Chapter 6

A Tool for Earthquake Damage Estimation

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Based on the activities of nine case studies of the two year RADIUS project, it has been observed that there is a wide variation in earthquake understanding, technical competency, earthquake risk preparedness, and emergency response and recovery countermeasures. In developing countries, awareness of earthquake risk must be promoted in addition to provision of advice.

The main purposes of the RADIUS project were to raise awareness and provide practical tools for earthquake risk reduction. This tool has been developed from the experiences of RADIUS case studies. The tool has been simplified in order to promote understanding, of the process and earthquake damage estimation, by decision makers and the public. Because earthquakes and natural disasters differ widely, the tool should be used for only preliminary estimation, requiring further validation and more detailed studies. It is hoped that this tool will assist many users to understand the seismic vulnerability of their cities and to assist starting preparedness programmes for future earthquake disasters.

The tool is a computer programme running on the widely available Excel 97. It is not a Geographic Information System (GIS) type of programme. The user needs to input the following information:

- Shape of target region by meshes
- Total population and distribution
- Total buildings, building types and their distribution
- Ground condition (soil type)
- Total numbers of lifeline facilities
- Choice of scenario earthquake and its parameters

The programme then validates the input data and performs analysis. Output from the analysis includes:

- Seismic (ground shaking) intensity, such as PGA and MMI Intensity
- Building damage
- Lifeline damage
- Casualties, such as number of deaths and injuries
- Summary tables and thematic maps showing the result

The tool requires only simple input data and will provide visual results with user-friendly process with help and instruction documents. For more active users, a GIS View Sample of Bandung has been prepared since the GIS tool is useful for more detailed studies.

All the activities of the RADIUS project have been summarized on a CD-ROM together with this tool, which can be used as a tutorial for users. The CD-ROM includes the RADIUS project description, reports from the case-study cities, report on the comparative study, the guidelines for RADIUS-type projects, proceedings of the RADIUS symposium, and other reports.

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The following figures are examples of typical interactive windows seen using the tool:

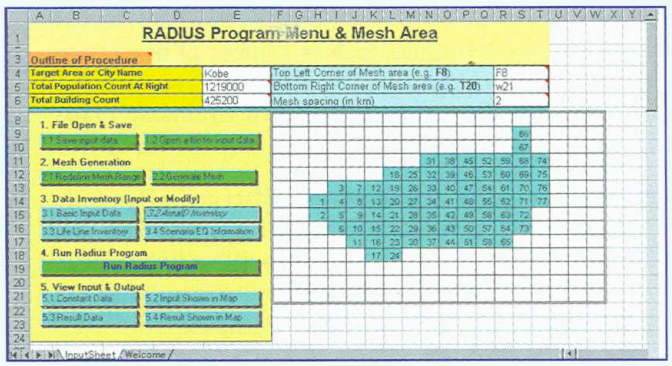

Figure 1: Preliminary definition of the target area.

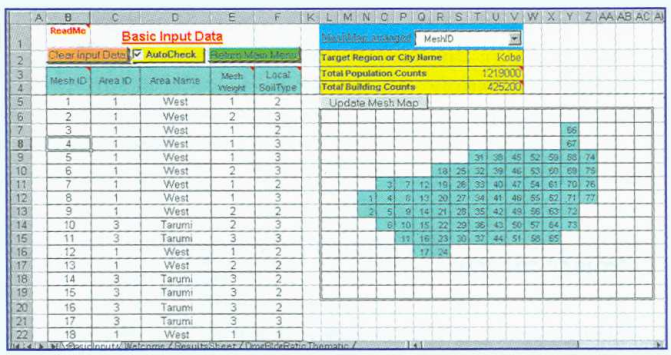

Figure 2: Basic data input.

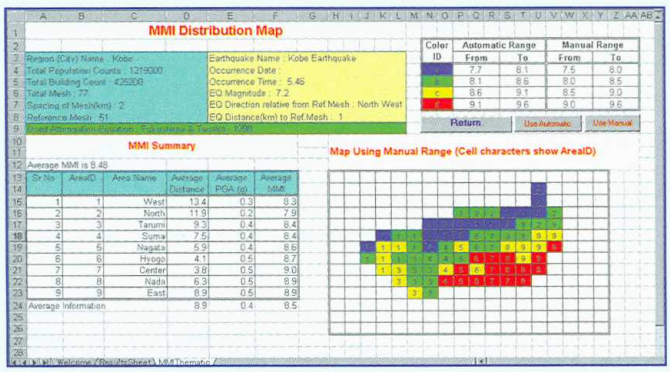

Figure 3: Seismic intensity distribution map.

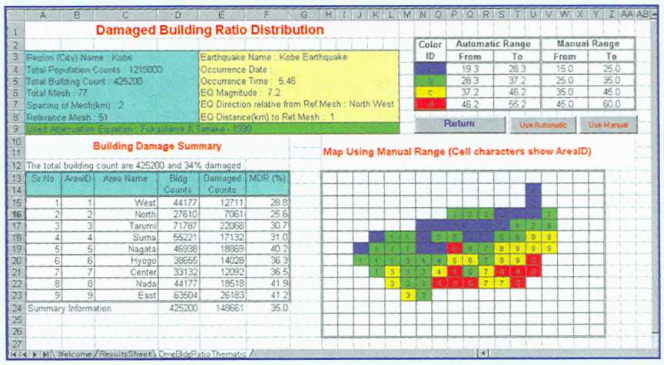

Figure 4: Thematic map of building damage distribution.

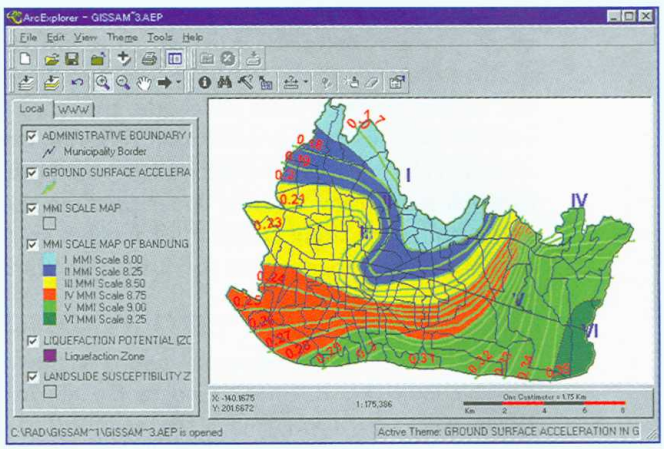

Figure 5: Seismic intensity of MMI with PGA distribution (Bandung).

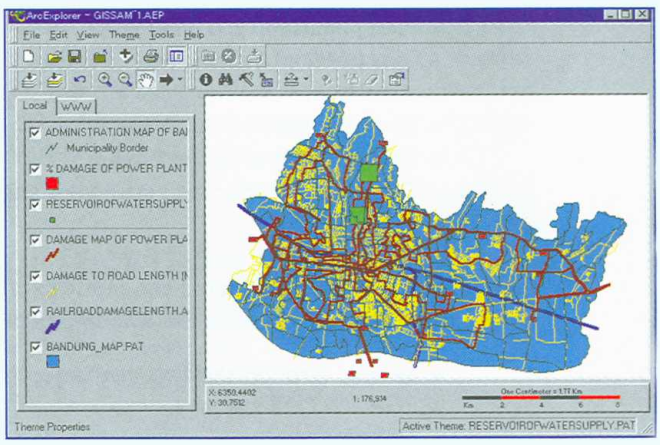

Figure 6: A sample of damage estimation for power facility (Bandung).