

# 地震防災のための東京国際ワークショップ2006<住宅の被害軽減を目指して> 概要

## 1. 日時

平成 18 年 11 月 22 日（水）午後 全体会議

平成 18 年 11 月 23 日（木）終日 各国に関するグループ・ディスカッション

## 2. 場所

ワークショップは世界銀行のビデオ会議システムを用い、以下の会場を双方向につないで行われた。また全体会議はウェブストリーミング・サービスにより、インターネットを通じて視聴可能であった。

- 世界銀行東京開発ラーニングセンター（東京）
- 建築研究所（つくば）
- インドネシア大学（ジャカルタ、インドネシア）
- バンドゥン工科大学（バンドン、インドネシア）
- 世界銀行アチェ事務所（バンダアチェ、インドネシア）
- 貧困削減戦略資源センター（カトマンズ、ネパール）
- 世界銀行イスラマバード事務所（イスラマバード、パキスタン）
- イスタンブール工科大学（イスタンブール、トルコ）
- JICA トルコ事務所（アンカラ、トルコ）

## 3. 主催者等

独立行政法人 建築研究所

防災科学技術研究所

政策研究大学院大学

三重大学

## 4. 共催者

後援

内閣府

文部科学省

国土交通省

協力

世界銀行東京開発ラーニングセンター (TDLC)

国連地域開発センター (UNCRD)

国連国際防災戦略事務局 (UNISDR)

国連教育科学文化機関 (UNESCO)

国際協力機構 (JICA)

広島大学

インドネシア：バンドゥン工科大学、シャクアラ大学、ガジャマダ大学、公共事業省人間居住研究所

ネパール：ネパール工科大学、ネパール国立地震工学協会 (NSET)

パキスタン：プレストン大学、ペシャワール大学

トルコ：イスタンブール工科大学、公共事業住宅省

## 5. 参加者

全体の参加者

|    |     |
|----|-----|
| 合計 | 177 |
|----|-----|

11月22日

| 会場                    | 人数  |
|-----------------------|-----|
| 世界銀行東京開発ラーニングセンター(東京) | 66  |
| 建築研究所(つくば)            | 13  |
| 世界銀行アチェ事務所(インドネシア)    | 1   |
| バンドン工科大(インドネシア)       | 17  |
| 世界銀行ジャカルタ事務所(インドネシア)  | 17  |
| イスタンブール工科大(トルコ)       | 1   |
| 世界銀行パキスタン事務所(イスラマバード) | 2   |
| ネパール DLC(カトマンズ)       | 20  |
| ウェブストーリーミング・サービス      | 61  |
| 合計                    | 150 |

11月23日(東京会場)

| 対象国           | 参加者数 |
|---------------|------|
| インドネシア        | 47   |
| トルコ           | 45   |
| ネパール          | 47   |
| パキスタン         | 44   |
| ペルー           | 53   |
| 東京での国別分科会登録者数 | 57   |

11月23日(各国会場)

| 会場                   | 参加者数 |
|----------------------|------|
| アンカラ (JICAトルコ事務所)    | 6    |
| バンダアチェ (世銀アチェ事務所)    | 4    |
| バンドン(バンドン工科大)        | 15   |
| イスラマバード (世銀パキスタン事務所) | 19   |
| イスタンブール (イスタンブール工科大) | 1    |
| ジャカルタ (世銀インドネシア事務所)  | 5    |
| カトマンズ (ネパール DLC)     | 18   |
| 合計                   | 69   |

## 6. 使用言語

英語

## **Key Points of Discussions in BRI Workshop 2006**

### **1. Plenary Meeting, November 22**

#### **Session 1:**

- a) What is the meaning of appropriate technology for those who have little income and are forced to use cheap construction materials?
- b) There is a need to train construction workers who are not familiar with construction processes using new technologies.
- c) Does safer construction naturally mean being expensive?

#### **Session 2:**

- a) [On Indonesia]  
How far can people follow the efforts made for reconstruction after natural disasters? (OR: How far have the Indonesians concerned with such efforts achieved in dissemination?)
- b) How can the issue of engineers' professional liability be incorporated in this Safer Housing Project?
- c) [On Nepal]  
How can the following three facts be connected in the Project?:
  - Stone masonry buildings are mainly seen in rural areas;
  - Community risk map making are in progress in urban areas; and
  - Efforts to disseminate technologies are being done in Katmandu.

