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ICHARM

International Centre for Water Hazard and Risk Management
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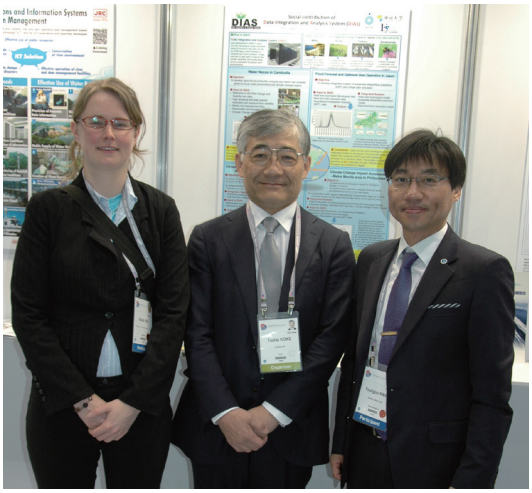
Contents

United Nations Educational, Scientific and Cultural Organization

Message from Director

ICHARM discussed water issues at WWF7

Etymologically, the English word "forum" traces back to "forum" used for public space in ancient Rome. The word now means a place for open discussion and discussion itself in which to make conclusions, recommendations and decisions. "Symposium" rings similar, but the word originates in "symposion" used for gathering or party in ancient Greece, currently meaning a place in which to voice and discuss views and ideas on a particular topic in front of audience.



ICHARM Director Toshio Koike (center) at the 7th World Water Forum with ICHARM staff

The 7th World Water Forum, held last April in Daegu and Kyeongbuk, Korea, with over 40,000 participants from 168 countries, was a gigantic "forum"-type discussion, as you can tell from the title, where people openly debated a broad range of water issues with final results including, most importantly, the Daegu & Gyeongbuk Implementation Commitment (DGIC). The gathering ended successfully after a highly productive week.

DGIC is the declaration for actions on water issues towards the 8th World Water Forum in Brazil. It pledges the development of an Implementation Roadmap (IR), in collaboration with various agencies, for each of the 16 respective themes under the four major domains of Water Security for All, Water for Development and Prosperity, Water for Sustainability, and Constructing Feasible Implementation Mechanisms, as well as the monitoring of progress each year. Responsible for one of the themes, "Adapting to change: Monitoring risk and uncertainty for resilience and disaster preparedness," under Water Security for All, ICHARM held a wrap-up session in cooperation with seven other related sessions and developed an Implementation Roadmap with four goals, seven objectives and 20 activities. Yoshiyuki Imamura, former chief researcher of ICHARM (now a professor at Yamaguchi University), signed DGIC on behalf of participants in this theme.

The development of IRs is the first step for creating scientific and social value through water-related disaster reduction in globally collective efforts. ICHARM is an unique entity where practitioners and researchers team up to enhance the understanding and forecasting of water-related hazards and improve their risk assessment, as well as put research outcomes into practice, while offering master's, doctoral and other educational and training programs. Leveraging our advantages, we will continue cooperating with other international actors and striving to produce effective results in worldwide reduction of water-related disasters.

July 31, 2015
Toshio Koike
Director of ICHARM

世界水フォーラムの成果を活かす

フォーラムは、古代ローマ市の公共広場（forum）が語源と言われ、公開討論の場や、公開討論そのものを示し、結論や提言をまとめる場合や、意思決定を行う場合も含まれます。ちなみに、シンポジウムは古代ギリシアの饗宴（symposion）に由来すると言われ、あるテーマに関する意見や考え方を、聴衆の前で討論する場とされています。

本年 4 月に韓国の大邱市・慶州市で開催された第 7 回世界水フォーラムは世界 168 カ国から 4 万人を超す参加があり、文字通り超大型フォーラムでした。水に関わる多様な問題を議論し、閣僚宣言と大邱－慶北実行誓約（DGIC）を取りまとめて、成功裡に閉幕しました。

DGIC は、安全保障、開発、持続性、実施メカニズムの 4 つの領域に 16 のテーマを設定し、多くの機関の協力を得て実施のためのロードマップを策定し、毎年の進捗をモニタリングして、次回の第 8 回のブラジルでのフォーラムにつなげようという行動文書です。ICHARM は「全ての人のための水の安全保障」の領域において、「変化への適応：レジリエンスと災害事前対応のためのリスクと不確定性の管理」のテーマを担当し、関連する 7 つのセッションと協力して総括セッションを開催し、4 つのゴール、7 つの目的、20 の活動からなる行動ロードマップ (IR) を策定し、テーマを代表して今村前上席研究員（現山口大学教授）が DGIC に署名しました。

IR の策定は、国際的な協調による水災害軽減による科学的、社会的価値の創出の第 1 歩です。ICHARM では、実務経験者と研究者が協力して、「水災害のハザードの理解と予測」と「リスク評価」の 2 つの研究と社会適用を進め、修士・博士課程の教育・研修を実施しています。このユニークな特性を生かし、国際社会と協力して、実効ある成果を挙るべく努力してゆく所存です。

Special Event

ICHARM attends the 7th World Water Forum

「第 7 回世界水フォーラム」について

世界水フォーラム（WWF）は、国際 NGO の世界水評議会 (WWC：本部フランス) の提唱で始まり、３年一度、世界の水関係者が一堂に会し、地球上の水問題解決に向けた議論や展示を行う世界最大級の国際会議です。議論は水道水、農業、環境、総合水資源管理、し尿処理、廃水、エネルギー、災害など幅広いものです。WWF7（第 7 回世界水フォーラム）は、2015 年 4 月 12 日から 6 日間、韓国の大邱 (Daegu)、慶尚北道（Gyeongbuk）において開催され、政府関係者を含む 168 ヶ国約 41,000 人が参加、日本からは国土交通省など政府、大学、民間企業、NGO など大勢が参加しました。

WWF は任意会議ですが、多様な主体が参加する規模の大きな会議で水関係の様々な会議の中でも世界的に注目されており、この会議で政府・組織が新しいコミットを発表、関係者の自発的約束・活動を促すことで、近年の多くの地球規模の行動に貢献しています。WWF7「閣僚宣言」「閣僚への提言」では災害や気候変動対応について重ねて強調されました。

閣僚宣言（抜粋）

・水は持続的な開発の中心であり、ポスト 2015 年開発アジェンダに水の達成目標と関連するターゲットを含むことを支持

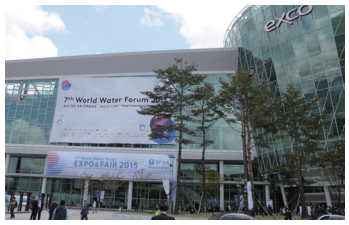
・気候変動対策で水は重要な課題のひとつと強調

・仙台で開催された国連世界防災会議の成果をふまえ、国家、地域、国際レベルでの水関連災害への強靭化や予防活動の必然性を確認

・水問題の「解決策」から「実行」に移すため、科学技術の役割が重要であることを強調

・我々は「実施ロードマップ（IR）」に期待し、WWF7 の結果を支持する

Outline of the 7th World Water Forum

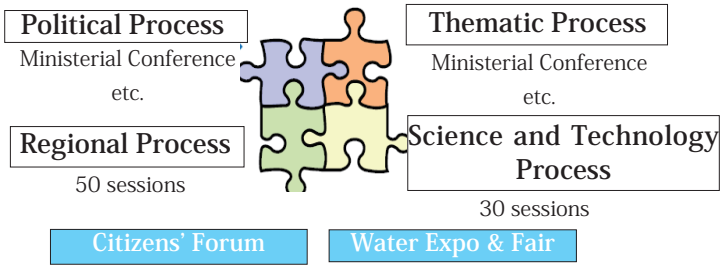


EXCO venue

The World Water Forum (WWF) was originally proposed by the World Water Council, a France-based international NGO, and has been held every three years. It is one of the largest international events in which experts in water-related fields gather from all over the world and discuss and exhibit global water issues to find their solutions. The forum addresses a wide range of topics such as domestic water, agriculture, environment, integrated water resources management, night-soil treatment, wastewater treatment, energy and disaster. The 7th WWF was held on April 12-17, 2015, in Daegu and Gyeongbuk, Korea (see the figure below). About 41,000 participants from the government and other sectors of 168 countries met at the forum, including Japanese delegates from the Ministry of Land, Infrastructure, Transportation and Tourism (MLIT) and other governmental agencies, universities, private corporations and NGOs.

WWF is a conference on a voluntary basis but has been drawn more global attention than other water-related meetings in terms of its scale and its diversity of participating entities. It has contributed to initiating many global actions in recent years as governments and organizations announce their new commitments in this gathering and encourage relevant groups and organizations to make their own commitments and take concrete actions in a voluntary way. At WWF7, the ministerial declaration and the recommendations to ministers highlighted the importance of strengthening responses to disasters and climate change.

WWF7 structure



WWF7 Ministerial Declaration (Partially citation)

- We reaffirm that water is at the core of sustainable development and support the inclusion of one dedicated water goal and water-related targets in the Post-2015 Development Agenda.
- We stress that water is one of the major issues in tackling climate change.
- Taking note of the outcome of the Third United Nations World Conference on Disaster Risk Reduction, we acknowledge the pressing need to take preventive actions and enhance resilience and preparedness towards water-related disasters at national, regional, and international levels.
- We underline the critical role of science and technology in paving the way from "solutions" for resolving water-related challenges to "implementation" by applying innovative and applicable technologies to policies as well as building sound and effective action plans linking science, technologies, policies and practices.
- We support the results of the 7th World Water Forum and look forward to the "Implementation Roadmap", along with its relevant Monitoring System, which could be considered as a reference for establishing implementation and monitoring guidelines for water-related goals in the Post-2015 Development Agenda.

ICHARM at WWF7

Nine members of ICHARM, including Director Toshio Koike, participated in WWF7 for 15 sessions as either chair or speaker (see the table below). The following reports on four sessions among them.

