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CENTRE FOR REGIONAL DEVELOPMENT

DISASTER MANAGEMENT PLANNING
HYOGO OFFICE

**INTERNATIONAL WORKSHOP ON
EARTHQUAKE SAFER WORLD IN THE 21ST CENTURY:**

*Emphasis on Self-help, Cooperation and Education
through Community Involvement*

国際連合地域開発センター
防災計画兵庫事務所

PROCEEDINGS

**INTERNATIONAL WORKSHOP
ON
EARTHQUAKE SAFER WORLD IN THE 21ST CENTURY:**

*Emphasis on Self-help, Cooperation and Education
through Community Involvement*

Organized by

United Nations Centre for Regional Development
Disaster Management Planning Hyogo Office
RADIUS Japan Team
GeoHazards International
Hyogo Prefecture
Kobe City
The Yomiuri Shimbun

Supported by

The Great Hanshin-Awaji Earthquake Memorial Research Institute
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JAPAN**

NOTE

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UNCRD's Role

UNCRD's Disaster Management Planning Programme was initiated in 1985. Progress in regional development has led to a better and safer living environment, but it has also made the environment more vulnerable to natural hazards. The programme's research and training projects aim to support local government, non-government, and academic institutions in creating partnership with communities in developing countries for disaster management planning. Our programme's goal is twofold: (1) improve the capacity of communities to develop and implement disaster management plans and (2) strengthen public awareness of natural hazards.



UNCRD has supported the activities of the United Nations International Decade for Natural Disaster Reduction (IDNDR 1990-2000). UNCRD's programmes have incorporated pre-disaster management methods such as preparedness, mitigation, and prevention. For example, the Mega-City Risk Assessment Project in China, the Integrated Approach to Cyclone Disaster Management in Bangladesh, and "Quake Busters" educational software for children have been important components of the decade.



In April 1999, UNCRD's Disaster Management Planning Programme moved from Nagoya to a new office in Hyogo Prefecture, where the Great Hanshin-Awaji Earthquake disaster occurred on January 17, 1995 and its residents are now attempting to redevelop their city. The new Hyogo Office will examine the reconstruction process in Hyogo and other disaster-damaged areas in developing countries as well as carry out the following programmes to fulfill the concept behind IDNDR of "establishing disaster prevention as an essential element of sustainable development."

(1) To provide advisory services to communities vulnerable to disasters in cooperation with governmental agencies, NGOs, and academic institutions alike;

(2) To improve safety of core community facilities such as schools and hospitals, and cultural heritage that may be damaged by disasters; and

(3) To identify and learn best practices in disaster management at the community level and disseminate them through workshops and information technology.



Workshop Program

Day 1: Monday, January 29, 2001

8:30	Registration	
9:00	Welcome Address	<i>M. Kobayashi (UNCRD) and R. Shaw (EdM)</i>
9:15	Orientation	<i>W. D. Iwan, California Institute of Technology</i>
9:30	Overview	<i>B. Tucker, GeoHazards International</i>
10:00	Discussion	
10:15	Break	
10:45	Session I: GESI Results	Three parallel working group discussions
12:15	Lunch	
13:30	Session I: GESI Results <i>Moderator:</i>	Plenary session for reporting of working group discussions <i>W. D. Iwan, California Institute of Technology</i>
14:30	Session II: GESI Process	Three parallel working group discussions
16:00	Break	
16:30	Session II: GESI Process <i>Moderator:</i>	Plenary Session <i>W. D. Iwan, California Institute of Technology</i>
17:30	Directions for the next day	

Day 2: Tuesday, January 30, 2001

8:30	Session III: GESI Future	Three parallel working group discussions
10:00	Break	
10:15	Session III: GESI Future <i>Moderator:</i>	Plenary Session for reporting of working group discussion <i>W. D. Iwan, California Institute of Technology</i>
11:30	Session IV: GESI Conclusions <i>Moderator:</i>	Plenary Session Panel Discussion (Group Leaders and Reporters) <i>W. D. Iwan, California Institute of Technology</i>
12:00	Lunch	
13:00	Session V: RADIUS <i>Session Coordinator:</i>	How the RADIUS results are useful to cities <i>E. Tsunozaki</i>
13:00	Guidelines	<i>C. Villacis, GeoHazards International</i>
	- Presentation of the tool	
	- Impact of the tool application to actual cities	
	- Discussion and recommendations	
14:00	Software	<i>S. Segawa and F. Kaneko, Oyo Corporation</i>
	- Presentation of the tool	
	- Examples of tool application to actual cities	
	- Discussion and recommendations	

15:00	Discussion	<i>Moderator:</i>	<i>T. Tsugawa, Kajima Corporation</i>
15:30	Break		
16:00	<i>Session VI: School Safety Program</i>		
		<i>Session Coordinator:</i>	<i>A. S. Arya, Roorkee University</i>
16:00	Concept and philosophy		<i>A. S. Arya, Roorkee University</i>
16:10	Experiences of Bandung, Indonesia		<i>H. Rahayu, Bandung Institute of Technology</i>
16:25	Experiences of Bengkulu, Indonesia		<i>C. Zakariyah, Mayor of Bengkulu</i>
			<i>H. Rahayu, Bandung Institute of Technology</i>
16:40	Comments on Indonesia		<i>T. Boen, Teddy Boen Consultant</i>
16:50	Experiences in Pakistan		<i>A. Shaban, Aga Khan Education Service</i>
17:05	Experiences of Chamoli, India		<i>V. K. Sharma, NCDM, M. Gupta, SEEDS,</i> <i>A. S. Arya, Roorkee University</i>
17:20	Experiences of Kathmandu, Nepal		<i>A. M. Dixit, NSET</i>
17:35	Experiences of Tashkent, Uzbekistan		<i>V. Santoro, I. GE. S.</i> <i>B. Nurtaev, Academy of Science of Uzbekistan</i>
17:50	Experiences in Macedonia		<i>Z. Milutinovich, IAIS-Skopje</i>
18:05	Issues and Concern: Discussion Session		
		<i>Moderator:</i>	<i>A. S. Arya, Roorkee University</i>
18:45	Summary and future direction		<i>A. S. Arya, Roorkee University</i>

Day 3: International Symposium, Wednesday, January 31, 2001

- 9:30 *Opening Session* *Coordinator:* *M. Kobayashi, UNCRD DMP*
- 9:30 Welcome Address *H. Kato, The Yomiuri Shimbun, JAPAN*
- 9:40 Opening Remarks *Y. Kimura, UNCRD*
- 9:50 Keynote Address *T. Katayama, NIED, JAPAN*
- 10:20 Coffee Break
- 10:30 *Overview* *Coordinator:* *R. Shaw, EDM-RIKEN, JAPAN*
- 10:30 RADIUS Initiative *K. Okazaki, MLIT, JAPAN*
- 11:00 Global Earthquake Safety Initiative *B. Tucker, GHI, USA*
- 11:30 School Earthquake Safety Program *A. S. Arya, Roorkee University, INDIA*
- 12:00 Lunch
- 13:00 Panel Discussion 1: *Experiences on Self-help and Cooperation*
- Moderator:* *K. Okazaki, MLIT, JAPAN*
- Panelist:* *K. Purbani, Municipality of Bandung, INDONESIA*
- I. Ikawa, City of Kobe, JAPAN*
- R. Santiago, Metropolitan Manila, PHILIPPINES*
- V. Vaidya, Mumbai Municipal Corporation, INDIA*
- A. Rosquillas, Municipality of Tijuana, MEXICO*
- 14:15 Panel Discussion 2: *Experiences on Education and Community Involvement*
- Moderator:* *R. Shaw, EDM-RIKEN, JAPAN*
- Panelist:* *A. Shaban, AKES, PAKISTAN*
- A. Dixit, NSET, NEPAL*
- B. Villacis, GHI, USA*
- K. Onishii, Peace Winds, JAPAN*
- S. Tateishi, MOFA, JAPAN*
- 15:30 Coffee Break
- 15:45 Panel Discussion 3: *Steps Towards Earthquake Safer World in the 21st Century*
- Moderator:* *M. Kobayashi (UNCRD-DMP)*
- Panelist:* *A. S. Arya, Roorkee University, INDIA*
- T. Brennan, USAID/OFDA, USA*
- M. Erdik, Bogazici University, TURKEY*
- H. Kameda, EDM-RIKEN, JAPAN*
- T. Okada, AIJ, JAPAN*
- T. Saito, Hyogo Prefecture, JAPAN*
- 18:15-18:45 *Press Briefing*

Overview

The workshop is aimed to focus on the specific issues of earthquake disaster with special emphasis on three key elements: self-help, cooperation and education, which can and should be combined together for the community involvement in disaster mitigation. These are exemplified by the experiences in developing countries through three unique approaches: the RADIUS (Risk Assessment Tools for Diagnosis of Urban Areas against Seismic Disasters) Initiative, the GESI (Global Earthquake Safety Initiative), and the School Earthquake Safety Program.

During the United Nations International Decade for Natural Disaster Reduction (IDNDR: 1990-2000), the self-help and cooperation in the earthquake disaster mitigation has been emphasized through the practical implementation of case studies in developing countries in the RADIUS Initiative. The financial and technical assistance came from the Government of Japan. It aimed to promote worldwide activities for the reduction of urban seismic risk, which is growing rapidly, particularly in developing countries. The primary goal of the initiative is to help people understand their seismic risk and raise public awareness as the first step towards seismic risk reduction. The major focus was to promote capacity building in the local government at the city level. A diverse group of related stakeholders in the earthquake threatened cities gathered to prepare an earthquake scenario and a risk management plan, which can be implemented by the available resources.

The Global Earthquake Safety Initiative (GESI) focuses on helping cities around the world to recognize and reduce their risk of life loss in earthquakes. This initiative builds on the work of the RADIUS Initiative, and is targeted to the decision makers and disaster managers in the earthquake threatened cities worldwide. The initiative has five major objectives: (1) To express the risk of life loss in earthquakes in an easy-to-understand form for non-technical people, (2) To measure trends in a city's risk of life loss in earthquakes and to identify broad causes of those trends, (3) To produce a tool to broadly evaluate the effectiveness of different mitigation activities in reducing expected future earthquake casualties, (4) To identify the risk of life loss in public schools and the potential for reducing that risk, and (5) To promote communication about best practices in earthquake risk reduction among cities around the world. Around 25 major earthquake threatened cities are participating in this initiative.

The School Earthquake Safety Program is aimed to promote self-help and education for disaster management by building safe and sustainable community. The participatory approach in the community development and training and capacity building among the local people are the key focus areas of the program. Schools have been found as the key element for the community involvement in Japan and other countries worldwide. School not only provides education to the children, a strong school also helps in emergency shelters immediately after the earthquake. Through this school-strengthening program, a community based training program is formulated to spread the knowledge of earthquake resistant traditional technologies rooted in culture and heritage.

The 21st century is visualized as an era of information, knowledge and education. It is necessary to create proper awareness at different levels of the community for a safer future. This workshop is the first step towards that non-ending process. It is found through the recent experiences of devastating earthquakes that a self-taught, educated and trained community is capable to cope with the natural phenomenon.

Project Cities

RADIUS (Risk Assessment Tools for Diagnosis of Urban Areas against Seismic Disasters) Initiative

- Asia: Bandung (Indonesia)
Tashkent (Uzbekistan)
Zigong (China)
- Europe and Africa: Addis Ababa (Ethiopia)
Izmir (Turkey)
Skopje (TFYR Macedonia)
- Latin America: Antofagasta (Chile)
Guayaquil (Ecuador)
Tijuana (Mexico)



GESI (Global Earthquake Safety Initiative)

- Americas: Vancouver (Canada), Antofagasta (Chile), Santiago (Chile), Guayaquil (Ecuador), Quito (Ecuador), San Salvador (El Salvador), Tijuana (Mexico), Mexicali (Mexico)
- Asia: New Delhi (India), Mumbai (India), Bandung (Indonesia), Jakarta (Indonesia), Kobe (Japan), Nagoya (Japan), Tokyo (Japan), Kathmandu (Nepal), Islamabad (Pakistan), Manila (Philippines), Tashkent (Uzbekistan)
- Middle East: Istanbul (Turkey), Izmir (Turkey)



School Earthquake Safety Program

- Retrofit and Education
Chamoli (India)
Kathmandu (Nepal)
- Retrofit
Bengkulu (Indonesia)
- Education
Bandung (Indonesia)
Tashkent (Uzbekistan)



GESI Session

GESI OVERVIEW

The Global Earthquake Safety Initiative (GESI) focuses on helping cities around the world recognize and reduce their risk of life loss in earthquakes. This initiative builds on the work of the RADIUS project of the UN International Decade for Natural Disaster Reduction (IDNDR) and years of research by UNCRD, GHI and others.

The initiative has four objectives:

- (1) To express urban earthquake risk in lay terms,
- (2) To measure trends in the urban earthquake risk of two dozen of the world's major cities,
- (3) To evaluate the effectiveness of various means of reducing earthquake casualties, and
- (4) To highlight the increasing earthquake risk of schools of developing countries and the potential for reducing that risk.

This initiative only focuses on the risk of *life loss* in earthquakes. Earthquakes cause many other important losses – including economic damage, political upheaval and cultural destruction – which are not considered in this initiative.

Data has been collected on a wide range of topics that affect life loss in earthquakes for approximately two dozen major cities around the world. Those data are currently being analyzed using methods developed for GESI and preliminary results will be released on December 15, 2000. Two regional training and evaluation workshops in January and March of 2001 will complete phase 1 of GESI.

UNCRD, GHI and many individuals and organizations in the participating cities have actively been involved in implementing GESI in 2000. Major funding for the first phase of the initiative comes from UNCRD, GHI and the United States Office for Foreign Disaster Assistance. Additional support has come from many institutions and individuals.

Background

The UN IDNDR Secretariat conducted the RADIUS project in 1998 and 1999 to promote activities for reducing earthquake disasters in urban areas around the world. The project worked in-depth to promote risk reduction in nine cities – Addis Ababa, Ethiopia; Antofagasta, Chile; Bandung, Indonesia; Guayaquil, Ecuador; Izmir, Turkey; Skopje, TFYR Macedonia; Tashkent, Uzbekistan; Tijuana, Mexico; and Zigong, China – using prior work by GHI and its partners as a model. It also conducted a study of the risk in 20 cities from all corners of the globe. One of the main objectives of the RADIUS project is to develop practical tools for seismic risk management, which could be applied to any earthquake-prone city in the world. The tool developed currently is said quite useful to analyze city's earthquake risk but rather complex to lay people including city decision-makers.

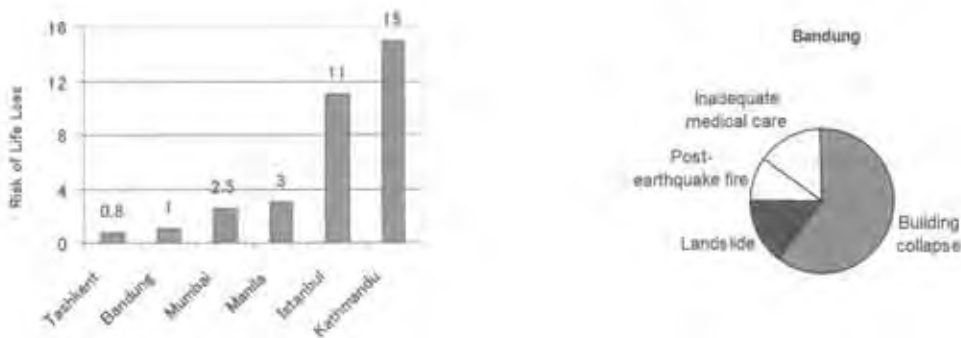
Objectives

Objective (1): To express urban earthquake risk in lay terms.

It is critical that earthquake-threatened communities and their political leaders understand the risk they face.

This initiative synthesizes technical information about earthquakes into a simple characterization of that risk. Specifically, this initiative compares major, earthquake-threatened cities according to their risk of life loss in earthquakes. It also identifies the most critical factors of that risk. The example below shows how such information might be presented.

The same method that is used to compare the risk of life loss of cities around the world can also be used to compare the risk of cities within a country or a region. It can even be used to compare the risk of life loss among different neighborhoods in a city.

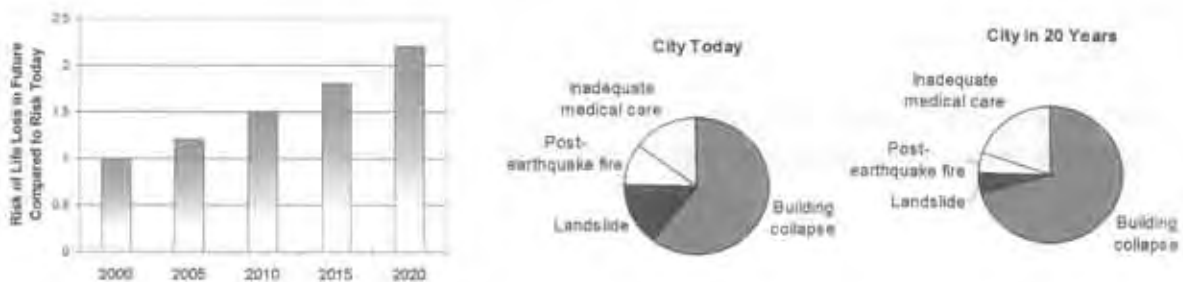


In the chart on the left, the risk of life loss in five cities – Tashkent, Mumbai, Manila, Istanbul and Kathmandu – is compared to the risk of life loss in Bandung. It indicates that an individual in Kathmandu is fifteen times more likely to die in an earthquake over a set period of time than an individual in Bandung. The pie chart on the right shows which factors are likely to be responsible for the most deaths in future Bandung earthquakes.

(Note: These charts are not based on real data and are for illustrative purposes only.)

Objective (2): To measure trends in the urban earthquake risk of two dozen of the world's major cities

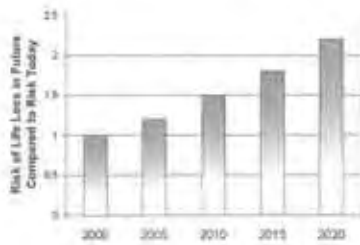
Cities are constantly changing, and so are their earthquake risks. The second objective of this initiative is to measure whether a city's risk of life loss due to earthquakes is increasing or decreasing, and by how much. This information can also be presented in a series of charts, as shown in the example below.



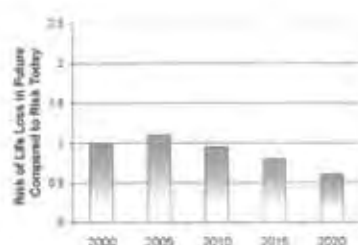
This example compares a city today to the same city in the future if current development patterns continue. For this city, the risk of life loss to an individual in an earthquake is increasing. The pie charts indicate that in 20 years, building collapse will account for a larger proportion of earthquake-caused deaths than today.

Objective (3): To evaluate the effectiveness of various means of reducing earthquake casualties

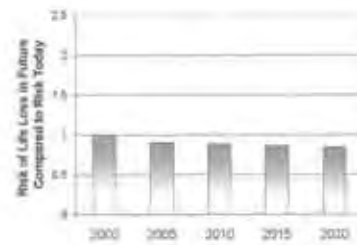
The most important reason for cities to understand their risk from earthquakes is to enable them to work to reduce that risk. However, it is not always easy to know how to reduce risk most effectively. The third objective of this project is to produce a tool that can help cities to evaluate which measures will save the most lives. Cities can combine this analysis with information about the costs of various measures to determine which risk reduction programs make sense for them. The example below shows the types of results this tool might produce for a city. A city can use these charts to compare the costs of various risk reduction options with their short-term and long-term benefits.



This chart shows a city's risk today and in the future if current activities remain unchanged,



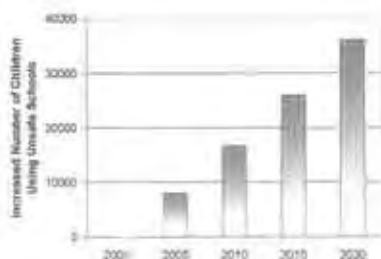
...compared to one possible mitigation action, such as if all new construction is built to an improved standard of safety,



...or compared to another option, perhaps if emergency response is improved by a certain amount.

Objective (4): To highlight the increasing earthquake risk of schools of developing countries and the potential for reducing that risk.

The tools that have been described in objectives 1 – 3 can be applied to the city as a whole or to particular elements of a city. The fourth objective of this project is to apply these tools to the public schools. Schools are an important yet frequently highly vulnerable component of society, and they can be a popular place for earthquake risk reduction activities to begin. Specifically, this initiative will compare the risk of life loss of school children in cities around the world. It identifies broadly which factors are likely to cause the most deaths in schools. The trends in school risk, i.e. whether that risk is rising or falling, will be measured and the effectiveness of various mitigation approaches in saving the lives of school children will be analyzed. The chart below shows how some of this information could be presented.



