organisation at the field level), which are called people's union, women's union, farmers union, youth unions, these are key organisations at the local level who are active in disaster mitigation and other





development activities at the local areas. Basically these are part of the national structure which is also a government or national affiliated organisations. The local administration and INGOs are often involved in community service.

Now the stakeholders of the CBDM, the policy maker at the central and provincial level is called the Department of Dikes Management and Flood and Storm Control. The national managers are central level of DDMFSC, provincial level DDMFSC Red Cross, INGOs and, local managers of provincial disaster management unit and other local government officials. Local trainers are the district and commune officials, and the DMC (disaster management centres), INGOs, Red Cross and academic institutions. Here, we involved the academic institutions to get their feedback as well as how they can be involved in the CBDM dissemination in the future. As for community workers, we considered villas, Red Cross, commune and health volunteers, mass organisation, and school teachers.

Integration and dissemination of guidelines through training courses, workshops, and general dissemination. They recommended that they should be done on a regular basis to motivate communities and increase training courses for sustaining CBDM for local officers and people. In Viet Nam, the government structure is very active in disaster management so they should be well aware about the whole CBDM aspects. So they should be involved in every stage, and they should have a strong partnership between NGO and government organisation so that there can be information dissemination, learning, and information sharing. Then, pilot intervention. They strongly recommended that we should do different pilot intervention for CBDM so that people can see the success of CBDM practice in the field through policy development and organise conferences and workshops to disseminate lessons learned from other countries to the vulnerable areas in Viet Nam. They also recommended to arrange publications on sustainable CBDM and organise public awareness on activities on CBDM.

It is important to mention that DDKFC, which is the main coordinating agency, expressed their commitment to incorporate CBDM in Viet Nam. They will lead and work on that in the future. This is a very good news for us working in Viet Nam.

The responsibilities of actors. It is through this process, we identified who can do what. What are the responsibilities of different stakeholders. At the national level, provincial level, and NDMP partnership, all these agencies can play a strong role in institutionalising CBDM in Viet Nam. They are doing this at the different level in their own way, but not in a very coordinated manner. And not following a very standard practice. We identified some responsibilities of the international organisations who are active in Viet Nam, such as FAO, UNICEF, WHO, UNDP and INGOs. These are all specific responsibilities, in fact, identified by themselves and communities. The mass organisations are very important in Viet Na for dissemination of guidelines and tools. One of the

main feedback I received from the women union, youth union, and farmers unions was that we should include academic institutions in disseminating and institutionalising CBDM practice in Viet Nam. It should be a part of the academic process and curriculum so that students can learn from the beginning what is disasters there and how they can be mitigated and what are the process.

Recommendations. Set up a coordination unit for CBDM. It was agreed that NDMP is the coordination unit in Viet Nam. Ensure government policy and budgetary support. District and provincial government should prepare an annual plan for CBDM activities. Implement pilot projects. Develop more cases on Viet Nam context. Incorporate CBDM into national strategy for disaster mitigation. Add more tools for local authorities and other agencies which are not directly working in disaster management, but can contribute, for example, agriculture department and aquaculture department who are not directly involved, but can have a significant role to play. They also mentioned that they should all be involved in the process of CBDM. Involve private sectors and professional associations and mass organisations. Guide a new coping mechanism to face new realities, for example, climate change, industrialisation, environmental degradation etc. CBDM practice should be part of the regular academic programmes. Ensure financial support by donors, implementing agencies for successful CBDM. CBDM guidelines should consider risk management approach not limited to the disaster management. An outline of a method of monitoring and evaluation of successful CBDM projects. Incorporation of the gender strategy is critical. As for time frame in Viet Nam, different stakeholders mentioned that 2-5years and some say that more than 5 years to institutionalise CBDM.

The challenges of CBDM. Identifying significant positive impacts of CBDM is one of the major challenges. Producing an active action plan for a uniform application, slow process of policy discussions, budgetary allocations, difficulty in mobilizing donor support, developing participatory roles for mass organisations, and making sure that existing staff is mobilised at all levels.

These are some of the pictures of the Viet Nam floods in different time frame. And this is the picture of an agriculture land during normal times, in the flood season. You see that the same area is flooded.

Thank you very much.



## Q&A

**Question :** I would like to ask the two presenters from Mongolia and Viet Nam. In the future, I want to be a kindergarten teacher. It is important to protect kindergarteners from risks. Do you have disaster education for kindergarten children?

**Ms. Borkhuu:** In Mongolia, we do not have such education.

**Mr. Khan:** In Viet Nam, there are not regular programs for kindergarten children. But various NGOs and organisations have conducted some programs about disaster management such as the evacuation drills and raising public awareness, but there are not any programs at the national level. Each government agency has conducted such a program with each local government. Local agencies of the disaster management have carried out most of programs of disaster management for children.


**Question:** I think that the environmental conservation is important for disaster management. Do local residents have programs of disaster management from environmental view points? Are you addressing environmental issues from the viewpoints of disaster management?

**Mr. Khan:** At first, planning for disasters is important for local communities. It is necessary to prepare what we should do in the time of disasters. Therefore, planning for the disaster management is necessary. In addition, it is important for local governments to join in planning. There is a close relationship between environmental issues and disasters. In Viet Nam, there is little relationship between the institutionalisation for the disaster management and environmental issues, and each organisation and government agency deals with each issue separately. We have just started to integrate each program regarding environmental issues and disaster management, but government agencies have not been interested in environmental issues, yet.

**Question:** I think that education for disaster management is important. Students practice the evacuation drills at schools in Japan. What are students doing for disaster management in Mongolia and Viet Nam?

**Ms. Borkhuu:** In Mongolia, disaster management is a new issue. We have just established a new organization of the disaster management. Therefore, there is not a systematic program of disaster management yet. We have just started the evacuation drills and educational activities for students.

**Mr. Khan:** In Viet Nam, issues of the disaster management have not been linked to academic and educational programs yet. When disaster occurs, some kinds of projects with regard to assistance for reconstruction will be conducted. However, they are temporary projects and can not be sustained. Each project has not been institutionalized. A big point is that some kinds of organizations are conducting them in partnership with others. We try to integrate programs of disaster



management into educational programs, but they have not been coordinated wholly.

**Comment:** We started a special program on our education at high schools in India. We try to put it into our curriculum. In addition, in the context of community, the Indian government and state governments consider a whole system. We get financial resources in Banjya and start a project. Disaster management is combined into the project to empower communities. Some projects have been conducted already. India is a big country and has various villages. The budget of NGOs is limited, and projects are often small. Therefore, I think that it is important for residents to have the power against earthquakes and create such projects by themselves. I introduced a few case studies in India.

**Question:** I am conducting a project of the community based disaster management in Central and South America. Our project is going to finish in July. A big issue for us is how to sustain this project after July. I join in this symposium to learn lessons to sustain projects of the community based disaster management. I would like to ask Mr. Sohel Khan. You wrote that the financial support from donors is one of big challenges in your paper. I understand that it is possible to solve such a problem and sustain CBDM by the application of CBDM, but do you mean that the financial support from donors is money for sustainability and it is difficult to get the financial support, when we start new projects of CBDM?

**Mr. Khan:** What I told is that not only financial support from donors but also support from governments is important for sustainability. In order to implement CBDM process, local governments and communities have to conduct it by themselves. Of course, civilian power is very important. The more communities act, the less dependencies on donors become. Moreover, we can avoid duplication of resources. If they keep getting financial support forever, they depend on donors more and the project is going to opposite direction for sustainability.

**Mr. Yamaguchi:** I would like to thank, Maiko High School students, Bolormaa and Sohel. As they talked, the community based disaster management is very effective to reduce damages from disaster, and many people should join in community activities to implement the community based disaster management. Thank you very much.

## 1.3 Panel Discussion

**Moderator:**

I. Davis (Cranfield Univ.) U.K.

**Rapporteur:**

I. Pearce (City of Seattle) USA

**Panellist:**

Z. Delica (CDP) Philippines

M. Kobayashi (Kyoto Univ.) Japan

M. Lubino-Bissante (MSDC) Guadeloupe

J. Mahmood (ADRRN) Malaysia



## Panel Discussion

At this Panel Discussion, expert members in disaster management gathered to share insights and their own experiences about the essence of CBDM, in their own terms. The members of the Panel Discussion were those who served as a medical doctor, professor, scientist, and activist; all of them who have lead progressive lifestyle in disaster management and much more dynamic in terms of their work. The panel discussion started with an introductory note from renowned professor Ian Davis, who had been actively involved in the field of disaster management for more than 20 years. Dr. Davis moderated the panel discussion while Ms. Ines Pearce from Seattle Project Impact rapported the discussion.



**Ian Davis**

- Professor,

**Cranfield University,  
the United Kingdom**

### **INTRODUCTION: Ian Davis**

Brief introduction was made by Dr. Davis to set the context for the panel discussion, where by he focused on the title of the symposium, "Building Safer Communities against Disasters: From Kobe to the World and World to Kobe." Decomposing the keywords in this title, Dr. Davis built the context of which the panellists can focus on and for the audience to think about, in terms of how to build safer communities for the future. Below is a brief excerpts of Dr. Davis' introduction broken down by his sub-themes based on the title of the International Symposium:

#### ***Building***

Let me just say a word about building. I am an architect in my background, so I can say that building is very much in my blood. What is important about building is that it is both a process and a product. I think, if there is a comment to be made about CBDM planning, it sometimes lack planning and process and very often adequate monitoring as it is taking place.

#### ***Safer***

At this conference, a decision was made to stall early warning system. But it won't do any good useless it is done at the community level. Community would have to issue warning. It is no good to have a technological fix with clever satellite because it can break down. We really have to work on safety.

#### ***Communities***

Like Piccadilly in London, it's very hard to get communities where people are moving in and out. It's like a transitory train station, and it's very hard to get a community involved in a large city. So we have got to think through with organisations like UNCRD and ask "how do you work with communities where there is no real community?"

#### ***Kobe to the World and World to Kobe***

How do you get people experienced from one situation to come to the other situation to work on it? I think this is a problem for the government, where it is their responsibility to make sure that one expertise and knowledge is transferred freely in this direction.

Dr. Davis teaches at Cranfield University and is active as a university lecturer, researcher, architect, planner, writer, specialist in building and physical planning in Hazard-Prone Areas. He also is an expert in emergency shelter, reconstruction planning, refugee settlements, disaster management and risk reduction and the development of training in these fields. He co-authored 'At Risk: Natural Hazards, People's Vulnerability and Disasters' (1994), (with Piers M. Blaikie, Terry Cannon, Ben Wisner, and Piers Blaikie) In 1996 he became the only UK citizen to be awarded United Nations Sasakawa Award for his contribution to International Disaster Prevention.



## Zen Delica

Good morning to everybody. I will be sharing brief experience about CDP. This centre is a very small NGO, located in the Philippines with a big dream. CDP recently implemented CBDM in a province, which is beset multiple risks. We did a programme with a civil society, meaning the oldest stakeholders, the government, some experts and consultants. And also we did this through the support of the Japanese Government and JICA. This approach that we did in this island, Kamigin Island, is about facilitating sustainable institutional mechanism, meaning, to institutionalise the bottom-up approach, and making them aware about the risks are present at the village level. We had training, awareness raising, preparedness planning, early warning system, and evacuation drills, and then replicating these activities in other villages. This is done at the community level. But the community cannot sustain these activities by themselves alone, it has to be institutionalise and the government needs to be aware at the provincial and municipal level. And they need to allocate resources to sustain these activities. So this is the two-prong approach that we are trying to implement that from the community to the community. And then building the capacity of the government, from the village level to the provincial level. The capacity of the provincial level is also creating awareness of the risks in their area, therefore advocating for support in terms of policies, resources, and in terms of linking with communities. So, there has to be a mechanism where the governments are aware of the risks in this area. And so this is the system that we try to promote so that this will not be undertaken only in one province, or one municipal but will be replicated in other provinces. So can you imagine, if all the communities are aware of the risks and are aware through governmental process, there will be a safer world.

## Masami Kobayashi

As my mission is to disseminate CBDM to the Japanese people. From India doc. Arya has said that what you are saying may be understood to the university people but the normal people may not understand you at all. So my purpose is to speak in a way that normal people would understand. What I would like to do is to restore the forest culture in Japan and wooden buildings in Japan, which has a long tradition. In disasters, vulnerability is caused by social structure. It's not about the personal vulnerability, vulnerability against earthquakes is because you live in a house not resistant to earthquake. You might be suited to live in a wooden housing, but if the government bans such a housing, then affordable wood frame houses would not be accepted. The timbers are earthquake resistant itself and it's about how to use them to reduce the disaster impact. What I am trying to do is to conduct research to make improved wooden framed houses affordable and usable to the society.

This shows how we can retrofit the traditional wooden frame housing. In Japan you would see very much a housing like this. In this structure, we insert dampers in this wooden structure framework, with chemical component inserted. This insert would support the wooden structure



**Zen Delica**  
- President,  
Center for Disaster  
Preparedness (CDP),  
Philippines

Ms. Delica has extensive experience in management and training, especially in CBDM. She has been the Executive Director of a national agency, Citizen's Disaster Response Center for 10 years. She has also worked with the Asian Disaster Preparedness Center for 4 years (1999-2003). Currently she provides consultancy services to various agencies through CDP. She holds a M.A. in Public Health from Adventist University of the Philippines, in Development Practice from Oxford Brookes University and in International Humanitarian Law from Oxford University.

in case of disasters. This is quite easy to install but would require consultation with the contractors. First, this concept was not accepted widely through negotiation it has become more popular.

What we are proposing is a kind of monotype, a very simple structure than the traditional structure. It is more affordable and stronger structure, just like stacking blocks. The monococ can serve as a basic building units using wood, and wood is quite resilient if used in a monococ mode. But it has been difficult for it to be approved by the government, because of the lack of precedent. There has been no category for it. So, we need supporters who would testify its usability. And we asked through Kyoto University and working on trying to get it into the market. The Kyoto University actually gave us a grant of 12 million yen, so that we can construct a life size housing using this system. The role for the academic is to make this technique understandable to the society. We also need to institutionalise this kind of movement, so that it can survive in the market.

It is important that we make such kind of information available. And we cannot do everything alone, but we need to share our experiences. The target may be elderly for this house use. And if we can use this as one example, to take off this project, then this system would be a success that could be used at the community level.