ICHARM の活動と貢献

ICHARM から小池センター長はじめ計 9 名が参加、15 のセッション・イベントで運営や発表を行いました。以下で 4 つを紹介をします。

ICHARM's contribution to WWF7

Date	*Session*	*Participant from ICHARM*	*Organizer*
Thematic Process			
Wed., April 15	Assessing, mitigating, and monitoring risk with use of innovative methodologies and technologies (T.1.3.2)	Welcome remarks: Suzuki (Deputy Director) *as of date above Presentation: Sawano (Chief Researcher), Iwami (Chief Researcher) Panelist: Imamura (Former Chief Researcher)	Water Resources Agency, Ministry of Economic Affairs (WRA), ICHARM
Thu., April 16	Preparedness, Response and Adaptation against Extreme Flood under Climate Change (T.1.3.3)	Presentation: Tokunaga (Chief Researcher)	Han River Flood Control Office(HRFCO), ICHARM
Fri., April 17	Adapting to change: Monitoring risk and uncertainty for resilience and disaster preparedness (T.1.3.Con)	Chair: Koike (Director) Presentation: Tokunaga (Chief Researcher) Wrap-up: Imamura (Former Chief Researcher)	ICHARM
Wed., April 15	Water Showcase World Final (T.WS)	Co-proposal: Tokunaga (Chief Researcher)	WWF7 Secretariat
Political Process			
Mon., April 13	Ministerial Conference, Plenary Session	Koike (Director), Imamura (Former Chief Researcher), Tokunaga (Chief Researcher)	Korean Government
Mon., April 13	Ministerial Roundtable 6, Adaptation to Climate Change and Management of Water related Disaster Risks	Keynote Speech: Koike (Director)	Costa Rica, Netherlands, Korea
Regional Process			
Tue., April 14	Climate change adaptation and mitigation in Africa, Americas, Asia-Pacific, Europe and the Mediterranean region / Building resilience to water-related disasters in the Asia-Pacific region (INR.1.3.AP)	Presentation: Sawano (Chief Researcher) Wrap-up: Kuniyoshi Takeuchi (Advisor)	International Centre for Integrated Mountain Development (ICIMOD)
Science & Technology Process			
Tue., April 14	World Water Challenge special session	Proposal: Iwami (Chief Researcher)	Korea Environment Corporation (KECO)
Tue., April 14	Advances in Drought Analysis Tools and Coping Strategies (S.3.2)	Presentation: Koike (Director)	International Drought Initiative (UNESCO/ RCUWM)
Wed., April 15	World Water Challenge ceremony session	Iwami (Chief Researcher), Imamura (Former Chief Researcher), Kwak (Research Specialist)	Korea Environment Corporation (KECO)
Thu., April 16	Water and natural disasters (S.3.Con)	Imamura (Former Chief Researcher)	Korea Society of Hazard Mitigation (KOSHAM), Korea Environment Institute (KEI)
Side Event, etc			
Wed., April 15	The UNESCO´S International Hydrological Programme (IHP): Challenges and Opportunities	Takeuchi (Advisor)	UNESCO-IHP
Wed., April 15	UNESCAP/WMO Typhoon Committee/ the 4th Meeting of TC Working Group on Hydrology	Moderator: Tokunaga (Chief Researcher)	Korea Institute of Civil Engineering and Building Technology(KICT)
12-17 April	Poster exhibition at the UNESCO booth and Japan Booth in EXPO	Kwak Youngjoo (Research Specialist), Karina Vink (Research Specialist)	UNESCO-IHP, government of Japan

Special Event

革新的な方法と技術の活用によるリスク評価、低減と観測セッション（T 1.3.2）の共催と発表

ICHARM と台湾水資源庁が共催して約 80 名の参加を得ました。鈴木グループ長（当時）は開会挨拶で本年は仙台防災枠組（SFDRR)、SDGs、気候変動枠組条約など国際合意がされる年であり、先進的な技術や方法が有用である好例を示したいと述べました。

岩見上席研究員から気候変動の影響を考慮した先進的な降雨流出・氾濫解析の説明の後、澤野上席研究員からリスク評価とデータ管理の重要性や、ICHARM の国際協力の役割について等説明しました。

Assessing, mitigating, and monitoring risk with use of innovative methodologies and technologies (T1.3.2)

ICHARM co-hosted this session with the Water Resources Agency of Taiwan, and about 80 participants attended. Atsushi Suzuki, the Deputy Director of ICHARM of that time, made an opening speech, referring to this year as the one with important international commitments, such as the Sendai Framework for Disaster Risk Reduction 2015-2030, the Sustainable Development Goals, and the Framework Convention on Climate Change, and hoping that the session would be able to highlight the crucial role of advanced technologies and methodologies in coping with water issues. ICHARM Chief Researcher Yoichi Iwami spoke after him, explaining the latest rainfall-runoff-inundation analysis capable of considering the impact of climate change. Chief Researcher Hisaya Sawano was another speaker, stressing the importance of risk assessment and data management and also outlining the role of ICHARM in international cooperation.

Former Chief Researcher Yoshiyuki Imamura (2nd from left), Chief Researcher Hisaya Sawano (3rd from left), Deputy Director Atsushi Suzuki (5th from left), Chief Researcher Yoichi Iwami (rightmost)

強靭化と防災のためのリスク・不確実性モニタリング最終セッション（T 1.3）の主催と進行

参加者は約 70 名。ICHARM が主催者となり、テーマプロセスの水災害テーマに属する 7 セッションの総括を行うとともに、小池センター長が議長となり、ICHARM が準備段階から主導してきた IR(実施ロードマップ) について、各セッション代表者や参加者と内容、今後の進め方について意見交換しました。

IR は WWF7 の成果達成の鍵と位置づけられ、閣僚宣言においてもその期待が強調されています。WWF7 事務局では、IR で提案された行動の共有とモニタリングを行うための AMS（行動モニタリングシステム、http://ams.worldwaterforum7.org/）を開発しました。ICHARM は引き続き水災害テーマの IR を主導する役割を期待されています。

Concluding Session 1.3: Adapting to change: Monitoring risk and uncertainty for resilience and disaster preparedness

This ICHARM-hosted session was chaired by ICHARM Director Toshio Koike and drew about 70 participants. Summarizing the results from seven water-related disaster sessions in the thematic process of WWF7, the participants and the representatives of each session discussed the implementation roadmap, drafted under ICHARM's initiative from the preliminary stage, regarding its content and how the world should proceed with the plan.

ICHARM Director Toshio Koike (leftmost)

The implementation roadmap is considered as the key component to realize the results of WWF7 and emphasized in the ministerial declaration with high expectations. The WWF7 secretariat even developed the Action Monitoring System (see http://ams.worldwaterforum7.org/) to monitor and share the progress in implementing actions listed in the roadmap. ICHARM is continuously expected to play the leading role in putting the roadmap of the water-related disaster theme into action.

台風委員会 (TC) 水文部会 (WGH) 第 4 回作業部会

台風委員会 (TC) 水文部会 (WGH) 第 4 回作業部会が開催されました。

韓国での作業部会は WGH の関連行事で、毎年、韓国国土交通部漢江洪水統制所が主催して行っています。今回、WWF7 にあわせ TC WGH の 16 名（日本、ラオス、マレーシア、韓国、タイ、ベトナム、米国）が集まりました。4 月 15 日はメンバーのみの会議を開催、水文部会議長の

UNESCAP/WMO Typhoon Committee/ the 4th Meeting of TC Working Group on Hydrology

The 4th meeting of the Typhoon Committee (TC) Working Group on Hydrology (WGH) was held during the 7th World Water Forum (WWF7) in Daegu, Korea.

This annual meeting in Korea is a sub-event of WGH organized by the Han River Flood Control Office of the Ministry of Land, Infrastructure and Transport of Korea. Sixteen members of TC WGH met on this occasion of the international conference from Japan, Laos, Malaysia, Korea, Thailand, Viet Num and America. On April 15, they had a closed meeting, in which activities of TC were reported and views

and comments were exchanged under the chairmanship of Chief Researcher Yoshio Tokunaga of ICHARM. On the following day, they held an open session, "Preparedness, Response and Adaptation against Extreme Flood under Climate Change," in which members of TC WGH delivered a presentation before general audience as well as experts. Tokunaga was one of the speakers presenting flood analysis using satellite data.

The 4th meeting of the Typhoon Committee (TC) Working Group

Water Showcase World Final (T.WS)

With the trophy for the Outstanding Award

Water Showcase was a special program of the Thematic Process of WWF7, which was a type of contest to select good projects on water issues. A project conducted in Ambon, Indonesia, to empower residents for possible collapse of natural dams was jointly submitted for the contest by JICA local staff, residents in the affected area and NGOs.

The project was nominated as one of the nine final candidates among from 115 projects submitted from all over the world and finally given the Outstanding Award with a trophy. The trophy was presented to ICHARM because its chief researchers, Hisaya Sawano and Yoshio Tokunaga, led the project and also because advice provided by PWRI played a key role in this successful project.

Besides these four sessions, ICHARM researchers were very active throughout the conference period: a keynote by Director Toshio Koike at the ministerial roundtable meeting, a final wrap-up by Advisor Kuniyoshi Takeuchi at the Asia-Pacific water-related disaster session, outreach activities by Research Specialists Youngjoo Kwak and Karina Vink at the exhibition space, and a speech by Former Chief Research Yoshiyuki Imamura (now a professor at Yamaguchi University) representing coordinators at the closing ceremony.

Research Specialist Vink at the UNESCO-IHP booth

Conclusion

WWF7 was a great opportunity to realize that Japan makes important scientific and technological contributions to disaster management and climate change, which have been frequently debated worldwide in recent years. It was also a great opportunity for ICHARM to show the international community our leadership capacity in global water issues at voluntary meetings such as WWF. It is all up to us now whether what has been accomplished at WWF7 will fade away soon or will be truly meaningful for the future of the world.

