Rebuilding A Safer Aceh
Against Earthquake Hazard

Based on the joint research by;
- National Graduate Institute for Policy Studies (GRIPS)
- Disaster Mitigation Center - Institute of Technology Bandung (ITB)
- Building Research Institute (BRI)

Kenji Okazaki
Professor, GRIPS, Japan
Seismic risk level of Aceh is very high
How to rebuild a safer Aceh against earthquakes...?

- Earthquake and tsunami 26 Dec. 2004 provided *opportunities* to rebuild a safer Aceh against earthquakes
- Reconstruction should not increase earthquake *vulnerability* of people!
Study on the Vulnerability of Buildings in Aceh
Field survey Feb. 2006

- Cooperation of ITB-GRI PS-BRI

- Objectives:
  1. Study on the level of earthquake vulnerability of ongoing reconstructed buildings (mainly housing and school buildings)
  2. Develop recommendations to improve the quality of reconstructed buildings in Aceh
- Walls

Large spacing

Untidy
Results from Field Survey

- Quality of construction is below standards
- Lack of supervision/inspection
- Construction differs from drawings/specifications
- Unskilled workers
Planning: from recovery to reconstruction

- Transition shelters are provided while permanent houses are provided.
Planning: Site Plan and Infrastructures

Inadequate infrastructures:
- Drainage
- Sanitation
- Fresh water
- Electricity

Many houses have been completed but not used yet.
Design

- Imported materials and technology can cause problems for maintenance and sustainability
- Detailing is rarely provided in structural drawings, causing poor quality.
Construction

- Foundation

Cement poured on top
Columns

Rebars exposed
- Columns

Tilted
- **Walls**

  Collapse before completed, no anchorage

  Different bricks
- Joints

No detailing on joint
For safer housing/building

**Design/construction**
- Design should follow building codes and technical requirements
- Structural drawings and specifications should be clear and easy to follow

**Supervision/inspection**
- Make sure that building construction follows the drawings
Planning and coordination

- Self-reconstruction with international assistance
  - Donation of permanent houses would not enhance coping capacity of communities
- Strong coordination of international assistance
  - Accountability (visual outcome) of each organization may cause inefficient resource allocation for recovery and reconstruction
- Master plan
  - Prioritization of the projects and coordination of construction of infrastructure
Recommendation

- Community involvement for awareness raising
- Good communication and coordination among donors, governments and communities
- Enforcement of Building Codes
- Mechanism for quality control
- Training of workers and supervisors
- Dissemination of appropriate construction methods
Shake table demonstration for awareness raising in Aceh

- Collaboration of Building Research Institute Japan (BRI) and National Society for Earthquake Technology-Nepal (NSET)
- July 29, 2006 at Syiah Kuala University
- Active and supportive response