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ICHARM

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

Trust and Risk

The World Science Forum (WSF2024) was held in Budapest, the capital of Hungary, in late November 2024 (<https://worldscienceforum.org/>). Plenary Session 1 focused on "Conceptualizing Trust in Science," and discussed how to place trust in science in the context of public understanding, accountability, and policymaking. The theme of Plenary Session 2 was "Weighting Risk in Policymaking," which focused on how to respond to compound risks in particular, recognizing that scientific evidence is only one component of policymaking. Both sessions provided valuable opportunities to reflect on the nature and role of science in contributing to solutions to global challenges, such as sustainable development, disaster risk reduction, and climate change.

Professor KAJITA Takaaki, a Nobel laureate in Physics and a panelist for Plenary Session 1, referred to the chain-break photomultiplier tube accident in 2001 at Super-Kamiokande, one of the world's largest and most advanced neutrino observatory. He emphasized the importance of being "honest" during this crisis, which threatened to destroy trust in science, saying, "I was honest about what I knew and what I did not know." When a new discovery is made, discussions often emerge that question the validity of the previous theory as if it were "wrong." He added that the previous theory was not "wrong" but just "incomplete." He clearly expressed the significance of the accumulation of scientific knowledge and the way it should be developed.

Science Council of Japan (SCJ) has been discussing the nature of "science for society" since the beginning of this century. Based on these discussions, in September 2020, SCJ issued a proposal that "knowledge integration" and "facilitators" to bridge science and society are important to reduce disaster risks and promote sustainable development under climate change. At the same time, the Council for Infrastructure of Japan issued a report on the policy of "River Basin Disaster Resilience and Sustainability by All" with the aim of building a sustainable and resilient society in the face of severe flood disasters, which are becoming more frequent in the era of climate change. As a person who has been involved in both policymaking processes, it was a great pleasure for me to have the opportunity to introduce the background and content of these policies and share them with the international community in Plenary Session 2.

In Japanese vocabulary, there are two words equivalent to the English word trust: "信用 (shinyo)" and "信頼 (shinrai)." 信用 (shinyo) refers to believing and using, while 信頼 (shinrai) refers to believing and relying on. This event provided an opportunity to reflect on how science should be believed, used, and relied upon by society to mitigate risks and achieve sustainable development under climate change.

January 31, 2025
KOIKE Toshio
Executive Director of ICHARM

信用・信頼とリスク

2024年11月下旬、ハンガリーの首都ブダペストにて世界科学フォーラムが開催されました。[\(https://worldscienceforum.org/\)](https://worldscienceforum.org/) その総会セッション1では、「科学への信頼の概念化」をテーマとして、一般市民の理解や説明責任、政策決定の文脈の中で、科学への信頼をどのように位置づけるかが議論されました。総会セッション2のテーマは「政策決定におけるリスクの重みづけ」で、科学的証拠は政策決定の一つの要素に過ぎないという認識の下、とりわけ複合的リスクの場合への対応方法が焦点となりました。この両セッションは、持続可能な開発、災害リスクの軽減、気候変動などの地球規模課題の解決に貢献する科学の在り方、役割を考える上で、貴重な機会となりました。

総会セッション1のパネリストとして登壇されたノーベル物理学賞受賞者の梶田隆章教授は、2001年のスーパーカミオカンデの光電子増倍管の連鎖破壊事故に触られました。科学への信頼を失いかねないというこの危機にあって、「何が分かり、何が分からないかを正直に説明した」と述べられ、「正直」であることの意義を強調されました。また、新発見をすると、あたかもその前の理論が「間違っていた」かのように論じられがちです。そうではなく「不完全であった」のだと付け加えられました。科学知の集積の意義と、発展の在り方を明確に表されました。

日本学術会議では、今世紀初めから「社会のための科学」の在り方が議論されてきました。これらを踏まえて、2020年9月には、気候変動下で災害リスクの軽減と持続可能な開発の推進には、「知の統合」と科学と社会の橋渡し役となる「ファシリテータ」が重要であるとの提言が発出されています。同時期に、気候変動下で頻発する激甚洪水災害に対して、持続可能でレジリエントな社会を構築することを目指して、「流域治水」の政策が社会資本整備審議会から答申されています。両者に関わらせて頂いた者として、総会セッション2にてこれらの経緯と内容を紹介し、国際社会と共有する機会を頂けたのは幸いです。

日本語では、trustには「信じて用いる（信用）」と「信じて頼りにする（信頼）」という2つの意味が含まれます。WSF2024は、気候変動下において、リスクを軽減し持続可能な開発を実現するために、信じて用いられ、頼りにされる科学のあるべき姿を考える機会となりました。

