Symposiums
The Spring Meeting of the Association of Japanese Geographers, 27–28 March 2004

Open Symposium “How Can We Make Hazard Map for Effective Reduction of Earthquake Damages”

1. Introduction

It was almost a decade ago that the Hyogoken Nanbu Earthquake occurred. Before entering the tenth year after the earthquake, it is high time for us to freshly review the disaster mitigation strategy as concerns have been growing on the disintegration of public awareness of disaster mitigation. Following the open symposium “Hazard Mapping and Geography: Why Hazard Mapping Projects Are Now Strongly Promoted” in March 2003, the Association of Japanese Geographers (AJG) held an open symposium “How Can We Make Hazard Map for Effective Reduction of Earthquake Damages” in March 2004.

These two symposia were open to public, gathering a lot of participants at each symposium from in and out of the association, where effectiveness of hazard maps for strengthening the local disaster mitigation capability was reaffirmed. The 2004 Symposium focused on the mitigation of earthquake disaster. The objective of this symposium was to conclude recommendations from the geographic society on the functions of effective hazard maps in local society for mitigating damages, through the discussions of overall and comprehensive prospects from both producers of the hazard maps and users who effectively use them for disaster mitigation.

2. Overview of the Symposium

The symposium consisted of the First and Second Sessions and Overall Discussions. At the First Session “Make Active Use of Active Fault Study Results for Mitigating Damages,” four presentations were made from the hazard map producer side:

Keynote Lecture: Active Fault Study and Countermeasures against Earthquake Disaster—the Present State and Problems—

MATSUDA Tokihiko
Association for the Development of Earthquake Prediction

The lecture summed up that basic information of large-scale earthquakes became presumable as a result of active fault studies in Japan started in the 1970’s. The information includes place, scale, period and probability of occurrence of large-scale earthquake caused by active faults. In order to mitigate earthquake disasters, accuracy of these presumptions have to be enhanced. To do so, active fault surveys have to be promoted continuously in days ahead. By increasing the volume of information effective for prediction of not only seismic motion, but also for displacement of active faults used as basic materials for earthquake disaster mitigation, measures have to be strengthened against disasters caused by the displacement and deformation of ground surface near active faults.

Probabilistic Seismic Hazard Maps and Intraplate Earthquake Hazard Reduction

SUZUKI Yasuhiro
Nagoya University

The production of a probabilistic seismic hazard map of the whole of Japan by the Headquarters for Earthquake Research Promotion has great significance as it gives a rational understanding of the size of the ground motion occurrence potential of the entire country. On the other hand, there are some problems and points to be noted in its use. For example, risk at each position cannot be fully understood because of the coarse analysis unit, therefore the map cannot be used to raise attention for the occurrence area of strong ground motion near active faults.
(e.g. "damage belt" of the Hyogoken Nanbu Earthquake.) In addition to the promotion of earthquake resistant constructions in large area, consideration on land use and local-specific measures near active faults are crucial against earthquake motion. Despite these requirements, the probabilistic seismic hazard maps cannot provide sufficient information on the risk of active faults and may increase the lack of consideration on land use near active faults.

**Information about Location of Active Faults for Seismic Hazard Mitigation**

NAKATA Takashi*  
and KUMAMOTO Takashi**  
*Hiroshima University  
**Okayama University

Structures located directly on an active fault, as strong as they may be, cannot be saved from destruction once an active fault activates. There are 43,360 school facilities in the country, of which 1,005 schools are located within 200 m from active fault lines and over 200 schools are located directly on active faults. In order not to repeat such land uses, an introduction of "Active Fault Act" can take effect, by which structures can be built avoiding and in consideration of active faults when they are found through a compulsory detailed geological survey prior to the construction of public facilities, such as schools and hospitals, facilities handling dangerous objects, major lifelines, etc. near active faults.

**Application of Land Condition Maps for Hazard Mapping to Mitigate Earthquake Damages**

UNE Hiroshi  
Geographical Survey Institute

A hazard map in micro scale is needed for the mitigation of earthquake disasters. In order to produce it, an effective use of "land condition map" and "land classification map" are required. These maps clarify natural conditions of the land in planimetric manner mainly by landform classification in large scales. To do this, display and analysis by using GIS through the provision of "land condition map" in digital data are essential. At the same time, development of these data for the entire country has to be promoted in a short time.

At the Second Session, four presentations were made from the standpoint of actively using hazard maps for disaster mitigation.

**Utilization of Hazard Maps Based on Risk Communication**

TERUMOTO Kiyomine  
National Research Institute for Earth Science and Disaster Prevention

Risk communication is an important tool for improvement of the regional-level risk mitigation. After the Taiwan 921 Earthquake, building restrictions along Chelungpu Fault were introduced. Citizens accepted it without strong resistance, because the hazard of the fault zone was widely recognized, and the opinions of citizens were well considered through the process of establishment of the system. It is important to provide plain information to the citizens and in this context utilization of hazard maps shall be promoted.

**Hazard Information and Map Useful to the People and the Community in Hazard Prone Area: Some Lessons from Miyagi-ken-hokubu Earthquake Disaster in 2003**

MURAYAMA Yoshiyuki  
Tohoku University

The lecturer and his group conducted a survey on the severe damage caused by the Miyagi-ken-hokubu Earthquake in 2003, in which they made clear that the damage to the wooden buildings was closely related with the year they were built and ground deformation such as subsidence and fissure directly below the buildings; damages were centered at embankment, cutting and boundary of embankment in the case where land was largely deformed; and there were many damages in old river course and scarcely any on natural levee in alluvial lowland. In earthquake disasters, strength of buildings and land condition are crucially important. Effective hazard maps for local area should display landform and the state of its deformation and land condition such as geological features on the top surface shown in landform. It is a challenge as to how this precise information
should be delivered to the local people and local administrative bodies.

