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FIRE AND DISASTER MANAGEMENT AGENCY ACTIVITIES IN 2004 AND AN APPROACH TO THE FUTURE

By

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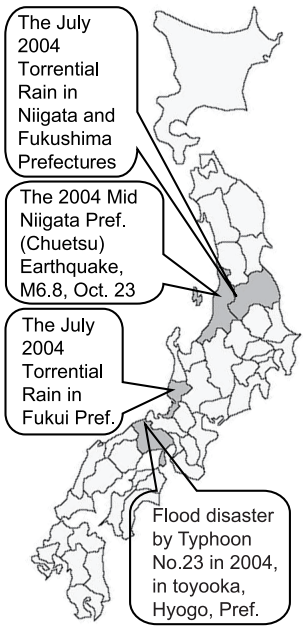
Large-scale disasters in 2004 and response activities by the Fire and Disaster Management Agency (FDMA) of the Ministry of Internal Affairs and Communications as well as FDMA future plans are reported in this article.

With regard to the existing fire defense situations in Japan, all cities, towns and villages (hereafter referred to as municipalities) take administrative responsibility for their own fire defense activities.

The FDMA is a government agency which manages fire defense organizations in all parts of the country. The FDMA, as a national organization, is in charge of fire fighting and emergency medical and rescue services as disaster preparedness and first response for emergency under the assumption of damage caused by severe earthquakes and floods.

DISASTERS – 2004

The year of 2004 was remarkable for a number of natural catastrophes like torrential rains



Large-scale disasters in 2004

Action taken by the FDMA

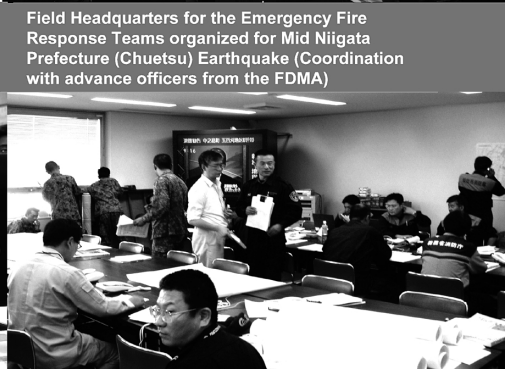
I. **Establishment of FDMA Disaster Countermeasures Office**

II. **Dispatch of advance officers from the FDMA to disaster-stricken areas**

III. **Dispatch of the Emergency Fire Response Teams**

Fire, Disaster and Risk Management Center in the FDMA (Oct.23) (Headquarters meeting with Deputy Minister of Internal Affaires and Communications)

Minister of Internal Affairs and Communications Taro Aso (Left) getting a briefing on the damage from Commissioner Shogo Hayashi (Right) of the FDMA



Field Headquarters for the Emergency Fire Response Teams organized for Mid Niigata Prefecture (Chuetsu) Earthquake (Coordination with advance officers from the FDMA)

A glimpse of the activities at Fire, Disaster and Risk Management Center

and frequent typhoons that had not struck in recent years. Earthquake also showed up its ugly face.

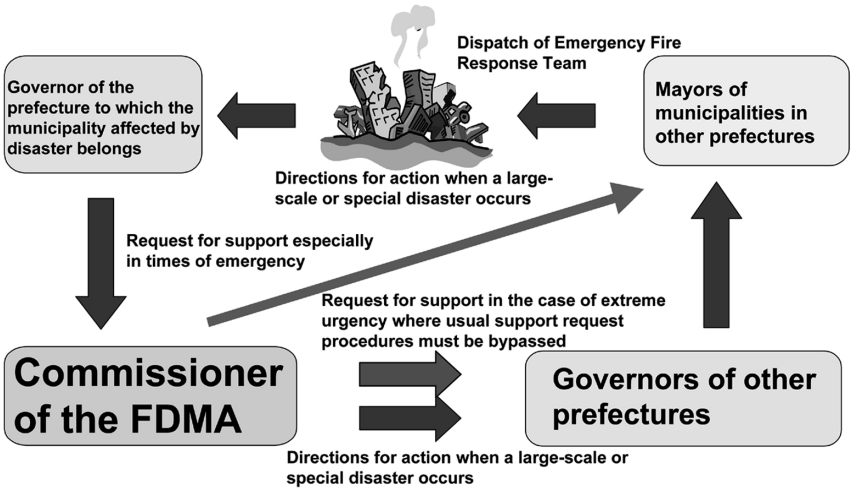
About three to six typhoons affect the Japanese landmass each year. However, the islands were affected by ten or more of them in 2004.