This chart indicates that the number of school children using unsafe schools will increase by nearly 40,000 in the next 25 years. Such a projection can be used to set a measurable, popular goal to be reached in the future,

Implementation

The activities of GESI Phase One appear in the schedule below.

Activity	Month:											
	1	2	3	4	5	6	7	8	9	10	11	12
1. Recruit cities to participate and identify key partners.	•	—	—	•								
2. Collect data.			•	—	—	—	—	•				
4. Compile and analyze data for initial cities.						•	—	•				
5. Internal review of initial results.								•				
6. Analyze remaining cities.								•	—			
7. Send preliminary results to partner cities.									•			
8. Conduct evaluation workshop in Japan.										•		
9. Conduct evaluation workshop in Latin America.												•

A representative of UNCRD or GHI visited each participating city to invite them to join the initiative. A Memorandum of Understanding for conducting the project was signed with most cities, and a contact organization and individual were identified. A second visit was made to each city to collect the required data. Eight questionnaires were developed for the project and the responses to these questionnaires were obtained through face-to-face interviews to local officers and experts, written responses, and referring to published sources. In many cities a local advisory committee, consists from technical people, was established to review the data collected and approve its use for the project. The list of topics on which data were collected appears below:

- Frequency and size of likely earthquakes
- Soil conditions
- Land use planning capacity
- Inventory of buildings and their seismic vulnerability
- Inventory of public school buildings
- City-wide emergency response capacity
- Emergency medical care capacity
- Fire fighting capacity
- Likelihood of post-earthquake fire
- Likelihood of post-earthquake landslides

The following cities are participating in phase one of GESI:

The Americas:

Canada: Vancouver
 Chile: Antofagasta, Santiago
 Ecuador: Guayaquil, Quito
 El Salvador: San Salvador
 Mexico: Mexicali, Tijuana

Europe:

Turkey: Istanbul, Izmir

Asia:

India: Delhi, Mumbai
 Indonesia: Bandung, Jakarta
 Japan: Kobe, Nagoya, Tokyo
 Nepal: Kathmandu
 Pakistan: Islamabad
 Philippines: Manila
 Uzbekistan: Tashkent

GESI RESULTS

The GESI project had been evaluated in two regional workshops, the Asian Regional Workshop was held in Kobe, Japan from January 29-31, and the Latin American Regional Workshop was held in Quito, Ecuador on March 5-7. The objectives of both workshops are: (1) To determine if the results of GESI are useful to cities and international developments organizations, (2) to understand how the results can be made more useful, (3) to discuss how the process of data collection and results dissemination can be improved, and (4) to recommend follow-up actions.



For each workshop, participants were divided into three working groups based on their involvement with the project and technical background. The first group was comprised of city representatives who had worked with the GESI team to collect data for their city, together with city government officials who would be involved with the implementation of the results of the project. The second working group included representatives from international aid agencies including USAID- OFDA, United Nations Center for Regional Development, the

International Strategy for Disaster Reduction (ISDR), and the World Health Organization. The third group of participants in the workshops was comprised of international experts, professors and scientists in the fields of engineering, seismology, and disaster management. In all, there were about 35 invited participants, as well as 30 others who participated in each workshop as observers.

The GESI Project was broken down into three topics, *Results*, *Process* and *Future*. Each topic was introduced to the groups in a discussion period lasting an hour and a half, followed by a plenary session in which a reporter from each group presented the group's findings and recommendations. The summaries presented by each

reporter were the basis for

an hour-long plenary discussion. At the end of each plenary discussion, the Moderator reviewed the major points and ideas that were generated by the combination of all three working groups. In the last session of the Workshop, which was a plenary session, a summary of each session was presented for review, to ensure that the conclusions of each session accurately represented the consensus of the participants. Following parts summarizes the discussion of the Asian workshop.



1. Results

The city representatives and the group of international aid agencies were asked in the first session to evaluate the usefulness of the results to their respective constituents, how they believed the results would be used, and how the results could be made more useful. They were also asked to comment on the implications that the results might have on future policy decisions concerning development practices, and the usefulness of focusing on and separating the school system out from the general city assessment.



The city representatives concluded that the GESI project has potential for being successful in its goal to be a simple tool that motivates action in implementing long-term mitigation measures. They indicated that more attention should be given to the mitigation recommendations, that more explanation of the results was necessary to prevent misunderstanding, and that it is important to prioritize actions so that resources are used

efficiently. The group concluded that this project would hold the attention of the international development agencies, and that would itself encourage action in the cities. The city representatives believed that by using a regional approach or a country-wide approach the results would be more comprehensible, as the cities would have a common cultural or economic basis. The group determined that separating out the school was essential, and that it might be useful to separate out and perform a separate assessment of hospital systems as well.

The suggestions from the city representatives for improving the methodology focused on the usefulness of the results. They reiterated that more explanation needed to accompany the results to ensure that the conclusions have meaning to local decision makers, and that it is important to improve the graphical representation of the results. As a tool to measure the increase or reduction of risk over time, it was suggested that a factor representing community involvement and general public awareness was needed, as these are the most effective means of reducing risk. As well, the city representatives emphasized the need to validate the data to ensure that the results do not overestimate or underestimate the risk, leading to complacency among cities with low risk, and were concerned that the results did not convey the seriousness of the problem among cities assessed to have lower risk than others. It was believed that it would benefit the cities to have the results circulated to the academic and professional communities, as well as released to the government agencies.



The international aid agencies agreed that the results are useful and will contribute to global risk reduction efforts by motivating both the leaders and the general public. They believed that the project would be more useful in reducing risk by helping set priorities within a city than by ranking the cities, although the ranking was still seen as valuable. From the perspective of international aid agencies, they indicated that the scope of the project needed to be expanded to many more cities (eg. Hundreds), which would help the agencies set global priorities. While they were concerned that the project did not address risk in rural areas, they acknowledged that most of the world's populations is now urban.

The international aid organizations believed that the results could be used in many different ways. They believed that the GESI results would be useful as a tool for prioritizing efforts and to illustrate and rank the available options in order of importance. They indicate that if properly disseminated, the results could cause a temporary 'splash', but that it would not be ultimately effective unless mitigation was included and emphasized. There was concern that without proper dissemination, the initiative would remain an ineffective, academic study, and that a clear dissemination strategy is needed along with a means of implementing the strategy on the local, regional and international levels. Assuming proper dissemination, there was strong concurrence that this is a valuable and important public awareness tool, that there should be focus on lifeline systems in each community, and that periodic updates would be necessary to assess the changing risk of each city.

Methodology



In the first session, *Results*, the third group, the international experts, was asked to perform a technical evaluation of the methodology and to assess the reasonableness of the results. This session began with a detailed explanation of the existing methodology that augmented the technical write-up that had been circulated to the participants before the beginning of the Symposium (Appendix 1).

The conclusions of this group were that a loss estimation model is a reasonable choice for the methodology as it is both scientifically and technically defensible. They also concluded that conceptually, a comparison of risk between the cities is reasonable, and that the specific comparison that was presented appeared reasonable. They believed that the

model needed refinement, and offered tangible suggestions. These included investigating other indicators for shaking such as MMI or MSK, incorporating a shape factor or a variable expressing percentage of city affected, and including separate estimates depending on the time of day or presenting the results as maximum and minimum possible estimates. This final suggestion was deemed especially important when working with the school system. Other suggestions included incorporating a variable that accounted for the effectiveness of unofficial Search and Rescue efforts dependent on the weight of the buildings and to ensure that the sequence of events in an earthquake is accounted for to prevent the double counting of casualties.

Results/Methodology Plenary Session

The Moderator summarized the finding of the three groups as follows. The results were determined by all the groups to be useful, with the evaluation of mitigation options being an essential part of the results package. The presentation of the results is critical, both in terms of how and where the results are presented as well as the mode and manner of the presentation style. The methodology should be a continually upgraded, and the process of validating data and controlling the quality of data is critical. The general consensus was that the scope of the project needs to be expanded, both to include greater number of cities, other communities within each city, more segments of society and rural areas.



Following the summary, there was discussion of the sensitivity of the model, both in terms of changes with time and to modifications in the original data set, and difficulties arising from the presently small sample set. It was mentioned that to be effective, the results would have to be disaggregated, more specific, and include a broad-brush cost-benefit analysis of mitigation efforts, but that the cost of doing more detailed studies should be balanced against the ability to work in more cities. It was suggested that the simplified loss estimation model that is the basis for the methodology could be expanded to a multi risk approach. The final comments concerned the usefulness of the GESI project and results. GESI was deemed to be an effective basis for further study, a starting point to measure mitigation efforts within a city, a tool for public awareness, or a way for international aid organizations to measure the effectiveness of projects in progress or upon their completion.



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II. Process

In the second session, the city representatives and the representatives of the international aid agencies were asked to evaluate the overall process and approach used by the GESI team, with particular emphasis on the data collection process and the use of 'official' and 'unofficial' data. Participants were also asked to discuss the release of the results, whether it should be private or public, and in what medium the results should be released.

The group of city representatives concluded that it is best to use the official data, augmented as needed by unofficial data, but that the entire set must be reviewed by formal institutions (governments, institutions and universities) or the results might be questioned. They acknowledged that this means that different types of data will be handled with different accuracy levels and different tolerances for professional analysis. They gave examples of scientific data versus legal data versus statistical data.

Results of the GESI project should be released to the public after the data has been reviewed and modified, as

appropriate, by feedback from the cities. Although this may not result in standard data between cities, the group decided that it was more important to have a city-based approach with consensus within each city, and an internal validation of the data set and results.



The group of city representatives gave suggestions for the improvement of the both the data collection process and the improvement of the results package and presentation. For the data collection process, they indicated that it is important to ensure that both formal and informal sectors are involved, that there should be a scaling factor to have an answer that comes between 'yes' and 'no', and that more explanation of the data was needed so that the respondent will understand the purpose of the questionnaire and how the information will be used in the generation of results. In reference to

improving the results, the city representatives indicated that it is important that the results, as presented, be labeled as preliminary until it is possible to attempt to create a consensus among different sectors in each city to complete the validation process. They suggested that this would best be accomplished by a third visit to each city, through a regionally held workshop or through interactions with local organizations.

The international aid agencies also indicated that it would be best to use a combination of official and unofficial data, and that it is important to qualify the present results as preliminary. They stated that the quality of the data and the sources of the data are linked, and every source (and therefore data set) has strengths and weaknesses, from accuracy to political agendas to capacity and completeness. They proposed that it is the role of the unbiased assessor to triangulate through the data differences, choosing the appropriate data based on best practices, while remaining transparent by publicly releasing the process of data selection. When significant conflict remains on a particular data value, the suggestion was to try both and see how the results differ, and make the best selection or present the results as a possible range of values.

In reference to the release of the results, the group determined that the presentation in general, is in a good, easily understood format. They suggested that the results be released in a workshop convened by a neutral source such as the UN where it can be thoroughly explained to prevent misunderstandings and associated complications. Before public release, it would be important to have a session to review and validate the data to get agreement with the various governments and agencies so that ownership for the project will shift to the cities. This process of validation and transfer of ownership would help the project to be accepted and allow for future assessments to be undertaken. They thought that this should be the process for the present 21 cities, but that as the project scales up, it would be necessary to build partnerships and alliances to complete all aspects of the process, and that the Kobe Workshop should be seen as the inception of these partnerships and alliances.



In the second session, the group of international experts was asked to participate in an exercise to independently assess the validity of the city rankings based on expert opinion. The conclusion from this exercise was that a minimum data set would need to be supplied to experts in order for them to make an independent assessment which would include seismicity, details about the building stock and information about population and density. They felt that even with such data, the exercise as presented would validate the procedure, but not the data, and concluded that such an exercise was neither necessary nor useful. As alternatives for this independent assessment exercise, they recommended assembling a different group of experts, applying a different loss estimation model to a subset of the same cities or conducting a detailed city-specific analysis in a very small subset of cities.

Process Plenary Session

Many ideas were suggested during the plenary session that expanded upon all the concepts presented by the reporters. In reference to the proposed expert-opinion ranking exercise, it was discussed that the comparison of cities may not be the most important aspect of the project or results, and that the processes of data collection and result generation serve an important purpose. With reference to the use of official and unofficial data, it was pointed out that governments would never endorse unofficial data if it means they have to respond to the underlying problems, so it is more important to use the same sources from city to city for data agreement. It was also reiterated that one of the strengths of the project is as an independent assessment using the best available data, and not limited to 'official' or endorsed data. It was mentioned that the participation of both professionals and government representatives is important, the first to ensure the accuracy of the data and the second to instigate action.



III. Future

In the third session, all three groups were asked to comment on the future of the GESI project, whether it should be continued and if so, how implementation should be improved, how forecasts of mitigation efforts could be bolstered, and the role that school assessment should play in future generations of the project.

The city representatives concluded that the project should be continued, and that efforts to expand the project were needed, perhaps focusing on regional or country-wide comparisons. They indicated that the project should continue to independently assess the schools apart from the rest of the city, and should expand to cover hospitals as well. They felt that the comparison is a necessary part of the project, as it allows for the results to be presented in a positive manner to the cities, it establishes a base-line for quality control of data, and that the comparison within specific groupings could be useful for the cities.

In terms of suggestions for overall improvements to the project, the group of city representatives indicated that it is essential to involve international aid organizations from the beginning of the project. They also felt that with the expansion to include more cities, it would be necessary to decentralize the project at the regional level, which would involve an increased effort to train representatives in the methodology and process. They believed that the project would be more effective if it focused more on the vulnerability and mitigation options of the individual city than on the ranking aspects. In concluding remarks, the group indicated that the effort and scope of the project would best be served by an international fund set up for the project.



The international aid agencies agreed that the project should be continued, and that it needed to be expanded to incorporate many more cities. Their conclusion was that this process of scaling-up should be accomplished by initiating training at regional focal points, building local partnerships to facilitate data collection, and having GeoHazards International serve as the compilation point for the data and to continue to perform the analysis.

In terms of effectively motivating action, the international aid organizations indicated that the GESI project should make general recommendations for risk reduction in cities, and support the priorities determined by the cities instead of making specific or detailed forecasts or policy recommendations. About the project in general, they indicated that it is important to complete periodic updates

of the rankings and city scores, that would be helpful to suggest measures for follow-up in specific sectors such as schools, and that Geohazards International should seek future partnerships for funding from international organizations such as JICA, ADB, USAID, and ECHO.



The group of international experts presented similar findings. Their conclusions concerning the future of the GESI project were that it should include more cities, with the benefit of being able to compare cities at the regional and local levels. They further suggested that the scope and method should be expanded to allow for a cost-benefit analysis of mitigation measures, that Geohazards International should work at creating partnerships with local institutions at the local level and that Geohazards International should make improvements to the methodology as suggested in the first session.

Future Plenary Session

There was general agreement that the methodology is useful and would continue to be useful, but needs to be expanded to include a much larger sample of cities. This would require a new process model, with regional and national groups heading the data collection and results dissemination efforts, while the analysis and results processes would continue to be completed by GHI. In turn the decentralization of the general process will require increased effort to maintain the data quality, with a new emphasis on uniformity and consideration given to both official and unofficial data. The group indicated that the results, even in abstract form, are useful, but that it would be better to disaggregate the mitigation measures. While the comparisons between cities was seen as useful, it should focus more on country or regional comparisons, or between cities of similar socio-economic standings. The project should continue to focus on the loss of life, but an improvement would be to add a broad-brush indicator of the cost of mitigation measures. It is important that the data and results be periodically updated to adequately express the changing risk in each city.

IV. Conclusions

The fourth session of the GESI Workshop differed from the first three in that it was not preceded by a working group discussion period. In this session, each of the three workshop leaders presented a ten-minute summary of one of the sessions, highlighting the major points and conclusions.

Results

Objectives:

To determine if the results or GESI are useful to cities and international aid agencies,
To understand how the results can be made more useful.

All groups agreed that the results are useful, and that GESI is a successful project to motivate risk reduction, raise awareness, and establish funding priorities and strategies for use of resources. It was concluded that the application of the GESI methodology to specific systems, such as schools and hospitals, is very valuable.

There were many suggestions to improve the usefulness of the results, including a constant, continual update of the model. It was emphasized that the presentation of the results need to be tailored to the needs and interests of the stakeholders, which would include the general public, the local and national governments and international aid agencies. The quality control and validation of the data was stressed as a priority. It was concluded that



the scope of the project needed to expand to include significantly more cities, and to extend the method to include other arenas, such as rural areas or to be specific within countries or regions. Assessing the school system separately from the general city assessment was deemed necessary.

Process

Objectives:

To review the quality of the data (both official and unofficial)

To review the release of the results

To offer suggestions for improving the overall process of GESI.

The conclusions of the second session were that it was essential to ensure the authenticity of the data. To ensure that this continues when the project expands to hundreds of cities and the data collection process is decentralized, it will be important to ensure that everyone involved in the data collection process is familiar with the methodology. Official data should be used when possible, however, as an independent assessment it is important to use the best available data, even if this means using unofficial data. In all cases, it will be important to have the data set reviewed by formal institutions. To get the best possible data, it will be necessary to work with professionals, universities and government agencies.



The group determined that it is necessary to release the results, but there was disagreement on whether they should be released in their present form, or if they should wait for modification before release. There was general consensus that continued and increased communications with the city would be useful, and that the results should be released at the city level. Ultimately, it was believed that the best means of disseminating the results would be through a series of workshops convened by a neutral third party such as the United Nations.

Suggestions for improving the overall process included increasing the amount of explanation and training given to people involved in the process of collecting data, and ensuring that there is involvement of both formal and informal sectors in each city. The importance of building partnerships between different international, national and local agencies was also stressed.

Future

Objectives:

To review the future recommendations for the GESI project

For the third session, the results were grouped by those ideas or suggestions for which there was general agreement, and areas in which debate remained. All groups concluded that the GESI project should be continued, and that the current methodology was acceptable with modification. There was consensus that the particular emphasis on schools was important, and that this effort should be extended to other sectors of the community. The inclusion of the risk management measures was concluded to be essential. It was determined that the methodology should be applied to significantly more cities, and that to accomplish this it would be necessary to decentralize the data collection process and build partnerships with local organizations. Finally, it was concluded that the project must commit to periodically updating the data sets and results, and publish those findings under the UN auspices.



Many issues were left undecided. There were remaining questions on the inclusion of the rankings, and the proper grouping of cities to be ranked. There was no single method to accomplish the expansion of the project to significantly more cities, and whether the analysis methodology should be released and decentralized as well as the data collection process. Finally, there was disagreement as to whether and to what extent cost-benefit studies and development of policy recommendations should be included in GESI or left to more detailed, post-GESI studies. It was mentioned that it was important to continue with the application and development of the project even if perfect agreement could not be attained.

V. Additional Comments and Addendums

Many thoughts and ideas were suggested during breaks and at other times in the Symposium. We have attempted to include as many ideas as possible that were not included earlier in the discussion.

- There was a suggestion to compare earthquake risk within a city to risks from other hazards within that city.
- Involve local earthquake people in the dissemination process so that they don't get defensive, but rather can present themselves as the concerned individuals in the city who are involved in addressing the problem.
- Present the results with understandable units on the y-axis. Suggestions included % deaths, expected total number of deaths for a design earthquake. It was also suggested to use the x-axis to provide additional information (e.g., put % deaths on the y-axis and population on the x-axis, then plot each city as a point).
- Use an integrated, multifaceted approach to publicize the results--TV, internet, newspapers, magazines, etc.





RADIUS Session

RADIUS OVERVIEW (Reference: RADIUS Report 2000: Kenji Okazaki)

I. Objective and Scheme

The United Nations General Assembly designated the 1990s as the "International Decade for Natural Disaster Reduction (IDNDR)" to reduce loss of life, property damage, and social and economic disruption caused by natural disasters. The IDNDR secretariat launched the **RADIUS (Risk Assessment Tools for Diagnosis of Urban Areas against Seismic Disasters)** initiative in 1996, with financial and technical assistance from the Government of Japan. It aimed to promote worldwide activities for the reduction of urban seismic risk, which is growing rapidly, particularly in developing countries. The primary goal of the initiative is to help people understand their seismic risk and raise public awareness as the first step towards seismic risk reduction.

The direct objectives of RADIUS were:

- A) To develop earthquake damage scenarios and action plans in nine case-study cities selected worldwide;
- B) To develop practical tools for seismic risk management, which could be applied to any earthquake-prone city in the world;
- C) To conduct a comparative study to understand urban seismic risk around the world; and
- D) To promote information exchange for seismic risk mitigation at city level.

The results of applying the tools will be useful to decision makers and government officials who are responsible for disaster prevention and disaster preparedness in their respective cities:

- To decide priorities for urban planning, land-use planning, and building regulations;
- To prepare an improvement plan for existing urban structures such as reinforcement (retrofitting) of vulnerable buildings and infrastructure, securing of open spaces and emergency roads; and
- To prepare for emergency activities such as life saving, fire fighting, and emergency transportation.

