Newsletter

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ICHARM
International Centre for Water Hazard and Risk Management
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Message from Executive Director

Autonomous, decentralized and coordinated society

An "autonomous, decentralized and coordinated society" is considered highly resilient to large-scale disasters and the COVID-19 pandemic.

Panel discussion at the Academic Forum, Science Council of Japan, 7th July, 2022.
学術フォーラムにおけるパネル討議、(2022 年 7 月 7 日 日本学術会議)

KOMIYAMA Hiroshi, the 28th president of the University of Tokyo, proposed that a university should encourage a more active interdisciplinary circulation of knowledge by exemplifying a human body, in which internal organs function autonomously and yet coordinate themselves, though positioned separately, by receiving information sent by the brain through the nervous system. He also proposed that a university should structure scientific knowledge by putting together segmentized pieces of knowledge to create more opportunities where scientists can locate themselves in the big picture of science and where scientific outputs can interact with social problems.

Established around the same time as KOMIYAMA's proposals, the Group on Earth Observation (GEO) made an implementation plan for the Global Earth Observation System of Systems (GEOSS) after critical discussions on whether earth observation should be conducted using a system or systems. GEOSS resulted finally, based on the concept that the systems participating in GEOSS autonomously operate while retaining their original mandates and governance arrangements and that they also enhance interoperability in that they function as a single unit, allowing users to access, compare and analyze all observations and other products.

In Japan, more than 600,000 people migrated annually from rural areas to large cities in the 1960s. The government tried to promote "autonomous-decentralized land management" by applying several comprehensive national development plans to solve many problems caused by urban overpopulation and rural underpopulation. In 2015, the government launched a new land management policy that aimed to create compact cities by concentrating life-related functions in designated areas and closely networking them and surrounding areas to avoid cityward migration and reduced convenience outside the cities. However, the excess concentration of population in Tokyo did not improve.

The COVID-19 pandemic, however, has changed people's awareness. According to a survey conducted in September-October 2021 by the Cabinet Office, 45% of people in their twenties living in the Tokyo Metropolitan area were very or somewhat interested in moving out to rural areas, and 33% had already taken action for that purpose. We should take advantage of this trend and transform our society into an autonomous, decentralized one by revaluing nature's benefits and threats, maximizing existing social infrastructure and institutions using scientific knowledge, and daring to draw a dynamic future vision.

July 29, 2022
KOIKE Toshio
Executive Director of ICHARM

自律分散協調社会

大規模な災害や COVID-19 パンデミックに対してレジリエントな社会として、自律分散協調的な社会の仕組みが有効であるという考えが示されています。

東京大学第 28 代総長の小宮山宏は、体内に分散している各臓器がそれぞれ自律的に動きつつ、脳と神経によって情報がすみずみまでゆきわたっていることによって各要素が総体としては協調的に機能するように、分野横断的に「知のめぐり」の活性化を提案しています。同時に、細分化した知識を相互に関連づける「知の構造化」によって、研究者が自らを全体像のなかに位置づけることを可能にし、学術の成果と社会の問題が交叉する場を提供するべきとしています。

同時期に設立された地球観測に関する政府間部会（GEO）では、一つのシステムにすべきか複数システムにすべきかの論争を経て、「システムオブシステムズ」の考え方を基本とする全地球観測システム (GEOSS) の開発が計画されました。GEOSS に参加する既存の個々の地球観測システムは自律的にそれぞれの働きと責任を保持しつつ、相互運用性を確立することによって全体としてはデータへの接続や比較、理解を可能とします。

我が国では 1960 年代には年間 60 万人を超える人が地方から都市圏に移住し、都市の過密化と地方の過疎化が問題となり、数次の国土計画により自律、分散を図ってきました。2015 年には、生活に必要な各種機能を一定の地域に集約化するとともに、各地域をネットワークで連接して、圏域人口の維持と利便性の低下を回避する「国土構造のコンパクト＋ネットワーク化」を打ち出しましたが、東京の一極集中はいまだ解消されていませんでした。

しかしコロナ禍に伴って人々の意識に変化が表れています。内閣府の 2021 年 9 ～ 10 月の調査によれば、東京圏の 20 歳代の 45% が地方移住に強い関心～やや関心があり、地方移住にむけて実際に行動をとった人も 33% いました。この意識の変革期に、科学の知により既存の社会基盤や社会的制度を効果的に連接し、自然の恩恵と脅威を再認識して、将来を大胆に描き、自律分散協調社会への変革を進める必要があります。

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

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

ついては、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/WUcq4ZsQ8vhoiNmq7
回答期限：2022 年 10 月 28 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/WUcq4ZsQ8vhoiNmq7
Survey to be done by: 28 October 2022
Time required: about 5 minutes

Special Topics

Report on the Kumamoto Summit: Roles of science and technology in transformation towards a quality-oriented society
熊本サミット報告 ―「質の高い社会への変革」のための科学技術の役割―

The 4th Asia-Pacific Water Summit was held in Kumamoto City, Japan, on April 23-24, 2022, to gain a holistic understanding of and discuss practical solutions to water-related issues based on strong leadership and effective resource mobilization exerted by the Heads of States and Governments (HSG) who practice cross-sectoral decision making.

At the opening ceremony with the online presence of Their Majesties the Emperor and Empress, His Majesty the Emperor kindly made his remarks, followed by the opening address by Japan's Prime Minister KISHIDA Fumio and a video message by United Nations Secretary-General Antonio Guterres. Representing the 4th APWS organizers, Mr. Mark Pascoe, the new chair of the Governing Council of the Asia-Pacific Water Forum (APWF), shared the APWF report with the participants. Mr. ONISHI Kazufumi, the mayor of Kumamoto, explained groundwater conservation measures placed in Kumamoto City and also conveyed a message of appreciation for all the support provided to Kumamoto City when the Kumamoto earthquake occurred in April 2016. His Majesty the Emperor delivered a memorial lecture entitled "Hearts, Minds, and Water: Touching Water in People's Beliefs" and indicated clues to solving problems by introducing the people-water relationships commonly seen in Asia-Pacific based on his profound insights into the worships of mountain, snake and dragon.

At the HSG meeting, Prime Minister KISHIDA announced the launch of the Kumamoto Initiative for Water in his keynote address. He declared that Japan would commit to promoting measures for climate change adaptation and mitigation and measures to improve people's basic living environments. The HSG at the 4th APWS unanimously adopted the Kumamoto Declaration as the outcome document of the 4th APWS to achieve transformation into quality-oriented societies that are resilient, sustainable, and inclusive. They stressed the need to accelerate efforts for improving governance, closing the financial gap, and appealing to the science and technology community and requested the participants in the Summit to clarify barriers, breakthroughs, opportunities, and ways forward for reform and improvement.

Responding to the requests set forth by the HSG, nine parallel thematic sessions and two special sessions, "Showcase" and "Small Islands State," were organized. The participants exchanged their experiences, knowledge and ideas and discussed how the goals and proposals at the summit should be achieved. The results were reported to three integration sessions on "governance," "finance" and "science and technology." The overall integration session summarized the key messages and reports from the three integration sessions. The discussion summary of the overall integration session was reported In the closing ceremony, and the 4th APWS Chairs Summary was adopted as one of the summit's outcome documents, in addition to the Kumamoto Declaration and the Kumamoto Initiative for Water.

ICHARM played vital roles in planning, operating and summarizing a parallel thematic session on "Water and Disaster/Climate Change," a special session, "Showcase," and an integration session on "Science and Technology." In particular, ICHARM contributed to developing the three key proposals, i.e., "promoting water cycle consilience," "fostering Facilitators," and "taking an end-to-end approach," as replies to the HSG's question on what role science and technology should play in supporting leaders in making cross-sectoral decisions.

(Written by KOIKE Toshio)

様々な分野を統合する首脳級の強いリーダーシップの発揮や資源の動員による水問題の包括的理解と効果的な解決のために、別府（2007 年）、タイ・チェンマイ（2013 年）、ミャンマー・ヤンゴン（2017 年）に続き、2022 年 4 月 23 ～ 24 日に熊本市において第 4 回 アジア・太平洋水サミットが開催されました。

天皇皇后両陛下のオンラインによるご臨席の下に開催された開会式では、天皇陛下よりお言葉があり、岸田文雄内閣総理大臣、アントニオ グテーレス国連事務総長から挨拶がありました。主催者を代表して、アジア・太平洋水フォーラム（APWF）のマーク・パスコー新議長から APWF 報告があり、熊本市の大西市長から地下水保全の取り組みの紹介と熊本地震時の国内外からの支援に対する感謝が述べられました。天皇陛下より「人の心と水～信仰の中の水に触れる～」と題する記念講演があり、山岳信仰や、蛇神・龍神と水に関する深いご洞察を通して、アジア・太平洋域に共通して見られる人と水との関わりと課題解決の糸口を示唆されました。

首脳会議では、岸田総理より基調講演があり、気候変動適応と緩和の両面での取組と、基礎的生活環境の改善等に向けた取組を推進する「熊本水イニシアチブ」が発表されました。参加した首脳級は最終討議を行い、強靭性、持続可能性、包摂性を兼ね備えた質の高い社会への変革を目指す「熊本宣言」が全会一致で採択されました。宣言では、ガバナンスを整え、資金ギャップを埋め、科学技術へ要望することを加速化する必要があるとされ、その実現に当たっての障壁、突破口、機会、推進方法を明らかにすることが、首脳からサミット参加者に要請されました。

この首脳から要請に応じて、水関連の 9 つのテーマについて分科会、および特別セッション「ショーケース」および「島しょ国セッション」が開催され、様々な取り組み事例が報告され、またあるべき姿についての意見交換が行われました。その結果は、「ガバナンス」、「資金」、「科学技術」に関する 3 つの統合セッションに報告され、これらの議論がさらに総括統合セッションに諮られて「議長サマリー」が合意され、「熊本宣言」、「熊本水イニシアチブ」とともにサミット成果文書が構成されました。

ICHARM は、分科会「水と災害 / 気候変動」、特別セッション「ショーケース」、統合セッション「科学技術」の企画・運営・取り纏めを担当し、特に「熊本宣言」において首脳から要請された「分野横断的な意思決定において、科学技術がどのような役割を果たすべきか」の答えとして、「水循環のコンジリエンスの促進」、「ファシリテーターの育成」、「エンドツーエンドの取り組みの推進」を取りまとめ、「議長サマリー」への反映に貢献しました。

Theme 1: Water and Disaster/Climate Change
分科会テーマ１：水と災害 / 気候変動

ICHARM が主催し、小池俊雄センター長がモデレータを務めた " 分科会テーマ 1:水と災害 / 気候変動 " では、" 気候変動の下で持続可能でレジリエントな道筋に移行するための関係当事者全員によるエンドツーエンドの努力 " について議論がなされました。

本分科会に先立ち、ICHARM は水と災害ハイレベル・パネル（HELP）およびアジア開発銀行（ADB）と協力し、またアジア・太平洋水フォーラムならびに国内外 9 機関の支援を得て、今年の 2 ～ 3 月にガバナンス、科学技術、ファイナンスのオンラインのプリセッションを開催しました。その議論を踏まえ、それぞれの課題に対する考え方、具体的行動提案を取り纏め、本セッションの開催を準備しました。

冒頭、文部科学省研究開発局審議官である林孝浩氏よりオープニングスピーチがあり、アジア・太平洋地域の関係者が連携して取組が強化されることにより、水サミットが目指す「質の高い社会」へと変革することを願うと述べられました。

次に、キーノートスピーチでは 4 人から発表がなされました。タジキスタン共和国エネルギー水資源省のダレルジュマ氏は、水の問題に対して、緊急のアクションをクリアな形で進め、最前線で活動していきたいと述べられました。宇宙航空研究開発機構の山川宏氏は、水問題解決に向けて、JAXA は最新の宇宙技術を活用した衛星観測ネットワークの強化で応えていきたいことを述べられました。オランダ水大使のヘンク オヴィンク氏は、2023 年国連水会議は包摂性、行動指向、セクター横断的、が 3 つの重要な基本方針であると考えていることを述べられました。アジア開発銀行のニータ ポクレル氏は、政府やリーダーが正しい政策を策定して進めるには、プロジェクトを現場で実施している人を動員していくことが重要であることを述べられました。

次に、パネルディスカッションとして、4 名のパネリストが登壇しました。IPCC 第 6 次評価報告第二作業部会・慶應義塾大学のラジブ ショウ氏は、IPCC の AR6 での前の報告書との違いとしてリスクは複雑であり、より複合的になっていることなどを上げるとともに、ガバナンス、科学技術、資金調達が非常に重要であることを述べられました。世界気象機関のヨハネス クルマン氏は、Global water information system の実行が喫緊であり、これが評価、適応策の策定、科学的な気候変動の理解につながることについて述べられました。グローバル・ウォーター・パートナーシップの安田由美子氏は、女性、先住民、障がい者団体など様々な団体とのパートナーシップが重要であること、ガイダンス、マテリアル、能力開発、プロジェクトサポートなどを含む様々な方法でサポートが提供されうることを紹介されました。フィリピン気候変動委員会のロバート エリック A. ボルジェ氏は、皆でパートナーシップを組み、holistic で持続可能な水管理をしていかなければならないことについて述べられました。

ICHARM hosted a session on "Theme 1: Water and Disaster/Climate Change," which was moderated by KOIKE Toshio, the executive director of ICHARM and discussed issues under the title of "End-to-End Efforts for Shifting onto a Sustainable and Resilient Path under Climate Change by all."

Participants in Theme 1: Water and Disaster/Climate Change
分科会テーマ１：水と災害 / 気候変動の参加者

Prior to the session in Kumamoto, ICHARM, in cooperation with the High Level Panel on Water and Disaster Risk Reduction (HELP) and the Asian Development Bank (ADB) and with the support of the Asia-Pacific Water Forum and nine national and international organizations, held online pre-sessions in February and March on governance, science and technology, and finance. Based on those discussions, we prepared for the main session by developing a basic plan to address each issue and proposals for concrete actions to tackle them.

The main session started with an opening speech by Mr. HAYASHI Takahiro, the deputy director-general of the Research and Development Bureau, the Ministry of Education, Culture, Sports, Science and Technology. He encouraged transformation into a "quality-oriented society," the theme set by the Water Summit, by strengthening collaboration with related parties in the Asia-Pacific region.