Typhoon number 23 in particular brought about severe damage killing 95 people in Toyooka, Hyogo Prefecture.

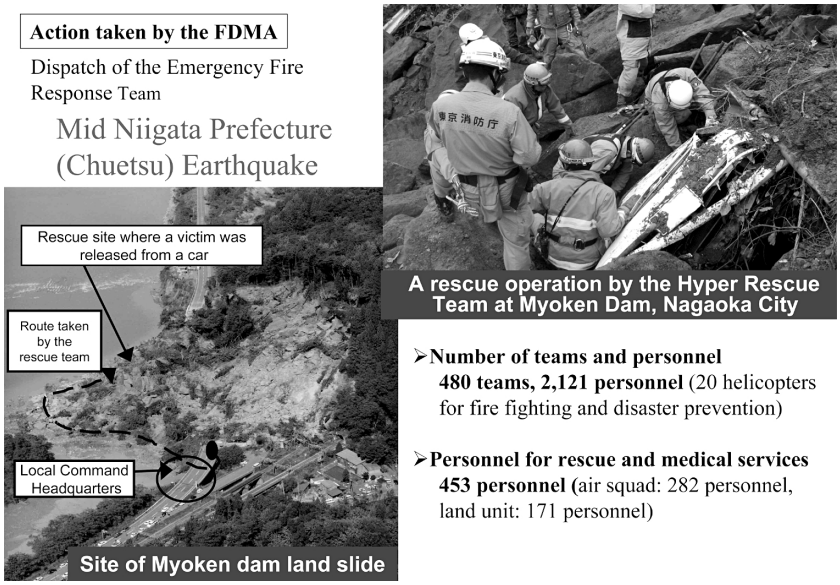
Japan is usually prepared for disasters which occur due to 40-50 mm of rain per hour. Severe torrential rains exceeding 100 mm per hour affected the Niigata, Fukushima and Fukui Prefectures in July 2004.

Many earthquakes have rocked Japan since last decade. The earthquake which rocked Chuetsu district in Niigata Prefecture on October 23rd left a strong impression in particular (see ICUS Newsletter, Special Issue 2005).

The occurrence of frequent earthquakes is not a phenomenon specific to the last year. Japan is now in an extended period when earthquakes will frequently occur.



Action plan of Emergency Fire Response Team



Rescue operation by Emergency Fire Response Team

COUNTERMEASURES BY THE FDMA

The Fire, Disaster and Risk Management Center, established within the FDMA, is equipped with systems for analyzing pictures transmitted from helicopters as well as for checking responses by the FDMA. This enables the advance units to be sent forward to specific locations damaged by hazards in any emergency.

Last year, the emergency fire response teams were dispatched to disaster-struck areas four times; namely to Niigata, Fukushima, Fukui and Hyogo Prefectures, and finally to Chuetsu, Niigata Prefecture.

The members sent from each prefectural fire defense headquarters to the areas damaged by the 1995 Kobe Earthquake met with various problems. By letting these problems be a lesson, Emergency Fire Response Teams were established in 1995 with a view to prepare for conditions requiring human aid in each prefecture. The Fire Organization Law was revised in June, 2003 and in the April 2004, this law was formally enforced.

The International Rescue Team (IRT) of Japan was one of the first teams to arrive at some of the areas struck by tsunami occurring in the Indian Ocean (see ICUS Newsletter, Vol.4, No.4, 2004) and carried out an invaluable number of first aid and rescue operations. On the 28th of December 2004, over 80 persons in all including fire and emergency services personnel medical staff and police personnel were dispatched. The relief work of the Japanese rescue team was highly appreciated and made headlines which were reported by the CNN and BBC at the end of the year. Japan is equipped with countermeasure systems against disasters and can contribute towards relief in case such a disaster occurs in Asia or surrounding areas.

