



## Message from Executive Director

### Building Process



with Ms. KAMIKAWA Yoko, the special envoy of the prime minister of Japan at the UN General Assembly Hall (New York, March 24, 2023)  
上川陽子総理大臣特使とご一緒に  
国連総会ホールにて  
(ニューヨーク、2023年3月24日)

*"I believe that the building process of a sound water cycle itself can also contribute to peace-building."*

This phrase is part of the opening remarks made by Ms. KAMIKAWA Yoko, the special envoy of the prime minister of Japan, as the co-chair of the session at the interactive dialogue on "Water for Climate, Resilience and Environment" at the UN Water Conference 2023 in New York in April 2023.

The United Nations had the plan to hold this conference for the first time in 46 years after the first one in Mar del Plata, Argentina, in 1977. In response, Japan launched concrete preparatory activities in 2019 towards the success of the conference and focused on organizing the 4th Asia-Pacific Water Summit in Kumamoto, Japan, which was defined as one of the regional processes of the conference by a related UN resolution. Around the same time, ICHARM was requested to host the 9th

International Conference on Flood Management (ICFM9). Convinced that the event would effectively function as a bridge between the Kumamoto Summit and the UN Water Conference, we accepted the request and proposed that the ICFM9 be held in Tsukuba and Tokyo in February 2023 in collaboration with two partner organizations of Japan, the Ministry of Land, Infrastructure, Transport and Tourism and the National Graduate Institute for Policy Studies.

However, soon after the preparation started, the COVID-19 pandemic broke out, and the summit was postponed by more than one year. Furthermore, just before the summit, which had been rescheduled for April 2022, Russia invaded Ukraine, gravely violating international law. Many people have since been killed. The world has been thrown into a global health, food, and energy crisis. Due to the cumulative impact of these events, complex, cascading, and systemic risks latent in social, economic, and environmental systems have suddenly emerged and threatened human lives and prosperity beyond national boundaries. The world peace has been damaged seriously.

How can the world regain the peace where people-people and people-nature relationships thrive in harmony? I kept pondering this question throughout the preparation processes for the Kumamoto Summit, the ICFM9, and the UN Water Conference.

Both society and nature are diverse. Science has yet to fully explain the meaning and value of diverse components in either realm or their linkages. However, as fellow earthlings, we must respect diversity, deepen our understanding of diversity, and make ceaseless efforts to fill gaps among diverse components through dialogues and identify and strengthen their interlinkages. In this context, summits and conferences are invaluable opportunities where we can promote unified collaboration by straining our ears to various voices, drawing on all scientific and indigenous knowledge, creating innovative visions, and co-designing and co-implementing concrete activities.

Ms. Kamikawa's phrase has reminded me of the meaning and significance of key "building processes."

### 構築していく過程

「健全な水循環を構築する過程そのものが、平和の構築に貢献すると私は信じます。」

2023年3月に開催された国連水会議2023の「気候、レジリエンス、環境のための水」に関する双方向対話セッションの冒頭にて、共同議長を務められた上川陽子総理大臣特使が寄せられたメッセージです。

この国連水会議は、1977年にアルゼンチンのマルデルプラタにて開催された第1回会議から、46年の時を経て開催された会議でした。我が国では2019年より準備を開始し、まず、国連水会議の地域プロセスの一つとして国連決議で位置付けられた、熊本にて開催される第4回アジア・太平洋サミットの準備に取り組みました。また ICHARM では第9回洪水管理国際会議 (ICFM9) の主催要請を受け入れ、国土交通省および政策研究大学院大学と協力して、ICFM9 を2023年2月に開催して、熊本サミットから国連水会議への議論の橋渡しの場とすることとしました。

それらの準備の矢先に COVID-19 が勃発し、サミット開催が1年以上も延期となりました。そして2022年4月のサミット開催直前には、ロシアがウクライナに侵攻するという暴挙に出ました。多くの人が亡くなり、世界的な健康、食料、エネルギー危機となり、これらの影響の蓄積により、社会・経済・環境システムの中の複雑で連鎖的、構造的なリスクが顕在化し、国境を越えて人類の生命と繁栄を脅かし、平和が著しく損なわれています。

人と人、人と自然との間に順調で和やかな関係が保たれている平和を取り戻す方法は何でしょうか。熊本サミットおよび ICFM9 から国連水会議への取り組みを通して考えてきた課題です。

人間社会も自然も多様です。科学は、これらの多様性の意義と価値、さらには多様な要素間の関連性を十分に説明できておりません。我々は多様性に敬意を払い、多様性の理解を深めるとともに、対話を通して多様な要素間の乖離を埋め、連携性を見出して強化する努力を続けることが必要と考えます。サミットや国連水会議は、多様な声に耳を澄まし、科学的知見と経験知を総動員して、革新的なビジョンを創出し、協調した具体的行動を計画して、実施に移す協働作業を推進する場なのです。

上川総理大臣特使の一文によって、「building process」の意味と重要性を改めて認識いたしました。

April 28, 2023

KOIKE Toshio

Executive Director of ICHARM

**Special Topics**

3. ICFM9 held in Tsukuba and Tokyo, Japan / 第9回洪水管理国際会議 (9th International Conference on Flood Management) を開催

**Research**

7. Participation in a World Bank workshop in Kerala, India / インド・ケララ州における世界銀行ワークショップへの参加
8. HyDEPP-SATREPS Philippines Project: Participation in ICFM9 and the World BOSAI Forum 2023 / HyDEPP-SATREPS フィリピンプロジェクト：訪日研修としてのICFM9参加及び世界防フォーラムでのプロジェクト活動の紹介
9. Introduction of ICHARM research projects / 研究紹介
9. MATSUKI Hirotada, Director, River Department, National Institute for Land and Infrastructure Management (Former ICHARM Deputy Director) [Disaster risk reduction cycle by dual governance (Local independence and interdependence)] / 松本洋忠 国土技術政策総合研究所河川研究部長 (前 ICHARM グループ長) 「二層ガバナンスによる防災減災サイクル (地方の独立性と相互補完性)」

**Training & Education**

11. Educational program updates / 修士課程研修 活動報告
13. Follow-up seminar for ICHARM graduates / ICHARM 卒業生のためのフォローアップセミナーの開催
14. Action Reports from ICHARM Graduates
15. Kowlessar Akshay Prakash, Land Drainage Officer (Civil Engineering) at the Land Drainage Authority, Government of Mauritius
16. Comment from a student: My field trip experience to Tsurumi River Basin center, Japan Meteorological Agency, and Arakawa Museum of Aqua

**Information Networking**

17. The 55th Annual Session of the Typhoon Committee / 台風委員会第55回総会
18. UN General Assembly President visits ICHARM to discuss water issues / 第77回国際連合総会議長チャバ・コロシ氏が ICHARM を訪問
19. Comments from participating doctoral course students / 参加した博士課程学生からのコメント

**Public Relations**

20. ICHARM delivers flood workshops for local schools / つくば近郊の学校で初めて「洪水防災学習」を開催しました
21. Public symposium "Can you survive unexpected floods?" / 一般公開シンポジウム「君は想定外の洪水から生き残れるか～e-sports@KasenBousai～」を開催

**Field Survey**

23. Field surveys in the lower Stung Sen River in Cambodia / カンボジア・セン川下流域における現地調査

**Miscellaneous**

24. Annual Hanami lunch / お花見ランチ
25. Comments from internship students / インターン生からのコメント
25. Personnel change announcements / 人事異動のお知らせ
26. Business trips / 海外出張リスト
27. Visitors / 訪問者リスト
27. Publications / 対外発表リスト

**Editor's Note / 編集後記****Request to participate in online survey on ICHARM Newsletter****ICCHARMニュースレター読者アンケートのお願い**

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

ついでには、一層の内容の充実を図るべく、読者の皆様にアンケートをさせて頂きたく以下のサイトにアクセス頂き、アンケートにお答え頂ければ幸いです。

<https://forms.gle/NsyWvxSMVgAWc9MV8>

回答期限：2023年7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 since its establishment in March 2006 to deliver the latest news about research, projects and other activities to readers around the world. As we are currently working on the improvement of the newsletter, we would be grateful if you could spare time to answer the following questions and let us hear your voices about our publication.

Survey posted at: <https://forms.gle/NsyWvxSMVgAWc9MV8>

Survey to be done by: July 30 2023

Time required: about 5 minutes

# Special Topics

## ICFM9 held in Tsukuba and Tokyo, Japan

### 第9回洪水管理国際会議（9th International Conference on Flood Management）を開催

The International Conference on Flood Management (ICFM) is held every three years to discuss various issues related to floods and to achieve significant academic and cross-disciplinary changes.

ICHARM/PWRI hosted the 9th International Conference on Flood Management (ICFM9) at National Graduate Institute for Policy Studies (GRIPS), and the Tsukuba International Congress Center in Tsukuba, Japan, on February 18-22, 2023 in collaboration with two partner organizations of Japan, the Ministry of Land, Infrastructure, Transport and Tourism and the GRIPS.

The high-level symposium was held at the GRIPS on Feb. 18, and the 4-day conference was held in Tsukuba. It has been 12 years since ICHARM hosted the 5th ICFM in Tokyo, Japan, in 2011.



洪水管理国際会議（ICFM）は3年ごとに開催され、洪水に関する様々な問題を議論し、学術的・分野横断的に大きな影響を与えることを目的としています。

土木研究所ICHARMは、国土交通省と政策研究大学院大学（GRIPS）と協力して第9回洪水管理国際会議（9th International Conference on Flood Management:ICFM9）を、2023年2月18日にはハイレベルシンポジウムをGRIPSで、19～22日には本会議をつくば国際会議場でそれぞれ開催しました。なお、日本での開催は、第5回（2011年東京）にICHARMが主催して以降、12年ぶりとなります。

### <High-level Symposium on Integrated Water Cycle Management in the Post-COVID-19 Era>

（下記記事は政策研究大学院大学（GRIPS）ホームページに2023年3月9日に掲載されたLatest Newsの記事を再構成したものです。写真は全てGRIPSにより撮影されたものです。）

A high-level symposium, "Integrated Water Cycle Management in the Post-COVID-19 Era," was held on February 18, 2023 to commemorate the 9th International Conference on Flood Management (ICFM9). The objective of the symposium was to bring stakeholders, notably leaders from politics, government, academia and CSOs, to discuss issues, share experiences and knowledge, and reaffirm commitment to action. Approximately 250 people from 40 countries and regions attended. HM the Emperor of Japan graced the first morning session of the symposium with his presence, listening intently and showing high interest with the lectures.



An opening remark by Dr. Han Seung-soo, chair of HELP



A discussion at the high-level-panel

The morning session opened with greetings from Dr. Han Seung-soo, chair of the High-level Experts and Leaders Panel on Water and Disaster (HELP) and former prime minister of the Republic of Korea; United Nations Under-Secretary-General for Economic and Social Affairs Mr. Li Junhua; and GRIPS President OTA Hiroko.

The session continued with lectures on water and disaster by President of the 77th Session of the General Assembly of the United Nations H.E. Ambassador Csaba Kőrösi; and Secretary-General of the World Meteorological Organization (WMO) Prof. Petteri Taalas.

In the afternoon session, GRIPS Professor HIROKI Kenzo, HELP coordinator, moderated a high-level panel entitled, "Integrated Flood Management in the Post-Corona Era," with panelists including Director for SDGs of the Office of the 77th President of UN General Assembly Dr. Johannes Cullmann, and Executive Director of the International Centre for Water Hazard and Risk Management (ICHARM) Prof. KOIKE Toshio.

### <4-day conference in Tsukuba>

The 4-day conference in Tsukuba was attended by a total of 394 flood experts from 41 countries and area (212 from Japan, 100 from Asia, 78 from the rest of the world, including four unknown). It was consisted of four plenary sessions and 24 parallel sessions, with 143 oral presentations in the parallel sessions and 48 poster presentations. And five special sessions were also held on cross-cutting themes, and eight companies and organizations participated in the technology exhibition to show their unique services and technologies related to flooding. In addition, a public symposium, "Can You Survive Unexpected Floods?" took place on the afternoon of the first day.

### <本会議報告>

本会議には日本含めて41の国・地域から、合計394人の洪水に関する専門家（日本から212名、アジアから100名、世界から78名（不明4名））が参加しました。本会議は、全体会合（Plenary session）を4セッション、分科会（Parallel session）を24セッション開催し、発表者は、分科会での口頭発表143編、ポスター発表48編となりました。

また、横断的テーマを含む5つの特別セッションを開催するとともに

に、洪水に関する民間企業の技術を紹介する「技術展示ブース」を設置し、8社・団体が出展を行いました。さらに、1日目の午後には一般公開シンポジウム「君は想定外の洪水から生き残れるか」を開催しました。以下、主な内容の報告です。より詳細な報告については、ICHARM ホームページやICFM ホームページをご覧ください。

開会式では、ICFM Ad Hoc Committee の議長である Prof. Slobodan Simonovic が主催者を代表して開会挨拶を行い、次いで、本会議をホストする土木研究所の代表として藤田光一理事長、および日本の洪水政策を担う国土交通省の研究機関である国土技術政策総合研究所の奥村康博 所長からそれぞれ挨拶を行いました。最後に、開催地であるつくば市を代表し、五十嵐立青市長からウェルカムスピーチが述べられました。

開会あいさつに続き、竹内邦良山梨大学名誉教授に「ICFM Lifetime Achievement Award」が授与されました。

次いで、東北大学理事・副学長（研究担当）、およびISC（国際科学委員会）の次期 Vice President である小谷元子教授から、“The responsibility of science, entrusted to us by society” と題し、オンラインでの基調講演が行われました。

以降、3日間にわたり、プレナリーセッション1～4と、パラレルセッションを実施しました。

昼食会場兼休憩会場でもある多目的ホールでは、洪水に関する民間企業の技術を紹介する「技術展示ブース」が設置され、8社・団体が出展を行いました。

ポスター発表に関しては、1、2日目に「Poster Indexing」および「Poster Viewing」を開催しました。

最終日の閉会式では、国土交通省水管理・国土保全局の草野慎一審議官から基調講演をいただいた後、Prof. Slobodan Simonovic による「ICFM9 Erich Plate Best Student Poster Award」の授賞式が行われました。

次いで、小池俊雄センター長から「Statement of ICFM9」案が参加者に提示されるとともに、Prof. Simonovic に ICFM を引き継ぐことを象徴する「トーチ」が渡され、Prof. Simonovic および Institute for Catastrophic Loss Reduction (ICLR) の Executive Director である Prof. Paul Kovacs から、次回 ICFM10(2026年夏) のホストを ICLR が務めることが発表されました。

21日午後と22日は、宇宙航空研究開発機構 (JAXA)、防災科学技術研究所 (NIED)、国土交通省関東地方整備局利根川上流河川事務所、下館河川事務所、江戸川河川事務所のご協力を頂き、希望者による現地視察を実施しました。

以上、4日間にわたった ICFM9 は、天候にも恵まれ無事に終了しました。COVID-19 がなかなか収束しない状況ではありましたが、国内外か

The following sections summarize the conference. For more detailed reports, please visit the websites of ICHARM and ICFM as follows;

ICHARM: [https://www.pwri.go.jp/icharm/special\\_topic/20230219\\_21\\_icfm9.html](https://www.pwri.go.jp/icharm/special_topic/20230219_21_icfm9.html)

ICFM: <https://www.icfm.world/ICFM-Conferences/ICFM9>



Participants at the opening ceremony  
開会式後の集合写真

The opening ceremony began with Professor Slobodan Simonovic, the chair of the ICFM Ad Hoc Committee, who delivered opening remarks on behalf of the organizers. He was followed by Dr. FUJITA Koichi, the president of PWRI, which hosted the conference, and Mr. OKUMURA Yasuhiro, the director of the National Institute for Land and Infrastructure Management (NILIM), a research institute of MLIT, which helps formulate flood-related policies in Japan. Finally, Mr. IGARASHI Tatsuo, the mayor of Tsukuba City, welcomed participants on behalf of the host city.



