

## **IV Database Manual**

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## Database System “KERMIT” Users Manual

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### 1. Introduction

Database System “Kathmandu Earthquake Risk Mitigation Tool (hereafter **KERMIT**)” is specially developed for the “The Study on Earthquake Disaster Mitigation in the Kathmandu Valley, Kingdom of Nepal”. **KERMIT** has two main objectives.

One is to display the GIS data using the GIS software **ArcView**. GIS data are provided as the results of the Study. **KERMIT** menu dialogs lead you to the target file, which you have interested in. **KERMIT** is capable to display not only GIS data but also tables, graphs, etc., which provided as part of the results of the Study. They would be displayed by **ArcView**, **Microsoft Excel**, **PowerPoint**, **Word** and **Windows Media Player**.

Another objective is the simulation of ground motion and damages caused by various scenario earthquakes. When parameters such as location, fault size and magnitude of earthquake are specified, the result of calculation will be automatically converted to the GIS data and displayed.

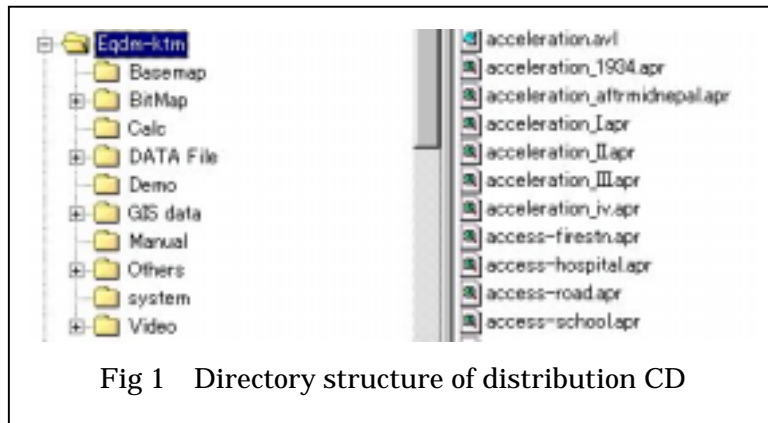
### 2. Requirements

- **KERMIT** needs the display of 1024x768 pixels.
- **KERMIT** needs free hard disk space of more than 400 MB in C Drive.
- **KERMIT** uses the "**ArcView GIS**" (Version 3.1 or 3.2) by ESRI, **Microsoft Excel 2000**, **Microsoft PowerPoint 2000**, **Microsoft Word 2000** and **Windows Media Player** (Version 6 or 7). Namely, **KERMIT** requires those software are installed in your computer.
- a colour printer/ plotter, speaker system if necessary.

### 3. Installation

As **KERMIT** does not have its own setup function, the user should execute the following two simple operations.

1) Copy the Directory "*eqdm-ktm*" with all sub-directories from distributed CD-ROM to root directory of C drive. Figure 1 shows the directory structure of provided CD.



2) Edit the configuration file "*eqdm.inf*" in directory "*\eqdm*", using your text editor and overwrite it. The "*eqdm.inf*" file consists of following contents.

- a) First line: directory path which include the file "*arcview.exe*"
- b) Second line: directory path which include the file "*excel.exe*"
- c) Third line: title of your **ArcView**. See the title bar of active window of **ArcView**

An example of "*eqdm.inf*" is shown below.

```
C: \esri \av_gis30 \arcview \bin32 \  
C: \Program Files \Microsoft Office \Office \  
arcview gis version 3.1
```

#### 4. Operation

You can execute "*eqdm.exe*" in "*\eqdm-ktm \system*" directory. Main menu form appears at center of the display as shown in Figure 2.