(Written by Yoshio Tokunaga)

徳永上席研究員が進行役となり台風委員会活動報告及び意見交換が行われました。

16 日は「気候変動下の大規模洪水の準備、対応、適応」セッションを開催し、一般参加者の聴講のもと台風委員会メンバーが発表を行いました。ICHARM からは徳永上席研究員が「衛星データを用いた洪水解析」を紹介しました。

Water Showcase 最終選考会優秀賞受賞

Water Showcase は「テーマプロセスのスペシャルプログラム」で、水に関する優れたプロジェクトを募り発表コンペを行うものです。

2013 年 7 月 25 日に発生したインドネシア　アンボン島の天然ダム決壊に備えた住民の能力強化（提案者、JICA 現地スタッフ、被災地住民、NGO の共同提案）が応募されました。前もって天然ダム決壊の怖さを CG 再現動画やパンフレットを用い地元住民に対し普及啓蒙活動を行い、ダム湖の水位をモニタリングする装置を設置し、危険な状態になったときに避難を呼びかけました。

世界から集まった 115 件 の候補のうち、この案件を含む 9 件が最終選考に残りました。

発表の結果、Outstanding Award（優秀賞）を獲得し、トロフィーが授与されました。ICHARM の澤野上席研究員と徳永上席研究員が当時 JICA の専門家として実際のプロジェクトを主導していたことや、土木研究所の専門家のアドバイスがプロジェクト成功の鍵であったことから、トロフィーは ICHARM に寄贈されました。

この他にも、小池センター長による閣僚円卓会議での基調講演、竹内顧問によるアジア太平洋水災害セッション総括、郭専門研究員・ヴィンク専門研究員による展示会での活動紹介、今村前上席研究員（現 山口大学教授）による閉会式でのコーディネーター代表スピーチ等多くの活動をしました。

おわりに

ICHARM の WWF7 での活動を通じて、近年、地球規模で議論が白熱している防災や気候変動対応分野で、日本の科学技術が重要な役割を果たしていること、WWF のような任意会議において ICHARM が水災害分野で世界をリードできる可能性があることを、国内外の多くの参加者に強く印象づけることができました。この活動成果を一過性のものとせず、今後に役立てることが期待されています。

Information Networking

Advisor's activities

この６月をもって二つの公務を無事終えることができました。一つはIRDR 科学委員会委員、もう一つはIUGG ジオリスク委員会委員長です。私の貢献は微々たるものでしたが、多くの素晴らしい知己を得て、共に学び活動する、この上ない経験をすることができました。

IRDR は、ICSU を中心にISSC、UNISDR の共催で 2008 年に発足しました。以来、統合的災害リスク研究の推進、科学的知見に基づく災害リスク軽減策推進のため、国際的中核として機能を果たしています。去る６月２～４日に第 13 回 IRDR 科学委員会が中国・青島で開催されましたが、これが私が委員として出席する最後の会議になりました。今後の IRDR の活動の、一層の発展を祈念しています。私がうれしく思っておりますのは、１月の東京会議、３月仙台での国連防災世界会議で見られたように、IRDR 日本国内委員会が IRDR 活動の支援や主導を通じ、中心的な役割を果たしていることです。私は現地主義、ボトムアップ型アプローチの重要性を主張してきました。地域の能力開発と、科学者、実務者、政策立案者による継続的な対話を通じての防災推進です。台湾では、IRDR 台北の中核的研究拠点や国家災害防救科技中心（NCDR）が中心になって、新台北市と新竹県でこうした対話が始まっています。また各国のナショナルプラットフォームの強化は、仙台防災枠組が取り組む、主要な実践課題になっています。

６月 22~28 日には、第 26 回 IUGG 総会が、文化、音楽、自然の豊かなチェコ共和国・プラハで開かれました。私は IUGG 総会には、1983 年ドイツ・ハンブルクでの第 18 回以来参加し、特に IAHS と IUGG-GeoRisk 委員会の活動を通じて、多くの優秀な研究者と知り合うことができ、私の国際活動のホームベースを形成してきました。今回、旧知の Harsh Gupta 会長と Alik Ismail-Zadeh 事務総長から IUGG フェロー（名誉会員）の資格をいただいたのは光栄でした。

チェコでは、プラハの西にある Barrandian 地域と呼ばれる、地質学上世界的に有名な場所を訪れる機会に恵まれました。Barrandian は、この地を克明に調査研究した偉大な地質学者 Joachim Barrande に因んだ名称です。彼はブルボン家 Charles X の孫の家庭教師として、王がパリを追われ、1831 年からプラハ城に住んだのに従ってきました。この地域には多くの化石を含む海底堆積物が見られ、その化石、地層が、世界の層序学において地質年代測定の基準となっていますが、これは Barrande の 1830 年代以降の調査の成果です。今回私が石灰岩の採石場から持ち帰るのを許された化石は、小さな貝殻のものばかりですが、数億年前、現在のプラハ西部が海底にあったことを想像するには、十分な証拠品となりました。

At the 26th IUGG General Assembly, Advisor Takeuchi was awarded the Fellowship by President Harsh Gupta (left)

In June 2015, I completed two of my official obligations: the membership of the Science Committee of the Integrated Research on Disaster Risk (IRDR) and the chairmanship of the Commission on Geophysical Risk and Sustainability (GeoRisk Commission) of the International Union of Geodesy and Geophysics (IUGG). My contribution was little but it was a great experience for me to know, learn from and work with many splendid people.

IRDR was established in 2008 by the International Council for Science (ICSU) and co-sponsored by the International Social Science Council (ISSC) and the United Nations International Strategy for Disaster Reduction (UNISDR). It has since been acting as an international core of promoting integrated research on disaster risk and knowledge based policy making on disaster risk reduction. On 2-4 June 2015, the IRDR 13th Science Committee was held in Qingdao, China, which I attended for the last time as a member. I wish all the best for the future development of IRDR activities.

I am pleased to see that IRDR Japan national committee is now playing a central role in supporting and leading its activities as seen in Tokyo last January and in Sendai last March. My stand has always been for a bottom-up approach through local empowerment and sustained dialogue between scientists, practitioners and policy makers. A challenging trial of such a dialogue is now on-going in New Taipei City and Hsinchu County in Taiwan under the name of IRDR Flagship and leadership of the International Centre of Excellence of IRDR-Taipei in Academia Sinica and the National Centre for Disaster Reduction. Strengthening of national platforms is now part of the central focus in implementation of the Sendai Framework for Disaster Risk Reduction.

It was also my great pleasure to participate in the 26th IUGG General Assembly (GA) on 22-28 June 2015 in Prague, Czech, a splendid city of culture, music and nature. I have been attending IUGG GA since 1983, when it was held in Hamburg, Germany, and acquainted with so many distinguished scientists through IUGG, especially through the International Association of Hydrological Sciences (IAHS) and the IUGG GeoRisk Commission, which have long been the home base of my international research life. To my great joy, I was awarded with the IUGG Fellowship (honorary membership) by my good friends, President Harsh Gupta and Secretary General Alik Ismail-Zadeh of IUGG, in this meeting.

I could fortunately join a field trip to a world famous geological site in the west of Prague, so-called the Barrandian area, named after Joachim Barrande, a great geologist and a tutor of a grandson of Charles X of the Bourbon Family, who fled from Paris and lived in Prague Castle from 1831. This is a marine sediment area with many fossils. The fossils there serve as the standard geological dating scale for stratigraphy in the world, the geological practice starting from the investigation of the area by J. Barrande in the 1830s. Fossils I got from a quarry of limestone are only of small shells, but they are great enough to conjure up the image of the Prague area under the sea some hundreds of millions of years ago.

A limestone quarry at the Barrandian area, west of Prague

(Written by Kuniyoshi Takeuchi)

Visit by Thai delegates

On May 15, 2015, a group of 10 delegates from Thailand visited ICHARM with an associate professor of the University of Tokyo and an expert from the National Institute for Environmental Studies, Japan (NIES), as part of the training course, "Technical Workshop on the Quasi-Real Time and Forecast Simulation of H08." At ICHARM, they discussed issues about hydrological models and their field application.

Discussion with visitors from Thailand, University of Tokyo and NIES

(Written by Masahiko Murase)

2015 年 5 月 15 日、「水資源モデルの シミュレーション」コースでタイからの専門家 10 名が東京大学 生産技術研究所　木口雅司特任助教、国立環境研究所　地球環境研究センター　花崎直太主任研究員とともに ICHARM を訪問し、水文モデルとその適用について意見交換を行いました。

ICHARM Open Day joined by local high school students

ICHARM held the annual "ICHARM Open Day" on April 17, 2015, as part of the open house event of the Public Works Research Institute (PWRI) during the Tsukuba Science & Technology Week in April. ICHARM's foreign researches and students studying in its master and doctoral degree programs worked hard to prepare oral and poster presentations for this event. This year, 64 high school students and four teachers were invited; 41 from the Ibaraki Prefectural Takezono High School and 23 from the Ibaraki Prefectural Namiki Secondary School. In this event, communication was all in English, including presentations and questions and answers.

Presentation by doctoral student Nasif Ahsan

The ICHARM Open Day began in the ICHARM auditorium, where ICHARM Advisor Kuniyoshi Takeuchi welcomed students from the local schools. Two speakers followed, each delivering a presentation that tapped into students' curiosity. The first speaker was Research Specialist Liu Tong from China, outlining water-related disasters and projects on which ICHARM is currently working. Ahsan Md Nasif, a doctoral course student from Bangladesh, spoke about water-related and other natural disasters that his country faces after explaining its geography and relevant conditions.

The second part of the event took place in a casual atmosphere, providing the students with an opportunity to encounter a more diverse range of people from ten different countries: Bangladesh, Colombia, Fiji, Guatemala, India, Kenya, Myanmar, Pakistan, Sri Lanka, and Venezuela. The students moved upstairs to an open space, where ICHARM's master and doctoral students prepared posters mainly to share disaster-related information about their countries. High school students were so eager to communicate with them, asking questions and getting answers in English, that they hardly had enough time to finish the conversation.