Professor Simonovic, the chair of the ICFM Ad Hoc Committee  
シモノビッチ ICFM 議長



Dr. FUJITA, the president of PWRI  
藤田土木研究所理事長

After the greetings, Professor Emeritus of Yamanashi University TAKEUCHI Kuniyoshi was awarded the ICFM Lifetime Achievement Award by ICFM.

Professor KOTANI Motoko, the executive vice president for research of Tohoku University, Japan, and the vice president of the International Science Council, delivered the keynote speech online entitled “The responsibility of science, entrusted to us by society.”



Mr. OKUMURA Yasuhiro,  
the director of NILIM  
奥村国土技術政策総合研究所長



Mr. IGARASHI, the mayor of  
Tsukuba City  
五十嵐つくば市長



Awardee: Dr. TAKEUCHI  
受賞者：竹内山梨大学名誉教授

The tables below show the lists of the plenary and parallel sessions that took place during the four-day conference:

List of Plenary session

Session Title	Speaker
Plenary Session 1: Concerted Actions towards a Resilient, Sustainable and Inclusive Society	<Panelist> • Dr. Johannes Cullmann, Director for SDGs, UN PGA Office • Dr. Anil Mishra, Chief of Section, Hydrological Systems, Climate Change and Adaptation, UNESCO-IHP • Prof. Rajib Shaw, IRDR Scientific Committee member and AP-STAG Chair
<Moderator> KOIKE Toshio, Director of ICHARM	

Plenary Session 2: Integrated Flood Management  <MC> SHINYA Takafumi, ICHARM Chief Researcher	<Keynote lecture> "Systems Approach to Management of Floods - Towards Resilience-based Approach", Prof. Slobodan Simonovic  <Report> • "Flood Forecasting System of Pakistan and Flood Season 2022", Mr. Sahibzad Khan, Director General of Pakistan Meteorological Department (PMD) • "Global Change & Adaptive Water Management for Reducing Water Hazard Risk: Case study in China," Prof. Jun XIA, Director of Research Institute for Water Security (RIWS), Wuhan University
Plenary Session 3: Adaptation to Changes  <MC> NAGUMO Naoko, ICHARM Research Specialist	<Keynote lecture> "A hidden threat, flood triggered chemical accidents: Challenges for disaster risk management", Prof. Ana Maria Cruz, Disaster Prevention Research Institute (DPRI), Kyoto University  <Report> • "International Handbook on Emergency Response for Flood Defences", Dr. ITAGAKI Osamu, Director of Upper Kiso River Office, Chubu Regional Development Bureau, Ministry of Land, Infrastructure, Transport and Tourism (MLIT) • "Follow-up Actions for Kumamoto Initiative for Water," Mr. TOKIOKA Toshikazu, Director for International Coordination of River Engineering, Water and Disaster Management Bureau, MLIT • "New developments in integrated approaches to flood management", Dr. Valentin Aich, Senior Water and Climate Specialist, Global Water Partnership (GWP) and World Meteorological Organization (WMO)
Plenary Session 4: River Basin Disaster Resilience and Sustainability by All –Showcases–  <MC> MIYAMOTO Mamoru, ICHARM Senior Researcher	• Davao, the Philippines: Dr. Anthony C. Sales, Regional Director, Department of Science and Technology (DOST) XI • West Africa: Mr. Salifou DENE, Volta Basin Authority (VBA) • Latin America: Dr. M. Alfonso Gutiérrez López, Autonomous University of Queretaro

ら多くの方の参加を頂き、リアル開催できたことに、主催者としてはうれしい限りです。

ICCHARMとしては、今回の会議で再強化することが出来た各種ネットワークを通じて、国内外の水災害被害軽減により一層邁進する所存ですので、関係各所の皆様におかれましては引き続きどうぞよろしくお願いいたします。

List of Parallel session

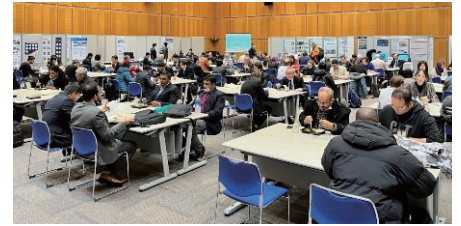
Theme		Chair	Co-chair
1. Lessons Learnt from the Recent Flood & Sediment Disasters towards Better Understanding and Actions	1a	Guillermo Q. Tabios III	OHARA Miho
	1b	Ali CHAVOSHIAN	QIN Menglu
	1c	Zhang Cheng	NAGUMO Naoko
2. Data Integration, Modelling, Forecasting and Early Warning	2a	YOSHIMURA Kei	Abdul Wahid Mohamed RASMY
	2b	Anil Mishra	Abdul Wahid Mohamed RASMY
	2c	TANIGUCHI Kenji	NUMATA Shingo
	2d	Nikola Zlatanović	TSUTSUI Hiroyuki
	2e	Xin Li	TAMAKAWA Katsunori
	2f	Maria Clara Fava	AIDA Kentaro
	2g	Minjiao LU	MATSUKI Hirotada
	2h	TACHIKAWA Yasuto	NAITO Kensuke
3. Assessment of Changing Global Risks and their impacts on flooding	3a	HIRABAYASHI Yukiko	USHIYAMA Tomoki
	3b	Jos van Alphen	MIYAMOTO Mamoru
	3c	Karmakar Subhankar	Shrestha Badri Bhakta
4. Flood & Sediment Disaster Counter Measures: Structural and Non-structural Approaches	4a	SHIMIZU Yasuyuki	MIYAMOTO Mamoru
	4b	TAKEBAYASHI Hiroshi	Kattia Rubí Arnez Ferrel
	4c	Nigel Wright	HARADA Daisuke
5. Flood & Sediment Disaster Resilience: Shock Absorption, Response and Transformation	5a	Dalila Loudyi	SHINYA Takafumi
	5b	Paul Kovacs	Ralph Allen ACIERTO
6. Flooding Governance and Finance	6	K. E. Seetharam	MORI Noriyuki
7. Education and Capacity Building for Effective Flood Management	7	Duminda Perera	FUJIKANE Masakazu
8. Interlinkage between Flood & Sediment Disaster Resilience and the SDGs: Interdisciplinary and Transdisciplinary Approaches	8	KAWASAKI Akiyuki	YOSHINO Hirosato

10. Systems approach to management of floods	10a	OKI Taikan	DENDA Masatoshi
	10b	Valentin Aich	KAKINUMA Daiki

\*The extended abstracts submitted for Theme 9, "Compound flooding disasters," were merged into other themes due to low submissions.

※テーマ9 "Compound flooding disasters" は投稿数が少なかったため、他のテーマに統合

Technology Exhibition took place in the multi-purpose room, which was also used for participants to have lunch and breaks. Eight private companies had booths to show their unique services and technologies related to flood management.



Multi-purpose room  
多目的ホールの様子

Poster Indexing and Poster Viewing were held for poster presentations on the first and second days of the conference.

At the closing ceremony on the final day, Mr. KUSANO Shinichi, the deputy director-general of the Water and Disaster Management Bureau, MLIT, gave the keynote speech, followed by the presentation of the ICFM9 Erich Plate Best Student Poster Award by Professor Simonovic.

Next, ICHARM Executive Director KOIKE Toshio presented the draft Statement of ICFM9 to the participants and passed a little torch symbolizing the succession of ICFM to Professor Simonovic. Then, Professor Simonovic and Professor Kovacs, the executive director of the Institute for Catastrophic Loss Reduction (ICLR), announced that ICLR will host ICFM10 in summer 2026.



Awardees of Poster Award  
ポスター賞の受賞者



Announcement of ICFM10  
ICFM10の発表

On the afternoon of the 21st and 22nd, site visits were conducted with the cooperation of the Japan Aerospace Exploration Agency (JAXA), the National Research Institute for Earth Science and Disaster Resilience (NIED), and three local offices of MLIT's Kanto Regional Development Bureau (the Upper Tone River Office, the Shimodate River Office, and the Edogawa River Office).

Blessed with nice weather, ICFM9 completed its four-day schedule successfully. As the organizer, ICHARM is delighted to have been able to hold ICFM9 in person with the participation of many people from from all over the world though COVID-19 was still posing a threat.

ICFM9 was an excellent occasion for ICHARM to refresh its determination to continue further reducing water-related disaster damage in the world using the various networks reinforced through this conference. We will appreciate continued cooperation from experts and organizations around the world.

*(Written by KURIBAYASHI Daisuke)*

# Research

## Participation in a World Bank workshop in Kerala, India インド・ケララ州における世界銀行ワークショップへの参加

The World Bank held a workshop and a field survey on January 23-25 in Thiruvananthapuram City, Kerala State, India, to help the state improve its flood control capacity. ICHARM was invited to join the workshop to provide expert advice.

Kerala State is located in the westernmost part of India. Because the state faces the Arabian Sea on the west and mountains on the east, its rivers have similar characteristics to those of Japan, which are mostly short and very steep, unlike many other rivers on the Indian continent. The state experienced severe floods in 2018 and 2019, and the state government and the World Bank are currently working together to plan effective flood control measures.

Since sharing similar topographical features with Kerala State, Japan is considered suitable for assisting the state in planning flood control measures by providing practical knowledge. For this reason, the World Bank organized a workshop by inviting experts from Japan. It was attended by the officials of the state government, the World Bank, and the Japan Water

Agency, as well as a research team from ICHARM led by Executive Director KOIKE Toshio, including Senior Researchers USHIYAMA Tomoki, Abdul Wahid Mohamed RASMY, and YOSHINO Hirosato.

The workshop was held for two days on the 23rd and 25th, and the field survey took place at local dams on the 24th.

### 1) Workshop Day 1: January 23

The ICHARM team explained Japan's technologies related to flood control and made the following presentations.

- ① Outline of Japan's challenge
- ② Explanation of analysis results produced using ICHARM's technologies regarding floods in Kerala State in 2018 and 2019
- ③ Other related topics

After these presentations, other participants asked many questions about data required for analysis, model reliability, integrated dam operation, and so on.

### 2) Workshop Day 2: January 25

Based on the discussions on the first day, the participants discussed how the state should plan and implement flood control measures. ICHARM proposed five "Cos" principles to keep in mind to move on to the next step while cooperating among related parties: Co-integration, Co-analyzing, Co-learning, Co-designation, and Co-development.

### 3) Field survey: January 24

The field survey was conducted at the Moonzhiyar dam for power generation and the Maniyar barrage for irrigation on the Kakkad River, a tributary of the Pamba River, to which Kerala State has recently paid a great deal of attention in the context of flood control.

ICHARM will continue to cooperate with Kerala State and the World Bank in the state's flood control project.



Attendees of Workshop  
ワークショップの参加者

インド・ケララ州は、インドの最南部の西側に位置しており、西側はアラビア海に面し、東側は山地となっていることから、インド大陸に位置するものの、河川の距離が短く、勾配が急である日本の河川の形状と類似しています。このケララ州において、2018年及び2019年に洪水が発生し、現在、現地州政府と世界銀行が協力して対策を検討しているところです。

対策を検討するにあたって、類似する地形形状を持つ日本の知見が求められたことから、世界銀行の主催により、現地州政府の関係者や世界銀行の関係者等が参加するワークショップがケララ州・ティルヴァナンタプラム市で開催され、日本からは、ICHARM（小池俊雄センター長、牛山朋来主任研究員、モハメッドラズミー アブドゥル ワヒド主任研究員、吉野広郷主任研究員）と水資源機構が参加しました。

ワークショップは、1月23日（月）、25日（水）の2日間開催され、また、24日（火）には現地のダムへの調査を行いました。

#### 1) ワorkshop Day 1 目録 (1月23日)

日本の技術の紹介を行い、ICHARMからは以下について発表しました。

- ① 日本における取組の紹介
- ② ICHARMの技術による2018年及び2019年のケララ州における洪水にかかる解析結果の紹介
- ③ その他

これらに関して、出席者からは、分析に必要なデータ、モデルの信頼性、統合的なダムへの運用などについて、活発な質問がありました。

#### 2) ワorkshop Day 2 目録 (1月25日)

1日目の議論を踏まえ、今後の現地における対策の進め方について議論がなされました。ICHARMからは、次のステップとしては、関係者で協力を行う、5つの"Co"、Co-integration、Co-analyzing、Co-learning、Co-designation、Co-developmentを提案しました。

#### 3) 現地調査 (1月24日)

ケララ州において関心の高いパンバ (Pamba) 川支流のカクカド (Kakkad) 川のMoonzhiyarダム (発電ダム)、Maniyarダム (灌漑ダム)の現地調査を行いました。

ICHARMは今後とも引き続きケララ州の治水対策に協力してまいります。

(Written by YOSHINO Hirosato)

## HyDEPP-SATREPS Philippines Project: Participation in ICFM9 and the World BOSAI Forum 2023

### HyDEPP-SATREPS フィリピンプロジェクト：訪日研修としての ICFM9 参加及び世界防災フォーラムでのプロジェクト活動の紹介

ICHARM は、「地球規模課題対応国際科学技術協力プログラム (SATREPS)」に基づくフィリピンとの共同研究プロジェクト「気候変動下での持続的な地域経済発展への政策立案のためのハイブリッド型水災害リスク評価の活用 (略称: HyDEPP-SATREPS)」において、日比両国の研究機関とともに様々な活動を行っています。

2022 年 11 ~ 12 月に開催しました第 1 回訪日研修に続いて、第 2 回訪日研修を実施しました。第 2 回訪日研修は、第 9 回洪水管理国際会議 (ICFM9) にあわせて開催し、2023 年 2 月 17 日 (金) ~ 2 月 25 日 (土) にかけて、フィリピン側の研究代表者のフィリピン大学ロスバニョス校 (UPLB) Fernando Chinte Sanchez, Jr. 教授、研究マネージャーの UPLB の Patricia Ann Asico Jaranilla-Sanchez 教授、フィリピン大学ディリマン校の Eugene Calalang Herrera 准教授及び Jonathan Suba Serrano 氏の 4 名が来日しました。

前半には、第 9 回洪水管理国際会議の特別セッションの一つとして、セッション「気候変動下でのレジリエンス向上に向けた日本・フィリピンの SATREPS プロジェクト」を開催し、研修メンバーが、ラグナ湖流域における 2020 年の台風 Ulysses での被害状況調査や湖水のシミュレーションの進捗状況などの研究報告を行いました。セッションには、会場で 35 名、オンラインで 15 名の 50 名が参加し、プロジェクト関係者以外の参加者とも意見交換を行うことができました。訪日研修の後半は、琵琶湖流域の現地視察を行うとともに、滋賀県立大学、滋賀県琵琶湖環境科学研究センターにおいて、日本側プロジェクトメンバーとの意見交換を行いました。コロナ禍を経て、初めて顔合わせできたメンバーもあり、対面で、今後のプロジェクト活動に関する議論を行う貴重な機会となりました。

また、2023 年 3 月 10 日に、仙台市において開催された世界防災フォーラムのセッション「創造的防災に向けた分野・部門横断的アプローチ / Transdisciplinary approach toward innovative recovery and disaster risk reduction」において、日本側の研究代表者の大原美保がプロジェクトの活動を紹介しました。特に、2021 年・2022 年に実施したハザードマッピング・リスク評価に関する e ラーニングの活動に対しては大きな関心が寄せられ、他国への水平展開の可能性について質問がありました。

The Project for Development of a Hybrid Water-Related Disaster Risk Assessment Technology for Sustainable Local Economic Development Policy under Climate Change in the Republic of the Philippines (HyDEPP-SATREPS) is a joint research project between Japan and the Philippines under the Science and Technology Research Partnership for Sustainable Development (SATREPS). Under this project, ICHARM has been conducting various activities.