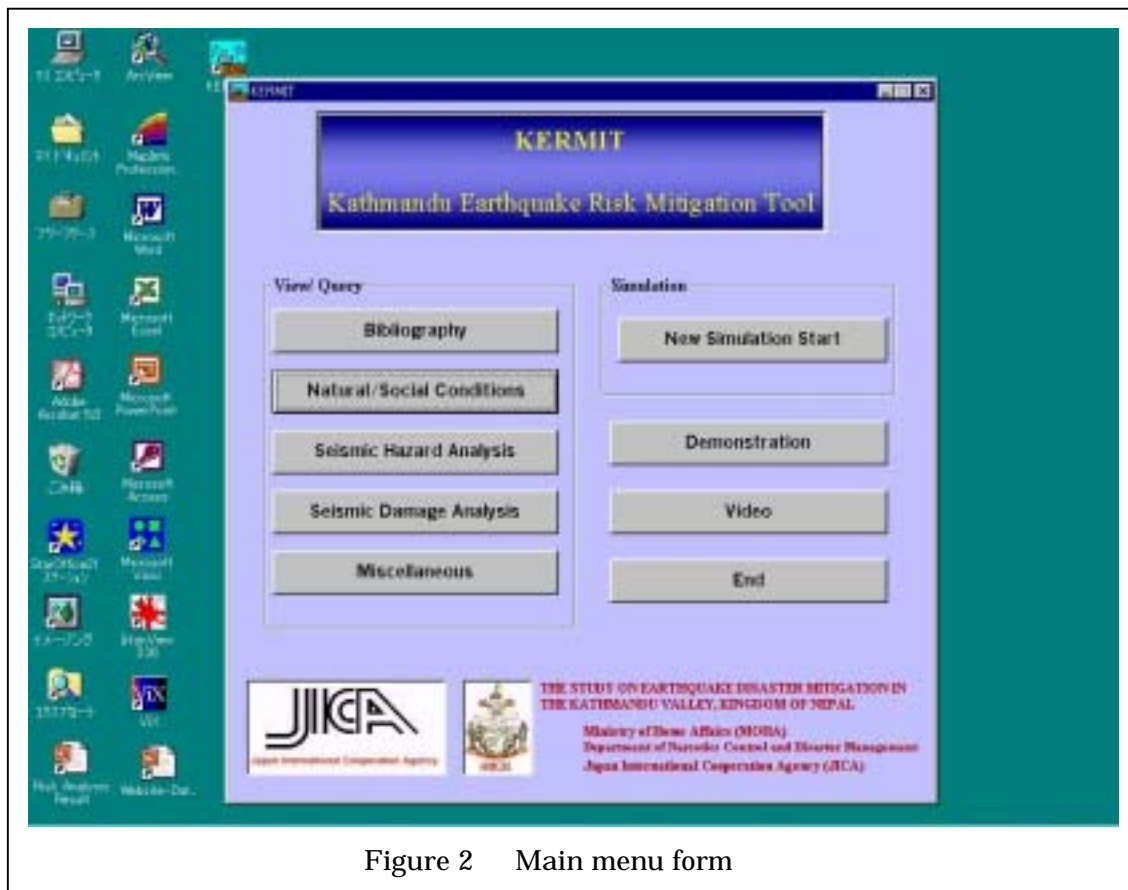


Figure 2 Main menu form

The main menu indicates eight buttons to lead to the following categories.

- 1) Bibliography
- 2) Natural / Social Conditions
- 3) Seismic Hazard Analysis
- 4) Seismic Damage Analysis
- 5) Miscellaneous
- 6) New Simulation Start
- 7) Demonstration
- 8) Video

At the categories, “Bibliography”, “Natural / Social Conditions”, “Seismic Hazards”, “Seismic Damage” and “Miscellaneous”, the user can see the results of the Study as the user likes from the list box in the sub-menu.

At the category, “New Simulation”, you can simulate a ground motion and damages caused by a scenario earthquake with new parameters step by step.

At the category, “Demonstration”, you can see the outline result by the slideshow of Microsoft PowerPoint 2000.

At the category, “Video”, you can see information dissemination video of the pilot community meeting by Windows Media Player as shown in Figure 3.

