



# Newsletter

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# ICHARM

International Centre for Water Hazard and Risk Management  
under the auspices of UNESCO

## Message from Director

### I never thought it would come here.

This past summer, I had a chance to visit the ruins of Arahama Elementary School in Sendai, Japan. The school stood in the Arahama area on March 11 in 2011, when the giant tsunami caused by the Great East Japan Earthquake hit the area where approximately 2,200 people in about 800 households lived. Unfortunately, many of them became tsunami victims, but 320 residents, students, and school personnel survived. Having evacuated in the four-story reinforced-concrete school building, they had followed the vigilant principal's instructions and moved to the rooftop by the time the tsunami reached the school. Sendai City has decided to preserve the school ruins building as an important legacy to pass down the threat of the tsunami and the lessons learned to future generations.



Director Toshio Koike (rightmost) with Prof. Hiroki Sunohara of GRIPS (leftmost) and 2 Ph.D. students at the graduation ceremony

"I never thought it would come here." This message is heard repeatedly almost every year whenever devastating flood disasters occur. Indeed, heavy rainfall events have been increasingly frequent. Putting together various lines of scientific evidence, however, naturally leads us to a conclusion that unprecedentedly powerful hazards are far from scientific fictions. I still clearly remember the extreme shock I felt when I learned that water-related disasters would be highly likely to be amplified by climate change while studying compiled papers and contextualized results in a wide range of fields of science as a review editor of Working Group 1 of the fourth IPCC Assessment Report, published in 2007. It is critically important for experts to integrate various sources of scientific knowledge and translate it into people's actions.

In its 5th Science and Technology Basic Plan adopted in 2016, the government of Japan proclaims the promotion of "Society 5.0," an initiative to bring wealth to people by merging the physical space and cyberspace and creating a 5th society after the historical societies structured around hunting, agriculture, industry, or information. To strengthen disaster-resilience in society, scientists and engineers need to help people build the capacity for accepting disaster risks simulated and predicted in the cyberspace and to create science and technology understood and trusted by people. In light of the locality and variety of water-related disasters which are greatly influenced by factors such as land use, lifestyles, and industry, we have a mission to provide tailor-made information, engineering, and human resources which will lead people to take practical actions as the principal of the Arahama Elementary School did.

### こんなことが起こるとは思わなかった

今年の夏、仙台市荒浜小学校遺構を訪問する機会を得ました。2011年3月11日、約800世帯、2,200人が暮らす太平洋に面する荒浜地区は大津波に飲み込まれました。この時、鉄筋コンクリート4階建ての小学校に避難した児童や教職員、住民ら320人は、校長先生の適切な指示で難を逃れたのです。津波による犠牲を再び出さないため、仙台市はその校舎を震災遺構として公開し、津波の脅威や教訓を後世に伝えていきます。

「こんなことが起こるとは思わなかった。」これは毎年起こる激甚豪雨災害のたびに繰り返される言葉です。確かに近年かつてない頻度で豪雨が発生しております。しかし、積み重ねられてきた様々な科学的知見を組み合わせれば、経験したことがない極端事象の発生は決して科学的なフィクションではないことに気づきます。2007年に発表されたIPCCの第4次評価報告の第一作業部会の評価編集者を務めさせて頂き、様々な分野の数多くの論文を拝見し、またそれらを文脈立てて取り纏めた結果を得て、気候の変化とともに激甚化が予測される水災害に、私自身が震撼としたことを記憶しております。統合的な科学的知見をいかに取りまとめ、社会における人々の行動に結びつけるかが鍵です。

わが国は、第5期科学技術基本計画において、狩猟、農耕、工業、情報と歴史的な社会の発展段階を踏まえ、仮想空間と現実空間を高度に融合させた人間中心の5番目の社会、Society 5.0の構築を提唱しております。災害に強い社会づくりには、仮想空間上の災害リスクを人々が如何に受け止めるかが鍵で、人々から理解され信用される科学技術の創出が必要です。また水災害の発生は地域それぞれの土地利用や生活や産業によって多様であることに鑑みれば、それぞれの地域にあった情報や技術を提供することと、経験と科学的想像力をもって人々の行動を牽引する、荒浜小学校の校長先生のような人材が求められます。

October 31, 2018

Toshio Koike  
Director of ICHARM

**Special Topics**

3. Field surveys of the July 2018 torrential rain disaster in western Japan / 2018 年 7 月西日本豪雨に関する現地調査

**International Flood Initiative (IFI)**

5. Discussion on establishment of IFI Platform and "TOUGOU" research program in Indonesia / インドネシアにおける IFI プラットフォームの構築と統合プログラムの協議  
 6. Practitioners Meeting on the Platform on Water Resilience and Disasters in Myanmar / ミャンマーにおける「水のレジリエンスと災害に関するプラットフォーム」の実務者会合開催

**Research**

7. Introduction of ICHARM research projects / 研究紹介  
 7. Katsunori Tamakawa, Research specialist [ Investigation of improving AMSR2 satellite based soil moisture estimation by considering water surface effect in Cambodia ] / 玉川勝徳 専門研究員「水域を考慮したカンボジアにおける AMSR2 輝度温度補正と土壌水分推定改善手法の検討」  
 9. Development of an information sharing system to deliver river water-level forecasts for small- and mid-sized rivers as a PRISM Program project / 官民研究開発投資拡大プログラム (PRISM) における中小河川の水位予測情報提供システムの開発  
 10. Pilot project on agriculture drought monitoring and prediction over northeastern Brazil / ブラジル北東域における農業学的干ばつ監視・予測研究プロジェクト  
 12. ICHARM activities on maintenance of rain gauges for flood monitoring, forecasting and early warning activities in Sri Lanka with support from JAXA and DIAS projects / スリランカにおける洪水監視・予測・早期警報のためのリアルタイム自動雨量観測装置メンテナンス活動報告 (JAXA・DIAS プロジェクト)  
 13. ICHARM special session, "Flood Risk Management in Mountainous Areas," held at an international conference in Morioka, Iwate / 『国際防災・危機管理研究 岩手会議』において ICHARM セッション開催  
 14. 62nd R&D Seminar / 第 62 回 R&D セミナー

**Training & Education**

14. ICHARM's new Ph.D. program and the recruitment of new master's and Ph.D. students / ICHARM の新博士課程と修士・博士のリクルート活動  
 15. Comments from new doctoral course students / 博士課程 新研修員からのコメント  
 16. Educational Program Updates / 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」 活動報告  
 17. Comments from graduated students of Ph.D. course / 博士課程卒業生からのコメント  
 18. UNESCO Pakistan Project: International training on river discharge and sediment transport assessment in Indonesia / ユネスコパキスタンプロジェクト：インドネシア国における流量流砂量計測に関するトレーニング実施

**Information Networking**

19. Side Event "Hydrology Towards Sustainable Resilient Societies" at the United Nations High-Level Political Forum on Sustainable Development / 国連・持続可能な開発に関するハイレベル・ポリティカル・フォーラムでのサイドイベント「持続可能で強靱な社会に向けた水文学」  
 21. Overseas Academic Investigation: Model Development for Forecasting Flood Risk of Large Rivers in consideration of Climate Change and Socioeconomic Scenario / 基盤研究 (B15H05136) 海外学術調査：気候変動及び社会経済シナリオを考慮した広域河川氾濫リスク予測モデル開発の活動  
 23. Participation in the kick-off symposium of UNESCO Chair WENDI / ユネスコ・チェア WENDI のキックオフ・シンポジウムへの参加  
 24. International Atomic Energy Agency (IAEA)/Regional Cooperation Agreement (RCA) RAS/7/030 Project activities in Indonesia and China / インドネシアと中国における IAEA 地域研修コース (RTC) の活動  
 25. WMO/GWP APFM annual meeting / WMO/GWP 主催「洪水管理連携プログラム」会合  
 26. Participation in the Stockholm World Water Week / ストックホルム国際水週間への参加  
 27. WWDR2020 Development Workshop / 世界水発展報告書 2020 準備会合への参加  
 28. Session on Flood Risk in Myanmar at the Korea International Water Week 2018 / Korea International Water Week 2018 でのミャンマーの洪水リスクに関するセッションへの参加

**Others**

28. Comments from internship students / インターン生からのコメント  
 29. Personnel change / 人事異動のお知らせ  
 29. Awards / 受賞リスト  
 30. Business Trips / 海外出張リスト  
 30. Visitors / 訪問者リスト  
 32. Publications / 発表論文リスト

**Request to participate in online survey on ICHARM Newsletter****ICHARM ニュースレター購読者アンケートのお願い**

ICHARM では、2006 年 3 月の設立以降、ICHARM の最新の動向をお知らせする「ICHARM ニュースレター」を、年 4 回発行しています。

各号では、購読者の皆様にアンケートをさせて頂き、記事内容向上の一助とさせて頂きたく存じます。

つきましては、以下のサイトにアクセス頂き、アンケートにお答え下さい。

[http://www.icharm.pwri.go.jp/questionnaire/questionnaire\\_en.html](http://www.icharm.pwri.go.jp/questionnaire/questionnaire_en.html)  
[http://www.icharm.pwri.go.jp/questionnaire/questionnaire\\_ja.html](http://www.icharm.pwri.go.jp/questionnaire/questionnaire_ja.html)

回答期限：2018 年 11 月 30 日まで

回答時間 (目安)：5 分程度

Thank you for subscribing ICHARM Newsletter. ICHARM has been publishing the quarterly newsletter for over 10 years since its establishment in March 2006 to deliver the latest news about research, projects and other activities at ICHARM to readers around the world. We would be grateful if you could spare time to answer the following questions to improve the next volume of the Newsletter.

Survey posted at: [http://www.icharm.pwri.go.jp/questionnaire/questionnaire\\_en.html](http://www.icharm.pwri.go.jp/questionnaire/questionnaire_en.html)

Survey to be done by: 30 November 2018

Time required: about 5 minutes

# Special Topics

## Field surveys of the July 2018 torrential rain disaster in western Japan / 2018 年 7 月 西日本豪雨に関する現地調査

From July 5 to 7, 2018, continuous rainfall in western Japan induced many slope failures, debris flows and floods with a massive transport of sediment in several prefectures of Chugoku and Shikoku regions, including Hiroshima, Okayama, and Ehime. Those events caused huge damage with about 230 people dead or missing throughout Japan. Disasters due to torrential rainfall have occurred annually in the recent years: for example, the Hiroshima disaster in 2014, the Kanto-Tohoku disaster in 2015, the Typhoon Lionrock disaster in 2016, and the Northern Kyushu disaster in 2017. Among those, ones with slope failures, debris flows, or floods with sediment and driftwoods tend to be particularly devastating. Therefore, ICHARM has been vigorously studying complex flood phenomena of those types of hazards and effective approaches for disaster information dissemination in order to mitigate future damage due to similar disasters. From this point of view, ICHARM conducted field surveys in Okayama and Hiroshima prefectures immediately after the torrential rainfall disaster over western Japan.

From July 14 to 16, Senior Researcher Miho Ohara and Research Specialists Young-Joo Kwak and Naoko Nagumo conducted a joint field survey with researchers from Utsunomiya University, Shibaura Institute of Technology, and University of Hyogo in damaged areas including Okayama City and Mabi Town in Kurashiki City, Okayama Prefecture, and Mihara and Onomichi cities, Hiroshima Prefecture. They observed the inundation situation due to a dike breach along the Oda River by using an Unmanned Aerial Vehicle, or a drone (Figure 1), and examined dike damage along the tributaries (Figure 2). They also interviewed local people about the situation at the time of the disaster and the livelihood after the evacuation. The investigation team confirmed that the maximum inundation depth exceeded the 2nd floor level of the houses in the area.



Figure 1 Dike breach along the Oda River (a drone photo taken over Mabi Town, Kurashiki City)  
図1 小田川の破堤（倉敷市真備町、ドローンで撮影）



Figure 2 Dike breach along the Suemasa River  
(Mabi Town, Kurashiki City)  
図2 末政川の破堤（倉敷市真備町）



Figure 3 Sediment-related flood in Sozu River  
(Saka town, Aki-Gun)  
図3 総頭川の洪水・土砂氾濫（安芸郡坂町）

2018 年 7 月 5 日から 7 日にかけて西日本で降り続いた雨により、広島県、岡山県、愛媛県など、中四国の広い範囲で斜面崩壊、土石流や洪水・土砂氾濫が多発しました。これにより、全国で 230 人の死者・行方不明者を含む甚大な被害が生じました。このような豪雨災害は、2014 年の広島豪雨、2015 年の関東・東北豪雨、2016 年の台風 10 号による豪雨、2017 年の九州北部豪雨のように、近年、毎年のように発生しています。とくに、洪水だけでなく、斜面崩壊や土石流、大量の流砂・流木の氾濫を伴うような災害において被害は大きくなる傾向にあります。同様の災害による被害軽減に向けて、このように複雑な氾濫現象の解明や、災害時の効果的な情報伝達方法の検討などを目的に、ICHARM では継続的に調査・研究を進めています。今回の西日本の豪雨災害においても、これらの観点から岡山県、及び広島県で災害発生直後から現地調査を行っています。

7 月 14 日から 16 日には、大原主任研究員と郭専門研究員、南雲専門研究員が、宇都宮大学、芝浦工業大学、兵庫県立大学と合同で岡山県岡山市、倉敷市真備町、及び、広島県三原市、尾道市等で現地調査を実施しました。倉敷市真備町では、図 1 に示すように小型無人飛行機（ドローン）を用いて地域を流れる小田川の破堤による浸水や、図 2 に示すような支川堤防の損傷状況に関する調査を行いました。また、この地域の最大浸水深は家屋の 2 階床上に達していることを確認したほか、被災当時の状況や避難生活について、地域の方々にお話を伺うことができました。

7 月 22 日から 24 日には、江頭研究・研修指導監、山崎専門研究員（当時）、原田専門研究員、南雲専門研究員が現地調査を行いました。この調査では、広島県三原市、安芸郡坂町、呉市等で土砂の流出・氾濫に着目した調査を実施しました。坂町を流れる総頭川では、図 3 が示すように大量の土砂が氾濫しながら流下し、図 4 のように流木が橋梁で河道を埋塞している様子を確認しました。また、呉市の天地川沿いでは、図 5 に示すようにマサとよばれる花崗岩由来の土砂の堆積によって、河道近くの家屋 1 階部分が埋もれている様子もみられました。

さらに、7 月 26 日から 27 日には、今村特別研究員と白井主任研究員（当時）が、国土技術政策総合研究所水害研究室とともに、倉敷市真備町の現地調査を行いました。この調査では、国土交通省中国地方整備局岡山河川事務所の三戸雅文事務所長と今回の洪水が地域に与えた影響

について意見交換を行ったほか、事務所職員の皆様の協力のもと、小田川や支川の破堤状況、また、堤内地の家屋の倒壊状況等を調査し、堤防の復旧状況や河道内の樹木伐採の状況、排水ポンプ場の浸水状況も確認しました。

ICHARM では被災されました皆様に心よりのお見舞いと、一日も早い復旧・復興をお祈り申し上げるとともに、よりレジリエントな社会の構築に向け、今後もこの豪雨に関する調査・研究を進めていきます。

Research and Training Advisor Shinji Egashira and Research Specialists Yusuke Yamazaki\*, Daisuke Harada and Naoko Nagumo conducted another field survey from July 22 to 24. In this survey, they selected several affected sites in Hiroshima Prefecture, including Mihara City, Saka Town and Kure City, and specifically investigated sediment runoff and flooding. In Saka Town lying along the Sozu River, the investigation team learned from observation that a wide area of the town was flooded with muddy water with a large volume of sediment (Figure 3). They also found the river channel filled with driftwoods at a bridge (Figure 4). In Kure City, the first floor of a house built near the Tenchi River was buried entirely in the sediment produced originally from granite rock (Figure 5).



Figure 4 River channel filled with driftwoods at a bridge (Sozu River, Saka Town, Aki-Gun)

図4 流木により橋梁部で埋塞された河道（安芸郡坂町、総頭川）



Figure 5 House half-buried with flood-transported sediment (Tenchi River, Saka Town)

図5 氾濫土砂により埋もれた家屋（安芸郡坂町、天地川）

Furthermore, on July 26 and 27, Director for Special Research Yoshiyuki Imamura and Senior Researcher Hiroaki Shirai\* visited Mabi Town in Kurashiki City, Okayama Prefecture, with members of the Water Hazard Laboratory of National Institute for Land and Infrastructure Management. They first discussed the impacts of this flood with Mr. Masafumi Mito, the director of the Okayama River Office of the Ministry of Land, Infrastructure, Transport and Tourism, and then visited dike breach sites along the Oda River and its tributaries to investigate the damage extent of flood-affected houses. Also, they checked the inundation situation of drainage pumping stations as well as deforestation of river channels. This survey was conducted with support from the river office members.

ICHARM members would like to express the deepest sympathy to those who are affected by the disaster and hope for the earliest restoration. ICHARM continues research on this torrential rainfall disaster to learn new findings and lessons for building a more disaster-resilient society.

\* Yusuke Yamazaki is currently a researcher at the Volcano and Debris Flow Research Team of the Erosion and Sediment Control Research Group, PRWI.

Hiroaki Shirai is presently studying in a Ph.D. program in economics at the University of Wisconsin-Madison.

(Written by Naoko Nagumo)

## International Flood Initiative (IFI)

国際洪水イニシアティブ (International Flood Initiative: IFI) はユネスコ (UNESCO)、世界気象機関 (WMO)、国連大学 (UNU)、国連国際防災戦略 (UNISDR) 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、ICHARM は、IFI の事務局を担当しています。

2016 年 10 月に承認された「洪水リスク軽減と持続可能な開発を強固にするための学際的な協力に向けた宣言文 (ジャカルタ宣言)」を受け、各国および関係機関と協働しながら、統合洪水マネジメントに貢献する活動を進めています。特に、フィリピン・スリランカ・

The International Flood Initiative (IFI) is a worldwide framework to promote collaboration in flood management among international organizations such as UNESCO, the World Meteorological Organization (WMO), the United Nations University (UNU) and the United Nations International Strategy for Disaster Reduction (UNISDR). ICHARM has been its secretariat since the establishment of IFI.

