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## NEWSLETTER



### Message from Director

In the past three months, there were several events that I would like to share with the readers in this issue of ICHARM Newsletter.

On May 29, Dr. András Szöllösi-Nagy, director of the Division of Water Sciences of UNESCO, and I were awarded the 2008 International Contribution Award by the Japan Society of Civil Engineering (JSCE) (Also see page 2). It was remarkable that we, who have long been committed to global water issues together, were given the same prize at the same time. Besides our shared professional experience, we have been good friends for so long, and that multiplied our joy in receiving the award. I feel deeply indebted to the directors of NILIM and PWRI for the nomination they made to JSCE for the award. Having Dr. András Szöllösi-Nagy as an Advisory Board member and me as the director, it was as if ICHARM were doubly awarded with the prize. To celebrate this big event, a commemorative lecture meeting, "Global Climate Change and Challenges in Water Management," was organized and gave me an opportunity to show my deep appreciation to many individuals and organizations, such as UNESCO, MEXT, MLIT and PWRI, which help ICHARM in many aspects. I also would like to thank them and sincerely ask them for continued support for ICHARM.

On May 10-12, I visited Bergen, Norway, to participate in the first Scientific Committee for the Program "Integrated Research on Disaster Risk (IRDR)" of the International Council for Science (ICSU). The committee was held in parallel with the World Social Science Forum by the International Social Science Council (ISSC) and got off to a hopeful start under the leadership of Committee Chair Gordon McBean for the research program that requires close collaboration between natural and social sciences. The committee discussed and

decided to launch four working groups on case studies, risk assessment, vulnerability, and data collection and quality control. I was assigned to the Case-Studies Working Group, which promote collaboration among other relevant research programs in Japan and Asian regions. With support from a number of individuals and organizations, I was able to immediately set up a sub committee under the Science Council of Japan and start working on the assignment towards the second Scientific Committee, which is scheduled in October.

On June 16-19, the second Global Platform was convened in Geneva, Switzerland, by the International Strategy for Disaster Reduction (ISDR). As the secretariat for the International Flood Initiative (IFI), ICHARM coordinated a follow-up symposium on the report compiled by the High-level Panel on Water and Disaster (HLEP) of the United Nations Secretary General's Advisory Board on Water and Sanitation (UNSGAB). Mr. Salvano Briceño, director of ISDR, and Mr. Shinichi Kitajima, ambassador extraordinary and plenipotentiary to the permanent delegation of Japan attached to the international organizations in Geneva, also participated in the meeting. It was the important first step to carry out the action plan proposed by HLEP.

This past July marked an important transition for ICHARM. Mr. Akira Terakawa left ICHARM to become the executive director for research affairs of the National Institute for Land and Infrastructure Management (NILIM). He also has been assigned to be the director of the Research Center for Land and Construction Management. He had made considerable contribution to the development of ICHARM since its preparation stage during 2004-2006 and as the deputy director from 2006 to this past July. Former Team Leader Shigenobu Tanaka of the ICHARM International Technical Exchange Team has been promoted to the deputy director position. ICHARM staff, including myself, would like to express our deepest gratitude to Mr. Terakawa's contribution and have refreshed our commitment to global water issues under the new leadership.



Dr. Takeuchi (right) and Dr. Szöllösi-Nagy (left)

Kuniyoshi Takeuchi  
Director, ICHARM

Takeuchi Kuniyoshi

## Special Events

### Lectures by the award-winning hydrologists on the occasion of the 2008 JSCE International Contribution Award

Dr. András Szöllösi-Nagy, deputy assistant director general of UNESCO, and Dr. Kuniyoshi Takeuchi, director of ICHARM, were awarded the 2008 International Contribution Award by the Japan Society of Civil Engineers (JSCE) for their outstanding contributions to global water issues. To celebrate the distinguished world-class hydrologists, the National Institute for Land and Infrastructure Management (NILIM) and the Public Works Research Institute (PWRI) jointly held a special lecture meeting on "Global Climate Change and Challenges in Water Management" on May 29 in Tokyo. The lecture meeting was also supported by the Japanese National Commission (JNC) for UNESCO, JSCE, and the Japan Society of Hydrology and Water Resources.

Mr. Akihiko Nunomura, former director of NILIM, started the event with an opening speech on behalf of the organizers, followed by a speech by Ms. Sonoko Watanabe, who is currently vice secretary general of JNC for UNESCO and chief of the Planning Coordination Office of the International Affairs Division, Minister's Secretariat of the Ministry of Education, Culture, Sports, Science and Technology.

The two hydrologists then gave a lecture in front of a large audience gathering to celebrate the special occasion. Dr. Takeuchi spoke first on "Disaster Management for Sustainable Well-being." In the lecture, he addressed "human empowerment" as a key concept in disaster management. He pointed out that, to reduce water-related disaster damage worldwide, the elimination of vulnerability factors within communities are imperative in addition to the protection of communities from external forces of natural hazards. For that reason, he emphasized the enhancement of the ability to cope with water-related disasters at the local and individual levels. In this context, Dr. Takeuchi explained that ICHARM prioritizes "Localism" in its efforts, introducing the centre's contribution to development and dissemination of satellite-based early warning systems as well as trainings in water hazards and risk management.