CHANGING CONDITIONS

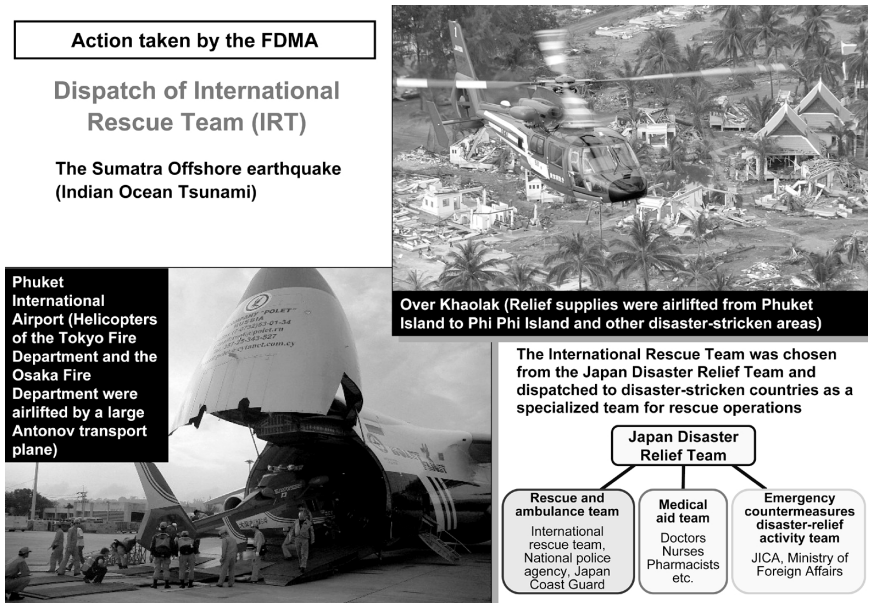
Conditions with regard to fire fighting and disaster preparedness are continuously changing.

First, the occurrence of large-scale disasters is indeed a matter of great concern.

Second, the law concerning the measures for protection of the people in armed attack situations etc. was enacted in the Diet last year. Two situations are assumed in this law; one in cases of emergency where missiles are shot into Japan by a hostile country or infiltrators enter Japan. The other one is for urgent countermeasures against acts of terrorism.

Third, recently, in particular, industrial disasters have occurred frequently. Therefore, companies are required to complete and strengthen their fire and disaster preparedness systems.

The preparation of fire defense systems in response to damage caused by the above mentioned matters must be forwarded from the national point of view with consideration to international cooperation. Based on this view, it is very important that the fire and disaster preparedness systems in municipalities need to be further improved.



Activity of International Rescue Team

COUNTERMEASURES BY THE FDMA FOR THE FUTURE

In order to strengthen the system for taking any initial action as a national duty in response to disasters, an overall revision of the system of the Fire, Disaster and Risk Management Center was made. The system was improved to be able to take any action required even in case of complete power failure or the destruction of facilities due to earthquakes and other hazards. The FDMA had poor results with regard to dispatching logistics and support units last year. The FDMA members lost no time in arriving at areas damaged by hazards. However, it could not be estimated how long teams would have to stay there. Hence, it is vital to improve the logistics and support systems.

In response to the convening of a World Fire Defense Agency Commissioners Conference for strengthening international cooperation, the first conference was held with representatives from ten countries. It was seen in this conference that there are few countries which have a national organization such as the FDMA in Japan. As can be recognized from the response to the great damage caused by the 2004 Sumatra earthquake and tsunami, the international network for fire fighting and disaster preparedness is urgently in need of strengthening.