The results will also be useful to communities, NGOs, and citizens:

- To understand the vulnerability of the area where they live;
- To understand how to behave in case of an earthquake; and
- To participate in preparing plans for disaster prevention.

The results will be useful to semi-public companies that maintain urban infrastructure to understand the necessity of prevention and preparedness. The results will also be useful to business leaders, building owners, developers, real estate agents, and insurance/reinsurance companies so that they may minimize the damage on their human resources as well as properties for their business.

Timetable

Year 1996

- Planning of the initiative

Year 1997

- Invitation for the case-study cities
- Pre-selection of the 20 cities

- Establishment of the STC subcommittee for RADIUS
- Selection of the three international institutes

Year 1998

- Selection of the nine case-study cities (January)
- Implementation of the case studies (1.5 years from February)
 - Kick-off meetings and earthquake damage scenario workshops were held
- Training seminars in Japan (May/June)
- Comparative study on "understanding urban seismic risk in the world" (1 year from April)
- RADIUS Workshop at the International Conference in Yerevan, Armenia (September)

Year 1999

- Implementation of the case studies (continued)
- Action plan workshops were held
- Comparative study on "understanding urban seismic risk in the world" (continued)
- Development of practical tools
- RADIUS Workshop in the IDNDR Programme Forum in Geneva (July)
- International RADIUS Symposium in Tijuana, Mexico (October)

Year 2000

- Publications
- Evaluation of the case studies

II. Case Studies

1. Objectives

The direct objectives of the case studies were:

- To develop an **earthquake damage scenario** which describes the consequence of a possible earthquakes; and
- To prepare a **risk management plan** and propose an **action plan** for earthquake disaster mitigation.

The case studies aimed:

- To raise the awareness of decision makers and the public to seismic risk;
- To transfer appropriate technologies to the cities;
- To set up a local infrastructure for a sustainable plan for earthquake disaster mitigation;
- To promote multidisciplinary collaboration within the local governments as well as between government officers and scientists; and
- To promote worldwide interaction with other earthquake-prone cities.

In order to develop earthquake damage scenarios, the physical damage to buildings and infrastructure, human losses in the city, as well as the effects on urban functions and activities were first estimated. The earthquake damage scenario describes the various stages of the city's damage during and after a probable earthquake. Human loss was estimated, based on the damage of buildings and infrastructure, the efficiency of relief activities, and outbreaks of fires.

A risk management plan was prepared, based on the scenario. It contained the following aspects:

- Urban development plan to mitigate seismic disasters;
- Improvement plan for the existing urban structures such as reinforcement (retrofitting) of vulnerable buildings and infrastructures, securing of open spaces and emergency roads, and designation of areas for evacuation;
- Emergency activities such as life saving, fire fighting, emergency transportation, and assistance to suffering people;
- Individual countermeasures for important facilities; and
- Dissemination of information to, and training of, the public and private sectors.

Finally, an "Action Plan" was proposed. It prioritized the necessary actions so that they could be implemented soon after the project. Therefore, the action plan had to be practical. It may be a first small step for each community in the city. The scenario and action plan were disseminated to relevant organizations and the public.

III. Development of Practical Tools

One of the major objectives of the RADIUS initiative was to develop two kinds of practical tools for urban seismic risk management, based on the experience of the nine case studies implemented worldwide. One of the tools is a set of Guidelines for Implementation of Risk Management Projects. It is expected that the guidelines will be used:

- To explain the philosophy and methodologies adopted by RADIUS;
- To assist in reading, understanding, and interpreting the RADIUS case study reports; and
- To provide general guidelines on how RADIUS-type Risk Management Projects can be implemented in other cities.

GHI developed the guidelines, based on the experiences in Quito (Ecuador), Kathmandu (Nepal), and the nine RADIUS case studies. The emphasis was put on:

- A) How to involve decision makers, relevant organizations/institutions, communities, private sectors and scientists in a multidisciplinary way;
- B) How to practically transfer scientific data into decision making information;
- C) How to disseminate information and educate people, particularly through the mass media;
- D) How to prepare a risk management plan as well as an action plan; and
- E) What to do as the next step.

A computer programme for simplified Earthquake Damage Estimation was developed by the OYO Group (OYO Corporation and OYO International). It is intended that this programme will be used as a practical tool to aid users in understanding the seismic vulnerability of their own cities and encourage the start of disaster prevention programmes. The results of the application of the programme should be regarded as a preliminary estimation. The programme requires input of a simple data set and provides visual results with user-friendly prompts and help functions. Input data are population, building types, ground types, and lifeline facilities. Outputs are seismic intensity (MMI), building damage, lifeline damage and casualties, which are shown with tables and maps. Users can apply a historical earthquake such as Tangshan (1976, China), Kobe (1995, Japan), Kocaeli (1999, Turkey) and Chichi (1999, Taiwan) as a hypothetical scenario earthquake. The programme is available on CD-ROM and can be downloaded from the RADIUS home page, along with other outcomes, including guidelines and reports of the RADIUS project.



RADIUS Case Study City Map and RADIUS Tool

IV. Comparative Study on Urban Seismic Risk

In April 1998, the IDNDR secretariat and GeoHazards International (GHI) launched the Understanding Urban Seismic Risk Around the World (UUSRAW) project, with the participation of more than 70 member cities worldwide that are seismically active. The study aimed:

- A) To provide a systematic comparative assessment of the magnitude, causes, and ways to manage earthquake risk in cities worldwide;
- B) To identify cities that are facing similar earthquake risk challenges and foster partnerships among them; and
- C) To provide a forum in which cities could share their earthquake risk management experiences using a consistent, systematic framework for discussion.

The Earthquake Disaster Risk Index (EDRI) provided a framework for the UUSRAW project. The EDRI compared metropolitan areas according to the magnitude and nature of their earthquake disaster risk, which is analyzed using five main factors, namely, "hazard", "vulnerability", "exposure", "external context" and "emergency response and recovery". The study report includes (a) a summary of the assessments of earthquake risk and risk management in the participating cities; (b) a compilation of the city profiles; (c) a compilation of specific risk management efforts undertaken in the participating cities; and (d) a summary of the feedback received from the project participants throughout the course of the project. The project established a worldwide network of earthquake professionals that can support continued work in comparative urban earthquake risk assessment.

V. Information Exchange

More than 30 cities, all of which had carried out a seismic risk assessment or were in the process of doing so with independent resources, joined RADIUS as "Associate Cities" for information exchange and international cooperation. Most of the associate cities kindly wrote a "city report" and sent it to the IDNDR secretariat. The reports are presented on the RADIUS home page.

35 Associate Cities

Algiers (Algeria), Baoji (China), Beijing (China), Bogota (Colombia), Cairns (Australia), Calcutta (India), Dalian (China), Damascus (Syria), Gyumri (Armenia), Hefei (China), Istanbul (Turkey), Jabalpur (India), Kathmandu (Nepal), Khartoum (Sudan), Lima (Peru), Manizales (Colombia), Mumbai (India), Newcastle (Australia), Pereira (Colombia), Pimpri (India), Quito (Ecuador), St. George's (Grenada), San Juan (Argentina), Shiraz (Iran), Sochi (Russia), Spitak (Armenia), Suva (Fiji), Tai'an (China), Tangshan (China), Tehran (Iran), Tianjin (China), Tuscan Region (Italy), Ulaanbaatar (Mongolia), Urumqi (China), Yerevan (Armenia)

"IDNDR highlights" was published monthly by the IDNDR secretariat and sent to a number of governments and experts by e-mail. The progress of RADIUS was reported in the publication each month. The RADIUS Web site was created in early 1998, and the information on the initiative was fully revised and updated in 1999. This was carried out with the technical assistance of GHI. Available on the site are full reports of the nine case studies, reports from the three international institutes, city reports from the associate cities, the developed practical tools, the result of the comparative study, and the proceedings of the RADIUS Symposium in Tijuana. The address of the RADIUS home page is: <http://www.geohaz.org/radius>

The IDNDR home page, which was created later, also started presenting the result of RADIUS. It now contains major information on RADIUS. The address is: <http://www.idndr.org>

PRESENTATION OF RADIUS RESULTS: Session V

Presentation of the RADIUS Tools

Carlos Villacís of GeoHazards International (GHI), made a presentation entitled, "Guidelines for the Implementation of Risk Management Projects." According to his presentation, most current efforts and resources are being expended in technical evaluations that are not being used. The participation of decision makers and the general public need to be included in effective risk management. The RADIUS guidelines describe the processes to assess a city's seismic risk, prepare a plan to reduce the city's risk, and set up the conditions for implementing the plan. He stressed that preparing for the implementation involved all sectors of the community and required informing the community about the project, seeking potential funding -- especially "local funding" -- and creating or strengthening local risk management institutions. He closed his session by pointing out that although this tool would provide valuable guidelines, there were other technical, financial, institutional, political, and even circumstantial requirements that needed to be considered.



Impact of the Application of the RADIUS Tools to Actual Cities



Antonio Rosquillas, of the Municipality of Tijuana, made a presentation entitled, "Impact of the RADIUS Project on Earthquake Mitigation Activities in Tijuana, Mexico." He mentioned that at the RADIUS project's onset, the community was indifferent about the project and the government lacked interest in it. Everybody underestimated the potential risk due to earthquakes. After several meetings, most government institutions accepted that Tijuana has some seismic risk. Many NGOs joined the project. The Health Sector meets once a month. Today, RADIUS is a permanent city program. Multi-disciplinary work has been promoted. There is a close partnership between technical and government people. Tijuana's work is recognized and used as a model, both nationally and internationally.

Muzaffer Tuncag, of the Turkish Chamber of Civil Engineers, presented "Earthquake Mitigation Activities in Izmir." Throughout the RADIUS Project, different meetings, which assembled representatives several organizations and communities, were organized at the Municipality. The public realized that Izmir is the only city that has tried mitigation measures in Turkey. The RADIUS steering committee distributed CD copies of the city's "master plan" to city institutions. The governor's office published the disaster map, and drills are planned to be carried out in certain participating communities. As a result of the city's past experience with the RADIUS project, Izmir was chosen as a candidate for a new pilot project supported by the World Bank and UN agencies. Muzaffer Tuncag also introduced educative courses and certification programs for foremen and construction superintendents.



Evaluation of the RADIUS Case Studies

Carlos Villacís of GeoHazards International, presented "Impact of the Application of the Methodology Adopted by RADIUS." According to his presentation, an effective risk management project has to (1) transfer ownership, (2) build local capacity, and (3) involve the various community sectors. In this respect, RADIUS was an effective project and has generated local, long-term initiatives. Although the project approach seems to be effective, there seems to be a problem regarding who should lead its continuation. There is also room for improvement on how to use/disseminate the project tools.



Presentation of the Software

Shukyo Segawa of Oyo Corporation explained "Overview of the RADIUS Tool - Simple Damage Estimation Software"-demonstrating the program with data on Kobe city. The purpose of software is (1) to facilitate preliminary estimation of earthquake damage in developing countries, (2) to be used by city administrations and the general public and (3) to raise awareness on earthquake risk.



Input data to the program are familiar to the users in their own cities and output data from the program are seismic intensity, building damage, lifeline damage, and casualties. A summary table and thematic map show the results.

This program is very useful as an educational tool, but users should consider that the program outputs might be used for preliminary earthquake damage estimation only. It should not be used for a detailed and exact site-specific earthquake analysis or detailed microzonation. Experts in the respective fields should be consulted for a precise estimation of loss values.

Examples of Tool Application to Actual Cities



programs.

Zoran Milutinovic, of the Institute of Earthquake Engineering and Engineering Seismology at the University "St. Cyril and Methodius" in Skopje (IZIIS-Skopje), presented an effort of the European council and twenty-two multi-national centers, operating in the Europe under the auspicious of twenty-five governments. He found, through comparison of other tools, that a RADIUS tool has strong potential due to its ability to facilitate the data collection of a city's actual elements by authorities such as the city civil protection and to help them develop their disaster response and emergency management

However, the unknowns about the RADIUS tool are the program's capacity and whether it can be enlarged. Mr. Milutinovic mentioned that the tool has pre-defined functions and pre-defined parameters that should be overwritten and generalized.

Etsuko Tsunozaki, of the ISDR (International Strategies for Disaster Reduction) and the coordinator of the RADIUS session, made her interventions. She commented that RADIUS was a project of the IDNDR (International Decade for Natural Disaster Reduction). After the IDNDR concluded in 2000, the ISDR secretariat succeeded the IDNDR. The ISDR intends to elaborate the RADIUS methodology, including the tools, and it is seeking the possibility to continue the efforts of RADIUS. Since the ISDR is also interested in the vulnerability analysis for different hazards, it is cooperating with UNDP to prepare the multi-hazard study. It is hoped that the ISDR can also help to promote the GESI project as part of the ISDR initiative.





School Session

OVERVIEW

Background

Earthquake risk of urban areas in developing countries is gradually increasing. This is partly because of the continued migration of population from village to city areas and the unplanned growth of cities. This population pressure combined with many other factors, compel improper construction, and many important buildings like schools are built rapidly and without proper seismic design. The United Nations IDNDR (International Decade for Natural Disaster Reduction) has been able to make significant progress in raising

awareness among diverse communities regarding the risk and effects of natural disasters. A strong shift has been observed from post-disaster rehabilitation and reconstruction to pre-disaster mitigation and preparedness policy. As a part of the preparedness process, strengthening school buildings and disaster education have been emphasized.



School and children in Bengkulu, Indonesia



Disaster Education Material
Bandung, Indonesia

Through a recent survey, it has been found that more than 40% of the population in developing countries lies in the age group of 6 to 18. By addressing the school age community, it is possible to establish the culture of prevention and mitigation. Children take a very strong message back to their homes, and, through them, it is possible to address a wide range of the population.

Earthquake-threatened communities need earthquake-resistant schools to protect their children and teachers. Moreover, an earthquake-resistant school can be used as relief and rehabilitation shelter during an earthquake. Also, a strong leadership of teachers

has been proven very useful in dealing with emergency situations. Schools supported by active teachers can play an important role in community training, and building partnership among different sectors of the community. This is important not only during emergency situations, but also before and after the events.

Two important issues are related to school earthquake safety: the first are physical and socio-economic aspects, and the second is disaster education for students, teachers and communities. These issues are very much inter-related and should be addressed in an integrated manner.

Objective

The basic problems related to disaster mitigation and preparedness are the lack of training, awareness, education, and self-reliance within the community. An appropriately educated and trained community is much more capable to cope with natural disasters. In other words, disaster management and related efforts are very much part of a sustainable development process. The current project aims to promote the mitigation culture through community participation and an empowerment process tailored to residents with specific needs. If successful, the capacity building efforts will enhance the social development of the most vulnerable populations in each of the project cities and create models for future replication.

The overall objective of the proposed project is to conduct a comprehensive earthquake disaster mitigation training program for capacity building and community development, with a special focus on the school system and the construction industry in participating project cities. This will be the first step to reach a long-term goal of building the capacity of communities in developing countries to properly prepare for and respond to earthquakes.

The five specific objectives of the project are to: (a) evaluate the vulnerability of selected school buildings in each city, (b) recommend appropriate designs and affordable means to strengthen vulnerable schools, (c) retrofit demonstration school(s) using appropriate or improved traditional and local technology, (d) provide training to workers of local building industry who build schools and residential dwellings, and (e) prepare appropriate disaster education materials for school children, teachers and communities and use them for the training and education purposes.

The education departments in each country are expected to arrange special classes in the schools to disseminate information and to make provisions for disaster education in the curriculum.

The direct beneficiaries of the school retrofit and training program will be school children, their families, teachers, school authorities, local engineers, masons, and homeowners. The indirect beneficiaries are government organizations and the community as a whole.



Retrofitted school in Kathmandu, Nepal



Primary School in Chamoli, India

Project Cities

Five cities have been selected to participate in the project. These are Bandung and Bengkulu (Indonesia), Chamoli (India), Kathmandu (Nepal) and Tashkent (Uzbekistan). These cities vary in size and population, as well as in their national and external context (refer to Section 5). Among these cities, two cities (Bandung and Tashkent) were chosen from the RADIUS (Risk Assessment Tools for Diagnosis of Urban Areas Against Seismic Disaster) case studies. In these cities, the RADIUS project produced a seismic scenario and earthquake preparedness plan, which involves diverse sectors of the communities in risk reduction activities. Because of their disparities, different approaches will be taken in different cities. A detailed scope of work by the cities is described in Section 4.



School in Tashkent, Uzbekistan

The existing RADIUS network and the availability of suitable counterparts in each city ensure proper coordination of different activities in the cities. Since existing efforts in each city are designed to complement each other, duplication of the efforts is not expected. The following matrix shows the actor-activity relationship.

Cities	Activities			
	Education and Training of Students and Teachers	Training of Local Engineers and Masons	Study of School Buildings and Retrofit	Others
Bengkulu	UNCRD	UNCRD	Local TV company	Local NGOs are undertaking the school retrofit program
Bandung	UNCRD	IUDMP	UNESCO	RADIUS developed a damage scenario for the city
Chamoli	UNCRD	UNCRD	UNCRD	HUDCO is undertaking the school retrofit program
Kathmandu	UNCRD	UNCRD	KVERMP	KVERMP developed a damage scenario for the city
Tashkent	UNCRD and UNESCO	UNCRD and UNESCO	UNCRD and UNESCO	RADIUS developed a damage scenario for the city

Abbreviations: IUDMP (Indonesian Urban Disaster Mitigation Program), KVERMP (Kathmandu Valley Earthquake Risk Mitigation Program), HUDCO (Housing and Urban Development Corporation)

RESULTS: Session VI: School Earthquake Safety Programme

At the beginning of the session, **Anand Arya** of Roorkee University introduced his experiences on an educational building program in various countries and pointed out that most people do not have a fair idea of the various grades of damage as defined by the MSK Scale of Seismic Intensities, nor of the appropriate actions to be taken corresponding to the actual grade of damage. He also mentioned that a common tendency has been for engineers to recommend dismantling and reconstructing buildings, when, in many cases, it may not be the necessary action. People are not aware that the advantage of retrofitting includes its relatively small cost.



From Bandung (Indonesia), **Harkunti Rahayu** of the Institute Technology of Bandung presented an earthquake disaster education effort that has been carried out in schools in Bandung. She then explained the vulnerability of schools, which is worsened by the poor conditions of school buildings, infrastructure and facilities, including poor quality and over-population, and she urged the continuation of the school earthquake safety program. She also presented the UNCRD-ITB School Program of Bengkulu City and pointed out that the community-based participation was a good approach and should be continued. She finished her presentation with the future disaster management plan of Bengkulu City, which includes establishing and developing a shelter for victims, building

earthquake resistant medical facilities and preparing a concept of earthquake resistant building developments. The presentation was made on behalf of the **Mayor of Bengkulu**. **Teddy Boen** then explained school building structures and mentioned that school building damage was due mainly to poor quality control and the lack of maintenance.



Abid Shaban of the Aga Khan Education System of Pakistan introduced the Self Help School Construction Program carried out in Pakistan. He noted that community participation allows for construction skills and techniques to be left in the village, and these become part of a lasting knowledge that can be used in the construction of homes or in the construction of other facilities. He also stressed the need to share information among all cities for further improvement of disaster management.

Vinod Sharma of the NCDM (India) explained the experiences of earthquake-hit Chamoli, India and reported that in rural areas animal casualties are high and agricultural activities are affected; therefore, these issues should also be considered. He then noted that education and training is very much needed for public awareness and that available knowledge should be shared.



Amod Dixit of NSET-Nepal then explained the background and the results of the School Earthquake Safety Program, which was conducted in Kathmandu Valley. He presented the retrofitted schools and the method of retrofitting. He also mentioned that the project involved many institutions, including the central government, local government and the local community. He emphasized the importance of the training of masons and disaster education of children and teachers, which have raised the awareness of villages in Kathmandu Valley significantly.



Bakhtiar Nurtaev of the Institute of Geology and Geophysics in Uzbekistan next described the overall condition of schools in Tashkent and explained that schools in Tashkent are relatively big (at least 1000



students in one school), a condition that makes retrofitting very costly. He also mentioned that although the Emergency Ministry and the Education Ministry are working at disaster management, no elementary school education materials exist. Next, **Valter Santoro**, an international consultant of UNESCO for the Tashkent School Project, presented on the types of school buildings in Tashkent and pointed out some technical problems that they face.



Lastly, **Zoran Milutinovic** of the St. Cyril and Methodius University explained that a certain level of awareness and preparedness of schools and pupils has been achieved through the education system of the Republic of Macedonia, as a result of activities of specialized NGO's and specialized UN agencies. For further improvement, due to the presently low economic potential of the country, it is preferable to establish the proper emergency preparedness of the education system.