**Masami Kobayashi**  
- Professor,  
Kyoto University,  
Japan

Dr. Kobayashi is a professor of School of Global Environmental Studies in Kyoto University, member of Osaka Town Planning Association, and member of Osaka Disaster Mitigation Association. He has published numerous journals and books on town planning and environmental design. Mr. Kobayashi has previously served as the coordinator of UNCRD Disaster Management Hyogo Office.

### **Myrian Lubino**

Konnichiwa. Coming from Guadeloupe, a very small island in the Caribbean. I am an earth scientist and my aim is to promote disaster management with government and community, at each level of society. To not only work with vulnerable society but in all society. Guadeloupe is within French government. And we are French. So, we can have some help from France in case of emergency, but we are 800km away from France. So we have to be able to help ourselves from disaster. And we have so much disasters, volcanoes, typhoon, and flood. So I would like to present with you what I am doing now.

We just had an earthquake in December. You can see that our buildings are not very safe. I am analysing the effects of this earthquake and making comparing between Japan and Guadeloupe as well as the volcanic action that could cause tsunami.

I want to show you our disaster risk management in child care centre in Guadeloupe. It is important to train children and teachers. In this photo you can see the small children



they are 3 years old, and we are trying to make them evacuate using special song used in emergency. This third photo is of the logo for Junior Chamber of Commerce. This is an association linked with government and population. And with this kind of association, we have made travelling exhibitions. And we show historical earthquakes through such kind of exhibitions trying to remind people about the past historical earthquakes. The second part of this programme concerns the scientific problem of the Caribbean, and there is another part that explains how disaster help is organised.

This is another cartoon made by my students. And this shows that we can work with young people. They are the best for the moment, I feel that they are best link and way to touch everybody. I agree when we say that we must discuss with our neighbours. In case of emergencies, our parents and children will be very far so we must be able to work with neighbours, and this kind of communication strategy is very important in reducing disaster risks.

### **Jemilah Mahmood**

I purposely put out the 3 logos. I am a president of Mercy Malaysia, very much a response organisation into the health network. The next is ADRRN was recently organised to bring NGOS and stakeholders in responding together.

What I would like to do today is to share with you my experiences to share why it is important to institutionalise CBDM. We have been affected by the tsunami in one way or the other. It is the topic of every discussion but I would like to tell you that there are disasters everywhere. 10 days before this tsunami, we were in the Philippines affected by tropical storm. Although the loss is not as great as the tsunami, it was still very devastating for the people there.

We try to always focus on women and children. We find that it is actually very important to institute all programmes with children in mind, basically the psychological intervention when the community has healed. You can't force with communities on prevention when they are still traumatized. Then only can you start talking about making communities more resilient.

Bridging cultural differences. I would for you to focus on this photo, where it may not mean much to you, but these are all surgeons and doctors, psychologist. They are all wearing Christmas hats because this was on Christmas day. Now one doctor with torch light. Now he is a Muslim and doesn't know Christmas carols but he has strenuously taken the effort to learn them. So that he can join the group doing the Christmas carols. So what we try to do is to make people feel that humanity is universal, it doesn't have face, religion, and culture. And this kind of effort is important especially now in a kind of place like Aceh. Because prior to this disaster, Aceh had a closed system and much religious system. And we have to remind ourselves of the cultural context. It wouldn't



**Myriam Lubino-Bissainte**

**- General Director,  
M.I.R.A.I. Sustainable  
Development  
Consultancy,  
Guadeloupe**

Dr. Lubino-Bissainte is originally from France. She founded MIRAI Sustainable Development Consultancy which is former BISMAMPRIINTVEC which had worked on disaster management and mitigation between 1997 and 2001 in Guadeloupe and the Caribbean area. She holds Ph.D in Earth Sciences from University of Pierre and Marie Curie of Paris VI (UPMC VI).

be complete if I didn't show you the tsunami.

To see it on tv and live, having had horrible experiences in Iraq, I think I have not recovered from tsunami. This is what you see as far as the physical structure is concerned. What we want to do now is that, we have to realise that this is the community in severe shock. You will see a community in shock, people still wondering with very little expression on their faces. Unlike other disaster hit places, usually we have been very good at getting the children to laugh, but this has been extremely difficult to do right now in Aceh. In the Chinese language, the written word "crisis" has two meanings: one is danger and the other is opportunity. And in that way, tsunami offers us an opportunity to think about implementing CBDM from scratch because literally this is what is happening in Aceh. What we are proposing is a pilot project that we want to share with government and people and local civil society, in that when we do a pilot project, we should think about not only shelters but also community centre and mosques, which is extremely important in their culture. A school which will give opportunities for orphans to be educated and to be based with communities and families because it is not the norm for children to be put in orphanage in some places in Asia. In our health centre, we are going to implement psychological intervention programme not only in the health sector but also the educational sector, and then bring in the emergency preparedness and emergency medical system. With this we hope to be working with rescue 118 and universities.

Skills training, I was just saying how whenever there is a disaster it is always the women and children who die. We saw that in Aceh at least, there were many women who didn't survive. This is due to the lack of ability to swim, to climb the coconut tree fast enough. Again, we have to address all these issues, by taking into account the cultural nuances, the cultural aspects as we can't expect women to open swim in a culture that they don't. And finally, out of the 300 medical personnel 150 are confirmed dead. And only 17 reported for work, so this is a community severely traumatised without hardly any resources left. There is just no one to do the scrubbing and cleaning of the medical unit.

And this is the stark reality. I am sorry if this upsets you but this is the reality.

I am very nervous that everyone wants to do something for the tsunami, but hope that people will be sensitive about the cultural, religious, and other historical aspects before they jump the wagon. And I hope that after such consideration they would work with the local community and make use of the local resources before they start to make any actions.



**Jamilah Mahmood**  
- Chairperson,  
Asian Disaster  
Reduction and  
Response Network  
(ADRRN), Malaysia

Dr. Mahmood is currently the chairperson of both ADRRN and National Federation of Non Governmental Organizations for Disaster Management in Malaysia. She founded the Malaysian Medical Relief Society (MERCY Malaysia) in 1999 and has held the position of President since then. She has been practicing medicine since 1986 and holds a Master in Obstetrics and Gynaecology as well as Fellowship of the Royal College of Obstetricians and Gynaecologists, United Kingdom.

1.4 Session II.

Safety of Non-Engineered Construction



## Opening speech of PM session

*Kenji Okazaki, Coordinator, UNCRD*

Good afternoon. This morning, we talked about "Community-Based Disaster Management" to promote preparedness against disasters at the local level. In this afternoon's session, we will discuss the importance of building safer houses against earthquake disasters. At the end of this session, we would like to conduct a Shake Table demonstration.

To begin, this map shows distribution of epicentres around the world. You can see that Sumatra has experienced many earthquakes in the past. Many buildings around the world are made of bricks, sun-dried bricks known as adobe, and various stone masonries. They are easy to be manufactured, but very fragile during earthquakes. Therefore when an earthquake occurs, many valuable lives have been lost due to the weakness of houses against earthquakes.

Japan has a very strict building code. Before the Hanshin-Awaji Earthquake, it was said that Japanese buildings were safe against earthquakes. However, as Governor Ido pointed out this morning, over 6,000 people were killed mostly because of the collapsed houses right after the earthquake. The rescue teams arrived at the communities after they were dead. It is said that earthquakes do not kill people, but buildings do. That is why, in order to minimize the fatalities from disasters, we should make houses safer since we cannot predict when a big earthquake will take place.

Let me give you some examples from Japan. Right after the Hanshin-Awaji Earthquake, the Seismic Building Retrofitting Act, unique in the world, was introduced. This is expected to promote retrofitting of existing vulnerable buildings. At the same time, the Housing Quality Assurance Act was established in order to assure that housing quality includes the structural strength to withstand earthquakes. Furthermore, various seismic retrofitting guidelines have been developed according to the structural types of each building. A simplified computer programme was also developed so that even children could work on to check and analyse the seismic vulnerability of their house. In spite of these efforts against earthquakes in Japan and other countries, there are still a huge numbers of existing houses vulnerable to earthquakes. In promoting the retrofitting of houses, we have to work at the community level to convince people about the necessity of retrofitting their houses since these houses are not government-owned. That is why UNCRD has been promoting "Community-Based Disaster Management" by involving communities and residents.

I would now like to explain some projects of UNCRD. In India, a major earthquake happened in Gujarat State in 2001. In the period of recovery, the safety and security of the newly-constructed housing had to be considered otherwise the same damage would re-occur in another earthquake. We have conducted training and the Shake Table demonstration with 1/2 size of houses made of stone, adobe, and bricks enabling engineers and masons at the reconstruction site to transfer technology for seismic-resistant buildings. We have used various materials in order to convince people in the communities that retrofitting is neither difficult nor costly, but very effective. After these experiments, the idea of seismic resistance was accepted. People truly understood the concept



**Kenji Okazaki**  
- Coordinator,  
UNCRD Disaster  
Management Planning  
Hyogo Office, Japan

Dr. Okazaki has extensive experience serving in both national/local government and international organizations ranging from Ministry of Land, Infrastructure, and Transport and Fukuoka/Hyogo Prefectural Governments to United Nations Economic and Social Commission for Asia and the Pacific (UN/ESCAP). He also worked for the IDNDR Secretariat, Geneva, from 1996 to 1999 as the manager of RADIUS project for urban seismic management. He holds Ph.D from Kyoto University. He received the 1999 Japanese Earthquake Disaster Prevention Association Award.

of the experiments when they actually watched the Shake Table demonstration.

This Shake Table demonstration was started by NSET in Nepal as a very effective tool in promoting house retrofitting. We conducted another demonstration in Afghanistan as a part of the disaster management training. For adapting to the Afghanistan local situation, we produced a manual guidelines, published in Persian and English, to explain the simple but safer building techniques for different structures of buildings with help from Prof. Arya from India. Last November, UNCRD also conducted the Shake Table demonstration at the housing exhibition hall in Bam, Iran, where a strong earthquake took place in December 2003.

UNCRD conducted the demonstration with houses made of concrete blocks and bricks on 18th January at this WCDR. We will also show you the demonstration of houses made of bricks at the end of this symposium. And on 21st, with cooperation of the BRI, we will also conduct another round of the Shake Table demonstration with masonry and wooden houses. If you are interested, please visit our demonstration on 21st, January.

Finally, I would like to introduce the school project. It aims to enhance the capacity of communities for disaster risk management through retrofitting of school buildings. Local people will be involved in the process of retrofitting in order to incorporate the cultural and traditional risk management. This is an effective way to involve people. The pilot projects will be conducted in Uzbekistan, India, Indonesia, and Fiji. Thank you.



# Lessons for safer houses from Hanshin-Awaji Earthquake

*Yoshiteru Murosaki, President, NRIFD*



**Yoshiteru Murosaki**  
- President,  
National Research  
Institute of Fire and  
Disaster (NRIFD), Japan

Dr. Murosaki is the president of NRIFD, attempting to make use of the expertise and technology of NRIFD in the community and contribute to prevent and mitigate disasters. He graduated from Kyoto University and had taught at Kobe University. He is also an honorary professor of Kobe University and vice representative of Japanese NGO, Citizens towards Overseas Disaster Emergency(CODE).

I would like to start by recalling the issues that we learned from the Hanshin-Awaji Earthquake of 1995. Though Japanese audiences are familiar with this earthquake, I am reviewing it for the international audience. Approximately 6,400 people were killed due to the earthquake. Talking about the cause of the death, it is worth mentioning that 3500 people died within one hour of the earthquake. Most of the victims were crushed by the collapse of traditional wooden houses. People could not breathe after collapse of roof, wall and heavy objects. Cause of death of another 500 people, which is shocking to report here, is lack of evacuation of trapped people inside the house. They were trapped inside the house and neighbours and rescuers could not evacuate them in time and fire which spread immediately after the earthquake reached those houses and killed them. We have many heartbreak stories from victim's families about the incidents. One important aspect of the incident is that if the houses had not collapsed, they could have been evacuated before fires started and they would not have been killed. So, even if the cause of death of these 500 people is fire, the primary cause was the collapsed houses. It means there is lot to do with safety of the houses.

Another 1500 people died because of the delay in receiving rescue measures and immediate medical services. This could be attributed to insufficient emergency medical services, however, there is a point related to safety of buildings again. Traditional Japanese houses were ductile enough to give people time to evacuate and also they had space for inhabitants to be safe, even in houses which would have been damaged in earthquakes. However, in the case of Hanshin-Awaji earthquake, most of the houses suffered from pan-cake collapse. Then the huge burdens of the debris were on the legs and the part of the body for some hours before medical teams arrived. But many people had been already killed by the time the medical services came because of so called "Crush syndrome". So, this case is again related to the safety of the houses.

Another 900 people had successfully evacuated and survived the first shock of the earthquake. They reached the shelters. However, they suffered from cardiac problems or caught colds and felt the distress induced by the shock and ultimately died in the shelters. The school buildings, which were shelters, were cold and crowded. The problem was that there was a large number of people coming to the shelters. Elementary schools are not big enough to meet the number of evacuated people after earthquake and those who came later, particularly elderly people, did not have sufficient room and stayed in colder corridors and finally died of cold. Thus, it is again the vulnerable houses that contributed to these deaths. If their buildings were safe enough, people would not have needed to come to shelters and face the risk of disease.

With these points, it's clear that the reason behind the casualties was solely the vulnerability of the houses. The question arises: "why were those houses unsafe?" One obvious reason is that the magnitude of the earthquake was very big. But in addition, it is also attributed to the lack of seismic resistant capacity of the buildings. There are three main aspects in regards to weak buildings,



Firstly, about 90% of the buildings which collapsed in the earthquake were built before the new building codes were enacted in 1981. The provisions of the older building codes were not sufficient to meet the requirements against big earthquakes. However, the Japanese government cannot force citizens to upgrade their buildings according to the new codes. It is a voluntary option for the residents either to retrofit or do nothing. One important aspect associated with this is that the building codes did not anticipate such a big earthquake.

Secondly, the safety of building is much more related to the construction work than to what is written or drawn on paper as a design. The carpenters who built those wooden houses had never experienced such a large earthquake and they did not consider it. Once they got approval on the building from the authority, they do not care much regarding changes such as replacing some walls for parking space and for other proposes which result in houses very weak against earthquakes.

Thirdly, another important aspect is lack of appropriate maintenance of houses. In Japan, because of high humidity, foundations will usually be rotten and also there would be termite attacks on the wooden superstructure. Earlier, Japanese had the practice of very good maintenance of houses, overhauling them once a year or so, but after the economic expansion, house owners tended to sell their old houses to buy new ones instead of keeping the old one in good conditions. This was another cause of the heavy damage of houses in Kobe.