The most important problem to be solved in the future is to strengthen the systems linking the municipalities. Firstly, it can be pointed out that systems for communicating satisfactorily with other cities, towns and villages of Japan have yet to be established. Secondly, there is a problem in the preparation of widespread administrative radio installations for disaster preparedness. Thirdly, a reconnaissance helicopter can be dispatched before taking command of emergency disaster response teams. Full command is taken after studying the images of the scene sent from the helicopter. If necessary, support units can be dispatched. We are planning to prepare a system, in which a portable earth station can receive images via satellite, in all parts of Japan. Fourthly, over 60% of disaster victims are elderly. Last year, we recognized that regional disaster prevention in a community is eventually most important for rescuing elderly persons living alone. Fifthly, municipalities are lagging behind badly in taking earthquake proofing measures for disaster prevention stations. Promotion activities with regard to this problem have been carried out in cooperation with the FDMA and ICUS, IIS, the University of Tokyo. Finally, with consideration to the importance of a regional disaster prevention system, a concept of relief and refuge stations has been proposed to regional bodies. At present, there are about 24,000 primary schools all over the country. Information with regard to fire fighting and crime prevention in ordinary times is to be collected at empty classrooms utilized as disaster management stations by considering a school district as one unit area. These classrooms can also be used to strengthen the disaster preparedness capacity in the school area while securing regional safety in ordinary times. These classrooms can be used as relief and refuge stations where information about safety can be relayed in the event of disasters. We hope this plan of utilizing unoccupied schools as disaster management stations will spread throughout the country in the light of the aforementioned projects.

The actions taken by the FDMA as well as issues to be dealt with in the future have been described above. We will take further positive actions with a view of securing the overall safety of our country.

**ICUS Visiting Professor, Commissioner of the FDMA, Ministry of Internal Affairs and Communications, Japan*

Guidelines for Promoting Seismic Retrofit of Critical Facilities for Disaster Management Published by the FDMA and ICUS Collaboration

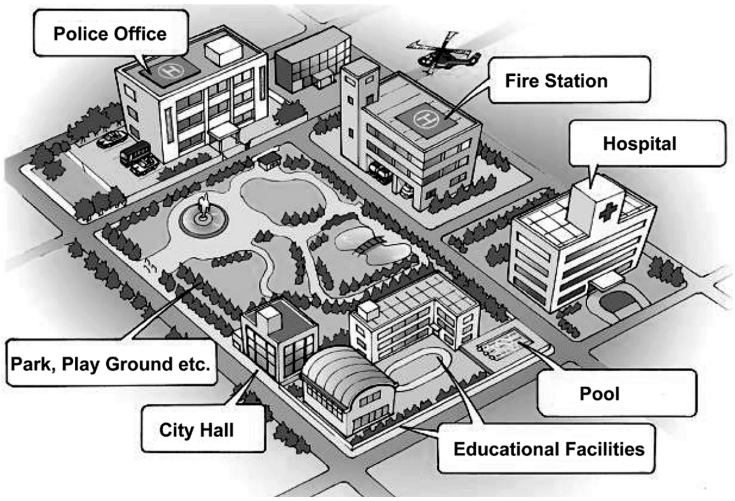
In the Mid Niigata Prefecture Earthquake of M6.8, according to the Japan Meteorological Agency (JMA), occurred on October 23rd 2004, four towns and village offices suffered severe damage.

These were centered on the areas with seismic intensity of JMA scale 6 or more, and emergency response activities were seriously interrupted in operations by their severe damage. These buildings were constructed before 1981 when the Japanese seismic design code was revised and were designed based on the old code. This earthquake damage made us strongly feel the necessity and importance for seismic retrofitting of the critical facilities for disaster management.

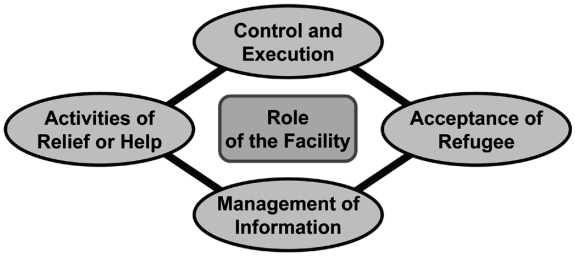
In response to such lessons, Fire and Disaster Management Agency (FDMA) has just completed the guideline in collaboration with ICUS and many architect offices and construction companies. This effort has a significant meaning as the first collaboration made by industry, government and academic society.

Until now, many examples have been published related to the seismic retrofit of buildings, however, this guideline has specific features like providing information to people who are involved in the local governments to understand the importance of seismic retrofit of critical facilities such as city or town halls, school buildings, fire stations which are expected to play an important role in case of disaster. This guideline is designed to make local government people understand easily about key issues such as basic judgment of seismic capacity evaluation and effective retrofit procedures, necessary cost, working time by the introduction of actual examples of seismic retrofitting.