In October 2016, the Jakarta Statement towards an interdisciplinary and transdisciplinary partnership to consolidate flood risk reduction and sustainable development, was adopted by the member organizations of IFI. As part of this effort, the Philippines, Sri Lanka, Pakistan and Myanmar have already decided to establish a Platform on Water Resilience and Disasters involving various government agen-

cies, and ICHARM has been supporting their decision as facilitator.

This article reports establishment of IFI Platform in Indonesia and practitioners meeting in Myanmar.

パキスタン・ミャンマーにおいては、各国の関係機関による「水のレジリエンスと災害に関するプラットフォーム」の構築に向けた取り組みが始まり、ICHARMはファシリテーターとしてその活動の促進を図ってきました。

本号では、インドネシアにおけるIFIプラットフォームの構築、およびミャンマーにおける実務者会合について報告します。

## Discussion on establishment of IFI Platform and “TOUGOU” research program in Indonesia / インドネシアにおける IFI プラットフォームの構築と統合プログラムの協議

A team of ICHARM researchers visited government agencies of Indonesia and UNESCO Jakarta office on August 3-8, 2018, to explain the details of the Integrated Research Program for Advancing Climate Models (TOUGOU) and discuss the concept and coordination system of the Platform on Water Resilience and Disasters, an effort led by the International Flood Initiative (IFI). Both topics were addressed in the 2018 January mission, and both sides reached a consensus to move on with the plans.

In the TOUGOU program, ICHARM is assigned to analyze present and future water-related disaster risk in relation to climate change impact for the Solo River basin in Java Island of Indonesia. It will also study appropriate adaptation measures for the basin and provide assistance in the implementation of planned measures. Through all these tasks, ICHARM is aiming to develop a prototype approach for implementing adaptation measures, which is applicable to other river basins as well.

As these TOUGOU activities could be a demonstration of organizing a platform, the research team encouraged PUPR<sup>\*1</sup>, a government body in charge of river management, BMKG<sup>\*2</sup>, BNPB<sup>\*3</sup>, and other agencies to participate in the TOUGOU project and strengthen inter-organizational coordination.

As part of this effort, the first director-general-level plenary meeting coordinated by three Indonesian ministries and agencies will be held on November 21, 2018, in Jakarta to confirm concrete activities and the basic policy regarding the platform. ICHARM will be closely working with local stakeholders by helping them facilitate the collection, organization and sharing of data needed for the platform project and the TOUGOU program, analyze climate change-induced risks, and plan practical adaptation measures.



At PUPR (Minister Basoeki, fourth from left) / 公共事業・国民住宅省 (Basoeki 大臣、左から 4 番目)



At BMKG / 気象気候・地球物理庁



At BNPB / 国家防災庁

2018 年 8 月 3 日～ 8 日にかけてインドネシア政府の関係機関、及び UNESCO ジャカルタ事務所を歴訪し、2018 年 1 月の訪問で確認した「統合的気候モデル高度化研究プログラム」(以下、「統合プロ」)の実施、および国際洪水イニシアティブ (IFI) による「水のレジリエンスと災害に関するプラットフォーム」の構築について、今後の方針や連携体制を協議しました。

統合プロにおいて ICHARM は、ジャワ島のソロ河流域を対象として現況及び気候変動の影響を踏まえた将来の水災害リスク解析を実施するとともに、気候変動適応策の検討や現地実装支援を実施し、これらを通じて気候変動適応策実装のためのプロトタイプを開発することとしています。

この統合プロの活動は、IFI が目指すプラットフォームの構築におけるデモンストレーションともなりうることから、河川管理を担う公共事業・国民住宅省 (PUPR) に加え、気象気候・地球物理庁 (BMKG) や国家防災庁 (BNPB) にも主体的な参加や相互の連携強化を提案しました。

今後の予定として、2018 年 11 月 21 日にジャカルタにおいて 3 省庁合同でプラットフォーム構築に関する局長級会合を開催し、具体的な行動や活動方針を確認するとともに、プラットフォームの構築及び統合プロの実施に必要なデータの収集・整理・共有を図り、気候変動リスクの評価、適応策の検討を協働で進めていくこととしています。

\*1 PUPR: Ministry of Public Works and Housing

\*2 BMKG: Meteorological, Climatological, and Geophysical Agency

\*3 BNPB: National Disaster Management Authority

(Written by Yosuke Tomizawa)

## Practitioners Meeting on the Platform on Water Resilience and Disasters in Myanmar / ミャンマーにおける「水のレジリエンスと災害に関するプラットフォーム」の実務者会合開催

ICHARM は、IFI (International Flood Initiative) の事務局として、ミャンマーにおける「水のレジリエンスと災害に関するプラットフォーム」の設立を支援しています。これまでミャンマーでは、関係機関の局長レベルによる 2 回の会議を開催し、プラットフォームの構成、活動内容について議論、確認をしました。今回の会議 (2018 年 9 月 5 日) は、ネピドーにおいて課長レベルの実務者会合として開催し、プラットフォームで中心的役割を果たす 4 機関の水資源・河川整備総局 (DWIR)、気象・水文局 (DMH)、灌漑・水利用管理局 (IWUMD)、災害管理局 (DDM) から課長職レベルの職員と、国家水資源委員会 (NWRC) のアドバイザーボードの議長他が、ICHARM からは澤野グループ長、シュレスタ主任研究員、吉野主任研究員、玉川専門研究員が参加し、活動に必要なデータの確認や今回の活動で活用する DIAS (Data Integration and Analysis System) のトレーニングを行うこと等、今後の具体的な進め方について議論しました。

この会議に合わせて、DWIR、DMH、DDM、IWUMD の局長等、ヤンゴン工科大学 (YTU) の学長をそれぞれ訪問し、プラットフォームについて意見交換をしました。また、その他にヤンゴン教育大学を訪問し、ミャンマーにおける流域地質情報について意見交換をしました。

ICHARM は今後とも引き続きミャンマーにおけるプラットフォームの活動に協力してまいります。

As the secretariat of the International Flood Initiative (IFI), ICHARM has been supporting Myanmar in the establishment of the "Platform on Water Resilience and Disasters in Myanmar (PWRDM)." In the previous two meetings held in Myanmar with the director generals of related organizations, the participants discussed and agreed on the organization of the platform and its prospective activities.

Another meeting was held on September 5, 2018, with director-level local practitioners in Nay Pyi Taw, Myanmar. The participants included the directors from the four core management departments of the PWRDM: Directorate of Water Resources and Improvement of River Systems (DWIR); Department of Meteorology and Hydrology (DMH); Irrigation and Water Utilization Management Department (IWUMD), and Department of Disaster Management (DDM). The chairperson and other members of the Advisory Group from the National Water Resources Committee (NWRC) also attended the meeting. From ICHARM, Deputy Director Hisaya Sawano, Senior Researchers Badri Shrestha and Hirosato Yoshino, and Research Specialist Katsunori Tamakawa participated. The meeting discussed concrete plans for the future activities agreed upon in the previous meetings, such as identification of data to be used for the activities and training for operation of the Data Integration and Analysis System (DIAS).

In addition, the researchers of ICHARM made courtesy visits to the director generals and other officials of DWIR, DMH, DDM and IWUMD and the rector of Yangon Technological University (YTU) and exchanged opinions about the platform. They also visited the Yangon University of Education and exchanged views about issues on the information of geological features of the basins in Myanmar.

ICHARM will continue to cooperate with Myanmar in implementing the activities of the platform.



Group photo of Practitioners Meeting  
実務者会合の集合写真

(Written by Hirosato Yoshino)

# Research

## Introduction of ICHARM research projects / 研究紹介

ICHARM sets three principal areas of activity: research, capacity building, and information network. It plans and implements projects in these areas in order to fulfill its mission, always keeping in mind "localism", a principle with which we respect local diversity of natural, social and cultural conditions, being sensitive to local needs, priorities, development stage, etc., within the context of global and regional experiences and trends of disasters.

At present, ICHARM conducts innovative research in the following five major areas:

- (1) Data collection, storage, sharing, and statistics on water related disasters
- (2) Risk assessment on water related disasters
- (3) Monitoring and prediction of changes in water related disaster risk
- (4) Proposal, evaluation and application of policy ideas for water related disaster risk reduction
- (5) Support in constructing the applicability of water-related disaster management

This issue introduces one study as listed below:

**Katsunori Tamakawa**, Research specialist

Investigation of improving AMSR2 satellite based soil moisture estimation by considering water surface effect in Cambodia

ICHARM は、その使命を果たすため、世界及び地域での災害の傾向及び経験と災害対応に関する地域のニーズ、重要課題、開発段階等を踏まえつつ、自然、社会及び文化といった地域の多様性を考慮する原則というローカリズムを念頭に、研究、能力育成及び情報ネットワーク構築の3本柱を有機的に連携させて、現地実践活動を実施しています。

そのうち、研究としては

- (1) 水災害データの収集、保存、共有、統計化
  - (2) 水災害リスクのアセスメント
  - (3) 水災害リスクの変化のモニタリングと予測
  - (4) 水災害リスク軽減の政策事例の提示、評価と適用支援
  - (5) 防災・減災の実践力の向上支援
- の5つの柱のもと、革新的な研究活動を行っています。

本号では、玉川勝徳 専門研究員の行っている研究「水域を考慮したカンボジアにおける AMSR2 輝度温度補正と土壌水分推定改善手法の検討」を紹介いたします。



### Investigation of improving AMSR2 satellite based soil moisture estimation by considering water surface effect in Cambodia

水域を考慮したカンボジアにおける AMSR2 輝度温度補正と土壌水分推定改善手法の検討

**Katsunori Tamakawa**, Research specialist

玉川勝徳 専門研究員

Surface soil moisture is one of the important hydrological variables that govern interactions between the land surface and the atmosphere in the analysis of the long-term water cycle variations. It is also important information for developing countries practicing rainfed agriculture since it affects the growth of crops. In these respects, it is important to conduct spatial and temporal estimation of surface soil moisture quantitatively.

In this research, I investigated global soil moisture estimation with high temporal resolution using the Advanced Microwave Scanning Radiometer 2 (AMSR2) board on the Global Change Observation Mission 1st – Water (GCOM-W) satellite. Focusing on the effect of the existence of water areas in the footprint, I tested a method to estimate land-surface soil moisture content by excluding the effect of water surface areas.

AMSR2 is equipped with six-frequency, two-polarization sensors (Figure-1a, 1b). In general, the areal average of soil moisture is estimated at a low-frequency resolution of 6.9GHz (35km x 62km). For agricultural activities, however, it is land-surface soil moisture that farmers need (Figure-2).

In this context, I focused on the difference in footprint size between 6.9GHz and 89GHz (89GHz is 100 times as fine as 6.9GHz in terms of resolution), and developed a method to estimate land-surface brightness temperature. In this method, water areas are first detected using 89GHz data, and then calculation is performed to find the percentage of the water areas in 6.9GHz data. Finally, the 6.9GHz brightness temperature excluding the effect of water surface areas is estimated.

The study tested this method in the estimation of land-surface moisture content around Pursat station in Cambodia (Figure-3). The resultant brightness temperature

地表面の土壌水分量は熱収支に影響を及ぼす観点から、長期的な水循環変動を考える上で重要な水文学の一つです。また、途上国で行われているような天水に頼る農業においても作物の生育に影響する重要な情報です。このため、土壌水分量を時空間的に定量的に推定することはとても重要です。

本研究では人工衛星 GCOM-W に搭載されたマイクロ波放射計 (AMSR2) を用いて、広域的かつ高頻度で土壌水分量を推定する際に問題となる観測解像度 (フットプリント) 内の地表面の不均一性のうち、水域の影響に着目し、水域を除去した陸域のみの土壌水分量を推定する手法を検討しました。

AMSR2 は 6 周波数・2 偏波で構成されています (図 -1a, 1b)。土壌水分量を推定する場合、低周波数 6.9GHz の解像度 (35km x 62km) での平均的な水分量が推定されますが、例えば営農活動においては、領域内の陸域 (水域の影響を取り除いた) のみの土壌水分量が必要な情報となります (図 -2)。

本検討では、6.9GHz と 89GHz の観測解像度の違いに着目し、まず、AMSR2 の 89GHz (89GHz は 6.9GHz の約 100 倍の解像度のデータ) で水域を抽出し、それが、6.9GHz の領域内に占める割合を計算し、最終的に

6.9GHzの領域内の陸域のみの輝度温度を推定する手法を検討しました。

本手法をカンボジアの Pursat 観測地点（図-3の赤丸地点）に適用しました。水域の影響を除去した陸域のみの輝度温度を Yang ら (2007)<sup>1</sup> により開発された陸面データ同化手法 (LDAS-UT) に入力した結果を 10cm 深度の地上観測（ポイント）の土壌水分データで検証しました。

その結果、2013年8月～2014年7月の全期間、雨季から乾季（8月～11月）、乾季（12月～3月）、乾季から雨季（4月～7月）において、地表面に水面を含む地域で土壌水分量の推定精度が改善されました（図-4）。

この手法が確立されれば、農家が必要としている土壌水分量の準リアルタイムでの推定の可能性が広がり、途上国の営農活動に対して有効な情報提供が期待できます。また、今まで衛星搭載マイクロ波観測では推定困難であった、大河川を観測領域内に含む地域や日本のような島国で観測領域内に海岸線を含む地域における土壌水分量推定の改善が期待できます。

#### 謝辞

本研究を実施するにあたり協力いただいた、宇宙航空研究開発機構（JAXA）、カンボジア水資源気象省、東京大学 河川／流域環境研究室の皆様に感謝申し上げます。

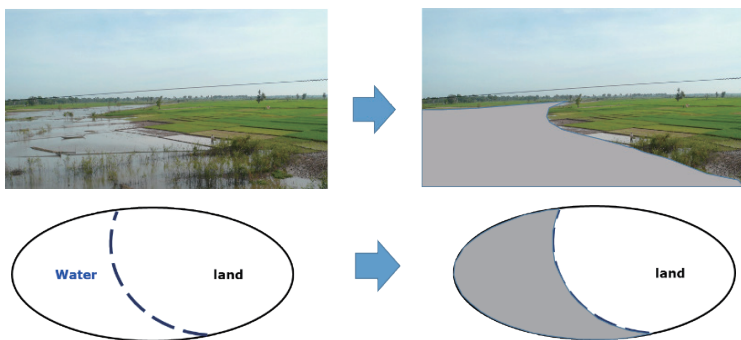


Figure-2: Schematic image of excluding water surface  
図-2: 領域内における水域除去のイメージ

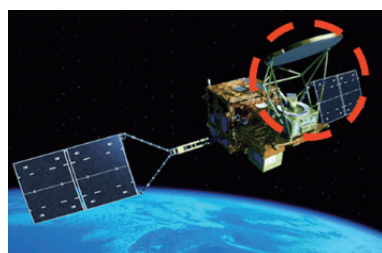


Figure-1a: GCOM-W satellite and AMSR2 Sensor [source: [http://www.jaxa.jp/projects/sat/gcom\\_w/](http://www.jaxa.jp/projects/sat/gcom_w/)]

図-1a: GCOM-W衛星とAMSR2センサー (JAXA HPより引用)

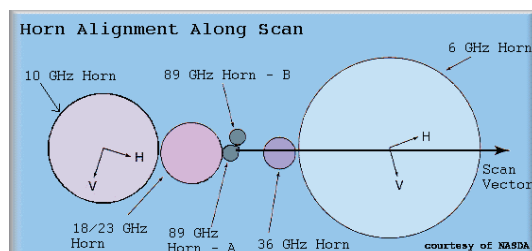


Figure-1b: Horn alignment and footprint size [source: <https://nsidc.org/data/amsre/amsre-instrument>]

図-1b: 各観測周波数の観測解像度のイメージ (NSIDC HPより引用)

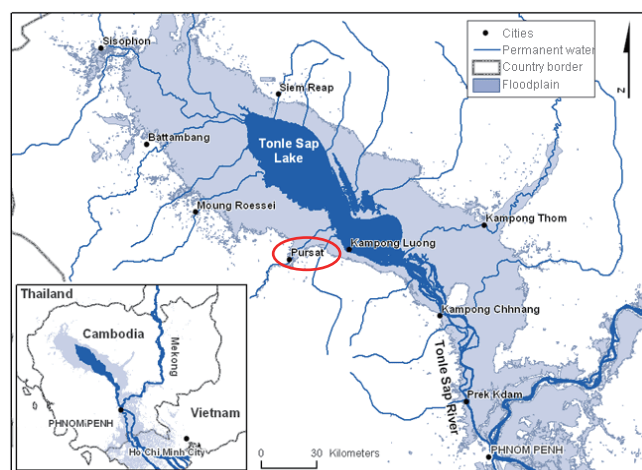


Figure-3: Location of Tonle Sap Lake and Pursat station (Red circle) [source: [https://en.wikipedia.org/wiki/Tonle\\_Sap#/media/File:Map\\_of\\_Tonle\\_Sap\\_Lake.jpg](https://en.wikipedia.org/wiki/Tonle_Sap#/media/File:Map_of_Tonle_Sap_Lake.jpg)]  
(Dark blue: Water area at dry season, Light blue: Water area at rainy season, Blue line: River)

図-3 左: トンレサップ湖と Pursat 観測地点の位置図 (赤丸)  
(出展: [https://en.wikipedia.org/wiki/Tonle\\_Sap#/media/File:Map\\_of\\_Tonle\\_Sap\\_Lake.jpg](https://en.wikipedia.org/wiki/Tonle_Sap#/media/File:Map_of_Tonle_Sap_Lake.jpg) の図に加筆)  
【濃い青: 乾期水域、薄い青: 雨季水域、青線: 河川】

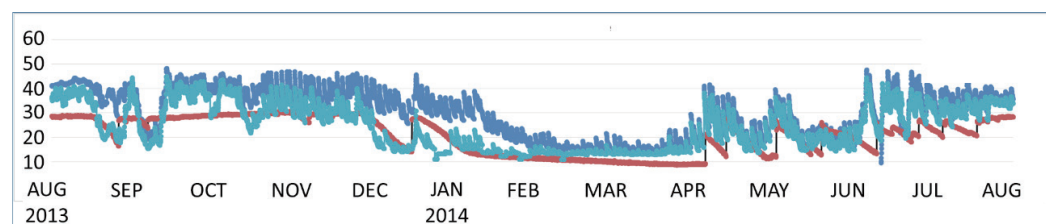


Figure-4: Comparison of observed and estimated soil moisture at the Pursat Station from August 2013 until July 2014  
(Red color: Observed, Blue color: Before 6.9GHz brightness temperature correction, Light Blue color: After 6.9GHz brightness temperature correction)

図-4 2013年8月～2014年7月における土壌水分の推定結果  
【赤線: 観測した土壌水分、青線: 輝度温度補正無し、水色線: 水域を除去した輝度温度を用いて推定した土壌水分】

#### References:

- 1 Kun YANG, Takahiro WATANABE, Toshio KOIKE, Xin LI, Hideyuki FUJII, Katsuroni TAMAGAWA, Yaoming Ma and Hirohiko Ishikawa (2007): Auto-calibration System Developed to Assimilate AMSR-E Data into a Land Surface Model for Estimating Soil Moisture and the Surface Energy Budget, Journal of the Meteorological Society of Japan, Vol.85A, 229-242, February 2007.

