

A BRIEF REPORT OF INTERNATIONAL CONGRESS ON GEOMORPHOLOGICAL HAZARDS IN ASIA-PACIFIC REGION

by

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1. PREFACE

There are many natural hazards i.e., floodings, landslides, land collapses, volcanic hazards, earthquakes etc. in Asia-Pacific Region. However the study of natural hazards are less developed especially in the developing countries of this region. The knowledge of mitigation of the natural hazards is required, mostly in these developing countries.

Many people used to consider that the countermeasures of natural hazards were the only the concern of civil engineerings. However a geographical or geological approach is important too. When we consider the mitigation of flooding, we must pay attention not only to structural measures but also non-structural measures i. e. geomorphological, geological, geographical approaches in the area. Furthermore, there are distinct regional differences in the natural hazards caused by the differences of geographical conditions. We must pay attention to the regional differences too.

Since the Japanese Archipelago is located in the Circum Pacific Orogenic Movement Area with Monsoon Zone, we have many experiences of natural hazards. The purpose of this congress is to exchange knowledge on the natural hazards between Japan and developed countries and developing countries in Asia and Pacific Region.

Working Group on Natural Hazards and

Environmental Geomorphology of the Association of Japanese Geographers, which is chaired by M. Oya, has been acted synchronously with Working Group on Rapid Geomorphological Hazards, IGU. Getting the support from Waseda University, we decided to organize an international congress geomorphological hazards in Asia-Pacific region at the occasion of Oya's retirement.

The International Congress on Geomorphological Hazards in Asia-Pacific Region was held between 6th and 10th of September 1993, at the International Conference Centre of Waseda University for the main congress and postcongress excursion was held in the Kano River Basin and Fuji River Basin in Central Japan.

It was supported by The Association of Japanese Geographers for public informations and financially supported by Waseda University, Fukutake Science and Culture Foundation. Many cooperators, students and graduate students, not only of Waseda University but from other organizations helped the congress. Ministry of Construction and Yamanashi Prefecture supported to the field excursion. The autours and all of the participants with to thank them.

In this paper we report the result of the congress.

2. ORGANIZING COMMITTEE

The congress was organized by Working

Group on Natural Hazards and Environmental Geomorphology, the Association of Japanese Geographers, and Working Group on Rapid Geomorphological Hazards, International Geographical Union (IGU).

Prof. Dr. Masahiko OYA undertook the Chief Organizer.

The Organizing Committee consist of Prof. Dr. Masatami NAKAYAMA (Waseda University), Prof. Dr. Isao TAKAGI (Keio University) and Prof. Dr. Hiroo OHOMORI (Tokyo University) with following Advisory Staff: Prof. Dr. Yukiyasu SAKA (Waseda University) and Prof. Dr. Noboru SUKEGAWA (Waseda University). Lecturer Dr. Shigeko HARUYAMA (Waseda Univ.) was responsible for public relation and Lecturer Sumiko KUBO (Waseda Univ.) was for secretary.

3. PARTICIPANTS AND GUEST SPEAKERS

70 participants from fourteen countries attended the congress. Eight foreign scientist were invited and six were supported for their domestic expences by the fund from Waseda University.

Invited guests are as follows: Dr. H. Th. Verstappen (IGU President, The Netherlands), Dr. C. Embleton (King's College London, UK), Dr. J. Szuprycznski (Polish Academy of Sciences, Poland), Dr. J. Demek (Palaky University, Czech), Dr. J. Chang (Nat. Taiwan Normal Univ., R. O. C.), Prof. Huang Zhenguo (Acad. Sinica, Guanzhou, China), Dr. C. Rosenfeld (Oregon State Univ., USA) and Dr. Sutikno, D. (Gadjamada Univ., Indonesia).