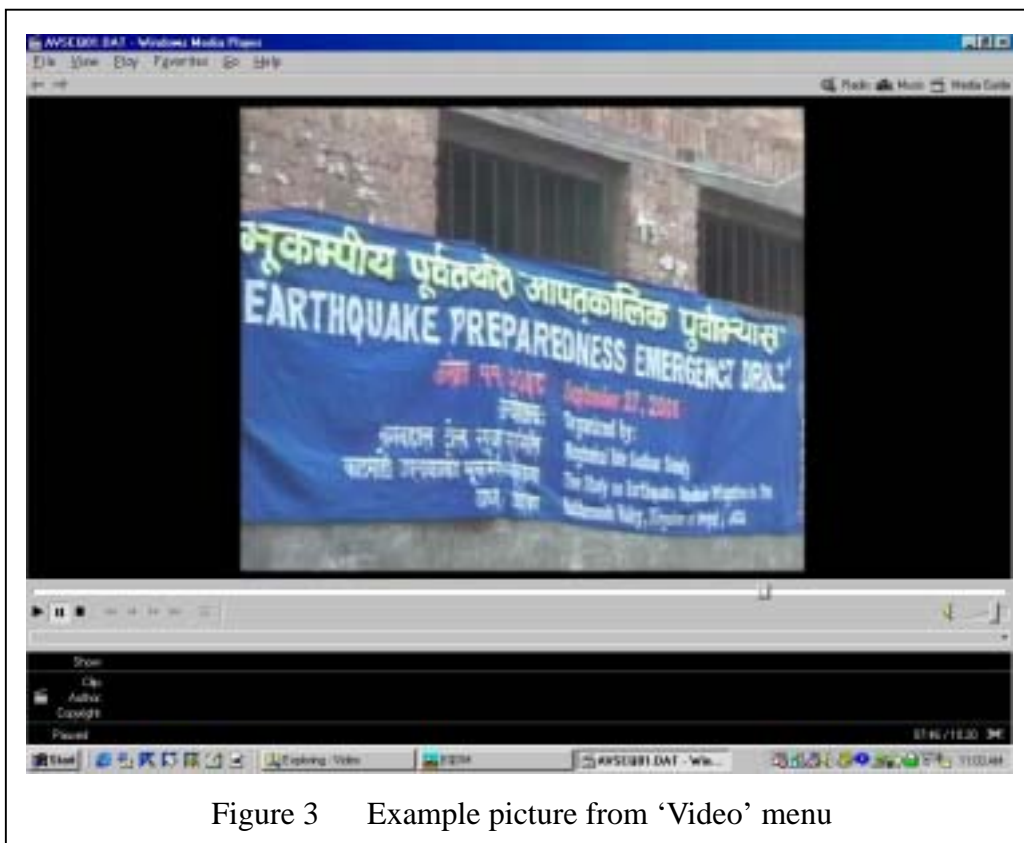