In order to minimize the damage, including building damage, there are five major areas upon which we need to focus: 1) Attitude towards to disaster mitigation should be guided towards the respect for human lives, building safe buildings that will not kill people; 2) Wisdom to help us protect our houses; 3) Technology which makes the houses safer; 4) Financial resources and material resources for retrofitting; and 5) Networking between citizens and experts as well as international networking.

In conclusion, we need to have an attitude to respect the life of humankind which leads to technological development and better knowledge that needs to be disseminated through the communities and shared widely through education and networking.



# Risk Mitigation for Non-engineered Construction

*Amod Dixit, General Secretary, NSET-Nepal*

Today, we are talking about nonengineered construction which has many problems in facing earthquake risks. To start the discussion from the definition, I would say there is a problem in the definition itself. The IAEE manual on seismic construction of nonengineered construction defines it as "Buildings which are spontaneously and informally constructed in traditional manner, without any or little intervention by qualified architects and engineers in their design." There is another approach which defines it as buildings with nonengineered material like thatch roofs which are not under the common scope of engineering. Sometimes, there is generic definition like "Buildings of developing countries." However, they cover large part of building typology in countries like India where buildings are categorized into four major types and most of them are nonengineered.

There is another version of defining or rather classifying nonengineered buildings as "Rural Non-engineered" and "Urban Non-engineered." Rural nonengineered are constructed by owners themselves with locally available material and building permit is not needed whereas urban nonengineered are usually made by petty contractors with materials brought from somewhere else and an official permit is required. However, there is little or no engineering intervention in both types. In conclusion, what we agree regarding the definition is that nonengineered construction has attributes of lack of engineering intervention, mostly rural, with traditional material, owner-built and mason-advised, informal and without detailed engineering analysis for design. There is a need to define it uniquely so that there will be a common understanding to solve the problems with this type of building.

Whatever definition we take, there is a vast prevalence of this type of nonengineered construction in seismically active regions. As they include informally constructed RC building which is a major trend in growing urban cities in developing countries, their safety is of the utmost importance. I would like to draw your attention to the case of India and Nepal where 90% of the building stock is non-engineered. The most important aspect here is that the trend of building construction is largely towards informal RC construction.

## Rural vs. Urban Non-engineered

	Construction	Building Permit	Building materials	Owner
Rural Non-engineered	Usually by owner (by local masons)	Not needed	Locally available, locally produced	Very much involved
Urban Non-engineered	Made by contractor (by masons)	Officially needed	Brought from somewhere else	Not involved



**Amod Dixit**  
- General Secretary,  
National Society for  
Earthquake  
Technology  
(NSET), Nepal

Mr. Dixit is a renowned geologist and chief of NSET. He has been closely studying the affects of earthquakes mainly in the Himalayas such as India and Nepal. Mr. Dixit holds over 10 years of experience working on earthquake mitigation projects.

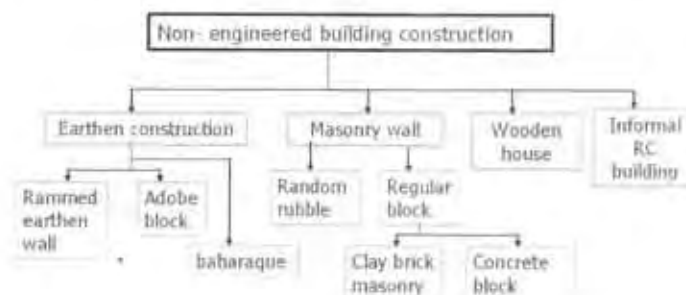
The inherent characteristics of these buildings pose problems from the aspect of safety during earthquakes. Moreover, the problems have not been well looked at, comprehensively. There are so many problems from engineering aspects like inherent weakness in material which leads to total collapse of buildings after heavy stress concentration resulting from lack of redundancy in configuration. In most cases, there will be no lateral load resisting system prevailing in the structure, poor quality of construction, lack of structural and member integrity. However, there will be the obvious question: “does the solution come only from engineering aspects?” The answer is “No.” It needs a comprehensive view from engineering aspects and at the same time social, economic, cultural and most of all, from the political aspects. The questions need to be addressed in this regard are:

- If we assume that technical knowledge and solution (Pre-engineering, retrofiting) exist and are available, why are they not implemented? Are there other aspects like cost, complications, social perception of risk, social standard and values?
- To what extent is non-engineered construction due to economic, cultural, or social factors?
- Who should be involved in delivering the solution?
- Should new non-engineered construction be banned in urban areas, if yes, by when?
- How to increase demand for the formal treatment of the subject by engineering?
- Should there be separate approaches for non-engineered buildings in urban and rural areas?
- To what extent are traditional methods and indigenous knowledge and wisdom useful?
- How to integrate the problem of non-engineering construction to that of a comprehensive earthquake risk management process?
- How to integrate disaster risk reduction with the broader social goals?
- What is the role of community organizations? What should be the approaches for awareness and education?

As there is consensus that nonengineered construction is vulnerable to earthquakes and mostly lethal, and such construction is still underway in developing countries, so that there is a need to treat

## Owner Built non-engineered Buildings

Buildings constructed informally in traditional manner without intervention of qualified engineer in their design



it with a visible structured approach.

Having said that there are problems in nonengineered construction, there is also a positive aspect to note. There are some good traditions and indigenous knowledge which need to be documented and synthesized. Discussion is underway to collect and compile the practices throughout the Himalayas where there are some monuments and other buildings withstanding earthquakes for more than 400 years. NSET- Nepal and SEEDS India are planning to document all the practices of this region from historical times and analyze what went well and what went wrong. Also there are some success stories at the present time. There are good examples of new construction with pre-engineering concepts, and some good examples of retrofitting initiatives. This work needs to be verified and backed up by scientific tests and theories. There are now several centres of excellence of earthquake engineering with knowledge of ground realities. There are many respected thinkers who want to make changes and I am pleased to see them here.

There are good case studies which have already been discussed at this symposium. An exciting example is mason training. A rough calculation shows that one skilled trained mason is equivalent to 10 good buildings per year in our case where there is rapid urbanization. Like a child that replicates knowledge to parents and neighbourhood, masons are disseminating the technology and replicating good practices in their areas of work. In India and Banepa Nepal, trained masons have united to form an association and they declared themselves that any member who will not abide by the fundamental rules of seismic construction in their work is not allowed to remain in the association. In Banepa, these masons were registered to the municipal office. City office has put the rules in effect that require all residential constructions to involve only those registered masons.

#### STAKEHOLDER RELATIONSHIP (rural; or urban Informal, non-engineered) in Building Construction





There is a lot of evidence of good practices concerning historical buildings. They have existed for many centuries ago, and have withstood a series of earthquakes. There are many good elements in favour of earthquake resistant systems in these buildings. As shown in the picture, they form symmetrical configurations, symmetrically located small openings, wooden belts and ties between roof and wall system. Even some new constructions which follow the traditional practice include earthquake resistant elements like vertical wooden posts, well connected band, which simply reveal that our forefathers were well aware of the problems and have knowledge how to live with nature.

We had an opportunity to test the performance of the historical buildings and that of new RC construction during the JICA project in Kathmandu. The results reveal the interesting fact that some of the historical buildings constructed with brick and timber are far better in response to tremor compared to newly constructed informal RC buildings. Though it needs confirmation with more sophisticated testing, a preliminary assessment shows that there were good practices which need to be continued rather than jumping to new material and new methods of construction without consideration for seismic safety.

There must be a sustainable solution to this problem and I repeat that there is no institution to think over it globally. I propose setting up an international commission for nonengineered buildings which looks at the problem systematically and comes up with a strategy and actions within a time frame. As we have discussed, the major portion of the building stock in the world comprises nonengineered construction, and therefore there must be a serious efforts towards achieving desired safety to these buildings in order to reduce the risk of lives from coming earthquakes.



# Indian Experience of Safer Reconstruction after Gujarat Earthquake

V. Thiruppugazh, Joint CEO, GSDMA

On 26 January 2001, Gujarat suffered from a big earthquake which resulted in 13,085 deaths and 167,000 people injured. It is estimated that over 10 million people were affected. In total, there was losses of about one billion US dollars (direct and indirect) from the earthquake. I think the scenario of the Gujarat earthquake is well known to all of you from newspapers, radio and television. However, the media has not covered the situation and developments after disaster very thoroughly, which I am going to discuss today. Media usually is more concerned about disasters themselves which make sensational news for them but all the efforts made afterwards may not be interesting enough for them as there is a saying "good news is not news." Today I will discuss how this disaster changed the scenario of the reconstruction in India after Gujarat earthquake.

On the onset, we were clear that reconstruction process is not a recreation of assets lost, it is not just a construction of physical infrastructure replacing the damaged one with same mistakes and flaws that create vulnerabilities in next disaster. The whole approach was to promote sustainable disaster risk management capacity in Gujarat so that the state would be free from disasters in future. Some of the expected outcomes of the project were sustainable rehabilitation and reconstruction, reduced vulnerability and subsequent saving of lives and property in future disasters, multi hazard-resistant houses and infrastructure, increased community risk awareness and preparedness for natural hazards through access to enhanced knowledge of hazards and disaster reduction techniques and enhanced emergency preparedness and response capacity of responsible units (such as fire & rescue brigades). We came out with a comprehensive policy with an approach that capacity building preceded everything else including housing reconstruction. We needed to train large number of masons and engineers, needed to develop guidelines and set up techno-legal framework.

There were in total 28 packages from government including housing. The government provided grants to home owners to rebuild their houses. In Japan, it is not appropriate but our case is different that people are so poor that if the government does not provide any grants, they will be



V. Thiruppugazh

- Joint CEO,

GSDMA (Gujarat States  
Disaster Management  
Authority), India

Mr. Thiruppugazh has been working to enhance the capacity of Gujarat in mitigating the damaging effects of the recent earthquake in the region. Mr. Thiruppugazh has been cooperating with the international community to not only redevelop and prepare the region for the next possible disaster but also promote this awareness to communities worldwide. He is currently responsible for managing activities related to long-term capacity building, community participation, empowerment, education and infrastructure development.



helpless. They can't get it from banking sector which requires sufficient deposit.

So far, we achieved 98% of total 928 thousands houses to be repaired and 89% of total 215 houses to be reconstructed. Among them 41,902 houses were reconstructed by NGOs in the public-private partnership program. There has been a lot of achievement on reconstruction and repair of public infrastructure like public building, bridges, dams, pipe line system etc. A total 454 schools were reconstructed and 16 schools were retrofitted with the help of villagers. We formed village committees comprising village head, headmaster and masons and handover the funds to that committee for retrofit and reconstruction. This approach gives not only schools to them but also education and more importantly a sense of ownership of the program and technology. Similarly, 434 health facilities were reconstructed and 1976 anganwadis have been repaired so far.

What is more important here is not the number but the approach how we did it. Consideration was that all new construction should be multi-hazard resistant, as far as repair is concerned, and should be through upgradation and retrofitting. The approach taken is to provide finance to the owners and enable them to construct the house, monitor their work, and impart education, which would take as long as 2-3 years time. It will result in capacity-building of individuals and masons and technology transfer to the communities. It will educate people how to achieve earthquake resistance in their houses. We provided materials, technical and financial resources.

Another approach taken was public-private partnership. About 80 NGOs joined hands with the government to share the cost of reconstruction of individual houses. What resulted from the approach was a sense of involvement of community people to the programme, and sense of ownership to the entire process which led to a 100% occupancy in the reconstructed houses. We know from experience of reconstruction in other parts that it is very hard to achieve. And flexibility of expansion based on needs is there to accommodate their needs in future. Most importantly, it

## RECONSTRUCTION & REHABILITATION

*The reconstruction program has been designed to address the needs of beneficiaries comprehensively...*



provided a means of knowledge transfer resulting in long-term disaster management capacity-building at community level. Communities are involved right from the beginning of the reconstruction process. The reconstruction was done in a decentralized approach where district collectors were given authority to implement the programme in their districts. All the newly constructed houses were registered jointly with husband and wife's name to ensure the right of woman in assets and housing insurance was made mandatory. To build the capacity of communities, we trained large number of masons and engineers and a massive awareness programme was carried out targeting various stakeholders.

For reconstruction, the government deployed 600 engineers for supervision of reconstruction and repair of houses. Continuous and ongoing training programmes were launched for engineers and masons, for which services were taken from qualified training institutes like IITs and NCCBM. For this purpose, a technical manual were developed for engineers for using locally available materials and locally acceptable construction styles. A total of 6,000 engineers and 29,000 masons were trained for multi hazard resistant construction. There was provision of third part audit for quality monitoring and supervision whereby it was made mandatory to have quality certification by government engineers in order to get 2nd and 3rd installment. There are a number of technical guidelines developed by GSDMA targeting various types of vernacular buildings including compressed stabilized earthen wall building, masonry buildings, cyclone resistant construction, etc. A large number of educational materials were produced targeting the common people. A detailed homeowner's guide was published and distributed widely and a public awareness campaign was carried out with audiovisual media. Half-scale shake table demonstrations were conducted in various parts of Gujarat to educate people, and to build the confidence of masons and engineers on recommended measures for earthquake-resistant techniques with the help of UNCRD.

## TOWN PLANNING SCHEMES

A sample illustration of Town Planning Schemes – old city of Bhuj



Before Town Planning Scheme

After Town Planning Scheme





Information dissemination among the people was carried out through 18,000 Gram sabhas in the state which held meetings twice a year to discuss disaster management issues of their own communities.

I would like to discuss briefly on the policy changes in Gujarat state and at the national level regarding disaster risk management. There is a change in concept of disaster management from reactionary approach to long-term disaster mitigation and preparedness at all levels of government and society. The Gujarat State Disaster Management Act has been enacted and a statutory authority focusing on disaster management, GSDMA, was established for the first time in India. There are a number of measures taken up in techno-legal regime such as licensing of engineers, certification of masons etc. Building code has been made mandatory. For better technological advancement and education, seismic engineering is now included in engineering colleges. A Risk / Vulnerability Atlas is being prepared which provides tools to link planning and disaster mitigation. A unique policy is being taken regarding undamaged public building that needs mandatory retrofitting of existing facilities.