技術政策総合研究所



Mr. Akihiko Nunomura, former director of NILIM



Ms. Sonoko Watanabe

Dr. Szöllösi-Nagy followed Dr. Takeuchi to speak on "Global Changes and Their Impacts on Water Resource: New Challenges and Opportunities for Civil Engineers." He shared his insightful views on how global climate as well as socio-economic changes may affect prospective work and roles of civil engineers. He suggested that those engineers should pay special attention to securing adequate reservoirs in basin water management. Pointing out the significance and difficulty in solving global water issues, he concluded the lecture by quoting the words of John. F. Kennedy: "Anybody who can solve the problems of water will be worthy of two Nobel Prizes, one for peace and one for science."

The lecture room with a capacity of about 100 people was filled with an ardent audience listening to the two speakers until the end of the event.

Dr. Szöllösi-Nagy and Dr. Takeuchi have been good friends for 35 years since they shared a laboratory at the International Institute for Applied Systems Analysis in Austria. It was quite a pleasant surprise for the two to find out that they were given the same award at the same time. Meanwhile, the Hungarian scientist celebrated his 60th birthday just a week before the event and was doubly happy calling the honorable award "the best birthday present I have ever had."



Dr. Kuniyoshi Takeuchi, director of ICHARM



Dr. András Szöllösi-Nagy, deputy assistant director general of UNESCO



At lecture



At the award ceremony in the JSCE 95th General Meeting

## Asian Development Bank (ADB) Visits ICHARM

### ADB visits ICHARM and joined the 20th ICHARM R&D Seminar and a debris-flow seminar in Tokyo

On June 10-11, Mr. Wouter Lincklaen Arriens, Mr. Neil Britton of the Asian Development Bank (ADB) and Mr. Terry Day, disaster prevention specialist of New Zealand, visited ICHARM to exchange views and ideas with ICHARM researchers. ADB and ICHARM are in the process of finalizing a technical cooperation contract with two-year sponsorship of ADB, and this visit was part of the preparation process to understand viewpoints on both sides.

#### Day 1 (June 10)

The morning meeting started with the introduction of ICHARM, including key activities, researchers and their experiences. Administrative issues were also discussed. The afternoon was spent on a series of presentations and discussions about region-specific technical cooperation projects in Indonesia, India, the lower Mekong River basin, and Bangladesh. ICHARM has assigned a group of researchers to each project, and each group is expected to carry out the project in close collaboration with local project leaders. In the afternoon meeting, each group detailed possible technical cooperation in their project and were given feedback from the ADB side.



Lead Water resource specialist : Mr. Wouter (left) and Senior disaster risk management specialist : Mr. Terry (right) at discussion ▶

#### Day 2 (June 11)



At discussion

The main discussion topics for the morning meeting were the framework of project management and communication measures between ICHARM and local project leaders. In the afternoon, the 20th ICHARM R&D Seminar was held in the ICHARM auditorium. In the seminar, Mr. Britton gave a presentation on risk management, Mr. Day on flood countermeasures in New Zealand, and Dr. Nishikawa on progress in flood management in Japan. Afterwards, Mr. Wouter and ICHARM Director Kuniyoshi Takeuchi facilitated discussions and helped seminar participants share useful information and knowledge among themselves.



At Seminar

#### Day 3 (June 12)

ICHARM, the PWRI Erosion and Sediment Control Research Group and ADB jointly held a project report seminar in Tokyo on a type of debris-flow control structure. As introduced earlier in ICHARM Newsletters, ICHARM provided technical assistance with ADB's financial aid for a trial implementation of this type of structure in Baguio, the Philippines. This type of structure is called "debris-flow dewatering brake" or "debris-flow brake." Debris-flow brakes are designed to reduce the energy of debris flows filtering water and increasing internal friction. This facility is competitively low-cost yet effective countermeasures for debris-flow prone areas in developing countries.

Diplomats of developing countries and international aid agencies were invited for the seminar. Mr. Masayuki Watanabe, who was in charge of the Baguio project and is a coordinator for disaster mitigation research at ICHARM, reported on the project. After his presentation, participants had a discussion on the project and expressed high interest in the structure.



Participant from embassy



Mr. Masayuki Watanabe

# ICHARM Master's Course Update

ICHARM jointly offers a one-year Master's course, "Water-related Disaster Management, Disaster Management Policy Program," with the Japan International Cooperation Agency (JICA) and the National Graduate Institute for Policy Studies (GRIPS). Eight students started the course last October and are currently working very hard on their graduation theses to meet the deadline in mid August!

From 3 to 5 June 2009, those students went on a field trip to the Tohoku region accompanied by ICHARM staff to learn structural and non-structural disaster countermeasures in Japan. There were four main destinations for their trip:

- 1) Isawa dam construction site
- 2) Hada District of Ohshu City (Residents are very active in voluntary disaster prevention activities.)
- 3) Kesenuma City (The city promotes efforts to raise residents' disaster awareness in addition to disaster education for quick and safe evacuation.)
- 4) Ichinoseki retarding basin (Residents are active in handing down their disaster experience regarding Typhoon Kathleen to the younger generation.)