## Development of an information sharing system to deliver river water-level forecasts for small- and mid-sized rivers as a PRISM Program project / 官民研究開発投資拡大プログラム (PRISM) における中小河川の水位予測情報提供システムの開発

In recent years, water-related disasters due to torrential rainfall have become more frequent and severe, consequently causing more human damage. Especially in many small mountainous river basins in Japan, where a river water-level forecasting system has not been in place, residents are often exposed to high flood risk. Many reports point out that residents living in such basins often fail to evacuate in time because the water level rises rapidly during the flood.

To address this challenge, ICHARM has started a research project in collaboration with other organizations such as MLIT in the framework of the PRISM\* program, launched in 2018 by the Cabinet Office of Japan. The project is planned to develop a system that can perform trend analysis using river water-level data collected for crisis management by observatories and deliver water-level forecasts for small- and mid-sized rivers managed by local governments in order to assist them in issuing evacuation advisories and orders at the right timing. ICHARM also has a plan to develop tools to help residents make informed decisions on evacuation and other necessary actions to protect themselves from flooding by reference to the provided forecasts.

### [Research Goals]:

- I. Development of a low-cost, simple model for discharge forecasting and methodology for converting water discharge to water level
  - The model and methodology should be low-cost, simple, capable of accurate forecasting, and applicable to any small- and mid-sized rivers.
- II. Improvement of forecasting accuracy using water levels from multiple locations
  - A methodology will be developed to improve forecasting accuracy by correcting water-level forecasts based on water-levels observed at numerous locations.
- III. Development of an automatic flood forecasting and displaying system
  - The system should be capable of automatically managing data input and output, calculation, and other processes.
  - A new function will be also added to support local governments to introduce the system in small- and mid-sized river basins.
  - Another new function will be added to deliver water-related disaster information based on the knowledge of behavioral psychology to encourage residents to make early evacuation decisions.

In addition to ICHARM's project, three more research projects proposed by PWRI have been adopted as those of the PRISM program. Please visit the following PWRI website (only in Japanese).

<https://www.pwri.go.jp/jpn/about/pr/press-release/pdf/20180820.pdf>

近年豪雨災害が頻発・激甚化しており、多くの人的被害が発生しています。特に多くの中小河川では洪水予測が未実施の一方で、洪水時の水位は急激に上昇するため、避難が遅れる危険性が高く、多くの沿川住民が洪水の危険性に曝されています。

ICHARM では、内閣府が平成 30 年度に新設した「官民研究開発投資拡大プログラム (PRISM\*)」において、国土交通省等関係機関と協調し、研究課題「観測水位を活用した傾向分析による中小河川の水位情報提供システムの開発」を開始しました。本研究では、危機管理型水位計等を活用し、都道府県等が管理する中小河川を対象に、避難判断を支援することを目的とした水位予測システムを開発します。また、そのシステムによる情報を用いて、住民の避難行動を促すためのツールも開発します。

### 【研究内容】

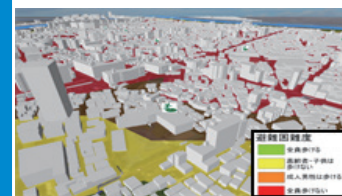
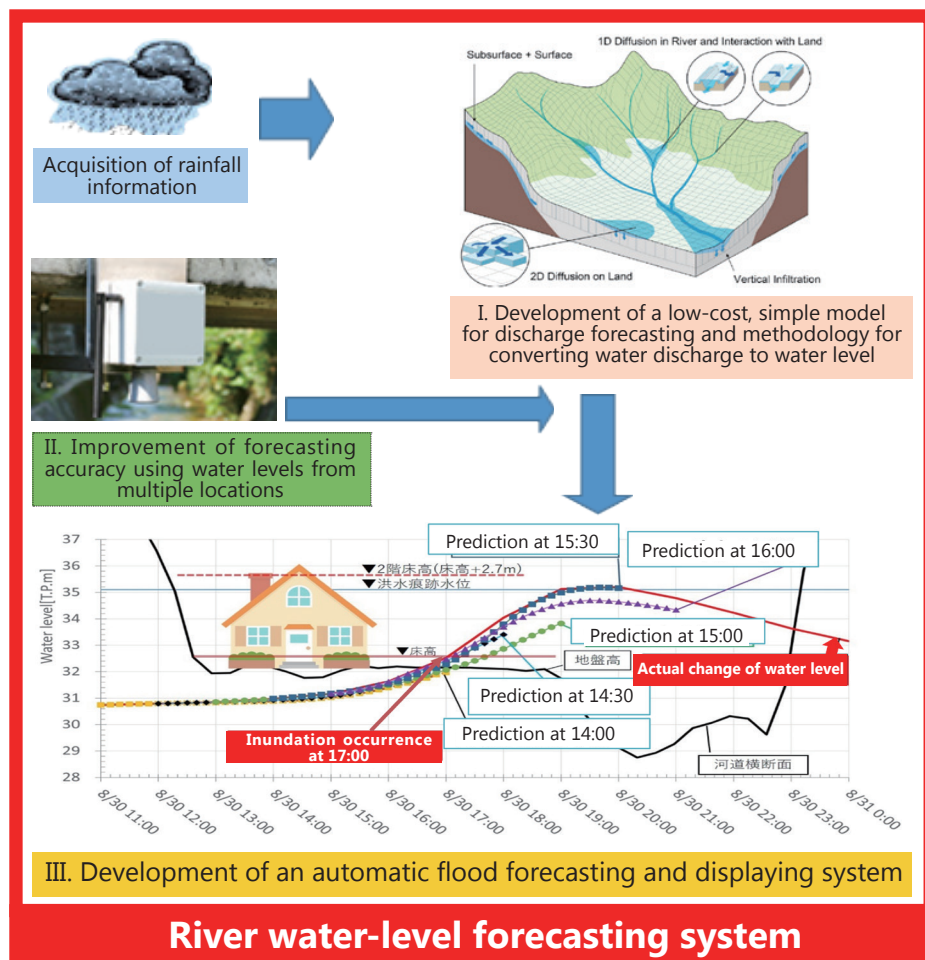
- ① 安価・簡便な流出モデル・水位変換方法の開発
  - ・汎用的な（どの中小河川でも使えるような）安価・簡便・高精度な洪水予測技術を開発します。
- ② 多地点水位観測値を活用した予測精度の向上手法の検討
  - ・多地点の水位観測データを用いて予測水位を補正し、予測精度の向上を図る手法を検討します。
- ③ 洪水予測の自動計算・表示システムの開発
  - ・データの入出力、演算等を自動処理する機能を開発します。
  - ・中小河川への河川水位予測システムの導入を支援するための機能を開発します。
  - ・住民の行動心理を踏まえて住民の避難行動を促すための水災害情報を配信する機能を開発します。

なお、土木研究所では、他に 3 つの研究課題が PRISM に採択されています。詳細は、下記土木研究所ホームページをご覧ください。

<https://www.pwri.go.jp/jpn/about/pr/press-release/pdf/20180820.pdf>

\* PRISM, short for the Public/Private R&D Investment Strategic Expansion Program, is a government-wide science and technology innovation policy with the Comprehensive Science and Technology/Innovation Council as its command tower. The council aims to strategically lead R&D projects to goals commonly shared in each field of science and technology, and plays a central role in directing and coordinating policies of each ministry and agency to target areas which are expected to invite high R&D investment from the private sector, as well as providing additional funding where necessary.

\* PRISM (官民研究開発投資拡大プログラム (Public/Private R&D Investment Strategic Expansion Program) (プリズム)) は、総合科学技術・イノベーション会議が政府全体の科学技術イノベーション政策の司令塔として、民間の研究開発投資誘発効果の高い領域 (ターゲット領域) に各府省の施策を誘導し、それらの施策の連携を図るとともに、必要に応じて、追加の予算を配分することにより、領域全体としての方向性を持った研究開発を推進する制度



**Deliver information to promote evacuation by residents**

(Written by Daisuke Kuribayashi)

## Pilot project on agriculture drought monitoring and prediction over northeastern Brazil / ブラジル北東域における農業学的干ばつ監視・予測研究プロジェクト

ブラジル北東半乾燥域は、2012年から5年間連続した干ばつ被害を受け、歴史的な貯水池における低水位が記録されました。この際、セアラ州の貯水池には僅か6-7%の水しか残りませんでした。このようにブラジル北東域における干ばつ被害は深刻な状況にあります。しかしブラジルでは、農業学的干ばつのマネジメントを向上させるための特定のツールはまだありません。世界銀行は、水の安全保障に対するアプローチを推し進めるための知識・能力を強化する多くの取り組み、とりわけブラジルにおける干ばつ監視・予測の確立を強く支援しています。そこで世界銀行は、ICHARMの所有する干ばつ監視・予測システムに着目し、2018年5月、ICHARMへブラジル北東域における農業学的干ばつ監視・予測研究プロジェクトを委託しました。委託期間は、1年間(2018年5月～2019年4月)です。またブラジル北東域・セアラ州の位置を図1に示します。

ブラジル北東域・セアラ州における農業学的干ばつ監視・予測システ

Since 2012, the semiarid Brazilian Northeast has been suffering from a prolonged drought for five consecutive years, and historically low water levels have been recorded in many reservoirs in the region. In Ceará State, the reservoirs had only 6 to 7% of the total water storage in the past five years. The drought damage over Northeast Brazil is in a serious situation. However, Brazil has not been able to develop practical tools to enhance agricultural drought management. The World Bank has been strongly supporting multiple efforts to strengthen the knowledge and capacity to implement water security approaches globally and the establishment of agricultural drought monitoring and prediction in Brazil in particular. In this context, having learned about ICHARM's agricultural drought monitoring and prediction system, the World Bank commissioned ICHARM to conduct a pilot project on agricultural drought monitoring and prediction over the Northeast Brazil in May 2018. The contract period is one year from May 2018 to April 2019. The project location is Brazil's northeastern region and Ceará State (Figure 1).



Figure 1 Location of the Northeast region and Ceará State in Brazil  
図1 ブラジル北東域・セアラ州

This technical assistance project aims to ensure water resources for sustainable supplies of agricultural water by strengthening the capacity of water-related or-

ganizations and building resilience in water resources management. The project will consist of three components: (1) the development of an agricultural drought monitoring and prediction system for Northeast Brazil; (2) the development of a tailored system to monitor and predict an agricultural drought in Ceará State; and (3) the evaluation of the project outcomes to develop a strategy for applying the developed systems to other states in Brazil and other LAC countries.

In component (1), ICHARM is planning to develop an agricultural drought monitoring and prediction system for Northeast Brazil using the Coupled Land and Vegetation Data Assimilation System (CLVDAS) as a core model. This system will be developed on the Data Integration and Analysis System (DIAS) using rainfed conditions and globally available datasets. In component (2), ICHARM will develop an agricultural drought monitoring and prediction system specifically for Ceará State according to the local context using crop, irrigation, and other information on DIAS. In component (3), ICHARM will suggest a draft strategy to apply the systems to other states of Brazil and other LAC countries, as well as provide lessons and good practices learned through the pilot project and a roadmap and guidelines describing minimum requirements and recommendations for the implementation of a full-scale project.

As a part of this project, the first face-to-face workshop and a field investigation were held in June 2018 in Fortaleza, Ceará State. For the investigation, Director Toshio Koike and Research Specialist Hiroyuki Tsutsui visited several places for different purposes: Jaguarire, Brum, for a pilot recovery project for degraded soil area, Fapija for a community irrigation network (Photo 1), Tropical NE Banesa for a banana plantation (Photo 2), and Castanhão Dam. Through those visits, we recognized that the national and state agencies and the private plantations are highly conscious of drought disaster risks and have a strong interest in agricultural drought information from an agricultural drought monitoring and prediction system to be developed in the new project.



Photo 1. Community irrigation network in Fapija  
写真 1. Fapija コミュニティー灌漑ネットワーク



Photo 2. Banana plantation in Tropical NE Banesa  
写真 2. Tropical NE Banesa バナナプランテーション

The first face-to-face workshop was held, gathering many participants from different organizations including the World Bank, ICHARM (Director Koike and Research Specialist Tsutsui), the Ceará State Meteorology and Water Resources Foundation (FUNCEME), the Secretariat of Agricultural Development of Ceará (SDA), the Federal University of Ceará (UFC), University of Brasilia (UNB) (Photo 3). At the work-



Photo 3. The 1st face to face workshop in Fortaleza, Ceará State  
写真 3. 第 1 回 face to face ワークショップ (Fortaleza, Ceará State)



Photo 4. Activity explanation from ICHARM in the 1st face to face workshop  
写真 4. 第 1 回 face to face ワークショップにおける本プロジェクトの取り組みに関する説明 (ICHARM)

ムによる技術協力は、農業用水資源の持続のための水資源機関の能力強化と、水資源管理における対応力の向上を目的としています。本技術協力において期待される活動は、大きく 3 つのコンポーネントに分けられます：それは、(1) ブラジル北東域における干ばつ監視・予測システムの開発、(2) セアラ州における干ばつ監視・予測システムの開発、(3) 開発したシステムをブラジルの他の州や LAC 諸国に適用する戦略を構築するための、プロジェクト結果の評価です。

コンポーネント (1) において、ICHARM は、主に CLVDAS (Coupled Land and Vegetation Data Assimilation System) を核とするブラジル北東域における農業学的干ばつ監視・予測システムを開発します。本システムは、天水条件下、全球データセットを用いて DIAS (Data Integration and Analysis System) において開発されます。コンポーネント (2) において、ICHARM は、灌漑・穀物情報など現地状況に合わせたセアラ州における農業学的干ばつ監視・予測システムを DIAS において開発します。コンポーネント (3) において、ICHARM は、ブラジルにおける他の州や LAC 諸国へ適応戦略案を作成します。また ICHARM は、演習や、このパイロットプロジェクトを通じて得られた教訓、そしてフルスケールのプロジェクト実施に向けたロードマップや最小限の必要条件や推薦事項を記述しているガイドラインも併せて提供します。

2018 年 6 月には、本プロジェクトの一環として、セアラ州の現地調査と第 1 回 face to face ワークショップが開催され、ICHARM からは小池センター長と筒井専門研究員が参加しました。現地調査では、Jaguarire/Brum における劣化土壌の試験的改良プロジェクト地域、Fapija におけるコミュニティー灌漑ネットワーク (写真 1)、Tropical NE Banesa バナナプランテーション (写真 2)、そして Castanhão ダムを訪問しました。本現地調査を通じて、セアラ州は、国・州機関から民間プランテーションまで、干ばつに対する意識が高く、本プロジェクトにおける農業学的干ばつ監視・予測システムによる干ばつ情報に強い興味を持っていることが分かりました。

さらに世界銀行、ICHARM、Ceará State Meteorology and Water Resources Foundation (FUNCEME)、Secretariat of Agricultural Development of Ceará (SDA)、Federal University of Ceará (UFC)、University of Brasilia (UNB) をはじめとした多くの機関の出席の下、第 1 回 face to face ワークショップが開催されました (写真 3)。世界銀行から本プロジェクトの概要が説明され、FUNCEME からは、セアラ州における最先端の気象学的干ばつ監視・季節予測研究について報告されました。また ICHARM からは、CLVDAS を核としたブラジル北東域・セアラ州における農業学的干ばつ監視・予測システム開発、本プ

プロジェクトの取り組みについて報告されました(写真4)。さらに全出席者によるグループディスカッションが行われ、その結果が本プロジェクトにおける実施計画に反映されました。

その後、ICHARM は、第2回 face to face ワークショップ(2018年10月)に向けて、その実施計画に従い、コンポーネント1におけるブラジル北東域を対象とした農業学的干ばつ監視・予測システムの開発を進めています。

shop, the World Bank provided an overview of this pilot project, and the FUNCME reported about a leading-edge metrological drought monitoring and prediction study in Ceará State. Furthermore, ICHARM explained the agricultural drought monitoring and prediction systems for Northeast Brazil and Ceará State, which use CLVDAS as a core model, and the planned activities of the pilot project (Photo 4). After that, all participants actively joined discussions on various issues related to the project and systems.

After the workshop, the results were brought back and have been incorporated in the implementation design of this project. Currently, ICHARM is working on component 1, developing an agriculture drought monitoring and prediction system for Northeast Brazil according to the implementation design to present the system at the second face-to-face workshop scheduled in October 2018.