Disaster Prevention City Planning of Matsumoto

NISHIYAMA Takayuki
City Planning Division, Matsumoto City Hall

Matsumoto City established its regional disaster prevention plan in 2001 based on the results of assessment of disaster hazard. In this plan, two levels of measures were introduced; 'city-level,' for which the city government is responsible, and 'community-level,' for which citizens of the community are expected to act independently. In order to promote community-level measures, City Government has made a lot of effort to improve the consciousness of disaster mitigation among citizens through providing relevant information. The officers of the Government visited the communities again and again to talk with the citizens and make them understand the reasons of the disaster hazard assessment of the districts. The importance of consciousness of the disaster hazard by the citizens at community level was emphasized.

How Can We Realize the Image of Disaster from Potential Map?: Viewpoint of Science Journalist

YAMAGUCHI Masaru
NHK, Japan Broadcasting Corporation, Nagoya

After mentioning the effectiveness of seismic hazard map for disaster mitigation, the following three points to give a real impact to the hazard map were addressed from the stand point of a science journalist. These three points were: 1) In order to make understood the systems to produce the seismic hazard map, an analytical understanding of various accumulated effects of earthquake has to be employed. 2) It should be necessary to let the people know the real-time changes of seismic hazard map, for which the Tokachi-oki Earthquake on 26 September 2003 was a good chance, and 3) a device has to be made to let people understand the reasons and limits of presumption that strong motion prediction is a result of presumption and is not absolute.

At the general discussions, three comments were made from KUMAKI Yota (Geographical Survey Institute), KAMADA Kozo (Ministry of Education, Culture, Sports, Science and Technology) and UMITSU Masatomo (Nagoya University). After that, discussion were held on the evaluation of the probabilistic seismic hazard map of the whole of Japan by the Headquarters for Earthquake Research Promotion, the promotion of preparation and use of land condition maps, the relationship of the education of geography and hazard maps, and recommendations. Based on these discussions, organizers and the Disaster Management Committee of the AJG concluded the following recommendations.

3. Recommendations

The Association of Japanese Geographers, which has been studying the appropriate coexistence of natural environment and human lives, makes the following four recommendations from a geographic viewpoint towards solving problems of earthquake mitigation measures:

1) As a measure for mitigating damages from earthquakes by active faults on land, it is necessary to examine appropriate land uses taking the positions of active faults into account. However, such examination has not been sufficiently implemented. As a first step to solve this problem, the Government and the relevant organizations shall strongly promote basic active fault study; by doing so positional information in high accuracy of active faults to be used for land use planning shall be developed and made available to the public.

2) Existing probabilistic seismic hazard map can provide little reality. In order to illuminate the capacity of local disaster prevention, it is necessary to produce detailed hazard maps to make people concretely realize the images of earthquake disasters. Active use of land condition maps and Geographic Information Systems (GIS) shall be sought that are useful to assess and visualize the local hazards.

3) Hazard maps shall be made popular as a material to illuminate the capability of local disaster prevention. Therefore, lifelong learning shall be promoted in local commu-
nities to deepen the understanding of the hazard maps.

4) In order to enhance the capacity of children, who take on the future, to cope with disasters, instructions of disaster prevention to children by using hazard maps are important. Systematic instructions of disaster prevention with proper understandings of localities of home shall be promoted in school education such as geography education.

The Association of Japanese Geographers, towards the realization of recommendations, calls for a collaborative effort and promotion on building measures for earthquake disaster mitigation to alleviate earthquake damages, to relevant organizations and academic societies involved in such practice. The Association also strengthens concrete efforts in the fields, such as: 1) continued promotion of active fault study, 2) application of geographic expertise to hazard maps such as land condition map and GIS, 3) education on disaster mitigation in lifelong learning, and 4) realization of systematic disaster mitigation education in geography education.

The Argument on the Policy of Integrated Curriculum for Geography Education

The Argument on the Policy of Integrated Curriculum for Geography Education
FUKUSHIMA Yoshikazu
Senshu University

Since mid the 1980's, the crisis of geography education has been immanent as the academic ability of Japanese university students has declined, and the ratio of geography education at high schools has decreased. How can geographical studies contribute to comprehensive courses? In Japan, social evaluation of geography is poor, mainly because it is thought to lack social contribution and social appeal.

Recently not only private schools but also even public schools and preparatory schools are looking to practice the integrated curriculum enthusiastically. This Geography Education Committee is presenting the structure of integrated curriculum through elementary school to high school in this symposium. The ideas on a spiral and interlocking curriculum and on the establishment of geography as a subject conscious of post social studies have already been presented.

The present is a good time to propose an attractive integrated curriculum including harmonizing regional geography and systematic geography. While working for Senshu University for over twenty years, I came to understand that geography is different from economics which can constitute the systematic context of science. It can be said that geography is connected to every science. We should introduce the integrated curriculum as soon as possible in order to remove the poor image of geography and to develop geography education.

The Issue of Achievement and Integration in Geography Education
KON Masami
OIHAMA High School

I indicate geographical study's main points in elementary, junior and high school.
1. To be allied with elementary, junior and high school and share with their teaching contents each other.
2. To allot part of the contents of teaching to other subjects.
3. To elicit delight in geographical study.
4. To plan geographical study in line with development stage.
5. To practice diversification of teaching method.
6. To make out "knowledge infusion" as learning style of new type.
7. To aim at real worldwide image in geographical study.

That is, we should think about how to bring out the student's eagerness to study. Therefore we must examine the contents of teaching and