#### **Session 3:**

- a) Will there emerge any suggestions for earthquake preparedness before the end of the Project?
- b) Which is the main objective of the Project either raising people's risk preparedness or making guidelines?
- c) What is needed for capacity building? (OR: How can capacity building be done?)
- d) [On Peru]  
How long does cane endure as a building component?
- e) What are key building techniques for tsunami-proof housing?

## 2. Group Discussions on each country, November 23

### Peru:

a) [On PUCP (Pontifical Catholic University of Peru)]

How long/often have they conducted shaking table experiments?

How have they conducted experiments of safer adobe models (e.g., in retrofitting methods and earthquake simulation methods)?

b) Is it technically feasible for local people to add vertical reinforcement member to adobe houses as stipulated in building codes?

c) How long can chemical meshes endure as building component (e.g., polymer mesh, protection mesh, and PP-band mesh)?

d) [On SENCICO]

How can we share SENCICO's know-how/tools for disseminating safer building techniques (e.g., by translation of SENCICO manuals into English)?

Revenue is a main obstacle for SENCICO to disseminate safer building techniques.

e) [JICA's model houses in Peru]

What kinds of backgrounds do the participants of the project have (e.g., dwelling place and experience of building houses)?

What are their opinions about the houses?

What are possible obstacles to put such houses into practical use (e.g., labor cost and handling cost of building materials)?

### Indonesia:

a) To what extent and in what way can the reconstruction experience of Banda Aceh be incorporated into the reconstruction of Central Java?

b) How can we share reconstruction experiences among different types of disasters?

c) What can we learn from the reconstruction process of Kobe in terms of central government supports and local initiatives?

d) In order to ensure the quality of reconstructed houses, salary standard for construction workers as well as quality standard of workers is needed.

e) Geographical identification of seismic risk level (e.g., seismic microzonation) and informing it to people are important to proceed with participation approach.

f) How can the safety design standard (i.e., minimum requirements) be included in seismic codes (e.g., whether Sumatra Fort can be a rational base for minimum requirements)?

g) Concerning certificate system given to houses (or households) that satisfy building codes requirements, there remains some possibility of misuse/misconception. (i.e., To educate general

public is not easy, and they can not become professionals.)

- h) There are some models of safer housing in quake-affected areas of Indonesia, including those use local building materials.
- i) How can we educate primary school children on safer housing?

**Nepal:**

- a) Nepal has a good appreciation on technical dissemination practices. Based on this, new challenges exist in combining awareness/knowledge and enforcement/action (e.g. dissemination of building codes).
- b) It is preferable to prioritize stone masonry in this Project because of the lack of technical guidance in contrast with the case of adobe.
- c) [On Topic 1 of the Project]  
It is important to consider how to involve community people lacking access to GIS/computer. In Nepal, there is a simple method to assess building quality, although it is not a self-assessment type one.
- d) [On Topic 3 of the Project]  
Field survey pre-test shows clear correlation between respondents' academic qualifications and disaster risk perceptions. This leads to the possible inclusion of disaster education issue in this Project.  
In spite of difficulty in asking family income in the questionnaire, it is indispensable to ask 'how much can you spend to protect your house?' for understanding respondents' risk preparedness.
- e) What are recent activities of Department of urban Development and Building construction (e.g., related to the implementation/familiarization of building codes and the improvement of anti-seismic performance of buildings)?

**Pakistan:**

- a) Pakistan Atomic Energy Commission (PAEC) with Quaid-e-Azam University has initiated a project to develop historical catalogue of earthquakes hit Pakistan, and the catalogue shall be developed within two years.
- b) A PAEC researcher (Dr. Aziz Qureshi) is already working on Radon gas to predict earthquakes.
- c) Shaking table test or explosion test near a building model, which is better way to replicate the actual ground motion (ore to conduct dynamic testing of structure)?
- d) Since all faults are not visible on the surface, there is a need to explore buried faults through different technologies exemplified by deep geophysical surveys (e.g. correlation between an experiment result and lessons learned from a real earthquake; clamping ration of the masonry model; modeling of stiffness properties).

- e) It is important to have joint thickness not more than 15mm; otherwise the strength of masonry may decrease dramatically.
- f) Several questions are about researchers/ experiments conducted by seminar presenters with regard to methodologies used and findings and so on.