(Written by Hiroyuki Tsutsui)

## ICHARM activities on maintenance of rain gauges for flood monitoring, forecasting and early warning activities in Sri Lanka with support from JAXA and DIAS projects / スリランカにおける洪水監視・予測・早期警報のためのリアルタイム自動雨量観測装置メンテナンス活動報告 (JAXA・DIAS プロジェクト)

Rasmy 主任研究員と玉川専門研究員はデータ送信機能付き自動雨量観測装置のメンテナンスを目的にスリランカを訪問しました(Rasmy 主任研究員は2018年8月17日から9月7日、玉川専門研究員は2018年8月17日から8月23日)。スリランカ国から転送される雨量データは、GSMaPの雨量情報をリアルタイムで補正することに用いられ、洪水監視・予測・早期警報の情報に変換され同国に試験的に提供されています。現在、データ送信機能付き自動雨量観測装置9基、独立式雨量観測装置13基がKalu, Gin, Nilwala, Unnichchaiの各流域に設置されています。これら機器の設置・保守や情報の提供は、JAXA PMMの枠組みの下での、同国灌漑局とICHARMにおける共同研究、また、文部科学省のデータ・統合解析システム(DIAS)水課題プロジェクトの枠組みの下で実施されています。

ICHARMは、これらの地上観測雨量計からのデータ、GSMaP Realtime (GSMaP\_NOW) データ、水文モデル、数値気象予測を利用して、Kalu川流域を対象とした洪水監視・予測・早期警報のための先進的なシステムを開発し、現在、DIAS上で試験的に運用し、最新の科学技術の成果をスリランカの水に関わる災害管理・軽減のためにどう活用するか実証しているところです。国家レベルの枠組み(IFI(国際洪水イニシアティブ)やIFIが推進する水のレジリエンスと災害に関するプラットフォーム)の中で、本システムを実証することで、各国が同様のシステムを導入する可能性が高まると考えられます。スリランカでの活動は、水関連災害リスク管理のための最も実践的な戦略を、コミュニティー・

Senior Researcher Mohamed Rasmy and Research Specialist Katsunori Tamakawa visited Sri Lanka during August 17 to September 7 for the maintenance of real-time automatic rainfall observation systems installed there for enhancing the real-time application of GSMaP rainfall products for flood monitoring, forecasting and early warning activities as well as for promoting the ICHARM activities in Sri Lanka. The installation and maintenance of the rainfall observation system have been funded by JAXA's Precipitation Measuring Mission (JAXA-PMM) and DIAS-WATER projects. Presently, nine automatic rainfall observation with transfer systems (AROTS) and 13 stand-alone rainfall observation systems (SROS) are installed in the Kalu, Gin, Nilwala, and Unnichchai river basins. The work has been coordinated by the Irrigation Department (ID) of Sri Lanka.

ICHARM has developed a state-of-art system for flood monitoring, forecasting, and early warning by utilizing these ground gauges, GSMaP Realtime (GSMaP\_NOW) data, a hydrological model, and quantitative weather forecasting for the Kalu river basin and the system is under test operation. DIAS is hosting this system for demonstrating the potential of the latest advancements in science and technology in managing and mitigating water-related disasters in Sri Lanka. Through the demonstration of this system and its merits in international and national platforms (e.g., IFI and its platform on water resilience and disasters), similar systems will be placed in operation in other countries. This activity would be one of ICHARM's legacies in assisting the implementation of best practicable strategies to localities, nations, regions and the globe to manage the risk of water-related disasters. Furthermore, several meetings and discussions were held with stakeholders and organizations to promote the ICHARM activities in Sri Lanka.



The maintenance of the real-time rain gauges system at Kalutaru (left) and Kalawana (right)



Discussion with Irrigation Department (left) and NBRO (right)

国・地域・世界の各レベルで実現するという点で、ICHARM の代表的な活動実績になるのではないかと期待されます。スリランカでの ICHARM の活動をさらに推進するため、両研究員はこの他にも現地関係者と打ち合わせを行いました。



Discussion with Directors and engineers in Batticaloa (left), with vice chancellors and head of Geography Department of South Eastern University (SEUSL) (right)



Delivering a public talk on implementing smart infrastructure in Sri Lanka (left), and receiving a token of appreciation from the Eastern Chapter of institute of Engineers, Sri Lanka (IESL) (right)

(Written by Mohamed Rasmy Abdul Wahid)

## ICHARM special session, "Flood Risk Management in Mountainous Areas," held at an international conference in Morioka, Iwate / 『国際防災・危機管理研究 岩手会議』において ICHARM セッション開催

The "Global Conference on the International Network of Disaster Studies in Iwate, Japan" was held in Morioka City, Iwate Prefecture, on July 17-19, 2018. The conference was organized by three institutes: the Research Center for Regional Disaster Management, Iwate University, Japan; the Center for Crisis Management Research, School of Public Policy and Management, Tsinghua University, People's Republic of China; and the Program on Crisis Leadership, Ash Center for Democratic Governance and Innovation and Taubman Center for State and Local Government, Harvard Kennedy School, USA.

ICHARM hosted a special session on flood risk management in mountainous areas on the morning of the 19th, which was facilitated by Prof. Shinji Egashira, the research and training advisor of ICHARM. The session started with the presentation by Mr. Yusei Sato, an engineer of Iwate Prefecture, who explained the flood damage caused to the Omoto River basin by Typhoon No.10 in 2016 and new prefectural flood management plans. ICHARM researchers also spoke about individual research topics regarding the disasters in the Omoto River basin and northern Kyushu Island. After the presentations, the speakers and other participants actively discussed issues and countermeasures to strengthen flood risk management in mountainous areas.

Prof. Egashira facilitates the session  
江頭研究・研修指導監によるセッション進行Presentation by Mr. Sato  
佐藤技師による発表

2018年7月17日から19日にかけて、いわて県民情報交流センター「アイーナ」(岩手県盛岡市)にて、"Global Conference on the International Network of Disaster Studies in Iwate, Japan" 『国際防災・危機管理研究 岩手会議』が開催されました。これは、岩手大学地域防災研究センター、清華大学公共管理学院危機管理研究センター(中国)、ハーバード大学ケネディスクールクライシス・リーダーシップ・プログラム(米国)の3機関が主催し、岩手県、復興庁が共催した国際会議です。

ICHARM は、江頭研究・研修指導監がファシリテーターとなり、「Flood risk management in mountainous areas 中山間地における洪水リスクマネジメント」というテーマで、19日(木)の9:15から12:30にかけての2セッションを主催しました。セッションにおいては、岩手県土木整備部河川課の佐藤優聖技師から、2016年台風第10号による小本川流域の被害と岩手県による治水対策についてご説明頂いた後、これまで ICHARM が岩手県小本川や九州北部などで行ってきた各研究活動を紹介し、中山間地における洪水リスクマネジメントの課題や在り方について活発な議論を行いました。

(Written by Daisuke Kuribayashi)

## 62nd R&D Seminar / 第62回 R&D セミナー

ICHARM では、水文分野や水災害分野に関する国内外の研究者・有識者を招へいし、国土技術政策総合研究所・土木研究所の幹部及び研究者が最新の知識や知見を入手できる機会として「ICHARM R&D Seminar (ICHARM 研究開発セミナー)」を不定期に開催しています。

2018年8月10日開催の第62回 R&D セミナーは、A.W.Jayawardena 香港大学 土木工学科 非常勤教授をお迎えしました。

同教授は、研究・研修指導監として2007年～2012年まで ICHARM に勤務しており、修士学生の指導を行っていました。このため、R&D セミナーの前日の8月9日に行われた修士学生の Final Presentation にも参加して頂きました。

R&D セミナーでは、「Data driven approaches of hydrological modelling」というタイトルの講演をしていただき、その中では、“artificial neural networks”、“support vector machines”、“fuzzy logic systems”、“dynamical systems”そして“genetic algorithms”などの AI を基盤とするモデル構築技術を活用している適用事例とともに、水文モデルの data-driven アプローチの最近の開発状況を強調されました。質疑応答では、研究者や学生から多数の質問が提議され、活発な意見交換となりました。

ICHARM では今後も様々な機会を捉え、セミナーを開催していく予定です。

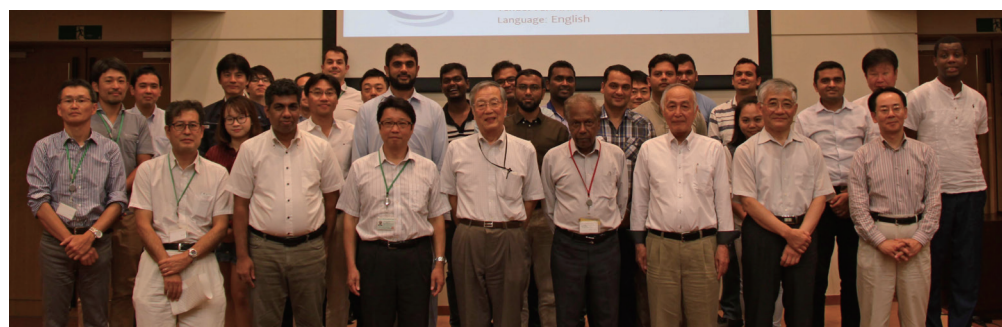
ICHARM holds R&D Seminars to provide self-development opportunities for researchers to keep up with the latest knowledge and information by inviting domestic and international experts in the field of hydrology and water-related disasters.

The 62nd R&D Seminar was held on August 10, 2018, inviting Prof. A. W. Jayawardena of the Department of Civil Engineering, The University of Hong Kong. He worked at ICHARM from 2007 to 2012 as the training and research advisor. He delivered a lecture titled “Data-Driven Approaches of Hydrological Modeling,” highlighting recent developments in data-driven approaches of hydrological modeling with examples of applications using AI-based modeling techniques, such as artificial neural networks, support vector machines, fuzzy logic systems, dynamical systems, and genetic algorithms. In the Q&A session, researchers and students of ICHARM's graduate programs had lively discussions with the professor, asking many questions and exchanging creative ideas. On the day before the R&D seminar, he also attended the Final Presentation, in which the master's course students spoke about their research thesis.



Prof. A.W. Jayawardena  
Department of Civil Engineering,  
The University of Hong Kong  
A.W.Jayawardena 香港大学  
土木工学科 非常勤教授

ICHARM will continue to hold R&D seminars on many occasions.



Group photo with audience / 聴講者とともに集合写真

(Written by Mikiko Nakamura)

# Training & Education

## ICHARM's new Ph.D. program and the recruitment of new master's and Ph.D. students / ICHARM の新博士課程と修士・博士のリクルート活動

ICHARM の教育・研修に関する最近の話題です。ICHARM では2010年度から GRIPS と連携して博士課程「防災学」を実施し、これまで9名の卒業生を輩出しています。2018年、JICA は、ICHARM の「防災学」の応募者などを対象とし、新たな留学生プログラム制度を創設しました。この制度は2015年仙台で開催された国連防災世界会議の場において日本が表明した人材育成に沿ったもので、知日派リーダーを育成し、途上国との中長期かつ良好な関係の構築・維持を目的としています。アジアの対象国の政府機関の職員で、ICHARM では今後5年間、毎年2名の受入を行なう予定です。

ICHARM では、この制度により就学する学生に対して、将来、各々の国の防災政策の幹部として活躍して

In 2010, ICHARM launched the Disaster Management Ph.D. Program in collaboration with the National Graduate Institute for Policy Studies (GRIPS) of Japan, and has since graduated nine students. In 2018, the Japan International Cooperation Agency (JICA) created a new doctoral program for disaster management practitioners, including possible applicants for the current ICHARM-GRIPS doctoral program. At the Third United Nations World Conference on Disaster Risk Reduction, held in Sendai, Japan, in 2015, the Japanese government announced that it would create capacity development programs for people from developing countries to study expertise in Japan, hoping that they will also learn a great deal about Japanese society and culture and become bridges between Japan and their countries in building and maintaining a good, long-term partnership. The new Ph.D. program is part of this national policy and scheduled to accept two students every year for five years.

For the success of the new program, ICHARM is vigorously working with GRIPS to upgrade the curriculum by including more contents focusing on policy development in addition to the scientific and technological contents provided in the pre-

vious program. The new program is designed that alumni will lead national/local disaster management policy in their countries.

On October 3, the opening ceremony of the 2018 master's and doctoral programs was held at GRIPS for eight master's students and three doctoral students. Of the three, two Ph.D. students, Mr. Selvarajah Hemakanth from Ministry of Irrigation and Water Resources of Sri Lanka and Mr. Nguyen Van Hoang from Ministry of Agriculture and Rural Development of Vietnam, will be studying under the new JICA program.

Mr. Hemakanth is particularly interested in studying an early warning system for floods and landslides in rivers in Sri Lanka and will be supervised by Director Toshio Koike. Mr. Hoang will be studying rainfall forecasting and integrated dam operation for specific rivers in Vietnam to develop more effective water resources policies, and supervised by Research Specialist Yoshihiro Shibuo. Both students are thrilled to be able to concentrate on their research for the next three years at ICHARM with researchers and other students.

From this year on, ICHARM is hoping to continue accepting students with leadership qualities to carry on national efforts in disaster management and water resources in their countries. To this end, we step up our effort to recruit competent individuals in developing countries for the master's and doctoral programs. In this past August, we visited the Philippines to meet with officials in charge at CHED (Commission on Higher Education), PAGASA, DPWH, and a local JICA office. In the meetings, we explained the new program and heard details about the applicant selection process from the Filipino side. The meetings were also great opportunities to exchange opinions for the successful operation of the program. We are planning to continue this recruitment campaign for other countries.



Mr. Selvarajah Hemakanth (left) and Mr. Nguyen Van Hoang (right)

Selvarajah Hemakanth 氏 (左) と Nguyen Van Hoang 氏 (右)



Meeting on the master's and doctoral programs at CHED, Philippines

フィリピン高等教育委員会と修士・博士プログラムに関して打ち合わせ

もらうことを念頭に、従来までの科学技術の教育・研修に加え、GRIPSと連携し政策に関するカリキュラムの充実を図ることとしています。

本年 10 月 3 日には GRIPS において、2018 年度の修士及び博士課程の入学式が行われ、修士課程に 8 名、博士課程に 3 名が入学しました。博士課程のうち 2 名は JICA の新留学生プログラムを用いた学生で、スリランカかんがい水資源省職員の Selvarajah Hemakanth 氏とベトナム農業農村開発省職員 Nguyen Van Hoang 氏です。

Hemakanth 氏は、スリランカの河川を対象とした洪水・地すべりに関する早期警報システムに関する研究を希望していて、小池センター長が指導教官となります。また、Hoang 氏はベトナムの特定河川を対象として水資源政策立案のための降雨予測及び統合的ダム運用に関する研究を希望していて、渋尾専門研究員が指導教官となります。両者ともに、ICHARM の他の多くの研究員や学生とともに、つくばでの 3 年間の研究活動を行なえることを大変喜んでいました。

ICHARM としては、来年度以降も各国の防災・水資源政策をリードすることが期待される人材を受入れることとしています。このため、各国への修士・博士課程の学生リクルート活動を強化することとしました。本年 8 月には、まず、フィリピンを訪問し、CHED (高等教育委員会)、PAGASA (大気地球物理天文局)、DPWH (公共事業道路省)、JICA 事務所の幹部或いは担当者に対して、ICHARM 職員から教育・研修制度の説明を行なうとともに、フィリピン政府 (高等教育委員会、PAGASA 他) から応募者選考方法などの説明を受け、ICHARM が GRIPS 及び JICA と連携して実施している博士及び修士課程がより有意義なものとなるように意見交換を行ないました。今後、主要国に対してのリクルート活動を継続して行なう予定です。

(Written by Yoshio Tokunaga)

## Comments from new doctoral course students /

### 博士課程 新研修員からのコメント

Three students joined the 2018-2021 doctoral program in October. They would like to say brief hello to the readers around the world.

2018 年 10 月、2018-2021 年度 博士課程に 3 人の研修員が加わりました。彼らからのコメントをここに紹介いたします。



**Selvarajah Hemakanth** (from Sri Lanka)

Supervisor: Director Toshio Koike

I am Hemakanth Selvarajah from Sri Lanka and I have been working as Irrigation Engineer in Irrigation Department since March 2008 and involved in works under several sub divisions of Irrigation Department. I got the Bachelor of the Science in Civil Engineering from the University of Ruhuna in Sri Lanka and the Master in Civil Engineering from the University of Tokyo in Japan. I worked as Divisional Irrigation Engineer who managed the dams and irrigation schemes with administrative and financial authorities. Mainly water management and flood management were the key components of my routine work. And I worked as a Design Engineer for a certain period at a capacity of designing large irrigation structures such as radial gated spillways of dams in Sri Lanka.

I would like to express my sincere gratitude to ICHARM for accommodating me for the Ph.D. in Disaster management Program. I am sure that the next three years are going to be the most valuable period of my life. Because by looking at

the curriculum, the exposure which I am going to get in the Disaster Risk Reduction at this institute would be crucial for me to transform myself as the study is basically combination of natural science and technology and policy. My Ph. D. research topic is Development of an Integrated Multy Catchment Water Management Plan and Investigating the Economic and Policy Issues in Eastern Dry Zone of Sri Lanka.



**Nguyen Van Hoang** (from Vietnam)

Supervisor: Research Specialist Yoshihiro Shibuo

My name is Nguyen Van Hoang from Vietnam. I work for Sub Department of Natural Disaster Prevention and Control of Central and Highland Regions, Department of Disaster Response and Recovery, Vietnam Disaster Management Authority, Ministry of Agriculture and Rural Development of Vietnam.

In fact, I received my master's degree in Disaster Management Policy in the Water-related Risk Management course in 2016-2017 organized by ICHARM, JICA and GRIPS. I am very much delighted to be able to come back to ICHARM to participate in the doctoral course of Disaster Management Program, starting from this Autumn. My master's thesis was about investigating possibility in reducing flood damages in downstream while maintaining the water level in the upstream hydro-power dam by pre-releasing stored water, which was done through hydrological simulation. I am interested in pursuing this research topic further. Furthermore, I aim for my research to be able to contribute to alleviate the water-related hazard issues in the central Vietnam, by providing science and technology-based suggestions which can be further combined with policy framework that can be practically applied in Vietnam.