At the end of the session, **Anand Arya** mentioned the importance and difficulties of fundraising for retrofitting projects and urged the creation of a fund that could be used for this purpose. He also pointed out the importance of raising public awareness and said, "We have to generate guidance materials for teachers and children." He closed the session stressing "primary schools are closest to the community and give a strong message to parents and the community."



International Symposium

OVERVIEW

The international symposium was divided into five parts: the opening session, the overview session, and three panel discussions. The opening session aimed to provide a welcome address for the workshop and a keynote address on progressing toward an earthquake safe world. The overview session provided an overview of three projects: RADIUS, GESI and School Earthquake Safety. The first panel discussion highlighted the major issues and concerns of earthquake disaster management at the city level and its possible solutions from the government perspective. The second panel discussion provided a few success stories of community involvement at the grass-root level in earthquake risk reduction efforts. The third panel discussion covered the broad aspects of earthquake disaster management and its trend in the 21st century with respect to key elements such as self-help, cooperation and education.

Opening Session

Masami Kobayashi of UNCRD-DMP coordinated the opening session, and the speakers included **Hiroshi Kato** of The Yomiuri Shimbun, Osaka, **Yo Kimura** of UNCRD and **Tsuneo Katayama** of the Education, Science and Technology Ministry's National Research Institute for Earth Science and Disaster Prevention.



Hirohisa Kato mentioned in his welcome address that six years had passed since the Great Hanshin-Awaji Earthquake struck Kobe on 17th January, 1995, and that The Yomiuri Shimbun has continued to report the process of rehabilitation in Kobe. He also said that it is their important mission to report on the lessons learned in earthquakes not only in Japan, but also all over the world; to prevent similar tragedies from happening again.

Yo Kimura said that this workshop was a joint effort of communities, media, governments, as well as the United Nations, which has a particular-significance because this is the way international efforts should be conducted in the future. He added that the most important purpose of this kind of workshop was assembling knowledge and experiences and that the accumulated information should be put into action to prepare for the next major incident, no matter where it happens.



Tsuneo Katayama argued that lessons from past earthquakes were not sufficiently disseminated to the general public. For example, most of the victims of the Indian earthquake would have had very little, if any, knowledge of the lessons learned in the Turkey earthquake, even though the research was reported around the world. Therefore, information should be even more widely disseminated so that all people have access to it. He also focused on rescue activities in El Salvador and India and pointed out that we need more powerful international institutions to coordinate fundraising and support the activities, because it is impossible for a small group of people to fight natural phenomenon such as large earthquakes.

Overview Session

The session was coordinated by **Rajib Shaw** of EDM-RIKEN, and the speakers included **Kenji Okazaki** of the Ministry of Land Infrastructure and Transport, Government of Japan, **Brian Tucker** of GeoHazards International and **Anand Arya** of Roorkee University.



Kenji Okazaki emphasized that lost lives cannot be rescued afterwards, but we can keep the death toll to a minimum through basic disaster management before the event. RADIUS transferred ownership to local people and promoted the capacity of local risk management. Moreover, many local people were involved with RADIUS, and this involvement was the most valuable asset of the project. His hope was that RADIUS would become an initiative and standard that could be continued worldwide.



Brian Tucker presented the example that in Kathmandu, Nepal a child attending public school has a four hundred times greater chance of dying due to an earthquake over his/her lifetime than a child attending a public school in Kobe. He explained that GESI concentrates on life loss and should continue to provide a focus on the vulnerability of schools. GESI should involve local, national and regional organizations to collect data, regularly update the assessments of cities and disseminate the results at international conferences, ideally hosted by a U.N. organization.



Anand Arya of Roorkee University, introduced Kobe's case of the Japanese Government increasing a subsidy for the rehabilitation of schools to two-thirds of the costs after the earthquake. Now school buildings are required to be designed for one and a quarter times the horizontal strength of the older buildings in order to not only secure safety, but also to function as shelters after the disaster. He also emphasized that the safety plans of schools are paramount, because schools, especially primary schools, are the closest to the community.

Two more brief reports on the recent earthquakes in El Salvador and India were presented.

Amy Young, of GeoHazards International, reported that the earthquake in El Salvador occurred on 13 January, 2001 and that El Salvador really did learn a lesson from the terrible earthquake in 1986, so that new construction had almost no damage. However, more than 500 landslides caused the greatest damage and billions of dollars will be needed to help El Salvador recover from the quake. She also said GeoHazards International had previously indicated El Salvador's landslide risk through GESI and other studies. Such projects will allow local government and communities to receive the information they need to prevent these kinds of the tragedies from happening again.





Ravi Sinha, of the Indian Institute of Technology, reported on the earthquake that hit the west of India on 26 January, 2001. The closest city to the epicenter was Bhuj -- which was known to be in a seismically prone area, so this earthquake should not come as a surprise. He pleaded that obvious and similar lessons were being learned everywhere and that we already have knowledge to help cities prepare against earthquakes. However, people cannot make their communities more disaster resistant if the knowledge is not implemented or action is not taken at local levels. He noted that today there was an earthquake in Gujarat, tomorrow there will be one somewhere else, and that we have to focus on sustainable, long-term disaster management as an international effort.



Hazard Map of India



Damages of buildings in Ahmedabad, India

(Presented by Ravi Sinha)

Panel Discussion 1

The first panel discussion highlighted the major issues and concerns of earthquake disaster management at the city level and its possible solutions from the government perspective. It focused on how local governments are developing plans for risk management and carrying them out on a self-help basis, involving the representatives of the communities. It also focused on how they are cooperating with other people, such as experts, scientists, decision makers, and representatives from relevant organizations and communities. Through the discussion, the panelists tried to identify what would be the keys to promote self-help activities and cooperation at local levels.



The discussion was moderated by **Kenji Okazaki** of the Ministry of Land Infrastructure and Transport of the Government of Japan. The panelists consisted of representatives from cities of different size, population, geographic location and culture. The panel included the following city government officers:

Kamalia Purbani is the responsible person for the RADIUS project in Bandung. She has also been deeply involved in the GESI project in the Bandung. Ms. Purbani has worked very closely with the local university and is well aware of the problems and prospects in Bandung for earthquake disaster mitigation.

Kazuo Ikawa is Chief of the Disaster Management Department of the city of Kobe. He has direct experience in disaster management during and after the Great Hanshin Awaji Earthquake, 1995. For the last several years, he has been actively involved in the reconstruction and recovery process, and he has been a great supporter of disaster mitigation activities in the city. Mr. Ikawa provided deep insight on the recovery process following an earthquake.

Ramon Santiago is Chief of the Disaster Management Department of the Metro Manila Development Authority. He oversees actual emergency operations of Metropolitan Manila, and he has a deep interest in the disaster management aspects of the city. He played a vital role in strengthening the city's disaster management department, and he has focused deeply on mitigation aspects. He focused on the actual problems of a metropolitan city in a developing country.

Vilas Vaidya is the Chief of the Disaster Management Department of the Mumbai (previously named "Bombay") Municipal Corporation and has taken a leadership role in strengthening the disaster management department of the city. He has been a great advocate of the need for pre-disaster mitigation processes and has facilitated multilateral cooperation within the city. He focused on his experiences of dealing with the problems of mega-cities.

Antonio Rosquillas is the Chief of the Disaster Management Office in Tijuana, and he has been actively participating in the RADIUS project. He relayed his experiences during the RADIUS project, especially the interdisciplinary approach, and the steps for sustaining the project.

RESULTS



Kamalia Purbani of Bandung focused on three basic concepts of decentralization in Indonesia: (1) giving back the power to the people, (2) helping the city to stand alone (self-help) and (3) shifting the role of government from rowing to steering.

Conditions of basic education facilities in Bandung are as follows: (1) the city has a dense population -- the population is 2.4 million, (2) most infrastructure and public buildings were constructed without respect to earthquake codes and earthquake-safe

construction practices, and (3) the quality of most school buildings (especially elementary school buildings) is very poor.

Mitigation activities were introduced by three projects: the IUDMP project, RADIUS project, and UNESCO project. Sustainability and complementary efforts were the main lessons from these mitigation projects. Community awareness is a key point for the successful implementation of mitigation activities since it creates sustainability. One of the main RADIUS project results is the value of a strong cooperation between local government and academic institutions, which can complement each other.



Kazuo Ikawa of Kobe noted that when the Great Hanshin-Awaji Earthquake occurred it was hard for city officers to reach their place of employment. Therefore, counteraction was delayed. Due to this lesson, some lodgings were made in FY2000. These lodgings are for disaster management officers to stay in. In an emergency, city officers can reach their offices and attend to the disaster.

Also, a permanent Disaster Management Center was opened. By means of telephone, administrative wireless communication in an emergency (in broadcasting form), wireless communication, satellite communication, and computer communication, voice and literal information on disasters are gathered. Additionally, there is a plan to gather image information on disasters by means of helicopter. Taxi wireless, amateur wireless, and mail officers are also asked to gather information.

Kobe concluded some agreement with other cities to cooperate widely. In the case of the Great Hanshin-Awaji Earthquake, because water supply was out of order, fires could not be put out. This lesson was learned and 100-ton water tanks were constructed under parks and playgrounds of schools. Additionally, by means of rivers, ponds, the sea, and rainwater, water for fire fighting is maintained.

Practices for preventing disasters are carried out with the involvement of citizens. The "Disaster Mitigation and Welfare Community" has been organized in order to promote the cooperation of citizens. Their bases are "Local Welfare Centers." There are disaster mitigation courses to promote the cooperation of core staff in local communities with Kobe University.

Ramon Santiago focused on Metro Manila, which is the capital region of the Philippines. It has a large population, around 9.5 million, which is 15 % of the national population. Metro Manila is inviting the implementation of several programs in order to mitigate the effects of seismic phenomena. The Philippine government prescribes the application of an adoption of concepts and principles. Self-reliance and the use of mutual assistance are regarded as two key factors to cope with disasters. The Philippine Disaster Management Organization has been organized as multi-level, multi-agency, multi-disciplinary, and multi-sector.



There are several disaster mitigation programs, including the Metro Manila seismic telemetry network, strong motion array, mapping and paleo-seismology of active faults, microzonation of Metro Manila, repair and retrofitting of highways and bridges, etc. Disaster preparedness projects, continuing training of emergency response staff and hazard awareness, are also conducted.

After promoting self-help or self-reliance, the stronger commitment of the local government unit is found not to be dependent too much on the national government. As a result, there exist increased capacity, better decision-making, and increased participation. There still exist some needs, such as more resources and commitment for seismic hazard awareness, better planning skills, policy changes, etc.

Vilas Vaidya of Mumbai indicated that Mumbai is the capital of the Maharashtra state. The population of Mumbai was 12.6 million in the year 2000. Half of the population lives in slums. Mumbai is facing many disasters -- not only earthquakes, but also floods cyclones, epidemics, road accidents, fires, chemical and industrial disasters, and transport disasters. The Mumbai Disaster Management Plan is prepared by the head of the city government. It is based on GIS and effective policy analysis.



There are several efforts to prevent these disasters. These include preparation for natural and man-made disasters, studies of the consequences of earthquakes, identifying activities for disaster situations, and disaster management plans. Disaster mitigation plans were started, including scientific investigations for the realistic assesment of risk, preparation of a disaster management plan, and carrying out pilot projects to reduce certain risks. A comprehensive disaster management plan covers different types of disasters, sets up a suitable emergency communication network, facilitates temporary shelters to stranded commuters in order to minimize the effect of the disaster, and further improvemes the plan and its implementation mechanism.

Antonio Rosquillas of Tijuana started with the geographic location of the city in Mexico. Tijuana is 180 km from the San Andreas fault system. Many lessons were learned from RADIUS project. Building a team of people was a key factor. The workshops were a key factor for the project's development. Also, a multi-disciplinary approach was effective. Three earthquake drills played an important role in the decision-making process.



From January 1999 to October 2000, the continuity and adoption of the project to the city was attempted. The consequent project was called "The Tijuana RADIUS Project." It is now a part of the city's efforts to mitigate risk. In addition, school authorities have their own "RADIUS School Project," and the Health Department has its own "RADIUS Health Group." 230 people from 77 institutions participated in the workshops and drills.



Kenji Okazaki summarized the discussion as follows:

Five panelists from five cities made their presentation. Disaster Mitigation is very hard especially in mega-cities like Mumbai and Metro Manila. 30 to 40% of people in cities of developing countries live in slum areas. In these places, their first priority is not earthquake mitigation, but obtaining food and water for next day. In such a situation, it is very hard to do disaster mitigation.

From the point of view of cooperation, so many organizations take part in disaster mitigation, that they have a hard time. Some say, "Our work is done, the rest is none of our business," or "We cannot offer information." The panel representatives showed us how they carried out "self-help and cooperation" successfully.

Finally, from the point of view of international cooperation, the panelists offer some proposals of how to foster cooperation between cities, or how to transfer technology:

- (1) In Tijuana, the city invited experts from developed countries, and learned from their experience.
- (2) The city of Kobe thinks it is important to access information freely, so that citizens can prepare for disasters. Some say, "Damage expectation could cause panic." On the contrary, in many cases, disclosure of information seldom causes panic, but promotes disaster mitigation.
- (3) They have experience, and in some cities, they promote disaster mitigation. The difficulty is that the information is disclosed, but does not spread widely.

Panel Discussion 2

Panel discussion 2 very specifically focused on two aspects: cooperation and education for earthquake disaster mitigation. The panel discussion was moderated by **Rajib Shaw** of EDM-RIKEN, and the panelists consisted of representatives from several NGOs, from both developed and developing countries, and the Ministry of Foreign Affairs of Japan, which has a special thrust on grass-root level activities. This panel provided a few success stories regarding grass-root level community involvement in earthquake risk reduction efforts. The panel consisted of the following panelists:

Abid Shaban is the Chairman of the Aga Khan Education Service, and is specifically responsible for its work in the education sectors. The Aga Khan Foundation has a special focus on rural development, and it has been deeply involved in the development practices in different parts of Pakistan. He was requested to describe the school program, which the AKF has been carrying out in different parts of Pakistan. He will present on the motivation for and background on the project, along with its successes and the mechanism for the continuity of these efforts.

Amod M. Dixit is the Secretary of the National Society for Earthquake Technology (NSET) in Nepal. NSET is an NGO that promotes earthquake risk mitigation activities throughout the country. NSET has been very successful in implementing an earthquake risk mitigation program in Kathmandu Valley through a "scenario and action plan" approach. They have also done intensive work on school earthquake safety. He focused on NSET's projects, highlighting key points of their success. He also presented how the government and NGO partnership worked, and how it reached the community level.

Carlos Villacis is the Technical Director of GeoHazards International (GHI), a non-profit organization that has been deeply involved in the earthquake risk reduction process in developing countries. GHI's work started in Quito, Ecuador, continued in Central Asia and Kathmandu, Nepal and then in the UN IDNDR RADIUS Project. He provided an overview of GHI's work, the lessons learned through its experiences, and his vision for the role of NGOs/NPOs in promoting risk reduction activities. He also gave some direction on the sustainability of the efforts.

Hiroaki Ishii is a staff member of the non-government organization Peace Winds, which has been involved in overseas work dealing with different types of disasters, including man-made ones. He presented his experiences with the role of NGOs-NPOs in the development process. He also focused on the newly established Japan Platform, which is the basis for these types of work, and where the networking of non-government organizations has been proven to be very important.

Sairi Tateishi belongs to the Ministry of Foreign Affairs (MOFA) of Japan, where she is involved with grass-root projects funded by the Japanese Government. MOFA places a very strong emphasis on the importance of grass-root projects for basic needs like education, health, and the environment. She described the mechanism of this scheme and its effectiveness in promoting community-based activities in different countries. She also emphasized how non-governmental organizations took a leadership role in this initiative.

RESULTS

Abid Shaban of the Aga Khan Education Services shared his experiences as part of an NGO providing education in Pakistan. The NGO's major focus of operation is the northern area of Pakistan, close to the Himalaya and Karakorum Range and bordering China and Afghanistan. The area is extremely seismically active. According to the UBC code, it could be classified Zone 4. Fifteen years ago, a program was started called, "Self-help School Construction Program." In the program, a tremendous amount of community input was used at every stage of the



construction process and even in the post-construction process.

He expressed his gratitude to the government of Japan, to JICA, and other providers. Their support is like a vaccine and the disease is the earthquake. There is no Nescafe solution. These are really trail blazing, pioneering investments that have been made. He complimented the visionary steps necessary to provide this financial support.



Amod Dixit of NSET-Nepal stressed that schools were very quickly identified because of several reasons. As commented on by everyone, the school is the place where knowledge is passed onto parents, families, communities, and also government institutions. NSET's School Earthquake Program consists of retrofitting school buildings, training masons of local villages, and involving students and parents, along with the entire community, in addressing the problems and developing an earthquake preparedness plan for the school.

The approach is "community-based, low-technical, and low-cost" because it has been proven that only these conditions are accepted and replicated by other schools. The project's emphasis has shifted from only making the school building stronger to making the community and school system stronger against earthquakes. Ownership of the concept and the programs is transferred. The knowledge obtained from the technicians and managers should go into the community, synergy development and awareness raising.

Through the project, lessons are learned, and seismic engineering techniques are replicated in private housing projects. Thus, retrofitting and affordable solutions were demonstrated under Nepalese-can-do conditions. Low-cost technology is required. Otherwise, without implementing low-cost technology, it is necessary for the different community sectors to formally accept the process. An approach that is transparent and includes participation is very essential. Participation is necessary because there are 30,000 schools in Nepal and, without the participation of the community, it is impossible to reach them all – it does not seem that anything could be done within the century. If there is wide participation, the community is involved and, still, it seems that these many of these schools can be reached in a decade or so. Transparency is essential to develop trust and to allow people to get to know the program. Without that, it is impossible to do anything.

Carlos Villacis of GHI (USA) stated that the link between natural disasters and social and economic development has been ignored. Risk management has to be an integral part of the development process. Emergency response preparedness should not cease, but the focus should shift towards mitigation and risk reduction activities. Disasters are very complex problems that require multi-disciplinary work and solutions. The entire community must be involved.



Transfer of ownership means that reducing risk is the community's responsibility and not that of anyone else's (such as the UN, Japan or the US). Effective risk management initiatives should generate local sustainable actions and solutions. NGOs help keep focus, interest and motivation and ensure that the process is not interrupted by administrative changes. GHI is an independent non-profit organization based in California. Its mission is to reduce death and suffering caused by natural disasters in the world's most vulnerable communities.

Saori Tateishi of the Ministry of Foreign Affairs in Japan focused on the Grant Assistance Program for grassroots projects that was introduced in the fiscal year 1989 to meet the diverse aid requirements of developing countries. Under this scheme, overseas establishments or embassies of the Japanese governments with their in-depth knowledge of the conditions in their respective host countries play a key role in funding relatively small projects implemented by local public bodies, research or medical organizations, and NGOs of developing countries. Japanese NGOs operating abroad may also qualify for a grant if their activities

in the recipient countries are considered to be long-standing and well established at a grass roots level. Since the fiscal year 1995, applications by Japanese NGOs for a grant under the scheme may be made to the NGOs Assistance Division of the Ministry of Foreign Affairs. The applications are then forwarded to the appropriate diplomatic establishment in the subject countries. A grant application submitted by an NGO is assessed by the Japanese governmental establishment in the country concerned. Once an application has been approved, the NGO in question concludes a grant contract with the Japanese governmental establishment in the country concerned, receives the grant from the Japanese governmental establishment and procures the materials and equipment, etc.



Eligible projects of the scheme are those that benefit grass roots activities. The costs of constructing a building and procuring materials and equipment are mainly covered in the cost of a grass roots development cooperation project. Personnel and ordinary operational costs are not covered by the funds of this scheme. A double application for a grant and NGO project subsidy is forbidden. The priority fields for grants are (1) health and medical care, (2) primary education, (3) public welfare and environmental improvement and (4) poverty relief and income improvement as well as WID (women in development).



Hiroaki Ishii of Peace Winds, an NGO based in Japan and established in 1996, described the activities of the group, which focuses on aiding people who suffer from disputes, natural disasters, and poverty. Without a political or religious agenda, it especially aims to assist people who cannot live without outside help. Peace Winds obtains funds for its activities from citizen contributions, grants for grassroots projects from the Ministry of Foreign Affairs in Japan, additional funding from the Japanese government, and support of UN organizations.

In the case of the Kosovo disputes, Peace Winds delivered prefabricated houses that were used in Kobe to affected areas. Staff engineers supervised local staff in the construction of temporary houses. It also worked in North Iraq, East Timor, Mongolia, and Indonesia. A new scheme is shown which is termed the "Japan Platform." In this scheme, NGOs, the Japanese government, and the Japanese business community cooperate in order to effectively counteract disasters. In the case of emergency assistance, scale and speed are needed in order to support people effectively and timely. Such an activity was established last August. The first activity of the Japan Platform scheme was carried out after the Indian Earthquake. Each organization wanted to do this kind of activity, but they could not. By means of this scheme, they can. If this activity is successful, this scheme will be applied to other fields. As a result, it is hoped that the relation among NGOs, the Japanese government, and the business community of Japan becomes better.