**Turkey:**

- a) Main obstacles in Istanbul to reinforce apartments include generation gap in risk perception and financial/credit issue.
- b) [On Reinforcement method using scrap-tires]
  - How many man-days are needed for reinforcing a house?
  - How much does it cost for an ordinary house in terms of labor cost and equipments used?
- c) How pull tension should be adjusted (e.g., initially, 3-4 days later, some years later)?
- d) Both vertical and horizontal reinforcement are indispensable to make masonry structure safer?
- e) JICA Turkey's basic strategy for safer housing/building is to raise risk awareness among people.
- f) [On Topic 3 of the Project]
  - Each participating country can use own criteria for choosing two field survey communities (e.g., a pair of quake-affected and unaffected communities; a pair of urban and rural communities). However samples of each community should represent the whole community (e.g., in proportion of masonry and the other buildings).



1. Workshop Plenary Meeting  
on November 22, 2006



2. Workshop Plenary Meeting  
on November 22, 2006



3. Workshop Plenary Meeting  
on November 22, 2006



4. Workshop Group  
Discussion on Indonesia on  
November 23, 2006



5. Workshop Group  
Discussion on Nepal on  
November 23, 2006



6. Workshop Group  
Discussion on Pakistan on  
November 23, 2006





7. Workshop Group  
Discussion on Peru on  
November 23, 2006



8. Advisory Committee on  
November 22, 2006



9. Advisory Committee on

November 22, 2006



10. Thematic Workshop on  
"Aseismic Building  
Technology Acceptable to  
Communities" on November  
17, 2006



11. Thematic Workshop on  
"Aseismic Building  
Technology Acceptable to  
Communities" on November  
17, 2006



12. Briefing on Seismological  
Safety Enhancement Policy  
for Buildings in Japan at  
Ministry of Land,  
Infrastructure and Transport  
(MLIT) on November 20,  
2006



13. Briefing on Seismological Safety Enhancement Policy for Buildings in Japan at Ministry of Land, Infrastructure and Transport (MLIT) on November 20, 2006



14. Briefing on Disaster Management Policy of Japan at Cabinet Office on November 21, 2006



15. Briefing on Disaster Management Policy of Japan at Cabinet Office on November 21, 2006



16. Dr. Hiroyuki Kameda, Earthquake Disaster Mitigation Research Center, National Research Institute for Earth Science and Disaster Prevention (EDM, NIED) at Technical Meeting on November 15, 2006



17. Briefing on Disaster management Policy of Local Government of Hyogo Prefecture on November 15, 2006



18. Special Lecture by Dr. Kimiro Meguro, Tokyo University on November 20, 2006



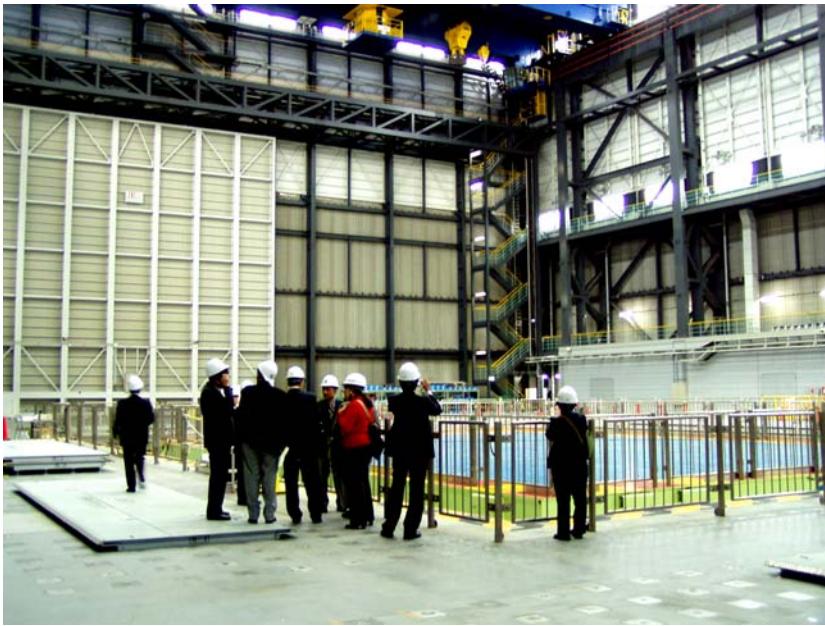
19. Discussion on Topic 2  
"Feasible and Affordable  
Seismic Construction" at  
United Nations Center for  
Regional Development  
(UNCRD) in Kobe on  
November 16, 2006



20. Introductory Explanation  
on E Defense (Large Scale  
Shaking Table Experiment  
Facility) in Miki city on  
November 16, 2006