Students and ICHARM staff at the entrance hall

In the post-event questionnaire, many students commented that the event was fun because everyone there was friendly and easy to talk to, although many also wished for more time to talk. Thanks to people who helped this event happen,

4 月のつくば科学技術週間に開催された土木研究所の一般公開に合わせ、ICHARM は今年も「ICHARM Open Day」を 2015 年 4 月 17 日に開催しました。ICHARM の外国人研究員と博士課程及び修士課程の外国人学生が一丸となり、つくば市の茨城県立竹園高等学校・茨城県立並木中等教育学校から 64 名（竹園 41 名、並木 23 名）の生徒の皆様及び各校先生方合わせて 4 名を招待しました。このイベントは、講演、発表及び質疑応答などすべて英語で行っています。

まず ICHARM 講堂において、竹内顧問の挨拶の後、専門研究員の Liu Tong 氏（中国）による水災害に関する概要説明及び ICHARM が取り組んでいるプロジェクトの概要に関する講演の後、博士課程の学生である Ahsan Md Nasif 氏（バングラディシュ）による母国の地理などの概要、水災害、自然災害に関する講演を行い、生徒の皆さんの興味を引きつけました。

続いて ICHARM2 階に移動し、バングラディシュ、コロンビア、フィジー、グアテマラ、インド、ケニア、ミャンマー、パキスタン、スリランカ、ベネズエラからの 10 カ国の学生によるポスターセッションを行いました。質疑のために設けた時間を利用し、生徒の皆さんはそれぞれ英語を駆使し、予定時間を越えるほど、とても熱心に研究員達に質問されていました。

参加者にお願いしたアンケート結果においては、「皆、明るく接してくれたので、気軽に話しかけることができ、楽しかった。」「もう少し話をしたかった」という意見が多く、生徒の皆さん、そして研究員の双方にとってとても有意義なイベントになったと思います。次世代の水文学研究者及び技術者を輩出すべく「ICHARM OpenDay」は来年も行う予定です。

the ICHARM Open Day this year was another success for both ICHARM and the participants, just like the previous ones. We are planning to hold it next year, hoping that someday young participants will join us as researcher or engineer to study and practice hydrology.

(Written by Takashi Shirai)

30th ISO/TC113 meeting held in Tokyo

2015 年 5 月 25 日から 29 日にかけて、東京都新宿区の土木学会において、第 30 回 ISO/TC113(Hydrometry：開水路における流量測定) 東京総会が開催されました。これまで ICHARM は、ISO/TC113 の国内審議団体である土木学会の代表として他国で開催される総会に参加してきました。今回の東京総会では ICHARM が国土交通省水管理・国土保全局、土木学会の関連するメンバーと共に、準備をすすめてきたものです。ICHARM からは、SC1(Velocity area methods) の日本代表として、岩見上席研究員、萬矢研究員（現　主任研究員）が参加しました。

オープニングでは土木学会の大西専務理事、国土交通省 水管理・国土保全局河川計画課　塚原課長、経済産業省国際標準課　福田課長から、レセプションでは国土交通省　北村水資源部長、土木研究所　魚本理事長からご挨拶を頂きました。

同総会において、ISO/TR 24578 (Hydrometry -Acoustic Doppler profiler - Method and application for measurement of flow in open channels) を正式に IS 化するために、萬矢研究員を新たに主査とすることが決議されました。また New Work Item Proposal（新業務項目提案）として登録されていた ISO/NP 24577 (Hydrometry – Use of non-contact methods for measuring water surface velocity and discharge) が萬矢研究員を主査として Technical Report (技術報告書) にすることが承認されました。

また国土交通省関東地方整備局の協力を受け、鶴見川多目的遊水池を視察しました。

The 30th ISO/TC113 meeting was convened on May 25-29 at the Japan Society of Civil Engineers (JSCE) in Shinjuku, Tokyo. The scope of ISO/TC113 is the standardization of hydrometry, or measurement of liquid flow in open channels. ICHARM has participated in ISO/TC113 meetings previously held in other countries, representing JSCE, the responsible body in Japan to discuss various issues related to ISO/TC113. ICHARM prepared for this Tokyo meeting in collaboration with relevant members of JSCE and the Water and Disaster Management Bureau of the Ministry of Land, Infrastructure, Transport and Tourism (MLIT). Chief Researcher Yoichi Iwami and Researcher (now Senior Researcher) Atsuhiro Yorozuya of ICHARM attended the SC1 meeting on velocity area methods as Japanese representatives.

ISO/TC113 Hydrometry 30th Meeting in Tokyo

The opening ceremony and the reception party were held during the meeting period, in which officials of several government agencies spoke to welcome the participants from all over the world, including Mr. Hirofumi Ohnishi*[1], Mr. Koichi Takahara*[2], Mr. Yasukazu Fukuda*[3], Mr. Tadashi Kitamura*[4] and Mr. Taketo Uomoto*[5].

In the ISO/TC113 meeting, Yorozuya was appointed as convener to upgrade ISO/TR 24578 (Hydrometry – Acoustic Doppler profiler – Method and application for measurement of flow in open channels) to an international standard. The meeting also approved that he would be the convener for ISO/NP 24577 (Hydrometry – Use of non-contact methods for measuring water surface velocity and discharge), which had been registered as new work item proposal, and would lead the preparation of a technical report on the topic.

The participants also visited the Tsurumi River multi-purpose retarding basin, thanks to the cooperation of the Kanto Regional Development Bureau of MLIT.

**1 Executive Director, JSCE*
**2 Director, River Planning Division, Water and Disaster Management Bureau, MLIT*
**3 Director, International Standardization Division, Ministry of Economy, Trade and Industry*
**4 Director-General, Water Resources Department, MLIT*
**5 President, Public Works Research Institute*

(Written by Atsuhiro Yorozuya)

Visit by Indonesian delegates

2015 年 6 月 1 日、JICA の「インドネシア　ダウンスケーリングと水文流出解析による気象変動の影響評価 3」コースの一環として、インドネ シアからの専門家 3 名が ICHARM を訪問し、小池センター長らとともに水理・水文 モデルやリスクマネジメントについて意見交換を行いました。

Discussion between ICHARM Director and visitors from Indonesia

On June 1, 2015, three delegates from Indonesia visited ICHARM to discuss hydrological models and risk management with ICHARM Director and other experts. The visit was part of a JICA course on climate change simulation and assessment.

(Written by Masahiko Murase)

Visit by NAHRIM-Malaysia DG and delegates

On June 4, 2015, the director general and two other experts of the National Hydraulic Research Institute of Malaysia (NAHRIM) visited ICHARM. They were showed around experiment facilities and discussed water-related hazard and risk management with ICHARM Director for Special Research (now Deputy Director) Junichi Yoshitani and other experts.

Discussion with NAHRIM Director General and delegates from Malaysia

(Written by Masahiko Murase)

2015 年 6 月 4 日、マレーシア国立水理研究所長ら専門家 3 名が土木研究所、及び ICHARM を 訪問し、土木研究所の実験施設を視察するとともに、吉谷特別研究監（現　グループ長）らとともに水災害・リスクマネジメント研究と研修について意見交換を 行いました。

Visit by officer of Malaysia's Education Ministry

Discussion with Malaysia's Education Ministry officer and visitors from Tsukuba University

Dr. Zaini Ujang, a secretary-general II of Malaysia's Education Ministry, visited ICHARM on June 12, 2015, accompanied by Professor Kuniaki Miyamoto, Associate Professor Masaki Utsumi and Assistant Professor Naoko Kaida of the University of Tsukuba. The main purpose of his visit was to learn about educational curriculums and facilities for the National Disaster Research Center, a new institute that Malaysia is currently planning to build in a new academic district called Pagoh.

Dr. Ujang and the professors met with Advisor Kuniyoshi Takeuchi and Research and Training Advisor Shinji Egashira of ICHARM, sharing information and exchanging views. They were also showed around research facilities of PWRI.

(Written by Minoru Kamoto)

2015 年 6 月 12 日、マレーシア教育省事務次官 Dr. Zaini Ujang 氏と筑波大学　宮本邦明教授、内海真生準教授、甲斐田直子助教が、マレーシアの新学園都市パゴで開設準備中の National Disaster Research Center の教育カリキュラム、設備等の参考のために、ICHARM を訪問しました。

竹内顧問や江頭研究・研修指導監らと情報・意見交換の後、土木研究所施設を案内しました。

Local Practices

ADB Myanmar project (TA-8456) update: Training on RRI Model and Storm Surge Model and Consultation Meeting

Participants at the "Training of Trainers" workshop

ICHARM organized a three-day "Training of Trainers (ToT)" program at the headquarters of the Department of Meteorology and Hydrology (DMH), Ministry of Transport in Nay Pyi Taw, the capital of Myanmar, on June 15-17, 2015, as part of the Asian Development Bank (ADB) funded project, "Transformation of Urban Management (TA-8456): Part II Flood Management". The program, providing lectures and hands-on training on the Rainfall-Runoff-Inundation (RRI) Model and the Storm Surge Model for the river basins including the three target cities of the project, Yangon, Mandalay and Mawlamyine, targeted the officers of DMH and the Irrigation Department (ID), Ministry of Agriculture and Irrigation. From ICHARM, Chief Researcher Hisaya Sawano, Senior Researcher Badri Shrestha and Research Specialists Yusuke Yamazaki and Yoko Hagiwara attended and supported the training.