After the presentation of the five panelists, **four students of Maiko High School** described their experiences in the the Great Hanshin-Awaji Earthquake. A student recalled she and her family lived in a shelter for four months. After that, they moved to a temporary house and lived there for four and half years. Recently, they returned to their original location and live in a new public house built by the city. She now feels more at ease, but there are some scars left by the quake. Near her home, reconstruction is only partially finished. Everyday, she hears the construction noise. The Great Hanshin-Awaji Earthquake is not a past event. It is remembered often.



In their school, "Present Society," a subject which focuses on disaster mitigation, is studied two hours a week. For example, a class is divided into four groups: the Hanshin-Awaji Earthquake group, the Turkey Earthquake

group, the Taiwan Earthquake group, and the Tottori Earthquake group. Each group gathers information, makes a presentation, and comments on what they've learned from each other. Some students give reports and presentations on the Usu Volcano or Miyake Island Volcano. At the beginning, students were at a loss for understanding its relevance, but the importance of self-help activities and cooperation is now understood by the students.

In January 17, 2001, the "Memorial Event" of the Great Hanshin-Awaji Earthquake was held. The Memorial Event consisted of a general meeting, subcommittee meetings, and a treat. In the general meeting, a psychological counselor lectured on the PTSD mechanism, the importance of mind-care, and how to carry out mind-care. In a subcommittee, it was learned that the railroads that were destroyed in the earthquake were reconstructed not only because of efforts by railroad and construction companies, but also because of the understanding and help of local citizens. The treat consisted of making sake-less soup. While some sufferers ate sake-less soup, they were reminded of the quake.



Miko High School will start an "Environmental and Disaster Mitigation Course" in FY2002. It is the first case of this type of course in Japanese high schools. Natural disasters exemplify the natural environment snarling at human beings. Disaster mitigation exemplifies protecting human lives and property against disasters. Environment and disaster mitigation are closely related. In this course, 2/3 of students' class load will consist of ordinary classes and 1/3 will consist of specialized classes. In their specialized classes, university instructors, NGOs, and business representatives will lecture. Students will also have field trips to the Nojima Fault and Quake Memorial Hall.

Rajib Shaw summarized the discussion as follows:



Some very important lessons were learned from NGOs in developing and developed countries, as well as from government participation through the NGO network. These are summarized into three points. The first point is, "What is the problem?" As Mr. Carlos Villacís pointed out, the disaster is a problem of great magnitude. It is not a technical problem nor a social problem, but a problem that is a mixture of these two types and is related to every aspect of our life. Thus, a disaster mitigation culture will start in every aspects of our life through education.

The second point is, "Who will solve the problem?" Many of our panelists have pointed out local participation. With local people who are living in the areas these panelists work in, they have to solve the problem. They have to know, "What is the problem? How can it be solved?" Some guidelines and tools can be provided. We can motivate local people, but they have to solve the problem.

The third important point is, "How do we solve the problem?" This is a very difficult question. It does not seem that there is a single answer. A process is necessary. There are many ways of solving this problem, but the key point is to promote a risk mitigation culture, which should focus on emergency management. Mr. Ishi mentioned that his organization had developed an excellent model for partnership. How can this approach of networking and partnerships of NGOs be engrained deeply into the society and the people, and be used to solve the problem of partnership of people themselves? So it seems that this is a very good model. Perhaps we can learn many things from this model.

Panel Discussion 3

Panel discussion 3 covered the broad aspects of earthquake disaster management and its trends in the 21st century with respect to the following key elements: self-help, cooperation and education. **Masami Kobayashi** of UNCRD-DMP was the moderator of the panel discussion. Brief profiles of the panelists are as follows:

Anand Arya is an Emeritus Professor of Roorkee University, India, and has been involved in the work and study of non-engineered constructions in developing countries. His recent work includes the Vulnerability Atlas of India and focuses on the training masons in earthquake resistant construction in India and Nepal. He has been awarded the United Nations Sasakawa Award. Professor Arya was involved in several UN projects related to earthquake disasters and disaster education. Professor Arya served as an advisor of the UN IDNDR RADIUS project for the Asian cities.

Tomas Brennan is the Senior Regional Advisor of OFDA, USAID, and is based in Manila, Philippines. ODFA has been actively involved in disaster mitigation projects in developing countries. Through the ADPC, USAID has initiated the Asian Urban Disaster Mitigation Program (AUDMP), which is a multi-disaster project, with emphasis on earthquakes in Kathmandu, Nepal and Bandung, Indonesia.

Mustafa Erdik is Professor and Head of the Earthquake Engineering Department of Bogazichi University, Istanbul, Turkey. He has been actively involved in the earthquake risk mitigation aspects of Turkey and Central Asia. He is deeply involved in the reconstruction process after the 1999 Turkey Earthquake. He has been awarded the United Nations Sasakawa Award. Professor Erdik served as an advisor of the RADIUS project for Izmir, Turkey, and also as a member of IDNDR RADIUS STC (Scientific and Technical Committee).

Hiroyuki Kameda is the Director of the Earthquake Disaster Mitigation Research Center (Miki), which was newly formed after the Great Hanshin-Awaji Earthquake in 1995. He is also a Professor at Kyoto University and served in the Disaster Prevention Research Center. Professor Kameda has been deeply involved in the broad aspects of urban earthquake hazard mitigation, especially to study the vulnerability of lifelines and infrastructure using GIS technology. He is currently the project leader of a multilateral, multinational project for the earthquake and tsunami disaster master plan development in the Asian and Pacific region, which includes a wide range of stakeholders.

Tsuneo Okada is an Emeritus Professor of Tokyo University and is currently the President of the Architectural Institute of Japan. His research focused on the buildings and structures in Japan and abroad, and he served as the head of several committees related to the Great Hanshin-Awaji Earthquake, 1995. He played key roles in promoting JICA's technical cooperation in developing countries through the establishment of several research centers in Turkey, Mexico and Peru. His current research focused on the traditional construction of Japan and its seismic stability effectiveness. He also served as the chairperson of the Japan RADIUS Support Committee.



Tomio Saito is Chief of the Disaster Management Department of the Hyogo Prefecture. He has had very direct experience in this capacity during and after the of the Great Hanshin-Awaji Earthquake in 1995. For the last several years, he has been actively involved in the reconstruction and recovery process, and he has been a great supporter of disaster mitigation activities carried out in and outside in the prefecture.

RESULTS



Tomio Saito mentioned that the Great Hanshin-Awaji Earthquake revealed vulnerability in modern society and showed us the importance of building an earthquake-resilient society. Hyogo Prefecture summed up five important lessons learned from the earthquake: (1) to prepare for disasters, (2) to ensure quick responses, (3) to network among agencies, (4) to build community capacity, and (5) to pursue a disaster-resilient society.

Firstly, to prepare for future disasters, Hyogo Prefecture revised its disaster management plan after the earthquake, improved an organizational structure in the government, and legislated a registration program of experts from search and rescue and medical fields. A multi-information system for disaster management was also installed. Secondly, to ensure a quick response, a disaster management center with earthquake-resistant measures was established to integrate other management systems. It prepared 76 waiting places near this center to ensure a first response within 30 minutes of a disaster. Thirdly, Hyogo Prefecture is trying to strengthen the network among agencies, including self-defense, fire fighting, police, and meteorological agencies. Inter-municipal and inter-prefecture cooperation was also agreed on. Then, community capacity building for disaster management has been encouraged, by institutionalizing community unity and supporting their activities. Also a set of diagnosis systems for a safer environment is under development.

The Memorial Center, which will be open in next spring, is now under construction in Kobe. It has four functions: (1) to collect, store, and exhibit materials about the earthquake, (2) to carry out comprehensive research, focusing on practical aspects of disaster management, (3) to support practical training and assistance, and (4) to promote a cooperative network among domestic and international agencies.

Mustafa Erdik cited that the Kocaeli Earthquake revealed building vulnerability in this region, as seen by the many and serious 'pancake-type' collapses. Major casualties were counted in pancake-type collapsed buildings, and extensive building damage immediately demanded temporary housings -- tents and tent cities within a few days and prefabricated housings within several months. National recovery programs started with support from the World Bank, but a program for the *retrofit of vulnerable residential buildings, which had not experienced earthquake damage*, was not funded.

Istanbul has a 70% probability of experiencing a M7.4 earthquake in 30 years, and the scenario earthquake in Istanbul (M 7.4 earthquake at 20km distance) shows that about 5,000 buildings (0.6%) will totally collapse (pancake-type), resulting in about 40,000 fatalities. Several projects in Istanbul have been carried out by national, international, academic, and non-profit organizations, but prioritization and retrofit of vulnerable residential buildings has NOT yet done. So Mr. Erdik introduced a concept of MINIMUM retrofit. The performance criterion is the prevention of total 'pancake-type' collapse. The minimum retrofit implies just the right amount of retrofit to avoid total collapse where most—up to 70%—of deaths are associated. The main and only objective is saving lives at minimum cost, not saving the building. Criteria for the identification of minimum retrofit are: 5+ story buildings, built before 1976, located in zones with $PGA \geq 0.25g$, $SA(0.2) \geq 0.6g$ or $EMS-I \geq VIII$; buildings with added floors, and buildings that experienced



structural damage in the 1999 Kocaeli Earthquake. Schemes of MINIMUM retrofit include the addition of shear walls and external buttressing. He presented that initial assessments indicate about 5,000 buildings are eligible for MINIMUM retrofit, which would cost about USD 200 million in total. It is expected that about 20,000+ lives can be saved through this project.

Anand Arya mentioned that, before the IDNDR, the policy of India focused only on response -- response without adequate preparedness -- but that there has been considerable discussion about mitigation and prevention measures after the IDNDR. He mentioned that the Indian government has to take in the competing demands, so it needs a very balanced view of all the demands -- state-wise, sector-wise, disaster-wise, and so forth. A high-power committee established a disaster management plan, which includes prevention, mitigation and preparedness as the necessary components.



The important issues that came to the committee are the need for very strong awareness programs in regard to the occurrence of disasters, capabilities, and expenses so that people know what is involved. A National Center for Disaster Management (NCDM) was established, so that training and the development of appropriate human resources in the country. He mentioned that one very strong requirement presented to the government is that an appropriate legislative framework should be created. There is a good amount of know-how available for the development of preventive measures, but actual implementation is very poor. It has been recognized that a large-scale effort has to be made to implement that know-how in disaster-resistance activities.



Tsuneo Okada mentioned that earthquake engineering itself has only a 100-year history; thus, recent progress in this field helps identify the problems of societies as well as the future direction mitigation should move in. He said that earthquake risk, the possibility of earthquake occurrence, or the extent of acceleration from a single fault movement has been learned through a global perspective. He also said that we have similarly learned standards for earthquake-resistant structures.

In terms of building problems, there are two major concerns: 1) damage in non-engineered buildings and 2) damage in engineered buildings. Engineered buildings especially are damaged due to inappropriate techniques. Building codes were legislated and strengthened, step-by-step and country-by-country. A major worldwide concern is how to deal with buildings constructed in the period of construction between non-engineered buildings and engineered buildings. Non-engineered buildings are also prone to earthquakes, but they tend to be less damaged since they have few stories. High-rise buildings applying inappropriate techniques account for huge life-loss numbers. Currently in Japan, one non-profit organization will be established in cooperation with about 90 architectural organizations to analyze building structure, to network related people and to provide training for experts and citizens. Global networks to promote seismic analysis of the existing building stock and to retrofit buildings are needed to fill in information and technical gaps among countries suffering from similar conditions.

Thomas Brennan mentioned that USAID/OFDA was basically a response organization, responding to victims' needs following a disaster. USAID/OFDA spends 85% of its budget on response, and only about 10% for mitigation. In Asia, however, it promoted mitigation activities; there, USAID/OFDA spent 50% for mitigation and 50% for response. Over the last five or six years, it has converted to carrying out mitigation efforts. A lot of money and lives are saved if disasters are mitigated rather than only responding to them.



He introduced three broad mitigation categories: *institutional*, *capital-intensive* and *community-based* approaches. *Institutional* mitigation includes legislation of building codes, legislating of disaster management agencies, and so on. *Capital-intensive* mitigation includes investing in retrofitting public buildings and other infrastructure, buying search and rescue equipment such as motion detectors, and similar activities. *Community-based* types of activities include public awareness programs, community drills, and education in schools.

He agreed that Japan and the U.S. do all three activities and that this combined approach is the best, but it is also the most expensive. So in developing economies we have to make very difficult decisions. Community-based disaster preparedness is much better to widely promote effective disaster mitigation. He summarized that communities have a capacity to offer an available, much cheaper and more effective way. If the neighbor can stabilize someone, one can assess his own situation, be transported safely to medical facilities, and, 95 % of the time, he will survive.



Hiroyuki Kameda explained that the Earthquake Disaster Mitigation Research Center (EDM) was established to promote integrated research activities from physical, social and informational aspects. EDM has three teams: (1) a disaster process simulation team, (2) a disaster information system team, and (3) a structural performance team.

The disaster process simulation team deals with the reconstruction process of the city of Kobe with long-term monitoring. The information team tackles grasping and disseminating information on an affected area as soon as possible. By using DMSP, developed by the US military, and affiliating with NOAA, which maintains DMSP, EDM calculates differences of light levels before and after an earthquake and makes a prediction about the damaged area. They launched this project in the Kocaeli Earthquake and improved its methodology through the Taiwan and El Salvador earthquakes. He explained another multi-lateral project titled, 'Earthquake and Tsunami in Asian and Pacific Regions' (EQTAP). This project will provide three outputs. The first is a master plan for risk management, the second is an EQTAP toolbox, which will present a digitalized document of the research output, and the third is called the EQTAP digital city, which enables users to access information via the internet. EDM is trying to fulfill these objectives in the next five years.

Masami Kobayashi proposed that what he has found, through his recent projects, to be the important issues to lead successful outcomes are: (1) to have a cooperative framework, (2) to improve and standardize the framework, and (3) to apply it locally, based on differences in economical, social and cultural backgrounds. To avoid uniformity and to consider local backgrounds, focusing on the community is important. Targeting schools seems to be especially effective as a key component of community involvement. As we have very limited resources for new construction, the keywords of "*retrofit*" or "*reinforce*" have important meanings. To build a community capacity, cooperative networks, especially with non-profit organizations, are important. Worldwide cooperation enables us to share information and to educate and train local people.



Tomio Saito answered that each country has its own cultural background, but the importance of reducing earthquake risk has the same value. So we need to mitigate risk through global cooperation. He thinks it his task to disseminate lessons learned from the Kobe Earthquake. One of his plans is to provide practical training to domestic and international experts, including community leaders, through the Memorial Center.

Thomas Brennan said that legislation and enforcement of building codes were going to make the most impact in Asia. Legislating is not difficult, but enforcing and implementing those building codes is the major problem for most countries. He found it interesting to use supervising firms like those in Turkey to inspect buildings in their design and construction phases. He also answered that education creates demand -- if people want their home retrofitted, we can improve buildings easily, but they are usually not interested unless they know the risk they are currently living under. He explained that, for example, in the United States ten years ago, people smoked as much as people in Japan do. The way we stopped smoking is like this -- my friends who have children stopped smoking because their children came home from schools saying, "Please, Dad, I don't want to die, please don't smoke". Only by their parents not smoking were the children satisfied. That is a tradeoff. He agreed that maybe we cause people to panic through this education process, and children are going to be concerned, but maybe we should put the emphasis on developing precise curriculum for grades 1 through 12, according to their capacity.



Mustafa Erdik, when asked about NGO activities in Turkey, answered that most of the NGOs from several countries outside Turkey are involved in the rehabilitation phase. They have some domestic NGO activity, but when it comes to preparedness and awareness raising of people, they have questions. He again cautioned that something needs to be done about the existing buildings in Turkey, like retrofitting them at a minimum cost to save lives and trying to start a campaign to inform people how to do this.

Tsuneo Okada cited that reinforcement of the existing building stock should be a worldwide concern. He said that we need to invest in pre-disaster management, since we already know future damage using loss estimation modeling. To deal with existing inappropriate building stock, we should have a long-term strategy including education and training through a human network. From an international aid agency standpoint, which he learned by working with JICA, it is important to establish a framework for technical cooperation with specific objectives, budget allocation and human resources.

Anand Arya mentioned that retrofitting is a major problem in India because 85% of buildings are brick-masonry, stone-masonry or adobe, which are vulnerable to severe damage in the future. The recent earthquake showed how vulnerable and risky they are. It is also clear that a retrofit program of that large a size cannot be taken, so developing a priority list of buildings is important. Schools, hospitals, monuments and lifelines should make the priority list. Arya also agreed that people's homes are important; how to encourage people who want to retrofit their homes is very important. Therefore, in India, a subsidy scheme has been submitted to the Planning Commission by the Urban Development Ministry. This scheme would allow people to retrofit their homes with a loan or some subsidy, maybe in-kind, like giving material such as cement or steel and spending their money for the labor, etc.

Hiroiyuki Kameda said that research professionals tend to think only with respect to the field of their background. To fulfill gaps between academic field and real problems, they should go outside their comfort-zone. EDM has three different fields and tries to integrate these fields since it aims to tackle real problems. He said that communication and consulting, which have not been considered as research fields, should be the main targets we proceed to through education and cooperation.

Masami Kobayashi finally expressed his gratitude to the experts and participants from several countries. He summarized that we found very similar problems and future visions despite our very different cultural and economic backgrounds. We all agree that a community-based approach is important and that focusing on schools is a



key component of community institutionalization. He emphasized that we should encourage community capacity building for a safer world through practical activities of *self-help, cooperation and education*.



Special thanks to Ms. Ritsuko Murakami, of the Earthquake Disaster Mitigation Research Center, who voluntarily dedicated her time for this symposium as MC.

Photos and News

読賣新聞

12月22日 金曜日
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朝刊 1面

＜国際シンポジウムの参加者募集＞

読売新聞大阪本社では来年1月、国際シンポジウム「地震にまけない世界へ向けて 21世紀国際ワークショップ」を国際連合地域開発センター(UNCCRD)防災計画兵庫事務所などと開催します。海外14か国15都市から政策立案者、NPO代表、学者ら約40人が参加。開発途上国を支援している由緒プロジェクトなどを基に、29、30日(グループ討議)、31日(シンポジウム)を行います。阪神大震災から6年。地震に強い未来を築く方策を考えます。(詳細は2面)

地震にまけない世界へ向けて 21世紀国際ワークショップ

◇会場 しゃんせし神 戸田製鉄工場(神戸・ポートアイランド) 料。定員は29、30日が40人、31日は500人。
◇参加申し込み 住 所、氏名、年齢、職業、連絡先を明記してUNCCRD防災計画兵庫事務所へ、ファクス(078・2300・7751)か、Eメール(ws2001@hyogo.tyoe.go.jp)にて。
◇主催 実行委員会(UNCCRD防災計画兵庫事務所、兵庫県、神戸市、読売新聞大阪本社などで組織)
◇後援 阪神・淡路大震災記念協会、NTT

朝刊 2面

地震防災国際シンポジウム参加国と内容

【参加国】アメリカ合衆国、イタリア、インド、インドネシア、ウズベキスタン、カナダ、中国、トルコ、ネパール、シンガポール、スイス、パキスタン、フィリピン、メキシコ(参加者は後日紹介します)
【主催以外の主な国内参加】片山恒雄・科学技術庁防災科学技術研究所所長、岡田恒男・日本建築学会会長、岡崎健一・建設省住宅

局国際基礎調査、亀田弘行・地震防災フロンティア研究センター長(福木尚) 【主な内容】(29、30日は差障りのみで、一般参加者も討議に加われる。31日は同時通訳あり)
◇29日(午前9時～午後6時) 世界20都市で行われた国連の地震被害軽減支援活動(GESI)について討議。
◇30日(午前8時30分～

午後7時)GESIのまとめと、開発途上国の学校の耐震化と防災教育、コミュニティ参加を進めている国連の「スクールプロジェクト」について討議と報告。
◇31日(午前9時30分～午後6時) 3つのパネルディスカッション。防災行政担当者ら各自立と協力による都市づくり、NGOや教育関係者らは災害に強いまちづくりについて討議。最後「地震にまけない世界へ向けて」総括討議を行う。

International earthquake forum to open in Kobe next month

Daily Yomiuri

KOBE—Experts from around the world will meet in Kobe next month to discuss ways to improve earthquake preparedness in seismically vulnerable areas.

The event, a combination of workshops and a symposium, will coincide with the sixth anniversary of the Great Hanshin Earthquake, which killed more than 6,000 people in Kobe and its surrounding areas.

It is being organized by the Disaster Management Planning Hyogo Office of the U.N. Center for Regional Development (UNCRD), The Yomiuri Shimbun, local governments and other organizations.