Next, four speakers made presentations as keynote speeches. H.E. Mr. Daler Juma, the minister of energy and water resources of the Republic of Tajikistan, expressed the nation's strong will to take urgent action in a clear manner to solve water issues and continue acting at the forefront. Dr. YAMAKAWA Hiroshi, the president of the Japan Aerospace Exploration Agency (JAXA), stated that JAXA will contribute to solving water-related issues by strengthening its satellite observation network with the latest space technology. Mr. Henk Ovink, Netherlands' water ambassador, spoke about the three principal pillars of the 2023 United Nations Water Conference, stressing that it should be inclusive, action-oriented, and cross-sectoral. Ms. Neeta Pokhrel of the Asian Development Bank emphasized that it is important for governments and leaders to mobilize field practitioners leading projects in order to formulate the best possible policies and put them into practice.

A panel discussion followed with four panelists. Prof. Rajiv Shaw of Keio University, who is also a member of Working Group II of the Intergovernmental Panel on Climate Change (IPCC) for the Sixth Assessment Report, mentioned the importance of governance, science and technology, and financing, pointing out that risks are complicated and have become even more complex while addressing differences between the findings reported in AR6 IPCC and the previous report. Dr. Johannes Cullmann of the World Meteorological Organization (WMO) argued that a global water information system should be urgently put in place, for the system will effectively support assessments, formulation of adaptation measures, and a scientific understanding of climate change. Dr. YASUDA Yumiko of the Global Water Partnership (GWP) emphasized the importance of partnerships among various organizations representing different groups of people, such as women, indigenous peoples, and persons with disabilities. She also explained that support can be provided in various ways, including guidance, materials, capacity building, and project support. Hon. Robert Eric Borje, the vice-chairperson and executive director of the Climate Change Commission, Philippines, stated that nations and organizations need to form a partnership to ensure holistic, sustainable water management.

Finally, Ms. SEGAWA Keiko, the vice-minister for Global Environmental Affairs, the Ministry of the Environment, gave a closing speech, reminding the participants that all stakeholders should try their best to fulfill their responsibilities from both global and

regional perspectives.

Based on these discussions, the session agreed on and proposed taking coordinated, cooperative action in the three areas, science and technology, governance, and finance, to provide end-to-end solutions through a gender-equal and socially inclusive approach. The content was passed on to the Integration session, discussed and incorporated into the Chair's Summary.

(Written by MOCHIZUKI Takafumi)

最後に、環境省地球環境局審議官である瀬川恵子氏よりクロージングスピーチがあり、関係者が国際と地域の両面から取り組むことの重要性について述べられました。

このような議論をもとに本セッションにおいては、全ての関係者はジェンダー平等かつ社会的包摂のある方法でエンドツーエンドの解決策を提供するため、科学技術、ガバナンス、ファイナンスの三つの分野で協調的・協力的行動を取ることが必要であることが提案されました。その内容は統合セッションに渡され、議論された結果、議長サマリーに組み込まれました。

Special Session "Showcase"
特別セッション「ショーケース」

The Special Session, "Showcase," was held hosted by the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) and co-hosted by Kumamoto City and ICHARM. The session, themed as "Showcase of Efforts toward Sustainable and Resilient High-Quality Society," started with an opening speech by MLIT Minister SAITO Tetsuo. The representatives of Sri Lanka, Indonesia, Kumamoto City of Japan, and Davao City of the Philippines then spoke about their water-related activities. This was followed by a panel discussion.

The four showcases presented by the four countries commonly highlighted the importance of "multi-sectoral and multi-layer activities," "knowledge integration," "facilitator training," and "inclusiveness."

Eng. K.D.N. Siriwardana, the director general of Irrigation of the Irrigation Department of Sri Lanka, started his presentation by talking about their ancient irrigation system, which is more than 3000 years old and yet is still in service. He then explained their current activities, in which national and local experts cooperate with farmers to build a society resilient to climate change.

H.E. Dr. Basuki Hadimuljono, the minister for Public Works and Housing, Indonesia, spoke about cross-agencies activities to combat climate change, including an effective dam operation practice coupled with a rainfall and river level prediction system. He also described an e-learning program to train facilitators who will contribute to implementing policies to improve communities' resilience and sustainability.

Dr. Anthony C. Sales, the regional director of the Department of Science and Technology Region XI, the Philippines, mentioned two crucial components for the integration of "scientific knowledge integration" and "local community activities": "Online Synthesis System for Sustainability and Resilience (OSS-SR)" and "facilitators." Moreover, he introduced innovative, comprehensive activities by the HELP Davao Network, an organization working to help the community improve its flood resilience and sustainability by involving volunteers from various fields and sectors such as academia, media, government, industry, and civic organizations.

Mr. ONISHI Kazufumi, the mayor of Kumamoto City, spoke about the current status of the city's vital water resource and water-related disasters. After explaining that its groundwater has been decreasing in volume and quality and that the city has been experiencing floods frequently, the mayor described their efforts to reduce flood risks, such as evacuation drills using a

Kumamoto City Showcase
熊本市ケース紹介

特別セッション「ショーケース」は、国土交通省の主催の下、熊本市と ICHARM が協力して開催されました。「持続的かつレジリエントな質の高い社会にむけた取組のショーケース」というテーマのもと、斉藤鉄夫国土交通大臣の開会スピーチから始まりスリランカ、インドネシア、フィリピン・ダバオ市、そして熊本市の各代表者がそれぞれの取り組みを紹介し、その後パネルディスカッションが行われました。

4 つのケース紹介では、「分野横断的・多層的アプローチ」、「知の統合」、「ファシリテータの育成」や「包摂性」の重要性が明確に示されました。例えば、スリランカの K.D.N. スリワルダナ灌漑局長からは、3000 年以上の歴史を持つ灌漑構造物が今日も使われていることの紹介のほか、国や地域の専門家と農民が協働し、気候変動に対してレジリエントな社会の構築に資する活動について紹介されました。

インドネシアのバスキ ハディムルヨノ公共事業・国民住宅省大臣からは、降雨・水位予測技術を用いたダムの効率的な運用による洪水リスク減少に関する活動を例とした、省庁間連携の気候変動適応に関する取り組みや、コミュニティのレジリエンス・サステナビリティ向上のための政策実装に貢献するファシリテータ育成を目的として実施した e ラーニングについて紹介されました。

フィリピン科学技術省 11 地区局のアンソニー C. サレス局長は、" 科学的知識の統合 " と " 地域コミュニティの活動 "、すなわち、" 知の統合オンラインシステム（OSS-SR）" と " ファシリテータ " という 2 つの重要な要素の統合について言及しました。それに加えて局長からは、HELP ダバオネットワークによる、革新的で包括的な取り組みが紹介されました。HELP ダバオネットワークは、学術・メディア・政府・産業・市民組織といった様々な分野や主体からのボランティアを含むことで、コミュニティが洪水に対する強靭さや持続性を向上することを支援するために働いている組織です。

熊本市の大西一史市長からは、熊本の水資源環境の特徴である地下水

量が減少傾向にあり、また水質も悪化傾向にあること、また、繰り返される水害について述べられました。そして、近隣の市町村および農家を巻き込んで行われている、水資源保全及び水質改善に向けた活動についてや、洪水仮想現実（VR）を用いた地域住民を対象とした避難訓練等の水害リスク軽減のための取り組みについて紹介されました。

続くパネルディスカッションにおいて、水と災害ハイレベル・パネル（HELP）のハン スンス議長からは、４つのケース紹介でも示された「分野横断的」ならびに「重層的」アプローチを同時に進めるべきである、とコメントがありました。また、上川陽子衆議院議員（元法務大臣）からは、ケース紹介のあった４つの地域は異なる課題に直面しているが、分野横断的で、持続可能な包摂的アプローチをとっている点は共通しており、さらに、いずれのケースも共通して、科学技術の知識と、現場での経験、さらにコミュニティの力を最大限に活用する必要があると述べられました。その上で、横断的協力体制、最先端の科学技術とイノベーションへの支援、また、ギャップを埋めるためのファシリテータとなり得る専門家の育成の重要性について述べられました。

続いて世界銀行の水グローバル・プラクティスアフリカ地域プラクティスマネージャーのマリア アンジェリカ ソトマヨール氏から、世界銀行という各地域での活動に対して支援を行う立場から、各ケース紹介へのコメントがされました。最後に、IPCC 第６次評価報告第二作業部会副議長でもあるマレーシア国民大学のジョイ ジャクリーン ペレイラ教授からは、紹介のあった各ケースで共通していることは気候変動の影響であり、それは IPCC でも確認されていることが述べられ、そして将来の気候変動リスクについて解説がされました。

その後、パネリストのコメントに対して４地域各代表者から謝意が表されるとともに、指摘事項への対応のコメントがあり、最後に国土交通省水管理・国土保全局の井上智夫局長による閉会の言葉でセッションは幕を閉じました。

各ケース紹介では、「分野横断的・多層的アプローチ」、「知の統合」、「ファシリテータの育成」や「包摂性」の重要性がはっきりと示され、これら一部については議長サマリーに反映されました。

VR-based flood experience system and their plans to conserve water resources and improve water quality by involving neighboring municipalities and farmers.

During the panel discussion that followed, Dr. Han Seung-Soo, the chair of the High-Level Panel on Water and Disaster (HELP), commented that the "cross-sectoral" and "multi-layered" approaches presented in the four cases should be pursued simultaneously. Ms. KAMIKAWA Yoko, a member of the House of, added that although the four case regions faced different challenges, they all shared a cross-sectoral, sustainable, and inclusive approach, and that they commonly had the need to maximize the use of scientific and technological knowledge, on-site experience, and community power. She also mentioned the importance of cross-sectoral collaboration, support for cutting-edge science and innovation, and the training of experts who can serve as facilitators to bridge the gap.

Ms. Maria Angelica Sotomayor, the World Bank Africa practice manager of the Water Global Practice, commented on each case study from the perspective of the World Bank, which provides financial support for activities in all four regions. Finally, Prof. Joy Jacqueline Pereira of Universiti Kebangsaan Malaysia, the vice-chair of Working Group II of the IPCC Sixth Assessment Report, pointed out that the common denominator in each case study was the impact of climate change, which was confirmed by the IPCC, and explained future risks caused by climate change.

The representatives of the four regions expressed their appreciation for the panelists' comments and responded to the points raised. The session concluded with closing remarks by Mr. INOUE Tomoo, the director general of the Water Management and Land Conservation Bureau, the Ministry of Land, Infrastructure, Transport and Tourism.

It is worth keeping in mind that all four presentations stressed the importance of a "multi-sectoral and multi-layered approach," "knowledge integration," "facilitator training," and "inclusiveness." Parts of the presentations and discussions in the showcase event were reflected in the APWS4 Chair's Summary.

The panelists and speakers of the session
セッション終了後の集合写真

(Written by NAITO Kensuke)

Integration Session: Science and Technology
科学技術統合セッション

"科学技術における分野間協働の確立、科学と社会の間の協働の促進、そのための人材育成について検討を行う"ために設置された、"科学技術統合セッション"は、小池俊雄センター長がモデレータを務める等、ICHARM が主体となって開催いたしました。

冒頭、国連教育科学文化機関 (UNESCO) 事務局長補（自然科学）

"The Integration Session: Science and Technology" was held by ICHARM as the main organizer, with Director KOIKE Toshio as the moderator. The session was set up to establish interdisciplinarity in science and technology, to encourage collaboration between science and society, and to develop human resources to achieve these matters.

The session started with the opening speech by Dr. Shamila Nair-Bedouelle, the assistant director-general for Natural Sciences of the United Nations Educational,

Scientific and Cultural Organization (UNESCO), stating that connecting science and society and promoting open science, which offers people access to scientific knowledge, will speed up the solution of problems.

Subsequently, five presentations were delivered as keynote speeches. The first one was by Mr. Garvey McIntosh, the NASA Asia representative from the U.S. Embassy in Tokyo, in place of H.E. Mr. Rahm Emanuel, the U.S. ambassador to Japan. He began his speech by showing the video message from the ambassador, who addressed the challenges posed by climate change. Then, Mr. McIntosh emphasized the importance of cooperation in solving water problems. Dr. KAWAMIYA Michio, the director of the Japan Agency for Marine-Earth Science and Technology (JAMSTEC), followed and introduced a climate change prediction model while expressing his hopes to contribute to decision-making processes with scientific knowledge. Dr. Johannes Cullmann, the director of the World Meteorological Organization (WMO), spoke about the significance of integrating science, technology, and the Earth Observing System and providing services such as early flood or drought warning information in order to effectively respond to climate change. Mr. Shahbaz Khan, the director of the UNESCO Cluster Office in Beijing, pointed out that water security requires the abilities and knowledge of local individuals and organizations and stressed that indigenous knowledge is valuable and should be integrated with science and technology to help solve issues. The last presentation was made by Mr. INOUE Tomoo, the director-general of the Water and Disaster Management Bureau, the Ministry of Land, Infrastructure, Transport and Tourism (MLIT). He explained Japan's efforts from an administrative standpoint, including the revision of flood control plans to cope with climate change impacts and the introduction of more effective operations of existing dams. He also mentioned the importance of science and technology-based decision-making and human resource development.

After all discussions, the session concluded that it was important to develop water-cycle consilience by accelerating the open science policy with a special focus on observation, modeling, and data integration to foster "facilitators" and build cooperation among various fields and sectors by taking an end-to-end approach.

The session ended with closing remarks by Mr. HAYASHI Takahiro, the deputy director-general of the Research and Development Bureau, the Ministry of Education, Culture, Sports, Science and Technology (MEXT), Japan.

The achievement of the Integration session was combined with those of the Governance and Finance sessions and reflected in the Chair's summary, which shows a clear path and practical actions for quality growth for the Asia-Pacific region to realize a "sustainable, resilient, and inclusive society."

ICHARM will work toward the implementation of the actions proposed in the summary.