**Osamu Itagaki** / 板垣 修 (from Japan)

Supervisor: Director Toshio Koike

I am civil engineer, working in Flood Disaster Prevention Division, River Department, National Institute for Land and Infrastructure Management (NILIM), Ministry of Land, Infrastructure, Transport and Tourism (MLIT). I live in Tsukuba city with my wife and two daughters (junior high school students) and one son (kindergarten). I with my family lived in Syria for three years (from 2007 to 2010), and in the Philippines for two years (from 2015 to 2017).

My current main research topics are, (1) How to prepare flood risk information based on limited available data in localities, (2) How to prepare easy-to-understand/ use flood risk information for diverse stakeholders, (3) How to promote flood risk reduction measures in an effective way, and (4) How to validate flood risk information.

I wish to train myself through the Ph.D. course, and to contribute to flood risk/damage reduction around the world.

I assume that by reducing the flood risk in an area, the average annual flood damage in the area will be reduced, and the area will succeed in saving the loss caused by the flood on average. The saved loss will bring the more wealth stored in the area. And the more wealth in the area will bring the larger possibility of comfort and happiness to the people in the area.

## Educational Program Updates / 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」活動報告

2018年9月13日にJICA筑波にて11期目の修士課程の閉講式が行われました。ICHARMの小池センター長、JICA筑波の高橋所長、GRIPSの春原教授による祝辞が贈られ、研修員からは代表としてMesake Mataitoga氏（フィジー）が答辞を行いました。8月9日に実施された最終のプレゼンテーションの結果と論文を総合的に判断し、優れた研究成果を残した学生に贈られるBest research awardがAsghar Malik Rizwan氏（パキスタン）、Jayasinghe Roshan Indika氏（スリランカ）の2名に、研修中に最も参加者全体のために貢献した研修員に対してICHARMから授与される「Sontoku Award」がVenkatesan Vasanthakumar氏（インド）に、それぞれ贈られました。翌日はGRIPSにて博士課程及び修士課程の学位授与式が行われ、修士課程の研修生14名に「修士（防災政策）」の学位が、博士課程のAsif Naseer氏、



Closing Ceremony for the Knowledge Co-Creation Program on "Flood Disaster Risk Reduction" in JICA TSUKUBA  
JICA筑波での「防災政策プログラム水災害リスクマネジメントコース」閉講式

On September 13, 2018, the closing ceremony of the eleventh years of ICHARM master's program was held at the JICA Tsukuba office, where ICHARM Director Toshio Koike, JICA Tsukuba Director Masayuki Takahashi, and GRIPS Professor Hiroki Sunohara made a congratulatory speech, and Mr. Mesake Mataitoga of Fiji spoke in return on behalf of the students.

The Best Research Award was presented to Mr. Asghar Malik Rizwan of Pakistan and Mr. Jayasinghe Roshan Indika of Sri Lanka this year. The award was given those two by ICHARM and GRIPS to laud them for excellent work based on their master's theses and final presentations delivered on August 9. The Sontoku Award, given every year by ICHARM to the student who has made the most contribution to the entire class during the program, was presented to Mr. Venkatesan Vasanthakumar of India this year.



Graduation Ceremony in GRIPS  
GRIPS での卒業式

On the following day, the graduation ceremony was held at GRIPS. The fourteen students were finally awarded a hard-earned master's degree. In this ceremony, Mr. Asif Naseer and Mr. Mahtab Mohammad Hossain were also awarded a doctoral degree in Disaster Management.

Meanwhile, a new set of 8 students have started the twelfth year of the master's program. On October 1, the opening ceremony was held at ICHARM in the presence of JICA Tsukuba Director Takahashi and PWRI President Kazuhiro Nishikawa along with other JICA officials and PWRI executives. Three more students also joined the ninth-year doctoral program in October.



Opening Ceremony in ICHARM / ICHARM での開講式

(Written by Tomoki Nakamura)

Mahtab Mohammad Hossain 氏に「博士（防災学）」の学位が授与されました。

10 月からは、12 期目の修士課程が開始され、1 日に ICHARM にて開講式を行いました。JICA 筑波からは高橋所長及び事務担当者、土木研究所から西川理事長及び幹部職員が参加しました。本年度は 8 名が 1 年間の研修を受けます。また、10 月に 9 期目の博士課程 3 名も入学しました。

## Comments from graduated students of Ph.D. course / 博士課程卒業生からのコメント

Two Ph.D. students of the Disaster Management Program, Dr. Naseer Asif and Dr. Mahtab Mohammad Hossain, successfully completed all requirements and received a Doctoral Degree in Disaster Management at the graduation ceremony held at GRIPS on September 14, 2018.

They contributed brief comments as below while looking back on last 3 years at ICHARM.

### Naseer Asif (from Pakistan)

I always had a passion burning inside me to do something big, to do something substantial and to pay back my homeland in any little possible way. Being selected for Ph.D. program at the National Graduate Institute for Policy Studies (GRIPS) in collaboration with International Centre for Water Hazard and Risk Management (ICHARM) under the auspices of UNESCO and Public Works Research Institute (PWRI) was definitely a milestone in my journey towards achieving my dream.

博士課程「防災学プログラム」の 2 名の研修員、ナシール アシフ氏とマフタブ モハマド ホセイン氏は無事に審査に合格して 2018 年 9 月 14 日に GRIPS（政策研究大学院大学）で行われた卒業式で博士（防災学）の学位を取得しました。

彼らからの ICHARM で過ごした 3 年を振り返ったコメントを紹介します。

I belong to a country which has massive potential but unfortunately it remains unexploited due to lack of prospects. I had always been looking for a platform required to reinforce my academic qualification for a better contribution towards the amelioration of society. Due to my humble background at home, it was almost unimaginable for me to think about getting education of this quality which I have been able to get fortunately at this alma mater. I would always feel that my potential remained unexploited due to lack of infrastructure and resources in my homeland for aspirants like me. This experience, which has lasted about 3 years, have completely transformed and revolutionized my academic ability. Besides attaining advanced and cutting-edge theoretical knowledge, I have been quite fortunate to look closely at the beauty of life and culture of Japan and its' people. ICHARM has given me the honor and privilege of learning in world's premier institute for flood hazard and water resource management and working in state-of-the-art research facilities under the supervision of extremely competent and helpful professionals.

This has also helped me in honing my peoples' skills and also teaching me management and coordination, the necessary tools to excel in any professional organization.

I would like to pay heartiest gratitude to ICHARM, GRIPS and PWRI for giving me these memories which I shall cherish forever.



Dr. Naseer Asif (right) with Director Toshio Koike (left)

### Mahtab Mohammad Hossain (from Bangladesh)

It is almost three years; Mohammad Mahtab Hossain worked in ICHARM as a research assistant since October, 2015. I spent memorable moments in Japan but it is now heart breaking for me that I have to leave Japan. I was directly enlightened by all of you. But, this is time to go back to own country and apply the acquired knowledge for reducing the disaster damage. The objective of my Ph.D. research is to develop a methodology for identifying cost-effective strategies to prevent boro crop damage and increase economic benefits in the haor areas of Bangladesh. I am expecting that the collaboration will be continued in future to achieve the research goal.

I would like to express my sincere gratitude and profound appreciation to my supervisor Associate Professor, M. Ohara, for continuous and patience cooperation to reach at the end. I am grateful to Professor T. Koike, Professor S. Egashira, Associate Professor, M. Rasmy for their sincere comments. Special thanks to Mr. Y. Tokunaga, Dr. Shibuo San, Ms. Y. Okawa San, Ms. M. Nakamura San. Finally, I am proud to be a member of the ICHARM family. I wish all the best for ICHARM's future.



Dr. Mahtab Mohammad Hossain (left) with Supervisor Miho Ohara (right)

## UNESCO Pakistan Project: International training on river discharge and sediment transport assessment in Indonesia / ユネスコパキスタンプロジェクト：インドネシア国における流量流砂量計測に関するトレーニング実施

ユネスコ・パキスタンプロジェクトの一環で、流量・流砂量計測に関する現地トレーニングを実施した。土木研究所からの参加者は水工研究グループ（併：水災害研究グループ）の萬矢主任研究員と水工研究グループの小関研究員である。期間は平成30年7月22日（日）～7月28日（土）7日間であり、場所はインドネシア国バンジェルマシン市である。流砂観測に関するトレーニングはあまり多くないこと、途上国における土砂災害は深刻であることから、このようなトレーニングへの高い関心が伺え、本トレーニングでは、パキスタン、アフガニスタン、インド、インドネシアの政府機関の職員が出席した。

As part of the UNESCO Pakistan project, "Strategic Strengthening of Flood Warning & Management Capacity of Pakistan", ICHARM conducted a week-long training workshop on river discharge and sediment transport assessment in Banjarmasin, Indonesia, on July 22-28, 2018. Senior Researcher Atsuhiko Yorozyuya, who is also with the Hydraulic Engineering Research Group of PWRI, led this workshop with Hiroshi Koseki, a researcher of the Hydraulic Research Group. The training participants were river engineers from the governments of Pakistan, Afganistan, India, and Indonesia. Pakistan sent the largest group of 15 engineers: one from the Water and Power Development Authority (WAPDA); two each from the Pakistan Council of Research in Water Resources (PCRWR), the Federal Flood Commission (FFC), and a university; and eight from provincial irrigation departments of Punjab, Khyber Pakhtunkhwa, Sindh, and Balochistan. All participants were excited about this occasion, especially learning sediment transport assessment, because workshops for the subject are rare and sediment disaster risk management is an urgent matter for the participants' countries.

The training workshop consisted of three parts: 1) lectures on the working of devices and methods; 2) lectures on river discharge and sediment transport assessment; and on-site training. As part of the training, the participants learned how to operate an acoustic Doppler current profiler (ADCP), a high-tech measurement device introduced through the UNESCO project and currently used by PCRWR. Twenty out of the 22 participants had their first ADCP experience in this training. The remaining two, participating from PCRWR, have so far attended several ADCP training workshops. Watching them handling the device, the instructors were pleased to see their technical improvement.

For more information, visit the following address:

[http://www.unesco.org/new/en/jakarta/about-this-office/single-view/news/discharge\\_and\\_sediment\\_transport\\_assessment\\_on\\_barito\\_river/#.W3Jhg5SomUs.facebook](http://www.unesco.org/new/en/jakarta/about-this-office/single-view/news/discharge_and_sediment_transport_assessment_on_barito_river/#.W3Jhg5SomUs.facebook)



Mr. Ali Behzad and Mr. Arslan Muhammad Aslam of PCRWR prepare the ADCP

PCRWR の Ali Behzad 氏 と Arslan Muhammad Aslam 氏が計測器を設定している様子



Senior Researcher Yorozuya (front row, third from right) with the training participants  
萬矢主任研究員（前列、右から3番目）とトレーニング参加者

(Written by Atsuhiko Yorozuya)

パキスタン国からの出席者は Pakistan Council of Research in Water Resources (PCRWR) から2名、パンジャブ、カイバル・パクトゥンクワ、シンド、バロチスタン州の灌漑局から8名、Federal Flood Commission (FFC) から2名、Water and Power Development Authority (WAPDA) から1名、大学から2名である。

本トレーニングは以下の三つの要素で構成されている。それらは1) 計測機器の原理、観測手法に関する座学、2) 流量・流砂量観測に関する座学、3) 流量・流砂量観測に関する現地実習である。今回のトレーニングにおいて、参加者22名中20名が初めて Acoustic Doppler Current Profiler (ADCP) に触れた。この計測機はユネスコプロジェクトで準備し、現在では PCRWR が使用しているものである。本トレーニングにおいても PCRWR が使用している ADCP を用いて現地実習を実施した。PCRWR から出席した2名はこれまで数回の計測トレーニングを受けてきているが、彼らが自分たちで使用している様子をうかがい知ることができた。

このトレーニングの様子は以下のページでも紹介されている。

[http://www.unesco.org/new/en/jakarta/about-this-office/single-view/news/discharge\\_and\\_sediment\\_transport\\_assessment\\_on\\_barito\\_river/#.W3Jhg5SomUs.facebook](http://www.unesco.org/new/en/jakarta/about-this-office/single-view/news/discharge_and_sediment_transport_assessment_on_barito_river/#.W3Jhg5SomUs.facebook)

## Information Networking

**Side Event “Hydrology Towards Sustainable Resilient Societies” at the United Nations High-Level Political Forum on Sustainable Development / 国連・持続可能な開発に関するハイレベル・ポリティカル・フォーラムでのサイドイベント「持続可能で強靱な社会に向けた水文学」**

The United Nations High-level Political Forum on Sustainable Development (HLPF) meets annually for eight days, including a three-day ministerial segment. The Forum's first meeting was held on September 24, 2013. It replaced the Commission on Sustainable Development (CSD), which had met annually since 1993. The HLPF is the main United Nations platform on sustainable development and plays a central role in the follow-up and review of “the 2030 Agenda for Sustainable Development: the Sustainable Development Goals (SDGs)” at the global level.

HLPF2018 was held on July 9-18, 2018, under the theme of “Transformation towards sustainable and resilient societies.” The meeting reviewed progress in the achievement of the SDGs, particularly focusing on Goal 6 “Ensure availability and sustainable management of water and sanitation for all” and Goal 11 “Make cities and human settlements inclusive, safe, resilient and sustainable,” as well as Goals 7, 12, 15, and 17.

On July 10, WMO and UNESCO-IHP organized a side event, “Hydrology Towards

国連・持続可能な開発に関するハイレベル・ポリティカル・フォーラム (HLPF) は、1993年より毎年開催されてきた持続可能な開発委員会 (CSD) に置き換わる形で設立され、2013年9月24日の第1回会合以来、3日間の閣僚会合を含めて毎年8日間開催されています。このHLPFは持続可能な開発に関する国連としての主要なプラットフォームであり、持続可能な開発のための2030アジェンダ・持続可能な開発目標 (SDGs) について地球レベルでフォローアップ及びレビューを行う中心的な役割を担っています。

2018年のHLPFは「持続可能で強靱な社会に向けた変革」と題して7月9～18日に開催され、SDGs達成に向けた進捗状況のレビューを行

うとともに、今回は特に目標6「すべての人々の水と衛生の利用可能性と持続可能な管理を確保する」、目標11「包摂的で安全かつ強靭で持続可能な都市及び人間居住を実現する」、そして目標7、12、15、17に重点が置かれました。

このHLPF開催期間中の7月10日には、WMOとUNESCO-IHPによるサイドイベント「持続可能で強靭な社会に向けた水文学」が開催され、持続可能な社会の構築、SDGsへの貢献における教育、人材能力、科学技術とイノベーション、そして水文サービスなどの様々な項目についての役割を提示することについて議論を行いました。また、本サイドイベントは、知識や教育、水文サービス、能力開発が科学に基づく賢明な意思決定をどのように支援できるのかについて、具体的な成果を提供することを目的としました。ICHARMはUNESCOとWMOのパートナー機関として、同じくユネスコ・カテゴリー2センターである統合水資源管理国際センター (ICIWaRM) とともに参加しました。

サイドイベントの冒頭、WMOの水文委員会 Harry Lins 会長、WMO 国連代表部の Paul D. Egerton 氏、UNESCO 水科学部の Blanca Jimenez-Cisneros 部長から挨拶があり、セッションは UNESCO の Anil Mishra 氏が進行役を務めました。その後、各国の事例についての発表があり、タジキスタン国連代表部 Mahmadamin Mahmadaminov 大使からは6月20～22日に同国ドシャンベで開催された「持続可能な開発への水 2018-2028：行動への国際10年に関するハイレベル国際会議」の取り組みについて紹介がなされました。ICHARMからは池田鉄哉上席研究員から「IFIの取り組みが盛んな国での水のレジリエンスと災害に関するプラットフォームの進捗」について、フィリピン、パキスタン、ミャンマー、スリランカの事例について発表を行いました。発表では、各国でのプラットフォーム設立についての進捗を紹介するとともに、データの収集・共有、洪水予報、洪水リスク評価といった具体的な行動について発表を行い、こうした現場レベルでの取り組みについて参加者から高い関心が寄せられました。

その後、「科学と政策の相互作用：機会、反応、オプション、そして提案」と題してパネルディスカッションが行われ、小池俊雄センター長がパネリストとして参加しました。同じ時期に日本では西日本を中心に甚大な洪水被害が発生していたこともあって、小池センター長からは近年、気候や水災害のパターンが変わってきていることから、日本で政策や法制度が改められてきたこと、こうした水災害リスクの軽減に対して科学技術からの貢献が重要であることが強調されました。今回のサイドイベントは、WMOやUNESCOといった協力機関と緊密に連携を図りつつ、IFIの進捗について、また日本の洪水対策について紹介する貴重な機会となりました。

Sustainable Resilient Societies,” which showcased their roles in various elements including education, human capacity, science technology and innovation as well as hydrological services for building sustainable societies and contributing to the SDGs. The side event also provided concrete inputs on how knowledge and education along with hydrological services and capacity development can support smart science-based decision making. ICHARM joined this side event as a partner organization together with the International Center for Integrated Water Resources Management (ICIWaRM), both of which are UNESCO Category 2 Centres.

The side event started from introductory remarks by Dr. Harry Lins, the president of the Commission of Hydrology, WMO, Mr. Paul D. Egerton, the WMO representative to the UN, and Dr. Blanca Jimenez-Cisneros, the director of the Division of Water Sciences, UNESCO. Dr. Anil Mishra from UNESCO moderated the session. The country case presentation followed. Mr. Mahmadamin Mahmadaminov, the permanent representative of Tajikistan to the UN, presented the efforts by the International High-Level Conference on the International Decade for Action “Water for Sustainable Development, 2018-2028,” which was held in Dushanbe, Tajikistan, on June 20-22, 2018. From ICHARM, Chief Researcher Tetsuya Ikeda made a presentation on “Progress of the Platforms on Water Resilience and Disasters in the IFI active countries” on behalf of the Philippines, Pakistan, Myanmar and Sri Lanka. He explained the progress in the establishment of a Platform in each country and concrete actions such as data collection and sharing, flood forecasting, and flood risk assessment. All the participants paid high attention to the efforts on the ground.