## 1. Isawa Dam construction site

The Isawa Dam, located in the upper Isawa River, is now under construction as part of the redevelopment project of the Ishibuchi Dam, located in the upper reach of the Isawa Dam. When completed by 2013,



How big!

it will be the second largest rock fill dam in Japan and 2.5 times as high and 9 times as large in volume as the Ishibuchi Dam. The students first visited the Isawa Dam Study Center. They were greeted by Mr. Ito, director of the MLIT Dam Construction Office and given an outline of the dam by Mr. Odajima, a dam construction expert. Then, they moved to a panoramic view point at the dam site. They were surprised to see how large 90 ton damp trucks are.



◀ Mr. Odajima explains the outline of Isawa dam.



▼ View point of Isawa dam

## 2. Hada District

Hada District of Ohshu City, located between the Tohoku Sinkansen Line and the Kitakami River, was severely damaged by Typhoon Kathleen in 1947 and Typhoon lone in 1948. The students had a chance to interview local residents, including Mr. Sato, a community leader, at the Hada Community Center to learn voluntary disaster prevention activities in the district. According to them, it was since 2002 when the area was widely inundated by Typhoon No.6 that Hada residents have started various disaster prevention activities. In 2003, a local flood hazard map was made; in 2004, a voluntary disaster prevention organization was established; in 2005, a book edited by the survivors of Typhoons Kathleen and/or lone was published; in 2006, water levels at the time of flooding due to Typhoon Kathleen were marked in different places around the district; in 2007, a voluntary evacuation drill and workshops were held, and "Safety Maps" were made based on the findings from the drill; and in 2008, memorial statues were built at the breach points. It is particularly worth noting that they always exercise disaster prevention activities "practically." The district's motto for disaster prevention is "Never lose anybody at emergency." In 2007, the residents practiced an evacuation drill to see if it was really possible to evacuate with nobody left behind in a chaotic situation.



Students interview to the resident at Hada District



Flood mark on the wall of Hada community center



"Safety Map" in Hada District

### 3. Kesennuma City

Kesennuma City of Miyagi Prefecture suffered severe damage from the Chilean Tsunami in 1960. Aware that an earthquake can happen anytime and will cause considerable damage once it happens, the city has been promoting activities to raise residents' tsunami disaster preparedness, such as evacuation drills and disaster education.

The students first visited the city hall and received a greeting remark by Mr. Sugawara, deputy mayor, and then moved to the Karakuwa Visitor Center to attend a lecture by Mr. Sato, chief of the Disaster Prevention Section.

One of the most interesting points in the lecture was a complex relationship between disaster awareness and evacuation behavior. According to the results of a questionnaire survey conducted after the 2003 earthquake, 90% of the residents were aware of the possibility of tsunamis right after the earthquake. However, merely 1.7% of them actually evacuated while the overwhelming majority (86%) of them did nothing. The survey also found that people were more likely to evacuate when power failure interrupted their access to information through TV or other means than otherwise. Those results made the students, as well as the ICHARM staff, realize that disaster awareness and information do not necessarily promote evacuation and also think about how much disaster information should be provided in what way.

After the lecture, the students experienced tsunamis in a simulation video room. It was a valuable experience for them, who usually spend most of the time just thinking about floods but not other extreme natural events.



Mr. Sugawara gives a greeting remark



Mr. Sato explains disaster prevention activities in Kesennuma City

### 4. Ichinoseki retarding basin and community efforts to keep memories of Typhoon Kathleen

Ichinoseki City of Iwate Prefecture has been frequently flooded because it is located at a confluence of the Kitakami and Iwai Rivers and also because the channel suddenly narrows downstream. To solve the problem, retarding basins are being constructed. The total area of the basins will be 1450 ha with the surrounding levees extending 28.2 km in total. Mr. Wako, section chief of the MLIT Iwate Branch Office, outlined the retarding basins and showed the students around the site. After that, at Ai-port, a Kitakami River information center, he lectured on a project for the 60th anniversary after Typhoon Kathleen and lone to prevent the memories of the past disasters from fading away from people's minds. The project included activities as from putting up flood mark indication boards at Ichinoseki Station to manufacturing playing cards to raise disaster awareness to playing musicals. Small meetings were also planned to listen to survivors from Typhoon Kathleen. The meetings were held eight times during the anniversary event and attracted about 280 people. Some survivors are active as voluntary guides at Ai-port. The students learned the importance of community efforts to hand down disaster experience to the next generation.



Playing cards on water-related disaster



Mr. Wako explains the outline of the retarding basin



Flood mark in Ichinoseki Station

## Research Introduction

### Development of a correction method for satellite-based rainfall data

The Hydrologic Engineering Research Team of ICHARM is currently working on the development of the Integrated Flood Analysis System (IFAS), a flood forecasting system using satellite-based rainfall information. The first report on the system appeared in ICHARM Newsletter Vol.3 No.3. In this second brief report, we will explain further progress in the IFAS project with specific focus on the development of a unique method for correcting satellite-based rainfall data.

IFAS is developed to be a powerful tool to operate flood forecasting and warning systems for developing countries. The tool is designed to use global rainfall data provided through satellites in near-real time by organizations such as the National Aeronautics and Space Administration (NASA), National Oceanic and Atmospheric Administration (NOAA), and Japan Aerospace Exploration Agency (JAXA).