Discussion at the Science and Technology Integration Session
科学技術統合セッションにおける議論

Participants at the Science and Technology Integration Session
科学技術統合セッションの参加者

(Written by YOSHINO Hirosato)

のシャミラ ナイア ベドウィル氏からオープニングスピーチがあり、科学と社会を繋げるとともに、科学知識にアクセス出来るオープンサイエンスにより課題の解決が早くなると述べられました。

引き続いて、キーノートスピーチでは５人から発表がされました。一人目のアメリカ航空宇宙局 (NASA) アジア代表であるガーヴィー マッキントッシュ氏が、ラーム エマニュエル駐日米国大使代理として参加され、最初に気候変動がもたらす課題について取り組むとの大使からのビデオメッセージを頂き、ガーヴィー氏からも、水の課題を協力して解決したいと述べられました。二人目の独立行政法人海洋研究開発機構地球環境部門環境変動予測研究センターのセンター長である河宮未知生氏からは、気候変動予測モデルの紹介があり、意思決定において、科学の知識で貢献したいと述べられました。三人目の、世界気象機関 (WMO) 局長であるヨハネス クルマン氏は、気候変動に対応するには、科学技術・地球観測システムを統合し、早期洪水・旱魃警戒情報のようなサービスの提供が必要であると述べられました。四人目の、ユネスコ北京事務所所長のシャバズ カーン氏は、水の安全保障のためにローカルな個人や組織の能力・知識が必要であるとして、地元の地域住民の知識は貴重で、これらを科学技術と統合することが問題解決の一助になると述べられました。五人目の、国土交通省水管理・国土保全局局長である井上智夫氏は、行政の立場から、気候変動の影響を反映した治水計画の改訂、既存ダムの効果的な運用などの取組を紹介するとともに、科学技術に基づく意思決定や人材育成の重要性を述べられました。

このような議論の後に、特に観測、モデリング、データ統合に焦点を当てたオープンサイエンス政策を加速することによる水循環のコンジリエンスの促進、「ファシリテーター」の育成、エンドツーエンドのアプローチを取りながら様々なレベルの分野やセクターを超えた協力が重要であると取りまとめられました。

最後に、文部科学省研究開発局審議官である林孝浩氏より、クロージングスピーチが述べられて、セッションが終了いたしました。

この成果は、他のガバナンス、ファイナンスのセッションにおける議論の成果と合わせて、「持続可能な社会」、「強靭な社会」、「包摂的な社会」の実現に向けて、アジア・太平洋地域の質の高い成長に向けた明確な道筋と実践的な行動を示した議長サマリーに反映されました。

ICHARM としても、この実現に向けて取り組んでまいります。

Special contribution / 特別寄稿

ICHARM では、国内外の多くの研究者や専門家と連携・協働して活動を推進しています。その一つとして、アジア・太平洋水サミット（APWS）については、セッションの開催など、水災害分野において積極的に貢献してきています。この 2022 年 4 月には第 4 回 APWS が開催され、熊本宣言が採択されました。その作成に際しては、2017 年 12 月にミャンマー・ヤンゴンで開催された第 3 回 APWS に引き続き、石渡幹夫日本水フォーラム理事が大いに貢献されました。このたび、その作成プロセスでの所見について寄稿いただきましたので、ここに紹介いたします。

ICHARM has been promoting various activities through partnerships and collaboration with a wide range of researchers and experts around the world. For example, ICHARM has actively contributed to a series of Asia Pacific Water Summits (APWSs) in the field of water-related disasters by organizing sessions. In April 2022, the 4th APWS was held and adopted the Kumamoto Declaration. Dr. ISHIWATARI Mikio, the board director of the Japan Water Forum, played a vital role in drafting the document, just as he did in the 3rd APWS held in Yangon, Myanmar, in December 2017. He kindly contributed a special article to this edition of ICHARM Newsletter by reflecting on his thoughts and findings during the preparation process. It is our great pleasure to share it with readers across the world.

Regional leaders pledge their commitment to the Kumamoto Declaration
首脳が水問題解決への決意を示した熊本宣言

ISHIWATARI Mikio, Board Director, Japan Water Forum
石渡幹夫　日本水フォーラム理事

2022 年 4 月に熊本市にて開催された第 4 回アジア・太平洋水サミットにおいて、参加した首脳により熊本宣言が採択されました。作成、採択に向けたプロセスでは小池俊雄 ICHARM センター長はじめ、国内外の多くの方々にご助言、ご支援をいただきました。改めまして感謝申し上げます。作成プロセスに関わったものとして、その意義や思うところについて、ご紹介いたしたいと思います。

まず、意義として、アジア・太平洋地域における「質の高い社会」の変革に向けて水分野が貢献する、という概念を打ち出したことが挙げられます。新型コロナ感染症からの回復で目指すべき社会の姿を示すことができました。「質の高い社会」については 2022 年 4 月の ICHARM ニュースレター第 64 号・Volume 17（1）にて小池センター長が解説されておられます。災害や感染症などのショックに対して強靭で、気候変動や自然環境、生態系などを考慮した持続可能な、貧困層や弱者を取り残さない包摂した社会をつくる、のが質の高い成長です。世界銀行でも GRID（green, resilient, inclusive development）というアプローチを打ち出しました。green と sustainable の違いはあるものの、考え方は完全に一致しています。

コロナからの回復において、質の高い社会づくりに向けて水分野が中核となる役割を果たしていく、ことを首脳の決意として示した、ここに熊本宣言の最も大きな意義があります。

またサミットに参加した首脳による宣言というところに価値があります。大臣による水に関する宣言はいろいろな会合でこれまでもありました。しかしながら首相や大統領といった首脳がまとめた宣言というのは、他の分野を探しても、気候変動、感染症対策、持続可能な開発といった重要なテーマに限られます。首脳が、水、といった特定の課題を議論し、宣言する、という価値は高いものがあります。

首脳による宣言作成は構えていたほど難しくなかった半面、ただやはり簡単なものではありませんでした。今

The 4th Asia-Pacific Water Summit was held in Kumamoto City, Japan, in April 2022, and the heads of state participating in the summit adopted the Kumamoto Declaration. I would like to show sincere gratitude to KOIKE Toshio, the executive director of ICHARM, and many others in Japan and abroad for their advice and support in the process of preparing and adopting the declaration. As a staff member involved in this process, I would like to explain the significance of the declaration and share some thoughts that I had during the process.

First, the significance of the Kumamoto Declaration. It is very important that the summit has proposed the concept that the water sector will contribute to the Asia-Pacific region's transformation into a "quality-oriented society," with the declaration presenting a vision of a society for the peoples in the region to work toward as they are recovering from the COVID-19 pandemic. Executive Director KOIKE explains what a "quality-oriented society" is in ICHARM Newsletter No. 64, Volume 17 (1), published in April 2022. As he means, a "quality-oriented society" is one that is resilient as it prepares for shocks such as disasters and infectious diseases; sustainable as it copes with issues on climate change, the natural environment, and ecosystems; and inclusive as it leaves no poor or vulnerable people behind. Quality growth is only possible through building such a society. The World Bank has recently launched a new approach they named GRID, or green, resilient, inclusive development. Though the declaration uses "sustainable" for "green," its concept is perfectly aligned with that addressed by an international organization.

Presenting such a concept is critical, but I would like to point out an even more significant aspect of the Kumamoto Declaration. That is, it is the heads of state that declare that the water sector will play a central role in creating a quality-oriented society in the post-pandemic world. This fact is extremely important; the declaration was made by nobody else but prime ministers and presidents attending the summit. The water sector has been privileged to have ministerial declarations at water-related meetings but none by the heads of state. In addition, such highest-level declarations have been issued for few matters except ones of great importance, such as climate change, infectious disease control, and sustainable development. However, in the Kumamoto summit, the heads of state came together, discussed a very specific issue of "water," and produced a declaration. This whole process has made the value of the Kumamoto Declaration immeasurable.

Looking back, drafting the declaration was not as hard as I had thought, but it was not easy, either. The first draft was shared with the Asia-Pacific countries in mid-March of this year, followed by two additional rounds of comments on the second and final drafts. An online preparation meeting was also held, where the drafting team directly explained its intentions to the participating countries and collected

over 90 comments from 15 countries. The team took extra care to keep the preparation process open, transparent, participatory, and collaborative, responding to all received comments with none left unattended. All the staff, including myself, did not want to undermine the spirit of the declaration emphasizing respect for these qualities. The comments found worth including are reflected in the declaration, even though they were from countries whose heads were not scheduled to be at the meeting.

While drafting the declaration, I sensed other countries' trust in Japan. There were no comments meant to be provoking or cause trouble, except one. It was as if they were thinking: "Japan will handle things properly. Let's leave all to them." What has created this atmosphere? I naturally remembered interaction and trust that has been strengthened years after years through a broad range of activities in the Asia-Pacific region led by so many Japanese, including businesses, researchers, and civilians.

On the other hand, I thought that Japan might be a little too naïve about tough international relations. Countries with international rivers were quick to react to issues that may compromise their interests in relation to others'. For example, the draft used the phrase "share water-related lessons learnt," meaning nothing to do with international rivers. However, some country demanded including an additional phrase, "subject to international agreements and national laws," in the draft. Requests like this reminded me that such countries cautiously look into words and phrases because they have to when sharing a river with others.

In the afternoon before the summit, some country requested to take out a phrase from the draft. The request also had something to do with an international river. A teleconference was immediately called to discuss the matter. I, as well as my colleagues, could see that they made this request to help Japan in a sense, but, at the same time, the phrase in question was too crucial to cut, especially when it would be the message from the heads of state. However, after serious discussions with relevant officials, the drafting team finally accepted the request. I thought that this incident might also show Japan's naiveness about issues on international rivers. When discussing the matter, it was not easy for Japanese staff, including me, to understand why they came up with such a request in the first place. That may be because the Japanese do not really know how tense things could get when countries share a river.

I think that whatever comments one makes should be made to help improve the documents they are working on. In my experience this time, that was not always the case. Some were meant to improve the declaration, while others were somewhat selfish in that countries and organizations tried to include their stances and opinions in the document. In general, such countries and organizations are talked into doing so somewhere else, and their comments are not included. However, I found helpful comments a little tricky in this respect. Helpful comments were more likely to be included in the document, but a closer look found them not always fair and neutral because they more or less reflect the opinions of whoever made them. This may be a good lesson for everybody: one should make comments to help whatever project they are involved in if wishing to see their ideas and opinions in the final output.

The Kumamoto Declaration proudly announces a new concept, "transformation into a quality-oriented society," with the commitment of the heads of state. In addition, Japan's prime minister KISHIDA Fumio announced the Kumamoto Water Initiative, pledging about 37 billion dollars for infrastructure development in the Asia-Pacific region. Expectations are high for everyone in the water sector to make further efforts to solve global water issues.

年の 3 月半ばに最初のドラフトをアジア・太平洋諸国に共有し、その後 2 次、最終と 3 回にわたりコメントを取り付けました。また、遠隔にて準備会合を開催し直接説明する機会を持ちました。合計で 15 か国から 90 以上のコメントをいただきました。オープンなプロセスを心がけ、コメントにはすべて対応し、きちんと回答いたしました。何しろ、宣言に、オープンな参加プロセスが水管理には重要、と書かれているのですから、宣言作成もそれに従わないわけにはいきません。首脳が参加しない国であっても、有益なコメントは反映させました。

作成の途中で感じたのは日本への信頼です。どの国もけんか腰のコメントやこちらを困らせる指摘は、一つを除きありませんでした。「日本に任せておけば大丈夫だろう、日本のやりたいようにやらせてあげよう」といった雰囲気を感じました。これまでの諸先輩方、民間、研究者、市民がアジア・太平洋地域で、長年にわたり様々な活動を通じて築き上げてきた交流と信頼の成果と理解しております。

他方で、厳しい国際関係に対して我々は少し無邪気かもしれません。多国間に関わりそうな点には、国際河川を抱える国は敏感に反応してきました。国際河川を意識したわけではない「事例共有」、という言葉に、「国際的な合意や国内法に応じて」、という言葉を入れるようコメントが入りました。流域国との関係から注意深く確認しているのがわかりました。

サミット前日の午後にとある国からとある言葉を消すようにコメントが出ました。これも国際河川を巡る問題です。急遽、遠隔会議を設定し、議論しました。先方も日本のことも考えてのコメントなのですが、どうしても譲れないのです。首脳が出る会議でこの点は受け入れられない。関係者と議論をして、結局先方の意見を取り入れました。その過程で日本の中で議論するのですが、私も含めてなぜそのコメントが出たのか皆すぐには理解できないのです。われわれは国際河川の対立についての緊張感をよくわかっていないのかもしれません。

国際文書へは質が高くなるようにコメントする。今回感じたのは、宣言をよくしよう、という姿勢のありがたいコメントがある一方、自分の立場、主張を何とか入れたい、というコメントを出す国・機関もある、ということです。事務方としては、自分たちの主義主張は、それはどこかで読めるから、といった対応をしがちです。他方、こちらのことを考えてコメントしてくれている場合は、いつの間にか先方の主張も交じってしまうことがありました。今後、我々がコメントする際も、全体への貢献も考えることが自分たちの主張も取り入れることにつながるのではないでしょうか。

「質の高い社会」への変革という新しい概念を打ち出し、首脳の決意を示すことができた熊本宣言。岸田首相からはアジア・太平洋地域でのインフラ構築のための 5000 億円をコミットした熊本水イニシアティブが打ち出されました。世界の水問題の解決に向けて関係者のさらなる努力を期待いたしたいと思います。

6th ICHARM Governing Board Meeting was held
第 6 回 ICHARM 運営理事会を開催しました

2022 年 6 月 21 日、第 6 回 ICHARM 運営理事会が開催されました。新型コロナウィルス感染症拡大防止の観点から、第 4 回、第 5 回とこれまで 2 回の会議はウェブにより行われましたが、今回は東京の会議室とウェブ会議とのハイブリッド形式での開催となりました。2020 年 2 月 13 日に署名された日本国政府と UNESCO との協定書での規定に基づき、この 4 月から土木研究所の新理事長に就任した藤田光一氏が議長を務め、合計 8 名の委員が参加しました。

協定書に従い、運営理事会では中長期プログラムの審査及び採択を行うとともに、ICHARM 活動報告の審査、今後 2 年間の実施計画の審査及び採択を行うこととされています。冒頭、全委員が自己紹介を行い、その後、運営理事会手続規則が採択されました。次に、この 4 月から始まった新たな土木研究所中長期計画（2022-2027 年度）に沿って、2022-2031 年度の長期計画と 2022-2027 年度の中期計画からなる ICHARM プログラム案が提示されました。本プログラムは松木洋忠グループ長が説明を行い、全委員の賛成によって採択されました。また小池俊雄センター長からはこれからの 2 年間の実施計画が説明され、満場一致で採択されました。

会議では、IHP-IX 期計画（2022-2029 年）の実施に当たり、水災害に関して ICHARM の重要な役割が強調されるとともに、第 4 回アジア・太平洋水サミットのフォローアップ、2023 年に予定されている水の国際行動 10 年（2018-2028 年）や仙台防災枠組の中間レビュープロセスに貢献するよう期待が寄せられました。また ICHARM による研究、能力開発、国際ネットワーク活動の進展を評価しつつ、ジェンダーバランスの考慮や若者の育成、広報活動や情報発信の強化についても示唆をいただきました。元々の議題では、活動報告の説明を行う予定でしたが、ウェブシステムの不具合に起因する時間的制約から、説明はビデオにより全委員に送るとともに、併せて更なるコメントをいただき、これらは議事録に反映させることとなりました。

本会議で採択された ICHARM プログラムと実施計画に従い、また委員からいただいたご示唆を踏まえ、ICHARM では地球規模での水災害リスク軽減に取り組んでいくこととしています。会議資料は右の ICHARM ウェブサイトから入手できます。

The sixth ICHARM Governing Board (GB) meeting was held on June 21, 2022. Whereas the previous two meetings, the fourth and the fifth ones, were held online to avoid the widespread of the COVID-19 pandemic, this sixth meeting was held in a hybrid style: some were present at a conference room in Tokyo, while others through a web system. As defined in the agreement signed between the government of Japan and UNESCO on February 13, 2020, FUJITA Koichi, who was appointed as the new president of PWRI this April, chaired the meeting. Eight members attended in total.