About 40 academics from 14 nations will attend, including several from Turkey, where more than 17,000 people died in earthquakes last year.

The experts will meet Jan. 29-31 at the International Conference Center in Chuo Ward, Kobe, to exchange ideas and propose improvements to antidisaster measures through such activities as self-help, cooperation and education in the community.

To mark the end of the U.N. Decade for

Natural Disasters, the program will focus on three key U.N. initiatives targeted at developing nations: the Risk Assessment Tools for Diagnosis of Urban Areas against Seismic Disasters (RADIUS) initiative; the Global Earthquake Safety Initiative (GESI); and the School Earthquake Safety Program.

RADIUS is designed to promote worldwide activities to reduce the growing risk posed to urban areas in the developing world by seismic activity.

Brian Tucker, president of GeoHazards International, will talk about GESI at one of the workshops and during a symposium on the final day. The initiative calls on decision makers and disaster officials in vulnerable cities to identify where life is most at risk and to step up contacts on impact-reduction measures with cities in other countries.

Anand Arya, professor emeritus of the University of Roorkee in India, will talk about the School Earthquake Safety Program.

The program seeks to strengthen the role of schools in educating children about

disaster management and also as places where local people can undergo training in disaster prevention and response.

The other panelists will be Thomas Brennan, senior regional advisor for Asia at the U.S. Agency for International Development, and Prof. Mustafa Erdik, an expert in earthquake engineering at Bogazici University in Turkey.

The organizers are inviting 40 people to attend the workshops on the first two days and 500 people to attend the symposium on the final day.

All discussions and speeches will be conducted in English. Simultaneous interpretation into Japanese will be available on the final day. Visitors to the workshops are encouraged to share their experiences and ideas.

Admission to the event is free, but reservations are required. To reserve a seat, send a fax with your name, address, age, occupation and telephone number to the Disaster Management Planning Hyogo Office of UNCRD at (078) 230-7751. Alternatively, e-mail the same details to ws2001@hyogo.uncrd.or.jp.

地震にまけない世界へ向けて 21世紀国際ワークショップ

国際連合地域開発センター(UNCRD)防災計画兵庫事務所、兵庫県、神戸市、読売新聞大阪本社など共催の「地震にまけない世界へ向けて」21世紀国際ワークショップは、1月29日から31日まで、神戸・ポートアイランドの神戸国際会議場で開かれる海外14か国15都市から約40人が参加し、日本の関係者とともに討議、神戸の教訓と国際プロジェクトなどをとり、世界の人々が手を携えて安全な未来を築く方策を考える。29、30の両日は、グループ討議で、これを踏まえて31日に二つのパネルディスカッションとシンポジウムを行い、災害に強いコミュニティの構築などを進言する。

【29日】(午前9時開会、英 都市地震対策の方向性を理解するための取り組み)「の報告と討議を、複数のグループに分かれて実施。UNCRDは、ナショナル(GHI)が、開発途上国などでの地震被害軽減や防災計画向上を目指すプロジェクト「GESI」を、なもので、取り組んだ都市の

防災担当や学識経験者、NGO、海外援助機関の代表らが参加。「GHI」はカリフォルニアを拠点に世界中で地震対策プロジェクトを展開しており、ブライアン・タッカー代表が出席。

【30日】(午前8時30分開会、英語のみ)◆前日のまとめ◆国連の国際防災10年(2000-09)に神戸9都市で実施された「RADAR」ラディアス、都市の地震災害の危険性軽減の取り組み)について、主導を務めた国土交通省建築指導課の高橋健二・国際基礎調査や海外の参加者が、成果や防災対策の変化などを報告。

◆UNCRD防災計画兵庫

【31日】(同時通訳)◆オープニングセッション(午前9時30分) 文部科学省防災科学技術研究所の片山恒雄所長の基調講演、国際的な地震被害の軽減、防災強化の取り組みなどの報告。◆パネルディスカッション「地域の自立と協力の経験から(午後1時) マニラ(フ

14か国から40人参加 安全な未来向け討議

29-31日 神戸国際会議場

事務所がバンドン(インドネシア)、チャモリ(インド)など5都市で計画している学校の耐震改修、地域の防災トレーニング・スクール・アイスクエア・セイフティ・プログラム(地震にまけない学校計画)について、インドの災害研究の第一人者、アナンド・アリヤ・ルキキ大名普救校地盤工学士らが報告。

【31日】(同時通訳)◆オープニングセッション(午前9時30分) 文部科学省防災科学技術研究所の片山恒雄所長の基調講演、国際的な地震被害の軽減、防災強化の取り組みなどの報告。◆パネルディスカッション「地域の自立と協力の経験から(午後1時) マニラ(フ

イリピン)、ムンバイ(インド)、ティファナ(メキシコ)、バンドンの防災担当や学者と神戸市の伊川一男・市民安全推進部長らが討議。◆同一教育とコミュニティムスタファ・エルディック地盤工学科長、アリヤ名普救校15分) 米国、ネパール、パキスタンなどのNGO代表が支援活動について討議。日本からは難民支援活動などに取り組む「ピースウィズ・ジャパン」の大西健丞主任調査員らが加わる。

◆締結シンポジウム「21世紀へのメッセージ」地震にまけない世界へ(午後3時45分) パネリストは、岡田恒夫(078-2500-7475)か、Eメール(ws2001@h.yogo.uncrd.or.jp)。

兵庫県防災監、米国際開発センター、海外災害援助局のトーマス・ブレナン・アジア局長、RADARSの科学技術顧問たつたボアジチ大(トルコ)のムスタファ・エルディック地盤工学科長、アリヤ名普救校の小林正美所長(京都大学教授)。最後に兵庫メッセージを出す。

【参加要項】一般参加は無料。定員は29、30日各40人。31日500人。希望者は住所、氏名、年齢、職業、連絡先を明記して向事務所へファクス

【参加要項】一般参加は無料。定員は29、30日各40人。31日500人。希望者は住所、氏名、年齢、職業、連絡先を明記して向事務所へファクス

Kansai @ West

l i s t

Participants sought for U.N. international earthquake forum

Daily Yomiuri

KOBE—The Disaster Management Planning Hyogo Office of the U.N. Center for Regional Development (UNCRD) is seeking people to attend an international workshop and symposium on earthquake readiness from Jan. 29 through 31 at the Kobe International Conference Center in Chuo Ward, Kobe.

The event will comprise two workshops and a symposium, and will be attended by about 40 academics, NGO members and policymakers from 15 cities in 14 countries.

They will discuss ways to build safer cities based on ongoing U.N. projects and lessons learned from the Great Hanshin Earthquake of 1995.

The discussion will serve as a review of the achievements of the U.N. Decade for Natural Disaster, which began in 1991.

They will discuss the progress of such programs as the Risk Assessment Tools for Diagnosis of Urban Areas against Seismic Disasters (RADIUS), the Global Earthquake Safety Initiative (GESI) and the School Earthquake Safety Program.

The events are being sponsored by The Yomiuri Shimbun, the governments of Hyogo and Kobe, and others.

Workshop participants will report on the effectiveness of individual and group antidisaster measures, and education projects conducted in earthquake-prone cities.

At the symposium, six panelists will discuss measures to improve earthquake

readiness. They will include Anand Arya, professor emeritus of the University of Roorkee in India, and Mustafa Erdik, an expert in earthquake engineering at Bogazici University in Turkey.

All the events will be conducted in English, but simultaneous interpretation into Japanese will be available at the symposium.

Admission is free, but seating is limited to 40 people for each of the workshops on Jan. 29 and 30, and 500 people for the symposium on Jan. 31.

To reserve a seat, fax the office with your name, address, age, occupation and telephone number at (078) 230-7751 or e-mail the same information to ws2001@hyogo.uncrd.or.jp/

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地震にまけない

二十一世紀「地震にまけない世界」を築くことを目指し、国際連合地域開発センター(UNCRD)防災計画兵庫事務所、兵庫県、神戸市、読売新聞大阪本社などは、二十九日から神戸で国際ワークショップを開く。阪神大震災の教訓と、開発途上国の防災施策を支援する国連プロジェクトをテーマに、三日間かけて討議が行われる。ワークショップを前に、開発途上国の現状や国連の取り組み、海外で生かすべき神戸の体験などを報告する。

消防車八台、うち五台は、究員ビジャヤ・シユレスタ故障で出勤不能。消火栓も、さんが調査した。「首都のし、貯水池は一か所。人口、人口は約百五十万人。消防百人当たりの電話回線八本、車一台が二十万人をカバー(日本は加入電話本数だけ、している計算になる。火災で百十四本)。ネバーを通報する電話さえ乏しい」

シユレスタさんの調べたネパール出身のUNCRD 記録によると、カトマンズD 防災計画兵庫事務所の研では一九三四年に大地震が

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国際ワークショップへ寄せて

起き、一万人以上の人々が、震の怖さと耐震工事の効果に驚かされた。しかし、今でも首都ですら防災計画はない。国に防災専門の機関もない。災害復旧の予算はあっても事前対策の予算は皆無という。

母国の現状を見かね、シユレスタさんは二〇〇〇年七月から、地震に必要な対策を提案する「都市防災マネジメント計画」作りを進めている。

そんな中、現地では、市民レベルでの活動が芽生えてきた。地元NGO「NSI (Geohazards EIT (エヌセツト))」が学校に起震台を持ち込み、地

を教え始めたのだ。「横木」と呼ばれる梁で壁を補強したレンガ造りの家の模型と、補強なしの模型二つを並べて揺さぶり、子供たちや父母、地域の住民らに亀裂の入る様子を見せられた。「うちの家はひびが入っちゃったよ」。子供たちは面白がりながら、地震の怖さを知る。

NSIは、開発途上国の地震被害軽減活動を続けている米田サンフランシスコの地震学者らのNGO「GHI (Geohazards International)」が九八年に企画した「カト

途上国の防災策診断

住民意識の芽生え支援

マンズ・バレー・プロジェクト」をきっかけに誕生した。

このプロジェクトは、地質学ナリオと、それに基づく防災のための行動計画を地元住民が参加して作るもので、GHI代表のフライアン・タッカーさんは「地震に強いまちづくりのためには、先進国の援助で耐震性の強い建物を建てるだけではダメ。現地の人たちの時間をかけて訓練する必要がある。カトマンズは、NSIとGHIという地元のパートナーが、継続的な活動ができる」という。

UNCRD防災計画兵庫事務所とGHIは共同で、その都市の防災施策を客観的に診断しようという「GESI (GHI-Gateways Earthquake Safe Initiative)」プロジェクトを二〇〇〇年から始めた。

カトマンズなど世界二十都市を対象に、人口、地震の強弱、都市計画、建物の耐震性、防災計画、病院のベッド数、消防車台数などを詳細なデータを比較。各都市の防災施策の弱点を浮かび上がらせるのが狙いだ。

UNCRD防災計画兵庫事務所研究員の百々数浩さんらが、データ分析を進めており、ワークショップで発表される結果が注目される。

地震にまけない

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「消防車の車庫は古いので多分壊れ、出動できない」あまり施されていないかった「水道管も古く、多くがすでに壊れている」。一九九八年十一月、旧ソ連のウズベキスタンの首都タシケン

の大地震被害想定会議。地元行政や学者、市民ら約七十人が参加した中で、第一線の人たちが実情を明らかにし、国連から派遣されて会議の運営にあたっていたラシア・ショウさんを驚かせた。

詳細は公表されていないが、タシケンでは六六年、住居の三分の一が倒壊する大地震があった。「だが、モスクワの援助に頼ること

国際ワークショッブへ寄せて

記者らには「若い人に発意させてくれ」との言葉をかけた。

同テーブルに坐ることでムートは一突。現場を含め、多くの参加者から発言が続出した。それが被災シナリオ作成へつながった。

シナリオの文章はメンバーの新聞記者が書いた。八午前五時、住居の三分の一が壊滅、学校も七十校が壊れ、水道管は三割以上が破損……。発生から時間を追って新聞記事のスタイルで記述し、「壊れた街のイメージが思い浮かぶ」

被災シナリオ綿密に

国連、行動計画作り促す

は九〇年代を「国際防災の十年」に設定し、ジュネーブの事務局長を置いて支援。被災シナリオとそれに基づいた行動計画(アクションプラン)を都市自身が作ることを支援するプロジェクト「RADIOUS(ラディアス) Risk Assessment Tools for Disasters of Urban Area against Seismic Disasters」を、日本

政府の援助で、計九都市で推進した。タシケンもこのうちのひとつだった。実施委員は十数か国からNGO(民間活動団体)も含め数十人が務めた。ショウさんは、インドの大学院を出て来日し、マスターとドクターを取得後、民間の立場で参加。その体験をもとに、グローバルな防災活

動を目指してUNCRD防災計画兵庫事務所の研究員になった。RADIOUSの行われた都市では、波及効果も出てきた。八五年に大地震の起きたメキシコの地方都市ティファナでは防災を担うNPOが誕生。バンドン(インドネシア)の参加者たちは近くのベンクルでノウハウを広めている。RADIOUSのコーディネーターは、国連へ出向していた岡崎健二・国土交通省建築指導課国際基準調査官で、「阪神大震災後、日本が蓄積したノウハウを途上国に伝える必要がある」と強調。ワークショッブが先進国、途上国間の連携を促し、国際防災の展望を明

地震にまけない

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「死者数は時間とともに増える。十七日はメールを通して「現場に」NGOによる救援支援を入れるだろうか。今月十委員会で、募金活動な四日、中米エルサルバドルの首都サンサルバドル近郊で起きた大地震で、国連地域開発センター(UNCRC)防災計画兵庫事務所(神戸市中央区)にあるメールリングサーバーを通じて、日本のNGOの電子メールが行き交った。

「被災者は余震を恐れ、道路で寝ている」「十五分ごとに余震を感じる」。現地入りした人からは、デジタルカメラで撮影した写真とともに被災地の様子が届

行政、防災研究機関、NGO 太さんは「一月で二百件もOなどに呼びかけ、兵庫県 交換した。や神戸市、学識経験者、N ある時、鈴木さんのメールGOなど全国から二十三のルがトルコ人姉妹を救った団体、個人が集まって、支た。「地震で骨折し、緊急援委員会が発足。「情報交 手術が必要だが、父親が失換できるネットワーク」と 業し、治療代を払えない」して、発生から約十日後に と送信。日本のNGOや賛 はメールリングリストを立ち 同者からまもなく約百八十八万円の募金が寄せられ、姉妹は手術を受けることができた。

国際ワークシヨップへ寄せて

「空港に支援物資が山積みになったままだ」。メール 発生から一か月後、支援が行き交い、デリンシェ市 委員会が、被災地で課題とに入った「被災地NGO なるポイントを聞きにまよ協働センター」の鈴木隆 めた。阪神大震災で指摘さ

NGO連携に威力

被災者の子供たちの心のケア、連携など、阪神大震災の反被災者の自立を促し、仮設省がトルコではある程度、住宅での孤立を防止するた生かされた。メールリングリめの「ふれあいセンター」ストの効力は大きかった」などの建設など四項目だ。と振り返る。

「これを踏まえ、協働センターの村井雅博代表ら トルコ地震から約一か月は、デリンシェ市に「阪神後の台湾大地震。同事務所大震災では避難所、仮設住宅、復興住宅と被災者が転ストも同じサーバー内に立ち上げ、意見交換の場を握ユニティーが壊された。自供した。

立のよりどころとなる施設を建設し、被災者が運営にかかわることができるよう「二〇〇〇年二月、施設建設を始めた。

支援委員会のメンバーの物資、人を無駄なく必要な一人、伊永勉・エイディア場所に着けることが可能にイ火害研究所代表は「仮設になった。NGOのネットワークは今後の災害でも活用住宅でコミュニティを育一クは今後の災害でも活用できるはず」と強調する。

現場情報メールで交換

地震にまけない

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地形学の専門家たちが「日本の活断層」といって「推理小説のなぞ解き」に例える作業がある。角度を若干変えて撮影した同じ地点の航空写真を二枚並べ、3D画像を見えるように凝視する。山の起伏や川の流れる中に一本の線が臭えてくる。線の中は、その時、線の間、崖、牛伏寺断層が走る長野県松本市では住民間で自主防災組織を結成するよう働きかけている。

「など様々な条件をあてはめていくと、活断層の場所がほぼわかるという。この方法は一九七〇年代から日本で定着、八〇年には国内の活断層をほぼ網羅

国際ワークショップへ寄せて

日本の診断技術を生かす、開発途上国などで活断層マップを作る計画が昨年七月、国連地域開発センター(UNCRD)防災計画兵隊事務所と、アジア防災センターが協力して始めた。各国の地理研究所などに航空写真を提供してもらい、派遣された研究者が診断する。現地で過去の地震の記録なども調べ、今後の発生確率などを算出し、危険性が高い地域を特定。防災政策に活用してもらう。現在の調査地区は、モンゴ

日本の断層診断世界へ

調査、被害軽減に直結

(鈴木助教)が、近年、人口が増えたことなどから伝統的なテント生活を交え、住宅を建てて定住する人々も増加。断層診断のノウハウを教えてほしいとの依頼もあり、将来は現地の研究者が知識を受け継いでプロジェクトを発展させていく期待も高まっている。

鈴木助教は「災害は将来必ず起きる。調査は、この国で被害を軽減するため、の街づくりに役に立つ」と確信している。

九五年五月に大地震に見舞われたサハリンでは、鈴木助教や現地研究者の共同調査で北部の中心都市・オハにも活断層があることが新たに発見されるなど、活断層の場所を把握する作業はほぼ終了。現在は断層

診断による危険発生率の調査を進めている。

こうしたデータについて、アジア防災センターでは英訳してホームページなどで公開。各国で情報を共有できるようにし、途上国の研究者にも役立ててもらう方針だ。

UNCRD防災計画兵隊事務所プロジェクトを担当している菅井隆世研究員は「活断層の近くにあり、人口も集中している最も地震の危険性が高い場所を特定し、被害を軽減するために資金や人を事前投資していくのが迫り。将来は、危険と診断された地域同士が連携し、互いに援助しあう協力的体制を築く足がかりになれば」という。

地震にまけない

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二十六日に起きたインド大地震は、被害状況が明らかになるにつれ、死者が二万人を超えたとみられるなど、未曾有の大災害になる恐れが出てきている。

UNCRD防災計画兵庫事務所が、学校を拠点に地域コミュニティとしての防災力を高める「スクール・アースクエイク・セイフティ・プログラム(地震にまけない学校計画)」をス

研究員は、母国の惨状に、ジャラート州では一九五六にも地震が起きており、このプロジェクトは、モデル校を子供たちや父母、地域住民が見守る中で、強度の建物に耐震補強する。同じ技術を自宅の補強にも応用してもらうためだ。だから、建材は別の学校や住

インドでは九九年三月にもチャモリ地震が起き、約百六十人が犠牲になった。

国際ワークショップへ寄せて

- 1 防災の必要性について考える防災教育の場として、地震させ、地域全体として、地震にまけないコミュニティづくりを目指す。
- 2 工事をきっかけに、学校が暮らす六教室分の多目的スペースなどを備えた。兵庫県山崎町の山崎小学校では二十日、学校に避難所を設営するユニークな訓練が行われる。小、中、高校生と父母、住民ら約千二百人が参加。同県教委が昨

学校の震災で避難所としての重要性が浮き彫りになり、防災拠点に位置づける自治体が急増。校舎の耐震化、施設整備、資器材や食糧備蓄が進められるのに合わせて、地域の自主防災組織の活動拠点としての役割も重視されている。

校舎二棟が全半壊した神戸市東灘区の本庄小学校は、一日最大二十センチの太陽光発電システム、二百人分の

学校を地域防災拠点に

命守る知恵と心も発信

や危険から自分の身や家族を守ることは動物でもやるが、災害から次世代の子供たちの命を守る知恵と心の伝達には、教育的な取り組みが必要。そのための「協力の器がコミュニティ」。学校はその拠点であり、子供たちと共に親にも防災教育、そして人間としての心の教育を行う場所となる。

プロジェクトはチャモリのほか、カトマンズ(ネパール)、バンドン、ベンク(インドネシア)、タシケント(ウズベキスタン)で実施されている。プロジェクトに期待をかけた、同事務所の小林正美所長は言う。「目の前の飢え

この連載は、姫路支局 坂成美保、神戸支局 井岡秀行が担当しました。

地震に強い社会を

神戸で ワークショップ開幕

海外14カ国

地震に強い社会のあり方を考える「二十一世紀国際ワークショップ」(国連地域開発センター防災計画兵庫事務所など主催)が二十九日、神戸市中央区の神戸国際会議場で始まった。

参加しているのは海外十四カ国十五都市と国内の防災担当者や研究者ら約四十人。同センターなどは都市の災害に対する強さを評価する手法を開発中で、その妥当性や使いやすさなどに