21. Wrap up Discussion at  
National Institute for Earth  
Science and Disaster  
Prevention (NIED) in  
Tsukuba on November 28,  
2006



22. Technical Visit to E Defense (Large Scale Shaking Table Experiment Facility) in Miki City on November 16, 2006



23. Technical Visit to E Defense (Large Scale Shaking Table Experiment Facility) in Miki City on November 16, 2006



24. Full Scale Specimens for Experiment at E Defense (Large Scale Shaking Table Experiment Facility) in Miki City on November 16, 2006



25. Technical Visit to Hokudan Earthquake Memorial Park (Nojima Fault) in Hyogo Prefecture on November 16, 2006



26. Technical Visit to Hokudan Earthquake Memorial Park (Nojima Fault) in Hyogo Prefecture on November 16, 2006



27. Facility for Experiencing Earthquakes in Hokudan Earthquake Memorial Park (Nojima Fault) in Hyogo Prefecture on November 16, 2006



28. Technical Visit to Disaster Reduction and Human Renovation Institution on November 15, 2006



29. Technical Visit to Disaster Reduction and Human Renovation Institution on November 15, 2006



30. Technical Visit to Disaster Reduction and Human Renovation Institution on November 15, 2006





31. Technical Visit to Disaster Management Course of Maiko High school in Hyogo on November 17, 2006



32. Technical Visit to Disaster Management Course of Maiko High school in Hyogo on November 17, 2006



33. Technical Visit to Disaster Management Course of Maiko High school in Hyogo on November 17, 2006



34. Courtesy Call on Dr. Hiroyuki Yamanouchi, Chief Executive of Building Research Institute (BRI), Tsukuba on November 27, 2006



35. Technical Visit of Experiment Facilities in Building Research Institute (BRI) in Tsukuba on November 27, 2006



36. Shaking Table for Experiment with Large Range of Displacement in Building Research Institute (BRI) in Tsukuba on November 27, 2006



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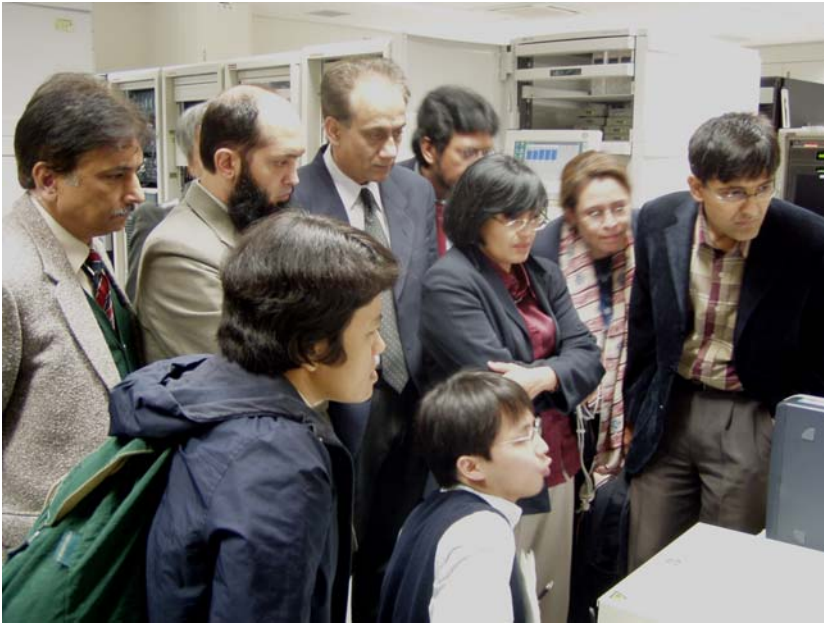
7. Courtesy Call on Dr. Yoshimitsu Okada, President of National Institute for Earth Science and Disaster Prevention (NIED), Tsukuba on November 28, 2006



38. Technical Visit of Experimental Facilities of National Institute for Earth Science and Disaster Prevention (NIED), Tsukuba on November 28, 2006



39. Technical Visit of Experimental Facilities of National Institute for Earth Science and Disaster Prevention (NIED), Tsukuba on November 28, 2006



40. Technical Visit of Research Laboratory of National Institute for Earth Science and Disaster Prevention (NIED), Tsukuba on November 28, 2006



41. Technical Visit to Geographical Survey Institute (GSI), Tsukuba on November 27, 2006



42. Briefing by Mr. Mamoru Koarai, Geographical Survey Institute (GSI), Tsukuba on November 27, 2006