Following is a table of contents of this guideline.



Critical facilities for disaster management



Role of the facility

[CHAPTER-1]
Why is Seismic Retrofit Necessary for Critical Facilities?
1-1 What is the current earthquake risk in Japan?
1-2 What is a critical facility?
1-3 What level of retrofit is required?
1-4 What are the causes making the retrofitting difficult?
1-5 What are the types of damages to buildings?
1-6 What types of buildings are vulnerable to earthquake?

[CHAPTER-2]
Procedures for Seismic Retrofitting
2-1 What is seismic capacity evaluation?
2-2 Preliminary screening to retrofitting – A flowchart
2-3 What should be investigated?
2-4 What is the output of seismic capacity evaluation?
2-5 Cost and time for evaluation?

[CHAPTER-3]
Seismic Retrofitting Method and Examples:
3-1 What is seismic retrofit?
3-2 Which method of retrofit is better?
3-3 Which is the popular retrofit method?
3-4 Is there any external retrofit method?
3-5 What is vibration control?
3-6 What is base isolation?
3-7 Model examples of seismic retrofit.
3-8 List of practical examples of retrofitted buildings.

I sincerely wish this guideline will be widely used by many people who are involved in the local governments and enhance disaster mitigation and contribute to the safety of the country.

Prof. Y. Nakano, IIS provided his valuable advice for the above project.

(by Reiko Amano,
Visiting Professor, ICUS
General Manager of Kajima Corp.)

Seconded to Asian Institute of Technology

Several months have already passed since I have been seconded to Asian Institute of Technology (AIT), located in the suburb of Bangkok, Thailand. When I arrived, January semester had already started. I took over the class shared with another instructor, and finished final examination by early May. Because AIT has a semester system, the period from early May to early August is summer vacation for students. They seem to enjoy studying and staying at their home.

I'm seconded to Remote Sensing and GIS Field of Study, School of Advance Technology as an expert of Japan International Cooperation Agency (JICA). Dispatch of JICA experts to AIT by Japanese government started in 1969. Experts for long-term, i.e. more than six months, amount to 118 persons. Most of the experts have been seconded to departments related to civil engineering as they have expertise in the same field. At present, AIT has only two JICA experts. To date, Japan has contributed greatly to the improvement of AIT, especially in the fields of civil engineering. However, Japan started to withdraw support to AIT gradually as well as United States and Germany, which used to be important supporters for AIT. Other than JICA experts, there are other Japanese faculty members, four directly hired and three seconded by other institutes of Japan.

Regarding remote sensing, AIT has continued an outstanding position among the Southeast Asian countries. AIT has a "Geoinformatics Center" consisting of two divisions. One of them is "Asian Center for Researches of Remote Sensing", a research-oriented division. The other is "GIS Application Center (GAC)", a training-oriented division. Geoinformatics Center has two antennas for receiving satellite data, supported by Institute of Industrial Science (IIS), The University of Tokyo. The received data are processed and distributed to IIS under several joint projects between AIT and IIS. I am working at the Geo-informatics Center most of the times. As staffs are from many countries, e.g. Thailand, Vietnam, India or Sri Lanka, I enjoy talking and sharing a considerable amount of information with them.

From a research viewpoint, I've started fundamental researches related to disaster mitigation. This year, Thailand had severe drought in almost all of provinces. I cite some articles from Bangkok Post, an English newspaper published in Thailand.

Sugarcane plantations covering over 60,000 rai (1 rai=1600 square meters) in three districts of Suphan Buri are dying as water supply from the local Kra Seaw dam stopped for the first time yesterday due to severe drought. Agricultural areas in Doembang Nangbuat, Nong Yasai and Sam Chuk districts also depend on water from the earth dam, which is located in Dan Chang district and has a capacity for storing 240 million cubic metres of water. The 4.25-km-long dam blocks the Nam Seaw River which flows from Uthai Thani. Only 20 million cubic metres now remains in its reservoir so the dam must stop discharging water for cultivation and keep the water to maintain its own physical condition, according to Thongthos Nokchan, the dam's irrigation and maintenance chief (March 21).