In compliance with the agreement, the GB examines and adopts the long-term and medium-term program, examines the ICHARM activity report, and also examines and adopts its work plan for the next two years. The meeting started with the self-introduction of all the GB members, which was followed by the adoption of the rules of procedure. Then, the ICHARM Program was presented to the GB members by ICHARM Deputy Director MATSUKI Hirotada. The program had been drafted in accordance with the new Medium- to Long-Term Plan (FY2022-2027) of PWRI starting from this April, consisting of a long-term plan for FY2022-2031 and a medium-term plan for FY2022-2027. The ICHARM Program was adopted with the consent of all the GB members. ICHARM Executive Director KOIKE Toshio explained the work plan for the next two years, which was also unanimously approved.

At the meeting, some GB members emphasized the important role of ICHARM in implementing IHP-IX 2022-2029 in terms of water-related disasters and expressed their expectations that ICHARM will contribute to the follow-up of the 4th Asia Pacific Water Summit and the mid-term review process in 2023 on Water Action Decade 2018-2028 and Sendai Framework for Disaster Risk Reduction. Another GB member praised ICHARM for its progress in research, capacity building and international networking. Meanwhile, other GB members suggested considering more about keeping gender balance, fostering the youth, and enhancing public relations and information dissemination. According to the original agenda, the ICHARM Activity Report was also to be explained at the meeting, but due to the time constraint caused by web system problems, it was agreed that its videotaped explanation would be sent to all the members later, and comments from the members would be then collected to be included in the meeting minutes.

Following the ICHARM Program and Work Plan adopted at the meeting with the suggestions provided by the GB members, ICHARM will continue striving for water-related disaster risk reduction on a global basis. The meeting materials are available on the ICHARM website below:

https://www.pwri.go.jp/icharm/special_topic/20220621_GoverningBoard.html

Participants in the 6th ICHARM Governing Board meeting
第 6 回 ICHARM 運営理事会の参加者

(Written by IKEDA Tetsuya)

Malawian Ambassador to Japan visited ICHARM
駐日マラウイ大使が ICHARM を訪問しました

On June 17, 2022, Mr. Kwacha Chisiza, the ambassador of the Embassy of the Republic of Malawi in Japan and his delegation visited ICHARM to meet with Mr. Hanke Titus Lloyd, a student from Malawi, who belongs to the Office of the President and Cabinet and who is currently studying in a one-year master's degree program, "Water-related Disaster Risk Management Course of Disaster Management Policy Program" (JICA knowledge Co-Creation Program on "Flood Disaster Risk Reduction").

At the beginning of the visit, the ambassador made a courtesy call on ICHARM Executive Director KOIKE Toshio. The executive director explained the history of ICHARM, its role and organizational structure, the objectives and programs of the master's course, and how the students are working on their studies. He also shared with the ambassador two episodes related to Mr. Samuel Joseph Gama, another Malawian student who graduated ICHARM in September 2017. Mr. Gama assessed climate change impacts on flood risk in the lower Shire River basin for his master's thesis. Just after returning home from Japan, he presented his research outputs at a meeting organized by the United Nations Development Programme (UNDP), and his idea was approved as a UNDP project. The other episode was related to the Conference of the Parties (COP) 26 held in Glasgow, United Kingdom, in 2021. The executive director joined an online preparatory meeting organized by the World Bank and discussed an event design. One of the participants recommended Mr. Gama as a session speaker representing Africa.

The ambassador was then shown around ICHARM, including observing a lecture for doctoral students, and gave words of encouragement to master's and doctoral students to make the rest of their training a fruitful experience.

After that, the ambassador had a talk with Mr. Hanke about his studies and his plans after returning to Malawi. Mr. Hanke opined that the country has been experiencing rapid population growth and resulting changes in land-use practices, which has, in turn, increased the severity and frequency of flood disasters in the lower Shire River basin. Based on this awareness, he told the ambassador that he is studying the relationship between the impact on discharge and inundation due to urbanization and the exposure of the population to flood risk. He also hoped that his study would contribute to sustainable development and effective land use to minimize flood risk in the basin in the future.

The ambassador expressed his deep appreciation to ICHARM for giving the two Malawian students a warm welcome and helping them with their academic work and expressed his wish to send more Malawian students to ICHARM in the future. ICHARM sincerely hopes that this visit will lead to a more constructive mutual exchange between Malawi and ICHARM.

Master student Mr. Hanke shaking hands with Malawian Ambassador
マラウイ大使と握手を交わす修士学生ハンケ氏

In front of ICHARM Entrance
ICHARM 正面玄関前にて

(Written by MIYAZAKI Ryosuke)

6 月 17 日、ワチャ チシザ駐日マラウイ大使とそのご一行が、現在、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 課題別研修「洪水防災」) で学んでいるマラウイからの学生ノウ ハンケ ティタス ロイド氏 (Office of the President and Cabinet 所属) と面会するために ICHARM を訪問しました。

始めにチシザ大使は小池俊雄センター長に表敬挨拶を行いました。小池センター長からは ICHARM のパンフレットを用いて、ICHARM の歴史、役割や組織体制、本コースの目的やプログラム及び現在の学生の状況について説明がありました。また、2017 年 9 月に修士課程を修了したマラウイからの留学生サミュエル ジョセフ ガマ氏に関する 2 件のエピソードが紹介されました。1 件目は、ガマ氏は修士論文で気候の変化による Shire 河下流域の洪水リスクの影響評価を研究し、その成果を帰国後に国連開発計画 (UNDP) の会議で報告したところ、プロジェクトとして採用されたことです。2 件目は、昨年、英国グラスゴーで開催された COP26 の世界銀行のサイドイベント準備会合に小池センター長が出席してセッションの計画を議論した際、ガマ氏がアフリカ代表として推薦されたことです。

その後、大使は、ICHARM 内の研究室や博士課程の講義の様子を見学し、学生ルームにて修士・博士学生に対し、残りの研修が実りあるものとなるよう激励の言葉を送りました。

続いて、ハンケ氏と特別会議室にて、これまでの研修の感想や帰国後の展望など意見交換が行われました。ハンケ氏は、Shire 河下流域において、近年、都市化に伴い人口が急速に増加し、洪水被害が頻発していることから、このような都市化が河川流量や浸水域に与える影響と、地域に存在する人口の洪水リスクへの曝露の関係について分析を行っており、本研究は、対象流域における今後の健全な地域発展や土地利用の検討に貢献しうるものと考えられます。

大使は、2 名のマラウイ学生の活躍ぶりや、ICHARM が温かく迎え入れたことに深い感謝の意を示し、今後もマラウイから出来るだけ多くの留学生を ICHARM に送り入れたい旨述べられました。この訪問が、マラウイと ICHARM のより建設的な相互交流のきっかけとなることを、ICHARM 一同心より願っております。

Research

Efforts to increase VFES's public availability: An experiment at Kumamoto City to test the applicability of low-cost data from a commercial 3D city model and 360° cameras

市販３Ｄ都市モデルデータと 360°画像を用いた洪水 VR の普及に向けた取り組み－熊本市における VR 体験会を通した検証－

気候変動の影響による水災害の激甚化に伴い、水災害時の避難の遅れが問題となっています。特に水災害に遭った経験が少ない人において、その状況を具体的に想像できないことも大きな要因と考えられます。近年、VR に代表される可視化・仮想体験技術が向上し、通常の生活では想像しにくい非日常的な状況を高いリアリティで表現することが可能となっています。ICHARM ではこの技術を活用し、仮想洪水体験システム（VFES）を開発しました。このシステムは、基盤地図情報、国土数値情報、UAV 及び地上レーザスキャナを組み合わせ詳細な空間情報を再現し、これに RRI モデルと iRIC による水の動きを重ね合わせて洪水時の状況を表現する仕組みです。VFES の体験者は、仮想空間上での洪水体験に加え、避難訓練を行うことができます。

VFES は仮想洪水下における避難行動の分析等の研究には有用ですが、一般への普及を目指すうえでは、空間情報の収集・作成、リアリティ向上などのコストを必要とします。特に広範囲な都市部の場合には、多くの人工構造物の計算処理に多額のコストが必要となります。また、仮想空間内において避難行動等による視点の移動を伴いながら水理計算に基づく水の動きを表現するためにも、高度な計算、描画能力を有する高額な VR 機材が必要です。このため、空間情報をより安価に作成する方法と安価な VR 機材で閲覧する方法を開発することが求められます。

ICHARM では、熊本県熊本市において、市販の３D 都市モデル及び 360°カメラの画像を活用し、VFES の簡便化を試みました。市販の３Ｄ都市モデルから地形、路面及び建造物境界を抽出するとともに、景観の代表点として約 400 箇所の交差点において 360°画像を撮影しました。RRI モデルによる流出計算と土砂移動を考慮した平面流況計算を行いました。VR ソフト上で空間情報、洪水流況、洪水の水面エフェクトを合成し、洪水中の動的な水災害状況を表現しました（以下、簡易型 VFES と記述します）。

水災害時の避難シナリオを２通り作成し、２パターンの動画作成を行いました。パターン１は避難想定路を無事通過できるギリギリの時間で設定し、パターン２はその１時間後の避難を行うこととしました。同じ避難経路であるにも関わらず、洪水状況は大きく異なり、避難行動が遅れるほど避難困難度が高まることがわかります（図 1）。

これらの簡易型 VFES を熊本市の一般住民に体験いただく体験会を

As water-related disasters have become more intensified in recent years due to climate change, late evacuations have emerged as a serious problem. One of the major factor is considered that people who fail to start early evacuation have little idea what flooding will be like when it occurs. However, this problem can be solved by introducing advanced technologies, such as virtual reality (VR), developed for visualization and virtual experience. They have been so improved as to draw flooding conditions, which people are unable to imagine as they lead a daily life. Taking advantage of such technologies, ICHARM has developed the Virtual Flood Experience System (VFES). This system can draw detailed spatial information based on base map information, numerical land information, and information collected using unmanned aerial vehicles (UAV) and terrain laser scanners (TLS). VFES draw flooding conditions by combining that special information and hydraulic analysis from the RRI model and International River Interface Cooperative (iRIC). VFES users can virtually experience flooding conditions and practice evacuation.

Although VFES is a very useful tool for research, there are many hurdles to clear in order to make VFES available for general purposes. A massive amount of spatial information must be collected and accumulated. Highly advanced VR devices are needed to capture high-resolution VR images, which are necessary to reproduce more real flooding conditions. At present, it is highly costly to meet these requirements, and more research is essential to bring the costs down for reasonable data collection and visualization.

In an effort to tackle these challenges, ICHARM tested a simplified procedure to prepare data and information for VFES in cooperation with Kumamoto City, Japan. The simplified approach used a commercially available 3D city model and 360° camera images of Kumamoto City. Data on terrain, roads and building boundaries were extracted from the commercially available 3D city model. We selected about 400 intersections as representative parts of the cityscape to collect 360° camera images at each intersection. 2D numerical simulations of flooding conditions were conducted using runoff simulation results from the RRI model and considering movable riverbed conditions. Then, we used VR software to reproduce dynamic flooding conditions by synthesizing the spatial information, the 360° camera imagery, the flooding simulation data, and the virtual effect of the flood flow surface. (Here in after, this system is called the Simple Virtual Flood Experiment System, or SVFEM).

We also created two evacuation scenarios in case of a flood and produced two patterns of movie accordingly. In pattern 1, a person starts evacuation at the time when he can barely pass through the evacuation route safely; in pattern 2, one hour later. As shown in Figure 1, although the evacuation route is the same in both patterns, the flooding conditions during the evacuation are very different; the later the evacuation starts, the harder it becomes for people to evacuate safely.

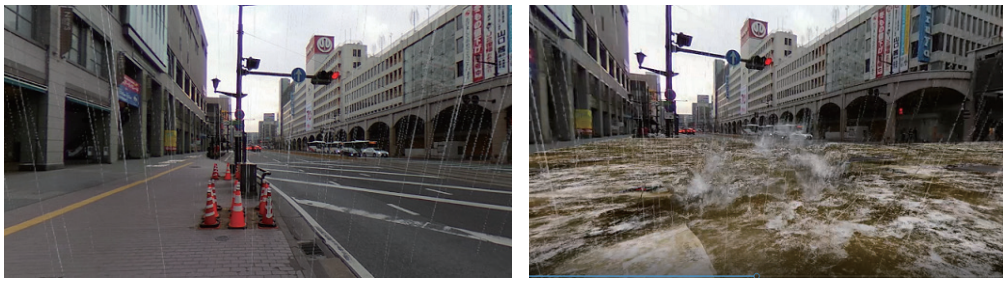


Figure 1 Difference in inundation condition between patterns 1 and 2
図１　パターン１とパターン２における浸水状況の違い

In March 2022, we set up an event for Kumamoto residents to have a SVFEM flood experience. The participants commented that they understood more about possible flood disaster risks around where they live and the importance of early evacuation through the SVFEM experience. The results of the event also proved that SVFEM using a commercially available 3D city model and 360° camera data is capable of providing SVFEM experience that is real enough for people to feel what actual flooding would be like.

(Written by DENDA Masatoshi)

2022 年 3 月に実施しました。参加された方には、お住まいの地域の水害リスクや早期避難の重要性に関してご理解いただくことができました。また、市販の3D モデルと 360° カメラの画像を合成し比較的安価に制作した簡易型 VFES は、水災害のリスクを説明するのに十分な品質を持っていることが確認できました。

ICHARM held the 68th R&D Seminar
第 68 回 ICHARM R&D セミナーを開催しました

ICHARM has been organizing R&D (Research and Development) Seminars on an irregular basis to provide researchers with opportunities for self-development and updating themselves with the latest research by inviting domestic and international experts in the field of risk management and water-related issues.