アジア開発銀行（ADB）の支援によるプロジェクト「都市管理に関する技術移転（TA-8456）パート II 洪水管理」の一環として 2015 年 6 月 15 日～ 17 日の 3 日間、ミャンマー政府運輸省気象水文局（DMH）職員および農業・潅漑省潅漑局（ID）職員を対象に、対象 3 都市 (ヤンゴン、マンダレー、モーラミャイン) を含む流域での降雨流出氾濫モデル（RRI モデル）・高潮モデルについてのトレーニングを、首都ネピドーの DMH 本部で開催しました。土木研究所 ICHARM からは澤野上席研究員、シュレスタ主任研究員、山崎専門研究員、萩原専門研究員が参加しました。

トレーニングは、2014 年 12 月 19 日に日本とミャンマーを TV 会

議システムでつないで実施した第 1 回、ネピドーの DMH にて 2015 年 2 月 16 ～ 20 日に実施した第 2 回、同じくネピドーで 5 月 12 ～ 14 日に実施した第 3 回に続き、今回が第 4 回（最終回）となります。第 2 回までは、モデルの内容や基本的な操作の理解を目的として、多くの技術職員を対象に講義を行い、第 3 回以降は、今後の RRI モデルや高潮解析のトレーナー育成を目的として、選抜されたメンバーを対象に実施しました。今回は DMH 及び ID から、トレーナー候補者の DMH 職員 7 名（水文部門 4 名、気象部門 3 名）、ID 職員 1 名、および、オブザーバー（トレーナー候補者以外の第 1 回、第 2 回参加者）である DMH 職員 11 名（水文部門 9 名、気象部門 2 名）、ID 職員 2 名が参加しました。

トレーニングに続き、6 月 18 日には DMH が水災害管理に係る中央政府機関を招いて、洪水リスク評価の重要性およびミャンマーの現状、課題等を話し合うコンサルテーション会合を、同じくネピドーの DMH 本部で開催しました。この会合で DMH と ID のトレーナー候補者は、各自担当の都市を含む流域での氾濫シミュレーションの結果を発表しました。ICHARM は、日本の河川管理や防災における洪水ハザードマップ活用の事例やフィリピンのリスク評価の事例等を紹介し、また、TA-8456 で実施したミャンマーの水災害管理に係るニーズアセスメントの結果（暫定版）を発表しました。

DMH 及び関連機関とは今後もリスク評価の内容、ハザードマップの作成と利用方法等について議論・検討を続けていく予定です。また、ニーズアセスメントを踏まえ、DMH の機能強化や関連機関の洪水および高潮リスク評価における機能強化に向けた提言をまとめていく予定です。

This June training was the fourth and the last of the series of the training activities under this project. The first session was conducted on December 19, 2014, through a TV conference system between Myanmar (DMH) and Japan (ICHARM), and the second and third sessions were held in Nay Pyi Taw on February 16-20 and May 12-14, 2015, respectively. The first two sessions offered lectures to many technical officers on the basic structure and contents of the RRI and Storm Surge models and how to use them. The last two sessions provided more specialized programs for the selected members to become able to fully utilize these RRI and storm surge analysis models and to be trained as future trainers of these models. A total of 7 officers from DMH (Hydrological Division:4, Meteorological Division:3) and one officer from ID, all of whom had been selected to be future trainers, attended this final session. In addition, 11 officers from DMH (Hydro. Div.:9, Meteo. Div.:2) and 2 officers from ID, who had already participated in the first or second sessions, also attended this final session as observers.

Following the training, DMH convened the Consultation Meeting for Risk Assessment also at its headquarters in Nay Pyi Taw on June 18, 2015, to discuss the importance of flood disaster risk assessment as well as current situations, issues and challenges in Myanmar. National level organizations relevant to water-related disaster management were invited to attend the meeting. Each newly-trained trainer in DMH and ID presented the results of her/his flood inundation simulation for the individually assigned target basin area including each target city. ICHARM introduced Japan's case of utilizing flood hazard maps in river basin management and flood disaster management. ICHARM also introduced Philippines' case of flood disaster risk assessment. Then, ICHARM also presented the results of the needs assessment of the organizations relevant to flood risk assessment that had been conducted as part of this project.

Participants of the consultation meeting

ICAHRM will continue discussion with DMH as well as these organizations on deciding contents of flood risk assessment, producing flood hazard maps, and how to utilize them. Based on the needs assessment, detailed analysis will be conducted to make final recommendations to strengthen DMH's capacity as well as the capacity of these organizations relevant to flood and storm surge risk assessment.

(Written by Yoko Hagiwara and Yusuke Yamazaki, Project led by Hisaya Sawano)

Research

Workshops on sediment disasters and management in Taipei

2015 年 5 月 25 日～ 26 日、台北にて開催された土砂災害および流域土砂砂管理に関する台―日ワークショップ、ならびにこれらに関わる現地視察に江頭研究・研修指導監が参加しました。これらのワークショップは成功大学防災研究センターが主導し、それぞれ農業委員会林務局および経済署水利局が主催し

Workshops and a study tour on sediment-related disasters and sediment management at the river-basin scale were held in Taipei, Taiwan, on May 25-26, 2015. This event was organized by the Forestry Bureau of the Council of Agriculture and the Water Resources Agency of the Ministry of Economic Affairs under the leadership of the Disaster Prevention Research Center of the National Cheng Kung University of Taiwan. Seven researchers and engineers participated from Japan, including ICHARM Research and Training Advisor Shinji Egashira.

In 1984, a large-scale landslide occurred in the Shoufeng River, a tributary of the Hualian River, which runs in eastern Taiwan. A natural dam resulted and eventually collapsed, causing a serious disaster due to sediment runoff. Since then, the importance of river deformation monitoring has been widely recognized and data have been collected continuously, as there have been persistent concerns over further sediment transportation and river deformation and many rivers in similar conditions exist in Taiwan. The frequent formation of natural dams due to heavy rainfall and earthquakes is another pressing issue that is demanding policy-making and practice of both emergency and permanent measures as soon as possible. In response to these issues, the participants in the workshops and the study tour had lively discussions on a broad range of topics including objectives of sediment management, monitoring methods, sediment discharge forecasting methods, and disaster management. The organizers are planning to publish part of the results of this event in an international journal.

(Written by Shinji Egashira)

たもので、日本から研究者・技術者合わせて 7 人が参加しました

1984 年台湾東側にある花蓮溪 Hualian River の支川壽豊溪 Shoufeng River において大規模崩壊に伴う天然ダムが形成され、天然ダムの崩壊と土砂流出によって甚大な災害が引き起こされました。その後も土砂流出と河川変動による災害の発生が懸念されるとともに、このような河川が多く存在していることもあって、河川変動に関するモニタリングの重要性が認識され、データが蓄積されています。加えて、台湾においても、豪雨や地震動による天然ダムの形成が多く見られ、その応急対策と恒久対策に関する指針と実際は緊急の課題です。ワークショップおよび現地視察においては、上述のような課題に関連して、土砂管理の目標、モニタリング手法、土砂流出予測法、および災害対策に関する活発な意見交換が行われました。これらの内容は一部、国際誌を通じて公表される予定です。

Poster presentations at EGU 2015 on IFI Project

IFI is a framework to promote collaboration in flood management among international organizations such as UNESCO, WMO, UNU and UNISDR. IFI focuses on research, information networking, education and training, community empowerment, and technical assistance in various areas including integrated flood management. ICHARM has been serving as its secretariat.

On April 9-10, 2015, Research Specialist Maksym Gusyev visited the Federal Institute of Hydrology (BfG) in Koblenz, Germany, as a part of International Flood Initiative (IFI) Flagship Project activities between ICHARM and BfG.

For the collaborative research, the aim is to apply current flood risk assessment methodologies of ICHARM to EU river basins, and the Rhine River basin is one example of the first IFI Flagship Project research activity. In BfG, Dr. Gusyev made a presentation at the International Centre for Water Resources and Global Change (ICWRGC) about simulated flood river discharge with the BTOP model and flood inundation area with the FID model in the Rhine River basin. He also had discussions with ICWRGC Director Dr. Johannes Cullmann about BTOP and FID model results and the need of BfG data to delineate the original and reduced flood hazards. As a result of this visit, the joint poster presentation was finalized for the European Geosciences Union (EGU) General Assembly 2015.

On April 15, Dr. Gusyev presented a joint poster on behalf of Dr. A. Gädeke, who visited ICHARM in August-December 2014, and Dr. J. Cullmann at the EGU 2015 session NH1.6 “Flood risk and uncertainty” in Vienna, Austria. During the poster session, he had fruitful discussions with international experts, and UNESCO-IHE students about applicability of global risk assessment to various river basins. For example, Dr. G. Schumann, NH1.6 session co-organizer, suggested that the ICHARM methodology can be a viable alternative to the FEMA flood hazard mapping with the HEC-RAS model for the entire US.

In the EGU 2015, Dr. Gusyev gave another poster presentation in Session HS2.3.9 “Functions of Water Storage, Mixing and Non-Stationary Catchment Response” about a novel ICHARM methodology for estimating groundwater storage and transit times with river water tritium analysis (Abstract EGU2015-7826). The presented methodology, which is a product of the collaborative research activity between

国際洪水イニシアチブ（International Flood Initiative: IFI）は UNESCO、世界気象機関、国連大学、国連国際防災戦略などの国際機関が世界の洪水管理推進のために協力する枠組みです。研究、情報ネットワーク、教育・研修、コミュニティーの強化及び統合洪水管理などの技術支援を主要分野としており、ICHARM は、IFI の事務局を担当しています。

2015 年 4 月 9 日～ 10 日、IFI フラッグシップ活動（以降 IFI FS と省略）の一環としてグシエフ専門研究員がドイツの連邦水文研究所（BfG）を訪問しました。

BfG との共同研究は、ICHARM で実施している洪水リスク評価を EU の河川流域に適用することを目的としていますが、今回ライン川を最初の事例として評価を行いました。グシエフ専門研究員はまず、BfG の「水資源と気候変動の国際センター（ICWRGC）」を訪問し、BTOP、FID の両モデルをライン川に適用して得た洪水流出と氾濫解析の結果を紹介するとともに、ICWRGC センター長であるヨハネス・クルマン博士とその結果について議論し、ポスター発表の準備を完了しました。

4 月 15 日、グシエフ専門研究員は、IFI FS の一環として 2014 年 8 月～ 12 月に BfG から招へいした A. Gädeke 研究員およびクルマン博士と共同で行った研究について、EGU2015（ヨーロッパ地理学連合総会 2015）のセッションでポスター発表を行い、ICHARM 手法の他流域への適用性などについて UNESCO-IHE の学生と有益な議論を行うことができました。また、セッションの共同主催者である G. Schumann 博士からは、ICHARM の手法は、現在アメリカで行われている HEC-RAS

モデルを用いた洪水ハザードマッピングの代替となりうるという感想もいただきました。

グシエフ専門研究員は、別のセッションにも参加し、ICHARMとニュージーランドのGNS Scienceが共同で進めている、河川水中のトリチウム分析を応用して地下水貯留と輸送時間を推定する新たな手法についてポスター発表を行いました。研究員は、この手法を北海道・石狩川の源流に適用した事例を紹介し、日本だけでなくアジア各国での貯留評価と湧水の特性評価に役立つこと説明しました。今回の発表は、世界の科学界にICHARMとその活動を知っていただくよい機会にもなりました。

ICHARM and GNS Science in New Zealand, was applied to headwaters of Hokkaido, Japan, and demonstrated promising results in both flood and drought characterization in Japan and other Asian countries. From these discussions, he highlighted ICHARM's novel research activities and increased the visibility of ICHARM for the international scientific community.