The effect of this reconstruction process is not limited to Gujarat state but to the whole country. One major development is that disaster management affairs has been transferred to the Ministry of Home Affairs from the Agriculture Ministry for effective prevention, mitigation and response strategy and programming. The Government of India is now preparing to set up a National Disaster Management Authority on the same lines of strategy taken by Gujarat State Government establishing GSDMA. The government is preparing a national act and policy for disaster management.

The same approach and policy is being taken by other states for long-term mitigation and effective reconstruction. Tamil Nadu State and Andaman and Nicobar Islands expressed interest for adaptation of similar policy and procedures of damage assessment, packaging for housing assistant for Tsunami-affected communities.

In conclusion, Gujarat state focuses on community based approach where a sense of ownership, capacity-building and knowledge transfer is ensured to grass-roots level. It guaranties that communities react to the disaster with a sense of urgency but in a planned way where few structures will be damaged with limited number of casualty in future disaster.



# Seattle project Impact: Equipping communities for Home Retrofit and Mitigation

*Ines Pearce, Project Leader, City of Seattle*

None of us can stop earthquakes or other natural disasters from occurring. However, we are not without power as we do have the ability to minimize the effects these disasters have on lives and property. In my area, the way we have found to do this is through a community wide mitigation effort called Seattle Project Impact. Originally borne from a national U.S. initiative from the Federal Emergency Management Agency (FEMA), Project Impact was a focus of seed money, specifically geared toward mitigation, to try to break the disaster-repair-disaster cycle. In Seattle, we truly took the federal concepts a step further by building long-term, sustainable programmes that could be first institutionalized and then exported to other cities and counties.

Partnerships are the key to successful mitigation & preparedness efforts. Every level of the community must be represented. Seattle Project Impact is a public-private partnership consisting of local, state, national governments, small & large businesses, academicians, scientists, voluntary organizations, neighborhood groups, technical experts, educators, and many others. It is important to accept that while they are all bringing something to the mitigation effort, there is also something they are looking for in return.

There are three guiding principles that we adopted from our very beginning in 1998 and continue today. Firstly, programmes need to honour city/business/partner needs & timelines. In our case, we had the U.S. Congress observing our activities with the six other pilot communities, giving us deadlines that had to be met in reporting progress. Secondly, programmes must be of substantial benefit to the community. Programmes have to be able to make a difference. Our efforts were geared toward the minimization of impacts. Thirdly, projects must be designed to be easily exported to other jurisdictions. Disasters know no boundaries, so we incorporated the eventuality of expansion into our programmes.

Strong and viable concepts can survive changing administrations, so no matter who is in charge, mitigation efforts can continue to thrive. In the U.S., as portions of our elected officials change every two years, mitigation programmes cannot be too identified with an administration. This does not remove, however, the importance of government official's support. Mitigation is still good government. Mitigation is the right thing to do, and it should be continued as the hazards are always there. We are responsible to the people we serve. As such Seattle Project Impact's public-private partnership created four mitigation programmes: Hazard Mapping, Home Retrofit, School Retrofit, and Disaster Resistant Businesses. I will only be describing the first two programmes, although they are all interrelated.

It may not seem clear as to why the Hazard Mapping Program precedes all discussion of the other programmes. But educating the public, our partners, government, etc., about the most recent scientific data on regional hazards has proven extremely important. If people do not understand



**Ines Pearce**

- Project Leader,

Seattle Project Impact,

City of Seattle

Emergency

Management, USA

Ms. Ines has served as Seattle Project Impact / Community Mitigation Program Manager in City of Seattle since 1998. She mainly manages four mitigation programs: regional home retrofit, school retrofit, disaster resistant business, hazard mapping, including all public / private partners. She worked for SAFECO Corporation for about three years and mainly engaged in emergency management and security.



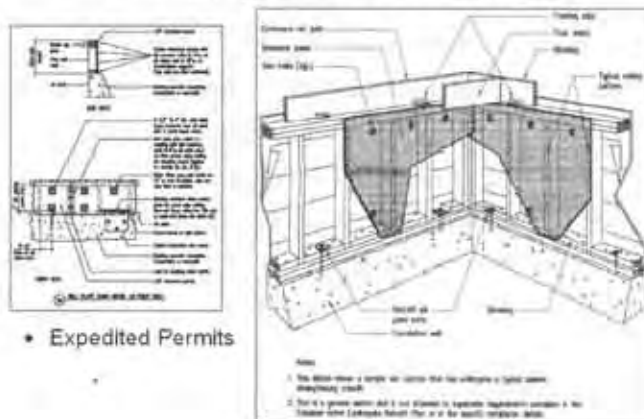
their vulnerabilities, they will see no value in mitigation. It is important to avoid talk about hazards in ways that scare people, as this rarely motivates them to action. Instead, we explain the hazard, and then describe the resources available to assist them in mitigation. Programmes have to be accessible and simple, in order to remove some of their reasons for not taking action previously. Hazard maps assist in this effort by giving direct answers to pertinent questions. People will not take action without understanding. Give them the choice, the informed choice.


Through partnerships, the sharing of information has helped us to better understand our risk through history. Combined information and expertise can assist in identifying where to build or not build, and types of construction that will perform best in those areas. The collaboration and research have laid a great foundation of understanding for our communities and is the basis for action. As new information comes available, we give a "heads up" of preliminary information to the affected governments for them to decide how they will address requests from the community, then release it directly to the community. We then provide resource information for the public to do something with this new information, such as retrofit their homes.

We all learn a lot from other's tragedies and disasters. The sharing of information is the key that can save lives and property in a future disaster. In Seattle, we learned from the California earthquakes that occurred in Loma Prieta in 1989 and Northridge in 1994. The small structural retrofit cost saved homeowners thousands of dollars of investment in their houses. Having a home retrofitted gave families somewhere to go, shelter for workers, and peace of mind to families and children. Sadly, displaced families had to deal with the costs of temporary housing, home repairs, and the psychological impacts of being uprooted. These displaced families placed a great burden on local governments to assist with shelter, food, and special needs.

There are three vulnerabilities to these unretrofitted wood-frame homes. First, the frame of the home is sitting on top of the concrete foundation only by gravity. Therefore, when earthquake

### Pre-Engineered Solutions





occurs, the house will slide off of the foundation creating major structural damage and pulling out utilities increasing the potential for fire. The house only needs slide a few centimeters to cause major damage, making the home uninhabitable. The second weakness of these houses is that many have a "sheer wall" or "pony wall" that is unreinforced. The "pony wall" is the wood frame between the foundation and first floor. They add height to one or more walls so that the home can be level and match the land slope. Unfortunately, the pony walls are no more than vertical pieces of wood. With the back-and-forth lateral motion of an earthquake, these pieces of wood cannot support the weight of the house above it and the pony wall fails. Again, major damage occurs to the home making it uninhabitable. The third weakness of these types of homes mirrors the first. Just as the frame is not connected to the foundation, neither are the floor and foundation systems connected together.

The purpose of Home Retrofit is to strengthen the home to move as one connected structure. One of our purposes in creating the pre-engineered plans is to remove a major reason that people don't mitigate against disaster, or in this case specifically, don't retrofit. Costs to the homeowner are kept low by removing the need to hire an engineer for typical retrofitting and simplifying the process. But the homeowners may still have questions, so training and education are the answer. Classes allow homeowners to make informed decisions to fit their needs.

It would be unrealistic to believe that all homeowners would perform their own retrofit. Building professionals need to be trained on new Home Retrofit standards, as some of the updates came directly from the two California earthquakes. We therefore worked with our partners to develop professional training that could be institutionalized in order to continue this needed community benefit. Through this process we learned that there were some contractors in the field whose construction practices were less than admirable. By requiring training to perform retrofit from our list, we are ensuring that those who are working with homeowners have more than basic skill with or above the code.

The next steps involve the costs for retrofit. Homeowners fall into two groups, those who can and those who cannot afford to retrofit. The cost for a homeowner to retrofit their own average-cost home is 1/2% of the value of the home. To have a contractor perform the retrofit, the cost can be 2% of the value of the home. The majority of unretrofitted homes are owned by people who can afford to pay for retrofitting in some way. They can pay using their own funding source such as credit cards, or take out a loan from one of our partnering financial institutions. These banks and credit union offer special loan packages tied to the Home Retrofit permit. Some families have tied reconstruction, weatherization, or expansion loans to their retrofit in order to perform work in the same area at the same time.

Low-income individuals have advocates, federal programmes, and assistance on a daily basis and



after disasters. High income and even middle income earners have their own resources. But low-to-moderate income individuals and families do not have advocates or programmes to assist them. When a disaster happens, they are the ones who typically fall off the map and move out of the area. This is why we are providing grants to those individuals, making 80% of median income or below, to structurally retrofit their homes.

A way to support ongoing mitigation is to continue to educate and inform the public. If we have a great programme and resources, but no one knows it exists then it is not serving anyone. So we are constantly working with the news media, have an extensive website, and put out information through partners to continually keep the information in the forefront. While we focus Home Retrofit on structural work, we also provide nonstructural retrofit information to all homeowners as there are many who live in newer construction or in multi-family housing. By securing their belongings within the structure, they are decreasing the potential injuries to adults and children in their households.

The spirit of mitigation was not to create a project with a start/end date, but instead to create programmes with institutionalized strategies to reduce hazards in the long-term. Knowing also that we were fortunate to receive this seed money, we developed programmes that could be sustainable through changing political heads, and could be exportable to other jurisdictions facing the same risk. Other jurisdictions do not have the benefit of money or partners, so we included regional expertise to make the programme expansion easier and less of a burden to the local jurisdictions to implement: a community legacy.



## Q&A

**Mr. Sazanami:** I would like to ask you about the financial arrangements to prevent the losses from disasters. I am interested to hear about the earthquake or tsunami insurance system. I heard that you have developed a good insurance system for disasters in California, is it the same in Seattle?

**Ms. Pearce:** Yes, California has such an insurance system. We have had experience of its effectiveness in the last earthquake in California. It is learned that insurance companies have lost a lot from that earthquake and now they are hesitating to invest in that sector. Our policy in this regard is to encourage homeowners through incentives by way of giving them assurance of earthquake coverage. If homeowners get their home retrofitted, they will receive the good coverage of their loss in case of earthquake. Besides this, they are getting better amount when selling their home. They are capitalizing the recognition when they resell their houses. It is kind of an encouragement for the homeowners for retrofitting their houses.

**Professor A. S. Arya:** I would like to make some comments on the theme paper By Mr. Amod Mani Dixit on non-engineered construction. In his paper he mentioned "non-engineered buildings", "semi-engineered buildings" and "engineered buildings". As per the codal provisions, what we have are the terminology "pre-engineered buildings". I think this is the right way to describe the buildings which have all seismic resistant elements with locally available materials, particularly, brick masonry. In his paper, he mentioned that masonry buildings kill people and RC buildings also kill people if they are not properly constructed with seismic consideration. Our past experience shows that if masonry buildings are constructed with seismic provisions, they withstand earthquakes very well and do not kill people. So, blaming masonry as weak against earthquakes is simple prejudice. The condition "if they are not constructed properly" applies both for RC construction and masonry equally.

He talked about the quantification of the retrofitting. What I want to say is we have guidelines for retrofitting with quantitative recommendation on size of reinforcement bars, size of mesh and their location and all the recommendations are based on quantitative analysis.





Mr. Amod Dixit discussed the solution of the problem and we have a good example from Gujarat. Though it happened after the earthquake in the process of reconstruction, but they are applicable for long term mitigation. What we did in Gujarat and now applied it for whole India is a massive training programme for masons and engineers. About 10,000 engineers are being trained for earthquake resistant techniques and 10,000 architects are being trained all over the country. The training includes analysis, design and construction including retrofitting for seismic upgrading of existing buildings. Now, curriculum of earthquake engineering is included in both engineering and architecture courses in college, and are compulsory. Similarly, mason training is underway all over the country. About 50,000 masons are being trained for seismic construction from all states. Government is now launching a seismic disaster reduction programme in 229 districts among the total 600 districts of India. The programme has a strong component capacity-building by way of training.

Now, I want to Ask Ms Ines Pearce about the cost of retrofitting of wooden houses in US. We have experience of masonry retrofitting but I want to know about the wooden houses retrofitting.

**Ms. Pearce:** If we go for average cost of retrofitting, it is only 1/2percent if retrofitted by homeowners themselves and it goes up to 2% if they hired contractors to retrofit their houses. The cost of retrofitting is very low.







## 1.5 Panel Discussion

**Moderator:**

C. Villacis (Consultant) USA

**Reporteur:**

B. Pandey (UNCRD) Japan

**Panellist:**

T. Boen (WSSI) Indonesia

K. Meguro (University of Tokyo) Japan

R. Shaw (Kyoto University) Japan

M.A. Karimi (Kerman Governor's Office) Iran



## Panel Discussion

### **Moderator's Remark: Dr. C. Villacis**

The objective of the panel is to discuss and recommend the strategy for safety of nonengineered construction. The following is a set of guiding questions developed by the organizers in order to facilitate the panel discussion to come to specific recommendations.

#### **Where do we lack in achieving the goal of safe construction?**

What is needed to achieve this goal, do we need more technology, given that there is already lot of research in the field of modern engineering. However, there is not much research on traditional materials. In most cases, even if techniques are developed, they are not applicable to the communities we are talking about. In this context, the question comes: Should we need to consider more on technology, or simply should we go to social, political/cultural aspects to implement the technology whatever we have had so far? Or, should the strategy be a combination of two which means developing new techniques that are more applicable and then disseminate them more widely?

#### **What are the complications in delivering a solution?**

We have some examples like that of Kathmandu and Gujarat. Now, the question is: Why these techniques are not adopted by communities in other parts of these countries and in the rest of the world. What are the real problems of them being implemented? Let's analyse the circumstances so that we can recommend the strategy which overcomes this failure.

#### **How can the opportunities and resources be tapped for safer housing in regards to disaster risk reduction?**

We have problems but at the same time opportunities as well. We have social coherence and communal behavior in these communities, which may be utilized to disseminate the technology for achieving safety through safer construction. It is learned that communities are receptive when we go to them with acceptable solution. Some indigenous knowledge exists in communities, which came to practice after going to a test of social acceptance in the course of decades and centuries and they are worthy in technical aspect as we learned from previous speakers. How can we promote this kind of knowledge and revive them?

#### **What can be learned from best practices ?**

There are some successful programs at present. We need to utilize the success stories to make success in other parts. Now the important task is to disseminate them widely. There are a lot of lessons for which we don't need to invest to learn them again in other areas.