The 68th R&D Seminar was held on April 26, 2022, by inviting Dr. Anthony C. Sales, the regional director of the Department of Science and Technology (DOST) Region XI of the Philippines, as the speaker. He kindly visited ICHARM to deliver a lecture after participating in the 4th Asia Pacific Water Summit, convened on April 23-24 in Kumamoto City, Japan.

In his lecture, titled "Advanced Activities for Flood Resilience in Davao City, Philippines," Dr. Sales explained advanced comprehensive activities that Davao City has implemented to increase its flood resilience and sustainability by involving so-called "PENTAHELIX," which refers to relevant sectors such as academia, the media, governments, industries, and civil societies. The lecture also addressed the implementation of the Online Synthesis System for Sustainability and Resilience (OSS-SR), an information/knowledge base whose development was supported by ICHARM for interdisciplinary science to provide support for making decisions and fostering facilitators.

The lecture clearly demonstrated the importance of a multi-sectoral approach to disaster risk reduction and how ICHARM has been making contributions to it. While taking pride in our efforts so far, we are also determined to work harder to further reduce disaster risks in Davao City, as well as other places across the globe.

ICHARM will continue organizing seminars at various opportunities in the future for further knowledge development on water-related disaster issues from a wide range of perspectives.

Picture 1 A scene from the lecture
写真 1　ご講演の 1 コマ

Picture 2 Group photo with audience
写真 2　参加者との集合写真

(Written by NAITO Kensuke)

ICHARM では、水災害分野に関する国内外の専門家を招聘し、最新の研究や知見について講演いただき、参加者の研鑽を深める機会として、「ICHARM R&D セミナー（ICHARM 研究開発セミナー）」を不定期に開催しています。

第 68 回を迎える今回は、フィリピン科学技術省（DOST）第 11 地区局長のアンソニー C. サレス氏を講師としてお招きし、2022 年 4 月 26 日に開催されました。サレス氏は 4 月 23・24 日に熊本市で開催されたアジア・太平洋水サミットにご出席後、つくばにお越し下さいました。

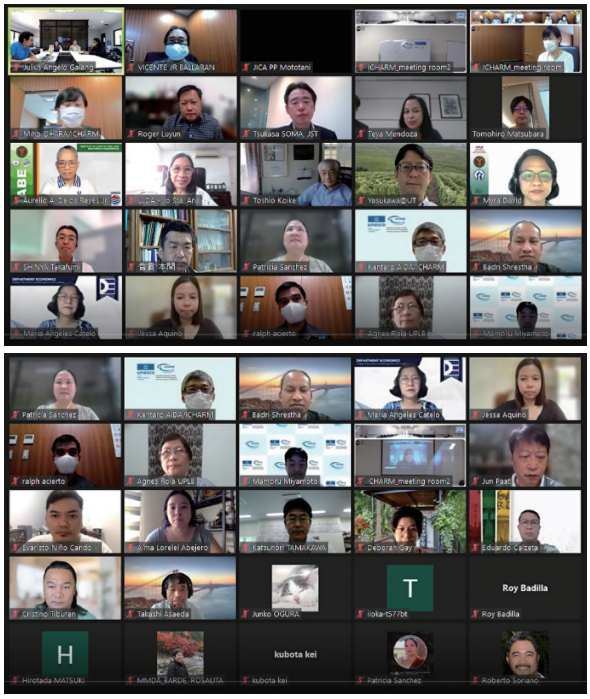
「Advanced Activities for Flood Resilience in Davao City, Philippines」と題された講演では、フィリピン・ダバオ市における学術・メディア・政府・産業・市民組織（通称 "PENTAHELIX"）を巻き込んだ、洪水に対するレジリエンスとサステナビリティを向上するための先進的かつ包括的な活動についてご紹介頂きました。また、ICHARM が開発支援した OSS-SR（オンライン知の統合システム）が、ファシリテータ育成に活用された事例も紹介されました。

サレス氏の講演では、災害リスク軽減における分野横断的な取り組みの重要性と、ICHARM がどのように貢献してきたかが示されました。私たちのこれまでの活動が現地に根付き始めていることに手ごたえを感じるとともに、ダバオ市のみならず、世界各地の水災害リスク軽減に向け引き続き取り組んでいく決意を新たにしました。

ICHARM では今後も様々な機会を捉え、幅広い分野から水災害・リスクマネジメントに関わる知見を広めるべく、セミナーを開催していく予定です。

The 2nd Joint Coordinating Committee Meeting of HyDEPP-SATREPS and UAV observation training for crop monitoring

The 2nd Joint Coordinating Committee Meeting was held on June 10, 2022, for "The Project for Development of a Hybrid Water-Related Disaster Risk Assessment Technology for Sustainable Local Economic Development Policy under Climate Change in the Philippines" under the Science and Technology Research Partnership for Sustainable Development (HyDEPP-SATREPS). This is a 5-year joint research project between Japan and the Philippines and had its kick-off in June 2021. The meeting took place virtually, attended by the HyDEPP-SATREPS members of the two countries, JICA members, and cooperative agencies such as DOST-PAGASA, LLDA, and MMDA. HyDEPP SATREPS' four groups (I – IV) delivered detailed presentations on their outputs. Group 1 is in charge of data collection and sharing, Group 2 of the assessment of flood and drought risk, which is further subdivided into 2-A: Integration of WEB-RRI and SIMRIW, 2-B: Satellite/UAV-Based Inundation/Agricultural Monitoring, and 2-C: Downscaling of Climate Change Model. Group 3 is responsible for resilience assessment and subdivided into 3-A: Analysis between Disaster Impact by Typhoon Ulysses and SDGs, 3-B: Resilience Study in Laguna Lake Area, and 3-C: Resilience Study in Pasig-Marikina-Manila Bay Area. Group 4 is for sustainable local economic development. The meeting also had a question-and-answer segment, where cooperative agencies asked questions and made comments. Announcements on future plans and activities were also made.



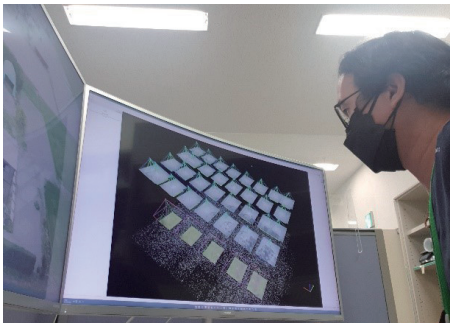
Attendees of the 2nd JCC Meeting of HyDEPP-SATREPS Project held on June 10, 2022

Unit team 2-A of Group 2 conducts flood and drought assessment using a numerical simulation model coupled with a hydrological model (WEB-RRI) and a crop growth model (SIMRIW). The team also utilizes unmanned aerial vehicles (UAVs), commonly known as drones, which have proven themself as effective agricultural monitoring tools in various ways. One is monitoring the health of crops using a special multi-spectral camera attached to them. To check the accuracy of simulations, unit team 2-B conducts inundation and agricultural monitoring with UAV observation technology in addition to satellite imagery analysis. Engr. Vicente G. Ballaran Jr., a research assistant and Ph.D. student at ICHARM, is now contributing to the research activities of unit teams 2-A and 2-B. Before coming to ICHARM, he was the group 2 study leader of this project on the Philippines side.


Dr. HARADA Daisuke giving instructions to Engr. Ballaran


Engr. Ballaran's flight training in a PWRI field


Engr. Ballaran's flight training using a simulator


Using computer software to process UAV-captured images

PWRI requires all the staff wishing to operate a UAV to have an operator's license. To obtain a license issued by PWRI, one must attend lectures on Japan's drone flight regulations and ten-hour flight training. After seven hours of flight training using a flight simulator and three hours of actual flight training on the PWRI premises from April 11 to June 16, 2022, Engr. Ballaran successfully obtained a license. He is now monitoring the growth of rice plants near ICHARM as test observations before starting crop observation in the Philippines.

(Written by Vicente G. Ballaran Jr.)

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) Water-related disaster data archiving, sharing and statistics
(2) Risk assessment on water-related disasters
(3) Monitoring and forecasting water-related disaster risk changes
(4) Support through proposal, evaluation and application of policies for water disaster risk reduction
(5) Support for improving the capacity to practice disaster prevention and mitigation

This issue introduces a researcher as listed below:

Kattia Rubí Arnez Ferrel, Research Specialist

How does suspended sediment affect bed evolution in a suspended-load dominated river? Numerical simulations on a meandering river of the Bolivian Amazon basin

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、カティア ルビ アルネス フェレル専門研究員の「How does suspended sediment affect bed evolution in a suspended-load dominated river? Numerical simulations on a meandering river of the Bolivian Amazon basin」を紹介します。

How does suspended sediment affect bed evolution in a suspended-load dominated river? Numerical simulations on a meandering river of the Bolivian Amazon basin

Kattia Rubi Arnez Ferrel, Research Specialist
カティア　ルビ　アルネス　フェレル　専門研究員

Introduction: The river network of the Amazon basin transports around 850 to 900 ton/year of sediment from the Andes to the ocean [1]. The name of the Andes Mountains comes from the Quechua word "anti" (East) as in "Antisuyu" (East region), one of the territories of the ancient Inca Empire. The Andes range is one key element of the Amazon basin, as it constitutes the source of sediment for the entire Amazon basin [1]. The sediment is transported from the Andes Mountains through the river network of the Amazon until it reaches the Atlantic Ocean by two types of motion: bedload, where particles are sliding, rolling and saltating, and suspended load. Most of the rivers that originate from the Andes have high-suspended sediment concentrations and low bedload [1]. Nevertheless, there have been few investigations regarding rivers where suspended load is dominant, especially in the upstream part of the Amazon basin near the Andes range. Therefore, the main objective of this study is to investigate the effect of suspended sediment on bed evolution in a river where suspended load is dominant. The results presented here are part of the research of Arnez et al. (2022).

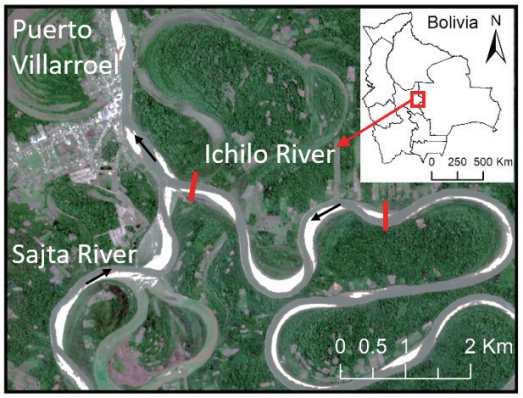


Figure 1. Location of the study area, where the red lines show the beginning and end of the numerical simulations

Area of study: The area selected for our study is located in the southern part of the Bolivian Amazon. The selected river is called the Ichilo, a meandering river originating in the Andes range with the Sajta River as its main tributary (Figure 1). After the confluence with the Sajta, the Ichilo will continue flowing, joining other rivers, until it becomes the Mamoré River, the main tributary of the Madeira River. Puerto Villarroel, an important urban center, has been established on the riverbanks of the Ichilo River and has one port structure, which is the beginning of the Ichilo-Mamoré waterway. The portion of the Ichilo River selected to perform numerical simulations is marked with the red lines in Figure 1, just before the confluence of the Ichilo and Sajta rivers.

Methodology: The methodology for performing numerical simulations of flow and bed deformation used 2-dimensional software called Nays2DH. The software was partially modified, as shown in Arnez et al. (2022). Erosion rates in the sediment transport equation were calculated as proposed by Harada et al. (2020), which calculates the erosion rates as $E=W_e c_s$, where W_e is the entrainment velocity and calculated as a function of the Richardson number and c_s is the sediment concentration of the bed load layer. More details about the equations can be found in [2] and [3].

For the numerical simulations, the initial topography of the river was obtained from a field survey performed in 2019 [4]. The

granulometric samples of the river taken from the point bars were used as the initial granulometric distributions (see [5] for more details about the field works), and a steady discharge was considered in the simulations.

Three cases were prepared to investigate the effect of suspended sediment transport on the bed evolution of the river. The first case (Case 1), in which suspended sediment was neglected, investigated riverbed changes. The second case (Case 2) considered both the effect of bed load and suspended sediment. Both cases were run under steady conditions using a full bank discharge. The last case (Case 3), using unsteady flow, was performed to observe temporal changes in the cross-sectional shapes before and after the peak discharge.

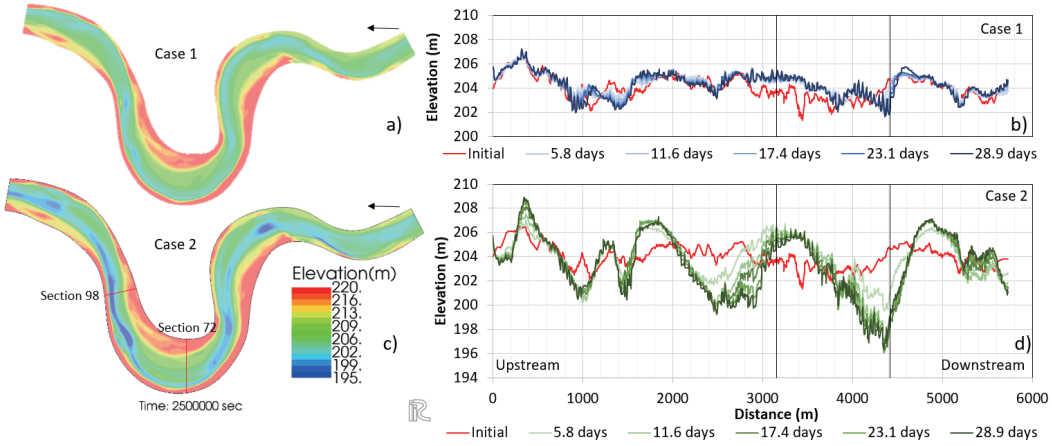


Figure 2. Comparison of the bed topographies (a and c) and bed elevation profiles (b and d) for Cases 1 and 2 (time=2,500,000 s)

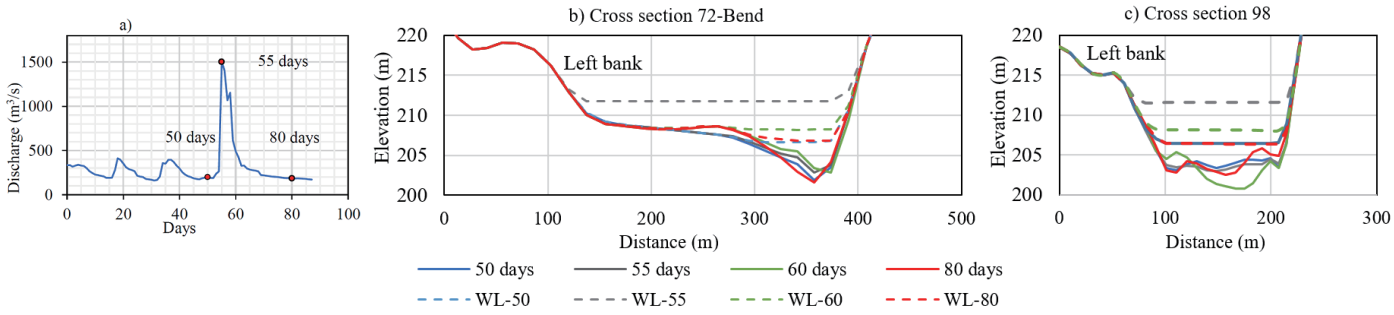


Figure 3. a: Hydrograph used for the simulations; b and c: Evolution of the cross-sectional shape over time for cross sections 72 (bend) and 98 (inflection)

Results: The bed topographies and profiles of the river along the thalweg after 2,500,000 (s) for Cases 1 and 2 (steady flow) are shown in Figure 2. The results illustrate the differences arising when suspended sediment is considered, showing active changes in the riverbed profile, compared to when suspended sediment is neglected. Bed erosion is clearly observed near the inflection points in Case 2 (Figure 2c), and the same is true for Case 1 but to a lesser extent (Figure 2a). In rivers where suspended sediment is dominant, bed elevation changes are highly dependent on erosion and deposition rates and the non-equilibrium nature of the equation of suspended sediment considered in the present numerical simulations.