Following the first training in Japan held from late November to early December 2022, the second training in Japan was conducted on February 17-25, 2023, in conjunction with the 9th International Conference on Flood Management (ICFM9). Four members from the Philippine project team participated in this training: Professors Fernando Chinte Sanchez, Jr. and Patricia Ann Asico Jaranilla-Sanchez from the University of the Philippines Los Banos (UPLB) and Associate Professor Eugene Calalang Herrera and Mr. Jonathan Suba Serrano from the University of the Philippines Diliman. Professor Jaranilla-Sanchez serves as the research manager on the Philippine side.

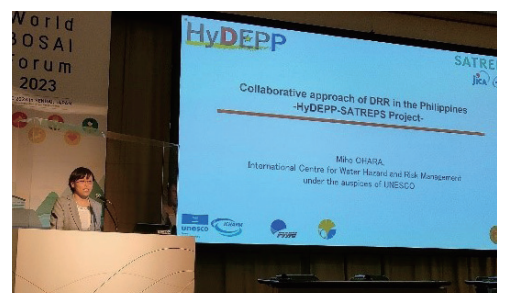
In the first half of the second training, the participants joined ICFM9. They delivered presentations in one of its special sessions, "the SATREPS project between Japan and the Philippines toward Climate Resilience," reporting on their research, including a survey of the damage caused by Typhoon Ulysses in 2020 and lake water simulation of the Laguna Lake basin. The session was attended by 50 people, 35 in person and 15 online. The opportunity was especially meaningful for the project members in getting feedback from other conference participants who were not involved in the project.

After that, the training participants visited the Lake Biwa basin and had discussions



Participants in the ICFM9 special session and the project members delivering a presentation (right) ICFM9 の特別セッション (左: 集合写真、右: プロジェクト活動報告の様子)

with Japanese project members at the University of Shiga Prefecture and the Lake Biwa Environmental Research Institute managed by Shiga Prefecture. The meeting was a valuable opportunity for both sides to discuss future activities, especially for some members who were finally able to see other members face-to-face for the first time after the COVID-19 pandemic.



Presentation at the World BOSAI Forum 世界防災フォーラムでの発表

On March 10, 2023, ICHARM Senior Researcher OHARA Miho\* made a presentation on the SATREP project in a session, "Transdisciplinary approach towards innovative recovery and disaster risk reduction," at the World Bosai Forum, held in Sendai, Japan. The audience showed particularly high interest in the e-learning program on hazard mapping and risk assessment that the project team developed and conducted in 2021 and 2022. There were several questions about the possibility of expanding this e-learning program to other countries.

\*Senior Researcher OHARA Miho completed her term at ICHARM in March 2023 and has started a new career as a professor of the Center for Integrated Disaster Information Research, Interfaculty Initiative in Information Studies, the University of Tokyo.

(Written by OHARA Miho)



## 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 a researcher as listed below:

MATSUKI Hirotada, Director, River Department, National Institute for Land and Infrastructure Management (Former ICHARM Deputy Director)

Disaster risk reduction cycle by dual governance (Local independence and interdependence)

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、松木洋忠国土技術政策総合研究所河川研究部長（前ICHARMグループ長）の「二層ガバナンスによる防災減災サイクル（地方の独立性と相互補完性）」を紹介いたします。



### Disaster risk reduction cycle by dual governance (Local independence and interdependence)

#### 二層ガバナンスによる防災減災サイクル（地方の独立性と相互補完性）

MATSUKI Hirotada, Director, River Department, National Institute for Land and Infrastructure Management (Former ICHARM Deputy Director)

松木洋忠 国土技術政策総合研究所河川研究部長（前 ICHARM グループ長）

This report aims to discuss a feasible scheme to implement disaster risk reduction policies. This scheme involves both local risk management and central disaster management. This dual governance is indispensable to building sustainable societies in the age of increasingly severe disasters.

#### Floods as a gate of multi-hazard DRR

Floods are unique among a variety of disasters. Unlike natural disasters like earthquakes or human-induced disasters like traffic accidents, floods are complex because they involve both natural and human-induced factors. However, this duality makes it possible to reduce flood risk by addressing two aspects of a disaster, i.e., vulnerability and exposure, particularly concerning the human factor. Thanks to meteorological forecasting and hydrological prediction, foreseeability has become another uniqueness of flood events. This feature enables people to prepare for future floods by constructing defensive infrastructure and installing emergency control systems.

Repeatability is still another unique characteristic of floods. Because floods occur repeatedly during an individual's lifetime, they can learn from their experiences and become better prepared for future events. At the same time, people can share lessons with others who have no flood experience. Older generations can pass their know-how down to younger generations. Such accumulation of lessons helps the next generations to be more perceptive to signs of coming flooding. This transgenerational transfer of knowledge and experiences fosters a flood-conscious culture and is applicable to coping with multiple hazards.

	Frequency	Foreseeability	Origin
Earthquake Thunder storm	Longer interval than human life	Predictable (sometimes)	Natural disaster
Flood Drought	Several times in a human working age (15-65)	Forecastable	Natural and human-induced disaster
Fire Traffic accident	Many times in a year	Unforeseeable	Human-induced disaster

Characteristics of floods in comparison with other disasters  
災害の中での洪水の特徴

減災政策を推進するための現実的な仕組みとして、地方のリスク管理と中央の災害管理の双方が重要です。二階建て体制によって災害の時代における持続的な社会を構築できます。

#### マルチハザード防災の入口としての洪水

洪水は、多くの災害の中でも特徴があります。地震は自然災害であり、交通事故は人為的な災害ですが、洪水は自然と人為の複合災害です。そのため、とくに人為的な面で、脆弱性や暴露性のリスクを減らすことができます。次に、気象予報や流出予測により洪水には予測可能性があります。洪水の前に、防災インフラや危機管理体制で備えることができるのです。

さらに、人間の一生の中で洪水は複数回発生します。洪水経験者は経験から学び、次の洪水に備えることができます。同時に洪水未経験者に知識を共有することができます。年配者は若年者に教え、蓄積された知識は次の世代を洪水の予兆に注意深くさせることができます。これが水防災を意識する文化であり、この文化はマルチハザードに展開可能なものです。

#### 地域社会でのリスク管理

防災文化は繰り返し洪水が発生する社会の中ではぐくまれます。洪水リスクは毎年存在しますが、10年に1度の洪水を大洪水とすれば、10年に9年は大洪水がないと期待で

きます。社会にとって1年周期の洪水リスク管理を何度も行う機会となります。洪水常襲地では洪水対策インフラによる防御が重要ですが、施設の機能は、組織的な準備、リスク監視、構造物管理の習慣的な努力によって維持されます。これがリスク管理サイクルです。

地方政府は、入手可能な材料、支出可能な予算、近隣在住の労働力を使って、このサイクルを運用することになります。この3要素が防御インフラの修復力を生みます。地域の中でこの3要素を揃えることで地方政府は洪水リスクへの対処能力を高めることができます。副次的には、域内調達の努力は、多自然工法を通じて、在来植生の多様性保全や継続的な雇用創出の効果があります。

**中央政府による災害管理**

10年に1度は起こりえる大洪水は、地域社会に大きな損害をもたらします。応急措置、機能回復、施設復旧が行政サービスと日常の生活再建のために急務となります。しかし、地方の対処能力では対応しがたいものです。加えて社会インフラは経年的にも偶発的にも劣化が避けられません。このような場合には、中央政府は財政的、技術的支援をもって地方政府を助けることとなります。これが災害管理サイクルです。

中央政府は被害を受けた地域に対し、追加的な財政的支援を行います。これは地方政府の予定された収入ではありません。このことは財源の空間的かつ時間的な再配分ともいえます。換言すれば、国内税制を通じた市町村間の相互支援ということができます。

中央政府は、国内のどこかで起きる災害に毎年のように直面していますが、地方政府にとっては毎年発生するわけではありません。そのため中央政府には、地方政府に比べて、技術的知見がより多く蓄積されていきます。災害直後の技術的支援は、適時かつ公平な技術移転にもなります。

**持続性のための災害リスク低減サイクル**

リスク管理サイクルと災害管理サイクルの組み合わせが、社会の生き残りの鍵となります。地方政府はリスク管理サイクルを地方独自の力で運営します。この地方の独立性を尊重しつつ、中央政府は地方相互の補完性を助けるため法律に基づいた措置を実行します。これにより、定期的な維持補修、不定期の修復、非常時の再建を相乗的に進めることが可能になります。中央政府と地方政府の共同運営によって「よりよい復興」プロセスを進めることができるのです。これが強靱で持続的な国と地域を実現するための災害リスク低減サイクルです。

**Risk management by local governments**

The culture of disaster risk reduction grows in societies in which flood events occur repeatedly. Flood risk exists every year. Suppose that a severe flood occurs once a decade; societies may have the remaining nine years without severe floods. In other words, societies can use each of the nine years to practice one-year-cycle flood risk management. It is important for societies in flood-prone areas to maintain flood management infrastructure on a regular basis. Keeping infrastructure functional is only possible through routine efforts of systematic preparedness, risk monitoring, and structural maintenance. This is the risk management cycle.

Local governments should operate this risk management cycle using available materials, affordable budgets, and local workforce. These three are the resources underlying the reparability of protective infrastructure. These resources enable local governments to enhance their capacity to cope with flood risk. While arranging such resources, they are likely to prioritize nature-based solutions, which, in turn, encourage the protection of indigenous biodiversity and the constant creation of employment opportunities.

**Disaster management by the central government**

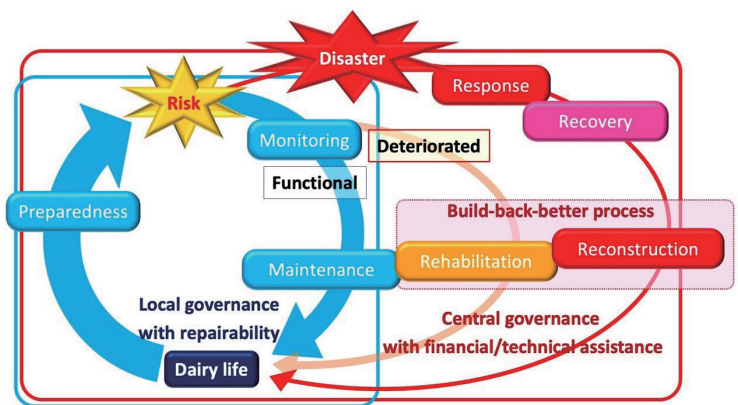
Severe flood events of a ten-year return period cause significant damage to some local societies. Once the damage is done, emergency response, functional recovery, and structural reconstruction are urgent needs to restore public services and daily life. However, these tasks are often beyond the coping capacity of local governments. Additionally, social infrastructure deteriorates due to temporal or accidental causes. To keep infrastructure fully serviceable, the central government should support local governments using financial and technical assistance. This intervention by the central government is the disaster management cycle.

The central government allocates extra finance to flood affected areas, but such support is unplanned for local governments. This is a spatial and temporal budget reallocation. In other words, this reallocation works as a mutual support system among local governments through the national taxation system.

Almost every year, the central government confronts disasters that occur somewhere in the nation, but they are not yearly hardships for local governments. That is a reason the central government has more technical know-how for disaster management than local governments. Post-disaster support by the central government can be a tool for a timely and impartial technical transfer.

**Disaster risk reduction cycle for sustainability**

The combination of the risk and disaster management cycles is key to ensuring social survival ability. Local governments should operate the risk management cycle without any external support. While respecting this local independence, the central government should implement legal actions to promote interdependence among local governments. Then, routine maintenance, occasional rehabilitation, and reactive reconstruction can work in a synergistic manner. Local and central governments can cooperate for the two cycles to effectively work in advancing the build-back-better process. As a result, the disaster risk reduction cycle will build resilient and sustainable nations and regions.



Disaster risk reduction cycle for sustainability  
持続性のための災害リスク低減サイクル

# Training & Education

<https://facebook.com/icharmtrainingcourse/>



## Educational program updates

### 修士課程研修 活動報告

Since 2007, ICHARM, in cooperation with the Japan International Cooperation Agency (JICA) and the National Graduate Institute for Policy Studies (GRIPS), has provided a master's program, "Water-related Disaster Management Course, Disaster Management Policy Program (JICA Knowledge CO-Creation Program on "Flood Disaster Risk Reduction)," mainly designed for foreign government officers to obtain a master's degree in one year. The students study theories and practices in the first half from October to March and work on their theses in the second half from April to August.

The following are the main activities conducted from January to March 2023 in the program.

#### ●Field trip <January 10-12, 2023>

##### <The Tone and Arakawa River Basins>

The students visited the Tone and Arakawa River basins and related museums to learn about the history and roles of urban river disaster prevention measures and local disaster prevention stations, which they had studied in the lectures. They were accompanied by Research Specialist HARADA Daisuke and the staff of the Lower Arakawa River Office of the Ministry of Land, Infrastructure, Transport and Tourism, who provided explanations from time to time.

#### [Itinerary]

##### January 10:

Sawara Roadside Disaster Prevention Station → Inoh Tadataka Museum (a museum dedicated to the man who created the first Japanese map with actual measurements)

##### January 11:

The Metropolitan Area Outer Underground Discharge Channel → Facilities managed by the Lower Arakawa River Office (Arakawa Chisui Museum, Disaster Management Office, Shinden District High Standard Levee)



In the Metropolitan Area Outer Underground Discharge Channel  
首都圏外郭放水路内にて



At the Shinden District High Standard Levee  
新田高規格堤防にて

##### January 12:

Minuma Motoyuri (Intake gate) Park, Tone Great Weir, Nature Education Museum → Kathleen Park (Tone River break point) → Sekiyado Castle Museum (museum exhibiting river improvement in the Tone River basin, history of water transportation, industrial materials in the basin, etc.)