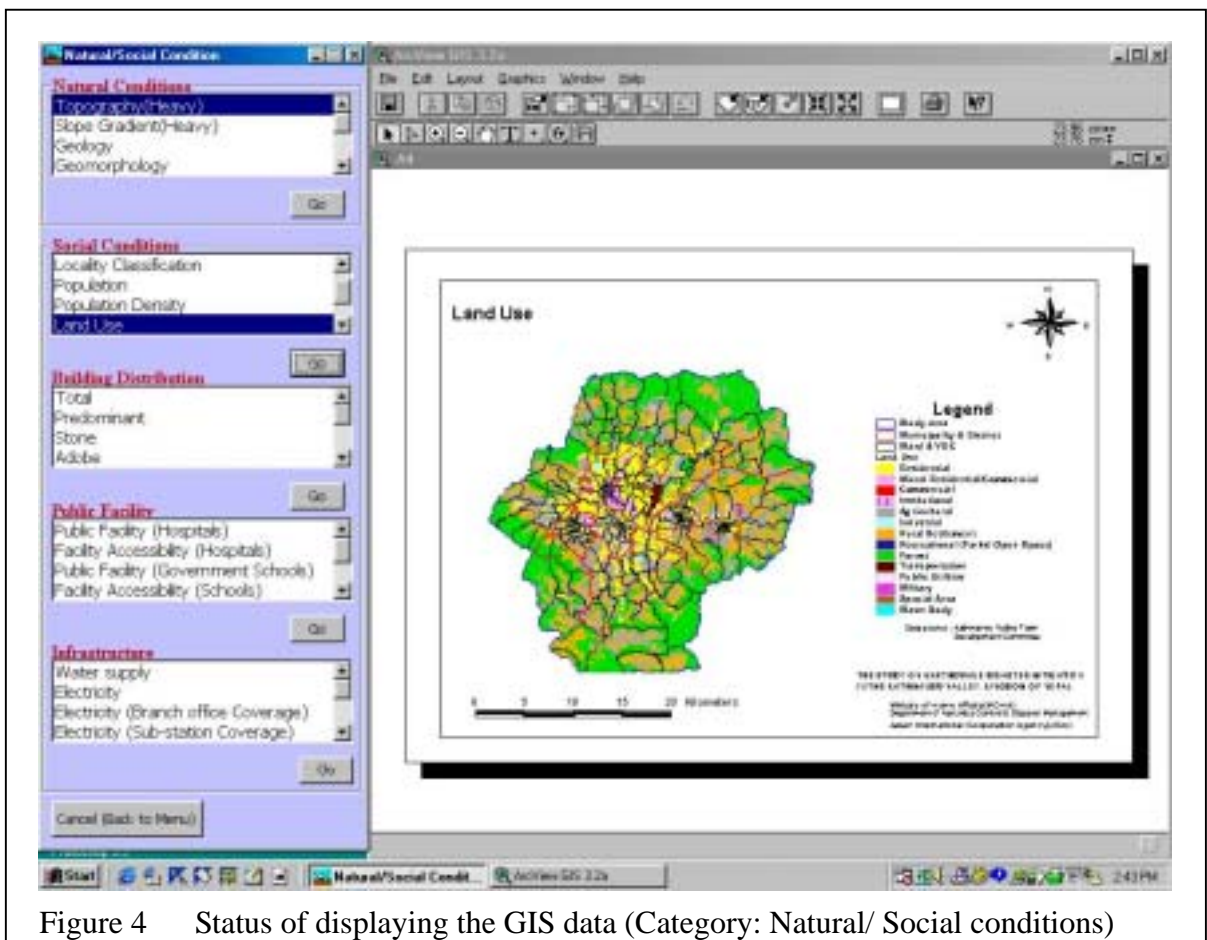