(Written by Maksym Gusyev)

Discharge measurement workshop in the Shinano River

2015年4月22日～25日に新潟県の信濃川小千谷観測所において流量観測現地ワークショップが実施されました。

これは、土木学会の流量観測技術高度化小委員会（委員長：神戸大学藤田一郎教授）の主催で行われたワークショップで、同小委員会の幹事であるICHARM職員が企画し、岩見上席研究員、萬矢研究員（現主任研究員）、工藤研究員、小関専門研究員が参加しました。また、大学、国土交通省水文担当者、建設コンサルタント、機器メーカーなど約100名の関係者に参加して頂きました。

観測技術の向上を目的として、それぞれが保有している流量観測技術を持ち寄って同一条件で観測を行い、手法を比較します。当日は流速が4 m/sを超えるような流況の中、一般的な浮子測法の他、電波流速計、電磁流速計、および画像解析による観測などが実施されました。ICHARMはaDcp（超音波ドップラー流速計）で観測したデータを基礎情報として参加者の皆様に提供します。

画像解析用の動画撮影には通常のハイビジョンカメラの他、夜間用の遠赤外線カメラ、さらにはマルチコプターを使用した上空からの撮影も行われました。このように、通常の観測技術だけではなく先進的な技術を試行するためにも貴重な機会となりました。ICHARMは今後もこのような機会を提供していきたいと考えています。

観測地点を提供して頂いた国土交通省北陸地方整備局信濃川河川事務所には大変お世話になりました。ここにお礼申し上げます。

An on-site discharge measurement workshop was held on April 22-25, 2015, at the Shinano River Ojiya observation station in Niigata Prefecture.

This workshop was organized by the sub-committee of the Japan Society of Civil Engineers on improvement of discharge measurement technology (chair: Professor Ichiro Fujita of Kobe University). As its current secretariat, ICHARM arranged the workshop and sent Chief Researcher Yoichi Iwami, Researchers Atsuhiro Yorozuya (now Senior Researcher) and Shun Kudo, and Research Specialist Hiroshi Koseki. About 100 people participated from universities, hydrology-related sections of the Ministry of Land, Infrastructure, Transport and Tourism, construction consulting firms, and measurement instrument makers.

Since the objective is to upgrade measurement technology, this workshop compares different discharge measurement instruments under the uniform conditions. On the day, the flow regime was rather rough with a flow velocity of over 4 m/s. This time, in addition to the conventional float measurement, several methods were tested, which use electric wave current meters, electromagnetic velocity meters or image analysis. ICHARM test-ran another method using an acoustic Doppler current profiler (aDcp) to share collected data with other participants.

Workshop participants at the observation point

This workshop is a great opportunity to learn about the latest measurement technology, as well as already existing ones. For example, movie shooting for image analysis was performed in three different ways using regular high-definition cameras, nighttime far-infrared cameras and cameras mounted on a multicoptor for aerial shooting. ICHARM is hoping to continue organizing this type of workshop for further progress in this field.

Finally, we would like to thank the Shinano River Office for their cooperation including letting us use their measurement points.

(Written by Hiroshi Koseki)

International Workshop on Typhoon and Flood in Taiwan

The 2015 International Workshop on Typhoon and Flood (IWTF) was held on June 27-29 in Taipei, Taiwan. Research Specialist Tomoki Ushiyama of ICHARM was invited as one of the speakers. The workshop is organized annually by the Taiwan Typhoon and Flood Research Institute to share information and discuss issues on research, field survey, forecasting techniques and decision making in terms of typhoon and flood.

2015 IWFT in Taiwan

Similar to Japan, Taiwan experiences typhoon disasters frequently. In 2009, a devastating typhoon, Marakot, hit the country, causing large-scale urban flooding and landslides that buried a village. To cope with such hazards, they have been developing advanced typhoon forecasting systems using ensemble predictions. In addition, learning that rainfall by typhoons has increased in the last 40 years, they have been studying the impact of global warming just as we have in Japan. One speaker reported that the flow volume may exceed the design discharge more frequently in the end of this century.

(Written by Tomoki Ushiyama)

2015 年 5 月 27 日～ 29 日に台北で行われた 2015 IWTF に講演依頼を受け、牛山専門研究員が ICHARM から参加し、九州北部豪雨の洪水予測について発表しました。この会議は、台湾台風洪水研究中心の主催により毎年開催され、台風や洪水を中心とした研究調査・予報・政策決定に関する情報交換を行っています。

台湾は台風による被害が多く、特に 2009 年の台風マラコットでは都市の洪水の他、山間部では村が全滅するほどの地滑り被害がありました。これに対応するため、台風予報の改善も精力的に進められています。一方、ここ 40 年間で台風による降水が増加していることから、温暖化影響の研究も日本と同様に進められており、温暖化後に計画水位を越える流出が増加するとの報告がありました。

Symposium on climate change impact and adaptation in water-related disasters

A symposium on climate change impact and adaptation in the field of water-related disasters was held on May 29, 2015, at the Youth Education National Olympics Memorial Youth Center in Tokyo. It was jointly organized by the Ministry of Education, Culture, Sports, Science and Technology (MEXT)-led Program for Risk Information on Climate Change (the SOUSEI program) and the Water and Disaster Management Bureau of the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) .


Presentation by Deputy Director Suzuki

The symposium was a great opportunity, including a keynote speech and panel discussions, for academic, administrative and general participants to get together and discuss water-related disaster issues in relation to climate change impact and adaptation.

Atsushi Suzuki, the Deputy Director of ICHARM of that time, also attended the symposium as panelist and presented the latest research results on water-related disaster risk assessment in Asia and production of information for adaptation.

(Written by Youji Chida)

2015 年 5 月 29 日に文部科学省創生プログラムと国土交通省水管理・国土保全局との共催で「水災害分野における気候変動による影響と適応に関するシンポジウム」が国立オリンピック記念青少年総合センターで開催されました。

本シンポジウムでは、文部科学省創生プログラム研究者と、国土交通省水管理・国土保全局、ならびに関係する省庁、自治体、研究者が一同に会して、「水災害分野における、地球温暖化による気候変動影響と適応策」に関し、一緒に議論する場を設けることを趣旨とし、基調講演及びパネルディスカッションが行われました。

ICHARM からは鈴木グループ長（当時）がパネラーとして参加し、創生プログラムで実施している「アジアにおける水災害リスク評価と適応策情報の創生」に関する研究成果を紹介しました。

Training

Joint training for Malaysian experts

ICHARM and the University of Tokyo teamed up for five-day workshops on February 23-27, 2015, for a group of Malaysian researchers led by Dr. Lariyah Mohd

JST（科学技術振興機構）と JICA が共同で実施している地球

規模課題解決のための研究プログラム SATREPS（Science and Technology Research Partnership for Sustainable Development）の研究課題「マレーシアにおける地すべり災害および水害による被災低減に関する研究」（研究代表者：登坂博行東京大学教授，平成 23 年度ー平成 27 年度）の活動の一環として Dr.Lariyah Mohd Sidek をはじめとする Universiti Tenaga Nasional (UNITEN) の研究者 9 名を日本に招き洪水解析に関する研修を 2015 年 2 月 23 日～ 27 日までの 5 日間で行いました。

9 名のマレーシアからの参加者は 2 つのグループに分かれ、グループ I は ICHARM で総合洪水解析システム IFAS(Integrated Flood Analysis System) に関する研修を行いました。ICHARM での研修では、ケランタン（Kelantan）川流域を対象とした IFAS による解析に加え、RRI モデル（降雨流出氾濫モデル）によるドゥングン（Dungun）川流域の氾濫解析の研修も行われました。また、マレーシアでは 2014 年 12 月に既往最大クラスの大規模な洪水が発生しマレー半島東部に甚大な被害をもたらしたため、この洪水の概要に関して Dr Lariyah Mohd Sidek に発表をしていただき、多くの ICHARM のスタッフが聴講しました。

グループ II は東京大学の登坂研究室で GETFLOWS に関する研修を行いました。

2 月 25 日には、2 つのグループ合同で利根川下流の視察を行いました。まず、国土交通省関東地方整備局利根川下流河川事務所を訪問し、中村徹立事務所長らから事業概要、利根川の特性等の御講義をいただいたのち、災害対策室の見学を行いました。その後、江戸時代の町並みが残る小野川沿いや川の駅水の郷さわらを見学し、巡視船はるかぜで対岸に渡って横利根閘門を見学しました。これらの視察により UNITEN の研究者らは日本の治水対策に関して理解を深めることができました。

UNITEN researchers attending the joint workshops

Sidek from Universiti Tenaga Nasional (UNITEN) of Malaysia. This training was held as part of a research task, "Research and Development for Reducing Geo-Hazard Damage in Malaysia Caused by Landslide and Flood," led by Tokyo University Professor Hiroyuki Tosaka for the period between 2010 and 2015. The task was originally developed under the research program to address global issues, entitled the Science and Technology Research Partnership for Sustainable Development (SATREPS), which is jointly organized by the Japan Science and Technology Agency (JST) and the Japan International Cooperation Agency (JICA).