After the visits, the students summarized their findings in their reports on what they learned, comparing the situation in their countries. The following comments are taken from their reports:

#### [Comments from students]

##### ■ Student from Bhutan:

*The construction of high and super levees is not feasible in Bhutan due to the steep terrain and the country's low economy. Additionally, Bhutan's emergency response system for floods also needs improvement. There are no separate centers or institutions equipped with machinery or supplies to activate emergency response efforts during pre-flooding or*

ICHARM では、2007 年以降、(独)国際協力機構 (JICA) 及び政策研究大学院大学 (GRIPS) と連携して、主に外国人行政職員を対象として、約1年間で学位を取得できる修士課程「防災政策プログラム水災害リスクマネジメントコース」(JICA 研修「洪水防災」)を実施しています。例年、10月から翌年3月までの6カ月は主に講義や演習が行われ、4月から8月にかけて学生は論文研究に取り組みます。

ここでは1月から3月に実施した主な活動を報告します。

#### ●視察

##### <1月10日～12日 利根川、荒川流域視察>

学生は、原田大輔専門研究員及び国土交通省荒川下流河川事務所の説明のもと、講義で学んだ都市型の河川防災対策や地域の防災ステーション等の歴史や役割を学ぶため、利根川、荒川流域及び関連する資料館を訪れました。

##### ・1月10日

道の駅さわら防災ステーション→伊能忠敬記念館 (日本で最初の実測日本地図をつくりあげた人物に関する資料館)

##### ・1月11日

首都圏外郭放水路→荒川下流河川事務所管轄施設 (荒川知水資料館・防災対策室・新田高規格堤防)

##### ・1月12日

見沼元坎公園 (農業用水取入口が整備)・利根大堰・自然観察館→カスリーン公園 (利根川決壊地点) →関宿城博物館 (利根川流域の河川改修、水運の歴史、流域の産業資料等を展示する博物館)

視察後に、学生は自国の状況と比較しながら今回の視察で学んだことをレポートとして提出しました。その一部を以下、掲載します。

#### [学生からの声]

■ブータンでは、急峻な地形や経済力の低さから、高い堤防やスーパー堤防の建設は不可能である。また、洪水前や洪水後に作動する機械や、物資を備蓄した独立したセンターや機関が存在しない。このため、洪水に対する緊急対応システムの改善とともに、河川を効果的に管理し、洪水の緊急事態に備え、各地区に災害管理センターを設置することが必要である。さらに、ブータンの国民は、洪水を堤防等の構造物対策だけで防御することを考えるのではなく、洪水の存在を受け入れる新しいメンタリティを取り入れる必要がある。構造物対策は重要ではあるが、洪水リスクを完全に低減することはできないことを国民は理解する必要がある。従って、構造物対策とともに非構造物対策を組み合わせ、教育や啓発キャンペーンなどのさまざまな手段を通じて、人々が災害リスクを理解することにもっと重点を置くことが重要である。(ブータン修士学生)

■フィリピンは河川護岸、堤防、灌漑用ダム、低地に設置された水門、少数の水力発電ダムといった洪水制御インフラをまだ整備していない。一方、

主要な河川流域のインフラ・マスタープランや統合計画を策定するための研究が進められている。しかしながら、洪水調節のためのインフラを建設する際に、通行権、川沿いの非正規住民、事業に影響を受ける住民の移転の必要性、ゾーニング、都市計画の欠如などの問題に直面している。既存の河川インフラや管理計画について、より強力な協力体制と着実な実行が必要である。日本のような大規模なインフラを建設するには、私たちの資金だけでは不十分だと思うが、融資を受けることによって、それらを実施することができるようになると信じている。(ワイリピン修士学生)

■スリランカの都市部のほとんどは、豪雨による洪水が頻発している。スリランカの河川は、上流域では急傾斜地を流れ、下流域では平坦な地形を流れるという日本の河川と似た特徴を有している。そのため、スリランカでは、日本で行われている洪水対策が有効活用されている。地下から海への放水路、涸れ川(かれがわ)への洪水迂回、オープンパーク(遊水地)を利用した洪水遅延、貯水池を利用した洪水貯留の管理などがスリランカで実施されている。日本の災害対策を構成している準備と管理、データ収集、統合洪水管理の促進について、経済的、社会的、環境的な要素を十分に考慮することは、スリランカにとって不可欠な要素であり、被災地における適切な洪水軽減のための対策の実現につながると考える。(スリランカ修士学生)

●実習

<3月1日~3日 Project Cycle Management 研修>

3月1日から3日の3日間にわたり、学生は専門のモデレーターのもとで「Project Cycle Management」(PCM)のワークショップに参加しました。この手法は、あるプロジェクトを手掛ける際に適用される計画・実行・評価のサイクルの管理に役立つ実用的かつ論理的なアプローチです。事前に小池俊雄 ICHARM センター長より、質の高いプロジェクト立案の動機付けに繋がる講義が行われました。

●セレモニー

<3月29日 桜植樹セレモニー>

2014年度から、毎年学生がコースを修了する9月上旬に、土研の敷地内の桜の木に、各年度のコースの名前を刻んだプレートを設置するというセレモニーを継続しています。桜の木は日本の文化の象徴であるとともに、その1本を「自分たちの桜の木」として位置付けることは、学生がそれぞれ帰国した後も ICHARM で学んだことを忘れずに、また、将来再び ICHARM に訪れ、桜の木と再会するときに、一緒に学んだ友を思い出し、また語り合えるようにとの願いが込められております。学生の間でも、このセレモニーは修了式前の思い出に残る行事として、記憶されております。

前 ICHARM センター長の竹内邦良山梨大学名誉教授より、今後もこのセレモニーを継続してほしいとの希望を受けていたことから、今般、土研敷地内に植樹のための新たな敷地を確保し、本コースの学生が自分たちの「桜の苗木」を本敷地内に初めて自ら植樹しました。

学生は、この桜の苗木が成長し、毎年見事な桜が咲くことを期待しております。

post-flooding. To address this, a disaster management center in each district deems necessary to effectively manage rivers and respond to flood emergencies. Furthermore, the people of Bhutan need to adopt a new mentality that accepts the existence of floods rather than believing that they can be stopped by structural measures alone. People need to understand that structural measures, while important, cannot fully reduce flood risk. Instead, a combination of both structural and non-structural measures is necessary. Therefore, more emphasis needs to be placed on understanding disaster risks by the people through various means such as education and awareness campaigns.

■ Student from the Philippines:

The Philippines has yet to fully develop flood control infrastructure, such as river revetments, levees, irrigation dams, flood gates in low-lying areas, and hydropower dams. Studies are still underway to formulate infrastructure master planning for most of our major river basins and integrated planning. We face issues with the construction of flood control infrastructure, such as the right of way, informal settlers along rivers, the need for relocation of affected residents, zoning, and lack of urban planning. We need stronger collaboration and serious implementation of any existing river infrastructure and management plans. I believe our own funds are not enough to build massive infrastructures like Japan, but through loans, we could implement them.

■ Student from Sri Lanka:

Most of the urban cities in Sri Lanka are experiencing frequent flooding due to heavy rainfall. The rivers in Sri Lanka show similar characteristics to Japanese rivers, which flow through steeper slopes in upper reaches and flat terrains in lower reaches. Thus, most of the flood management methods practiced in Japan can be effectively used in Sri Lanka. Underground flood conveyance to sea, flood diversion to dry river basins, flood retardation using open park areas, and flood storage by utilizing reservoir water storage are implemented in Sri Lanka. The Japanese practices of disaster preparedness and management, data collection, and promotion of integrated flood management considering economic, social, and environmental sensitive factors are vital for Sri Lanka to implement suitable flood mitigation interventions in the affected areas.

●Project Cycle Management (PCM) Training <March 1-3>

For three days, from March 1 to 3, the students participated in a workshop on "Project Cycle Management (PCM)" under the supervision of a professional moderator. PCM is a practical and logical approach to help manage the cycle of planning, implementation, and evaluation, which is useful when working on a project. Prior to the workshop, Professor KOIKE Toshio, the executive director of ICHARM, gave a lecture to motivate the students to plan high-quality projects.

●Commemorative sakura tree planting ceremony <March 29>

Since 2014, the ICHARM master's program has continued the ceremony of planting a cherry tree, or sakura in Japanese, on the premise of the Public Works Research Institute (PWRI) in early September, when students complete the course. A small plate indicating the graduating class is also prepared to place near the tree. Sakura is an important symbol in Japanese culture, and planting their own sakura tree in commemoration of graduation has been continued in the hope that each student will not forget what they have learned at ICHARM even after they return home and that they will visit ICHARM some day and see each other again under cherry blossoms, remembering their student days and renewing friendship. In fact, many former students cherish this pre-graduation event as one of their precious memories.

Since Professor Emeritus TAKEUCHI Kuniyoshi of Yamanashi University, the founding director of ICHARM, requested continuing this ceremony, an additional tree-planting site has recently been secured on the premise of PWRI. Also, instead of gardeners, the students planted a sakura tree on their own for the first time this year. The students hope that the baby sakura tree will grow big and show magnificent cherry blossoms every year.



Students planting a sakura tree  
桜植樹の様子

(Written by MIYAZAKI Ryosuke)

## Follow-up seminar for ICHARM graduates

### ICHARM 卒業生のためのフォローアップセミナーの開催

ICHARM was established in March 2006. One and a half years later, the Disaster Management Policy Program (master's program) was launched in October 2007, followed by the Disaster Management Doctoral Program in October 2010. As of September 2022, 170 students completed the master's program, and 15 received a Ph.D. ICHARM has been organizing the follow-up seminar annually primarily to support graduates from its educational programs with their current work by providing advice and information on the latest knowledge and good practices. This year, the seminar was held on February 22, 2023, with 17 graduates who came to Japan to attend ICFM9, faculty members, current students, and other invited guests.

The seminar began with opening remarks by Ms. MUTSUYOSHI Emiko, the director general of JICA Tsukuba, and Emeritus Professor TAKEUCHI Kuniyoshi of Yamanashi University, who was also the founding director of ICHARM.

In the first session, Executive Director KOIKE Toshio of ICHARM delivered the keynote address about transformative steps, highlighting five principles to keep in mind as a scientist; he encouraged young scientists to keep scientific curiosity, respect diversity, cherish a reciprocal relationship with fellow scientists, work together, and be humble by always reflecting on one's actions. He concluded his speech by imparting a valuable message to the graduates, current students, and researchers of ICHARM on the path to becoming respectable scientists or practitioners in the field of water-related issues.

The next session was set to listen to voices from graduates. The voices were collected from the participants beforehand, and four selected alumni, Mr. Akshay Kowlessar from Mauritius, Mr. Rafael Silva Araujo from Brazil, Mr. Muhammad Masood from Bangladesh, and Mr. Roshan Kumara Jayasinghe from Sri Lanka, spoke about their work experiences, challenges they faced, and how they solved them using the knowledge gained at ICHARM.

The third session featured an interaction between former and current students. An enthusiastic discussion took place in response to questions raised by current students, which were mainly related to the experiences the graduates had in practicing what they had learned at ICHARM in their countries or organizations. Mr. Asif Naseer from Pakistan, Mr. Ravindra Vitthal Kale from India, Mr. Robin Kumar Biswas from Bangladesh, and Mr. Seenipellage Chaminda Sugeeshwara from Sri Lanka shared



Discussions among participants  
参加者同士の議論の様子

The third session featured an interaction between former and current students. An enthusiastic discussion took place in response to questions raised by current students, which were mainly related to the experiences the graduates had in practicing what they had learned at ICHARM in their countries or organizations. Mr. Asif Naseer from Pakistan, Mr. Ravindra Vitthal Kale from India, Mr. Robin Kumar Biswas from Bangladesh, and Mr. Seenipellage Chaminda Sugeeshwara from Sri Lanka shared



Group photo  
集合写真

ICHARM が設置されて一年半後の2007年10月に Disaster Management Policy Program (修士課程) が創設、さらに、2010年10月には Disaster Management Doctoral Program (博士課程) が創設され、2022年9月時点において170人の修士取得者および15人の博士取得者を輩出してきました。この修了者および ICHARM のさらなる発展を願い、2023年2月22日にフォローアップセミナーを開催し、ICFM9に参加するために来日した卒業生17名、ICHARM スタッフ、現役学生等が参加しました。

セミナーは、JICA つくばの睦好絵美子センター長、ICHARM 前センター長の竹内邦良名誉教授による開会の挨拶から始まりました。ICHARM 小池俊雄センター長による基調講演では、自身が大切にしている科学者としての5つの心構え、すなわち、科学的な好奇心の最大化、多様性の尊重、相互のつながりの理解、共に働くこと、謙虚であること、それぞれのテーマに基づいて、水問題の分野で科学者や実務の専門家として活躍する ICHARM の卒業生、現役学生、研究者に向けてのメッセージを伝えました。

続いてのセッション「卒業生の声」では、事前に参加者から声を募り、卒業生を代表してモリシヤスの Akshay Kowlessar 氏、ブラジルの Rafael Silva Araujo 氏、バングラデシュの Muhammad Masood 氏、スリランカの Roshan Kumara Jayasinghe 氏が、仕事の経験、その中で直面した課題について述べ、それぞれが ICHARM で得た知識を用いてこれらの課題にどう向き合ったかについて発表し、ディスカッションが行われました。

続いてのセッションでは、「卒業生と在校生の交流」をテーマに、「ICHARM で学んだことをどのように自分の国や組織で実践したか」といった在校生からの質問に基づいて、活発な議論が交わされました。パキスタンの Asif Naseer 氏、インドの Ravindra Vitthal Kale 氏、バングラデシュの Robin Kumar Biswas 氏、スリランカの Seenipellage Chaminda Sugeeshwara 氏らが話題提供を行い、現役学生が将来のキャリアや ICHARM での研究をより良くするためのアイデアなどについての貴重な提案が行われました。最後に、小池センター長の挨拶により、フォローアップセミナーの午前の部は終了しました。

午後の部では、竹内前 ICHARM センター長による、昨年出版された著書「統合洪水リスク管理 (Integrated Flood Risk Management)、- 基本的な考え方と日本の経験 -」に基づいた特別講演が行われました。今回のフォローアップセミナーでは、多くの重要な点が話し合われ、参加者同士の親睦を大いに深めることができました。

**参加者の声**

**参加者 A (ICHARM 在学中)**

ICHARM の卒業生の意見を聞くことができる、とても良い機会でした。卒業後、各自が母国に戻って直面するであろう課題や、ICHARM で得た知識を活かすための様々なアイデアを知ることができました。

**参加者 B (ICHARM 卒業生)**

このイベントに参加できたことは、とても良い機会でした。このような ICHARM フォローアップセミナーを継続的に実施し、卒業生だけでなく、各国の関連組織やひいては国の状態を向上させることができれば、より有益だと思います。専門家同士の繋がりをより活発にし、最先端の科学的知見を共有するために、大変有益な機会でした。

**参加者 C (ICHARM 卒業生)**

ICHARM の在校生に会えたことが良かった。ただ、彼らと議論する時間が少なかったため、次回は 5～8 人の小グループでディスカッションする時間があればより良いと思う。

their valuable ideas, suggestions, and experiences to help current students with future careers and studies at ICHARM. Finally, the morning session of the follow-up seminar ended with the concluding remarks by the executive director.

In the afternoon session, Emeritus Professor Takeuchi delivered a special lecture based on his recently-published book, "Integrated Flood Risk Management: Basic Concepts and the Japanese Experiences."

This year's follow-up seminar was another excellent opportunity for the participants to gain valuable insights and advice and foster camaraderie among themselves through extensive discussions on various issues.

**Voices from participants**

**Participant A (current ICHARM student)**

It was a very nice opportunity to listen to the views of ICHARM alums in an interactive session. We came to know the challenges that we can face upon returning to work as well as the different types of actions we can undertake to utilize our newfound knowledge gained at ICHARM.

**Participant C (ICHARM graduates)**

It was good to meet the current students at ICHARM. We had little time to discuss with them. I think a less formal setting and more time to discuss in small groups of 5-8 people would be helpful for the next meeting.

**Participant B (ICHARM graduates)**

It was a great opportunity to participate in this event. It would be more beneficial to conduct this type of ICHARM follow-up seminar on a continuous basis to enhance the state of not just alumni, but also their organization and country in relevant sectors. Furthermore, it helps in the renewal of existing connections, the formation of new connections among technical expertise, and the sharing of experience for cutting-edge scientific relevant development.

*(Written by Jayasekara Sachintha and HARADA Daisuke)*

## ■ Action Reports from ICHARM Graduates

ICHARMでは、政策研究大学院大学 (GRIPS)、国際協力機構 (JICA) と連携して、世界各国から洪水対策の行政官を対象として、1年間の修士課程「防災政策プログラム 水災害リスクマネジメントコース」を実施するとともに、3年間の博士課程「防災学プログラム」を実施しています。これまで180名を超える実務者・研究者の方々が各課程を修了し、帰国後、本研修で習得された知識や経験を生かして、様々な分野において活躍されています。

ICHARMニュースレターでは、こうした卒業生の方々から、ご活躍の様子について寄稿していただくこととしております。本号では2021年 (14期) 修士課程卒業のKowlessar Akshay Prakash氏 (モーリシャス) から寄稿いただきましたので、ご紹介します。

ICHARM provides graduate-level educational programs for foreign government officers in charge of flood risk management in collaboration with GRIPS and JICA: a one-year master's program, "Water-related Risk Management Course of Disaster Management Policy Program," and a three-year doctoral program, "Disaster Management Program."