The panel session, “Science Policy Interaction: Opportunities, Response, Option and Recommendation,” took place after the presentations, and Director Toshio Koike participated as a panelist. Taking a recent severe flood disaster in the western part of Japan for example, Director Koike explained how Japan has revised its policies and laws to cope with the changing patterns of climate and water-related hazards in recent years. He also stressed the important role of science and technology in water-related disaster risk reduction. The side event was a valuable opportunity to introduce the recent progress of the IFI activities and the efforts of flood management in Japan in close collaboration with its partner organizations such as WMO and UNESCO.



Side event at the HLPF 2018 / HLPF 2018 でのサイドイベント

(Written by Tetsuya Ikeda)

## Overseas Academic Investigation: Model Development for Forecasting Flood Risk of Large Rivers in consideration of Climate Change and Socioeconomic Scenario / 基盤研究 (B15H05136) 海外学術調査：気候変動及び社会経済シナリオを考慮した広域河川氾濫リスク予測モデル開発の活動

Research Specialist Young-Joo Kwak has been leading a Grants-in-aid for Scientific Research B project, "Overseas Academic Investigation: Model Development for Forecasting Flood Risk of Large Rivers in consideration of Climate Change and Socioeconomic Scenario," as the principal investigator. The following reports the recent two main activities of the project in which Kwak published the results obtained in the final project year.

科研費研究課題（基盤研究 B 海外学術調査：気候変動及び社会経済シナリオを考慮した広域河川氾濫リスク予測モデル開発、代表：郭 榮珠）の最終年度の成果を公表し、さらに発展させるため、以下のように 2 件の研究活動を行いました。

### 1st activity

#### 2018 IEEE International Geoscience and Remote Sensing Symposium (IGARSS)

Kwak participated in the 2018 IEEE International Geoscience and Remote Sensing Symposium (IGARSS) on "Observing, Understanding and Forecasting the Dynamics of Our Planet," held in Valencia, Spain, on July 23-27, 2018. Kwak and Dr. Ramona Pelich, an international collaborator of the project, organized and co-chaired a two-day invited session, "Advanced Flood Monitoring and Prediction for Global Disaster Risk Reduction." They introduced and discussed advanced flood mapping for further flood risk reduction around the world. They were also successful in building a strong network of international experts in the field (Photo 1).

Besides moderating the session as a co-chair, Kwak also delivered a presentation on "Improved Flood Mapping Based on the Fusion of Multiple Satellite Data Sources and In-situ Data" at the New Remote Sensing Techniques and Methods II session and another presentation on "Effect of Building Orientation on Urban Flood Mapping Using ALOS-2 Amplitude Images" at the SAR Water Applications session.



Photo 1 upper: Research Specialist Kwak, bottom: Participants  
写真1 招待セッションで議論を行う様子（上：座長 郭専門研究員、下：セッション）

#### 2018IGARSS における招待セッション開催及び研究成果の発表

地球の観測、理解、そして予測をテーマにした第 38 回地球科学・リモートセンシング技術シンポジウムで（2018 年 7 月 23 日から 27 日までスペインのバレンシア市、フェリエバレンシア・コンベンションセンターにて開催）郭専門研究員と Dr. Ramona Pelich（ルクセンブルク科学技術研究所（LIST））は、招待セッションの座長を 2 日間に渡って務めるとともに、セッションの進行を通して世界災害軽減に向けて緊急対応可能な最先端洪水マッピング技術を紹介、討議を行い、研究進展のネットワークを形成することができました（写真 1）。

また郭専門研究員は、New Remote Sensing Techniques and Methods II セッションにて "Improved Flood Mapping Based on the Fusion of Multiple Satellite Data Sources and In-situ Data" と SAR Water Applications セッションで "Effect of Building Orientation on Urban Flood Mapping Using ALOS-2 Amplitude Images" という二つの最新研究成果についても発表しました。

#### Research meeting with LIST scientists

Kwak visited the Luxembourg Institute of Science and Technology (LIST) on July 30-31, 2018, to have a research meeting with LIST scientists of its Environmental Research and Innovation (ERIN) department. He discussed advanced flood mapping, particularly urban flood mapping, by using, comparing and fusing Sentinel-1 and ALOS-2 data. ERIN's Team leader Dr. Carlos Lopes and Kwak agreed on the possibility of collaborative research in the near future to improve the accuracy of urban flood detection.

#### ルクセンブルク科学技術研究所（LIST）と打合せ

また、郭専門研究員は、2018 年 7 月 30 日～ 31 日にルクセンブルク科学技術研究所（LIST）の ERIN（Environmental Research and Innovation）Department を訪問し、研究に関する打ち合わせを行いました。ICHARM 紹介をはじめ、研究での当面の課題である最先端人工衛星リモートセンシングによる洪水マッピング、特に合成開口レーダ（Sentinel-1 and ALOS-2）データの活用、比較、融合による都市洪水マッピングの正確度向上に関して、ERIN Department のチームリーダーの Dr. Carlos Lopez 氏と今後の相互研究協力の可能性について意見が一致しました。



Photo 2 Two-day meeting with LIST scientists: (from left) Kwak, Dr. Patrick Matgen, Dr. Marco Chini, Dr. Renaud Hostache, Dr. Carlos Lopez, and Dr. Yurchenco Vitaliy from iGEO on July 30-31, 2018

写真2 LIST の研究者と 2 日間の研究打ち合わせ（左から郭、Dr. Patrick Matgen, Dr. Marco Chini, Dr. Renaud Hostache, Dr. Carlos Lopez, and Dr. Yurchenco Vitaliy from iGEO）2018 年 7 月 30～31 日

## 2nd activity

### 3rd International Workshop on "Community-based integrated flood risk and water resource management for disaster risk reduction"

Research Specialist Young-Joo Kwak was invited to attend the 3rd International Workshop on "Community-based Integrated Flood Risk and Water Resource Management for Disaster Risk Reduction," held on September 5, 2018, in Dhaka, Bangladesh. On the day before the workshop, he met with Mr. Mahfuzur Rahman, the general director of the Bangladesh Water Development Board (BWDB), to have a preparatory meeting on the workshop and related research activities. He first thanked the general director for the invitation and then explained the purpose of the research activities with workshop. They also agreed that ICHARM and BWDB should build and strengthen a mid- and long-term partnership.

On the following day, Kwak opened the workshop with a keynote speech on "Emergency Flash Flood Mapping for Disaster Risk Reduction: 2018 Flood in Bangladesh" with help from the JICA Bangladesh Office. Mr. M. Arifuzzaman Bhuyan, Executive Engineer of the BWDB Flood Forecasting and Warning Center, also delivered a presentation on "ICHARM-BWDB Co-research Activities Focusing Flood Forecasting and Flood Mapping," explaining a joint effort between ICHARM and BWDB in taking emergency flood measures during the May 15, 2018 flood. Prof. Wataru Takeuchi of the University of Tokyo was also invited as a keynote speaker and made a presentation on "Remote Sensing of Flood Extent with Low-Cost Water Level Sensing in Bangladesh." After the speeches, a panel discussion was held with other participants, in which Kwak called on neighboring countries and international cooperation agencies for participation in flood risk reduction efforts, stressing that the efforts should not be limited to a single country.

In response to a request from BWDB, Prof. Takeuchi and Kwak conducted flood mapping technical training as a joint session between the University of Tokyo and ICHARM for 10 local managers and practitioners specially selected beforehand.

Kwak also conducted an on-site validation of a near-real-time flood map and an onsite investigation of flood damage, using the information of high-risk locations provided by BWDB.

Previously, Kwak produced a flood map based on the information collected from emergency satellite observation right after the June 15, 2018 flash flood in the Manu River, which flows through Syhlet of the Moulvibazar district in the Magna River basin. Taking advantage of this occasion, he validated the map, as well as investigated flood damage, using smart devices including drones with advanced sensing technology to promote "smart" investigation in Bangladesh.

#### BWDB-JICA 共催の第3回国際ワークショップ及び関連研究活動：9月2日～9月16日

「地域社会にもとづいた統合洪水リスク・水資源管理」をテーマとした2018年9月5日のワークショップが開催され、郭専門研究員が参加しました。本ワークショップの前日には、Mahfuzur Rahman 長官に対して、招待されたことへのお礼とワークショップを含む関連研究活動の趣旨を説明し、中長期的な協力関係を構築しさらに強化させることで意見が一致しました。本ワークショップは、在バンラデシュ JICA 事務所の協力を受けて開催され、郭専門研究員の基調招待講演「緊急観測洪水速報図：2018年バンラデシュ洪水」を皮切りとして、バンラデシュ水資源開発庁（以下 BWDB）の洪水予報警報センター責任者 Arifuzzaman Bhuyan 氏から「ICHARM と BWDB との協力研究活動洪水予報及び洪水マッピング」と題し、2018年6月15日の緊急洪水時に ICHARM と BWDB が共同で洪



BWDB conference room, Dhaka on September 4, 2018



Workshop at BWDB with some 60 participants  
BWDB 会議室にて：本ワークショップの60人余りの参加者とグループ写真

水対策に取り組んだ事例を発表、また東京大学 生産技術研究所の竹内渉教授の基調招待講演「低費用水位観測システムに伴う衛星洪水氾濫域マッピング (Remote sensing of flood extent with low-cost water level sensing in Bangladesh)」へと続き、最後に参加関係者とのパネル討議で、バングラデシュ国内の減災課題のみを対象とするのではなく、近隣諸国や国際協力機関に呼びかけを行いました。

引き続き、BWDB からの要請を受け、事前に選抜した優秀な管理者や実務者 10 人を対象に ICHARM- 東京大学 (竹内渉教授) 共催の洪水マッピング技術トレーニングを行いました。

最後に、2018 年 6 月 15 日にマグナ流域のシレット管区のマウルビバザール州を流れるマヌ川で発生したフラッシュ洪水を対象に郭専門研究員が作成した緊急観測洪水速報図について、BWDB から提供されたリスク情報をもとにスマートな現地検証 (ドローンのセンシング技術も含む)・洪水被害調査を実施しました。

The visit to Europe and Bangladesh were very fruitful. Through strategic research activities, Prof. Takeuchi and Kwak made a considerable contribution to developing countries and further enhancement of its flood disaster preparedness.

(Written by Young-Joo KWAK)

このような三つの一連の研究活動を通して、開発途上国への貢献、戦略的な国際協力研究の推進等を行い、洪水防災能力を向上させる成果を得ることが出来ました。

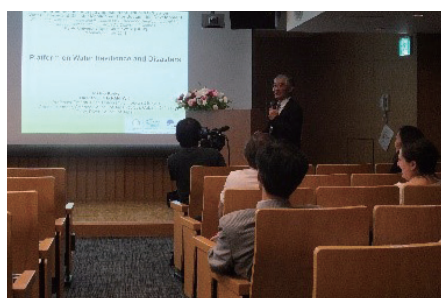
## Participation in the kick-off symposium of UNESCO Chair WENDI / ユネスコ・チェア WENDI のキックオフ・シンポジウムへの参加

Launched in 1992, the UNITWIN (University Twinning and Networking Programme)/ UNESCO Chairs Programme, which involves over 700 institutions in 116 countries, promotes international inter-university cooperation and networking to enhance institutional capacities through knowledge sharing and collaborative work. The programme supports the establishment of UNESCO Chairs and UNITWIN Networks in the key priority areas of UNESCO, such as education, the natural and social sciences, culture and communication. Through this networking effort, higher education and research institutions all over the globe pool their resources, both human and material, to address pressing challenges and contribute to the development of their societies. In many instances, the networks and chairs serve as thinktanks and bridgebuilders between academia, civil society, local communities, research, and policy-making.

On July 30, the Graduate School of Advanced Integrated Studies in Human Survivability (GSAIS/Shishukan) of Kyoto University held a kick-off symposium of the "UNESCO Chair on Water, Energy and Disaster Management for Sustainable Development (WENDI)." WENDI aims to promote a multi-disciplinary and holistic approach for research implementation, knowledge transfer and capacity building in the fields of water, energy, and disaster management and linkages to other sectors (food, forestry, biodiversity, climate change, and data science).

In this symposium, Prof. Juichi Yamagiwa, the president of Kyoto University, delivered opening remarks. Congratulatory addresses followed from the representatives of the Ministry of Education, Cultures, Sports, Science and Technology (MEXT) and the Ministry of Land, Infrastructure, Transport, and Tourism (MLIT). Then, GSAIS Dean Kaoru Takara presented an overview of WENDI, for which he serves as a UNESCO chair holder. From ICHARM, Director Toshio Koike and Chief Researcher Tet-suya Ikeda participated in this symposium. Director Koike provided a presentation on "Platform on water resilience and disasters" among other presentations made by the researchers of Kyoto University, who are the co-chairs of WENDI, and the representatives of UNESCO-related organizations of the world.

As ICHARM is established as a UNESCO category 2 centre, it is expected to develop and promote active collaboration between ICHARM and WENDI especially in the field of water-related disaster reduction and risk management.



Presentation by director Koike at the symposium  
シンポジウムでの小池センター長の発表

1992 年に打ち出されたユニツィン (大学の結合・ネットワークプログラム) / ユネスコ・チェアのプログラムには、116 か国から 700 を超える研究機関が参画し、国際的な大学間の協力とネットワーク構築を促進させて、知識の共有と協働を通じて組織的な能力を高めています。本プログラムでは、教育や自然・社会科学、文化、コミュニケーションといったユネスコの重要な優先分野において、ユネスコ・チェア、ユニツィンのネットワーク設立を支援しています。こうしたネットワークを活用して、全世界の高等教育・研究機関が人的・物的資源を蓄え、喫緊の課題への対処、社会の発展に貢献することとなります。また多くの場合、こうしたネットワーク及びチェアはシンクタンクとして、学術界、市民社会、地域コミュニティ、研究と政策決定との橋渡しの役割を果たすこととなります。

7 月 30 日、京都大学大学院総合生存学館 (思修館) において、WENDI (持続可能な開発のための水、エネルギー、災害管理に関するユネスコ・チェア) のキックオフ・シンポジウムが開催されました。WENDI は、水、エネルギー、災害管理の分野とその他のセクター (食糧、森林、生物多様性、気候変動、データ科学) との連携による研究の実施、知識の移転、能力開発に向けた複合学際的で全体的な取り組みを促進することを目的としています。

シンポジウムでは、京都大学・山極壽一総長から開会の挨拶がなされ、文部科学省、国土交通省の代表からお祝いの言葉が述べられました。その後、ユネスコ・チェア・ホルダー (責任者) である思修館の寶馨館長が WENDI の概要について発表を行いました。ICARM からは小池俊雄センター長と池田鉄哉上席研究員が出席し、小池センター長からは「水のレジリエンスと災害に関するプラットフォーム」について発表が行われました。また、WENDI の共同議長となっている京都大学の研

究者、世界中のユネスコに関係する機関の代表から、それぞれ発表がなされました。

ICHARM はユネスコの 카테고리 2 センターとして、特に水関連災害による被害軽減とリスクマネジメントの分野で、WENDI と連携し、一層の協働に取り組んでいくことが期待されています。

Source:

● UNESCO Natural Sciences

<http://www.unesco.org/new/en/natural-sciences/about-us/how-we-work/unesco-chairs/>

● Kyoto University

[https://www.kyoto-u.ac.jp/en/global/events\\_news/departement/seizongaku/news/2018/180731\\_1.html](https://www.kyoto-u.ac.jp/en/global/events_news/departement/seizongaku/news/2018/180731_1.html)

● WENDI

<http://wendi.kyoto-u.ac.jp/index.html>

(Written by Tetsuya Ikeda)

## International Atomic Energy Agency (IAEA)/Regional Cooperation Agreement (RCA) RAS/7/030 Project activities in Indonesia and China / インドネシアと中国における IAEA 地域研修コース (RTC) の活動

2018 年 8 月 6 ～ 10 日、第 3 回 IAEA 地域研修コース (RTC) がインドネシア・ジャカルタで開催されました。今回の研修はインドネシア国立原子力機構 (BATAN) の主催で、「同位体分析法の地下水の水質評価への活用」というテーマのもと開かれ、アジア 14 力国から 20 名が参加しました (写真 1)。日本からは講師として、プロジェクトコーディネーター (NPC) 辻村 真貴教授、副プロジェクトコーディネーター (ANPC) Gusyev 専門研究員が出席し、初日から 3 日間、同位体関連の話題を日本をはじめ各国のケーススタディを交えて紹介しました。Gusyev 専門研究員は、現在 ICHARM で行っている研究の成果を示しつつ、地下水資源の持続的な管理へのトリチウムトレーサーの活用について講義を行いました。8 月 8 日には、現地調査に参加し、Aqua Danon Indonesia が管理する飲料水用井戸で炭素 14 同位体の採取を実施しました。その後、インドとパキスタンから派遣されている IAEA 講師および BATAN 職員とともに、同日行われた RTC の閉会式に日本代表として出席しました。第 3 回 RTC は成功裏に終わり、日本から派遣された講師についても非常に良い評価をいただきました。

9 月 17-18 日、Gusyev 専門研究員は、中国科学アカデミー地質物理研究所の主催により、中国・北京で開催された「同位体技術を用いた地下水の涵養とダイナミクス」に関する技術ワークショップに参加しました。このワークショップは、IAEA / RCA RAS / 7/030 プロジェクトに参加しているアジア地域の正副プロジェクトコーディネーターを対象として開かれたもので、IAEA の専門家および技術責任者を含む RCA13 力国から 20 名が参加しました (写真 3)。各国からの報告では、辻村教授が発表を行い、現在進行中の研

The 3rd Regional Training Course (RTC) of the International Atomic Energy Agency (IAEA)/Regional Cooperation Agreement (RCA) RAS/7/030 Project was held in Jakarta, Indonesia, from August 6 to 10, 2018, on "the Use of Isotope Techniques in Assessing Groundwater Quality." The training course was organized by Indonesia's National Nuclear Energy Agency (BATAN) and attended by 20 participants from 14 countries in the Asia region (Photo 1). As instructors from Japan, Research Specialist Maksym Gusyev, the alternate NPC of Japan in the IAEA/RCA RAS/7/030 Project, and Prof. Maki Tsujimura, the national project coordinator (NPC), gave lectures on various isotope-related topics with case studies in Japan and other countries during the first three days of the RTC. Maksym specifically addressed the use of tritium-tracer in the sustainable management of groundwater resources demonstrating results of his on-going research at ICHARM. On August 8, he joined a 1-day field survey held at potable water wells operated by Aqua Danon Indonesia to conduct carbon-14 sampling and represented Japan at the closing ceremony of the 3rd RTC convened with IAEA lecturers from India and Pakistan and 2 local BATAN hosts (Photo 2). As a result, the 3rd RTC was considered a great success based on participants' comments highlighting the contribution of the lecturers from Japan.