For the unsteady case (Case 3), the hydrograph and the cross-sectional changes over time are shown in Figure 3. In the bend (cross section 72), the shape does not show significant changes, although erosion is observed to continue even after the flow. In the area near the inflection, changes are minimal during the rising stage to the peak from 50 to 55 days, while the erosion increases during the falling stage from the peak (55 to 60 days), followed by a deposition phase.

Conclusions: The effect of suspended sediment transport on the riverbed evolution of a meandering river was investigated by means of numerical modelling with the following results: 1) active morphological changes took place in the river when suspended sediment was considered; 2) the spatial location of the erosion was observed near the inflection points, where the river width decreases, thus causing an increment in the velocity and consequent erosion rates; and 3) the unsteady case showed complex changes arising under different flow conditions which are partly caused by the non-equilibrium nature of suspended sediment. The effect of suspended sediment transport on the bed evolution of meandering rivers where suspended load is dominant seems significant.

References:

[1] I. Quintana Cobo, "Dinamica de meandros del Alto Amazonas (Ucayali Basin)," Universidad de Cantabria (España), 2015.

[2] D. Harada and S. Egashira, "Method to analyze suspended sediment by means of entrainment velocity," JSCE Ser B1 Hydraul. Eng., vol. 76, no. 2, pp. 1111–1116, 2020.

[3] K. R. Arnez Ferrel, D. Harada, and S. Egashira, "Effect of suspended sediment on bed evolution in a meandering river of the Bolivian Amazon", 2022. (Manuscript submitted for publication).

[4] P. Kinzel, J. M. Nelson, and K. R. Arnez Ferrel, "Bathymetric Survey of the Ichilo and Sajta Rivers, near Puerto Villarroel, Bolivia, May 23-24, 2019." U.S. Geological Survey data release, 2019, doi: https://doi.org/10.5066/P9FW6E8K.

[5] K. R. Arnez Ferrel, J. M. Nelson, Y. Shimizu, and T. Kyuka, "Past, present and future of a meandering river in the Bolivian Amazon basin," Earth Surf. Process. Landforms, vol. 46, no. 4, pp. 715–727, 2021, doi: 10.1002/esp.5058.

Training & Education

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 been offering a master's degree training course, designed for mainly foreign government officers to obtain a degree in one year. The students attend lectures and exercises in the first half from October to March and work on their theses in the second half from April to August.

From April to May 2022, three field trips were conducted, in which the students had an opportunity to see Japan's typical flood control and other facilities and structures, including those that they learned in the lectures.

The following are a summary of each trip with students' comments.

●Field trip to the Kinu River basin (April 13-15)

During the three-day field trip, the students visited the Watarase and Kinu River basins and received lectures about the historical and other issues related to the two basins. Among many things, they learned about the economic development of Japan partly depending on the copper mined at the Ashio Copper Mine in the Watarase River basin and the resulting environmental destruction. They also learned about the Kinu River basin, including the construction of continuous levees, flood control measures, dams and water resources management and power generation, and the levee breach and the outflow in 2015.

In front of Ashio Sand Control Dam
足尾砂防ダムにて

<Comments from students>

■ ***Bhutan is a mountainous country located in the Himalayan mountain range. All major rivers originate from snowmelt in the northern region. Due to their steep slopes, rivers in Bhutan flow with high velocity. The high velocity causes sediment river transport and erosion much.***

Flood mitigation measures such as high standard levees and multipurpose retarding basins like those in Japan will reduce casualties by the floods. In Bhutan, urbanization and development along the river basins are progressing annually, and increasing flood-related urban disasters. I feel there should be a flood management policy to control floods. (Student from Bhutan)

■ ***Rivers in Nepal are like the Kinu River though its size is different. Most of them are snow-fed, while some rivers originate from middle hills just like the Kinu River, flowing to plain areas and causing floods. In such a situation, the construction and effective management of dams could be the option for managing river floods and water scarcity in some regions. However, dams have multidimensional effects on the river environment and biodiversity. Such effects and other aspects should be carefully studied in consultation with all stakeholders before the construction of dams. (Student from Nepal)***

●Field trip to the Shinano River basin (April 27-28)

During the two-day field trip, the students visited the Shinano River basin and practiced discharge measurements in an actual river. Because the lower Shinano River basin was flat with many lakes and marshes, long-term efforts have been made to increase agricultural land by building continuous levees, dams, and diversion

ICHARM では 2007 年以降、国際協力機構 (JICA)、政策研究大学院大学 (GRIPS) と連携し、主に外国人行政職員を対象として、1 年間で学位を取得できる修士課程研修コースを設けています。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執筆に取り組みます。

4 月から 5 月にかけては、 3つの現地視察が実施され、学生は、これまでの講義で紹介された日本の代表的な洪水対策施設等を実際に見学する機会を得ることが出来ました。

以下、研修の概要を学生のコメントとともに報告いたします。

●鬼怒川流域視察(4 月 13 日～15 日)

3 日間の現地視察では、渡良瀬川と鬼怒川を訪れました。渡良瀬川では、足尾銅山で採掘された銅による日本の経済発展と、それによる環境破壊など、渡良瀬川流域の歴史が紹介されました。鬼怒川では、連続堤防の建設、治水対策、ダムを含む水資源・発電の歴史、2015 年の堤防決壊と洪水氾濫について学びました。

<学生からの声>

■ ***ブータンは、ヒマラヤ山脈に位置する山岳国である。主要な河川はすべて北部地域に源を発し、その水源は雪解け水である。ブータンの河川は、急傾斜のため流速が速い。流速が速いため土砂の運搬量も多く、侵食量も多い。日本のような高規格の堤防や多目的遊水地などの洪水軽減策を講じることで、洪水による犠牲者を減らすことができる。ブータンでは、河川流域の都市化・開発が年々進み、都市型洪水災害が増加しているため、洪水を制御するための洪水管理政策が必要だと思う。(ブータン修士学生)***

■ ***ネパールの河川は鬼怒川と似ているが、その規模は異なり、ほとんどが雪に覆われている。しかし、いくつかの河川は鬼怒川と同じように中山間地から発生し、平野部に流れ込み、洪水を引き起こす。このような状況において、ダムの建設と効果的な管理は、地域によっては河川洪水と水不足を管理するための選択肢となり得る。しかし、ダムは河川環境や生物多様性に多面的な影響を及ぼす。すべての関係者に協議した上で、このような影響や他の側面は慎重に検討されなければならない。(ネパール修士学生)***

●信濃川流域視察(4 月 27 日～28 日)

2 日間の現地視察では、実際の河川での流量観測の演習も取り入れた信濃川流域を訪れました。信濃川の下流域は、平坦で湖沼が多いことから、連続堤防やダム、分水路の整備など、農地として豊かな平野を作るための工夫がなされてきました。近

年、信濃川は 2011 年 7 月や 2019 年 10 月など、最大規模の洪水を経験しましたが、これまでの対策が功を奏し、実際に被害が激減したことが確認されています。

<学生からの声>

■ バングラデシュでは、災害後、元の状態に戻すか、住民を他の場所に移すだけで、災害が起こりやすい地域を災害に強くすること、より良い場所に作り直すことはできていない。しかし、日本では、災害が起きやすい地域を、よりよく復興させ、逃げるのではなく、より住みやすい地域にすることができている。私たちの国は土地が不足しているので、日本流のアプローチを適用するのがよいと思われる。（バングラデシュ修士学生）

■ スリランカの灌漑局では、川の流速を測るのに流速計を使い、川の深さを測るのにロープやポールなどの伝統的な方法に今も頼っている。（それに対し）高速道路では、流入車を計測するために、画像処理技術が開発されている。画素の動きを解析し、コンピュータソフトを採用することで、このような技術を河川表層水の流速を計測する方法に再適用することができる。（スリランカ修士学生）

●富士川流域視察(5 月 11 日～13 日)

3 日間の現地視察では、竹内邦良山梨大学名誉教授随行のもと、富士川流域を訪れ、16 世紀に武田信玄公が始めた富士川流域の治水の歴史を学びました。武田信玄は、洪水のメカニズムや地域の脆弱性を深く理解した上で、ユニークで効果的な治水対策を考案しました。「信玄堤」は、その偉業のシンボルとして広く知られています。

<学生からの声>

■ 河岸保全は、富士川流域からマラウイに採用されるべき重要な教訓である。河岸侵食を軽減し、堤防を保護するために更なる研究が必要である。マラウイの河川では堤防の決壊がよく見られるが、これは河川の流れの力学と土砂輸送に対する理解が低いことが主な原因である。このような研究には、河川浚渫の可能性や、頻繁に起こる河道の変化を考慮した様々な河川にも照準を合わせる必要性が含まれるべきである。（マラウイ学生）

■ "一滴の雨水も、まず人類の福祉のために使われることなく、海に流してはならない" と、パラクラマバフ大王は言うように、スリランカには、水力文明を生んだ重要な灌漑の遺産がある。我々灌漑局の職員は、水・土地資源の持続可能な開発・管理を通じて、これらの伝統を守ることに専念しており、これは、武田信玄公の治水法（「甲州治水法」）と同じである。（スリランカ学生）

最後に現地訪問にご対応頂いた関係者の皆様に深い感謝の意を表します。

channels.

In recent years, the Shinano River has experienced flood events of the largest scale, including those in October 2019 and July 2011. However, many reports have confirmed that the measures taken so far have been effective in reducing damage drastically.

Practicing discharge measurements on the Shinano River
信濃川にて流量観測実習

<Comments from Students>

■ In Bangladesh, after a disaster, we just try to restore the original condition or relocate the people to other places. We are not making the disaster-prone area resilient to disasters and building back better. But Japan practices building back better and transforming land affected into area better to live in, instead of escaping from it. We are lacking land, so it is better to apply the approach that Japan uses. (Student from Bangladesh)

■ In the irrigation department in Sri Lanka, we use a current meter to measure the flow velocity of the river, and we still rely on traditional methods such as a rope and pole to determine the depth of the river. In highway systems, image processing technology has been developed to measure traffic volume. By analyzing pixel movement and employing computer software, such technology can rearrange and develop a method for measuring river surface water flow velocity. (Student from Sri Lanka)

●Field trip to the Fuji River basin (May 11-13)

During the three-day trip, the students visited the Fuji River basin accompanied by Prof. Emeritus TAKEUCHI Kuniyoshi of the University of Yamanashi. They learned about the history of flood control in the Fuji River basin, which was originated in the 16th century by TAKEDA Shingen, a feudal warlord ruling the area. He devised unique, effective flood control measures based on his deep understanding of flood mechanisms and local vulnerabilities. The Shingen Dike is widely known as a symbol of his great achievements.

At Shingen Dike
信玄堤にて

<Comments from students>

■ River bank protection is an important lesson that Malawi should adopt from the Fuji River basin. Further studies are needed to reduce river bank erosion and protect embankments. Embankment failure is a common occurrence in Malawian rivers and is largely due to insufficient understanding of river flow dynamics and sediment transportation. Such studies should include potential river dredging and training needs for various rivers, as well as take into consideration frequent channel changes that occur. (Student from Malawi)

■ "Not to let a drop at rainwater flow into the sea without first being used for the welfare of mankind," said King Parakramabahu the Great. Sri Lanka has a significant irrigation heritage, which has given rise to a hydraulic civilization. We, the Irrigation Department, are dedicated to preserving these traditions via sustainable development and management of water and land resources. This is identical to Lord Shingen Takeda's flood-control approach ("Koshu Flood Control Method"). (Student from Sri Lanka)

Finally, ICHARM would like to express the deepest gratitude to all the staff and officials who cooperated on the field trip.

(Written by MIYAZAKI Ryosuke)

Action Reports from ICHARM Graduates

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 100 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. Mohammad Faiz Syed (India), who graduated from the master's program in 2015, has kindly contributed the following article to this issue.

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100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2015年度（8期）修士課程卒業のMohammad Faiz Syed氏（インド）から寄稿いただきましたので、ご紹介します。

The third GRIPS SDGs Award

Er. Mohammad Faiz Syed won the SDGs Award from the National Graduate Institute for Policy Studies (GRIPS) for his contribution to 3-Day Advisory Flood Forecast System of Central Water Commission (CWC), Govenment of India. GRIPS launched SDGs Awards in 2019 to promote innovative efforts by alumni towards solving the most pressing environmental, social and economic challenges toward the achivement of SDGs. The awarding ceremony was held online on June 20. He gave a presentation about his activity and had discussions with several students in disaster management policy program.

A scene from special online GRIPS Forum (Mr. Faiz is at top right)

Mohammad Faiz Syed

Superintending Engineer, Central Water Commission, Govt. of India

I joined the CWC, an apex technical organisation of Government of India, as a Mechanical Engineering Graduate in 2007 after securing an All India 13th rank in the Indian Engineering Services (IES). I have keen interest in the water sector and has been serving at various important positions in the River and Flood management of the country. I earned his Master's degree in Disaster Management from GRIPS in 2015 and was awarded the Best Researcher Award for the same. I currently holds the position of Superintending Engineer in the North East region of the country and mainly looks after the works of survey & investigation, monitoring and appraisal of various irrigation projects in the states of Meghalaya, Manipur, Mizoram, Tripura and Assam. Being an important representative of central government, I plays a key role in the development of water sector in these States.