Prof. Siming Chen (Acad. Sinica, Nanjing, China), Dr. R. Heerdegen (Massey Univ., New Zealand), Dr. Prinya, N. (AIT, Thailand), Prof. Dr. I. Heyse (State Univ. Ghent, Belgium) and Dr. Embleton-Hamann (Vienna, Univ. Austria) were

supported their domestic expences.

4. MAIN CONGRESS

The main congress was held for two days (Photo 1). It consists of three sessions; Hazards of flooding and coastal hazards (Session 1), volcanic Hazards (Session 2) and Ground Failure and slope hazards (Session 3). The congress was held as following programme.

PROGRAMME

Monday, Sept. 6. 1993

9:30 Registration

10:00-10:30 Opening Address

M. Oya (Waseda Univ., Japan)

H. Th. VERSTAPPEN (IGU President, Netherlands)

10:30-12:00 Session 1-a: Hazards of Flooding

101* C. EMBLETON (Univ. London, UK). The flood hazard in Britain

102* J. SZUPRYCZNSKI (Polish Acad. Sci., Poland): Large floods in the lower Vistula River

103* J. DEMEK (Palacky Univ., Czech): Global warming and permafrost in Eurasia: A catastrophic scenario*

12:00-13:30 Lunch

13:30-15:30 Session 1-a: Hazards of Flooding and Others

104* Jui-Chin CHANG (Nat. Taiwan Normal Univ., R. O. C.): Natural hazards in Taiwan

105* Zhen-Guo HUANG and Fuxiang CHAI (Acad. Sinica, Guangzhou, China): Potential hazards from sea level rise in China

106 Zhiming CHEN (Acad. Sinica, Nanjing, China): Sequential analysis of China's hazards in geosciences

107 R. HEERDEGEN and J. ROSIER (Massey Univ., New Zealand): Does the hazard

- change with new legislation?—the New Zealand experience
- 108 M. M. ASHOUR (Ain Shams Univ., Egypt); Cancelled
- 15:30-15:50 Coffee Break
- 109 S. HARUYAMA (Waseda Univ., Japan), H. Okura (Nat. Res. Inst. Disaster Prevention, Japan), R. SIMKING and T. SIMKING (Nat. Res. Council, Thailand): Geomorphological zoning for flood inundation on SAR image
- 110 N. SADAKATA (Hokkaido Univ. of Education, Japan): Floods and alluviation caused by iron sand minings (kannanagashi) in the Chugoku Mountains, south western Japan
- 111 U. ALI (Govt. Jahanzed P. G. College, Pakistan): Cancelled
- 112 PRINYA, N. (Asian Inst. Technology, Thailand): Coastal Erosion in Thailand
- 113 K. KOIKE (Komazawa Univ., Japan): The Countermeasures against Coastal Hazards in Japan
- 114 T. HATORI (Earthq. Res. Inst., Univ. Tokyo, Japan): Tsunami magnitudes in Taiwan, Philippines and Indonesia
- 18:00-20:00 Reception at Okuma Garden House
- Tuesday, Sept. 7, 1993
- 10:00-12:00 Session 2: Volcanic Hazards
- 201* C. L. ROSENFELD (Oregon State Univ., USA): Mount St. Helens: an American approach to volcanic hazard mitigation
- 202 * SUTIKNO, D. (Gajah Mada Univ., Indonesia): Geomorphological study of volcanic hazard susceptibility in Indonesia; Case study of Merapi and Kelud Volcano
- 203 HEYSE, I. (State Univ. Ghent, Belgium); Megamorphology of the Virunga and the Karisimbi Volcano from the point of view of post volcanic hazard features (Rwanda)
- 204 M. KOARAI, M. TSUZAWA, Y. KUMAKI and T. SEKIGUCHI (Geog. Surv. Inst., Japan): Geomorphological maps for Japanese volcanoes by GSI, Japan
- 205 H. SHIMAZU (Kanazawa Univ., Japan) and T. OGUCHI (Tokyo, Univ. Japan): River terrace development after valley filling due to large landslide
- 12:00-13:10 Lunch
- 13:00-15:10 Session 3: Ground Failure and Slope Hazards
- 301 Y. MURAYAMA and S. HIRANO (Tohoku Univ., Japan): The rehabilitation process after 1990 Luzon earthquake—Some cases of La Union and Nueva Ecija—
- 302 E. YAMAMURA (Hokkaido Univ., Japan): Land hazards of Kushiro-Oki Earthquake of January 15, 1993
- 303 I. MATSUDA (Kanto Gakuin Univ., Japan): Earthquake vulnerability assessment and damage prediction for the Tokyo Metropolis
- 304 K. WAKAMATSU (Waseda Univ., Japan) and S. MIDORIKAWA (Tokyo Inst. Technol., Japan): Seismic microzoning on soil liquefaction potential based on geomorphological land classification
- 305 T. TAMURA (Tohoku Univ., Japan): Changing features of hillslope hazards in urban areas of Japan
- 306 Y. MARUYAMA (JAPEX, Inc., Japan) and M. SUGIURA (Asia Air Survey, Co., Japan): The Effect of urbanization on sediment disasters
- 15:10-15:40 Coffee Break
- 15:40-17:20 Session 3: Ground failure and