Since their launches, over 180 practitioners and researchers have completed either of the programs. They have been practicing knowledge and experience acquired through the training in various fields of work after returning to their home countries. This section is devoted to such graduates sharing information about their current assignments and projects with the readers around the globe. Kowlessar Akshay Prakash (Mauritius), who graduated from the master's program in 2021, has kindly contributed the following article to this issue.

## Kowlessar Akshay Prakash

**Land Drainage Officer (Civil Engineering) at the Land Drainage Authority, Government of Mauritius**

As an alumnus of the ICHARM master's program, I look back on my experience with gratitude and appreciation for the opportunities it led me to. When I first started the course in October 2020, I faced several challenges with the uncertainties associated with the COVID-19 situation. I was one of two students who had to attend the whole course online. However, ICHARM's seamless management of the situation allowed me to be a part of the program and complete my studies even though I was miles apart from the classroom.



Beach clean-up and mangrove planting activity with the Embassy of Japan of Mauritius and JDAA



Local news interview on design criteria for drainage infrastructure in the face of climate change

I thoroughly enjoyed my time learning from various professors, peers, and Ph.D. students at ICHARM, but I really felt that my thesis was where I really pushed myself further. My research as a master's student focused on developing an integrated water resources management plan for Mauritius under the RCP 8.5 climate change scenario. The study identified policy measures to counter the very likely impacts of climate change on the island's water resources.

Today, my work as a land drainage officer at the Land Drainage Authority (LDA) in Mauritius relies on the knowledge that I acquired at ICHARM. I am responsible for monitoring the terms of the contracts with appointed consultants, reviewing all technical reports, strategies, and recommendations proposed, and drafting technical reports addressing site-specific integrated land drainage issues. My roles also include analyzing research needs and managing the implementation of appropriate research programs to support the LDA, formulating policy measures in relation to integrated water and flood management, and being a member of the EIA Committee and the Climate Change Committee of Mauritius. However, there are several challenges that we are facing in our work, including technical, logistical, and systemic challenges. Despite these challenges, we achieved several milestones in the past year, including hydrological modeling for major projects, requesting drainage impact assessment

reports for large-scale projects, and knowledge dissemination through workshops and media.

In addition to my work as a land drainage officer, I have also been elected as the secretary of the Japan Dodoshima Alumni Association (JDAA). Through the association, we promote Japanese culture in Mauritius and provide networking opportunities for Japanese training programs and scholarship beneficiaries. We have also introduced Japanese experts on oil spill to talk about the recent disaster that happened in the Mauritian waters and the work that the experts are helping the Mauritian authorities with on coastal zone management and biodiversity.

I had the privilege of attending the 9th International Conference on Flood Management in Tsukuba, Japan, in February 2023, which was a remarkable experience. It was my first time attending and presenting at an international conference, and it was very enriching. The symposium was of a high level, and the dialogue and exchange of ideas were inspiring, presenting state-of-the-art research in the field of flood management. The conference provided an excellent platform to showcase my research work and receive feedback from experts in the field.

Additionally, it was a great opportunity to network with researchers, practitioners, and policymakers from around the world, opening doors to potential research collaborations and further professional development. The experience has motivated me to continue my pursuit of research and stay engaged in global conversations surrounding flood management and water security.

My time in Japan has been short but enriching, and I am grateful for the skills and knowledge I gained through the ICHARM master's program. Looking ahead, I am excited to collaborate on more research opportunities to improve water security and disaster management. I plan to develop a hydrology-meteorology committee to improve the synergies that currently do not exist, make project proposals to funding agencies for flood resilience building studies, and focus on watershed gauging. As the first Mauritian to attend ICHARM, I hope to inspire others to pursue similar opportunities and contribute to the betterment of our society.



Workshop organised with JICA, JDAA, and Japanese experts on disaster risk reduction



Interview by UNDRR on nature-based solutions (<https://www.undrr.org/news/mauritius-land-drainage-and-weather-radar-help-against-natural-hazards>)

## Comment from a student: My field trip experience to Tsurumi River Basin center, Japan Meteorological Agency, and Arakawa Museum of Aqua

Educational field visits are one of the learning activities conducted by ICHARM. The most recent one was held on March 16 and 17, 2023, for master’s and doctoral students studying flood disaster management. On the first day, we visited the Tsurumi River Basin Center in Yokohama, Japan, operated by the Keihin River Office, MLIT. This center conducts research on various aspects of river management, including water quality, flood control, and environmental conservation. It also features a number of exhibits and displays that showcase the history and ecology of the Tsurumi River Basin. Visitors can learn about the river’s flora and fauna, as well as the various industries and communities that have developed along the river over the years.

In my country, the Philippines, there are similar river basin centers that are tasked with managing and studying river systems, such as the Mindanao River Basin Management Council, the Cagayan River Basin Management Council, and the Agusan River Basin Management Council, to name a few. One of the most prominent is the Pasig River Rehabilitation Commission (PRRC), which was established in 1999 to oversee the rehabilitation and restoration of



Tsurumi River Basin facilities

the Pasig River, a major waterway that runs through the National Capital Region. Japan’s Tsurumi River Basin Center appears to be a larger and more comprehensive institution than the river basin centers in my country, which may not have the same level of resources or national-level support and are typically established at the regional or local level.

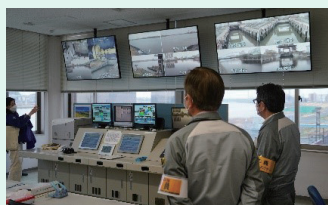
Also located on the Tsurumi River in Yokohama, Japan, is a facility called The Kawawa Retarding Basin. It is a flood control facility designed to prevent flooding by temporarily storing excess water during heavy rainfall and slowly releasing it downstream once the flood risk has declined. It can store up to 330,000 cubic meters of water and is equipped with various instruments to monitor water levels and flow rates. The basin is operated by the Kanagawa Prefectural government in coordination with other local and national authorities. It is quite similar to the



Inside the Kawawa Retarding Basin

Laguna Lake Development Authority’s Laguna Lake Flood Control Project in the Philippines, which includes several retention basins though they are not as massive as the Kawawa Retarding Basin.

On the second day, we visited the Japan Meteorological Agency (JMA), located in Tokyo. Established in 1875 as the Central Meteorological Observatory, JMA is now the national weather service for Japan and is responsible for monitoring and forecasting weather, seismic activity, including tsunamis, and other natural phenomena in the country. The agency operates a wide network of weather observation stations, radars, and satellites across the country and provides real-time weather and earthquake information to the public through multiple media channels, including its website and mobile apps. JMA works with other government agencies and organizations to provide weather information to and support decision-making at various sectors, including defense, transportation, and disaster response. JMA is similar to our weather bureau called the Philippine Atmospheric, Geophysical, and Astronomical Services Administration (PAGASA); both agencies play a vital role in providing valuable weather information. However, JMA is more accessible to various data, compared to PAGASA, whose data accessibility is somewhat limited due to the Data Privacy Act in the Philippines, enacted in 2012.



Arakawa Floodway Lock Gates Control Room

The last itinerary was a visit to the Arakawa Museum of Aqua, located in Kita City, Tokyo, which showcases the history and culture of water in the Arakawa River and the surrounding area. The main highlight of the trip was a boat ride along the Arakawa floodway, passing through its lock gates. The floodway is an artificial channel that diverts floodwaters from the Arakawa River into Tokyo Bay, effectively reducing the risk of flooding in the surrounding areas and protecting homes, businesses, infrastructure, and the Imperial Palace from flood damage. It is similar to the Manggahan Floodway in Metro Manila, Philippines, which is a large flood control facility that includes several retarding basins, pumping stations, and floodgates. The Manggahan Floodway is designed to protect the surrounding communities from flooding during heavy rainfall by providing a channel for excess water to flow safely out to Manila Bay.

The field trip provided an eye-opening experience for those from developing countries. It emphasizes that a combination of structural and non-structural measures is important in effectively mitigating the impacts of floods.

*(Written by Ballaran, Vicente Jr. G.)*



# Information Networking

## The 55th Annual Session of the Typhoon Committee

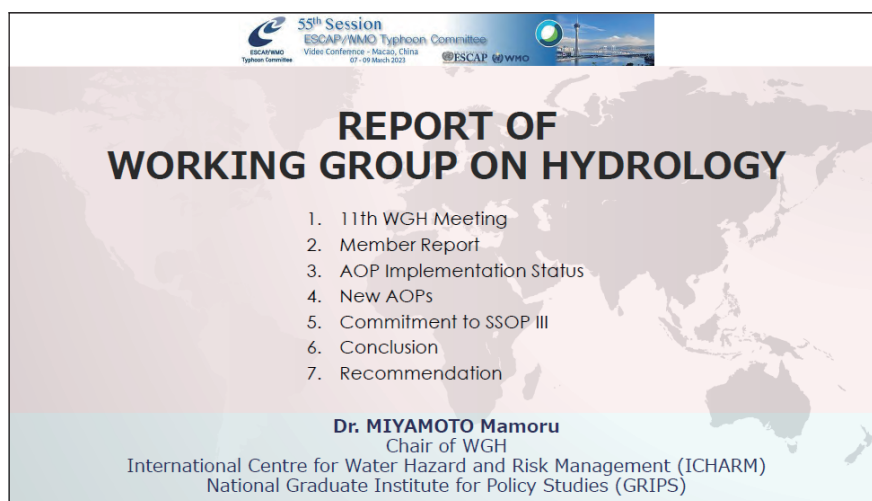
### 台風委員会第55回総会

The 55th Annual Session of the Typhoon Committee (TC) was held online on March 7-9, 2023, hosted by Macao, China. About 90 participants joined from 13 nations and territories (China, Democratic People's Republic of Korea, Hong Kong, Macao, Japan, Lao PDR, Malaysia, the Philippines, Republic of Korea, Singapore, Thailand, Vietnam, and the United States), the Economic and Social Commission for Asia and the Pacific (ESCAP), the World Meteorological Organization (WMO), and the TC Secretariat.

From the government of Japan, representatives of the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) and the Japan Meteorological Agency (JMA) participated. Two researchers attended from ICHARM: Senior Researcher MIYAMOTO Mamoru, who presently serves as the chair of TC's Working Group on Hydrology (WGH), and Researcher KAKINUMA Daiki.

At the meeting, each TC member reported the status of typhoons for the current fiscal year, and each working group presented its activities and proposals. The budget plans for the next fiscal year were discussed and approved, and the appointment of the new TC Secretary (2023-2026/early 2027) was announced. Finally, all the reports and presentations were compiled in the final report, which was presented on the last day of the session and approved by the participants. As the chair of WGH, Miyamoto reviewed the WGH Annual Operating Plans (AOPs) for 2022 and proposed new AOPs for 2023. The meeting also agreed that he will continue to be the chair and vice chair for WGH.

ICHARM identifies TC as one of the most important international frameworks for the risk reduction of water-related disasters and will continuously contribute to strengthening interregional cooperation to achieve the committee's goals.



Report of the Working Group on Hydrology (Contents)  
水文部会の報告 (目次)

(Written by KAKINUMA Daiki)

2023年3月7日から9日にかけて、中国マカオの主催により台風委員会第55回総会がオンラインで開催されました。会議には13のメンバー国・地域（中国、北朝鮮、香港、マカオ、日本、ラオス、マレーシア、フィリピン、韓国、シンガポール、タイ、ベトナム、アメリカ）とESCAP、WMO、台風委員会事務局から約90人の参加者がありました。日本政府からは国土交通省及び気象庁、加えて ICHARM から水文部会長の宮本守主任研究員と柿沼太貴研究員の2名が参加しました。総会では、今年度の台風の状況報告や各WGから活動報告・提案の発表が行われ、次年度の予算計画が決定されたほか、台風委員会の新事務局長（2023-2026年/2027年初旬）就任報告がありました。そして、最終日に会議内容を最終報告としてとりまとめ、参加者によって承認されました。

宮本水文部会長からは、水文部会のこれまでのAOPsのレビューや来年度からの新たなAOPsの提案を行いました。また、水文部会長職および副会長職（部会長職が兼任）が次期（2023～2025）も継続されることが全会一致で承認されました。

ICHARMでは、台風委員会を水災害リスク軽減のための最も重要な国際的枠組みの1つと位置づけ、引き続き地域間協力の強化のために貢献していく予定です。

## UN General Assembly President visits ICHARM to discuss water issues 第77回国際連合総会議長チャバ・コロシ氏が ICHARM を訪問

第9回洪水管理国際会議の開催に時期をあわせて、国連2023水会議の推進などのため来日された国連総会議長チャバ・コロシ氏が、2月16日に ICHARM を来訪され、小池俊雄センター長との会談や ICHARM の博士・修士課程学生との意見交換を行いました。

ICHARM に到着後、まず ICHARM の研究執務室を視察したのち、小池センター長から世界の水災害の現状と国際的議論の経緯・潮流、水災害に関して科学技術が果たすべき役割、その中で特に Water-Food-Energy Nexus や生活の質の向上の観点からの ICHARM の研究活動成果の紹介、End-to-End アプローチの重要性、我が国の流域治水の考え方や第4回アジア太平洋水サミットの成果文書等について説明が行われました。

コロシ氏からは、3月22日～24日に開催される国連2023水会議への日本の貢献に期待していること、ICHARM の活動が国連2023水会議の議論の方向性と一致していること、その研究活動成果は水会議で議論される水問題解決への Game Changer の要素となる得るといったコメントがありました。

さらに博士・修士課程学生との意見交換では、学生から寄せられた、洪水予警報システムにかかる国連の取組、気候変動に伴う災害に対処するための効果的な資源投入、国際河川での水資源管理といった質問に対して、コロシ氏からは非常に丁寧かつ洞察に満ちた応答や解説を頂きました。ICHARM の学生にとっては、国連総会議長と直接議論を交わすことのできる、極めて貴重かつ有意義な機会となりました。

H.E. Mr. Csaba Kőrösi, the president of the United Nations General Assembly, visited ICHARM on February 16, 2023, while staying in Japan to promote the UN 2023 Water Conference in conjunction with the 9th International Conference on Flood Management (ICFM9). During his visit, he had a meeting with Prof. KOIKE Toshio, the executive director of ICHARM, and participated in a discussion session with ICHARM doctoral and master's course students.

Arriving at ICHARM, Mr. Kőrösi took a brief look around the research room and proceeded to a meeting with Prof. KOIKE. The meeting started with the executive director's presentation explaining the current situation of water-related disasters around the world, the historical background and trends of international discussions, and the role of science and technology in water-related disaster reduction. He also included ICHARM's research activities, especially in terms of the Water-Food-Energy Nexus and the quality-of-life improvement, the importance of the End-to-End approach, Japan's latest flood management policy of "River Basin Disaster Resilience and Sustainability by All," and the outcome documents of the 4th Asia-Pacific Water Summit.

Mr. Kőrösi expressed his high expectations for Japan's contribution to the UN 2023 Water Conference, which took place in New York on March 22-24. He also stressed that ICHARM's research activities were completely in line with the direction of the discussions that would take place at the conference and that the outputs of ICHARM's research activities could be an element of "Game Changer" for solving water problems that would be addressed there.

During the discussion session with ICHARM doctoral and master's students, Mr. Kőrösi kindly provided detailed and insightful answers and explanations to the questions they asked about the UN's efforts to promote flood forecasting and warning systems, effective resource input to cope with disasters due to climate change, and water resources management in international transboundary rivers. It was a very valuable and meaningful opportunity for the students to have a face-to-face discussion directly with the president of the United Nations General Assembly.