In September 17-18 2018, Maksym was also dispatched from ICHARM to participate in a technical workshop on "Groundwater Recharge and Dynamics Using Isotopic Techniques" organized by the Institute of Geology and Geophysics of the Chinese Academy of Sciences (IGGCAS) in Beijing, China. The technical workshop



Photo 1. Group photo of the 3rd Regional Training Course (RTC) opening ceremony in Jakarta with local hosts from Indonesia's National Nuclear Energy Agency (BATAN), lecturers from the IAEA and Japan, and participants from Bangladesh, China, India, Indonesia, Lao PDR, Malaysia, Myanmar, Nepal, Pakistan, the Philippines, Sri Lanka, Thailand, Vietnam and Japan.

was organized for NPCs/ANPCs in the Asian region of the IAEA/RCA RAS/7/030 Project and attended by twenty participants from 13 RCA countries including the IAEA expert and technical officer (Photo 3). Prof. Tsujimura gave a country report presentation about on-going research activities and preliminary results of multi-tracers sampling in the Chikuma River and other Japanese headwater catchments. As the ANPC of Japan, Maksym provided technical recommendations on other country report presentations for the use and water age interpretation of tritium and carbon-14 isotopes in humid and arid climates, especially in Mongolia, Malaysia, Thailand and the Philippines. Japan's expertise of understanding groundwater circulation processes with isotopic techniques made an important contribution to the success of the technical workshop of the IAEA/RCA RAS/7/030 Project and was highly appreciated by participants of the RCA member countries.



Photo 2. Closing ceremony of the 3rd RTC opening ceremony on August 10 2018 with Maksym Gusev giving remarks as a representative from Japan (right), two local hosts from Indonesia's National Nuclear Energy Agency (BATAN), IAEA lecturers from Pakistan and India (left).



Photo 3. Group photo of participants from 13 RCA countries, including the IAEA expert (first row, second from left) and the technical officer (first row, center), at the IAEA Technical workshop of the IAEA/RCA RAS7030 project held on Sep 17-18 in Beijing, China

(Written by Maksym Gusev)

## WMO/GWP APFM annual meeting / WMO/GWP 主催「洪水管理連携プログラム」会合

The Associated Programme on Flood Management (APFM), organized by the World Meteorological Organization (WMO) and the Global Water Partnership (GWP), held its annual meeting on August 24, 2018, at the GWP secretariat in Stockholm, Sweden. ICHARM Researcher Mamoru Miyamoto participated in the meeting. APFM is going to renovate the mechanism of its organization to allow further cooperation with partners throughout the year and set up the Technical Support Unit (TSU). As a Support Base Partner (SBP) of APFM, ICHARM will contribute to the programme through the activities of the International Flood Initiative (IFI) Platforms in the Philippines, Sri Lanka, Myanmar, and Pakistan to ensure further collaboration with APFM based on the principle of the Integrated Flood Management (IFM).



Meeting of APFM / 「洪水管理連携プログラム」会合

(Written by Mamoru Miyamoto)

2018年8月24日に世界気象機関(WMO)と世界水パートナーシップ(GWP)が主催の「洪水管理連携プログラム」の会合が世界水パートナーシップ本部(ストックホルム)で開催され、ICARMから宮本守研究員が参加しました。洪水管理連携プログラムでは、パートナーとの年間を通しての継続的な協力体制を構築することが可能なように体制を刷新し、技術支援ユニットを結成する予定です。ICARMはサポートベースパートナー(SBP)として登録されており、今後、ICARMがフィリピン、スリランカ、ミャンマー、パキスタン等で実施している国際洪水イニシアティブ(IFI)のプラットフォームに関する活動等を通して貢献することが見込まれ、統合洪水管理の理念に基づいてより一層連携していくことが期待されます。

## Participation in the Stockholm World Water Week / ストックホルム国際水週間への参加

1991年以来、水に関する様々な地球規模の課題を議論する場として、ストックホルム国際水研究所(SIWI)がストックホルム国際水週間(SWWW)を毎年開催してきました。今年は8月26～31日に開催され、3,600名を超える参加者となりました。国連は、2018年の世界水の日、世界水アセスメントプログラムによる世界水発展報告書のテーマとして「自然による解決策(NBS)」に焦点を当てていることから、今年のSWWWでは「水、生態系、人類の発展」がテーマとなり、多くのセッションではNBSに関するトピックや活動が取り上げられました。

8月27日の開会式では、Amina J Mohammed 国連事務次長が基調講演を行い、特にジェンダーの視点から適切な水管理の重要性が強調されました。また、今年のストックホルム水大賞は、微生物による浄水・汚水処理技術について大きな変革をもたらした功績で、アメリカのBruce Rittmann教授とオランダのMark van Loosdrecht教授に授与されました。

8月28～29日にはアジア・フォーカスの4つのセッションが開催されました。その1つとして、「アジアにおいて水の影響を受けやすく、居住可能な緑の都市」についてのセッションがアジア太平洋水フォーラム事務局とICHARM及びその他の機関との共催により開催されました。ICHARMからは池田鉄哉上席研究員が参加し、「アジアにおける水関連災害と洪水管理に関するICHARMの活動(フィリピン、ミャンマー、スリランカの事例)」と題して発表を行いました。発表では、社会的な変化や気候変動の下で、健全な都市計画と持続可能な開発を実現するためには、洪水や渇水、土砂災害などの水関連災害がもたらす被害の軽減を十分に考慮する必要があるとのメッセージが発信され、参加者から幅広い賛同が得られました。

SWWWの開催期間中は、様々なセッションが開催され、中でも「新たな世界水フォーラムへの視野：ブラジルからセネガルへ」のセッションでは、今年、ブラジル・ブラジリアで開催された第8回世界水フォーラム(WWF8)の成果報告と、2021年にセネガル・ダカールで開催される第9回世界水フォーラム(WWF9)の計画について発表されました。ICHARMはWWF8に参加し、WWF9への参加も検討していることから、WWF9に対してどのように貢献していくことができるのかについて有用な情報を得ることができました。

閉会式では、来年のSWWWのテーマが「社会のための水—すべてを含めて」となることが報告され、また最初の開催から長年にわたって会場とされてきたストックホルム市会議センターから、Tele 2アリーナへと変更されることとなりました。SWWWは水分野においてもっとも影響力のある国際会議の一つであることから、ICHARMとしてもパートナー機関と協働しつつ、その活動についてインプットしていくことが極めて有意義と考えられます。

Since 1991, the Stockholm World Water Week (SWWW) has been organized every year by the Stockholm International Water Institute (SIWI) to discuss global challenges related to water issues. This year, SWWW was held on August 26-31, gathering more than 3,600 participants. The UN focuses on “nature-based solutions (NBS)” as the theme for the 2018 World Water Day and the World Water Development Report by the World Water Assessment Programme. The theme of SWWW of this year was set as “Water, ecosystems and human development,” and many sessions highlighted topics and actions on NBS.

At the opening plenary of the 27th, H.E Amina J Mohammed, the deputy secretary-general of the United Nations, delivered a keynote speech, emphasizing the importance of adequate water management from a gender perspective. The 2018 Stockholm Water Prize Laureate was awarded to Professor Bruce Rittmann from the USA and Professor Mark van Loosdrecht from the Netherlands for their revolutionizing microbiological-based technologies in water and wastewater treatment.

On August 28-29, four Asia Focus sessions were held. Among them was a session entitled “Water sensitive and livable green cities in Asia,” jointly organized by the Asia Pacific Water Forum Secretariat and ICHARM with help from some other organizations. From ICHARM, Chief Researcher Tetsuya Ikeda participated and provided a presentation on “ICHARM's activities on water-related disaster and flood management in Asia (Cases of Philippines, Myanmar and Sri Lanka).” He stressed that in order to realize sound city planning and sustainable development under changing societal and climate conditions, it is essential to fully consider reducing the risks of water-related disasters such as floods, droughts, and landslides, the message was widely agreed by the session participants.



Presentation by Chief Researcher Ikeda  
池田上席研究員による発表

During SWWW, other sessions also took place including one on “A new World Water Forum horizon: From Brazil to Senegal,” which presented the outcomes of the 8th World Water Forum (WWF8) in Brasilia, Brazil, of this year and the plans for the 9th World Water Forum (WWF9) in Dakar, Senegal, in 2021. As ICHARM participated in WWF8 and now considers participating in WWF9, the session was a good opportunity to get useful information to explore how ICHARM can contribute to WWF9.

At the closing, the theme of the 2019 SWWW was announced to be “Water for society – including all.” The participants were also informed that the venue will move to the Tele 2 Arena from the Stockholm City Conference Center, at which SWWW has long been held since its first meeting. As SWWW is one of the most influential international conferences in the field of water, ICHARM views it as an extremely significant occasion to provide inputs of our activities and discuss issues with other partner organizations.

(Written by Tetsuya Ikeda)

## WWDR2020 Development Workshop / 世界水発展報告書 2020 準備会合への参加

On September 20-21, 2018, the WWDR2020 Development Workshop was convened in Perugia, Italy. World Water Development Report (WWDR) is an annual report published under a different theme by the UN-Water of 31 UN entities, including UNESCO, WMO<sup>\*1</sup>, and the World Bank, with the World Water Assessment Programme (WWAP) playing a chief editorial role. WWDR2020 is scheduled to be published in 2020 on the theme of "Water and Climate Change," and the workshop was held to discuss the framework and work plan of the publication, gathering 42 professionals from UN entities such as UNESCO, WMO, UN-Water, UNU<sup>\*2</sup>, and FAO<sup>\*3</sup> and other international organizations such as GWP<sup>\*4</sup> and IWMI<sup>\*5</sup>. Director for Special Research, Yoshiyuki Imamura, also participated in the workshop because climate change is one of the principal research themes for ICHARM.

On the first day, the participants were divided into four groups and discussed the main messages and annotated table of contents (AToC) of WWDR2020. Imamura stressed the importance of incorporating the perspectives of disaster risk management, scientific approach, and holistic strategy in the publication, and many of his ideas were reflected in the main messages and AToC.

On the second day, the lead agencies were assigned to individual chapters based on the structure agreed on the previous day. The work plan was also discussed and finalized. Imamura pledged ICHARM's contributions to WWDR2020 mainly in the areas of disaster risk management, governance, and technological innovation. The report will be an excellent opportunity for ICHARM to disseminate its main activities such as IFI<sup>\*6</sup>, the TOUGOU<sup>\*7</sup> project, and DIAS<sup>\*8</sup> to the world through a major UN publication.

Each organization will soon start working on its assigned chapters. WWDR2020 is scheduled to be launched on March 22, 2020, to celebrate the UN World Water Day.

ユネスコ、世界気象機関（WMO）、世界銀行などの31の国連機関で構成される国連水関連機関調整委員会（UN-Water）は世界水発展報告書（WWDR: World Water Development Report）をテーマを変えて毎年発行しています。WWDRはユネスコの世界水アセスメント計画（WWAP: World Water Assessment Programme）が中心となり作成していますが、2020年に発行予定のWWDR2020のテーマは「水と気候変動（Water and climate change）」となっています。ユネスコ、WMO、UN-Water、国連大学、国連食糧農業機関などの国連機関やGWP、IWMIなどの国際機関などから42名が参加し、WWDR2020の作成のための準備会合が9月20～21日にイタリア・ペルージャで開催されました。気候変動はICHARMが取り組んでいる重要な研究テーマの一つであり、ICHARMからは今村特別研究員が参加しました。

準備会合の初日には参加者が4つのグループに分かれて、基本方針、構成などについて議論を行いました。今村特別研究員からは防災、科学的アプローチ、包括的な取り組みの重要性などを説明し、その多くが基本方針などに取り入れられました。2日目には前日に作成された構成案に基づき、各章毎の執筆分担が決められ、作成計画などが話合われました。ICHARMは防災、ガバナンス、技術革新などの分野で貢献することになりました。ここでは国際洪水イニシアティブ（IFI）や統合的気候モデル高度化研究プログラム、データ統合・解析システム（DIAS）などの成果が反映され、国連の報告書であるWWDR2020を通じて世界に発信されることになります。

今後は分担に基づき文章の作成が進められ、2020年3月22日（国連「世界水の日」）に発行される予定です。



Plenary session / 全体会合



Discussion at a parallel session / 分科会



Group photo: Participants raising SDGs plates  
集合写真：SDGs パネルを掲げて

\*1 WMO: World Meteorological Organization  
\*2 UNU: United Nations University  
\*3 FAO: Food and Agriculture Organization  
\*4 GWP: Global Water Partnership

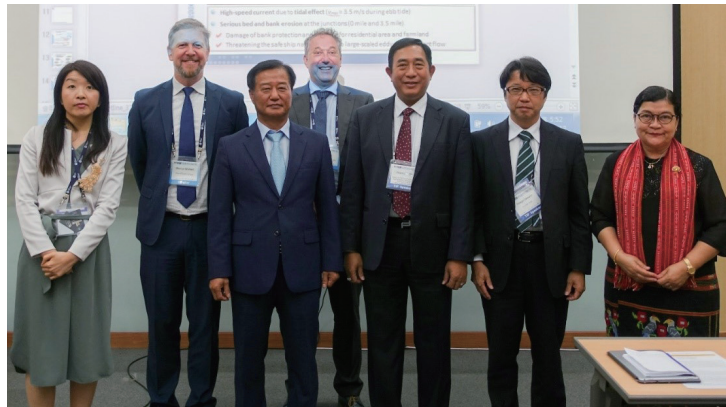
\*5 IWMI: International Water Management Institute  
\*6 IFI: International Flood Initiative  
\*7 TOUGOU: Integrated Research Program for Advancing Climate Models  
\*8 DIAS: Data Integration and Analysis System Program

(Written by Yoshiyuki Imamura)

## Session on Flood Risk in Myanmar at the Korea International Water Week 2018 / Korea International Water Week 2018 でのミャンマーの洪水リスクに関するセッションへの参加

韓国で Korea International Water Week 2018 (2018 年 9 月 12 日～15 日) が開催され、その中で日本水フォーラムがセッション “Pathway Forward: to Promote Cooperation among the Development Partners to Address Flood Risk in Myanmar” を 9 月 13 日に主催し、ICHARM から澤野グループ長がパネリストとして参加しました。セッションには他に、ミャンマーから水資源河川システム改良局の Htun Lwin Oo 局長、Khin Ni Ni Thein 国家水資源委員会諮問委員会事務局長らが参加し、ミャンマーでの洪水リスク軽減に向けた取り組み状況が紹介されるとともに、データ管理や、統合水資源管理を促進するためのインフラ整備の重要性について意見交換が行われ、それらについての国際協力の必要性が確認されました。

The Japan Water Forum organized a session, “Pathway Forward: to Promote Cooperation among the Development Partners to Address Flood Risk in Myanmar” in the Korea International Water Week 2018, held on September 12-15, 2018. Deputy Director Hisaya Sawano of ICHARM joined the session as a panelist. Mr. Htun Lwin Oo, the director general of the Directorates of Water Resources and Improvement of River System (DWIR), Myanmar, and Dr. Khin Ni Ni Thein, the secretary of the advisory group of the National Water Resources Committee (NWRC), were also among the panelists. In the session, current efforts for flood risk reduction were introduced, and then discussion followed on the importance of data management and investment in infrastructure to enhance the Integrated Water Resources Management. The session also confirmed the necessity of international cooperation to achieve these targets.



From left: Ms. Yumiko Asayama (Japan Water Forum), Dr. Marcus Wishart (WB), Mr. KIM, Chang Si (ISAN Corporation), Mr. Peter Vos (Global Green Growth Institute (Moderator)), Mr. Htun Lwin Oo (DG of DWIR, Myanmar), Mr. Hisaya Sawano (ICHARM), Dr. Khin Ni Ni Thein (Secretary of Advisory Group of NWRC)

(Written by Hisaya Sawano)

## Others

### Comments from internship students / インターン生からのコメント

ICHARM ではこの夏、2 名のインターン生を受け入れました (名古屋大学の Eric Millan Cabutaje 氏と Del Rosario Janice Cudiamat 氏)。

彼らからの、ICHARM での研究活動を振り返ったコメントを紹介いたします。

ICHARM accepted two internship students this summer: Mr. Eric Millan Cabutaje (Nagoya University) and Ms. Del Rosario Janice Cudiamat (Nagoya University) .

They contributed a short message as below while looking back at their studying at ICHARM.