The number of provinces suffering from drought has been reduced from 72 to 16 by rain-making operations, Agriculture and Cooperatives Minister Sudarat Keyuraphan said. Of these only four or five, including Chumphon and Surat Thani, are now badly affected as there is insufficient water for agricultural use. Cloud-seeding would now focus on these areas. A total of 1,070 seeding flights to relieve the dry spell were made from nine rain-making centres from March 15 to April 9. On April 9 alone, rain was reported in 30 provinces: eight in the North, six in the Central Plain, seven in the Northeast and nine in the South (April 11).

Remote sensing can be a powerful tool for drought monitoring because onset of drought is gradual and can be detected by long-term monitoring. In order to develop a drought monitoring system, I started with field measurements to model the phenomenon on the surface from remotely sensed data. Finally, I'd like to contribute to the mitigation of such severe disasters through remote sensing technique for two-year stay in Thailand.

(by Junichi Susaki)

Drying dam in Nakhon Ratchasima province
(Upper: April 23, Lower: June 11, 2005)

Seeding into dry paddy fields in Buri Ram province. Farmers are eager for rain. (June 12, 2005)

ICUS PARTICIPATION – IIS OPEN HOUSE

The Institute of Industrial Science conducted the OPEN HOUSE during June 2-3, 2005. The various Departments and their respective Laboratories are open for public viewing during this time. ICUS participated in the same by explaining its numerous activities in both Japanese and English. The topic of focus for ICUS was "Towards Safer and Securer Built Environment in Mega Cities in Asia." About 270 People visited ICUS this year.

Under the umbrella of the ICUS title, the research titles of ICUS members were as follows:

1) Prof. Taketo Uomoto:
-Development of Technologies for Increasing Durability of Concrete Structures

2) Prof. Kimiro Meguro:
-Today's Issues of Japanese Disaster Countermeasures: Ten Years after the Kobe Earthquake

3) Dr. Taikan Oki
- Re-Spotlight on Flood Disaster

4) Dr. Ryozo Ooka:
-Sustainable Urban Design with CFD Simulation
-Diffusion of Contaminants in Urban Area and Natural Ventilation

5) Dr. Yoshitaka Kato:
-Development of Maintenance Management System for Existing Concrete Structures

(by M. Yoshimura)

Mr. Chuko Hayakawa, a member of the House of Representatives, visiting ICUS

Lecture for high school students

ICUS New Staff

Dr. Taikan Oki has joined ICUS since April 1 2005 as Associate Professor. Trained in Civil Engineering at the University of Tokyo, Dr. Oki now runs the Laboratory for Hydrology and Water Resources Engineering at the Institute of Industrial Science, the University of Tokyo. He is assigned to the Council for Science and Technology Policy, Cabinet Office of Japan, to support policy making, prioritization and evaluation of measures for science and technology in Japan, particularly to support the development of the third master plan of national science and technology development from 2006 to 2010. He has served as a lead author for the IPCC Fourth Assessment Report as well as a contributing author for the UN - Millennium Ecosystem Assessment. Dr. Oki was a visiting scientist at the NASA/ Goddard Space Flight Center for 1995-1997, and he spent a few years at the Research Institute of Humanity and Nature in Kyoto. He was one of the associate editors of the JGR- Atmospheres of the American Geophysical Union. Dr. Oki is currently chairing the IAHS Hydrology

Dr. Taikan Oki

2020 Working Group, and he was the winner of the Tison Award of the IAHS in 2003. He is a science panel member of a few international research projects, such as GEWEX Asian Monsoon Experiment (GAME), Global Land Atmosphere System Studies (GLASS), Global Water System Project (GWSP), and Global Soil Wetness Project (GSWP). His research interests include: global water balance and hydrologic cycle; world water resources assessment and the virtual water trade, impacts of climate change on hydrological extremes and water resources managements, land-atmosphere interaction and its modeling; inter-annual variation of global climate and the Asian monsoon; application of remote sensing in hydrology.

(by T. Uomoto)

ICUS welcomes Dr. Rashmi Iyengar, who joined ICUS from April 2005 to assist in the preparation of ICUS publications. Prior to joining ICUS, she completed her training to be a medical doctor from India.