Executive Director KOIKE (second from left) delivers a presentation.  
小池センター長（左から2番目）による説明



UN General Assembly President Kőrösi at the meeting (center)  
会談を行うチャバ・コロシ国連総会議長（中央）



UN General Assembly President Kőrösi answers questions from ICHARM students.  
学生からの質問に答えるチャバ・コロシ国連総会議長

(Written by MORI Noriyuki)

## Comments from participating doctoral course students

### 参加した博士課程学生からのコメント

During question and answer session with the students currently studying at ICHARM's educational program, the first question was about the need to increase the capacity of countermeasures to reduce the negative effects of intensified climate change hazards. In this regard, President Kőrösi was asked about what practices the UN has been promoting in prioritizing preparation measures, especially with regard to early warning systems concerning the intensification of climate change, which has been pointed out to cause major hydrological disasters, such as floods and droughts, particularly in developing countries like the Philippines, which has recently ranked first in the world risk index.



Discussion session with ICHARM students

In his response, the president emphasized the need for accurate hydro-climatic data to improve resilience capabilities. He highlighted the importance of taking essential steps, including creating and integrating global water information systems encompassing hydrology, meteorology, and long-term climate science. The president referred to an ongoing five-year program called "Early Warning for All," which aims to protect all people through early warning, and underscored that if all nations work together, it will be a much more predictable world for years to come, based on increased proactiveness and preparedness against water-related disasters.

In connection with the vicious cycle of a poverty-disaster nexus in which vulnerable countries like Pakistan have to face disastrous events, the president was asked for comments on how the solidarity that the UNGA represents and the UN's shared resources could be tapped effectively for helping developing countries to reduce the impact of climate change-induced disasters as well as achieve implementable transformational change vis à vis the SDGs.

The president was of the view that considerable headway has yet to be achieved as regards attaining the targets of the SDGs, especially in the context of climate system transformation. He emphasized that scientific research backed by reliable data is essentially required in the assessments needed for policy decisions, in which institutions like ICHARM have a very important role to play.

The president stressed that member states needed to be realistic about achieving their individual SDG objectives. In this regard, he added that they must pursue the targets more seriously and that global finances must be more equitable and efficient to prioritize spending, while also aiming to reduce wastage of funds. He concluded that the whole spending structure needs rethinking in order to pursue meaningful sustainable development, which would require the equitable distribution of resources.

Lastly, the discussed issue pertained to water resources management in international transboundary rivers in developing regions, where developing water resources to cope with climate change impacts and meet the food, water and energy demands has become essential. In this context, the president was asked about the role of the UN in facilitating the development of a basin-specific framework for socio-economic development and regional peace in transboundary basins in Africa by combining scientific findings and international water principles.



The president's team advising the students

The president emphasized the importance of cooperation among all riparian countries to maximize the benefit of the international transboundary water resources to all communities. The existing international water convention could be adopted by countries to develop local frameworks. He also highlighted that scientific findings and climate change projections could play a constructive role in reaching agreements for equitable development and coping with the unique problems in each basin. The president viewed projects on international transboundary rivers (e.g., the GERD in the Nile basin) from a beneficial aspect, as these can be tapped advantageously to improve energy supply and food security for

communities in the basin. In this regard, the president stressed the need for data sharing to enable mutual planning and resource management in transboundary basins.

The visit of H.E. Mr. Csaba Kőrösi, the president of the United Nations General Assembly provided an opportunity for the students as it allowed direct interaction with the topmost administration of the UN. The students were excited and motivated by gaining insight into the latest trends and thinking at the UN and obtaining firsthand views of its leadership on their aspiration for dealing with climate change and water related issues.

*(Written by Tedla Mihretab Gebretsadik)*

# Public Relations

## ICHARM delivers flood workshops for local schools つくば近郊の学校で初めて「洪水防災学習」を開催しました

大規模な洪水災害が国内外で頻発していますが、洪水災害に効果的に対応するためには、洪水の危険性を知った上で、いざという時にどのように行動すべきか事前に考えておくことが求められます。

このため、国土交通省では、台風の接近によって河川の水位が上昇する時に、自分自身がとる標準的な防災行動を時系列的に整理してとりまとめる「マイ・タイムライン」の取組を進めています<sup>1)</sup>。

一方、ICHARMでは、仮想現実(Virtual Reality (VR))技術を用いて、パソコン上のデジタルツインの世界で洪水を再現し、パソコン上のアバター(分身)を操作することで、洪水災害を仮想的にリアルに体験できる「仮想洪水体験システム」の開発を進めています<sup>2)</sup>。

今回、国土交通省関東地方整備局下館河川事務所様のご協力のもと、上記を組み合わせ、弊所で初めて、今後の防災を担う中学生・高校生を対象にした「洪水防災学習」を実施しました。茨城県教育庁ならびにつくば市教育局のご協力を得ながら希望校を募った結果、以下の6校で実施しました。参加者は、各校で7人～30人でした。

茨城県立竹園高校・茨城県立結城特別支援学校・茨城県立並木中等教育学校・つくば市立学園の森義務教育学校・つくば市立谷田部東中学校・つくば市立手代木中学校

「洪水防災学習」は、各校により若干の内容の順番の違いはあるものの、いずれもおおむね90分間で以下のように実施しました。まず、栗林大輔上席研究員からの導入説明の後、傳田正利主任研究員の説明により、ICHARMが準備したパソコンを用い、一人あるいは複数人での仮想洪水体験システムの体験を30分で行いました。体験は、小貝川沿いで洪水リスクが高いとされるつくば市上郷地区に体験者が居住していると仮定し、パソコン上で再現した上郷地区にて、民家(自宅)から指定避難場所(上郷小学校)までアバターを操作するものとしました。具体的には、避難前に民家(自宅)にて水位や雨量などの情報を様々な媒体(テレビ、スマートフォンなど)で入手し、指定避難場所(上郷小学校)への避難途中では避難支援者への声掛けなど行いながら、いかにうまく避難したかを得点形式で表現するものとして制作しました。各体験者のお互いの避難の様子は、大画面で逐次確認できるため、体験者が大きく盛り上がりを見せる場面もありました。

その後45分間程度、小中学生向けマイ・タイムライン検討ツールである「逃げキッド」を全員に配布し、国土交通省職員から「マイ・タイム

Large-scale flood disasters frequently occur in Japan and abroad. To respond to flood disasters effectively, people should learn the dangers of flooding and prepare themselves for what to do when it happens.

For this reason, the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) has been promoting the “My Timeline” initiative, in which each person should make a timeline of standard actions to take as the river water level rises due to a typhoon or heavy rainfall.

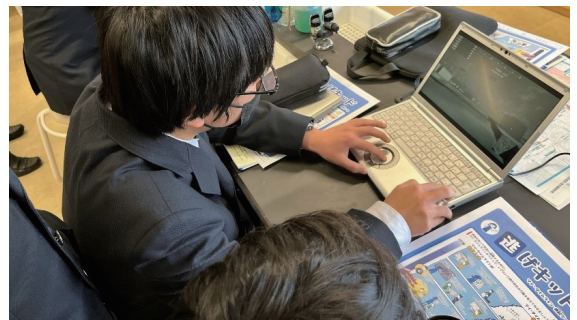
Meanwhile, ICHARM is developing a virtual flood experience system that uses virtual reality (VR) technology to reproduce floods in a digital twin reality on a personal computer, allowing users to have a realistic flood experience by operating an avatar in virtual reality.

With the cooperation of the Shimodate River Office of the Kanto Regional Development Bureau of MLIT, ICHARM conducted workshops about floods for junior high and high school students, a generation that is expected to lead disaster risk reduction in the future. The workshops are the first attempt ICHARM has ever planned that is specifically targeted at teenagers and also unique in coupling the latest VR technology with the new government initiative. With cooperation of the education departments of Ibaraki Prefecture and Tsukuba City, ICHARM invited local schools in the Tsukuba area to have flood workshops, and six of them accepted the offer. The workshops took place at each school with 7 to 30 students.

Although how the content was presented varied slightly from school to school, the 90-minute “Flood Disaster Prevention Learning” workshop was conducted as follows. Chief Researcher KURIBAYASHI Daisuke started the workshop with an introductory explanation. Then, Senior Researcher DENDA Masatoshi led a 30-minute experience of the Virtual Flood Experience System, with one or more participants using personal computers prepared by ICHARM. The experience was designed based on the assumption that the participants lived in the Kamigo district of Tsukuba City, a high flood-risk area along the Kokai River. They were instructed to evacuate from their homes to the district’s designated evacuation site (Kamigo Elementary School) while operating an avatar. The participants were also told to obtain information, such as water levels and rainfall, at their homes via various media (TV, smartphones, etc.) before evacuating and communicate with evacuation supporters while evacuating. Points were given to their actions, with total scores indicating how well they



The students listen to a researcher outlining the Virtual Flood Experience System.  
洪水 VR 概説の様子



A student tries out the Virtual Flood Experience System.  
洪水 VR 体験の様子



Flooding reproduced on the monitor by the Virtual Flood Experience System.  
洪水 VR で再現された氾濫状況

evacuated from their homes to the designated evacuation site. Because the participants could watch each other's actions on a large screen, there were scenes of great excitement during the workshops.



The students working on their own "My Timeline."  
マイ・タイムライン演習の様子

After experiencing the Virtual Flood Experience System, the participating students at each school spent about 45 minutes planning how they should act in case of flooding. First, they were provided with "Nige-kid (literally, running-away children)," the "My Timeline" tool for elementary and junior high school students to plan a timeline of emergency actions. An MLIT official then explained what "My Timeline" was and led the students to create their timelines. In this exercise, they were instructed to check the expected inundation depth in the Kamigo area and what would happen to their assumed homes if flooding of that scale hit the area. Then, they learned what to do from the onset of a typhoon or heavy rain to flooding by answering quizzes. Finally, they created their own action timelines in case of an emergency.

Although 90 minutes may not be long enough for this type of workshop, the students were able to learn how dangerous flooding could be using the Virtual Flood Experience System and what they should act before and during a flood event through the "My Timeline" exercise, benefitting from the synergistic effect of each experience. ICHARM plans to continue offering such opportunities from the next year on.

#### References:

1. Water and Disaster Management Bureau, MLIT, Japan, "My Timeline," <https://www.mlit.go.jp/river/bousai/main/saigai/tisiki/syozaiti/mytimeline/index.html>
2. Denda Masatoshi, Shinya Takafumi, Harada Daisuke, and Koike Toshio, "An Effort to Spread a Virtual Flood Experience System in Kumamoto City, Japan," *Civil Engineering Journal*, vol. 64, No. 10, pp. 12-15, 2022.

(Written by KURIBAYASHI Daisuke)



"My Timeline" learning material  
マイ・タイムライン作成教材「逃げキッド」

ライン」の説明および演習を行いました。上郷地区の想定浸水深や参加者自身の家庭の状況をチェックするところから始まり、台風発生から氾濫するまでの主な備えをクイズ形式で学習し、最後に「マイ・タイムライン」を実際に作成しました。

全体的に演習にかかる時間が短い中、参加者は仮想洪水体験システムで洪水の危険性を学びつつ、「マイ・タイムライン」演習で洪水時に準備すべき事柄を学習することが出来、各演習での相乗効果もあったと思われます。ICHARMでは次年度以降も、このような取り組みを継続する予定です。

## Public symposium "Can you survive unexpected floods?"

一般公開シンポジウム「君は想定外の洪水から生き残れるか ～ e-sports@KasenBousai ～」を開催

ICHARM held a public symposium, "Can you survive unexpected floods?" from 1:30 p.m. on Sunday, February 19, on the occasion of ICFM9. The symposium included "e-sports@KasenBousai," a unique game-like event using the Virtual Flood Experience System, which is currently under development at ICHARM. About 70 people participated, including students from six local schools in the Tsukuba area.

ICHARM Deputy Director MATSUKI Hirota opened the symposium by welcoming the participants. Then, Professor OKI Taikan of the Graduate School of Engineering of the University of Tokyo, who is also the special advisor to the university president, delivered a keynote lecture titled "Climate Change and Floods."

ICHARMでは、ICFM9開催に合わせて、2月19日(日)13:30から一般向けの公開シンポジウムを開催しました。シンポジウムにおいては挑戦的な試みとして、ICHARMで開発中の「仮想洪水体験システム」を活用し、つくば近郊の6校(筑波大学、茨城県立竹園高校、茨城県立並木中等教育学校、つくば市立学園の森義務教育学校、つくば市立谷田部東中学校、つくば市立手代木中学校)による「水防災競技会」を実施しました。

ICHARM 松木洋忠前グループ長の開会挨拶後、東京大学総長特別参与、大学院工学系研究科 沖大幹教授から「気候変動と洪水」と題して基調講演を頂きました。

沖教授からは、近年 CO2 濃度が年々上昇して地球全体の気温が上昇を続けていること、さらには温暖化に伴い地球上の多くの地域で洪水頻度が増加するという研究結果が紹介されました。また、東京は東アジアだけではなく世界のどんな地域でもこれまでに経験されていない気候リスクに曝される可能性があることなどが紹介されました。

続いて、e-sports の要素を取り込んだ「水防災競技会」を開催しました。会場フロアを大きく6つに分け、それぞれの区画に仮想洪水体験システム用のパソコンと大型モニターを設置し、各校の代表者が自らの分身となる「アバター」を操作して、いかにうまく避難前の情報収集を行いつつ、効果的な避難が出来るかを得点形式で競いました。競技会では、解説の筑波大学白川直樹准教授とともに ICHARM 栗林大輔 上席研究員が実況を行い、合間には洪水に関する質問の回答をいただきつつ進行しました。各校の避難の様子は、ステージ上の大型スクリーンで確認できるため、会場は大きな盛り上がりを見せていました。また、競技中は逐次チャット方式で、参加校を応援したりコメントを投稿したりできる仕掛けを導入しました。

続いて、今回の仮想洪水体験システムで用いられた研究紹介として ICHARM 久保田啓二朗 上席研究員から「水位予測システムおよび氾濫解析」、および新屋孝文 上席研究員から「疑似洪水体験システムの開発」の説明を行い、最後に国土交通省による洪水被害軽減の取組である「マイ・タイムライン」の紹介を国土交通省下館河川事務所の海津義和 所長からご説明を頂きました。

「水防災競技会」に参加した生徒からは、「対抗戦では、他校と一緒に競技ができて楽しかった」「実際に洪水が襲ってきたら、どのように避難をするか、イメージをしながら勉強することが出来た」などの感想が寄せられました。シンポジウムの全体参加者は70名ほどでしたが、競技会の形式で、会場全体で仮想洪水体験システムを体験する方式としたため、会場全体の共同体験として、より各参加者の記憶に深く刻まれることとなったことが推察されます。

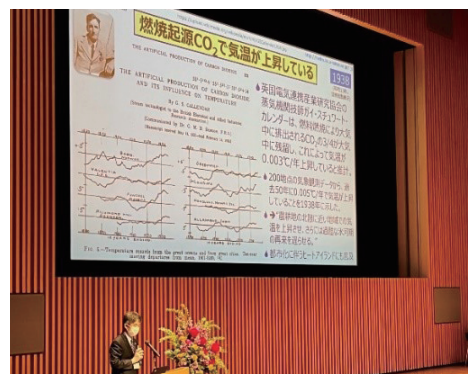
Showing research findings, Professor OKI pointed out that studies suggest that global temperatures have kept rising along with increases in CO2 concentrations and that floods are likely to be more frequent in many parts of the world as a result of global warming. He also said that Tokyo may be exposed to climate risks never experienced before in any region of the world, not only in East Asia.

A game-like event, "e-sports@KasenBousai," took place after the keynote lecture. Six teams of students from local schools (Tsukuba University, Takezono High School, Namiki Secondary School, Gakuennomori Compulsory Education School, Yatabehigashi Junior High School, and Teshirogi Junior High School) competed in this event to decide which team could evacuate best. For this event, part of the conference room was divided into six sections, each equipped with a computer to operate the Virtual Flood Experience System and a large monitor. Each team seated in one of the six sections manipulated their avatar in the virtual reality to collect useful information before evacuation and perform effective evacuation. The teams were instructed to earn the highest points to win the game. During the competition, ICHARM Chief Researcher KURIBAYASHI Daisuke provided live commentary with Associate Professor SHIRAKAWA Naoki of Tsukuba University, who answered questions about flooding in between. The audience responded in great excitement, watching the teams evacuating from flooding on a large screen on the stage. They also posted comments and cheered their favorite teams using a chat system introduced to engage more people in the event.