2001年1月30日読売新聞朝刊1面

都市の防災討議

「国際ワークショップ」開幕

神戸

「地震にまけない世界への代表、学識経験者ら約五十人が参加し、冒頭、インショップ」＝国際連合地域開発センター(UNCED)とつをきかけた。

初日は、UNCEDなど防災計画兵庫事務所、兵庫、神戸市、読売新聞大阪本社など主催が二十九日、神戸国際会議場で三日間の日程で開会。海外十四カ国から防災担当者、NG

「住民の防災意識も都市間で比較できた」(インドネシア・バンドン)などの意見が交わされた。エルサルバドルの首都サンサルバドルは「地滑りの危険が高い」との調査結果が出ていることも報告された。

インドの参加者は「今回の地震をリアルタイムの教訓にしてほしい」と、他国の参加者に訴えていた。

休憩時間に意見交換する各国の参加者(神戸市中央区の神戸国際会議場で)



神戸で「国際ワークショップ」開幕

海外十四か国の自治体職員や研究者ら約五十人が参加し、二十九日、神戸・ポートアイランドの神戸国際会議場で開幕した「地震にまけない世界へ向け、21世紀国際ワークショップ」(国連地域開発センター防災計画兵庫事務所、県、神戸市、読売新聞大阪本社など主催)。今年に入り、エルサルバドル、インドと大地震が相次ぎ、改めて防災体制の重要性が突きつけられる中、出席者たちはグループ討議で「手を携え、地震に強い街づくりを」と、活発に意見を交わしていた。

初日のテーマは各国の都市ごとの耐震設備などを調査、地震が起きた際の危険性を算出する「G.E.S.I」が予定されていた時間をオーバー、熱のこもった討議が続いた。理化学研究所地震防災フロンティア研究センター(三木市)の谷口仁士研究主幹(地震工学)は「少人数での討議だったので自由にものが書える雰囲気があり、有意義だった。今回の討議をふまえて、行政が防災計画にどう生かして

「地震に強い街」へ連携

「備えに到達点なし」

いくかが問われてくる。調査を継続していくことも必要だろう」と期待。阪神大震災を経験した神戸市の小野田敏行・市民防災課長は「地震の被害を軽減するためには、ハード面を整備するだけでなく、住民間のコミュニティ作りなど、ソフト面の防災体制が不可欠なという阪神大震災での教訓を伝えることができた」と話した。国内の自治体からは、神戸市のほか東京都と名古屋市の

「阪神」の教訓 伝えられた

防災担当者が出席。鈴木貴雄・名古屋消防司令は「各国からの出席者たちに触発され、視野が広がった気がする。地震に対する備えには「これでいい」という到達点はなく、継続して進めていかななくてはならないと改めて感じた」と話していた。会場では、各国の自治体やNPO(非営利組織)の活動内容を紹介するパネルも展示。参加者たちが休憩時間を利用して見学したり、情報を交換し合ったりしていた。また、インド大地震の被害の様子を伝える英字新聞「デイリー・ヨミウリ」が配られ、海外からの参加者たちが心配そうに紙面を伝っていた。三十日も「地震に負けない学校計画」などをテーマにグループ討議などが行われ、三十一日には「百問の討議の結果を踏まえた国際シンポジウム」が開かれる。

時間オーバー 白熱の討議

「インド地震」教訓 救命体制整備を

夕刊、2面

国際ワークショップで印の教授
2001.1.30

死者一万人を超すとみられるインド西部大地震について、インドの災害研究の第一人者、アナンド・アリア・ルーキー大学名誉教授（地震工学）は「初期の救命活動の体制の不備が被害拡大につながった。インドを教訓に世界各國とも体制整備を急がねばならない」と指摘。神戸で開会中の「地震にまけない世界へ向けて21世紀国際ワークショップ」で三十一日、世界への警告として緊急アピールする。

インドでは二十八日まで六千八百八十一人の死亡を確認した。アリア名誉教授は「犠牲者を減らすには、阪神大震災を経験した日本などの高い救出能力や技術が必要不可欠だったが、インドでは現場の救急活動において人材も資機材も明らかに不足していた」と指摘。世界各國でも大災害の際、同様の問題で被害拡大につながる恐れが強く、早急な体制確立が必要とする。

九年三月、同国チャモリで起きた地震の現場で、建築物の再建に従事する大工などを養成するプログラムを展開。今回地震が発生したグジャラート州にはワークショップ終了直後に入り、同様のプログラムを応用するほか、詳細な被害調査も実施し、早期の復興に努めるという。

（同ワークショップは国際連合地域開発センター防災計画兵庫事務所、兵庫県、神戸市、読売新聞大阪本社など共催）

読賣新聞

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「耐震校舎」成果を確認

国際ワークショップ アジア7か国が報告

神戸国際会議場で開催中の「地震にまけない世界へ向けて 21世紀国際ワークショップ」に国際連合地域開発センター(UNCRD)防災計画兵庫事務所、兵庫県、神戸市、読売新聞大阪本社など主催の「百目の三十日」、UNCRDが進めている防災教育普及プロジェクト「スクール・アースクエイク・セイフティ・プログラム(地震にまけない学校計画)」の成果などが話し合われた。

前日に討議した都市の地震にまけない世界に危険度調査プロジェクト「GESI(ジェシ)」を総括。▽参加都市を増やすべき▽大学など連携の道を探る▽学校と病院は別に調査すべき▽一般市民への結果公表が必要―など、今後の方向性をまとめた。さらに、国連が一九九六年から四年間、世界九都市で実施した市民参加による被災シナリオ、行動計画策定プロジェクト「RAADI(ラディアス)」の報告を聞き、

ド・チャモリンなどの成果が示された。最後に、インドの災害研究の第一人者で同国ルーキー大のアナンド・アリヤ名誉教授(地震工学)が「政府が学校の耐震性について法整備すべき。阪神大震災後、耐震性、防災意識ともに高まった神戸は参考になると総括した。

「子供たちが初めて避難訓練を体験し、地震の怖さや知識を習得、人ごとではないと思うようになってきた」(インドネシア・パンドン)、「学校は地域防災の核になるとわかり、耐震性を強化している」(イン

震災経験 世界で共有を

国際ワークショップ全体会議

神戸国際会議場で開催中。読売新聞大阪本社、兵衛、我々の責務」とあいさの「地震にまけない世界へ 兵庫、神戸市など共催）はつ。木村洋・国連地域開発に向けて、21世紀国際ワーク 最終日の三十一日午前、全センター所長も「ここで論シヨップ」（国連地域開発 体会議が始まった。写真。 センター防災計画兵衛事務 オープニングセッション で加藤博久・読売 新聞大阪本社社長 は「世界を震撼さ せた阪神・淡路大 震災からはや六 年。復興と生活再 建のために続けて いる震災報道はそ の悲劇を繰り返さ ないための提言で もある。二十世紀 の教訓を二十一世 紀に生かすことこ



カッションなどを行う。 続いて、文部科学省の片 山恒雄・防災科学技術研究 所長が基調講演し、「様々 な地震を通じて個々には体 験や知識を共有する機会が 増えてきた。これからの国 際対応としては、きちんと した機関が調整することが 必要」と提言した。 午後からはパネルディス

議論を十分に生かし、世界で共有していきたい」と呼びかけた。

防災シンポでインドの研究者

被災地の現状報告

神戸

助け合っているのが現状だ」と被害拡大の背景などを語った。
一方、十四日に地震が発生し、六百人を超える死者を出したエルサルバドルの被害について米国のNPO関係者が報告した。

神戸市中央区の神戸国際会議場で開かれている都市防災に関する国際シンポジウムで三十一日、インドから参加した研究者が、発生から五日がたっても依然として多数の住民ががれきに埋まったままになっているインド西部大地震の被害や救出活動の現状を報告した。

国連地域開発センター防災計画兵庫事務所などが主

催する「地震にまけない世界へ向けて 二十一世紀国際ワークショップ」。海外十四カ国の十五都市や国内の自治体の防災担当者、研究者らが参加、二十九日から地震に強い街づくりについて議論を重ねてきた。

インドでは二十六日、西部のアジ市近郊を震源とするマグニチュード7.9の地震が発生。救出活動は進んでおらず、犠牲者が急激

に増え続けている。

報告したのはインド工科大学（ボンベイ）のラビ・シンハ教授。被害地域の

特徴などを説明した後、「急速な都市化が進んで、耐震基準を守っていない建物が

数多く造られていた」「救出活動を急め、住民自身が

「防災教育学校を核に」

国際ワーク 兵庫メッセージ採択

神戸で開かれていた「地」防災計画兵庫事務所、兵として強化し、自立と協力層にまけない世界へ向けて 兵庫、神戸市、読売新聞大阪本社など主催）は三十一日、学校を防災教育の核として強化し、自立と協力を促す「兵庫メッセージ」を採択、来春開催す

る兵庫県の「阪神・淡路大震災メモリアルセンター（仮称）」を活動拠点とすることなどを決め開会した。

最終日は約二百人が参加。総括シンポジウムで、岡田恒男・日本建築学会会長が「防災を担う人材の育成を」、亀田弘行・理化学研究所地震防災フロンティア研究センター長が「研究者が専門領域を出て、NGO（民間活動団体）から学ぶべきだ」と提言した。

ムスタファ・エルディック・ボアシチ大（トルコ）地震工学科長はトルコ地震を「海外NGOが活躍した防災、啓もう分野はまだ不十分」と検証。トーマス・ブレナン米国海外災害援助局アジア局長が「建築基準の強化と順守が重要」、斎藤富雄・同県防災監は

「被災地のノウハウを外に実践的に伝えるのが兵庫の責務」と訴え、最後に同事務所小林正義所長がメッセージをまとめた。（二月七日朝刊で詳報します）

地域の防災力強化など提言

神戸の国際会議閉幕 都市防災について考える「地震にまけない世界へ向けて」二十一世紀国際ワークシヨップは三十一日、阪神・淡路大震災メモリアルセンター（仮称）を「将来は国連機関に」などとする兵

庫メッセージを宣言した。神戸市中央区の神戸国際会議場で開かれ、「二十一世紀へのメッセージ」をテーマにパネルディスカッション。トルコの研究者が「地震に強い住宅が国内に多数残っている。防災上で最大の課題」と問題を提起。インドの研究者は「学校や病院など優先的に耐震強化する検討を始めた」などと返答した。

神・淡路大震災の経験から①地域の防災力強化の行政と地域のコーディネーターとしてNPOの育成②防災教育の核となる学校の耐震強化が必要と提言。「その役割を担うメモリアルセンターを国連機関に成長させていく」とした。

「21世紀国際ワークショップ」最終日

舞子高生4人壇上で訴え

「地震にまけない世界へ向けて 21世紀国際ワークショップ」＝国際連合地域開発センター（UNCRD）防災計画兵庫事務所、県、神戸市、読売新聞大阪本社など主催＝最終日の三十日、県立舞子高一年の生徒が参加し、阪神大震災直後の生々しい状況について語り、「震災はまだ終わっていません」と訴えた。

「震災いまだ終わらず」



熱心にメモをとりながらシンポジウムを聴く舞子高校の生徒ら

午後からのパネルディスカッション「教育とコミュニティ参加の経験から」の後半、コーディネーターから招かれ、震災当時、小学四年だった四人が壇上へ。神戸市長田区の自宅が全焼した中川知子さん（16）が体験を発表した。

話は「変わり果てた街の

たこと、慣れない環境で体調を崩したこと、友人と再開できた時の喜び―などに触れた。

最後に「あれから六年がたったが、私の住んでいる街にはまだ工事の騒音が響いている。震災はまた過去のものではなく、今だからこそ考えなくてはならないことも多いと思う」と締めくくると、この日一番の拍手が起こった。

インド大地震で緊急報告

「予測、技術超えた規模に」

インド西部大地震について、インド工科大のラビ・シンハ助教授が、緊急報告を行い、被害状況を説明した。

最も被害の大きかったグジャラート州は住民のほとんどが被災し、同州のブジでは、耐震建築の鉄筋コンクリートの建物が軒並み倒壊した。

家屋内にいた住民の約三割が亡くなり、多くの人ががれきの下敷きになっている。壊れた高層建物内に取り残された人々を、住民ら情報を収集していた。

した。中山さんは「被災者関、民間活動団体の代表らが経験したことの一例を世界のの人たちに伝えられてよかった」と話した。

「有意義な会議」参加者らも感謝

ワークショップは三日間にわたって開催され、海外にわたって開催され、海外備を続けてきた成果で、参加者も感謝していた。

「と評価した。

国連地域開発センター兵庫防災計画兵庫事務所、県などが約四か月がかりで準備を続けてきた成果で、参加者も感謝していた。

神戸で地震防災国際シンポジウムを開いた

小林 正美さん

十四か国から五十人の専門 したなご (民間活動団体) 家を集め、先月十九日か に呼び掛け、「トルコ大震災 ち三日間、「地震にまけない 委員会」をつくら。 世界へ向けて 引継国際の 現在はチャモリ(インド) 「クショップ」を開いた。 バンドン(インドネシア)な

「物や金銭を渡した けの海外援助から人 間の信頼のネットワー クを築き上げていく援 助へと転換させるた め、神戸から世界にメ ッセージを送信したか った」

哲学者と辻哲郎の 「風土」の教えを環境 デザイン学として実践 してきた。人間の行動 と環境との関係は、伝 統的建築を生かした災 害に強い街とは……。

その研究の成果を生 かし、津上國の防災を 支援する国連地域開発センタ

「防災計画兵器事務所の所長 を九九年四月から 務め、同八月のト ルコ大震災では、 阪神大震災で活動

自立と協力、そして教育

と。兵庫県で、学校を拠点 として、地域に防災教育 を普及させるプロジェクトに 取り組む。今回のシ ンポは報告と意見交換の 場として企画した。

九九年三月のチャモリ 大地震の被災地を翌年十 月に訪れ、罹災しない 仮設の教室で、教師を囲 む子供たちのひとみの輝 きに、「日本で暮れつつ ある教師と子供の間、値 関係がそこにはある」と ぼつとまじられた。

それだけに、先ごろの インド大地震の被害を特 に心配している。「子供への 愛情は万国共通。次世代の命 を災害から守るため、私たち

には防災に取り組む義務があ る」



阪神大震災で活動 (姫路支局 坂成 美保)



● 京都六大学院工学研究科 教授。専門は人間環境設計学、 環境行動学。52歳。

世界と手携え推進

人材育成を最重視 政府の基準で設計 地域ベースに防災

高橋氏
エルティ
クック氏
アナン氏

「防災は人命の安全を第一とし、被災者の生活の安定を図ることが目的である。防災は単に災害に備えるだけでなく、被災後の復興支援も重要な役割を果たす。政府の基準に基づき、地域ベースに防災計画を設計し、人材育成を最重視する必要がある。」

高橋氏は、防災計画の設計において、政府の基準を厳格に守ることが重要であると指摘した。エルティ氏は、防災計画の実施には、地域ベースでの取り組みが不可欠であると述べた。クック氏は、防災計画の設計には、人材育成を最重視する必要があると強調した。アナン氏は、防災計画の設計には、地域ベースでの取り組みが不可欠であると述べた。

- シンポジウム参加者**
- ◇コーディネーター◇
 - 小林正典 (日本防災学会会長)
 - 山田隆男 (日本防災学会副会長)
 - ◇パネリスト◇
 - アナン・アリアン (インド防災局長)
 - エルティ・クック (米国防災局長)
 - 高橋氏 (日本防災学会)
 - 山田隆男 (日本防災学会)
 - 田中一太郎 (防災研究センター)
 - アナン・アリアン (インド防災局長)
 - エルティ・クック (米国防災局長)
 - 高橋氏 (日本防災学会)
 - 山田隆男 (日本防災学会)
 - 田中一太郎 (防災研究センター)

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緊急の情報を発信 既存物の補強急務 インドの実情説明

田中氏
アナン氏
クック氏

「緊急の情報を発信し、既存物の補強を急務とする必要がある。インドの実情を説明し、防災計画の設計に役立つ情報を提供する必要がある。」

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基調講演

防災に関する最新の研究成果や、被災者の生活支援に関する取り組みについて、専門家による講演が行われる。

講演者: 高橋氏、エルティ、クック氏、アナン氏

教訓、生活に根付くまで

防災計画の設計には、被災者の生活に根付くまで取り組む必要がある。政府の基準に基づき、地域ベースに防災計画を設計し、人材育成を最重視する必要がある。

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震災報道…悲劇繰り返さぬため

加藤博久、読売新聞大阪本社社長が、震災報道のあり方についてコメントを発表した。

加藤氏は、震災報道は単に被害の大きさを伝えるだけでなく、被災者の生活支援や復興支援に関する情報も伝える必要があると述べた。また、被災者のプライバシーを尊重し、悲劇を繰り返さないよう配慮する必要があると強調した。

世界と手携え推進

防災に関する最新の研究成果や、被災者の生活支援に関する取り組みについて、専門家による講演が行われる。

講演者: 高橋氏、エルティ、クック氏、アナン氏

人材育成を最重視 政府の基準で設計 地域ベースに防災

高橋氏
エルティ
クック氏
アナン氏

「防災は人命の安全を第一とし、被災者の生活の安定を図ることが目的である。防災は単に災害に備えるだけでなく、被災後の復興支援も重要な役割を果たす。政府の基準に基づき、地域ベースに防災計画を設計し、人材育成を最重視する必要がある。」

高橋氏は、防災計画の設計において、政府の基準を厳格に守ることが重要であると指摘した。エルティ氏は、防災計画の実施には、地域ベースでの取り組みが不可欠であると述べた。クック氏は、防災計画の設計には、人材育成を最重視する必要があると強調した。アナン氏は、防災計画の設計には、地域ベースでの取り組みが不可欠であると述べた。

緊急の情報を発信 既存物の補強急務 インドの実情説明

田中氏
アナン氏
クック氏

「緊急の情報を発信し、既存物の補強を急務とする必要がある。インドの実情を説明し、防災計画の設計に役立つ情報を提供する必要がある。」

田中氏は、緊急の情報を発信することが重要であると指摘した。アナン氏は、既存物の補強を急務とする必要があると述べた。クック氏は、インドの実情を説明し、防災計画の設計に役立つ情報を提供する必要があると強調した。

次代守る都市防災

危険度診断法を討議

調査継続、拡充目指す

都市の危険度の診断法をめぐって、自治体間の連携を促進する目的で、国土交通省が主催する「危険度診断法検討会」が、7月5日（土）に東京都庁で開かれた。この検討会では、自治体間の連携を促進する目的で、国土交通省が主催する「危険度診断法検討会」が、7月5日（土）に東京都庁で開かれた。

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自治体、企業に協力し、被災地の復興を進めようとする。

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パネルディスカッション

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行政とネットワーク

安全マップなど作製

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耐震模型で児童ら学習

時間かけてリスク削減

この検討会では、自治体間の連携を促進する目的で、国土交通省が主催する「危険度診断法検討会」が、7月5日（土）に東京都庁で開かれた。この検討会では、自治体間の連携を促進する目的で、国土交通省が主催する「危険度診断法検討会」が、7月5日（土）に東京都庁で開かれた。

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地震に備え、世界へ向け

21世紀国際フォーラム

「天災は多くの人を犠牲にする。その被害を軽減するために、国際的な連携が必要である。21世紀国際フォーラムは、そのための国際的な連携を促進する場である。」



「国境を超え、市民団結。GHI途上国を支援。国際的な連携を促進し、途上国の発展を支える。」



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Prepare for the worst, quake experts warn

Recent disasters in El Salvador and India highlight need for action in vulnerable areas

By Shinichi Yanagawa

Daily Yomiuri Staff Writer

KOBE—Experts from around the world last week called on communities prone to earthquakes to improve their readiness for disasters of the type that have wrought havoc on India and El Salvador in the space of a month, and to strengthen their post-earthquake response.

Participants in the International Workshop on Earthquake Safety World in the 21st Century ended the three-day event Wednesday by adopting the Hyogo Message, which sees a bigger role for schools in teaching disaster prevention, and a blend of self-help and community-wide cooperation. The message also reaffirmed the importance of urban disaster prevention to safeguard future generations.

The event served as a review of the achievements of the U.N. International Decade for Natural Disaster Reduction, which ended last year.

The participants discussed the progress made by such programs as the Risk Assessment Tools for Diagnosis of Urban Areas against Seismic Disasters (RADUIS) Initiative, the Global Earthquake Safety Initiative (GESI) and the School Earthquake Safety Program.

The event was organized by the Disaster Management Planning Hyogo Office of the U.N. Centre for Regional Development (UNCRD), the RADUIS Japan Team, Geohazards International, The Yomiuri Shimbun, Osaka, and the governments of Kobe and Hyogo Prefecture.

On the final day, Hirohisa Kato, president of The Yomiuri Shimbun, Osaka, noted that six years had passed since the Great Hanshin Earthquake struck Kobe and surrounding areas on Jan. 17, 1995.

