



Infrastructure Damage due to Earthquake and Tsunami



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Participants

53 researchers from 14 organizations participated in field investigation under the project of "Urgent Study of the Great Sumatra Earthquake and Tsunami Disaster" funded by: Urgent Research and Development in 2004 JFY (Special Coordination Funds for Promoting Science and Technology, in accordance with the Policy Council for Science and Technology Policy and Cabinet Office of Government of Japan). The research organizations involved in this project are as follows:

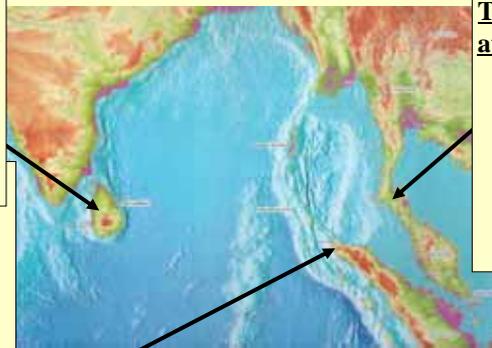
- Kyoto University • University of Tokyo • Fuji Tokoha University • Tohoku University • Tsukuba University • Kobe University • Port and Airport Research Institute • Forestry and Forest Products Research Institute • National Institute for Land and Infrastructure Management • Building Research Institute • Civil Engineering Research Institute of Hokkaido • Asian Disaster Reduction Center • National Research Institute for Earth Science and Disaster Prevention • Japan Meteorological Agency



STUDIES ON THE VULNERABILITY OF SOCIETY AND INFRASTRUCTURES AGAINST EARTHQUAKE AND TSUNAMI

Tsunami Disaster Survey in Sri Lanka

- Feasibility of development of Tsunami Warning System
- Questionnaire for Tsunami Attack
- Environmental Damage of Coast and Ocean
- Port Damage
- Lifeline Damage
- Infrastructure Damage
- Tsunami Upstream on Rivers
- Others



Tsunami Disaster Survey at Phuket and Khao Lak in Thailand

- Feasibility of Development of Tsunami Warning System
- Structural Damage
- Environmental Damage of Coast and Ocean
- Lifeline Damage
- Tsunami Upstream on Rivers
- Recovery Plan for Urban Area
- Others



Earthquake and Tsunami Disaster Survey at Banda Aceh in Indonesia

- Questionnaire for Seismic Intensity and Tsunami Attack
- Structural Damage
- Infrastructure Damage (Port etc.)
- Lifeline Damage (Power and Water Supply)
- Factory Damage
- Soil and Ground Damage
- Disaster Prevention Measures
- Others



Estimated JMA Seismic Intensity by Questionnaires in Banda Aceh was 5.



Earthquake Damage

ABSTRACT OF FIELD SURVEY OF DAMAGE DUE TO EARTHQUAKE AND TSUNAMI

Factors and Characteristics of Disaster

- Attack of Mega Tsunami (Height 10m, Max. Upstream Height 40m)
- Severe Structural Damage in Coast Area without Embankment and Tide break Forrest
- Increase of Damage by Debris in Tsunami (Houses, Bridges, Tanks, Trees, Cars, Trains, Pipes, etc.)
- Increase of Casualties by Lack of Knowledge of Tsunami (Few people escaped before Tsunami)
- Severe Damage of Mangrove by Upstream of Tsunami
- Spreading of Tsunami Disaster over Indian Ocean Rim Countries



Banda Aceh

Banda Aceh

Banda Aceh

Banda Aceh



Meulaboh

Sri Lanka

Phuket

Khao Lak

Urgent Recommendations to Tsunami Disaster Countries

- Development of Tsunami Warning System
- Education of Tsunami and Earthquake
- Evacuation Drills
- Foundation of Research Centers
- Construction of Tsunami Disaster Monument
- Stone Poles with Height of Tsunami in Every Street

Promotion of Future International Cooperation

- International Cooperative Research, Symposium Indonesia: BPPT, Institute of Technology, Bandung, Syiah Kuala University, etc.
- Thailand: AIT, Chulalongkorn University, etc.
- Research on Failure Potential of Tsunami
- Research on Structural Design and Urban Design
- Application of the Lessons to Tokai, To-Nankai, Nankai Earthquake, Japan