Figure 3 Example picture from ‘Video’ menu

#### 4.1 Display results

Figure 4 shows the status of displaying the GIS data as an example. When you click the “Natural/ Social Conditions” button on the main menu, a sub-menu dialog will appear (see left side of Figure 4). Choose and click the item, which you have interested in, in the list box, then click the button ‘Go’ just under the list box. **KERMIT** launch **ArcView**, **Excel** or **Word** automatically, and show the selected figure, table or text at right side of the display. Be sure to confirm of the **ArcView** launch, then click ‘OK’. If **ArcView** is already launched on your computer, **KERMIT** communicate with launched **ArcView** and let it open the target file (\*1).



#### (\*1) Notice when you edit the ArcView file

Before opening the selected file, **KERMIT** will send a command to ArcView to close the existing project file without saving. Your edition applied to existing project file will be lost. As it mentioned above, when open the target file, "KERMIT" show the Message Box. If you like to save your editing, your project file should be saved (as different name) before clicking ‘OK’ button.

Some results are displayed by **Microsoft Excel** as shown in Figure 5.

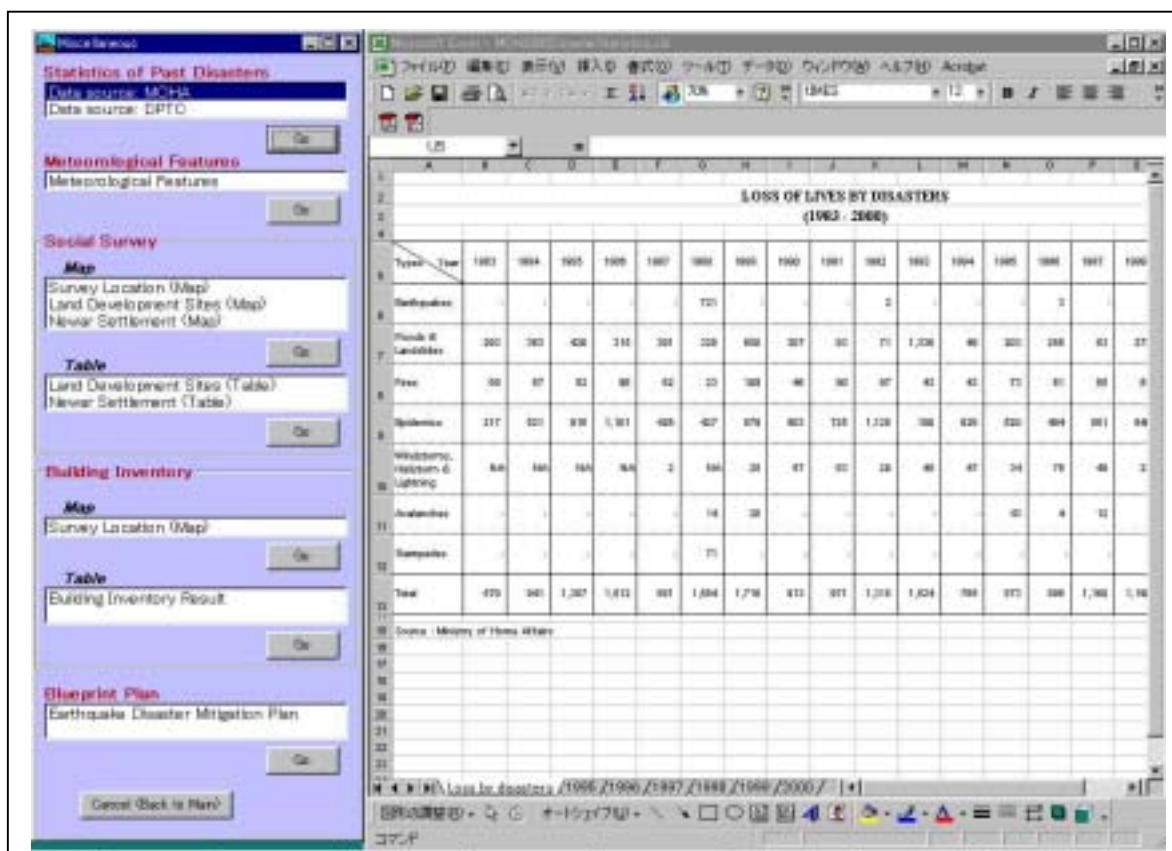


Figure 5 Status of displaying the **Microsoft Excel** data  
(Category: Statistics of Past Disasters in Miscellaneous menu)

When you would like to see another result in the different main category, click the button ‘Cancel (Back to Menu)’ at the bottom of the sub-menu dialog in the left side of display. After that, the main menu form appears again at center of the display as shown in Figure 2 and you can continue as mentioned above.

## 4.2 Simulation of a new scenario earthquake

Select and click 'New Simulation Start' button, a sub-menu dialog of 'New Simulation' appears (Figure 6: left).