#### **What should be strategy for the time ahead?**

Considering the situation and analyzing the constraints and opportunities, we can recommend a strategy to build safer communities by promoting safer construction in communities where non-



**Carlos Anival Villacis**  
- Consultant,  
USA

He is currently a consultant of disaster management in four organizations: JICA, UNESCO, the World Bank, and UNISDR. Academically, he obtained Ph.D. from Tokyo University in Civil Engineering. He was a visiting scholar at the Department of Geophysics in Stanford University and Mason Fellow of Master of Public Administration in Harvard University.

engineered construction prevails. We can come up with specific recommendation like that Amod proposed to have international commission for safety of non-engineered construction. Let's discuss on it.

In our panel, there are experts which have vast knowledge and practical experience in the subject. The panel comprises experts and policy makers both from developed and developing countries, with balance from academics and practitioners. The analysis and recommendation, which will come up from this panel, is expected to consider well the gap between policy/ program and implementation.

### **Mr. T. Boen (Indonesia)**

Non engineered construction is interrelated to poverty. Therefore the solution is mostly demographic, socio-economic and political in nature. In most surveyed areas, the level of earthquake awareness among local residents was very low. It is because people has other more urgent priorities and the government is considered as God that people must obey and listen to. Government officials/ agencies have the authority but not the expertise in many cases. After every earthquake disaster the government introduced a "timber prototype house" without consideration of local tradition, locally available materials, local artisans and are neither culturally congruent nor applicable.

Learning from Lathur and Gujarat, NGOs should focus on servicing through alternative techniques, training government engineers and helping them in management, supporting the government in damage assessment with providing more creative options in helping people build houses with government funding. There is also a need to train a new generation of planners, designers and builders who are expected to work in closer contact with communities and show greater understanding of local traditions and social economic political conditions. One of the best practices is "engineering non-engineered constructions" and this will be replicated for the reconstruction of Alor and Nabire in 2005. Engineering means analysing actual villager's houses including the materials used.

The Government must have a political will to mitigate earthquake disasters for non engineered construction and subsequently introduce the appropriate methodology affordable to each respective area. Construction should be done with community participation, meaning owner-driven housing, mostly in-situ reconstruction. In retrofitting and constructing of villagers housing, avoid using nonexistent resources, materials as well as nonexistent human resources.



**Teddy Boen**  
- Director,  
**World Seismic Safety Initiative (WSSI),**  
**Indonesia**

Mr. Boen is a Board Member of World Seismic Safety Initiative. He is an expert consultant in earthquake engineering with extensive experience in this field. He has been involved in numerous projects related to comprehensive disaster management.

### Prof. K. Meguro (Japan)

The issue here is how we can improve the safety of buildings that are made up with materials with low resisting capacity. First of all, we should admit that the real lacking towards achieving the safety comes from lack of imagination regarding disaster situation. This is applicable to all members of the society including house owners, decision-makers, academia, researchers and mass media. The motivation and planning actually starts when we are aware of the situation in the earthquake that may happen anytime in our daily lives. The disaster imagination will provoke to act ahead towards achieving safety.

Now coming to the context of safety of houses, there is lack of proper codes and guidelines which also means lack of appropriate technology. We may have sophisticated codes in terms of technicality but if they are not followed in implementation, they are meaningless and I would say they are, necessarily, bad codes. For new construction, we may achieve safety through stringent quality control in design and construction with hi tech-approach and enforcement of codes and regulation but still, the problem lies in retrofitting of building stock without earthquake resistant system. Masonry comes in picture when we talk about the problem of non-engineered construction. If we consider the distribution of masonry construction and distribution of seismic hazard around the world, there are many overlaps, where problem lies.

Researchers and engineers tend to use new and advanced technology without considering local conditions and situations. The important keywords towards successful implementation of technology are local availability and local acceptability. The technical solution should be suitable from an engineering point of view, but at the same time, the material used for that specific technique should be available there and the method of construction should be applicable for mass implementation. Also, the technology should fulfill the social aspects. The method of construction should respect the culture and should be acceptable to the way of life of the communities.

Based on the criteria and analysis, I propose a simple technology of retrofitting of masonry buildings. It is retrofitting by propylene band which is very light, available everywhere and cheap. It is applied to the masonry walls around the house. The Propylene band will not increase the strength of the wall against cracking but the real contribution is that it will hold the wall in position after cracking starts. The energy dissipation capacity of this application is high. It is important not to have sudden collapse of structure in earthquakes that do not let people evacuate from their house.

Further, to promote retrofitting, we need to have a good system in community. Taking an example from Japan, we have one-third of our population under vulnerability of coming earthquake disasters. We have millions of houses needed to be retrofitted. For these large number of buildings, neither government can't support them fully nor any financial support after disaster prevent the



**Kimiro Meguro**  
- Professor,  
Tokyo University,  
Japan

Dr. Meguro is a professor of Institute of Industrial Science in Tokyo University. He is actively involved in emergency management specializing in urban earthquake disaster. He has been promoting the importance of anti-seismic reinforcement at global level. He holds Masters and PhD degree in Engineering from Tokyo University.

lives. To this problem, I am proposing a public incentive program, whereby individual households should receive incentive if they retrofit their houses. The objective here is not to finance them but to encourage them for retrofitting by themselves. A new system of earthquake insurance should provide the support to this system and house owners mutual support system should be in place.

Education plays an important role. Definitely, education should target all sections including children. While children will not retrofit their houses by themselves, the most important is the message they will carry to their parents and also to build a culture of prevention in next generation. Finally, what I want to share with you is that being a professional in this field, we need to provide good information to the decision makers so that they can apply it appreciably within the framework of implementation. The advice should be well backed by sound technology and through analysis but at the same time it should be understandable by the officers.

### **Dr. R. Shaw (Japan)**

With regards to efforts towards achieving safety of nonengineered construction, there are two elements lacking: Appropriate technology and effective Communication. Although a lot of researches are being conducted for engineered construction, little emphasis is given to the nonengineered construction. In most places, researches are not demand-driven, and not implementation oriented. Thus, there is an urgent need to fill this gap. The other issue is communication to the end users. Even there are available knowledge and resources; these are not properly transmitted to the people and communities. This communication gap exists in many sectors including socioeconomic and political context, as well as educational regime.

The complication in delivering solution to this problem lies in lack of motivational tools. The building safety is a priority issue of the house owner, and to spend one's own resources, strong motivation is required. It is often observed that people are aware of the risk, people have resources, but people are not taking actions.

A small and humble exercise after the Gujarat earthquake by SEEDS was found to be extremely effective in reaching masses in the rural areas. A model Mason Association was formed in Gujarat, as an outcome of the reconstruction program of a village, which incorporated self-help approach of reconstruction. A participatory training methodology was adopted, which helped in developing trained masons. A formal association was formed, and both demand and recognition was created linking the initiation to the local government and corporate sectors.

The approach towards non-engineered safer construction needs different levels of interventions. At policy level, more attention should be given on the guidelines development, research on non-construction practices, research on improving communication, and developing incentive schemes.



**Rajib Shaw**  
- Associate  
Professor,  
Kyoto University,  
Japan

Dr. Rajib Shaw is originally from India and he is currently an associate professor of Kyoto University. In his previous job in UNCRD, was involved in many UNCRD projects, including the recent initiative of Community Based Disaster Management. Dr. Shaw continues to apply his expertise on the Asian region deploying projects in Bangladesh, Cambodia, India, Indonesia, Vietnams and the likes. Dr. Shaw holds a Masters Degree in Education from Yokohama University and a PhD from Osaka City University.

## 2. Public Demonstration of Improvised Shaketable Demonstration Test

### Program for Improvised shaking Table demonstration at WCDR

18th January 2005

- 14:30 Welcome address  
- *Dr. K. Okazaki, UNCRD*
- 14:35-14:50 Inauguration  
- *Mr. Doubara, Health Minister, Punjab state, India*
- 14:50-15:20 Shaking table demonstration on Concrete Block Houses models  
- Features of the models  
- Shaking of the model houses  
- *Mr. B. Pandey, UNCRD*
- 15:20- 15:30 Learning from the demonstration  
- *Mr. A. Dixit, NSET*
- 15:30-15:40 Break
- 15:40- 16:10 Shaking table demonstration on Brick (Adobe) Houses models  
- Features of the models  
- Shaking of the model houses  
- *Mr. B. Pandey, UNCRD*
- 16:10- 16:20 Interactions
- 16:20- 16:40 Certificate distribution and Remarks - *Mr. KIY Chowdhury, Minister for Disaster Management & Relief, Bangladesh*
- 16:20- 16:30 Concluding Remarks  
- *Mr. K. Onogawa, UNCRD*

21st January 2005

- 14:30 Welcome address  
- *Dr. K. Okazaki, UNCRD*
- 14:35-14:50 Concepts and Rationale of the demonstration  
- *Prof. K. Meguro, University of Tokyo*
- 14:50-15:20 Shaking table demonstration on Wooden House models  
- Features of the models  
- Shaking of the model houses  
- *Mr. Nanjia, BRI*
- 15:20-15:30 Break
- 15:30- 15:40 Historical accounts on improvised shaking table demonstration  
- *Mr. A. Dixit, NSET-Nepal*
- 15:40- 16:10 Shaking table demonstration on Stone Masonry House models  
- Features of the models  
- Shaking of the model houses  
- *Mr. B. Pandey, UNCRD*
- 16:10- 16:20 Message of the test Demonstration  
- *Prof. K. Meguro, University of Tokyo*
- 16:20- 16:30 Concluding Remarks  
- *Mr. K. Onogawa, UNCRD*

## 2.1 Background

### Introduction

UNCRD conducted a public demonstration of an improvised shake-table test on vernacular buildings made with brick, block, stone and wood at the UN World Conference on Disaster Reduction (WCDR) held 18-22 January 2005, in Kobe, as an event during the public forum. The objective of the demonstration was to give a message to the participants and observers of the conference that

- Simple technological improvements can save buildings from earthquakes as shown by the test;
- Improved Shake-table demo is an effective public awareness tool and can be carried out in communities in developing countries with comparatively modest effort.

The continuous loss of life and property due to earthquakes in developing countries underlines the importance of technology transfer and education and awareness in those communities. It has been realized that the disasters can only be reduced if people are well informed and motivated towards a culture of prevention, which requires not only the dissemination of relevant information and techniques but also confidence-building among citizens on the use of these techniques. This applies, particularly, on the use of safer construction practices in earthquake-prone developing countries where a large part of the construction is informal and owner-built.

The challenge of implementation of safer housing in vulnerable communities of these areas lies in convincing people that simple quake-resistant technology is applicable to their case. Readily and easily understandable information on an earthquake protection housing option that incorporates locally available material and knowledge is necessary to address the problem. It is observed from experience that on-site demonstration of the effectiveness of the simple techniques will be instrumental in raising awareness and in building confidence on the technology among common people.

UNCRD has used the demonstration tool called "Improved Shake Table Demonstration," with the technical assistance from the National Society for Earthquake Technology-Nepal (NSET), in its community-projects in different parts of world. It was found that the demonstrations were very effective in raising awareness among the public, in convincing common people, local craftsmen and authorities on the importance of inclusion of earthquake resistant features in housing construction and in training the local masons. Most importantly, these demonstrations were able to build confidence on simple techniques of safer housing to the owners who build their houses themselves.

The high rate of casualties in recent earthquake disasters is seen in the rural and urban areas of developing countries where the housing construction is mostly informal and non-engineered. It is observed that most of the victims of earthquakes are killed by their own houses which lack basic necessary earthquake resistant features. Aiming to reduce the huge loss of lives and protect the livelihoods of the communities requires easily accessible, low cost, easy to use and conceivable

technology for safer housing. Unless community residents are convinced of the techniques and can actually own them, it will not be implemented in practice and the aim of disaster reduction will not be achieved. Promotion of a convincing tool such as in this demonstration is very helpful in order to obtain the support from end users on risk information and methods to reduce it.

## Objective

The objective of the events was to disseminate a education demonstration tool on safer housing for non-engineered buildings for a wider application which promotes the implementation of simple techniques of earthquake disaster resistant housing in vulnerable communities of developing countries by:

- Impressing upon the people the consequences of living in seismically unsafe houses;
- Enhancing the understanding of the performance of simple structures, with and without the earthquake resisting features under the impact of an earthquake; and
- Building peoples' confidence in quake resistant building technologies including the retrofiting of existing houses.

## The Demonstration Method

A pair of 1/10th scaled model building made of locally available material in developing countries such as adobe, stone, brick or wood is placed on the tabletop of an improvised shaketable operated manually with a simple spring system. The buildings look alike, but differ slightly in that one is constructed in a conventional method without using any earthquake resistant elements in construction while the other uses the same construction material but with simple quake-resistant technology like horizontal seismic bands, wall-wall and roof-wall connection stitches, vertical shear resisting elements etc. They are then shaken by the table, with the help of screw jack system attached to spring system, to simulate an earthquake.

Upon the repeated incremental shaking, the performance of the both models under shaking at different intensities can be observed first hand. The demonstration reveals the weaknesses of the conventional construction model while, at the same time showing the effectiveness of the earthquake resistant features in the other model. Comparing the damages, one can easily be convinced of the value of the simple techniques of safer construction.

All the demonstrations were followed by a commentary in simple, non-technical language so participants and common people can understand what is happening. As the demonstration started from very small shaking with increasing intensity, people can see beginnings of damage occurrence right up to collapse of the conventional construction and survival of earthquake resistant one. It gives them a clear impression of where the problem lies and how with low to even no-cost technology a significant amount of safety can be provided to their adobe, brick, block or wooden houses.



## 2.2 Concept of improvised shaketable test on vernacular buildings

### What is Improved Shaketable?

It is a table subjected to vibration generated by the action springs attached with it.

### How does the shaking of the table represent earthquake motion?

Actually no two earthquake shakings are identical they are random in nature. Shaking of earthquake may contain some shocks, particularly killer shocks, similar to the shocks induced in this table.

### Why are two building models tested at a time?

Two building models face similar vibration when we shake the table. We can observe the difference in behavior of models built differently but look alike. It is to simulate the condition that two similar buildings are subjected in a same earthquake.

### What are the major differences between two models?

Difference are mainly in the aspects of strength and integrity. Weak building model does not have reinforcement in wall. There are no proper connections between various parts of building i.e. walls, floor, roof. The model which sustain less damage has reinforcement in walls at all corner points, junctions and end of openings, connection between walls by stitches, belts at various levels, bracing of floors and roofs, supports to walls and anchoring between floors/roofs and walls.