- Slope Hazards
- 307 C. EMBLETON-HAMANN (Vienna, Univ. Austria): The Torrent-hazard in Austria
7 Sep 1993
Session 2
- 308 A. OKAMOTO (Disaster Prevention Technical Centre, Nepal): Cancelled
201-205: Dr. M. OYA (Waseda Univ., Japan) and Dr. H. Th. VERSTAPPEN (IGU President)
- 309 I. AKOJIMA (Yamagata Univ., Japan): Designs of medium scale hazard maps of mountain slope in Japan
Session 3
301-306: Dr. H. OHOMORI (Tokyo, Univ. Japan) and Dr. M. OYAMA (Kanagawa Pref., Japan)
- 310 V. RAGHAVAN, K. WADATSUMI, S. MASUMOTO and K. SHIONO (Osaka City Univ., Japan): A blue print of a software support system for landslide susceptibility mapping
307-311: Dr. Y. SAKA (Waseda Univ., Japan) and Dr. C. EMBLETON (London, Univ. UK)
- 311 Y. KUMAKI, T. AKAGIRI and M. TSUZAWA (Geog. Surv. Inst., Japan): Geomorphological Survey of Landslide Hazard
Closing Address: Dr. M. OYA
(*Invited speeches: 30 min., contributed speeches; 20 min.)
- 17:20-18:30 Comments and Closing Address
Dr. T. KINOSHITA (Nat. Res. Inst. Disaster Prevention, Japan): Comments
H. Th. VERSTAPPEN: The International Decade for Natural Disaster Reduction*
M. OYA: The contribution of geomorphology for disaster mitigation
- List of Chairpersons
6 Sep 1993
Opening Address
Dr. I. TAKAGI (Keio Univ., Japan)
- Session 1-a
101-103: Dr. M. OYA (Waseda Univ., Japan)
104-108: Dr. K. UCHIDA (Okayama Univ., Japan) and Prof. Y. ICHINOSE (Hosei Univ.)
- Session 1-b
109-113: Prof. H. FUKUMOTO (Baika Junior College, Japan) and
- Ass.Prof. Y. HIRAI (Ehime Univ., Japan)

5. FIELD EXCURSION

A post-congress field excursion was held at the Kano River Basin and the Fuji River Basin, Central Japan, from September 8th to 10th. It was guided by Dr. M. Oya (Waseda Univ.), Dr. I. Takagi (Keio Univ.) and Dr. H. Ohomori (Tokyo Univ.) with assistants of Dr. S. Haruyama, S. Kubo and K. Negishi (Waseda Univ.). 29 participants including 15 foreign guests attended it. The schedule was as follows.