Nine invited Malaysian researchers were divided into two groups; Group I to attend the workshop at ICHARM on the operation of a flood forecasting model called the Integrated Flood Analysis System (IFAS) and Group II to participate in the workshop on GETFLOWS at Prof. Tosaka's laboratory of the University of Tokyo. The ICHARM group worked on flood analysis using IFAS over the Kelantan River basin and inundation analysis by applying the Rainfall-Runoff-Inundation (RRI) model to the Dungun River basin. In addition, Dr. Lariyah kindly made a presentation for ICHARM researchers on the December 2014 flood in Malaysia, which was one of the largest floods in history and caused devastating damage to the eastern part of the Malay Peninsula.

On the 25th, the two groups joined for a study trip to the lower Tone River area. They first visited the Tonegawa-Karyu River Office of the Kanto Regional Development Bureau, the Ministry of Land, Infrastructure, Transport and Tourism, for a lecture by Director Tetsuya Nakamura, in which he outlined their operation and the characteristics of the Tone River with other useful information. After the lecture, they had an opportunity to visit the disaster management headquarters of the river office. They also walked along the Ono River, where old houses of the Edo era still remain, and dropped by Mizu-no-sato Sawara, a riverfront recreational facility. Then they were given a ride on a patrol boat, Harukaze, to the opposite side of the river, where they studied the Yokotone lock. In addition to the workshop, the study trip helped the UNITEN researchers to have better understanding of flood control measures in Japan.

(Written by Mamoru Miyamoto)

IFAS training in Viet Nam

JICA のベトナムを対象とした技術協力プロジェクトである「災害に強い社会づくりプロジェクト（フェーズ 2）」の活動のために宮本研究員が 2015 年 4 月 19 日から 25 日まで JICA 短期専門家としてベトナムに派遣されました。

本プロジェクトでは、ベトナム国ゲアン省（Ca 川）における衛星情報等を活用した洪水予測の技術提供が計画されているため、宮本研究員は洪水予測技術に関する講義と ICHARM らが開発した IFAS（総合洪水解析システム）に関するトレーニングを実施しました。参加者は、ゲアン省 DARD (Department of Agriculture and Rural Development)

ICHARM Researcher Mamoru Miyamoto was sent to Viet Nam as JICA short-term expert on April 19-25 to help implement a JICA technical cooperation project, "Building Disaster Resilient Societies in Central Region in Vietnam (Phase 2)."

IFAS training at DARD of Nghệ An Province

This project is designed for the Ca River in Nghệ An Province to eventually conduct flood forecasting using satellite information, and as part of it, he lectured on flood forecasting technology and provided practical training on the Integrated Flood Analysis System (IFAS), developed by ICHARM. Ten participants joined the training from several government

agencies: five from Nghệ An Province (three from the Department of Dike Management and Flood and Storm Control (DDMFSC) of the Department of Agriculture and Rural Development (DARD) and two from the North Central Region Hydro Meteorology Services), three from Hatinh Province (two from DDMFSC of DARD and one from the Hydro Meteorology Services), and two from Quảng Bình Province (both from the Hydro Meteorology Services). Since some of the participants had already had experience with IFAS, we were able to go on to learn more advanced operation such as calibrating parameters and coping with reproduction errors in analysis results. They are planning to introduce IFAS as their flood forecasting system as the DDMFSC of Nghệ An Province leads the project.

(Written by Mamoru Miyamoto)

堤防風水害対策局から 3 名、北中部地域水文気象局から 2 名、ハティン省 DARD 堤防風水害対策局から 2 名、水文気象局から 1 名、クアンビン省水文気象局から 2 名の計 10 名でした。そのうち数名の参加者は既に IFAS を操作した経験があったため、トレーニングではパラメータのキャリブレーションや解析値の再現誤差などに関する詳細な内容を議論することができました。今後、ゲアン省 DARD 堤防風水害対策局を中心に IFAS を洪水予測システムとして導入し実運用することが予定されています。

Training seminar for Bhutan staff

Group photo with training participants

On May 12, 2015, six technical staff members of Bhutan visited ICHARM as part of a capacity development project on glacial lake outburst flood and rainstorm flood forecasting and early warning. The group consisted of experts from the Department of Hydromet Services (DHMS) of the Ministry of Economic Affairs and other relevant counterpart agencies.

At the meeting, Chief Researcher Masahiko Murase outlined the activities of ICHARM, and then Muhammad Masood, currently enrolled in ICHARM's doctoral program, made a brief presentation on the Integrated Flood Analysis System (IFAS). Senior Researcher Morimasa Tsuda followed, explaining actual cases to which the system has been applied.

(Written by Minoru Kamoto)

JICA の「ブータン国氷河湖決壊洪水（GLOF）を含む洪水予警報能力向上プロジェクトカウンターパート研修」の一環として、ブータン国より経済省水文気象局 (DHMS) はじめ 6 名が、2015 年 5 月 12 日に来所しました。

村瀬上席研究員が ICHARM の概要説明を行った後、ICHARM の博士課程の学生である Muhammad Masood 氏が IFAS（総合洪水解析システム）の概要の説明を行い、津田主任研究員が IFAS の活用事例の紹介を行いました。

Visit by Afgan officers

Fourteen Afghan officials of the Ministry of Energy and Water and other government agencies visited ICHARM on July 2, 2015. Their visit was part of an ongoing JICA counterpart training course, "Project for Capacity Enhancement on Hydro-Meteorological Information Management in Ministry of Energy and Water in the Islamic Republic of Afghanistan."

At ICHARM, they met researchers of the center and were given presentations on issues of their interests. Chief Researcher Minoru Kamoto of ICHARM outlined activities of ICHARM, which was followed by presentations by two doctoral students, Robin Biswas Kumar and Ahsan Md Nashif. Kumar explained studies on river channel changes while Nashif briefly explained the Integrated Flood Analysis System (IFAS) and studies on disaster risk. Research Specialist Maksym Gusyev also delivered a presentation on drought research using a distributed hydrological model called the BTOP model.

After that, they took a quick tour of an experimental laboratory for dam hydraulic engineering.

(Written by Minoru Kamoto)

JICA の「アフガニスタン国水文・気象情報管理能力プロジェクトカウンターパート（C/P）本邦研修」の一環として、アフガニスタンよりエネルギー・水省をはじめとした政府機関より、14 名が 2015 年 7 月 2 日に来所しました。

加本上席研究員が ICHARM の概要説明を行った後、ICHARM の博士課程の学生である Robin Biswas Kumar 氏と Ahsan Md Nashif 氏がそれぞれ河道変動の研究、IFAS（総合洪水解析システム）の概要と災害リスクの研究の紹介を行い、さらに専門研究員の Maksym Gusyev 氏が BTOP モデルを用いた渇水の研究の紹介を行いました。

その後、研修生は、ダム水理の実験施設を見学しました。

M.Sc. Field Tours

ICHARM offers a master's degree program, "Water-related Disaster Management Course of Disaster Management Policy Program (JICA Training Program: Training for Expert on Flood-related Disaster Mitigation)," in collaboration with the Japan International Cooperation Agency (JICA) and the National Graduate Institute for Policy

ICHARM は、（独）国際協力機構 (JICA) 及び政策研究大学院大学 (GRIPS) と連携して、2014 年 10 月から 8 年目となる修士課程「防災政

策プログラム水災害リスクマネジメントコース」（JICA 研修「洪水防災」）を実施しています。13 名の研修生は ICHARM 内での講義に加えて、日本の洪水対策についてよりよく理解するために、現地訪問を通して学んでいます。4 月には北陸地方、5 月には近畿地方、6 月には茨城県筑西市母子島遊水池を訪問しました。

信濃川流域（4 月 23 ～ 25 日）

信濃川の恵みにより良質な穀倉地帯である越後平野では、古くから水害の被害を受けてきました。直近では 2004 年及び 2011 年に豪雨による被害を受けました。そこで、その被害、対策事業を学ぶために北陸地方を訪問しました。

初日は、信濃川下流河川事務所を訪問し、2004 年及び 2011 年の豪雨とその対策事業の効果について講義を受けました。2004 年豪雨後の対策事業の効果として、2011 年の降水量は 2004 年の 1.6 倍であったにもかかわらず、建物への被害は 2004 年よりも 90%減らすことができたこと等の説明を受けました。その後、1922 年に完成し、当時東洋一の大工事と言われた、大河津分水路を見学しました。翌日は、午前に、まだ残雪が残る三国川ダムを訪問し、堤体内の見学などを行いました。午後には、小千谷市へ移動し、土木学会が開催する流量観測会（12 ページ参照）において、ICHARM の研究員より流量観測の実習を受けました。まだ、肌寒い季節にも関わらず、研修生は屋外実習などに真摯に取り組んでいました。

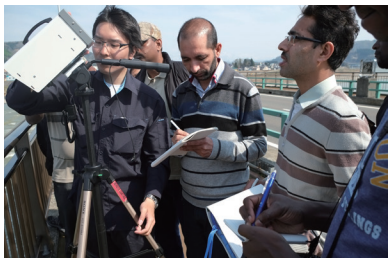
淀川流域（5 月 27 日～ 30 日）

琵琶湖からもたらされた豊富な水資源をもとに古くから発展してきた淀川流域の治水対策並びに平成 25 年 9 月の記録的豪雨をもたらした台風 18 号の影響及びそれに対する行政機関の対応などを学ぶために、淀川から宇治川にかけて現地訪問を行いました。概要は次のとおりです。

初日は、台風の概要及び管内の被害状況の概要を学ぶために、国土交通省近畿地方整備局を訪問しました。台風 18 号は記録的な降水量を観測し甚大な被害を各地に及ぼしましたが、そのような中で、2004 年の台風被害後の対策工事の効果により今回被害を免れた箇所も少なくないこと、淀川水系のダム群の連携操作及び瀬田川洗堰の操作によって更なる被害拡大を回避できたと思われることなどの説明を受けました。その後、2 日間をかけて淀川河川事務所、淀川ダム統合管理事務所、天ヶ瀬ダムや、台風での被害箇所に赴き、具体的な説明を受けました。最終日は、淀川流域の豊かな文化を学ぶために琵琶湖疏水記念館を見学しました。当日は、研修生は熱心に見学を行っており、予定時間を大幅に超えるほど活発な質問が行われました。

Studies (GRIPS). Currently, 13 students are enrolled in this 8-year-old program and study various issues in management of water-related disasters. Study tours are an important part of the program in addition to lectures to have a good understanding of flood management in Japan, and they recently visited the Hokuriku region in April, the Kinki region in May, and the Hakojima retarding basin in the Kanto region in June.