As shown in Figure 1, however, most satellite-based rainfall data underestimates ground observation, which makes it difficult to use them for flood forecasting. After repeatedly conducting accuracy verification on the data, we found that the error margin was proportionate to the wind velocity. This finding led us to the idea that satellite-based rainfall data should be corrected proportionately to the movement rate of a rainfall area; when the movement rate is large, major correction is likely to be necessary, but when it is small, minor or no correction should be enough. Based on this idea, we have developed a correction method for near-real time satellite-based rainfall data<sup>1)</sup>. This correction method has improved satellite-based rainfall data accuracy remarkably (Figure 2) and has already set in IFAS.

Our next step is to examine the applicability of this correction method by applying it to overseas river basins for further verification and eventually establish its global applicability. IFAS, empowered by this satellite rainfall correction method, will ensure flood forecasting technology with good accuracy and assist developing countries in flood risk management.

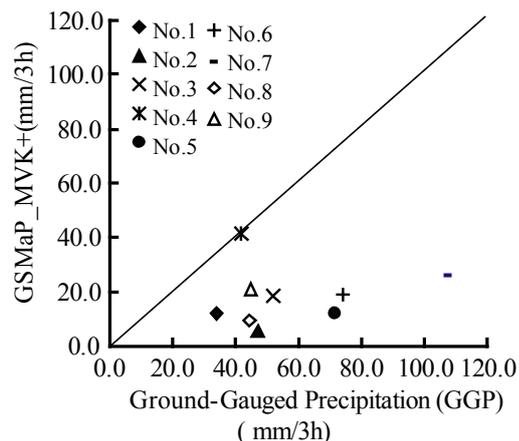


Figure-1 comparison between GGP and GSMaP\_MVK+

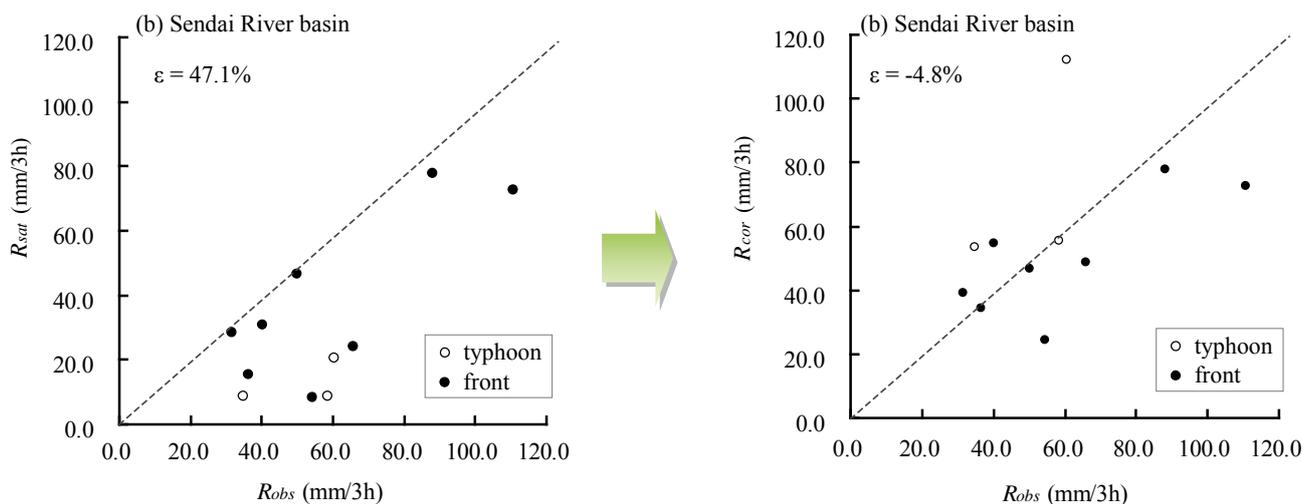
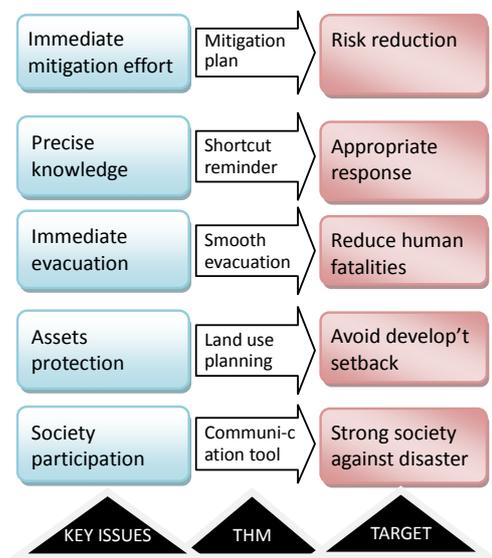


Figure-2 validation result (left: before corrected, right: after corrected)

1) THE PROPOSAL OF CORRECTION METHOD USING THE MOVEMENT OF RAINFALL AREA ON SATELLITE-BASED RAINFALL INFORMATION BY ANALYSIS IN THE YOSHINO RIVER BASIN: Yoshiki Shiraishi • Kazuhiko Fukami • Hironori Inomata, Annual Journal of Hydraulic Engineering, Vol.53, pp385-390, 2009

## Sustainable tsunami countermeasures for developing countries

It is known that huge disaster losses accompanying the gigantic Indian Ocean Tsunami in December 2004 is basically due to lack of fundamental yet crucial elements for tsunami disaster prevention such as knowledge about tsunamis, awareness on the potential hazard of tsunamis, protection facilities against tsunamis including early warning systems. Aware of this fact, ICHARM has been conducting research on the development of sustainable tsunami countermeasures for developing countries.