"We have continued to report on the lessons learned from the Great Hanshin Earthquake as the basis for proposals to ensure a similar tragedy never happens again. Those lessons should be made clear to people around the world," Kato said.

NGOs need coordinating

Tsuneko Katsuyama, director of the Education, Science and Technology Ministry's National Research Institute for Earth Science and Disaster Prevention, said: "Many NGOs have taken part in rescue activities in El Salvador and India, but their efforts seemed to have been hampered by their sheer number.

"I don't see the point of having many organizations acting on their own. We need an international organization that is able to coordinate relief activities, and to set up a fund."

Facilitators discussed self-help and cooperation, and education through community involvement. The panelists were Anand S. Aiyas, professor emeritus of

go to stricken areas to help, he said, adding that an earthquake memorial center due to open in Kobe next year will house such research and training facilities.

"We will also establish a network with organizations in Japan and overseas," he said.

Too many homes still unsafe

Erdik said that about 600,000 people's homes had been destroyed or badly damaged in the earthquake that hit Turkey in August 1999. The disaster caused damage \$2 billion of damage, causing a 5 percent drop in the country's gross national product.

About 80 percent of damaged homes have been repaired, he said. The government has implemented tougher guidelines for housing design and construction, and residents are required by law to take out disaster insurance.

India has a history of massive seismic activity. Aiyas said, in the last 200 years, there have been eight earthquakes with a magnitude of 8 or more on the Richter scale, 43 that measured between 7 and 7.9, and a staggering 312 tremblers measuring between 6 and 6.9 on the scale.

About 12 percent of the country is susceptible to earthquakes on that scale.

As part of the International Strategy for Disaster Reduction, officials checked the fragility of buildings throughout India, Aiyas said.

The Indian government formed a disaster-management program committee, which has almost completed a comprehensive set of plans. Scientists, NGOs, regional representatives and people from the insurance and other businesses have been involved in drawing up the plans, he said.

Okada visited Turkey early last month to inspect areas affected by the earthquake. "I was surprised to see that 54,000 permanent housing units were already near completion."

Okada said two types of building are particularly vulnerable to earthquakes: old structures built before the imposition of revised, quake-resistant regulations, and those that construction firms claimed met the requirements but, in truth, did not.

"Sixty percent of buildings in Japan are of the former type," he said. "If those houses are not reinforced with quake-resistant technologies, we cannot prevent them from being destroyed."

"This problem is common throughout the world. A network comprising NGOs and other groups should be formed to promote earthquake-resistant reinforcements, and engineers should learn about those technologies."

Brennan said disaster management required support through legislation. He also called for the formation of bodies to liaise between governments and

the private sector, and for greater community involvement in disaster measures.

The United States and Japan have already put those three elements in place, but many other earthquake-prone countries have yet to do so, he said.

The said countries should formulate their own measures for seismic risk reduction depending on their social environment.

He suggested such practical measures as equipping homes in densely populated areas with fire extinguishers, and holding regular fire drills, rather than spending the money on, say, a new fire engine.

Raising public awareness within the community is cheaper and more efficient than disaster-management programs drawn up by the central government, Brennan said.

Kaneda said: "People must get involved in self-help projects and have access to accurate information.

"It is our mission to be able to grasp the extent of damage as quickly as possible. We will then make that information available to governments and NGOs around the world."

"In the recent Indian earthquakes, we managed to estimate the damage in many locations and posted the information on our Web site within 24 hours using a U.S. military satellite photo taken at night."

Kobayashi said: "Community involvement will be given priority over other disaster measures. Governments, NGOs and other organizations should all participate."

Saito emphasized the different problems faced by individual countries. "But we also have problems in common. We should share our know-how and experience and cope with disasters together in the future."

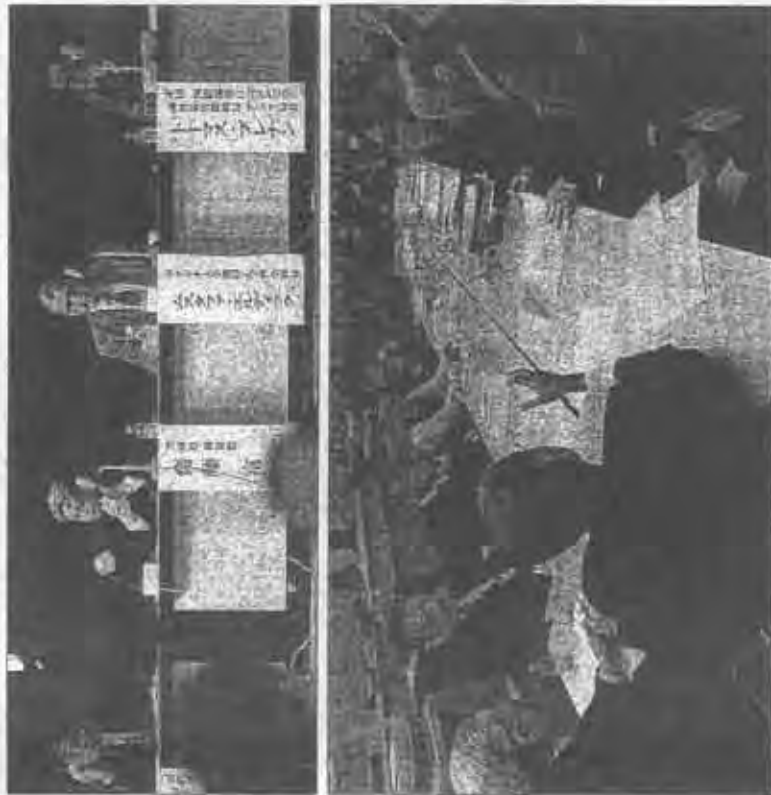
Brennan said schools could be used as a focal point for raising public awareness of disaster management. If students learn about disaster management, he argued, they will tell their parents about it.

Okada said, "It is better to spend time and effort on reinforcement now, rather than on repairing homes after an earthquake has struck."

"We have been caught in a cycle of putting up new buildings and repairing damaged ones (every time there is a major earthquake). We have to end that cycle."

Disaster management should operate within a clear legal framework, Aiyas said. About 85 percent of buildings in India are made of brick, stone and similar materials, and are vulnerable to seismic disasters. He said a list should be drawn up of schools, hospitals and other structures that require urgent reinforcement.

Kobayashi said: "We have to make a world that is no longer threatened by earthquakes in cooperation with nonprofit organizations, NGOs, governments and citizens. The Kobe memorial center will take the lead in bringing that about."



Yasumichi Shimizu
Top and above: Experts from around the world discuss earthquake preparedness at a symposium held in Kobe last week.

Rouseff University in India; Thomas O. Brennan, senior regional advisor for Asia at the U.S. Agency for International Development's office of U.S. foreign disaster assistance; and Prof. Mustafa Ozder, Erdik, chairman of the Kandilli Observatory and Earthquake Research Institute at Bogazici University in Turkey.

Hirotsugu Kaneda, director of RIKEN's (the Institute of Physical and Chemical Research) Earthquake Disaster Mitigation Research Center; Tsuneko Okada, president of Architectural Institute of Japan; and Tomio Saito, chief of emergency management at the Hyogo prefectural government, also took part. The discussion was coordinated by

Masumi Kobayashi, coordinator of the Disaster Management Planning Hyogo Office.

Many who witnessed television pictures of the Kobe earthquake recall seeing the Hanshin Expressway lying on its side. "The collapse of the highway taught us that even modern cities have fragile parts and that we had to build safer cities," Saito said.

Saito said the earthquake had taught officials the importance of preparedness, as well as the need to mobilize emergency services quickly and to establish lines of communication between local governments and emergency workers, including the Self-Defense Forces.

Most important is the need to train people who can

Community involvement a priority

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Welcome Party

Monday, January 29, 2001



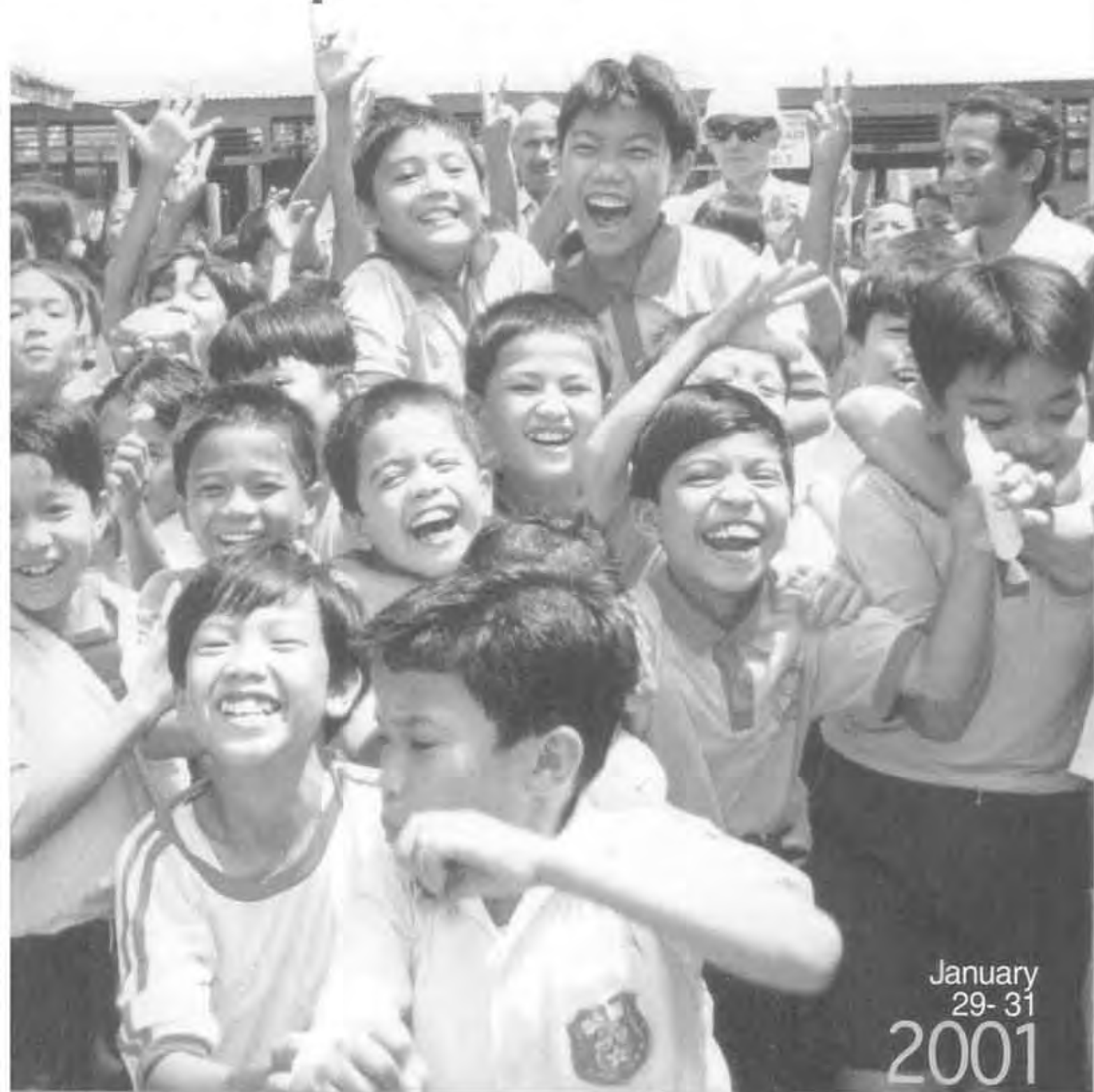
Reception Party

Wednesday, January 31, 2001

LAVANTE 4th floor, annex of the Portopia Hotel



living with earthquakes



January
29-31
2001

International Workshop on
EARTHQUAKE SAFER WORLD IN THE 21st CENTURY

Emphasis on Self-help, Cooperation and Education through Community Involvement

Welcome Message

EARTHQUAKE SAFER WORLD IN THE 21st CENTURY

Emphasis on Self-help, Cooperation and Education through Community Involvement

The workshop is aimed to focus on the specific issues of earthquake disaster management with special emphasis on three key elements: self-help, cooperation and education, which can and should be combined together for the community involvement. These are exemplified by the experiences in developing countries through three unique approaches: the RADIUS (Risk Assessment Tools for Diagnosis of Urban Areas against Seismic Disasters) Initiative, the GESI (Global Earthquake Safety Initiative), and the School Earthquake Safety Program.

The 21st century is visualized as an era of information, knowledge and education. It is necessary to create proper awareness at different levels of the community for a safer future. This workshop is the first step towards that non-ending process. It is found through the recent experiences of devastating earthquakes that a self-taught, educated and trained community is capable to cope with the natural phenomenon.

地震にまけない世界へ向けて 21世紀国際ワークショップ

コミュニティーベースの自立と協力、そして教育

「自立と協力、そして教育」、これらの3つの要素は、地域の人々が中心になってより安全なコミュニティを築き上げるために欠くことのできない要素です。「地震にまけない世界へ向けて 21世紀国際ワークショップ」は、この3つのポイントの大切さについて話し合いを進めながら、より多くの人々と一緒に地震にまけない社会のあり方について考えようとするものです。

ワークショップは発展途上国を対象に実施された3つのプロジェクト、RADIUS（都市での地震災害の危険性を軽減するための取り組み）、GESI（都市地震対策の方向性を理解するための取り組み）、及び School Earthquake Safety Program（地震にまけない学校計画）の事例を紹介しながら理解を深めたいと思います。

21世紀には情報と知識、教育がますます重要になるでしょう。より安全な未来のためには、地域のあらゆる分野の人々が地震にまけない社会に向けて自ら学び、知識を深め、互いに協力しあうことが大切です。本ワークショップは、終わりのないそのプロセスの最初の第一歩になると確信しています。

For Participants

January 29-30, 2001: **Workshop**/ Registration required/ Medium: English

1. Global Earthquake Safety Initiative (GESI)
2. How the RADIUS results are useful to cities.
3. School Earthquake Safety Program

January 31, 2001: **International Symposium**/ Registration not required/ Medium: Japanese and English

参加ご希望の方へ

1月29-30日 ワークショップ 1-2日目

(同時通訳なし。事前申し込みが必要となっております。参加ご希望の方はemailもしくはFaxにて事務局までお申し込み下さい。)

1. GESI（都市地震対策の方向性を理解するための取り組み）
2. RADIUSの成果とその活用
3. School Earthquake Safety Program（地震にまけない学校計画）

1月31日 国際シンポジウム

(同時通訳付き。ご自由に参加いただけます。ただし、人数把握のため、参加ご希望の方はemailもしくはFaxにて参加人数を事務局までお知らせ下さい。)

For your reference, please visit:

会議参加に関する情報は:

<http://www.hyogo.uncrd.or.jp/ws2001>



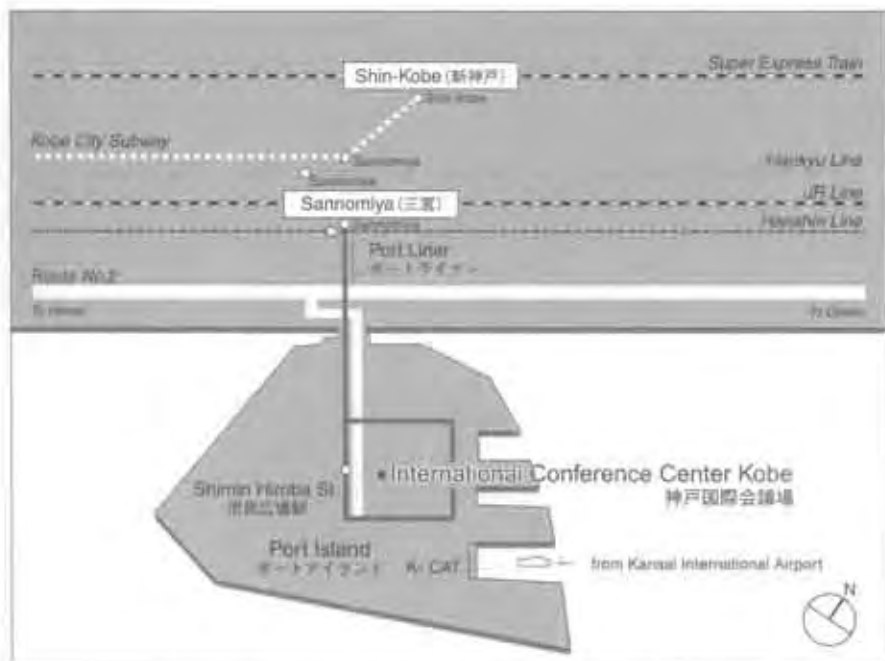
International Symposium Program

January 31, 2001: International Symposium

9:30	Opening Session	Coordinator: M. Kobayashi	UNCRD DMP
9:30	Welcome Address	H. Kato	The Yomiuri Shimbun, JAPAN
9:40	Opening Remarks	Y. Kimura	UNCRD
9:50	Keynote Address	T. Katayama	NIED, JAPAN
10:20	Coffee Break		
10:30	Overview	Coordinator: R. Shaw	EDM-RIKEN, JAPAN
10:30	RADIUS Initiative	K. Okazaki	MOC, JAPAN
11:00	Global Earthquake Safety Initiative	B. Tucker	GeoHazards International, USA
11:30	School Earthquake Safety Program	A. S. Arya	Roorkee University, INDIA
12:00	Lunch		
13:00	Panel Discussion 1: <i>'Experiences on Self-help and Cooperation'</i>	Moderator: K. Okazaki	MOC, JAPAN
14:15	Panel Discussion 2: <i>'Experiences on Education and Community Involvement'</i>	Moderator: R. Shaw	EDM-RIKEN, JAPAN
15:30	Coffee Break		
15:45	Panel Discussion 3: <i>'Steps Towards Earthquake Safer World in the 21st Century'</i>	Moderator: M. Kobayashi	UNCRD DMP
		Panelist: A. Arya	Roorkee University, INDIA
		T. Brennan	USAID-OFDA, USA
		M. Erdik	Bogazici University, TURKEY
		H. Kameda	EDM-RIKEN, JAPAN
		T. Okada	AIJ, JAPAN
		T. Salto	Hyogo Prefecture, JAPAN
18:00	Adjourn		

2001年 1月31日 国際シンポジウム

9:30	オープニングセッション	司会: 国際連合地域開発センター防災計画兵庫事務所 所長	小林 正美
9:30	歓迎のあいさつ	読売新聞大阪本社 社長	加藤 博久
9:40	開会のことば	国際連合地域開発センター 所長	木村 洋
9:50	基調講演	文部科学技術省防災科学技術研究所 所長	片山 恒雄
10:20	コーヒーブレイク		
10:30	さまざまな防災への取組み	司会: 理化学研究所地震防災フロンティア研究センター 研究員	ラジブ・ショウ
10:30	RADIUS Initiative	国土交通省住宅局 国際基準調査官	岡崎 健二
11:00	The Global Earthquake Safety Initiative	ジオハザードインターナショナル 代表	ブライアン・タッカー
11:30	School Earthquake Safety Program	ルーキー大学 名誉教授	アナンド・アリヤ
12:00	昼 食		
13:00	パネルディスカッション-1 「地域の自立と協力の経験から」	コーディネーター: 国土交通省住宅局 国際基準調査官	岡崎 健二
		パネリスト: バンドン、神戸、マニラ、ムンバイ、ティファナ	
14:15	パネルディスカッション-2 「教育とコミュニティ参加の経験から」	コーディネーター: 理化学研究所地震防災フロンティア研究センター 研究員	ラジブ・ショウ
		パネリスト: 海外NGO (パキスタン、ネパール、アメリカ)、国内NGO、外務省	
15:30	コーヒーブレイク		
15:45	21世紀へのメッセージ —地震にまけない世界へ—	コーディネーター: 国際連合地域開発センター防災計画兵庫事務所 所長	小林 正美
		パネリスト: ルーキー大学 名誉教授	アナンド・アリヤ
		米国際開発庁 海外災害援助局 アジア局長	トーマス・ブレナン
		ボアジチ大学 地震工学科長	ムスタファ・エルディック
		理化学研究所 地震防災フロンティア研究センター センター長	亀田 弘行
		日本建築学会 会長	岡田 恒男
		兵庫県 防災監	豊藤 富雄
18:00	閉 会		



International Conference Centre Kobe/ 会議場周辺案内図

International Workshop on Earthquake Safer World in the 21st Century

- Venue International Conference Center Kobe
 Contact United Nations Centre for Regional Development (UNCRD)
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- Organized by UNCRD Disaster Management Planning Hyogo Office
 RADIUS Japan Team
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- Supported by The Great Hanshin-Awaji Earthquake Memorial Research Institute
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地震にまけない世界へ向けて 21世紀国際ワークショップ

- 会場 神戸国際会議場 (神戸ポートアイランド内)
 事務局 国際連合地域開発センター 防災計画兵庫事務所
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