Dr. Rashmi

ICUS Activities

- *Prof. Uomoto and Dr. Kato visited AIT, Thailand for a meeting at RNUS (May 2-4).*
- *Prof. Meguro attended the "Earthquake Summit" at Lake Tahoe, USA. (April 24-27), and "International Symposium on Floods in Coastal Cities under Climate Change Conditions" at AIT, Bangkok, Thailand (June 24-26).*
- *Prof. Oki attended the "IAHS Hydro- logy 2020 Working Group Work- shop" at Iguassu Falls (April 1-11).*
- *Prof. Ooka attended the "Global Advances in Heat Pump Technology Applications and Markets" at Las Vegas, USA (May 30- June 4), and the "ASHRAE Annual Meeting" at Denver, USA (June 25-30).*
- *Prof. Dutta attended the "7th IAHS Scientific Assembly" at Iguassu Falls (April 5-12).*

Awards

Prof. Oki won the Environmental Award at the Annual Meeting of Japan Society of Civil Engineers in May.

Prof. Ooka won the Technology Promotion Award at the Society of Heating Air-Conditioning and Sanitary Engineers of Japan Standard in May.

INTERNATIONAL SYMPOSIUM ON FLOODS IN COASTAL CITIES UNDER CLIMATE CHANGE CONDITIONS

The Regional Network office for Urban Safety (RNUS) organized an international symposium on "Floods in Coastal Cities under Climate Change Conditions" during 23-25 June 2005 at the Asian Institute of Technology (AIT), Bangkok, Thailand. The symposium was sponsored by the Asia Pacific Network for Global Change Research (APN) under a year-long project. The symposium was attended by 45 participants mainly from South and South-east Asian countries and Japan including academicians, researchers, policy makers and practitioners.

After a brief opening ceremony, the symposium was started with a keynote speech on Flood Control Systems in Bangkok by the Director General of Bangkok Metropolitan Administration, Mr. Teeradej Tangpraprutgul. In his presentation, Mr. Tangpraprutgul discussed about the history of flood in Bangkok, the main causes behind it and demonstrated the existing systems for flood prevention and future plans.

The keynote speech was followed by three technical sessions on the 1st day. The first two sessions witnessed the different country case studies conducted by the key collaborators of the APN Project, followed by in-depth demonstration of the respective country policy issues and strategy. The country case-study reports were presented from Thailand, Bangladesh, India, Sri Lanka, Vietnam and Pakistan (in order of presentation). These sessions was chaired by Dr. Mukand S. Babel and Prof. Addala N Swamy respectively. Dr. Uditha Ratnayake and Dr. KS Rajan were the rapporteurs respectively. The day ended with a brainstorming session where the day's presentations were discussed and chalked out the composition of the policy guidelines.