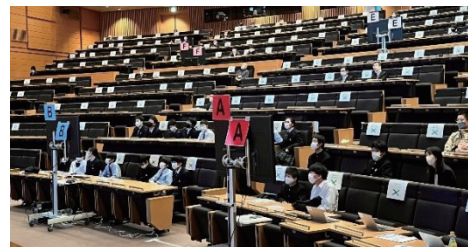
Following the e-sports event, three speakers spoke about related topics. ICHARM Chief Researchers KUBOTA Keijiro and SHINYA Takafumi outlined the research whose outcomes are applied to the Virtual Flood Experience System used for the competition. Mr. KUBOTA explained the water level prediction system and inundation analysis, and Mr. SHINYA explained the development of a virtual flood experience system. Mr. KAIZU Yoshikazu, the director of the Shimodate River Office, the Ministry of Land, Infrastructure, Transport and Tourism (MLIT), explained the "My Timeline" project, an initiative led by MLIT to reduce flood damage.

Students who participated in the virtual flood game made positive comments about the experience. For example, one student said, "I had a great time competing with other schools," and another said, "Because the new system gave us clear images of an emergency situation, we could learn more concrete ideas of safe evacuation in case of flooding." The event had a positive effect not only on the game participants but also on the rest of the audience. Because it was designed to involve the entire audience using a large screen, live commentary, and a chat system, the flood experience became a collective experience shared among the people in the symposium, which seemingly helped each person more effectively memorize what to do in case of flooding.

(Written by KURIBAYASHI Daisuke)



Professor OKI of the Graduate School of Engineering of the University of Tokyo, who is also the special advisor to the university president, delivers a keynote lecture.  
東京大学総長特別参与、大学院工学系研究科 沖大幹教授による基調講演



Participants in "e-sports@KasenBousai" 「水防災競技会」の様子



Mr. KAIZU, the director of the Shimodate River Office, explains the "My Timeline" project.  
下館河川事務所 海津所長による講演

# Field Survey

## Field surveys in the lower Stung Sen River in Cambodia

### カンボジア・セン川下流域における現地調査

As part of a JSPS\* research project entitled "Local characteristics of sediment transport and landform development processes along the coast of Lake Tonle Sap," ICHARM Research Specialist NAGUMO Naoko conducted field surveys at several sites along the lower Stung Sen River in Cambodia on March 4-12, 2023. Lake Tonle Sap, into which the Stung Sen River flows, is known to expand its area three to five times during the rainy season compared to the area during the dry season, because it receives floodwaters from the surrounding area. Sediment transport by the inflowing tributaries plays an important role in the landform development of the lake coast, which is cyclically inundated every year. The process is governed by the landform characteristics of each tributary, such as bed slope, sediment particle size, and drainage area, and the seasonal changes in river water level and discharge. The seasonal changes in lake water level are considered another important factor. Therefore, she began conducting field surveys on the bed materials and landform of the Stung Sen River, which has the largest drainage area in the Tonle Sap watershed. Regrettably, the COVID-19 pandemic caused a delay in the surveys for four years, but she was able to resume them this year.

\*JSPS: Japan Society for the Promotion of Science

Fig. 1 shows the riverbed of the Stung Sen River. Because the water level was low during the dry season, it was easy to observe the sediment transported by floods during the rainy season. The investigations at different sites along the river channel revealed that the sediment deposited on the riverbed changes from sand-gravel mixture to sand toward downstream. In addition, as shown in Fig. 2, riverbed sediment mining was observed at various sites along the Stung Sen River. The sediment collected is sold in nearby cities as building materials. She also saw local farmers pumping water from the Stung Sen River to cultivate dry-season rice, and tractors driving through a village in place of ox carts. She had never seen such scenes before. This year marks the 32nd year since the end of the civil war in Cambodia, and its economy continues to grow. The villages along the Stung Sen River are likely to undergo further changes in the near future.



Fig.1 Investigation of riverbed materials  
図1 河床材料調査



Fig.2 Sediment mining from the riverbed  
図2 河床からの土砂採掘

During this research trip, she also visited the Sambo Prei Kuk archaeological site on the right bank of the Stung Sen River. This important ancient site, consisting of a city area and a Hindu temple area, was listed as a UNESCO World Heritage Site in 2017. The site contains a large number of artificial channel networks connecting each archaeological remain to the Stung Sen River and its tributaries, but their purposes have been virtually unknown. Therefore,



Fig.3 Investigation of an ancient channel  
図3 古代水路の調査

科学研究費助成事業「トンレサップ湖岸域の土砂輸送と地形発達プロセスの地域特性」の一環として、南雲直子専門研究員は2023年3月4日から12日にカンボジアのセン川下流域で現地調査を行いました。セン川が流入するトンレサップ湖は周囲の洪水を受け入れるため、雨季になると面積が乾季の3～5倍に拡大することが知られています。毎年周期的に浸水する湖岸の地形発達には、流入支川の土砂輸送が重要な役割を果たすと考えられますが、その過程は各支川の河床勾配や輸送される土砂の粒径、流域面積といった各支川の地形条件や、水位・流量の季節変化に支配されます。それと同時に、湖水位の季節変化の影響も受けていると考えられます。そこで、トンレサップ水系最大の流域面積を持つセン川を対象に、河床材料や河岸地形に関する調査を進めてきました。新型コロナウイルス感染症の影響によりしばらく現地渡航ができませんでしたが、今回、4年ぶりに現地調査を行うことが出来ました。

図1は、セン川の河床を示したものです。乾季で水位が低下しているため、雨季に運ばれた土砂を容易に観察することができます。川の流路に沿って調査を行った結果、河床に堆積した土砂は、下流に向かって砂礫から砂へと変化することが分かりました。また、図2に示すように、セン川沿いの集落では、河床の土砂採掘を行う様子が各所で見られました。採取した土砂は、建築資材として近隣の市街で販売するそうです。さらに、乾季米の栽培のためにセン川から揚水を行う様子や、牛車に替わってトラクターが村の中を走る様子も見られました。いずれも、これまでは見られなかった風景です。カンボジアは内戦終結から今年で32年となり、経済成長が進んでいます。セン川沿いの農村も、これからますます変化していくのかもしれない。

今回の出張では、セン川右岸にあるサンボー・プレイ・クック遺跡群も訪問しました。この遺跡は、都城区とヒンズー教の寺院区からなる7世紀の重要な遺跡で、2017年にユネスコの世界遺産に登録されました。ここには、各遺構とセン川やその支流とをつなぐ多数の水路網が残っていますが、その用途はよく分かっていません。そこで、筑波大学の田下一太准教授の依頼を受け、地質学や考古学の専門家や、カンボジア人学生らと古代の水路や水田の調査を行いました。図3は水路の発掘調査の様子です。この遺跡近くのセン川氾濫原は雨季に水没するため、その支川ではせき上げが生じると考えられます。そのため、支川につながる水路にはほとんど流れが生じな

かった可能性があります。水路がどのような機能が有していたのか詳しく調べるには、遺跡周辺の地形や、雨季・乾季の水の流れに関する水利・水文学的検討が不可欠であり、引き続き調査に協力していきたいと考えています。

at the request of Associate Professor SHIMODA Ichita of Tsukuba University, she investigated the ancient channels and paddy fields with geologists, archaeologists, and Cambodian students. Fig. 3 shows the excavation of an artificial channel. Since the Stung Sen River floodplain near this site is submerged during the rainy season, its tributaries in the area are supposed to be affected by backwater. If that was also the case back then, little water would have flowed into the artificial channels connecting to the tributaries. To further understand the function of the artificial channels, it is essential to study the landforms around the site and the hydrological and hydraulic aspects of the water flow during the dry and rainy seasons. She will continue to cooperate with other experts in investigating the archaeological site.

(Written by NAGUMO Naoko)

## Miscellaneous

### Annual Hanami lunch お花見ランチ

土木研究所幹部と ICHARM で勉強する博士・修士コース学生 22 名との交流を目的とした花見会を 2023 年 3 月 30 日のお昼休みに行いました。今回の花見会は、COVID-19 の影響により、これまで 3 年連続中止となっていたため、実に 4 年ぶりの開催となりました。

桜は満開を迎えており、また、好天にも恵まれたなか、土木研究所藤田光一理事長他、幹部の方々にも参加していただきました。始めに、藤兼雅和上席研究員よりそれぞれ博士・修士学生の紹介を行ったのち、小池俊雄センター長より、桜にまつわる談話がありました。その後、お弁当を食べながらの談笑、藤田理事長の挨拶、修士学生全員による歌の合唱等が行われ、楽しい時間を過ごすことが出来ました。外国からの参加者も日本の伝統であるお花見を体験できたことと思います。

A cherry blossom viewing party, or *ohanami* in Japanese, was held on March 30, 2023, during the lunch break to promote interaction between the executives of the Public Works Research Institute (PWRI) and 22 doctoral and master's course students studying at ICHARM. This was the first ohanami in four years, as it had been canceled for three consecutive years due to COVID-19.

The event took place with cherry blossoms in full bloom under warm spring weather. From PWRI, President FUJITA Koichi and some other executives joined the students and staff of ICHARM. First, Chief Researcher FUJIKANE Masakazu introduced the students, and then Executive Director KOIKE Toshio gave a talk on cherry blossoms. After that, the participants enjoyed chatting over lunch, a greeting from President FUJITA, and a song sung by the master's students. It was a great opportunity for the students from different countries to get to know people outside ICHARM and experience a Japanese tradition.



People at the ohanami lunch under cherry blossoms  
満開の桜とともに記念撮影

(Written by MIYAZAKI Ryosuke)



## Comments from internship students

### インターン生からのコメント

ICHARMでは、Livia Lahat さん (Malaysia-Japan International Institute of Technology, Universiti Teknologi Malaysia) の1名をインターン生として受け入れました。

ICHARMでの活動を振り返ってコメントをいただきました。

ICHARM accepted one internship student Ms. Livia Lahat from Malaysia-Japan International Institute of Technology, Universiti Teknologi Malaysia from January 16 to February 10, 2023.

She kindly contributed a short message as below while looking back as her activities at ICHARM.

### Livia Lahat (Malaysia-Japan International Institute of Technology, Universiti Teknologi Malaysia)

My name is Livia Lahat from Malaysia. I am a PhD student in Malaysia-Japan International Institute of Technology, Universiti Teknologi Malaysia. It is good to be back here again after my master degree in ICHARM about 10 years ago. In Malaysia, I work for Department of Irrigation and Drainage. First of all, I would like to express my gratitude to the president of PWRI and the director of ICHARM for accepting my application to do an internship in ICHARM. During my one month stay, I am under supervision of Dr. Shrestha sensei. I learn a lot about the development of stage duration damage curves for rice crop. The knowledge, ideas and his insights on the subject matter will greatly help me in improving my research. I also have a chance to learn Rainfall Runoff Inundation (RRI) model. It is a model which combine hydrology and hydraulic analysis. It is also capable to map inundation area which then can be used for flood damage assessment. I learned on how to make use of the results from RRI model and import it to ArcGIS then calculate the rice crops damages based on the developed stage duration damage curves. I really thankful and grateful for the opportunity in doing internship here. Finally, I would like to thank all the staffs of ICHARM for their support and assistance directly or indirectly to me until my successful completion of the internship. I thank you very much and wish everyone a good health.



## Personnel change announcements

### 人事異動のお知らせ

#### New ICHARM Members .....

Five new members joined ICHARM.  
They would like to say brief hello to the readers around the world.



#### **MITSUHASHI Hisashi** / 光橋 尚司

*Director for Special Research / 特別研究監*

Having been involved as a civil engineer in flood control projects in river basins in Japan, as well as in planning and implementing ODA and MDBs projects aimed at reducing water-related disaster risks in Asia and Africa, I have come to be convinced that one of the most important roles of civil engineers is to realize the visions that people have for their communities and countries in a sustainable manner using engineering expertise. Together with ICHARM members, I would like to provide professional assistance for as many communities and countries as possible to improve water-related disaster risk management.



#### **TADA Tomokazu** / 多田 智和

*Senior Researcher / 主任研究員*

For the past 26 years, I have worked in research and administrative sectors, mainly for the Ministry of Land, Infrastructure, Transport and Tourism. I have experienced working in Tsukuba City twice before, for a total of about four years, but this is my first time working in an international environment. I will do my best to contribute to ICHARM's activities by making the most of my work experience.



**YAMAGUCHI Noriko / 山口 典子**

Deputy Head of General Affairs Division / 副参事

Hello. I've just started working at ICHARM since this April. Though this is the second time I've worked at this office, there are a lot of things I need to get used to again. I'll do my best to support researchers and other staff members so that they can focus on their work.



**ONARI Rikako / 大成 梨夏子**

Chief Staff / 主査

Hi. I am ONARI Rikako. I'm from the Hokkaido Regional Development Bureau. My previous office is located in Kushiro City (so cold!), and I worked for regional promotion. This is my first time working at ICHARM. There are many things to learn. I am looking forward to getting to know all members and students soon.



**KOBORI Kosaku / 高堀 幸作**

Administer / 主事

Before coming to ICHARM, I worked at the general affairs section of PWRI for 2 years, mainly engaged in human relations. I am excited to work in an international environment like ICHARM, where I can use my English skills to help researchers and students from overseas. I will also make my best effort to support ICHARM members so that I can contribute to solving global issues through them.