Role in the Project (3-Day-Advisory-Flood-Forecast-System)

I was one of the lead members in the development and operation of the 3-Day Advisory Flood Forecast system in India. I being Deputy Director for the project, worked relentlessly under the abled guidance of my Directror and contributed mainly in development of hydrological models, automatic integration of global rainfall data into these models and automation of the entire system. I was also involved in the development of GIS portal where the results of the system get published.

My training at ICHARM, Tsukuba, Japan under the Masters in Disaster Management programme (2014-15) was very helpful. This training acquired at ICHARM not only widened my views regarding Floods, its risks and vulnerabilities but also made me learn various skills and tools which were of great help in the development of this project.

Details of the project are as follows:

Three-Day Advisory Flood Forecast System of Central Water Commission (CWC), Government of India

Background:

Flood is the most common natural disaster in India. In States of Uttar Pradesh, Bihar, Assam, Gujarat, Rajasthan, Bengal, Andhra Pradesh and Odissa, flood is a recurrent problem. According to estimates, on an average, every year 75 lakh hectares of land is affected, 1600 lives are lost, and the damage caused to crops, houses and public utilities is over 1805 crores. To cope with this enormous damage caused by floods in the country, Government of

India relies heavily on flood forecasting as one of the non-structural measures. However, structural measures like embankments, dams, flood protection works etc. are also widely used and play a vital role.

CWC is an apex technical organisation under Government of India which is mandated to give flood forecast for the entire country. It has been doing flood forecasting for the last 62 years and currently has a wide and extensive network of 325 forecasting stations spread across the country.

Need for the Project:

The conventional flood forecasting by CWC has been done through gauge-to-gauge correlation method which has performed very well over these years. Yet, it is a statistical technique and this has a major in-built drawback of limited and fixed warning time (not more than 24hrs in India). It is done manually and hence it is time taking. To overcome such limitations, CWC introduced a rainfall based hydrological modelling technique for flood forecasting in 2017 through its three-day-advisory-flood-forecast-system. This system has been developed totally in-house by CWC officers involving no funds. It complements the conventional system already in place.

The main reason for moving to modelling based flood forecasting technique was the popular demand for longer warning time which is essential and critical for disaster managers and other stakeholders to plan and take preventive measures for minimising flood losses.

Project Details & Impact:

The system uses both hydrologic (rainfall-runoff) and hydrodynamic modelling engines for real-time water level and inflow prediction in the rivers and reservoirs generating forecast which gets updated every three hours for all the 325 forecasting stations simultaneously. It works in an automatic mode without any human intervention. The new forecasting technique has increased the warning time up to 72hrs (3 days in advance) and operates on a pan-India scale, covering all the 19 major river basins of the country. The system generates more than 2000 forecasts in a day which are easily accessible on a dedicated GIS platform. The three-day-advisory-flood-forecast-system of CWC is based on the latest state of the art technology, and it is at par with any modern flood forecasting technique used in the world.

Three-day-advisory-flood-forecast-system is not only a major upgrade from manual gauge-to-gauge to an automated rainfall based flood forecasting system but also a great help for all the concerned States and project authorities of the country involved in flood management. This system intends to provide timely and in advance flood warnings which are vital for early evacuation from the flood risk zones and for preventing impending flood damages in the region.

The system is sturdy, durable, and sustainable. It has been performing very well since 2017 and has operated successfully for all the past five flood seasons. It will serve the country in the long run since a separate directorate has been entrusted with the responsibility of its maintenance and continuous improvement in the future.

Acknowledgement:

Apart from Mr. Mohd Faiz Syed, the main development team included Mr. Ritesh Khatter who is currently posted as Director, Ganga Flood Control Commission (GFCC), Govt. of India.

The project would not have been possible without the full hearted support and encouragement from Chairman, Member (River Management) and Chief Engineer (FMO) of Central Water Commission.

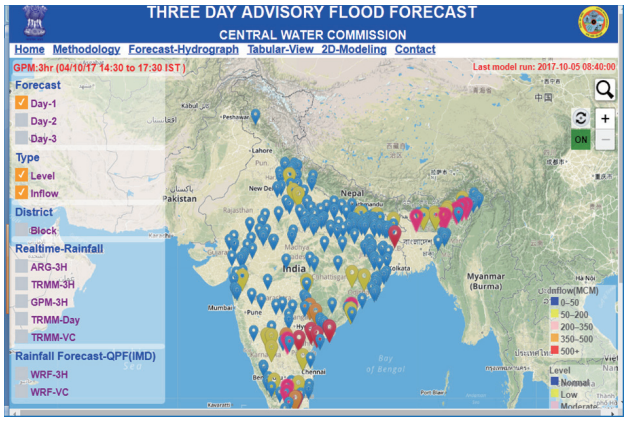


Figure 1 Web Interface of Three Day Advisory Flood Forecast of Central Water Commission, Govt. of India

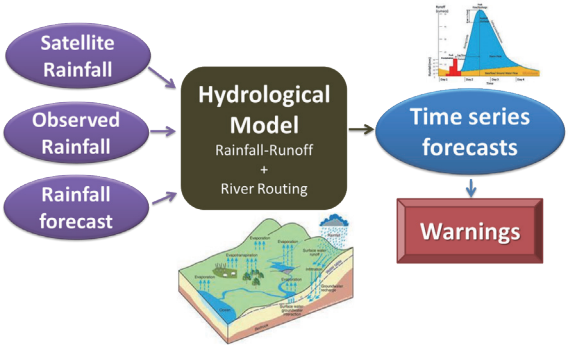


Figure 2 Broad Methodology of the Forecasting System used

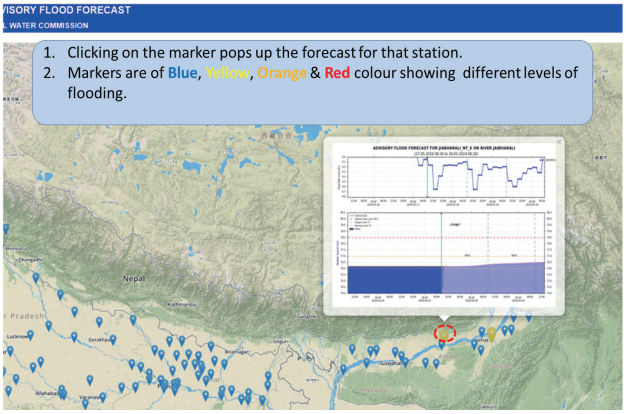


Figure 3 Forecast Sample on the GIS dissemination portal

Coming Events

Preparation for the 9th International Conference on Flood Management (ICFM9)
第 9 回洪水管理国際会議（ICFM9）の準備状況

ICHARM has been preparing for the 9th International Conference on Flood Management (ICFM9), scheduled to be held from February 18 to 22, 2023 mainly at Tsukuba. This article is to report the recent progress of the preparation.

The ICFM9 International Scientific Committee has reviewed the submitted abstracts and decided to adopt 262 of them. Based on the review results, a draft program for the sessions will be prepared, and the registration will open on the ICFM9 website.

Floor		1F			2F					4F
Room		Main Hall	Room 101	Room 102	Hall 200	Room 201	Room 202A	Room 202B	Hallway	Room 405
Feb.19 Sun.	9:00	Opening Ceremony								
	10:00	Plenary 1								
	11:00	Poster Indexing 1								
	12:00									
	13:00	Open-to-Public Symposium	Theme-2a	Theme-2e	Theme-3a	Theme-1a	Theme-8+9	Theme-5	Poster Exhibition	Special Session
	14:00									
	15:00		Theme-2b	Theme-2f	Theme-3b	Theme-1b	Theme-6	Theme-4a(+5)		Special Session
	16:00									
Feb.20 Mon.	9:00	Plenary 2								
	10:00	Plenary 3								
	11:00	Poster Indexing 2								
	12:00									
	13:00	Theme-10a	Theme-2c	Theme-2g	Theme-3c	Theme-1c	Theme-6+7	Theme-4b	Poster Exhibition	Special Session
	14:00									
	15:00	Theme-10b	Theme-2d	Theme-2h	Special Session	Special Session	Theme-7	Theme-4c		Special Session
	16:00									
Feb.21 Tues.	9:00	Plenary 4								
	10:00	Closing Ceremony								
	11:00									
	12:00									

Draft program for the sessions
プログラム案

As part of ICFM9, a short tour is planned on the afternoon of February 21 to several research institutes in Tsukuba, including the Public Works Research Institute, and the Japan Aerospace Exploration Agency (JAXA). Another trip is scheduled for February 22 to various destinations in the Kanto region, including the dyke break and reconstruction point along the Kinu River due to the heavy rain in 2015, the Metropolitan Area Outer Underground Discharge Channel, the Watarase Yusuichi (retarding basin), and the National Research Institute for Earth Science and Disaster Resilience. The registration for these trips will open at the same time as the registration for the conference.

Metropolitan Area Outer Underground Discharge Channel (Kasukabe City, Saitama Prefecture) to be visited as a field trip
フィールドトリップとして訪問予定の首都圏外郭放水路（埼玉県春日部市）

In addition, a high-level symposium will be held on the afternoon of February 18 at the National Graduate Institute for Policy Studies (GRIPS) in Tokyo, and a public symposium on the afternoon of February 19 at Epochal Tsukuba. We look forward to seeing many people there.

On June 22, the second meeting of the Local Organizing Committee was convened. ICHARM reported the progress in the preparation and was given advice on how to promote public participation and how to manage the sessions and conference effectively.

Epochal Tsukuba International Congress Center
エポカルつくば国際会議場

As the ICFM9 secretariat, ICHARM will continue working hard for the event to welcome as many people as possible.

(Written by MOCHIZUKI Takafumi)

第 9 回洪水管理国際会議（ICFM9）が 主につくば市において 2023 年 2 月 18 日から 22 日まで開催されます。その準備状況についてご紹介いたします。

これまで投稿いただいたアブストラクトは、ICFM9 国際科学技術委員会で審査され、その結果 262 件のアブストラクトを採用することとなりました。この審査結果をもとにセッションのプログラム案を作成し、ICFM9 のウェブサイトで参加登録を開始することとしています。

ICFM9 の一環として、2023 年 2 月 21 日午後、土木研究所、JAXA といったつくばの研究施設訪問を予定しています。また、2 月 22 日は関東エリアのフィールドトリップを計画しており、鬼怒川破堤地点、首都圏外郭放水路、渡良瀬遊水地、防災科学技術研究所を訪問する予定です。会議の参加登録と合わせ、これらの参加登録も始めることとしています。

さらに、2 月 18 日午後には東京・政策研究大学院大学でハイレベルシンポジウムの開催、2 月 19 日午後にはエポカルつくばで一般公開シンポジウムの開催を予定しておりますので、より広範の方々からのご参加をお待ちしております。

なお、6 月 22 日には国内委員会の第 2 回会合を開催しました。上記の準備状況についてご確認頂くとともに、一般参加を促す方法や、会議のとりまとめに関することなどのご助言を頂きました。

開催まで徐々に近づいて参りました。ICHARM では ICFM9 の事務局として、より多くの方にご参加頂けるよう準備に取り組んでまいります。

Public Relations

ICHARM Open Day 2022 held for local school students
ICHARM Open Day 2022 ～茨城県立竹園高等学校・茨城県立並木中等教育学校 が Web 参加～

4月19日、ICHARMは「ICHARM Open Day」をWeb開催しました。このイベントは、ICHARMの地域貢献活動として、地元の学校の生徒を招待し、国際交流の機会を提供しようとするもので、毎年、4月の科学技術週間に合わせて実施されています。今年は新型コロナウイルス感染症の感染拡大防止を図ることから、昨年と同様、ICHARM、学校、海外をつなぐWebセミナーの形式で開催しました。

このイベントには、茨城県立竹園高等学校・茨城県立並木中等教育学校の生徒91名、ICHARMの修士課程・博士課程の在学生8か国16名が参加しました。本イベントは、ICHARMの外国人在学生及びICHARMスタッフが協力し、プログラムはすべて英語を使って行われました。

イベントではじめに、ICHARM小池俊雄センター長による基調講演"Water-related Disasters Intensified by Climate Change and Sustainable Development Goals (SDGs)" が行なわれ、近年、気候変化に伴い、自然災害が増加傾向にあること、持続可能な発展のためにはファシリテーターの果たす役割が大きいことなどが紹介されました。生徒たちは、英語で聞くSDGsの授業に、真剣な表情で参加していました。

基調講演に続くプレゼンテーションでは、8カ国の修士課程・博士課程の学生（バングラデシュ、ブータン、インドネシア、マラウイ、マレーシア、ネパール、フィリピン、スリランカ）が、各国の概要、生活、文化の紹介のほか、水災害をテーマとしてプレゼンテーションを行いました。このうち、ネパールからの在学生のうち1人は本国からの参加で、国際会議さながらのOpen Dayとなりました。質疑応答の時間では、「日本政府はあなたの国に対して十分な支援をしていると感じますか?」、「あなたの国では、災害にあわれた人たちに、どのような精神的ケアをしていますか?」といった質問が出され、各学校の生徒は積極的に質疑応答に参加しました。

参加した学校の生徒からは、「雑音が入り、聞きにくかった」といった意見も聞かれ、Web開催では制約が多いと感じました。しかしながら、「水関係の災害は、どの国も日本の災害と共通するものが多いと感じた」、「驚いたことは、マレーシアでは地震は起きないということ」、「昨年は話を聞くだけになってしまったけれど、今年は質問もできて、良い英語学習になった」といった肯定的な感想も寄せられ、制約が多い中でもICHARM Open Dayを開催できて良かったと思いました。来年は是非、コロナウイルス感染症が終息し、対面で実施できればと願っています。

On April 19, ICHARM held "ICHARM Open Day 2021" online. The event is held every year during the Science and Technology Week in April as one of ICHARM's community contribution activities, inviting students from local schools and providing them with international exchange opportunities. This year's event was held as a webinar, just like the last year's, to prevent the spread of the COVID-19 infection, connecting ICHARM, two local schools, and one overseas site.

A total of 107 participants joined this online open day event, including 91 students from Ibaraki Prefectural Takezono High School and Ibaraki Prefectural Namiki Secondary School and 16 ICHARM doctoral and master's students from 8 countries. The event was conducted all in English with the cooperation of the graduate students studying at ICHARM in addition to ICHARM staff.