**Mr. Eric Millan Cabutaje** (from the Philippines)

Nagoya University

Internship period: September 10 - 25, 2018

It has been a great honor and privileged to be able to spend my two-week internship here at ICHARM. I appreciate my advisor Dr. Shinichiro Nakamura (Nagoya University) for sending me here. I was so excited to learn RRI (Rainfall-Runoff-Inundation) model with the supervision of Dr. Badri Bhakta Shrestha. He has been very supportive and ensured that I can learn every step of RRI. He has given me several assignments that can nurture my learnings with varying simulations. In addition, the people are friendly which makes the environment conducive to learning. The support of Ms. Hisae Okubo made my stay comfortable and the hospitality of Mr. Yoshio Tokunaga further marked good memories of my short stay in Tsukuba City.

With ICHARM, I was able to gain additional knowledge specifically RRI modelling which is of great help to my research about flood inundation on the agriculture sector in the Cagayan River Basin in Luzon, Philippines. Through RRI, I will be able to simulate flood inundation using current and future climate situations. It can be a reliable tool to validate the flood inundation damages not only to the agriculture but also to the social and infrastructure sectors. Attending to research presentations and reading of previous research works using RRI on other flooded river basins also provided me excellent ideas which can be applicable in my research area. Generally speaking, my stay with ICHARM gave me confidence in accomplishing my research on riverbasin flood inundation. Domo Arigatou Gozaimasu ICHARM!



**Ms. Del Rosario**

**Janice Cudiamat** (from the Philippines)

Nagoya University

Internship period: September 12 - 26, 2018

First and foremost, I would like to express my deepest gratitude to Director Toshio Koike for giving me this great opportunity to participate internship program in ICHARM. Also, I want to thank Dr. Yoshito Kikumori for being my supervisor during my two weeks internship period and to all the staff of ICHARM for their kindness, cooperation and sharing information with me. Although, the internship program was a short time, I really appreciate having this great and helpful experience for my research study and if given a chance, I hope I could get another opportunity to attend future programs of this research institute.

In my two weeks internship has provided me ample of knowledge regarding IFAS (Integrated Flood Analysis System) and RRI (Rainfall-Runoff-Inundation) model on flood simulation for estimating flood flow impact on river channels and using the acquired knowledge in my master's research thesis. Although my internship is short and brief, I have gained a lot of information and knowledge that is helpful for my research and for that I really appreciate the time and effort of all the members of ICHARM for this wonderful internship program.

## Personnel change announcement / 人事異動のお知らせ

### Leaving ICHARM .....

**- Hiroaki Shirai : Senior Researcher**

River Planning Division, Water and Disaster Management Bureau,  
Ministry of Land, Infrastructure, Transport and Tourism (MLIT)

**- Yusuke Yamazaki : Research Specialist**

Researcher, Erosion and Sediment Control Research Group,  
Public Works Research Institute (PWRI)

**- Tetsuya Nakagori : Senior Staff**

○**白井 宏明** 主任研究員

国土交通省 水管理・国土保全局  
河川計画課付

○**山崎 祐介** 専門研究員

国立研究開発法人土木研究所  
土砂管理研究グループ 研究員

○**中郡 哲哉** 指導員

## Awards / 受賞リスト

\* July - September 2018

- *Md. Khairul Islam has been selected for an Outstanding Student Presentation Award (OSPA) for his presentation during Japan Geoscience Union Meeting (JpGU) 2018 in Chiba, Japan, May 25, 2018*



- *Mohamed Rasmy Abdul Wahid was awarded for his outstanding research activities, such as development of WEB-RRI model by the President of PWRI, July 17, 2018*



Mohamed Rasmy Abdul Wahid with certification  
(front row, third from right)

## Business Trips / 海外出張リスト

\* July - September 2018

- July 7-10, Singapore, Yoshiyuki Imamura, to participate in the conference "Singapore International Water Week"
- July 8-13, New York in U.S.A., Toshio Koike and Tetsuya Ikeda, to attend the High-Level Political Forum 2018
- July 18-21, Bangkok in Thailand, Mamoru Miyamoto, SATREPS Kick-off meeting in Thailand
- July 21-28, Valencia in Spain, Young-Joo KWAK, to attend 2018 IEEE International Geoscience and Remote Sensing Symposium
- July 22-28, Jakarta and Banjarmasin in Indonesia, Atsuhiko Yorozyu and Hiroshi Koseki, to conduct international training on river discharge and sediment transport assessment with ADCP
- July 28-August 1, Luxembourg, Young-Joo KWAK, meeting with Luxembourg Institute of Science and Technology
- August 1-5, Czech Republic, Young-Joo KWAK, meeting with Czech Hydro-meteorological Institute
- August 2-9, Jakarta and Bandung in Indonesia, Hisaya Sawano, Yoshito Kikumori, Yosuke Tomizawa and Badri Bhakta Shrestha, (1) Research on "TOUGOU" program activity plan (2) Establishment of IFI National Platform
- August 5-12, Jakarta in Indonesia, Maksym Gusev, to attend Regional Training Course on the Use of Isotope Techniques in Assessing Groundwater Quality
- August 9-13, Indonesia, Mahtab Mohammad Hossain, World Congress on Water Conservation & Environmental Management (WC2EM 2018)
- August 12-15, Manila in the Philippines, Yoshiyuki Imamura and Yoshio Tokunaga, to recruit for the ICHARM's master course and doctoral course as well as exchange opinions regarding other ICHARM's activities
- August 16-September 9, Sri Lanka, Mohamed Rasmy Abdul Wahid and Katsunori Tamakawa, Maintenance of rain gauge station in Sri Lanka under the cooperation with JAXA-PMM and DIAS projects, Meeting with NBRO
- August 25-September 9, Bangladesh, Atsuhiko Yorozyu, Hiroshi Koseki (PWRI researcher) and Ahmed Tanjir Saif, (1) Field survey on Jamuna river (2) Meeting with BWDB (Bangladesh Water Development Board)
- August 22-27, Sweden, Mamoru Miyamoto, to attend the Advisory and Management Committees of WMO/GWP Associated Programme on Flood Management (APFM)
- August 26-September 1, Sweden, Tetsuya Ikeda, to participate in the Stockholm World Water Week (SWWW)
- September 2-8, Yangon and Nay Pyi Taw in Myanmar, Hisaya Sawano, Hirosato Yoshino, Badri Bhakta Shrestha and Katsunori Tamakawa, Practitioners Meeting on Platform on Water Resilience and Disasters in Myanmar and meetings with governmental organizations
- September 2-10, Long-xuyen in Vietnam and Phnom Penh in Cambodia, Naoko Nagumo, Research meeting with Department of Geology in Cambodia and field survey on topography and surface geology at Mekong Delta
- September 1-6, Yogyakarta in Indonesia, Shinji Egashira and Yusuke Yamazaki (PWRI researcher), to attend 21st Congress of International Association for Hydro-Environment Engineering and Research (IAHR), Asia Pacific Division (APD) (IAHR-APD 2018)
- September 2-17, Bangladesh, Young-Joo KWAK, (1) Workshop in Bangladesh (2) Flood mapping training in BWDB (3) Field survey on floods in 2018 in Chittagong and Maulvibazar.
- September 2-8, Ulaanbaatar in Mongolia, Maksym Gusev, Determining the Fossil Groundwater Dynamics in Selected Depressions by Using Isotope Techniques
- September 12-14, Taegu in South Korea, Hisaya Sawano, to attend Korea International Water Week 2018 (KIWW2018)
- September 16-19, China, Maksym Gusev, IAEA/RCA Technical Workshop on Ground Water Recharge and Dynamics Using Isotopic Techniques
- September 17-19, Paris in France, Yoshiyuki Imamura, Meeting at UNESCO
- September 19-23, Perugia in Italy, Yoshiyuki Imamura, to participate in the conference "WWDR 2020 Developmental Workshop"
- September 18-21, Gyeongju in South Korea, Toshio Koike, to attend The Asia-Pacific Regional Meeting of National Commissions for UNESCO
- September 23-26, Gothenburg in Sweden, Toshio Koike, to attend the 8th Third Pole Environment (TPE) Workshop

## Visitors / 訪問者リスト

\* July - September 2018

- Visited by delegate from Malaysia-Japan International Institute of Technology (MJIT), July 25, 2018  
Purpose: As part of JICA training program "MJIT Master of Disaster Risk Management Japan Attachment", Prof. Shinji Egashira (ICHARM Training and Research Advisor) and Prof. Kuniyoshi Takeuchi (University of Yamanashi, Former ICHARM director) gave lecture
  - Mr. Ali bin Selamat (Dean, MJIT)
  - Ms. Aznah binti Nor Anuar (Senior Lecturer, MJIT)
  - Mr. Khairul Hisyam bin Kamarudin (Senior Lecturer, UTM Disaster Preparedness & Prevention Center, University Technology Malaysia (UTM))
  - Mr. Khamarrul Azahari bin Razak (Senior Lecturer, UTM Disaster Preparedness & Prevention Center, University Technology Malaysia (UTM))
  - Total of 10 delegate from MJIT



● Visited by delegate from Local Government Division, Planning commission, and Local Government Engineering Department (LGED), Bangladesh, August 3, 2018

Purpose: Study tour on "Infrastructure Development and Livelihood"

- Mr. HABIBUR RAHMAN (Joint Secretary, Local Government Division, Government of Bangladesh)
- Ms. NARGIS KHANAM (Deputy Chief, Planning Commission, Bangladesh)
- Mr. MOHAMMED SALIM MIAH (Project Director, Rural Development & Livelihood Improvement project at Narshingdi Sadar Upazila of Narshingdi District, Bangladesh)
- Total of 8 delegate from Local Government Division, Planning commission, and Local Government Engineering Department (LGED), Bangladesh



● Visited by delegate from Korean Society of Disaster Information (KOSDI) / 社団法人 韓国災害(災難)情報学会, South Korea, August 30, 2018

Purpose: Meeting on PWRI/ICHARM researches

- LEE RAE CHUL (CEO, SQ Engineering CO.,LTD., 韓国災害(災難)情報学会 会長)
- KIM TAE HWAN (Professor, Dept. of Security Service, Yongin University, 韓国災害(災難)情報学会 副会長)
- JANG IL YOUNG (Professor, Kumoh National Institute of Thechnology, 韓国災害(災難)情報学会 理事)
- Total of 9 delegate from KOSDI / 社団法人 韓国災害(災難)情報学会



● Visited by Professors and Vietnamese trainees from Chuo University, September 6, 2018

Purpose: Make observation of PWRI experiment facilities and participate in short lecture by ICHARM

- Professor Tadashi Yamada (River Eng. and Hydrology Lab., Faculty of Science and Engineering, Chuo University)
- Assistant professor Daiwei Cheng (River Eng. and Hydrology Lab., Faculty of Science and Engineering, Chuo University)
- M. Sc. students Nguyen Thi Khanh Hoa and Hoang Chi Linh (River Eng. and Hydrology Lab., Faculty of Science and Engineering, Chuo University)
- 10 trainees from Thuyloi University in Vietnam



# Publications / 発表論文リスト

\* July - September 2018

## 1. Journal, etc / 学術雑誌 (論文誌、ジャーナル)

- Mahtab Mohammad Hossain, Miho Ohara, Mohamed Rasmy, Effective of the Submersible Embankment in Hoar Area in Bangladesh, *Journal of Disaster Research*, Vol.13 (4), pp.780-792, August 2018
- Andrea M. Juarez-Lucas, Kelly M. Kibler, Takahiro Sayama, Miho Ohara, Flood risk-benefit assessment to support management of floodprone lands, *Journal of Flood Risk Management*, <https://doi.org/10.1111/jfr3.12476>, September 2018

## 2. Oral Presentation (Including invited lecture) / 口頭発表 (招待講演含む)

- Yosuke Nakamura, Koji Ikeuchi, Shiori Abe, Toshio Koike, Shinji Egashira, Evaluation of the uncertainty of flash flood prediction using the RRI model in mountainous rivers, 13th International Conference on Hydroinformatics, Hydroinformatics, University of Palermo, July 2-6, 2018
- Naoko Nagumo, Shinji Egashira, Characteristics of the 2016 flood disaster in the Omoto River Basin: an example of floods in mountainous river basins, Iwate University, Iwate Prefecture Citizens' Cultural Exchange Center "Aiina", July 17-19, 2018
- Young-Joo Kwak, Rapid Flash Flood Mapping Using High-resolution ALOS-2 Data: A pilot case study of Omoto River, Japan, Global Conference on the International Network of Disaster Study in Iwate, Iwate University, Iwate Prefecture Citizens' Cultural Exchange Center "Aiina", July 17-19, 2018
- Yusuke Yamazaki, Shinji Egashira, Method to estimate the supply rate of sediment and driftwood into stream channels, Iwate University, Iwate Prefecture Citizens' Cultural Exchange Center "Aiina", July 17-19, 2018
- Daisuke Harada, Shinji Egashira, Numerical simulation model of driftwood in flood flows with sediment erosion and deposition, Iwate University, Iwate Prefecture Citizens' Cultural Exchange Center "Aiina", July 17-19, 2018
- Yosuke Nakamura, Koji Ikeuchi, Shiori Abe, REAL TIME FLASH FLOOD PREDICTION USING THE RRI MODEL IN MOUNTAINOUS RIVERS, Global Conference on the International Network of Disaster Studies, INDS, Aiina in Iwate Prefecture, July 17-19, 2018
- Yoshito Kikumori, Shinji Egashira, Hiroyuki Ito, Yosuke Nakamura, Research on a Flood Forecasting System in Mountainous Rivers, Iwate University, Iwate Prefecture Citizens' Cultural Exchange Center "Aiina", July 17-19, 2018
- Daisuke Kuribayashi, Miho Ohara, Takashi Iwasaki, Yoshio Tokunaga, A Disaster Information System for Local Governments Promoting Seamless Usage from Normal Times to Emergency, Iwate University, Iwate Prefecture Citizens' Cultural Exchange Center "Aiina", July 17-19, 2018
- Miho OHARA, Daisuke KURIBAYASHI, Manabu TERAWAKI and Yoshio TOKUNAGA, Analysis of Tense Moments during Emergency Flood Disaster Response of Local Governments, Global Conference on the International Network of Disaster Study in Iwate, Iwate University, Iwate Prefecture Citizens' Cultural Exchange Center "Aiina", July 17-19, 2018
- Badri Bhakta Shrestha, Practices on flood prediction, prevention and mitigation, Tenth NEAJ Symposium on Current and Future Technologies, NEAJ, Tokyo, Japan, July 21, 2018
- Mahtab Mohammad Hossain, Miho Ohara, Mohamed Rasmy, The Impact of Rainfall Variation on Flash Flooding in Haor Areas in Bangladesh, World Congress on Water Conservation & Environmental Management (WC2EM), Indonesia, August 10-12, 2018
- Gul Ahmad Ali, Atsuhiko YOROZUYA, Hiroshi KOSEKI, Shinji EGASHIRA, Shoji OKADA, STUDY OF BEDFORM AND BOIL BASED ON OBSERVATIONS IN BRAHMAPUTRA RIVER, 土木学会全国大会 International Program, 土木学会, 北海道大学, August 29-31, 2018
- Yusuke Yamazaki, Shinji Egashira, A method to specify critical rainfall conditions for sediment disasters and their regionality, 21st Congress of Asia and Pacific Division of International Association for Hydro-Environment Engineering and Research (IAHR-APD), IAHR-APD, Yogyakarta, INDONESIA, September 2-5, 2018
- Daisuke Harada, Shinji Egashira, Behavior of driftwood in terms of convection-diffusion equation, 21st Congress of Asia and Pacific Division of International Association for Hydro-Environment Engineering and Research (IAHR-APD), IAHR-APD, Yogyakarta, INDONESIA, September 2-5, 2018
- Young-Joo Kwak, Emergency flash flood mapping for disaster risk reduction: 2018 flood in Bangladesh, International Workshop 2018 on Bangladesh Water Development Board (BWDB), Bangladesh Water Development Board (BWDB), Dhaka, Bangladesh, September 5, 2018
- Young-Joo Kwak, W. Takeuchi, Future cooperation with stakeholders in International River Management between India & Bangladesh, International Workshop 2018 on Bangladesh Water Development Board (BWDB), Bangladesh Water Development Board (BWDB), Dhaka, Bangladesh, September 5, 2018
- Young-Joo Kwak, Advanced flood mapping using Earth Observation data, Intensive training in BWDB, Bangladesh Water Development Board (BWDB), Dhaka, Bangladesh, September 4-6, 2018
- 小池俊雄, リスクの同定、削減、管理の各分野における最近の動向、第11回国際水協会 (IWA) 世界会議・展示会、国際水協会 (IWA)、東京ビッグサイト、2018年9月17日

## 3. Poster Presentation / ポスター発表

- Young-Joo Kwak, S. Yun, Effect of Building Orientation on Urban Flood Mapping Using ALOS-2 Amplitude Images, International Geoscience and Remote Sensing Symposium (IGARSS)2018, Geoscience and Remote Sensing Symposium, Spain, July 22-27, 2018
- Young-Joo Kwak, R. Pelich, J. Park, W. Takeuchi, Improved Flood Mapping Based on the Fusion of Multiple Satellite Data Sources and In-Situ Data, International Geoscience and Remote Sensing Symposium (IGARSS)2018, Geoscience and Remote Sensing Symposium, Spain, July 22-27, 2018
- 南雲直子, 原田大輔, 萬矢敦啓, 小関博司, 山崎祐介, 江頭進治, ネパール国ウエストラプティ川の流路変動、2018年日本地理学会秋季学術大会、日本地理学会、和歌山大学、2018年9月22~23日

## 4. Magazine, Article / 雑誌、記事 (土技資含む)

None / 該当無し

## 5. PWRI Publication / 土研刊行物 (土研資料等)

- ICHARM, Meeting material of the 3rd ICHARM Governing Board Meeting, Technical Note of PWRI, Public Works Research Institute (PWRI), No. 4377, ISSN 0386 - 5878, July 2018

## 6. Others/ その他

- 今村能之, 洪水による被害軽減に資する指標の開発、技術開発支援事業成果報告書、一般社団法人 中国建設弘済会, pp. 149-188, 2018年9月

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We welcome your comments and suggestions.