Shinano River basin (April 23-25)



Lecture on observation using aDcp at the Shinano River

In April, the students visited the Shinano River basin in Niigata Prefecture, part of the Hokuriku region. The Shinano River runs through the Echigo Plain, which is one of the best rice-producing areas in Japan thanks to the river but has long suffered from flooding at the same time. The area experienced severe flood events in 2004 and 2011 due to heavy rainfall, for example. They visited there to learn about those two cases and local ideas to prevent the disasters from recurring.

On the first day, they paid a visit to the Lower-Shinano River Office for a lecture on the heavy rain in 2004 and 2011 and the effect of preventive measures they have since implemented. The lecturer presented the successful implementation of the measures after the 2004 heavy rain, explaining that the building damage in 2011 reduced by 90% compared with that in 2004 despite that the rainfall in 2011 was 1.6 times as large as that in 2004. After that, they took a short tour to the Ohkozu diversion channel, which was built in 1922 and whose scale of construction was reportedly considered the largest in the East at that time.

On the morning of the second day, the first destination was Sagurigawa Dam, where they had a rare opportunity to see the inside of the dam. In the afternoon, the students moved to Ojiya City and participated in a discharge measurement workshop (see p. 12) organized by the Japan Society of Civil Engineers. They practiced discharge measurement in an actual river with help from ICHARM researchers. Although it was still rather cold with lingering snow in places, they worked hard on the tasks prepared for them.

Yodo River basin (May 27-30)

In late May, the master's students visited the Yodo River basin in a field study tour. This river basin has been developed since ancient days by taking advantage of abundant water supply from Lake Biwa. They traveled along the Yodo and Uji rivers to learn about flood management over the Yodo River basin, damage caused by a devastating typhoon No.18, and the administrative responses to that damage.

On the first day, the students visited the Kinki Regional Development Bureau of the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) to understand the outline of Typhoon No.18 and damage it caused. They learned that although the typhoon marked a record rainfall in September 2013 and caused serious damage to the area, there were also quite a few places that escaped damage owing to structures built for disaster prevention after the 2004 typhoon disaster. They also learned that the collaborative operation of dams in the Yodo River system and the timely operation of the Seta River overflow weir may have been very effective in avoiding further flood damage.

At Amagase Dam

On the following two days, the students visited several places related to the flood disaster for more information, including the Yodo River Office, the Yodo River Dam Integrated Management Office, Amagase

Dam and typhoon-affected sites.

On the final day, they went to the Lake Biwa Canal Memorial Museum to learn about the diverse culture in the Yodo River basin. They became very interested in the exhibitions and asked so many questions that they needed extra time to finish them.

Hakojima retarding basin (June 12)

In mid June, the students took a study tour to the Hakojima retarding basin in Chikusei City, Ibaraki Prefecture, located in the northern part of the Kanto region. The retarding basin, a permanent measure to prevent flooding from the Kokai River, was built after relocating settlements in the area. They listened to the staff of the Shimodate River Office explaining about the retarding basin at the Tayagawa water gate, where they could overlook the entire basin, and then moved on to take a look at an overflow bank.

Conducting water level observation at Kuroko water level and discharge gauging station

After that, they visited the Kokai River Kuroko water level and discharge gauging station and saw the station staff actually performing water level observation.

In the afternoon, the students went to the Ninomiya Sontoku Museum in Moka City, Tochigi Prefecture, also located in the northern part of the Kanto region. Every year, students are taken to this museum because ICHARM is hoping that they will bring the philosophy of Sontoku Ninomiya back home with them in addition to the academic degree and expertise in water-related disasters. In fact, the Sontoku Award is given annually at the end of the master's degree program to the individual selected by his or her fellow students as having deep consideration for others and strong leadership.

Finally, ICHARM would like to express our deep appreciation to offices and agencies for their excellent support for our educational program.

(Written by Takashi Shirai)

母子島遊水池（6 月 12 日）

小貝川の恒久的治水対策として、集落の集団移転を伴い完成した母子島遊水池の視察を行いました。母子島遊水池を一望できる田谷川水門において、下館河川事務所の職員から説明を受けた後、越流堤を見学しました。その後、小貝川黒子水位流量観測所で、実際に水位観測の作業を見せて貰いました。

午後からは、栃木県真岡市にある二宮尊徳資料館を訪問しました。ICHARM の修士コースでは、終了時に「他者に対する配慮」「リーダーシップ」という観点から、学生に相互互選をさせ、最も支持を受けた学生に対して Sontoku award を授与しています。ICHARM は、学生に、学位や水災害に関連する知識だけでは無く、二宮尊徳の思想も知って母国へ帰って欲しいと考え、毎年、この資料館を訪問しています。

最後に、お忙しい中、現地訪問のご対応してくださいました国土交通省北陸地方整備局河川部河川計画課、信濃川下流河川事務所、信濃川河川事務所、国土交通省近畿地方整備局河川部河川計画課、淀川河川事務所、淀川ダム統合管理事務所、天ヶ瀬ダム管理支所及び関東地方整備局下館河川事務所の皆様には大変お世話になりました。ここにお礼申し上げます。

Recent earthquake in Nepal (Contribution)

Nepal was recently rocked by a huge earthquake and is suffering from extreme devastation. Mr. Narayan Gautam, who previously studied in ICHARM's educational program and is currently teaching at Tribhuvan University in Kathmandu, Nepal, contributed a brief report on the earthquake to this newsletter as follows:

Nepal is located between India and China and the country is situated in one of the seismically active zones. On April 25, 2015, Nepal faced disastrous earthquake having 7.6 magnitude scale. The earthquake occurred at11:56 AM of Nepal local time and its epicenter was in Barpak village development committee of Gorkha district. The epicenter is located 28.24°N latitude and 84.75°E longitude and about 83 km away from the capital city, Kathmandu. In the history of Nepal, it is one of the massive earthquakes after Nepal-Bihar earthquake of 1934.

Damage in a historical palace at Kathmandu

On an official record of May 26, 2015 the Gorkha earthquake caused fatalities of more than 8,600 people, about 22,000 people were injured and more than 500,000 houses were fully destroyed.

先日、ネパールは大地震に襲われ、大変な被害に見舞われ、現在でもその状況は続いています。以前 ICHARM の博士課程に在籍し、現在ネパールに帰国されている Narayan Gautam 氏（Tribhuvan University, Kathmandu, Nepal）に近況を知らせていただきました。以下は、Narayan 氏からの報告です。

ネパールはインドと中国に挟まれた、地震多発地域に位置しています。先日、2015 年 4 月 25 日午前 11 時 56 分（現地時間）、マグニチュード 7.6 という大地震が発生しました。震源地は Gorkha 地区 Barpak 村周辺（北緯 28.24°、東経 84.75°）、首都カトマンズから 83 キロの位置でした。この地震は、1934 年ビハール・ネパール地震に次ぐ大規模地震です。

5 月 26 日現在の公式記録によれば、今回の地震による死者 8,600 人以上、負傷者約 22,000 人、全壊家屋 500,000 棟以上となっています。

本震後、マグニチュード６を超える大きな余震が４回発生し、人的および物的被害がさらに拡大しました。

ネパール政府が発行した復興費用見積では、今後復興に必要な金額を670億米ドルとしています。本震とその後の余震により、地震の影響を受けた地域には至る所で地割れが認められ、さらに、地滑り、洪水、土砂災害など、水関連災害の危険性も高まっています。

The four major aftershocks were occurred greater than 6 magnitude scale after the Gorkha earthquake. And, those major aftershocks were also became reasons to amplify casualties and property damage in the earthquake prone areas.

The Government of Nepal has initially estimated 6.7 billion USD for reconstruction of earthquake damaged sectors on its Post Disaster Needs Assessment (PDNA) report. Due to the Gorkha earthquake and aftershocks, land-fractures are largely seen in most of the earthquake affected districts and it has also intensified the chances of various types of water induced disasters including landslides, floods and sedimentation throughout the country.

(Written by Narayan Gautam)

New ICHARM Members

Two new members joined ICHARM.
They would like to say brief hellos to the readers around the world.

Junichi YOSHITANI

Deputy Director — *Japan*

I am back to ICHARM after totally six-year assignments to National Institute for Land and Infrastructure Management and Disaster Prevention Research Institute of Kyoto University.
I have found that ICHARM now covers more focused research projects and has stronger education systems than before.
I will try to expand research capacities of the ICHARM researchers to be able to expand research fields and to create positive linkages between research projects and education keeping the current strengths.

Patricia Ann Jaranilla-Sanchez

Research specialist — *Republic of the Philippines*

I am very happy to be part of ICHARM as a Research Specialist in the risk group.
I have been working on climate change impact assessments of floods and droughts at the basin scale using hydrological modeling for different countries in Asia and Africa.
Currently, my research interest is on how water resources management can be utilized as an adaptation strategy to minimize the negative impacts on the agriculture sector in developing countries.
I am looking forward to collaboratively working with the ICHARM team in hopes that this enriching research environment will provide me the opportunity to grow and contribute to the world in the field of water and agriculture.

Leaving ICHARM

鈴木　篤　グループ長　　**Atsushi SUZUKI :** Deputy Director

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