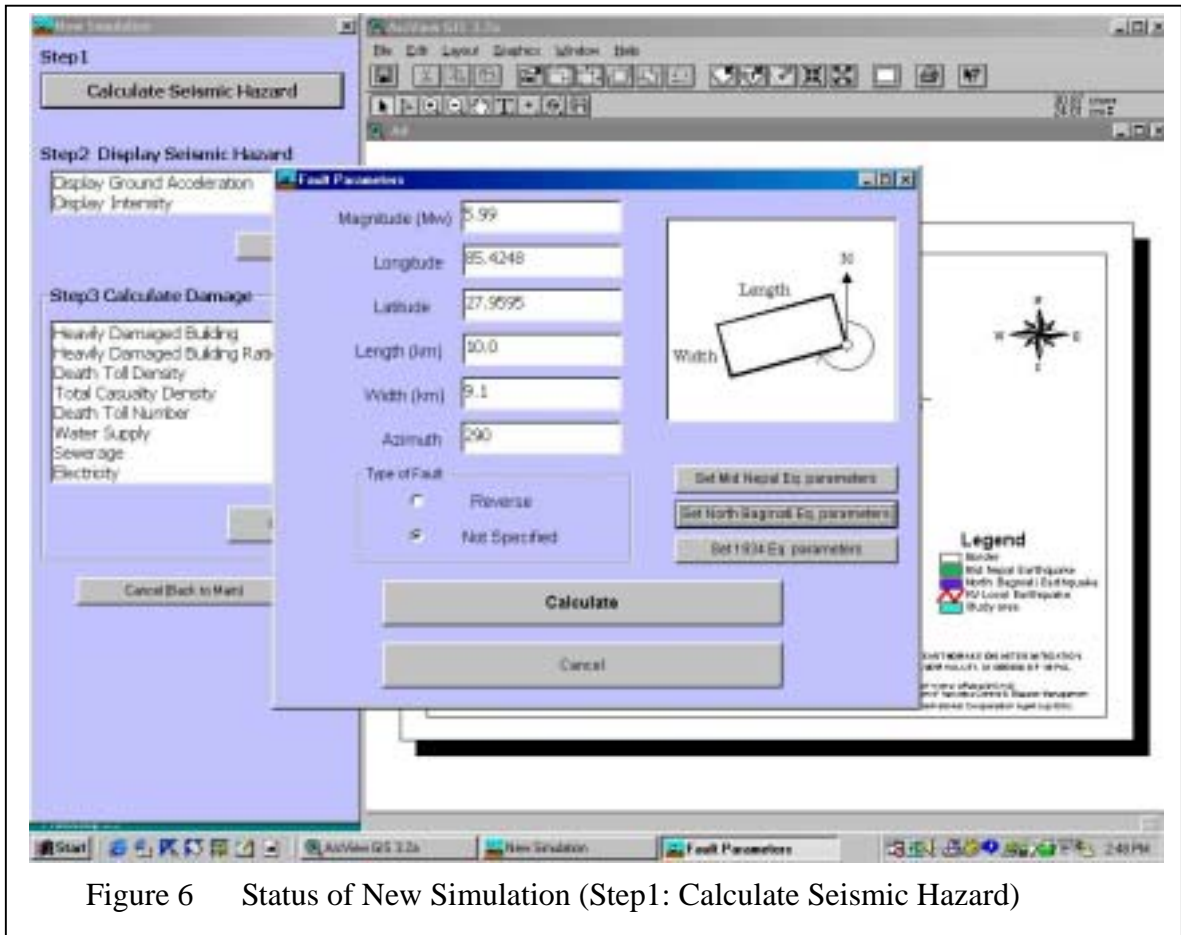


Figure 6 Status of New Simulation (Step1: Calculate Seismic Hazard)

This simulation consists of the following three steps.

Step 1: Calculate Seismic Hazard

Step 2: Display Seismic Hazard

Step 3: Calculate and Display Seismic Damage

Step 1: Calculate Seismic Hazard

Click 'Calculate Seismic Hazard' button. The sub-dialog of 'Fault Parameters' appears at the center of the display such as Figure 6. You can input the following six parameters of a new scenario earthquake.

/Moment magnitude / Location of fault (longitude, latitude)

/Length and width of fault / Azimuth of fault

Input those parameters in each box, and then click 'Calculate' button.