Day 1: We left the Shinjuku station in the morning by Odakyu-Gotemba Line and arrived at Numazu, changed into two chartered busses and visited the Kano River Basin. Stayed overnight at Yugashima Hot Spring. Observed points were:

- Kakitagawa artesian springs,
- Kanogawa Diversion Channel, and
- Egawa Residence, former local governor's house, and archeological remains of Yamaki Site at Nirayama Town Museum, Nirayama.

Day 2: Left Yugashima Hot Spring and

visited the Tagonoura Coast and moved into the Fuji River Basin. A large typhoon attacked the central Japan at that day and participants observed how coastal and flood protection facilities work at:

- Coastal protection works of Tagonoura Coast (Photo. 2),
- Latest coastal protection (off-shore) works at Kambara Coast,
- Historical Karigane Embankment of the Fuji River, and
- Braided channel of the middle part of the Fuji River.

Also visited the Kuon-ji Temple and stayed overnight at Shimobe Hot Spring.

Day 3: Going upstream the Fuji River Valley to the Kofu Intermontane Basin to observe:

- Conservation of Southern Alps Forestry Road (Photo. 3),
 - Midai River improvement works, and
 - Shingen Embankment of the Fuji River established in the 16th Century (Photo. 4).
- Because the large Typhoon has passed, the weather was getting better and arrived at Kofu Station about 16:00.

Participants discussed much about, not only the landforms, geomorphological hazards and conservation works, but also history, culture and religion of Japan in the train, buses and hotel rooms during the field trip.

6. RESULTS AND VIEWS

We have got followings results through the International Congress.

- 1) There are distinct regional differences in the causes and consequences of natural disasters. These differences are caused by the location of countries, natural conditions, moreover, political, economic and social conditions in each country. For

example, flooding is caused by typhoons in Taiwan, the Philippines, and Japan, but it is caused by ice jam in Poland. Due to differences in the causes and topography, the state of inundation (i. e. period of stagnation, depth of the standing water, velocity of the flood current) is different. The damage caused by the eruption of Mount St. Helens in the U. S. A. is relatively small, because the population density in the basin is low. If such an eruption will be occurred in Japan, large damages would occur.

- 2) Problems featured in the symposium included rapid geomorphological hazards (i. e. earthquake, volcanic eruption and flooding) and melting of permafrost due to a global warming of greenhouse effect, and rising sea-level. Damage due to the latter two problems will be appear slowly but won't stop. In the near future and damage will be appear remarkably strong. These studies were submitted by delegates from The Czech and People's Republic of China.
 - 3) Formerly construction works against natural disasters was done by civil engineering. However, recently geographic approaches to the mitigation of disasters are becoming important. The velocity of changes in the natural environment is increasing, especially as a result of changes caused by human.
 - 4) The relationships between geographers, geomorphologists and foreign delegates becomes close not only through discussion in the conference room but also on the field trips.
- Remaining problems will be as follows.
- 1) Because of the results of studies by geographers and civil engineers, zoning on

the map is very effective. Zoning of hazards areas is now shown on geomorphological survey maps showing classification of flood stricken areas in Japan.

- 2) The study of long term geomorphological hazards for such as the rising of the sea-level caused by changes of climate is delayed in every country. International exchanges of knowledge on such problems is required urgently.
- 3) Hitherto, the study of the natural hazards has been done by civil engineers, agricultural engineers, forestry engineers and geographers. The government is divided into ministry of construction,

ministry of agriculture and local governments. In the future, integrated studies of these problem and liason of these offices is required.

REFERENCES

- M. OYA (Chief Organizer), 1993: Abstracts of International Congress on Geomorphological Hazards in Asia-Pacific Region. 6-10 Sep. 1993, Waseda University, Tokyo, 116 pages.
- M. OYA (Chief Organizer) and S. KUBO (ed.), 1993: Landforms and Natural Hazards in the Kano River Basin and the Fuji River Basin.—Guidebook for Field Excursion—8-10 Sep. 1993, Waseda University, Tokyo, 49 pages.

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