### How can we incorporate these measures in our buildings?

At the time of construction, we can simply include these features. They are from locally available material like rod, wood, bamboo log etc. In case of retrofitting, we add these elements externally.

### How do these measures improve the performance of the building in a large shaking?

Reinforcement in walls helps prevent cracking; stitches make walls of two axis supportive each other in horizontal shaking, bands make entire building integrated so that individual wall does not fall inwards or outwards; bracing in floors and slab make them strong and capable to pass the load to walls and anchoring between floors and walls avoids sliding and help maintain the original configuration of building.

### What is the extra cost involved for these measures?

5-7% additional cost to the masonry buildings. This additional cost includes cost of material for reinforcement and extra labor charge for better workmanship. Retrofitting of houses may cost 15-20 % of original cost of construction.

### What does the difference in behavior of two models reveal?

Difference in level of damage in two building models in a same shaking shows that we can reduce damage in building in an earthquake if we follow the simple and practical earthquake resistant techniques.

### How can we get it done?

We need to get trained masons involved in new construction or in retrofitting works of existing houses. We can request City office / village committee for technical and financial support. There may be special subsidy scheme for earthquake resistant construction and seismic retrofitting. We should be aware ourselves about these simple measures and check to be sure that they are incorporated in the construction.



## 2.3 Test of Building Models

### **Welcome address by Dr. K Okazaki, UNCRD**

I welcome all of you all to this simple demonstration of vernacular building models in an improvised shaketable test. We have learned one specific lesson from many past earthquakes including the Great Hanshin-Awaji Earthquake of 1995 in Kobe that it is not earthquakes but the weak buildings that kill people during earthquakes. In the Hanshin-Awaji Earthquake, 80% of the victims were killed by their own houses and 90% of them were killed within 15 minutes of the earthquake. This fact implies that it is very important to make the residential houses safe against earthquake to protect people from earthquake. This shake-table demonstration aims to motivate individuals and institutions towards the safety of people against earthquakes. This will also help build capacity of communities by training and educating masons and individuals on the safety of houses.

UNCRD has been implementing various projects in different parts of world aiming for capacity-building and educating communities for disaster risk management. We have carried out this kind of shaketable test demonstration in Afghanistan, India, Iran, and Nepal in collaboration with NSET-Nepal which first initiated and piloted this tool in Nepal. In India, during the PNY project, we carried out similar tests but at 1/2 scale followed by training and interaction with masons and community people to raise awareness and build confidence in earthquake-resistant housing. In Afghanistan the test was accompanied with training of masons and engineers where simple construction guidelines was developed and distributed. In November last year, we carried out a similar test in Bam, Iran which was severely hit by a strong earthquake in December 2003. What we observed from all the demonstrations is that it is very instrumental in raising the awareness of common people and helps to build confidence in safer construction. We are planning to hold the tests 3 times here in Kobe during this conference. I welcome you all to the demonstration and would like to urge you to convey the message it will give to your friends.

### **Remarks by Mr. Doubara, Health Minister, Punjab State, India**

I am very happy to be here at this event. I appreciate the work of UNCRD and other partners who are making this simple test that is understandable to the common people. I see here models of simple buildings found in our part of world and I think this has relevance for all people living in these kinds of vernacular houses. The component of mason training and education for the common people with this kind of test is very much appreciated. We are coming from around the world here to discuss methods of disaster reduction. I think this kind of education is very instrumental towards attainment of this goal. I learned that National society for earthquake technology-Nepal has initiated this and now with the collaboration of UNCRD it can be disseminated to different parts of the world. We, in India, need it very much and I am happy to hear that such demonstrations have been carried out in Gujarat. I happen to be here at this great event, at your invitation. I thank you for the opportunity and hope the test demonstration will encourage and guide all of us towards achieving safety of the common people living in seismic areas. Having said this, I once

again wish for the success of the each demonstration.

## Test Demonstration

### 1). Block building model

Two block building models, 1/10th in scale to real size buildings, were fixed on the top of the shake table. The building models were 2 stories in height with 3 rooms on each storey. They were made of concrete blocks (mix of cement, sand and aggregate) with cement-sand mortar. Wooden sticks were used for doors and windows. The configuration of these building models was typical of those found for single family residences in semi-urban areas of developing countries.

The difference between the two models was basically in construction. The conventional model did not have any reinforcement in walls, corners and no special connection between roof and wall system. There were no bands around the walls. The model which represented seismic treated building had exactly similar structural system plus additional seismic elements such as seismic concrete belts at window sill, lintel and roof level and vertical reinforcement in wall junction and sides of opening. The structural connection between walls and roof was made with concrete stitch bands and reinforcement. These additional features were clearly marked in the model so that the audience could easily identify them in the improved building in contrast to the conventional building.



The features of the model buildings were first introduced with clear indications as to the differences between the two buildings before the shaking was started. Initially, mild shaking was applied to the table and the intensity was increased step by step by means of a spring mechanism. The very first effect to show in the conventional building was the dislodging of the roof from the walls that supported it. A clear crack appeared around the top of the walls (at the connection with the roof) and increased with subsequent incremental shaking. Some other cracks also appeared at the upper part of the walls, particularly, at the corners of openings. All of sudden, all the walls in 2nd storey collapsed and the roof was vigorously shaking. On the other hand, there were no visible cracks in any part of the improved building model except some minor hair cracks in the walls. Slow motion playback of the video of the final damage, which took place immediately after the severe shaking, showed the performance of both buildings at the time of shaking. It was observed that the damage in the building was mainly due to the lack of integrity of the members of the model house. The seismic belts and reinforcement helped the improved model to retain all its components.

## 2). Brick building model

Similar to the test of the block building models, two single-storey brick buildings with wooden floors and tile roofs were tested on the improvised shake table. The models were 1/10th in scale to a prototype single family dwelling. This kind of housing is common in Nepal, particularly, in the Kathmandu Valley, and other areas in developing countries. Model brick represented the adobe brick used for house construction. The floors and roofs were flexible with wooden joists and perkins. Dark red tiles made the building models aesthetically appealing.

The difference between the two model houses was seen in construction of the floor and roof, provision of seismic bands and reinforcement, and connection between walls and floor/roof. While there was no reinforcement in wall construction of the conventional model, the improved building models had reinforcement at all corners of each wall, sides of windows and doors, stitch connection between orthogonal walls at each six-layer interval and seismic belts of concrete at sill, lintel, floor, eave and gables. The floor of the conventional model was constructed with floor joists and planks running in each direction whereas the improved model had cross bracing in each floor compartment supported by the walls. The wooden frame roof for tiles was stiffened in the improved model unlike in the conventional model, by means of "A" trusses at close intervals and tying the members to each other by steel wires. All the additional features found in the improved model were made visible by ink marking and highlighting in order to distinguish the difference between the two models subjected to the same vibration.



At the start of the demonstration, features of the both models were explained in detail. Incremental shaking was then applied to the table on which both models were fixed. As a material of the construction, adobe brick, is very weak against lateral force, cracks started to appear from early stages. Unlike in concrete block buildings, there were many cracks running across the wall propagating from windows and door corners. At an intermediate level of shaking, the walls in the conventional building model were partially damaged with bricks falling close to the window. The walls in the weak model suffered from shaking in out of plane direction. There were visible imbalances of walls in a transverse direction. In the improved model, only small isolated cracks were observed in a number of shaking cycles. At the end, a strong shaking made the conventional building fall down with complete collapse of walls and roof. The pattern of damage was typically seen in many past earthquakes. The improved model withstood this with no visible damage except for a few tiles falling from the roof. It was clearly observed that the belts and stitches in the walls

help the improved building model move together avoiding any development of stress concentration in wall connections.

### 3). Stone building model

Field stones are a locally available material for housing construction in the rural mountainous areas of developing countries. Because of the irregular shape the unit stone and its heavy weight, stone masonry construction is regarded as very weak and unsuitable in seismic areas. However, it is still in use in many places where seismic hazards exist. The reason is simple: the material is easily available on the doorstep, free of charge, in most cases.

Two building models of field stone, 1/10th in scale, were single-storied with double lean-to roof and gabled walls at both ends. Roofs of the models were made of thatch, dry grass, supported in a wooden frame. The floors were wooden resting on the walls. Seismic resistant elements in one of the twin models was made mainly from wood. All the bands at sill, lintel, and floor and eave level were made from long wooden pieces run in parallel and braced to each other and those in transverse walls at junctions. The anchors at the corners of each wall were made by long pieces of stone which spans over both of the joining walls. Through stone, reinforcement was provided in a close interval in both directions of walls. The roof system was firmly anchored into the walls by means of wooden anchor logs. The roof trusses of the improved model were stiff and braced for rigidity. Vertical reinforcement was provided at wall corners running from the bottom to the eave level. The conventional building model lacked these special construction features aiming to resist horizontal loading.

In the shaking test, small vibration did not cause any harm to both models that were fixed on the top of the shake table platform. However, the increased load by larger spring-force that caused some impact on the roof and walls that were dislocated to each other in conventional model. Some walls along with floor joists and roofs fell down on the table top in a increased shaking. The typical failure of the flexible floor was observed as wooden joists were slipped off the wall. Unlike expected, there was no damage at all in the improved building model even in a final large shaking. The gripping of wall by well connected wooden bands and firm anchorage of those walls to the roof system prevented all sort of cracks and damage to buildings.



#### 4). Wooden building models

The two wooden building models were 1/10th in scale to prototype single family dwellings in Japan. One was prepared in accordance to the current building standard while the other one represented the typical wooden house construction in Japan 20-30 years ago, which can still be seen throughout Japan.

There are three major differences which are critical between the two models: the number of diagonal braces in walls, location of walls and joints. Regarding the diagonal braces on the first floors, the improved model A had 10 braces while the conventional model B had 7 braces. Simply speaking, it was estimated that model B was 70% weaker than model A. The model A had one extra wall, compared to model B, which was a boundary to the other room. As a result, the model A included 5 braces whereas model B had only 2 braces. The room of the model B was expected to be twisted by shaking because of lack of support of the wall unlike in model A. Regarding the joints, the steel clamp were placed on both ends of braces and pillars in the model A, whereas pillars and braces of the model B were simply connected at ends without any hardware.

Like the other tests, incremental shaking was applied to both buildings. As the intensity of shaking increased, model B started vibrating, was softened, particularly at the first floor at the early stage. At the intermediate level of shaking, strains also started to appear on the first floor of the model B. Yet, the back sides of both houses did not seem to be shaken as much as the front side. On the other hand, the model A did not suffer any damage at all. Later, with more intense shaking, model B sustained heavy damage on the first floor, especially in the room where the opening was large without bracing system. In that room, the board was peeled off from a wall and braces came off. The other side of the model B was so twisted by shaking that braces were also found off from the wall. At the end, a large shake was given on both houses, and the model B totally collapsed. Model A did not suffer from the shaking.





### **Historical account on improvised shaketable test demonstration: Amod Mani Dixit, National Society for Earthquake Technology- Nepal(NSET)**

NSET focuses on reducing the earthquake risk in Nepal. The earthquake risk of Nepal is extremely high. So, when we started our earthquake awareness program in 1997, we were exploring different awareness-raising methods and tools for different target groups. In this process, we developed this method of improvised community-level shaketable testing by simplifying a scientific tool usually used for research in sophisticated laboratories. We found that this method of awareness-raising is effective for all the different target groups - school children, teachers, parents, ordinary people in communities, home builders, and masons. High ranking government officials and even politicians appreciated and endorsed this tool as highly effective.

NSET conducts such Shaketable Demonstrations several times in different parts of Nepal regularly. Our friends from different states of India, Afghanistan, Tajikistan, and Iran also liked it very much. We entered into cooperation with them and have worked with them to implement shaketable demonstrations in their countries. This popular awareness-raising tool was recognized by the Tech Museum of San Jose, California as an effective technical innovation, and it recognized NSET as the Tech Museum Laureate 2004, Microsoft Education Category.


The Shaketable Demonstration simulates the effect of an earthquake on the common building in a simple and effective way. The shake table shows how earthquakes of different degrees of shaking damage the weaker buildings, and how earthquake-resistant buildings do not get damaged. They also see that buildings can be made stronger by employing simple earthquake-resistant technologies which they can implement with the help of the builders. They see the technologies employed as simple, of common sense, and affordable. They become convinced, and motivated to make their houses stronger. They develop a trust towards science and technology.

The shaketable demonstration, in combination with other tools, has helped us to raise people's earthquake awareness greatly. It has helped them to change their mindset from fatalism to a proactive approach towards improving earthquake safety in their houses. This is the biggest achievement of this demonstration.

### **Concept and rationale behind improvised shaketable test Professor K Meguro, University of Tokyo**

This kind of simple test demonstration on building models made by locally available materials like adobe, stone, bricks, blocks, and wood aims to raise awareness and educate people on the need of an earthquake-resistant system in houses. This kind of test may not fulfill the academic and research standards of tests and it should not be looked at from that prospective. The purpose of the test is not to generate the data for academic research but to enhance the understanding of





common people on building performance under shaking. As education plays a great role in implementation of technology in the field, such kinds of test demonstrations are very instrumental to fill the gap between research outcomes and implementation.

Further, I see the demonstration using simple technology which is applicable to communities and most importantly, these test are for models made with low standard material which is locally available in rural areas. From the test, we who are working in the field of disaster risk management, whether academicians, policymakers or community workers, should learn that we need to respect the ground conditions of implementation of technology we want to propagate for the safety of people. This kind of demonstration could be an effective tool for all to convince this reality.


### **Remarks by Mr. Chowdhury Kamal Ibne Yusuf, Minister for Disaster Management & Relief, Bangladesh**

I found the test very simple yet effective to convince all who are watching it. It demonstrates the value of safe construction against earthquakes. I think if we carry out this kind of simple test with the help of local masons in communities, it also helps build confidence among them and the common people on the safety of improved houses by this simple cost-effective measures. I am very much impressed by the demonstration and would like to bring the tool to my country, Bangladesh. Bangladesh is a seismic hazard country and we are expending efforts to promote this kind of earthquake-resistant technology in our communities. As Mr. Dixit says, this kind of test should not be limited to demonstrations but needs to go for real implementation of seismic construction.


We would like to request UNCRD for this kind of initiative in Bangladesh. I am happy to learn that Nepal is promoting this kind of technology. Nepal is our good neighbor and it will be our great pleasure to join hands with UNCRD and NSET -Nepal to implant this kind of technology in Bangladesh. We request and welcome you to come to Bangladesh. We will try our best to implant it successfully there. With this much, I would like to congratulate the organizers and hope to have dissemination of such technology more widely in future.