**Figure-1** the possible roles of THM in achieving the target of key issues in tsunami disaster risk reduction

preparation for future tsunamis; precise knowledge on the danger of tsunami hazard; immediate evacuation as priority response; assets protection as well as life protection; and public participation in countermeasure development and public awareness towards tsunamis. THM-based intervention is considered very effective to enhance the development of those key issues. Figure 1 illustrates the possible roles of THM in achieving the target of the key issues. ICHARM is now preparing a guideline for THM development in developing countries.

### Application of coastal forests for tsunami disaster mitigation

Application of coastal forests for tsunami disaster mitigation is investigated and proposed as one of coping strategies because in developing countries full implementation of structural countermeasures are difficult.

Figure 2 illustrates factors involved in interactions between a tsunami and coastal forest and the expected effects of a coastal forest on tsunami flow. Tsunami inundation depth is the main external force working onto a coastal forest. Forest resistance capacity depends on each tree capacity as well as the capacity of a forest as a whole. The tsunami flow reduction rate by a coastal forest is influenced by forest density and width in the tsunami direction. Tree counts, trunk diameter, vertical structure composition (portion of roots, trunk and canopy) and horizontal arrangement are the main variables that influence forest density.

Despite the possible functions of a coastal forest in tsunami mitigation, it should be kept in mind that all post-tsunami disaster investigation results have found that coastal forests showed no mitigation effects on tsunami inundation higher than five meters. It should be emphasized too that even for a tsunami inundation less than 5 m, coastal forests may not provide a hundred percent protection. Therefore, depending on local conditions, a combination of coastal forests and other types of mitigation measures is strongly suggested to ensure a high level of protection.

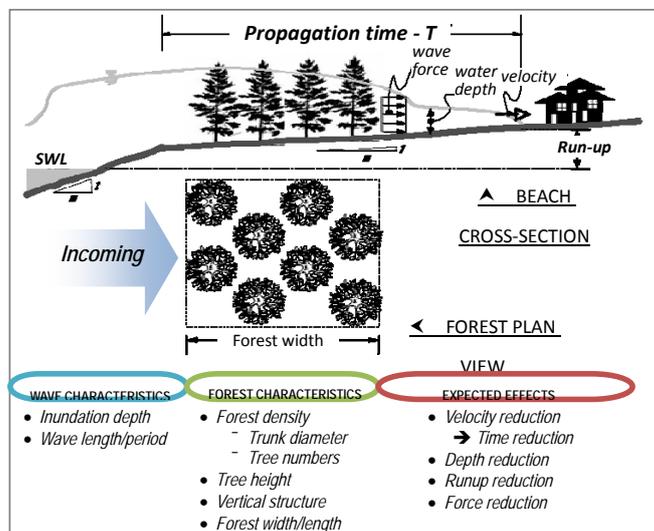
ICHARM is preparing a technical guideline of planning and designing coastal forest for tsunami protection to facilitate local governments, local communities, or the private sector to implement coastal forests as part of tsunami disaster mitigation measures. ICHARM also continues research on specific behaviours of a wider variety of coastal vegetations in their interaction with tsunamis.

The term “sustainable countermeasures” has become very important since tsunamis can be classified as a low-frequency, high-impact hazard. In general, they recur once in 100 years or more, but their disaster potential is very high due to their huge generated hazard and unpredictable time of event. About 90% of the past tsunamis were generated by tectonic earthquakes, whereas present knowledge has no ability to make advance prediction on an earthquake event. Consequently, a possible tsunami threat will be communicated to the public only after the earthquake. Unfortunately, in most cases only about 15 to 30 minutes will be left for evacuation including warning. Therefore, only well-prepared communities can successfully avoid this kind of great disaster. Sustainable countermeasures, including awareness, preparedness and protection are thus prerequisite conditions for communities to be well prepared.

ICHARM has analyzed and evaluated disaster risks related to tsunamis and storm surges in specific cities. Based on the risk analysis, ICHARM is further planning to propose coping strategies, develop teaching materials for tsunami disaster prevention, and propose guidelines for tsunami hazard mapping for developing countries.