The event began with a keynote lecture titled "Water-related Disasters Intensified by Climate Change and Sustainable Development Goals (SDGs)" by Executive Director KOIKE Toshio. In the lecture, he explained that the number of natural disasters is increasing due to climate change and that the facilitators play a large role in sustainable development. The students seemed to have great fun taking part in a special class on SDGs and gaining knowledge through English.

Key Note Lecture by Executive Director KOIKE Toshio
小池俊雄センター長による基調講演

In the presentations following the keynote lecture, the master's and doctoral students from 8 countries (Bangladesh, Bhutan, Indonesia, Malawi, Malaysia, Nepal, the Philippines, and Sri Lanka) spoke about life, culture, and some issues regarding water-related disasters in their nations. Because a student from Nepal participated from his home country, this year's Open Day looked just like an online international conference. Students from each high school actively participated in the Q & A session held after each presentation. They asked many questions, such as "Do you think the Japanese government provides enough support to your country?" and "What kind of mental support is given to the people affected by natural disasters?"

Some local students commented that it was difficult to hear because of noises, making us realize that there were limitations when holding a meeting online. However, there were positive comments as well: "I've learned that water-related disasters are similar in Japan and overseas countries," "What surprised me is that no earthquakes occur in Malaysia," and "I only listened to the stories last year, but this year I was able to ask questions, and it was a good opportunity to learn English." The ICHARM staff were grateful for such comments and though that the event was well worth their efforts despite some problems. We hope that the pandemic will end soon so that next year, the event can be held in a regular, face-to-face style here at ICHARM.

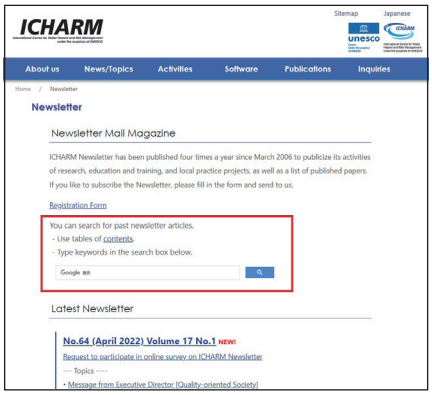
Participants of ICHARM Open Day 2022
ICHARM Open Day 2022 の参加者

(Written by UMINO Hitoshi)

Miscellaneous

New functions for a quick search for ICHARM newsletter articles
ICHARM ニュースレター記事が検索しやすくなりました

Since its first edition in March 2006, the ICHARM Newsletter has delivered more than 1000 articles on our activities and others'. For these articles to be easily searchable, we have posted a list of all the articles published in our newsletter on the ICHARM website. In addition, we have created a search window through which you can quickly find articles you are looking for by typing in some keywords. We would be very happy if you could make use of these new functions.



https://www.pwri.go.jp/icharm/publication/index.html

(Written by IKEDA Tetsuya)

2006 年 3 月の初版発行以来、ICHARM ニュースレターでは活動等に関して 1000 件を超える記事をお届けしてまいりました。これらの記事をより簡単に検索できるよう、このたび ICHARM のウェブサイトに全記事の目次一覧表を掲載しました。また、検索欄を設けて、いくつかのキーワードを入力することで容易に記事を見つけられるようにしました。これらの新たな機能をご活用いただければ大変嬉しく思います。

https://www.pwri.go.jp/icharm/publication/index_j.html

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

ICHARM accepted an internship student Ms. Pema Syldon from June 9 to 24 2022.

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

ICHARMで、インターン生として受け入れたPema Syldon氏からコメントをいただきました。

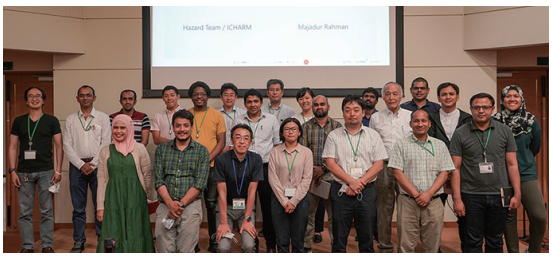
Ms. Pema Syldon,

from Bhutan, Graduate School of Environmental Studies, Nagoya University — *Stay period: June 9 - 24, 2022*

My name is Pema Syldon. I am a Master of Environmental Studies student at Nagoya University. I am with the Land and Infrastructure Design Laboratory, and my supervisor is Dr. Shinichiro Nakamura sensei. In Bhutan, I work for the National Center for Hydrology and Meteorology.

I was very fortunate for this internship opportunity at the esteemed ICHARM from 9-24 June. My supervisors were Dr. Miyamoto sensei and Dr. Shrestha sensei. I learned about the impacts of river floods under climate change in a target area in Bhutan. I was able to develop the rainfall-runoff-inundation model for my target area to simulate and analyze flood hazards. I learned how to calibrate and validate the model to the target area. With the help of Dr. Tamakawa sensei, I acquired bias-corrected data to conduct climate change analysis. I learned the process for selecting the models and processing bias-corrected data to conduct climate change scenario analysis. With these developments, I learned to identify changes in flood inundation information in the future in the target area. The knowledge and information I acquired from the internship will immensely add to my master's research, as well as to my agency.

I would like to express my gratitude to Dr. Nakamura sensei for giving me the opportunity for this internship. I would like to thank Dr. Miyamoto sensei and Dr. Shrestha sensei for their guidance throughout the course. Without them, I wouldn't be able to further my study. Finally, I would like to thank everyone at ICHARM for their support and cooperation in my successful completion of the internship. Thank you very much. どうもありがとうございます。



Ms. Syldon (front, center) with ICHARM members after her presentation

Personnel change announcements
人事異動のお知らせ

New ICHARM Members

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

MORI Noriyuki / 森　範行
Director for Special Research / 特別研究監　　*Japan*

It is my great pleasure to join ICHARM, which is one of the most excellent research institutes for water-related disasters in the world. Prior to coming to this position, I worked for various sections of MLIT HQ, Regional Development Bureaus, branch offices, etc., mainly in the field of water and river management in Japan. I also have overseas working experiences as a water resources specialist at the Asian Development Bank and a JICA expert in Syria and Laos as well. Based on my domestic and overseas experiences and knowledge, I would like to contribute to the further development of ICHARM.

KURIBAYASHI Daisuke / 栗林大輔
Chief Researcher / 上席研究員　　*Japan*

After working for three years at the Reconstruction Agency, I'm happy to return to ICHARM. The last time I was at ICHARM, I was mainly in charge of managing public relations and training and educational courses, in addition to research on risk management, for over ten years. Making use of such experience, I want to contribute as much as possible to the next stage of ICHARM.

Leaving ICHARM

- **IKEDA Tetsuya:** Director for Special Research
  Japan Construction Information Center (JACIC)

- **KAWAMOTO Takatoshi:** Senior Researcher
  Asian Development Bank (ADB)

○**池田鉄哉**　特別研究監
一般財団法人日本建設情報総合センター（JACIC）

○**河元隆利**　主任研究員
アジア開発銀行（ADB）

Awards / 受賞リスト

* April 2022 - June 2022

●小池俊雄センター長へ日本工学会よりフェローの称号が授与されました。（写真1）

●柿沼太貴研究員が2022年度河川技術に関するシンポジウムにて河川技術論文賞を受賞しました。（写真2）
受賞論文：
中小河川を対象とした洪水時におけるリアルタイム水位予測システムの開発に向けた研究

●原田大輔専門研究員が2022年度河川技術に関するシンポジウムにて優秀発表者賞を受賞しました。（写真3）
受賞論文：
多量の土砂・流木を含む洪水流の解析法

●*Executive Director KOIKE Toshio is awarded the title of Fellow by the Japan Federation of Engineering Societies. (Photo 1)*

●*Researcher KAKINUMA Daiki was awarded Best Paper Award , Symposium on River Engineering, JSCE, 2022. presented by Japan Society of Civil Engineering (JSCE). (Photo 2)*
Award winning paper:
DEVELOPMENT OF REAL-TIME FLOOD FORECASTING SYSTEM FOR THE SMALL AND MEDIUM RIVERS

●*Research Specialist HARADA Daisuke was awarded Best presentation award, Symposium on River Engineering, JSCE, 2022. presented by Japan Society of Civil Engineering (JSCE). (Photo 3)*
Award winning paper:
METHODS TO ANALYZE FLOOD FLOW WITH A HUGE AMOUNT OF SEDIMENT AND DRIFTWOOD

Photo 1 Executive Director KOIKE

Photo 2 Researcher KAKINUMA (center)

Photo 3 Research Specialist HARADA (left)

Business trips / 海外出張リスト

* April - June 2022

- May 24 - 27, Bali, Indonesia, KOIKE Toshio, to attend the special event of GP2022
- June 25 - July 8, Cordoba and Buenos Aires, Argentina, USHIYAMA Tomoki, KAKINUMA Daiki, and AIDA Kentaro, kick-off meetings (SATREPS Argentine Republic), and field survey for basins in Cordoba and Buenos Aires

Visitors / 訪問者リスト

* April - June 2022

- Visited by Dr. Anthony C. Sales, April 26, 2022
  Purpose: invited speaker for the 68th ICHARM R&D Seminar
- Visited by Mr. Kwacha CHISIZA, June 17, 2022
  Purpose: to interview with one master's student of Malawi

Publications / 発表論文リスト

* April - June 2022

1. Journals, etc. / 学術雑誌（論文誌、ジャーナル）

- 南雲直子、大原美保、藤兼雅和、井上卓也、平松裕基、ジャラニラ　サンチェズ　パトリシア　アン、フィリピン共和国の洪水常襲地を対象とした3D浸水ハザードマップの作成と技術の普及、E-journal GEO、2022, Vol.17、No.1、pp.123-136
- Li Zhou, Toshio Koike, Kuniyoshi Takeuchi, Mohamed Rasmy, Katsuhiro Onuma, A study on availability of ground observations and its impacts on bias correction of satellite precipitation products and hydrologic simulation efficiency, Journal of Hydrology, June 2022, Vol.610, pp.1-20

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

- Badri Bhakta Shrestha, Mohamed Rasmy, Takatoshi Kawamoto, Masakazu Fujikane, Quantitative assessment of flood damage to residential buildings and agricultural crops in the Solo River basin of Indonesia, Proceedings of the 9th International Conference on Water Resources and Environment Research (ICWRER 2022), pp.264-269, The 9th International Conference on Water Resources and Environment Research (ICWRER 2022), ICWRER (Online), April 25-27, 2022
- Shammi Haque, Koji Ikeuchi, Badri Bhakta Shrestha, Masashi Minamide, Generalizing flood damage mechanism processes of MC Type houses by developing comprehensive flood damage estimation method for Teesta River Basin, Bangladesh, Proceedings of the EGU General Assembly 2022, EGU General Assembly 2022 (Online), EGU, Vienna, Austria, May 23-27, 2022
- Daisuke Harada, Shinji Egashira, Methods to evaluate sediment and driftwood laden flood -In the Akatani river flood disaster in July 2017-, Proceedings of the 39th IAHR World Congress, 39th IAHR World Congress 2022, Spain Water and IWHR, China, Granada, Spain, June 19-24, 2022
- Shinji Egashira, Robin Biswas, Daisuke Harada, Kuniaki Miyamoto, On a reasonable, functional form for bed-load formulas, Proceedings of the 39th IAHR World Congress, 39th IAHR World Congress 2022, Spain Water and IWHR, China, Granada, Spain, June 19-24, 2022

3. Poster Presentations / ポスター発表

- Badri Bhakta Shrestha, Mohamed Rasmy, Takatoshi Kawamoto, Masakazu Fujikane, Exposure analysis and assessing households flood damage with adaptation options in the Solo River basin of Indonesia, Proceedings of the Japan Geoscience Union Meeting 2022, Japan Geoscience Union Meeting 2022 (Online), JPGU, May 22-June 3, 2022
- Menglu Qin, Daisuke Harada, Shinji Egashira, Modeling of Sediment Transport Process in Drainage Basins, Proceedings of the 39th IAHR World Congress, 39th IAHR World Congress 2022, Spain Water and IWHR, China, Granada, Spain, June 19-24, 2022
- 原田大輔、江頭進治、多量の土砂・流木を含む洪水流の解析法、河川技術論文集、2022年6月、28号、pp.289-295、河川技術に関するシンポジウム（オンライン）、水工学委員会河川部会、土木学会、2022年6月16日～17日

4. Magazines, Articles / 雑誌、記事（土技資含む）

- 南雲直子、マニラ首都圏周辺の持続可能な発展に向けた調査研究、GIS NEXT、No.79、pp.51、2022年4月

5. PWRI Publications / 土研刊行物（土研資料等）

None / 該当者無し

6. Other/ その他

None / 該当者無し

Editor's Note
編集後記

ICHARM ニュースレターをご愛読いただきありがとうございます。

COVID-19 の世界的な感染拡大から 2 年程度が経過いたしました。今号の Special Topics でも紹介させて頂いたように、この 4 月に熊本で開催された国際会議である第 4 回アジア・太平洋水サミット（APWS4）では対面とウェブを合わせた形となり、対面で大きな会議を開くことが出来るようになりました。COVID-19 の前の日常に戻りつつあり、喜ばしく思っています。また記事で紹介させて頂きました、来年 2 月に開催される ICFM9 についても、ICHARM の所在地であるつくば市で対面方式により開催される予定です。その際には、皆様にお会いできるのを楽しみにしております。

日本では一番暑い季節となり、また、台風のシーズンとなってきました。大きな災害が発生しないことを願うとともに、日ごろから備えをしていければと思います。

ICHARM ニュースレター
編集委員会
吉野　広郷

Thank you for reading the ICHARM newsletter.

As reported in this issue as the Special Topics, the 4th Asia-Pacific Water Summit (APWS4), an international conference, took place this April in Kumamoto, Japan, combining face-to-face and online meetings. About two years after the global pandemic of COVID-19 broke out, we could finally hold meetings in a face-to-face style, even at a major conference. I am delighted to be able to return to our daily routine, just like the one we took for granted before the pandemic. ICFM9, another international conference also mentioned in this issue, will be held with in-person meetings in February 2023 in Tsukuba, where ICHARM is located. We look forward to seeing many of our readers and other experts here.

Japan is entering the hottest season of the year, which is also the typhoon season. I hope that no severe disaster will occur this year and that the readers will prepare for potential disasters on a daily basis.

ICHARM Newsletter Editorial Committee
YOSHINO Hirosato

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