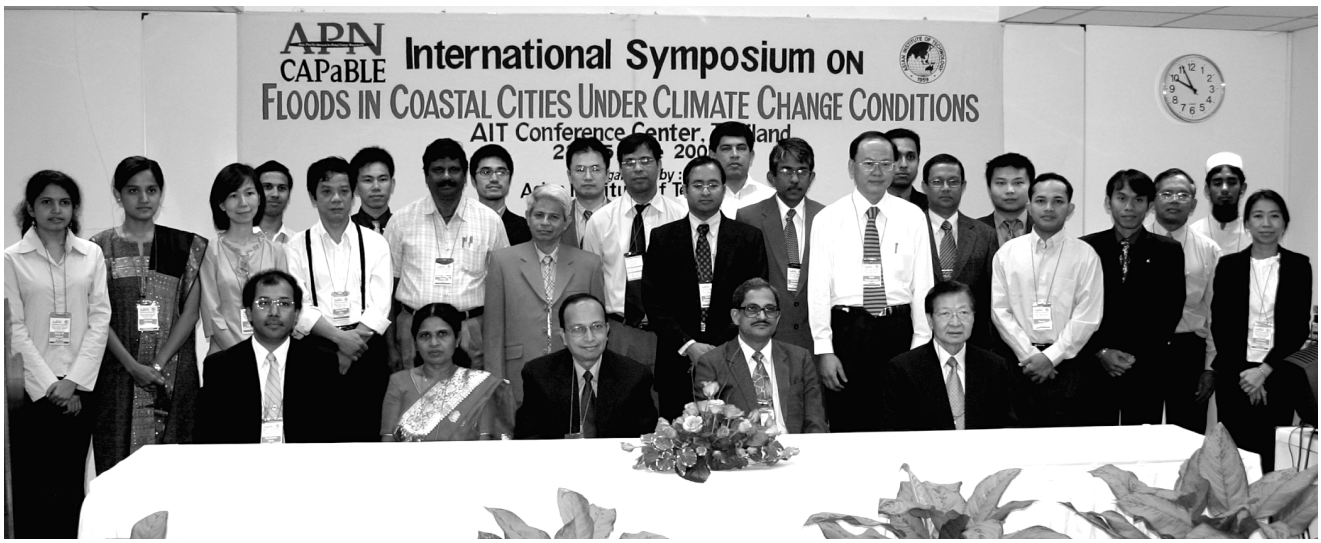
The second day started with the continuation of the previous day's brainstorming on policy issues. Prof. Ashim Das Gupta was the facilitator of brainstorming session. The next session of the day had the theme of Climate Change Impacts chaired by Prof. Tawatchai Tingsanchali. This session witnessed many different researches conducted at The University of Tokyo, AIT, Universiti Sains Malaysia and Thammasat University. The presenters revealed their simulation and possible risks due the climate change.

After lunch break, a technical tour was arranged to the Bangkok Metropolitan Administration (BMA). At BMA headquarter, the participants listened to a presentation on the Department of Drainage and Sewerage and then visited the Krung Kasem Pumpoing Station and Si Praya Treatment Plant.

The third day started with the session titled Tsunami and Coastal Flooding chaired by Dr. Junichi Susaki and rapporteur Dr. Yoshitaka Kato. This session had some attention-grabbing invited presentations by Prof. Kimiro Meguro of The University of Tokyo, Japan, Dr. Pennung Warnitchai, AIT, Dr. Srikantha Herath, UNU, Mr. David Hastings of UNESCAP and Mr. Ole Neilson from Geoscience Australia also.

The symposium concluded with the last brainstorming session chaired by Dr. Mukand S. Babel. This session outlined the policy issues of the discussed countries and developed a guideline for the policy maker to combat the climate change impacts and coastal flooding.

(by Dushmanta Dutta)



Some of the participants of the symposium on 23rd June before the Keynote speech

Editor's Note

The Sumatra earthquake occurred about 6 months ago. Although large natural disasters have not occurred in Japan this year, man made disasters such as terrorism, rail accidents have occurred at a global and local levels, respectively. Hundred or more people were killed when a train (Fukuchiyama line) of the West Japan Railway Company derailed on the 25th of April this year. ICUS sent its heartfelt condolences.

We should be ready to execute countermeasures for the disasters that may happen in future. This is one of the missions of ICUS and some of those activities are introduced in this volume.

There are two kinds of factors which cause severe damage to our social life. The first is a disaster that momentarily causes severe damage such as earthquake, tsunami, floods, etc. The other is a disaster that gradually effects. When the damage is gradual, it is difficult to address the same. For instance, environmental destruction, urban infrastructure ageing, etc. The former is "heel drop" as a killer shot, the latter is "low kick" that is sober though cumulative damage is large. An amateur (society) obviously pays attention to the killer shot. On the other hand, the expert concentrates on low kick. The editor's research is in the field of maintenance of urban infrastructures. It is classified from the above-mentioned classification into "Countermeasure for low kick"

I was seconded to AIT in the middle of May 2005. Weekdays are spent in AIT whereas the weekends are spent in a hotel in Bangkok. Many buildings are being constructed rapidly in Bangkok until midnight. It is very important to offer facilities at the right time from the economic point of view. However, it is a huge drawback that the quality of the facilities decreases as a result of the fast work. This was the situation that Japan experienced when the economic growth rate was high. To solve this issue, it will cost enormously. I sincerely wish Thailand and other Asian countries will not to be confronted with the same problem as Japan had.

(by Y. Kato)

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