### **Concluding Remarks by UNCRD Director K. Onogawa**

We have successfully carried out the demonstration. This is the first time, for me, to see this kind of demonstration and I am very much impressed. I think this kind of demonstration is quite useful to promote community based disaster management concept in different parts of the world. This demonstration, I think, is quite beneficial to communities as they educate the people directly on disaster management. The demonstration today became successful because of the efforts made by many people around the world. I appreciate your cooperation with UNCRD and expect continuous collaboration in future activities of UNCRD as well. I thank you for your patience and appreciate your interest.



### 3. Panel Cluster 4:



## Reducing the Underlying Risk Factors

#### Lead Agencies:

United Nations Environment Programme (UNEP)  
World Health Organization (WHO)  
United Nations Centre for Regional Development (UNCRD)

**Date:** 18 January 2005

#### Chair:

H. E. Laszlo Borbely, Minister delegate for the Coordination of Public Works and Territory Management, Government of Romania

#### Rapporteur:

Prof. Ian DAVIS, Cranfield University, UK

#### Speakers:

Dr. Rocio Saenz, Minister of Health, Costa Rica

Mr Yong Sung Park, Chairman of the International Chamber of Commerce and Chairman of Doosan Heavy Industries Co. Ltd. (Korea)

Prof. Tsuneo OKADA, Prof. Emeritus, Tokyo University, Director General of the Japan Building Disaster Prevention Association

Mr. Svein TVEITDAL, Director of DEPI, UNEP: Pre-disaster / Environmental issues

Dr. Wilfried KREISEL, Director of WHO Kobe Centre (WKC): Health issues

Mr. Kazunobu ONOGAWA, Director of UNCRD: Community-based Disaster Management

Mr. Amod DIXIT, Secretary General of NSET, Nepal: Non-engineered technology

Ms. Jamilah MAHMOOD, MercyMalaysia, Civil society and gender issues, Malaysia

# Reducing the Underlying Risk Factors

## Chairman's Remark

Romania had the pleasure to chair this cluster 4 of the thematic segment of the WCDR. I would like to thank the UN agencies which took a lead role in this cluster namely UNEP, WHO, UNCRD and the support given by UN-ISDR Secretariat.

I would also like to thank the high level panelists for their excellent presentations and outstanding contributions.

The discussion paper prepared by these agencies identified the key issues and the way forward in this area. It greatly contributed to the enhancement of the fruitful debate in the plenary, giving us the appropriate guidance.

The final version of the discussion paper will benefit from the relevant outcomes of the ten session of the Cluster 4, which covered areas such as health, financing disaster risk, environment, community based disaster management, post-disaster recovery, protection of critical facilities, gender and sustainable livelihoods.

Reducing the underlying risk factors is indeed a critical cross-cutting issue that runs through all stages of the disaster management cycle and there is a evident linkage with the four other clusters namely Governance, Risk identification, assessment, monitoring and early warning, Knowledge management and education, and Preparedness for effective response.

There are a number of casual factors of disaster risk, arising from and associated with urban and rural development, such as land management, integrated resources management, industrial and economic development, health risks, and building and construction aspects. Social issues relevant at the community level, as well as gender issues, also play a role in understanding and reducing risk.

A number of key factors that compound the risk were identified: (a) development process and the risk that they pose - for example, natural resource exploitation, urban development, environmental degradation, caused by a number of factors, such as soil erosion and deforestation: (b) structures exposed to disaster risk - for example, public infrastructure, residential housing, critical facilities such as hospitals, heritage assets: (c) institutional and financial framework and social setting - for example, building codes, financing and insurance for disaster mitigation, community actions for prevention, poverty and livelihood etc, and (d) mechanism to deal with risk, within the larger perspective of sustainable development.

The followings were identified as the main areas for the focus in the future:

- Reducing vulnerabilities;
- Development of management tools and interventions;

- Promotion of financial risk-sharing mechanisms, particularly insurance and reinsurance, public and private compensation-schemes to victims.
- Building of capacities and partnerships through public-private partnership in pre-disaster activities such as risk assessments and early warning systems.

The contributions to this thematic panel identified the following seven primary issues and emphasis was repeatedly given to this close interdependence: Good Governance, Partnership; Community Based Disaster Management, Education, Community Health Care, Gender Issues - which is a critical aspect of a disaster plan - since women and children, who are more dependent of their immediate vicinity, are therefore more vulnerable, and Environmental protection. The participants recognized the strong inter-linkages between the good environmental management and disaster mitigation. Hospitals and schools safety and retrofitting are also of an obvious importance so that lives can be saved and protected.

The outcomes from collective learning exercises were recognized as an important risk reduction tool, and planning teams at the local level to prepare disaster management plans should use these results. Some concrete examples were noted during the presentations and discussions.

The importance in building effective operational partnerships was taken for granted as the only sensible way forward if sustained progress is to be secured in risk reduction. Contributors cited the following typical examples:

1. UNCRD's Programme on Community Bases Disaster Management (CBDM)
2. UNEP-ISDR Joint Global Programme on Environment and Disasters
3. UNEP-IETC's Programme on "Action for Environment and Disaster Mitigation"(AEDM)
4. The ProVention Consortium that has forged effective links between the World Bank, IFCRS, Private Sector Bodies and Academia

Romania was pleased to chair this Cluster and I believe that the discussions held in the Cluster 4 will contribute to the outcomes of the WCDR.



## Presentation Summary of Mr. Kazunobu Onogawa, Director of UNCRD

### 1. Key issues for presentation

- Sustainability in Community Based Disaster Management (CBDM)
- Local actions through participatory process
- Institutionalisation of CBDM
- UNCRD Achievements
- Safer conventional houses with appropriate technology for resilient communities
- Safer construction of critical facilities like schools and hospitals
- Improvised shake table demonstration
- Guidelines/tools for awareness raising and CBDM
- Achieving safer urbanisation mechanism incorporating disaster management methods



### 2. Relevance to the Cluster 4 discussion paper

This presentation covers most of issues raised in the Cluster 4 discussion paper, focusing on Community Based Disaster Management.

### 3. Concrete recommendation to intergovernmental panel

- A mechanism of UN-Civil Society partnership needs to be strengthened in the context of CBDM through host of intergovernmental bodies, whereby official partnership in CBDM is established in all countries by 2015.
- CBDM should be incorporated into national and local development policies, particularly urban planning master plans, by 2015.
- Appropriate building codes and guidelines should be applied for all the houses and buildings by 2015. All the schools and hospitals should be disaster resistant by 2015.



 **4. UNCRD Session on**   
**"Community Based Disaster Management"**

**Organized by:**

United Nations Centre for Regional Development (UNCRD)

**In association with**

Sustainable Environment and Ecological Development Society (SEEDS)

Asian Disaster Preparedness Centre (ADPC)

**Date:** 21 January, 2005

**Chair:**

Key Note Speech : Ian Davis, Cranfield University, UK

"Developing Targets by 2015"

**Rapporteur:**

Eiko Narita and Bishnu Pandey, UNCRD, Japan

**Speakers:**

Manu Gupta, SEEDS, India

"Sustaining CBDM, SEEDS Perspective"

Zubiar Murshed, ADPC, Thailand

"Community Based Disaster Management? Regional Experience from Asia"

Carlos Villacis, Consultant- ISDR, USA

"Promoting sustainable, active community participation in DM"

Tsuneo Katayama, NIED, Professor Emeritus of Tokyo University, Japan

"Promoting Safer Construction Practices in Communities"

Zen Delica, CDP, Philippines

"NGO-Scaling Up"

Kenji Okazaki, UNCRD, Japan

"Capacity Building of Communities"

# Community Based Disaster Management

## Objectives

The overall objective of the session is to identify the important mechanism of sustainability in CBDM (Community Based Disaster Management) in reducing risk factors in disaster management and some concrete actions that can be taken to achieve such mechanism through partnership. It will mark some of the major achievements in CBDM that have led to their sustainability through partnership and institutionalisation, which can be used to build concrete recommendations from the perspective of UN partnership with its major constituents. The session aims to provide inputs to plan of action for the next 10 years on the aspects of safer communities, emphasizing partnership building in community based disaster management to deal with social aspects of mitigation and reducing the risk posed by unsafe housing through effective implementation of technology.

## Overview of the subjects being addressed

- Sustainability in CBDM : the measures that can be taken by community and government at all levels.
- Institutionalisation of CBDM :the policy measures of framing CBDM at the government level.
- Promoting safer practices in housing construction with focus on appropriate simple technology that communities can implement.
- Capacity building of community through training and awareness raising as well as through incorporation of disaster risk management into development strategy of local governments



## 1. Summary of the session's presentations

The session gathered a group of experts in community-based disaster management from international NGO, expert consultant, academic, and UN organisation. The presentations were based on their experiences on projects and researches that had been deployed at the grass-roots level. Moreover, this session tried to observe and further explore the issue of sustainability in community-based disaster management. The underlying premises of this session was based on a discussion of how community-based disaster management can sustain and continue to growth over time. Relating to this, this session also tried to raise a set of targets that could be and ought to be realised in community based disaster management (CBDM).

In the course of trying to focus on a few main thematic segments on the sustainability issue of CBDM, four segments were established:

- Governance
- Education
- Sustainability
- Safer Construction

These four thematic segments acted as a kind of guiding posts on sustainability in community based disaster management. Below is the briefing on the sub-themes that were discussed through experts presentation on CBDM.

## 2. Partnership

The discussion started off the session stressing on the importance of maintaining harmonious relationship in partnership building on disaster management. In CBDM, partnership is not a platitude but necessary factor in making CBDM last a long time. The importance of building a harmonious partnership is to have everyone cooperate on the same plane of field, where no one is above each other. In trying to achieve that kind of a relationship, it is critical that NGOs play an active role in acting as a binding force between the local people and the government. Most often NGOs have the closest relationship with the local communities, their people, their government (both official and unofficial), as well as have a close working relationship with the government.

Historically, NGOs started their activities in the relief field, responding to crises and disasters. NGO movement came out of a social movement with different members of civil society such as the church groups, women's group, students and other informal groups. Over time, NGO movement followed the path from relief-based to development-based work. Now, NGOs can be said to be at the helm of development process. As NGOs are now moving towards more development-based work, it is critical that NGOs intervene at the policy level, to help prepare communities in dealing with disaster risk.

An important aspect in developing good governance is the need for incorporating more than



**Manu Gupta,**  
- Program Director,  
SEEDS, India

Manu Gupta is the Program Director of the Sustainable Environment and Ecological Development Society (SEEDS), a non government organisation, which he co-founded in 1993. He has worked extensively in the area of community based disaster management in the most vulnerable areas of the country. India is among the worst hit by natural disasters and every year over 56 million people are affected. As such, there is need for strong community level preparedness to face recurrent devastating disasters. Manu Gupta advocates community enablement towards achieving the goal of stakeholder participation in local as well as national and regional development and disaster management policies and plans.



government in its process. Good governance is not just about the government, in fact, it was more than that. Good governance involves participatory process that includes people at the community level up to the government level.

### **Governance**

Good governance is one of the driving factors in achieving sustainable CBDM. As aforementioned, one of the important aspects of good governance is that it involves more than the government itself and that it is participatory from the grass-roots level, including the community members. In strengthening governance, it is important that local governments are involved as the decision makers of disaster management programme. Often times it is the government at the national level that get involved in the decision making process for disaster management and other policy related issues. However, it is the local government that knows the people and are often in touch with the community. Hence, there should be more momentum towards leveraging local governments to make the decisions, together with the community people, on disaster management practices.

### **Education**

Education is the foundation for creating civil society, and it can be applied to the process of imparting disaster mitigation activities. There is a need to augment education in disaster management at both formal and informal level. Also, education is a tool to reach both the young and the old and it can be done at the most grass-roots level, from local villages in the rural area to the universities in urban areas. To this extent, education in disaster management has a great potential imparting disaster knowledge and enhancing awareness; and this can be a tremendous tool in promoting CBDM. More educational training programmes and outreach activities have to be created to suit the local community.

### **Safer Construction**

One of the fundamental building blocks of society is housing. Hence it is critical that the current housing stock and the newly constructed houses are retrofitted. It has been noted that approximately 60 per cent of the world's housing stock is informally built and many of them are outside the radar of government surveillance. Having such a high percentage of housing stock escape the government radar on housing development, it is extremely important that safer construction for both formal and non-formal housing is implemented. In the case of formal housing, appropriate government funding and building codes should be provided and more importantly updated. In the case of informal housing, it would be important to promote safer housing practice through mason training and non-engineered retrofitting programmes at the grass-roots level. There is a great need to have more training programmes and information source for village masons and local construction engineers that are involved in the non-formal housing construction.



**Zubair Murshed**  
- Training Manager,  
the Asian Disaster  
Preparedness Centre,  
Thailand

He has been working with the ADPC since October 1998 and is involved in developing, organizing and conducting training courses at the Center. He has thirteen years of professional experience with 7 years international experience in Regional program management and development on capacity building of national disaster management organisations (NDMOs), I/NGOs; Regional advocacy on institutionalisation of community based approach in disaster risk management.

### Sustainability

Sustainability is the umbrella concept of CBDM, because non-sustainable and piece meal CBDM efforts would increase the risk more for communities. It is critical that CBDM efforts last a long time so that culture of prevention would be developed, implemented by all stakeholders in disaster management, as well as managed by them. It is not effective in the long run to have short-lived programmes on CBDM that would be terminated after a certain period of time. Sustainability is a complex issue, which cannot be achieved via one-size-fit all solution. One of the critical strategies for developing sustainable CBDM is to create demand at the community level, whereby there is an incentive for the community people to get actively involved in mitigating disaster risk. To do this, CBDM activities ought to be interesting and appealing to the people, small enough to manage (the concept of “small is beautiful”), and should be an agent in building trust with people. Above all, one important aspect of building sustainable CBDM is through its institutionalisation. To institutionalise CBDM, it is critical that CBDM becomes a part of government initiative: that it is accepted at the government level and reflected in its policies.



**Tsuneo Katayama**  
- Director General,  
National Research  
Institute for Earth  
Science and Disaster  
Prevention (NIED),  
Japan

Mr. Katayama holds numerous experiences in deploying research projects in the field of urban earthquake management and initiatives in “Lifeline” earthquake engineering. He has led various studies and projects critically viewing the effects and needs in disaster management from a wide perspective. Mr. Katayama has also held various teaching positions from the University of Tokyo, Chuo University, to New South Wales University. He is also currently a professor emeritus at the University of Tokyo.