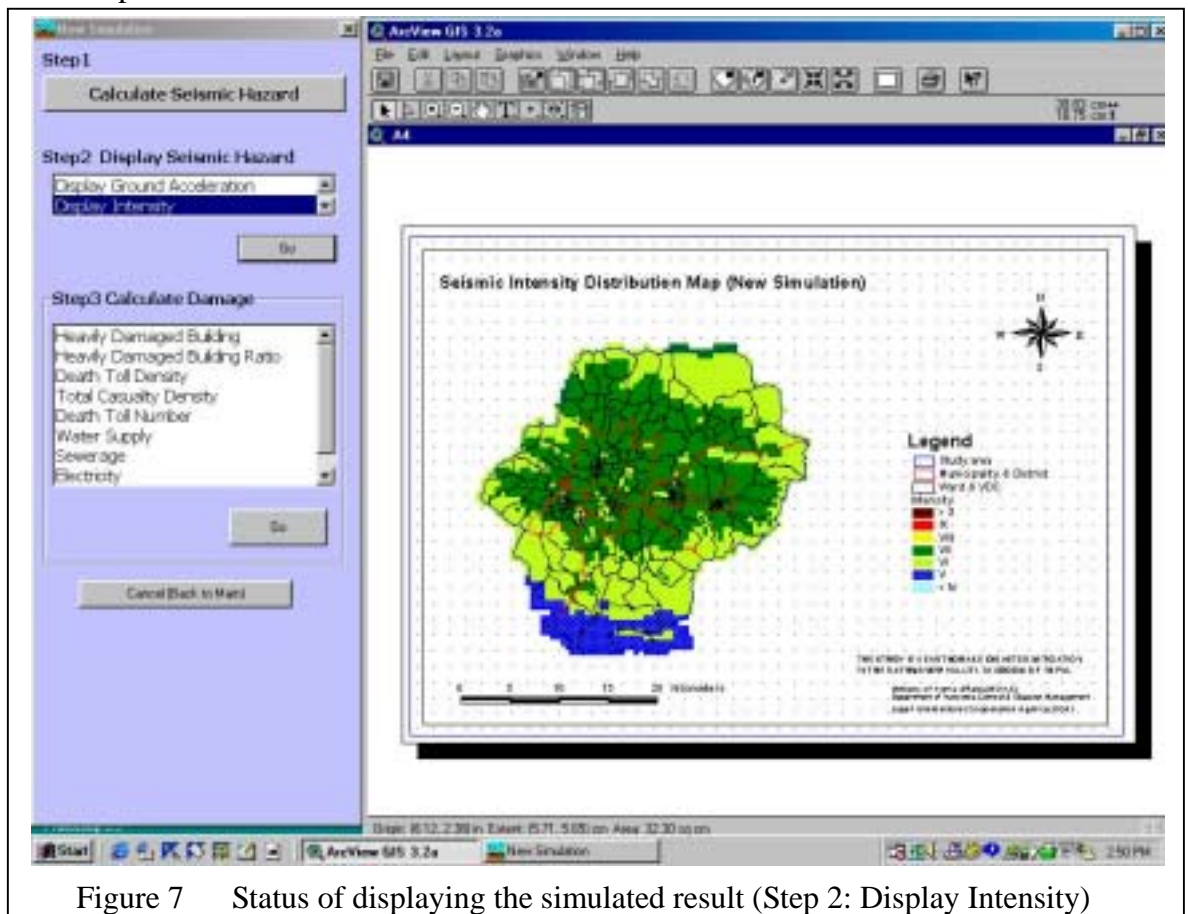
KERMIT calculate the distribution of peak acceleration, seismic intensity and potential of liquefaction. The results of calculation are automatically saved as text file.

### Step 2: Display Seismic Hazard

In this step, the following items of seismic hazard will be displayed.

- a) Peak Ground Acceleration Distribution
- b) Seismic Intensity Distribution
- c) Liquefaction Potential Distribution

You can select the item in the list box, and then click 'Go' button just under the list box. **ArcView** automatically open the base file including the macro. **ArcView** import the text file and display the distribution of the selected subject automatically. Figure 7 shows the distribution of seismic intensity as an example of new simulation.



### Step 3: Calculate and Display Seismic Damage

Based on the previous calculation of Step 2, the following items of seismic damage will be calculated and displayed.

- a) Heavily Damaged Building Number Distribution
- b) Heavily Damaged Building Ratio Distribution
- c) Death Toll Density Distribution
- d) Total Casualty Density Distribution
- e) Death Toll Number Distribution
- f) Damage to Water Supply Network
- g) Damage to Sewerage Network
- h) Damage to Electric Power Supply Network
- i) Damage to Telecommunication Network

You can select the item in the list box, and then click 'Go' button just under the list box. **KERMIT** calculate the damage of selected subject. **ArcView** open the basic file including the macro. **ArcView** import the text file saved at Step 2 and display the distribution of selected subject automatically.

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**Note**

If you skip the calculation of seismic hazard distribution (step 1) and execute step 2 or step 3, the result of the latest calculation will be displayed.

## **V Video CD on Pilot Community Activity**