**Leaving ICHARM** .....

- **MATSUKI Hirotada:** Deputy Director  
Director, River Department,  
National Institute for Land and Infrastructure Management (NILIM),  
Ministry of Land, Infrastructure, Transport and Tourism (MLIT)
- **OHARA Miho:** Senior Researcher  
Professor, Center for Integrated Disaster Information Research,  
Interfaculty Initiative in Information Studies,  
the University of Tokyo
- **YOSHINO Hirosato:** Senior Researcher  
Senior Research Coordinator  
Policy Research Institute for Land, Infrastructure, Transport and  
Tourism,  
Ministry of Land, Infrastructure, Transport and Tourism (MLIT)
- **IWASAKI Takahiro:** Deputy Head of General Affairs Division  
Deputy Head of Planning and Management Division,  
Public Works Research Institute (PWRI)
- **MIYAMOTO Junko:** Chief Staff  
Senior Staff, General Affairs Department,  
Public Works Research Institute (PWRI)
- **MIYAZAKI Ryosuke:** Chief Staff  
Hokkaido Regional Development Bureau,  
Ministry of Land, Infrastructure, Transport and Tourism (MLIT)
- **NUMATA Shingo:** Exchange Researcher  
Muromachigijyutsu Co., Ltd.
- **松木 洋忠** グループ長  
国土交通省国土技術政策総合研究所  
河川研究部長
- **大原 美保** 主任研究員  
東京大学大学院情報学環 総合防災情報研究センター  
教授
- **吉野 広郷** 主任研究員  
国土交通省国土交通政策研究所 研究調整官
- **岩崎 孝広** 副参事  
土木研究所  
研究企画課 副参事
- **宮本 淳子** 主査  
土木研究所  
総務課 指導員
- **宮崎 了輔** 主査  
国土交通省北海道開発局 開発監理部総務課  
上席専門官 (併) 北海道局 参事官付
- **沼田 慎吾** 交流研究員  
室町技術株式会社

**Position Change** .....

- **MORI Noriyuki:** Director for Special Research  
Deputy Director
- **森 範行** 特別研究監  
グループ長

**Business trips / 海外出張リスト**

\* January - March 2023

- January 15-21, AIDA Kentaro and Ballaran, Vicente Jr. G., the Philippines, to conduct field surveys of Pampanga and Candaba area with Dr. HOMMA and Dr. SUMITA, Tohoku University
- January 22-26, KOIKE Toshio, Abdul Wahid Mohamed RASMY, YOSHINO Hirosato, and USHIYAMA Tomoki, Thiruvananthapuram, Kerala, India, to participate in the upcoming mission to Trivandrum, Kerala, India organized by the World Bank between January 23-25, 2023
- March 4-12, NAGUMO Naoko, Kampong Thom, Cambodia, to conduct field survey of the lower Sen River channel and the Sambor Prei Kuk archaeological site
- March 11-17, Abdul Wahid Mohamed RASMY and TAMAKAWA Katsunori, Sri Lanka, (1) maintenance of real-time rainfall observation and data transfer system in Sri Lanka (2) discussion with Irrigation Department (ID) about the Flood Forecasting and Early Warning System (FFEWS)
- March 19-26, KOIKE Toshio, MORI Noriyuki, MIYAMOTO Mamoru, NAITO Kensuke, and NAGUMO Naoko, New York, USA, to participate in the 6th UN Special Thematic Session on Water and Disasters and UN 2023 Water Conference

## Visitors / 訪問者リスト

\* January - March 2023

- Visited by H.E. Mr. Csaba Körösi, the president of the United Nations General Assembly and members of Office of the PGA, UN, February 16, 2023  
Purpose: to discuss water and climate change \*See **Information Networking** on page 17.
- Visited by DR. KHAMARRUL AZAHARI BIN RAZAK and 4 members of Disaster Preparedness and Prevention Center (DPPC), Malaysia-Japan International Institute of Technology (MIIT), and Universiti Teknologi Malaysia (UTM), March 13, 2023  
Purpose: to survey studies on sediment-related disasters and to discuss its future research

## Publications / 对外発表リスト

\* January - March 2023

## 1. Journals, etc. / 学術雑誌 (論文誌、ジャーナル)

- モハメッド ラスミー アブドゥル フヒド, 安川雅紀, 牛山朋来, 玉川勝徳, 会田健太郎, S. Seenipellageka, S. Hemakanth, 喜連川優, Integration of Multi-Platform Data for Developing an Integrated Flood Information System in the Kalu River Basin, Sri Lanka, *Water*, MDPI, February 6, 2023
- 池田鉄哉, 水災害分野における研究・研修・ネットワークの三位一体的運用による相乗効果と今後の活動展開の方向性についての考察, *水文・水資源学会誌*, 水文・水資源学会, Vol.36, No.1, pp.63-73, 2023年2月
- 野澤千絵, 上田聖也, 柿沼太貴, 最大想定規模の浸水想定区域における土地利用規制別の人口推移と居住誘導に関する研究—RRIモデルによる農地の宅地化に伴う貯蓄機能低下の影響分析を通じて—, *都市計画報告集*, 日本都市計画学会, (公社)日本都市計画学会, Vol.21, No.4, pp.452-459, 2023年3月1日

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

- Abdulla Bava, Mohamed Rasmly, Hemakanth Selvarajah, Toshio Koike, Flood modelling and calibration of a recent flood event in Bharathapuzha river basin, Kerala, India, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Akshay Kowlessar, Toshio Koike, Mohamed Rasmly, A study on an integrated water resources management plan under climate change for Grand River North West River basin, Mauritius, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Daiki Kakinuma, Shingo Numata, Takafumi Mochizuki, Keijiro Kubota, Yosuke Nakamura, A Particle-filter application method for real-time flash flood prediction system for small and medium-sized rivers, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Daisuke Harada, Shinji Egashira, Katsuhiko Onuma, Methods to create hazard maps for flood disasters with sediment and driftwood, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Eugene C. Herrera, Kensuke Naito, Hydrodynamic Investigation of Laguna Lake, Philippines for Water Security and Flood Risk Management of Metro Manila, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- FAUZIYANA AHMAD, KOSEI YAMAGUCHI, EIICHI NAKAKITA, Tomoki Ushiyama, Investigation of Transition Signals from Single Cell to Multicell Thunderstorms in the Kinki Region, Japan using Vertical Vorticity and Multi-Parameter Radar Analysis, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Fernando C. Sanchez Jr., Patricia Ann J. Sanchez, Catherine B. Gigantone, Jessa O. Aquino, Abdul Wahid Mohamed Rasmly, Ralph Allen Acierito, Water Assessments in Watersheds of Laguna Philippines, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Jonathan S. Serrano, Eugene C. Herrera, Kensuke Naito, Hydraulic Analysis of the Marikina River Floodplain During Typhoon Vamco using Numerical Modelling, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Karina Vink, Ahmad Ali Gul, Mamoru Miyamoto, Implementing climate change adaptation and energy transition policies simultaneously through urban green infrastructure, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Katsunori TAMAKAWA, Shigeru Nakamura, Cho Thanda Nyunt, Tomoki Ushiyama, Mohamed Rasmly, Investigation of ensemble reservoir inflow prediction system in Sai River, Japan, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Kattia Rubí Arnez Ferrel, Harada Daisuke, Egashira Shinji, Influence of suspended sediment on the geomorphology of meandering rivers, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Kensuke Naito, Daiki Kakinuma, Mamoru Miyamoto, Mohamed Rasmly, Anthony C. Sales, Assessment of future flood risk using water and energy budget-rainfall runoff inundation (WEB-RR) model: case study for the Davao River in the Philippines, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Kentaro AIDA, Miho OHARA, Naoko NAGUMO, Patricia Ann J. Sanchez, Efforts to visualize the spatial damage distribution of typhoon disasters in the Philippines using Google Earth Engine, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Leandro Galvanese Kuhlmann, Mamoru Miyamoto, Julio Cesar Lana, Tiago Antonelli, Building disaster prevention capacity in a continental scale country: The trajectory and experience of the Geological Survey of Brazil, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Masatoshi Denda, Masakazu Fujikane, Development of a virtual flood experience system and its possibility as a flood risk communication tool, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Masheswaran Myuran, Toshio Koike, Mohamad Rasmly, Mamoru Miyamoto, Developing a river basin disaster resilience and sustainable plan for Malwathu Oya river in Sri Lanka, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Md. Majdur Rahman, Daisuke Harada, Shinji Egashira, Sediment transport processes in the Sangu river basin using rainfall sediment runoff model for sustainable river management, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Mesake Mataitoga, Miho Ohara, Wojciech Dabrowka, Shinya Abe, Meiapo Faasau, Proactive Approaches to Disaster Risk Management (DRM) for Hydro-Meteorological Hazards in Fiji, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Miho OHARA, Naoko NAGUMO, Kensuke NAITO, Masaki YASUKAWA, Patricia Ann J. Sanchez, e-Learning for Capacity Building on Flood Simulation and Risk Assessment Technology, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Mihretab G. Tedla, Mohamed Rasmly, Toshio Koike, Li Zhou, Evaluation of Satellite Precipitation Products (SPPs) for Real-time Extreme River Flow Modeling in the Blue Nile Basin, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Mohamed Rasmly, Katsunori Tamakawa, Maksym Gusyev, Miho Ohara, Katsuhiko Onuma, Developing a Flood Monitoring System by Utilizing Real-Time Satellite Rainfall Estimates and Water Energy Budget-Based Rainfall-Runoff Inundation Model in West Africa, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Mohamed Zuhail, Mohamad Rasmly, Development of Integrated Water Resources Management Plan for Gal Oya River Basin in Sri Lanka, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Mohammad Hossain Mahtab, Miho Ohara, Mohamed Rasmly, Assessment of Effectiveness of Submersible Embankment Considering Rainfall Variations in Haor Area in Bangladesh, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Muhammad Masood, Mohamad Rasmly, Necessary storage for managing early flash-flood to save crops in the north-eastern region of Bangladesh, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Naoko NAGUMO, Kentaro AIDA, Miho OHARA, Vicente G. Ballaran, Jr., Classification of communities based on landforms and flood history in Candaba Swamp, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Nikola Zlatanovic, MIYAMOTO Mamoru, An integrated design discharge calculation system for small to mid-sized ungauged catchments in Serbia, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Patricia Ann J. Sanchez, Allan T. Tejada, Jr., Renz Kevin R. Ilagan, Jessa O. Aquino, Catherine B. Gigantone, Myra E. David, Roger A. Luyun, Jr., 宮本 守, Flood Management in Angat Watershed, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Rafael Silva Araújo, Miho Ohara, Mamoru Miyamoto, Kuniyoshi Takeuchi, SPATIAL ANALYSIS OF DISADVANTAGED POPULATION EXPOSED TO FLOODS IN THE ITAPOCU RIVER BASIN, BRAZIL, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Ralph Allen E. Acierito, Tomoki Ushiyama, Toshio Koike, Attributing weather patterns to Davao River extreme rainfall from Reanalysis and GCM, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Ravindra V. Kale, Toshio Koike, Katsunori Tamakawa, Manmohan K. Goel, Yoshihiro Shibuo, Integrated WEB-DHM and RRI based modelling framework to assess the role of dam operation on flood disaster risk reduction in Brahmani-Baitarani delta, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023

- Robin Kumar Biswas, Egashira Shinji, Daisuke Harada, Application of Entrainment Velocity Concept for Evaluation of River Morphology: A Numerical Model Study, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Roshan Indika Jayasinghe, Mohamad Rasy, SIGNIFICANCE OF HAVING INTEGRATED WATER RESOURCE PLAN IN A COMPLEX WATERSHED SYSTEM FOR BETTER WATER MANAGEMENT DURING COVID PANDEMIC: THE CASE OF MAHAWELI RIVER BASIN, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Seenipellage Chaminda Sugeeswara, Mohamed Rasy, Tomoki Ushiyama, Masaki YASUKAWA, Toshio Koike, A Platform on Water Resilience and Disasters in Sri Lanka, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Shrestha Badri Bhakta, Abdul Wahid Mohamed RASYM, 牛山 朋来, Ralph Allen ACIERTO, Takatoshi Kawamoto, Masakazu Fujikane, Hiroyuki Ito, Takafumi Shinya, Assessment of flood damage to agricultural crops under climate change scenarios using MRI-AGCM outputs in the Solo River basin of Indonesia, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Tanjir Saif AHMED, Zia UDDIN, Shinji EGASHIRA, Daisuke HARADA, Shoreline erosion and its countermeasure along west coast of Teknaf peninsula, Bangladesh, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Thanura Lasantha Guruge, Bandara Palugasewwa, Egashira Shinji, Controlling Sedimentation through Regulating the River by Thalpitigala Reservoir Project, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- Tsuyoshi Koyabu, Masatoshi Denda, A Study on Improving Disaster Mitigation Awareness by Simulated Flood Experience Using VR Videos, The 9th International Conference on Flood Management (ICFM9), February 18-22, 2023
- 海野 仁, 牛山朋来, Abdul Wahid Mohamed RASYM, 氣候モデルを用いたインドネシア国ソロ川流域の利水影響予測, 土木学会関東支部第50回技術研究発表会, 土木学会, 2023年3月8日~2023年3月9日
- Shrestha Badri Bhakta, Abdul Wahid Mohamed RASYM, SHINYA Takafumi, Quantitative Evaluation of Reduction of Flood Damage to Residential Households by Adaptation Options in the Bengawan Solo River Basin of Indonesia, 6th Global Summit of GADRI, Kyoto University, March 15-17, 2023

### 3. Poster Presentations / ポスター発表

- 南雲直子, 内藤健介, 江頭進治, 秦 夢露, 原田大輔, 萬矢啓啓, 安平川人工水路における浮遊砂による地形形成, 2023年日本地理学会春季学術大会, 日本地理学会, 2023年3月25日~27日

### 4. Magazines, Articles / 雑誌, 記事 (土木技術資料含む)

- 傳田正利, 栗林大輔, 新屋孝文, 市町村防災情報システムの改良と適用, 土木技術資料, pp.44-47, 2023年1月号
- 傳田正利, 水災害時の早期避難の実現に向けて, 建設マネジメント技術, (一助)経済調査会, 3月号, 2023年3月15日

### 5. PWRI Publications / 土研刊行物 (土木研究所資料等)

None / 該当者無し

### 6. Other/ その他

- 南雲直子, 水害地形分類図, 日本地理学会 (編)「地理学事典」, 丸善出版, pp.540-541, 2023年1月

ICHARM では、活動紹介パンフレットを更新しました(2023年2月更新)。以下のページからダウンロードできます。  
[https://www.pwri.go.jp/icharm/publication/brochure\\_j.html](https://www.pwri.go.jp/icharm/publication/brochure_j.html)

ICHARM has recently updated its brochure with its latest activities on February 2023.

Please download it from the following website:  
<https://www.pwri.go.jp/icharm/publication/brochure.html>

## Editor's Note 編集後記

Thank you for reading the ICHARM Newsletter Vol. 68.

In Japan, we have finished enjoying cherry blossoms, or sakura (though people in northern parts of the country may still be enjoying them). It is a symbolic flower of the spring, the season Japanese people often associate with farewell, new encounters, and renewal.

The last few months were overwhelming but fruitful for ICHARM. From February 18 to 22, 2023, ICHARM organized the 9th International Conference on Flood Management (ICFM9) in Tokyo and Tsukuba, ICHARM's hometown. It ended with a great success with 394 participants from across the globe. The summary of the ICFM9 was then reported at the Sixth UN Special Thematic Session on Water and Disasters and the UN 2023 Water Conference, which were held at the UN Headquarters from March 21 to 24, 2023, in New York City, USA.

Through these international stages, together with the 4th Asia Pacific Water Summit, which was held on April 23 to 24, 2022, in Kumamoto, Japan, we have reaffirmed the importance of what ICHARM has been conducting based on its three pillars, i.e., innovative research, effective capacity building, and efficient information networking, to achieve a water hazard-resilient society under changing climate.

At the time of sakura, we renew our firm commitment to water-related disaster risk reduction in Japan and the world.

ICARM Newsletter Editorial Committee  
NAITO Kensuke

新年度が始まり、みなさまにおかれましても別れ、出会い、そして新たな出発と、様々な春を迎えられと同時に、春の象徴である桜を満喫されたことと存じます。

ICARMにおいては、令和5年2月18日から22日にかけてつくば市および東京で開催された第9回洪水管理国際会議 (ICFM9) を、世界各国から計394名の参加者を迎え、成功裏に終わらせることができました。ICFM9で議論された内容は、令和5年3月21日から3月24日にかけて米国ニューヨーク市の国連本部で開催された国連2023水会議および第6回国連水災害特別セッションにて共有されました。

令和4年4月23日から24日に熊本市で行われた第4回アジア太平洋水サミットを含めたこれら一連の国際舞台を経験し、改めて活動の柱である1) 革新的研究、2) 効果的な研修活動、そして3) 効率的な情報ネットワーキングに基づいてICARMがこれまでに行ってきた活動の重要性を認識しました。

今後も日本と世界の水災害リスク軽減にさらなる貢献を行って参りますので、引き続きどうぞよろしくお願ひ申し上げます。

ICARM ニュースレター  
編集委員会  
内藤 健介



メーリングリストへ登録ご希望の方は、下記 ICHARM ホームページの登録フォームか QR コードからご登録ください。

To subscribe the ICHARM Newsletter, please access the following site or the QR cord;  
<https://www.pwri.go.jp/icharm/mailmag/index.html>

また、今後の配信を希望されない方やメールアドレスが変更になった方は下記アドレスまでご一報ください。ご意見・ご感想もお待ちしています。

For those who want to unsubscribe the Newsletter, please contact us:

[icharm@pwri.go.jp](mailto:icharm@pwri.go.jp)

We welcome your comments and suggestions.