### Intervention of Tsunami Hazard Map (THM) in tsunami disaster reduction

There are five key issues in tsunami disaster risk reduction, i.e. mitigation efforts before society forgets about past disasters or becomes less serious about



**Figure-2** Factors involved in the tsunami and coastal forest interaction and the expected effects of coastal forest on tsunami flow

## ICHARM R&D Seminars

### 19th TPU Global COE Program: New Frontier of Education and Research in Wind Engineering and IAWE Activities on Wind-related Disaster Reduction - Prof. Yukio Tamura (7 April 2009)

The 19th ICHARM R & D seminar was held on April 7, 2009, at the ICHARM auditorium. The speaker was Professor Yukio Tamura of Tokyo Polytechnic University (TPU), who is also the director of the TPU Global Centre of Excellence (GCOE) on "New Frontier of Education and Research in Wind Engineering" and the current president of the International Association for Wind Engineering (IAWE). His presentation was entitled "TPU Global COE Program: New Frontier of Education and Research in Wind Engineering and IAWE Activities on Wind-related Disaster Reduction." In addition to giving a historical background to "Wind Engineering" and the establishment of IAWE in general, he highlighted the specific efforts made by his research team towards mitigating wind related disasters in collaboration with international research teams from around the world. It was interesting to note a link between fluid mechanics related to wind engineering and the structural design of buildings. In the education and capacity building front, activities that Professor Tamura's GCOE is pursuing are inspiring to ICHARM, which also aims to become a GCOE in water related disaster management.



Prof. Tamura

### 21th "ICHARM BEST PAPER AWARD" Special Lecture - Dr. Rabindra Osti (22 June 2009)

Dr. Rabindra Osti, senior researcher of ICHARM, was awarded the first "ICHARM BEST PAPER AWARD" for his research paper entitled "Method to Improve the Mitigative Effectiveness of a Series of Check Dams against Debris Flow," co-authored by Dr. Shinji Egashira, former professor of Ritsumeikan University. The paper has been published in Hydrological Process (vol. 22). In commemoration of the award, Dr. Osti gave a special lecture on the paper at the ICHARM Auditorium on 22 June 2009.

The ICHARM Best Paper Award is established to award an ICHARM researcher who published a distinguished refereed paper in the previous year. The selection committee led by ICHARM Director Kuniyoshi Takeuchi is in charge of the award.

In the paper, the authors proposed techniques for evaluating and improving the mitigative effectiveness of check dams against debris flows in steep mountain torrents. Additionally, to generalize their proposed evaluation process, they introduced and verified some non-dimensional parameters, namely non-dimensional potential storage, normalized inflow sediment volume and relative run-out sediment volume. The developed nomogram is expected to be used by any engineers and practitioners who are responsible for planning and designing check dam systems. The authors have successfully applied the method to actual debris-flow events, such as the 1999 debris-flow event in the San Julian River in Venezuela and several cases in Japan.

An ardent audience of about 40 people, including Dr. Egashira, listened to Dr. Osti's special lecture and had a fruitful discussion afterwards.



At seminar



Dr. Rabindra Osti (left) and Dr. Kuniyoshi Takeuchi, director of ICHARM (right)

## International Activities

### ICHARM participates in drafting 2nd Water Security Outlook of Asia

ICHARM has been taking part in various international activities. One such activity is the participation in drafting the second Asian Water Development Outlook (AWDO 2010) to write one of its five key dimensions, "Key Dimension 5 (KD 5): Building resilient communities that can adapt to changes," focusing on disaster risk management, disaster preparedness and adaptation. The second edition has been commissioned by the Asian Development Bank (ADB) in the run up to the Asia-Pacific Water Summit in 2010. A team of experts from regional water knowledge hubs and lead organizations of the Asia-Pacific Water Forum (APWF), including ICHARM Chief Researcher Junichi Yoshitani and Research Specialist Yoganath Adikari, are assigned to the preparation of AWDO 2010.

The team's guiding vision states that "societies can enjoy water security when they successfully manage their water resources and services to 1) satisfy household water and sanitation needs in all communities; 2) support productive economies in agriculture and industry; 3) develop vibrant, liveable cities and towns; 4) restore healthy rivers and ecosystems; and, 5) build resilient communities that can adapt to change." These correspond to the five key dimensions of AWDO 2010.



AWDO 2010 Team Meeting in Singapore

AWDO 2010 will focus on how countries in the Asia-Pacific region are coping with a wide range of water security issues that pose critical challenges to ADB's mission to boost inclusive economic growth, reduce poverty, bring about environmental change in the region, and prevent water-related disasters which shatter socio-economic development gains and bring countries in the region down to a total halt.

### Lecture in Singapore

A. W. Jayawardena, Research and Training Advisor of ICHARM, was invited to be a lecturer at the Spring School on Fluid Mechanics and Geophysics of Environmental Hazards held at the Institute of Mathematical Sciences of the National University of Singapore during the period from April 19 to May 2, 2009. This event was initiated and organized by the International Union of Theoretical and Applied Mechanics (IUTAM) with the support of the International Council of Scientific Unions (ICSU), the International Union of Geodesy and Geophysics (IUGG), ICSU Regional Office for Asia and the Pacific Region (ROAP), the Royal Society, and the Institute of Mathematical Sciences of the National University of Singapore (NUS). It covered two of ICSU's priority areas: Capacity Building and Natural and Human-Induced Environmental Hazards and Disasters.

The school was attended by 40 sponsored graduate students (MSc or PhD) or young postdocs from 14 countries of the Asia-Pacific region: Australia, Indonesia, Philippines, Vietnam, Malaysia, China, Japan, Korea, Bangladesh, Pakistan, India, Sri Lanka, Georgia and Iran. Several additional (unfunded) students from Singapore were also registered for the course. A number of additional senior members of the NUS faculty also attended lectures of interest to them. The course consisted of a series of lectures given by nine selected lecturers from around the world, tutorials, field visits and group projects. The lecture materials will be published in a book by World Scientific by the end of this year. More details of the course and the programme are available at: <http://www.ims.nus.edu.sg/Programs/09fluidss/index.htm>.