### 3. Primary Issues:

- **Education:** Education is the key to sustainability and empowerment. Education is a way for people to learn and be capacitated to use the information that is given to the communities. Also, more investment in children’s school education ought to be made. Furthermore, education in disaster management ought to be expanded to cultural efforts such as building museums and resource centres for the public.
- **Partnership:** Partnerships with the government and NGOs that can compliment with each other is important. CBDM is not a hierarchical and static movement. In fact, it is and ought to be inclusive and dynamic, because it ought to involve all stakeholders of community.
- **Structure:** Structural measures for building safety ought to be integrated as a part of the larger social system.

- Development: It is critical to recognize that CBDM is an integral part of the disaster management and development process. CBDM is not an independent concept on its own. Efforts in CBDM need to be able to relate with other disaster management efforts.



#### 4. Suggested targets and indicators to measure accomplishments

- By 2015 all schools should be earthquake resistant. Schools are considered one of the primary public infrastructure, hence, important to invest public funding to protect and strengthen the educational infrastructure.
- Establish resource centres that can act to educate the public through non-formal and formal method by 2015.
- National-Local- and Civil Society partnership ought to be built in a formal manner via institutional measures of CBDM.
- Promote the creation of local museums of technology and disaster mitigation at a regional level.
- Building empowerment centre specifically for women's education in all new schools built by 2015.
- CBDM departments should be created in local government offices which is funded by the national government.

#### 5. Partnerships

- There ought to be a national-local-NGO partnership network group created in every country at the regional and local level to promote efficient collaboration and avoid redundancy.
- Line ministries ought to designate one department in working together on CBDM activities.
- Partnership framework ought to be established between international organizations and civil society groups (both formal and informal) to build sustainable development in the context of CBDM.
- School programmes at both national and local level ought to be integrated in national government efforts in promoting CBDM activities and knowledge sharing.



 **5. UNCRD Session on**   
**“Policies for Safer Building / Housing”**

**Organized by:**

Ministry of Land, Infrastructure and Transportation (MLIT), Government of Japan  
United Nations Centre for Regional Development (UNCRD)

**Date:** 19 January 2005

**Welcome Speech :**

Mr. Shigetaro Yamamoto ,Director-General, Housing Bureau, MLIT, Japan

**Keynote Speech :**

Prof. Emeritus Tsuneo Okada, University of Tokyo, Japan

**Presentations by panellists:**

Ms. Salina Air-Mesbah, Director, Ministry of Housing and Urban Affairs, Algeria;

Mr. M.A. Karimi, Governor General, Kerman Province, Iran;

Dr. Javier R. Pique, President of Peruvian Permanent Committee for Seismic Design, Peru;

Prof. Anand S Arya, Prof. Emirates, Indian Institute of Technology Roorkey, Seismic Advisor,  
Government of India, India;

Ms. Ileana Tureanu, Vice Minister, Minister of Transportation, Construction and Tourism, Romania;

Mr. Richard M. Okawa, Vice president of International Service, International Code Council, USA

# Policies for Safer Building / Housing

## Objectives

- To identify the key problems in policies and implementation mechanism towards safer building/housing dealing with new construction as well as retrofitting of large stock of existing vulnerable houses.
- To formulate policy to achieve the desired safety in and develop set of actions for reducing the risk of disasters owing to current unsafe construction practice in building houses to undertake in next ten years.
- To recommend appropriate strategy for developing and implementing region/country specific building codes that ensure safety against disasters.

## Brief overview of the theme

For protecting people's lives against disasters, particularly in earthquakes, the most effective measure would be to build safer houses. Earthquakes in last decades including 1995 Great Hansin-Awaji Earthquake underlined the importance of the safer housing. While building codes should certainly ensure the safety of new construction, there is need for addressing the problem of large stock of existing vulnerable houses. The rules, regulation and codes should properly address the region/country specific practices, opportunities, limitations and problems. Moreover, promoting safer building construction may not be achieved only through efforts on controlling by codes and regulation but also a bottom-up approach where convincing the house-owners on safety issues, providing easy technology to the local craftsmen should be accompanied with. In this context, integrating safety in housing construction requires a comprehensive strategy that includes implementation of building codes, public awareness programs, informal trainings and education programs at the community levels. This is particularly relevant to the case of non-engineered construction which shares major portion of the housing construction in the world.

These issues will be discussed in World Conference on Disaster Reduction (WCDR) during thematic session on "Policies for Safer Building/Housing" under the cluster 4 "Reducing the underlying risk factor".

The issues of discussion in the session will be

- Current practice of housing construction and building codes in different regions/countries and their specific characteristics
- Underlying risks of the practice and their causes
- Analysis of proper approaches to address the problem including technological advancement, development of appropriate building codes, ensuring the implementation of rules, regulation and codes, community awareness, technology transfer etc
- Formulation of proper strategy and plan of action
- Lesson learned and account of best practices

## **1. Summary of the session's presentations and discussions**

Session II focused on policies for improving the safety of housing and buildings in case of a disaster. Organized by the Housing Bureau of Japan's Ministry of Land, Infrastructure and Transport and the United Nations Centre for Regional Development (UNCRD), the session was attended by representatives of seven countries from around the world.

The session began with a welcome address by the Director-General of the Housing Bureau of Japan's Ministry of Land, Infrastructure and Transport. The keynote speech was given by Dr. Tsuneo Okada, Professor Emeritus of the University of Tokyo. This was followed by presentations on housing/building safety policies and measures by each nation's representatives.

After the each nation's presentations, there was an exchange of views on priorities for measures to ensure the safety of housing and buildings. The recent earthquake off the west coast of Sumatra and tsunami in Indian Ocean was also discussed, including measures to reduce tsunami-related losses through evacuation into buildings.

The main purpose of buildings, especially housing, is to protect human beings from natural threats, such as wind, rain, cold temperature and the sun's rays. When buildings are themselves damaged by disasters, the impact on the lives of the occupants is enormous. Buildings are also a key infrastructure for increasingly sophisticated and complex social and economic activities, and so damage to buildings can severely impact social and economic activities in affected regions.

Damage to buildings caused by disasters can also seriously hinder relief and repairing efforts. For example, major hospitals and other facilities may become unable to function, roads may be blocked by wreckage, and there may be massive refugee flows. All of the countries that participated in Session II have experienced such problems due to earthquakes, storms and other disasters, and many other countries also face serious risks.

At the United Nations World Conference on Disaster Reduction, participants in Session II emphasize the importance of improving the disaster safety of housing and buildings as a basic and vital priority for the world's disaster reduction efforts. Participants also present ideas concerning the recent Sumatra offshore earthquake and tsunami, including the establishment of a tsunami warning system, and studies concerning the possibility of evacuation into medium to high-rise coastal buildings that have sufficient strength and height.

## **2. Primary issues**

Participants in Session II recognize the following as priorities for improving housing and building safety:

- 1) Analysis of hazards (earthquakes, storms, fires, tsunamis, etc.) affecting housing and buildings in

each region.

- 2) Development and improvement of building technology which reflect risks, building production practices and other factors in each region.
- 3) Establishment of building codes and standards and development of social systems to disseminate them and ensure their thorough implementation by an effective and efficient code administration and enforcement system.
- 4) Evaluation of seismic safety of existing buildings, and development and dissemination of technologies for strengthening and retrofit.
- 5) Prevention of secondary losses resulting from damage to buildings in disasters, and development of repairing technologies and systems.
- 6) Training of engineers, builders, administrators, etc.
- 7) Education for communities, building owners, developers, etc.
- 8) Formulation of building disaster prevention measures and development of implementation systems at the national and regional levels.
- 9) International cooperation at the research institute level, the national and regional government levels, and the community level.
- 10) Formulation of land use plans for future developments and urban expansion.

Initiatives concerning these priorities involve the following:

- 1) The number of safe buildings must be steadily increased by ensuring the safety of newly constructed housing and buildings, and by retrofitting existing housing and buildings that are currently at risk.
- 2) Affordable measures are needed that reflect regional differences in natural conditions, such as geography and climate, and in materials and construction methods used for housing and buildings.
- 3) Adequate structural strength and fire safety performance are essential as buildings become higher and larger because of urbanization. Maintenance and management capacity will also need to be developed.
- 4) There needs to be proper consideration for the safety of buildings that provide important functions in the event of disasters, such as hospitals and schools.
- 5) The use of medium to high-rise buildings for evacuation in case of tsunami should also be considered.
- 6) Initiatives are needed to raise community awareness of the need for disaster prevention measures for housing and buildings, and in particular for informing building owners of the need to improve existing housing and buildings that are at risk.

To prevent secondary disasters resulting from damage to buildings in the event of disasters, quick damage inspections and technology for repairing damaged buildings are needed.

### **3. Suggested targets and indicators to measure accomplishments**

#### **a) Proposal for Formulation of Action Plan**

Participants in Session 4.6 propose that each and every country should formulate and do follow-ups of a plan listing priority actions for the next 10 years in relation to disaster prevention for housing and buildings. These action plans may include the following:

- 1) By 2015, all new housing and buildings should be constructed in accordance with appropriate building codes, standards or guidelines.
- 2) By 2015, guidelines on the evaluation and retrofit of anti-seismic performance, etc. should be developed, improvement programs should be drawn up, and works should begin on improvements to enhance the disaster safety of existing housing and buildings.
- 3) By 2015, steps should be taken to ensure appropriate levels of disaster safety, including earthquake safety, in all key facilities such as schools and hospitals.

To achieve the above goal,

- 1) The appropriate policy of governments and actions on disaster risk management need to be framed.
- 2) Implementation strategy needs to include necessary legislation on hazard safety of habitation, land use zoning, and building bylaws with enforcement mechanisms.
- 3) All development projects need to have hazard assessment, safety measures and estimated costs.

#### **b) Proposal Concerning Formation of Building Disaster Reduction Network**

Participants in Session II consider that, in order to promote disaster reduction measures for housing and buildings, it would be useful to form a network comprised of researchers, engineers, private companies and organizations, central and regional governments, and regional communities, and that international collaboration is also essential for such a network.

#### **4. Partnership**

Participants in Session II agreed to continue to share information to help create a building disaster reduction network.

#### **5 Name, affiliation and contacts of presenters and titles of presentations**

##### 1) Keynote Speech:

- Prof. Emeritus, Tsuneo Okada, University of Tokyo

“Improvement of Seismic Safety of Building and Houses”

##### 2) Presentations by panellists

- Mr. Richard M. Okawa,

Vice president of International Services, International Code Council, USA

“Policies for Safer Building/Housing”

-Prof. Javier R. Pique, President of Peruvian Permanent Committee for Seismic Design, Peru



“Past, Present And Future: What Works In Achieving Safer Buildings”

-Mr. M.A. Karimi, Governor General, Kerman Province, Iran

“Policies for safer building in Bam”

-Prof. Dan Lungu, Director-General, National Building Research Institute,  
Ministry of Transportation, Construction and Tourism, Romania

“Seismic risk mitigation in the Romania ? Synergy from international projects”

-Ms. Saliha Ait-Mesbah, Director, Ministry of Housing and Urban Affairs, Algeria

“Development of the Algerian Seismic Design Code (RPA)”

-Prof. Anand S Arya, Prof. Emeritus, Indian Institute of Technology Roorkey,  
Seismic Advisor, Government of India, India

“Policies & Strategies for Safe Building/Housing Construction in India”

-Mr. Shigetaro Yamamoto, Director-General, Housing Bureau, MLIT

“Great Earthquakes Disaster Prevention Measures for Houses and Buildings”



**List of Assistants/Volunteers  
of  
UNCRD at UN WCDR**



Akiko Iizuka  
Eiji Yamamoto  
Eri Kasuya  
Kaori Matsuno  
Kenji Kurihara  
Maiko Takenaka  
Noriko Kotera  
Noriko Negoro  
Satoko Iritani  
Satoshi Nagata  
Shinichiro Kawasaki  
Shunsuke Nakagawa  
Tatsuo Usui  
Yoshisada Narita



*Special Thanks to These People*





### **United Nations Department of Economic and Social Affairs (UN/DESA)**

The Department of Economic and Social Affairs (UN/DESA) was created as the result of the consolidation of the Department of Policy Coordination and Sustainable Development, the Department for Economic and Social Information and Policy Analysis, and the Department for Development Support and Management Services.

UN/DESA is a vital interface between global policies in the economic, social and environmental spheres and national action. The Department works in three main interlinked areas: (i) it compiles, generates and analyses a wide range of economic, social and environmental data and information on which States Members of the United Nations draw to review common problems and to take stock of policy options; (ii) it facilitates the negotiations of Member States in many intergovernmental bodies on joint courses of action to address ongoing or emerging global challenges; and (iii) it advises interested Governments on the ways and means of translating policy frameworks developed in United Nations conferences and summits into programmes at the country level and, through technical assistance, helps build national capacities.



## About UNCRD

The United Nations Centre for Regional Development (UNCRD) was founded in 1971 in Nagoya, under an agreement between the United Nations and the Government of Japan. UNCRD has been striving to achieve the following objectives:

- Serve as a training and research centre;
- Provide advisory services;
- Promote global knowledge-sharing; and
- Encourage international cooperation among nations, regions, and organisations.

In 1999, The UNCRD Disaster Management Planning Hyogo Office was established in Kobe, where the Great Hanshin-Awaji Earthquake had claimed the lives of more than 6,000 people in 1995. The Hyogo Office focuses on various disaster management initiatives through multi-lateral collaboration at an international level while utilising the momentum created during the UNIDNDR 1990-99 (United Nations International Decade for Nature Disaster Reduction).

It promotes effective disaster mitigation, focusing on key elements of self-help, cooperation, and education through activities such as

- research projects;
- training and capacity-building;
- a series of international workshops; and
- advisory services.



## Contact Information

United Nations Centre for Regional Development (UNCRD)  
Disaster Management Planning Hyogo Office  
Hito-Mirai-Kan 5th Floor,1-5-2, Wakahama-kaigan-dori, Chuo-ku,  
Kobe 651-0073, JAPAN  
Tel:+81-78-262-5560  
Fax:+81-78-262-5568  
E-mail: [rep@hyogo.uncrd.or.jp](mailto:rep@hyogo.uncrd.or.jp)  
Web Site: <http://www.hyogo.uncrd.or.jp>