## Business Trips

### Meeting for the intercomparison of flood forecasting and warning systems in tropical Asia in Kuala Lumpur, Malaysia (20– 21 April 2009)

Kazuhiko Fukami, team leader of the ICHARM Hydrologic Engineering Research Team, visited the Humid Tropics Hydrology and Water Resources Centre for Southeast Asia and the Pacific under the auspices of UNESCO (UNESCO-HTC) in Kuala Lumpur, Malaysia, during April 20-21 to attend the first meeting for an international cooperative research for the assessment of flood forecasting and warning systems for tropical regions sponsored by UNESCO-IHP. The meeting discussed the framework and milestones of the research and investigated a flood forecasting and warning system for the Klang River in Malaysia. The other target rivers of the joint research are as follows: the Ciliwung River (Indonesia), the Klang River (Malaysia), the Pasig-Marikina River (Philippines), and the Thu Bon River (Vietnam).

### Second Experts' Symposium on Multi-Hazard Early Warning System in Toulouse, France (5–7 May 2009)

The 2nd Experts' Symposium on Multi-Hazard Early Warning System with focus on the Role of National Meteorological and Hydrological Services was held on 5-7 May 2009 in Toulouse, France. It was organized by WMO and hosted by the Meteo France. Akira Terakawa, deputy director of ICHARM, was invited to participate in the symposium.

The three-day meeting started with the opening address by Mr. Francois Jacq, permanent representative of France to WMO, followed by the briefings of the background and objectives of the project to implement multi-hazard early warning systems by Dr. Maryan Golnaraghi, chief of the Disaster Risk Reduction Programme, WMO. During the second day session, Terakawa made a presentation on the present status of Japanese flood forecasting and warning systems focusing on the importance of information sharing with local citizens. During the symposium, the participants also discussed possible international cooperation in this field, including the preparation of guidelines for sharing relevant experiences among members of the international community. More information is available at: [http://www.wmo.int/pages/prog/drr/events/MHEWS-II/index\\_en.html](http://www.wmo.int/pages/prog/drr/events/MHEWS-II/index_en.html).



### Drafting ICHARM's Strategy for Integrated Flood Risk Management in the Lower Mekong River Basin in Bangkok, Thailand (13–14 May 2009)

The 7th Annual Mekong Flood Forum (AMFF7) was held in Bangkok, Thailand, on 13-14 May 2009, and ICHARM sent Katsuhito Miyake, team leader, Tomonobu Sugiura, senior researcher, and Ali Chavoshian, research specialist, to attend the meeting. The main theme of the forum was the "Integrated Flood Risk Management in the Mekong River Basin"

ICHARM presented a paper on "CHARTING ICHARM'S STRATEGY FOR INTEGRATED FLOOD RISK MANAGEMENT IN THE LOWER MEKONG RIVER BASIN". The main objective of this paper was to chart ICHARM's Integrated Flood Risk Management (IFRM) strategy emphasizing on local conditions in the Lower Mekong River Basin.

Defining risk (R) as a factor of hazard (H), vulnerability (V) and exposure (E) (i.e.  $R = H \times V \times E$ ), the paper lists flood risk assessment and mapping as one of the principal pillars of the proposed strategy. It covers the identification and assessment of risks from floods and their consequences on future



development scenarios in the target area. Another key strategy is promotion of flood hazard maps, which are useful in flood responses, such as evacuation. The paper also discusses a need of in-depth study on hydrological events in the Lower Mekong River Basin. Study on climate change impact is also listed in the strategy. In the study, mitigation and adaptation will mainly focus on flood preparedness indicators/standards and an approach to establish flood resilience communities with respect to socio-economic processes and human activities. More effective and accurate flood inundation modeling constitutes ICHARM's IFRM strategy and is planned to be achieved by introducing ICHARM's flood inundation modeling in the Mekong River Basin. In combination with the intended results from ICHARM's ongoing research for tool development for generating near real-time satellite rainfall information and heavy rainfall area indication, the proposed strategy is expected to deliver a more pragmatic IFRM system for the Lower Mekong Basin.

As the side event of the AMFF7, there were two meetings with the MRC Secretariat and ADB representatives in order to discuss an ongoing project, so called the ADB-RETA project, for flood/drought risk reduction in the lower Mekong River Basin.

### Workshop on Developing Water and Climate Change Adaptation Guidelines in Kuala Lumpur, Malaysia (26–28 May 2009)

Kazuhiko Fukami, team leader of the ICHARM Hydrologic Engineering Research Team, attended the Workshop on Developing Water and Climate Change Adaptation Guidelines organized by the National Hydraulic Research Institute of Malaysia and the Asian Development Bank on May 26-28. About 40 experts and administrators in charge of water resources management got together from Asian countries for the meeting. Other Japanese representatives were also sent to the meeting by Tokyo University, the Ministry of Land, Infrastructure, Transport and Tourism (MLIT), and the Japan International Cooperation Agency (JICA). Participants discussed the scope of the guideline for hydroclimate modeling to predict the impacts of climate change on water resources and for adaptation strategy as well as a framework to support the drafting process of the guideline. To further discuss the guideline, they agreed on the establishment of a steering group. Professor Toshio Koike of Tokyo University was designated as the chairman of the group. ICHARM is expected to play a leading role in developing the guideline with the steering group as a knowledge hub of the Asian Pacific Water Forum on disaster risk reduction and flood management.

### Launch of the HelpDesk for Integrated Flood Management in Geneva (17 June 2009)

On June 17, Kuniyoshi Takeuchi, director of ICHARM, Kazuhiko Fukami, team leader of the Hydrologic Engineering Research Team, and Ali Chavoshian, research specialist of the Disaster Prevention Research Team, visited Geneva, Switzerland, to attend a side event of the Second Session of the Global Platform for Disaster Risk Reduction (GFDRR). The session was held to launch the HelpDesk for Integrated Flood Management (IFM). The HelpDesk is a platform of WMO based on the Associated Programme on Flood Management (APFM) and supported by a network of partners within IFM, including ICHARM. Its role is to provide technically competent, multi-disciplinary impartial and balanced guidance on IFM. Fukami highlighted, as a panelist of the Launch session, the significance of experiences that Japan has accumulated while making continuous efforts to overcome natural extreme hazards in its long history.

### Participation in the APWF Knowledge Hub review meeting in Singapore (19 April –2 May 2009)

Team Leader Katsuhito Miyake of the ICHARM Disaster Prevention Research Team attended the APWF Knowledge Hub review meeting held on 24 June 2009 at the PUB building in Singapore. This was the first annual progress review meeting of the APWF Knowledge Hubs (KHs), which discussed (1) progress update of existing hubs and review of business plans of candidate hubs, (2) review of the business plans of three candidate KHs, (3) establishment of a steering group and secretariat for the KHs, (4) other common issues. Miyake also attended two other meetings held during the Singapore International Water Week as follows:

1. **25 June:** Advisory Committee of the Network of Asian River Basin Organizations (NARBO) to discuss NARBO work plans including a new IWRM training organization.
2. **26 June:** 5th Governing Council of the APWF to share and discuss knowledge update of lead organizations, collaborations with other organizations, etc.



Knowledge Hub review meeting

## Coming Events

### ◆ International Workshop on Application and Validation of GFAS 3–7 August 2009, ICHARM

The workshop is co-organized by IFNet (International Flood Network) and International Centre for Water Hazard and Risk Management (ICHARM). The objectives of this workshop are to build capacities in the countries to be able to undertake hydrological prediction/forecasting in poorly-gauged basins through initiating GFAS/IFAS validation, and also discuss issues regarding accuracy and applicability of the system in the areas.

### ◆ Training Workshop on Risk Management and Flash Flood Mitigation Strategies

10–13 August 2009, Kuala Lumpur, Malaysia

The Training Workshop, co-organized by Asian three UNESCO Centres such as the Regional Humid Tropics Hydrology and Water Resources Centre (HTC, Malaysia), Regional Centre on Urban Water Management (Iran) and ICHARM, will be held to provide the participants with knowledge and information on natural water disasters management as well as risk assessment and flash flood mitigation strategies.

### ◆ Knowledge Sharing Workshop on Water Science and Technology for Sustainable Well Being

25–27 August 2009, Nepal

ICHARM and NDRI have jointly done researches on West Rapti River Basin in Nepal. In the workshop, the research results will be presented. In addition to that, in the workshop, IFAS training will be done mainly for the people who are in charge of flood management.

### ◆ Master's Course "Water-Related Risk Management Course of Disaster Management Policy Program" From 5 October 2009

The 3rd Master's Degree Program "Water-related Risk Management Course of Disaster Management Policy Program", which ICHARM offers jointly with GRIPS supported by JICA, starts in October.

### ◆ "Local Disaster Management Program with Flood Hazard Map" Training Course 8–28 November 2009

Improved "Flood Hazard Mapping" Training Course starts in November.

## • Personnel Changes •

Mr. Akira Terakawa left ICHARM on July 14 to become the executive director for research affairs of the National Institute for Land and Infrastructure Management (NILIM). Mr. Terakawa worked at ICHARM for five years and three months. Former Team Leader Shigenobu Tanaka of the International Technical Team has become the new deputy director of ICHARM.

Mr. Terakawa was assigned as the director to the Secretariat for Preparatory Activities of ICHARM for the establishment of a UNESCO Centre. The secretariat was set up in 2004 as part of the Public Works Research Institute. He led eight founding members and demonstrated excellent leadership in difficult negotiation and coordination with domestic and overseas organizations. In 2006, his efforts finally resulted in the official establishment of ICHARM. He became the deputy director and dedicated more of himself to the further development of the research institute.

We at ICHARM hope that Mr. Terakawa will continue to lead a successful career in his new position.

Other personnel changes are as follows:

**Mr. Akira Terakawa: Executive Director for Research Affairs of the National Institute for Land and Infrastructure Management**

<Former position: Deputy Director of ICHARM>

**Mr. Shigenobu Tanaka: Deputy Director of ICHARM** <Former position: Team Leader of International Technical Exchange team>

**Mr. Kei Kudoh: Team Leader of International Technical Exchange team** <Former position: Chief Researcher for Special Assignment>



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