Information Networking

3. Field observations, collaborative research meetings, and participation in global conference in Panama
4. The 24th IAHR-APD Conference in Wuhan, China
5. Seminars on water-related disaster risk management in Malawi and Zambia / マラウイとザンビアにおける水災害リスク管理についてのセミナー
6. The 13th Annual Meeting of the Working Group on Hydrology of the Typhoon Committee / 台風委員会水文部会の第 13 回年次会合への参加
7. The 31st UNESCO-IHP Regional Steering Committee Meeting for Asia and the Pacific / 第 31 回ユネスコ IHP アジア太平洋地域運営委員会
8. Visit by water ministers from seven African countries / アフリカ 7 か国の水関係閣僚等ご訪問
9. ICHARM welcomed Deputy Director-General of Hydrology Department of Ministry of Water Resources, China / 中国水利部水文司副司长ご訪問
9. Urban Transitions 2024 (UT2024) in Spain / スペインで行われた Urban Transitions 2024 (UT2024) に参加
11. Participation in Sub-Regional Meeting on Safeguarding Intangible Cultural Heritage in East Asia / 東アジアにおける無形文化遺産の保全に関する地域会合への参加
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Senior Researcher MIYAMOTO Mamoru [Creation of flood risk information contributing to business continuity management (BCM)] / 宮本 守主任研究員「事業継続性マネジメント（BCM）に資する水害リスク情報の創出」
16. Starting a SATREPS project in the Republic of Ghana / ガーナ共和国における SATREPS プロジェクトの開始に向けて
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34. Local students visited ICHARM / 常総市の中学生が ICHARM を来訪
35. The 73rd ICHARM R&D Seminar / 第 73 回 ICHARM R&D セミナーを開催

Miscellaneous

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36. Visitors / 訪問者リスト
37. Publications / 対外発表リスト
37. Notice of IFI website URL change / IFI のホームページの URL 変更のお知らせ

Editor's Note / 編集後記

Information Networking

Field observations, collaborative research meetings, and participation in global conference in Panama

ICHARM is participating in a research project funded by the Japan Society for the Promotion of Science (JSPS), titled "Investigation of factors influencing the impact of inter-annual climate variability and extreme weather events on the hydrological cycle in the Panama Canal basin." This project recently sent a group of researchers to Panama from October 13 to 25, 2024, to conduct field observations and attend collaborative research meetings and an international conference focused on climate and water resources management. This 12-day mission was designed to advance critical research related to the Panama Canal Basin's water cycle and climate patterns. Senior Researcher USHIYAMA Tomoki and Research Specialist Ralph Acierto led the research team along with NAKAEGAWA Toshiyuki, the department head of Applied Meteorology Research at the Meteorological Research Institute.

During their stay, the research team carried out key observational tasks in collaboration with local institutions. On October 15 and 16, they installed advanced observation equipment, including a disdrometer and an all-sky camera, on the rooftop of the Water Resources and Hydrology Research Center (CIHH) at the Universidad Tecnológica de Panamá (UTP). The data from the observations are expected to enhance radar data calibration and support future climate research in the region.



All-sky Camera

Disdrometer

Data collection

The team also held significant meetings with Panama's leading research and government organizations. A memorandum of understanding (MOU) was signed between ICHARM and UTP to strengthen the partnership for future research efforts. The ceremony was attended by UTP Vice President Angela Laguna Caicedo, as President Omar O. Aizpurua P. was unable to attend due to illness.

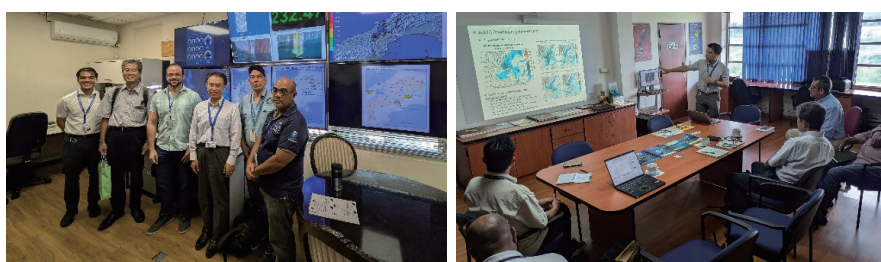


UTP and ICHARM MOU Signing Ceremony

In addition, the researchers visited the Panama Meteorological and Hydrological Institute (IMHPA) and the Panama Canal Authority (ACP) to discuss collaborative research and data sharing. These meetings resulted in the exchange of valuable radar data, which will be analyzed back in Japan to improve climate models.



Meeting at the Panama Meteorological and Hydrological Institute (IMHPA)



Meeting at ACP

Meeting at CATHALAC

The team's outreach extended beyond technical collaboration supported by the Japan International Cooperation Agency (JICA) Chair Program, aimed at fostering global collaboration in climate research. On October 21 and 22, each of the team members delivered lectures to UTP graduate students, sharing their insights on climate science and water management. The trip also included participation in the IESTEC Special Session on October 23 for international exchange, where they presented their research findings and gathered insights from global experts on climate issues related to the Panama Canal.



Lectures to UTP graduate students



Presentations at the IESTEC Special Session

Notably, the conference revealed crucial findings on the impact of the Panama Canal's expansion in 2016. While rainfall patterns in the region have remained relatively stable, lake inflow into the Panama Canal has decreased, necessitating measures to maintain water levels for canal operations. These insights are vital for understanding the long-term sustainability of the Panama Canal, a critical waterway for global shipping and trade. The trip also provided valuable information about the challenges Panama faces with climate change, including the impact of El Niño-driven droughts on water levels in the canal's lakes. Despite concerns about political instability in the region, the research team reported that Panama City felt secure and stable throughout their stay, with no major issues affecting the research or local operations.

As a key player in global water resources management research, ICHARM's mission to Panama highlights the importance of international collaboration in tackling pressing climate issues. The partnership between Japan and Panama continues to grow, ensuring that both countries can share knowledge and resources to address climate change's impact on water systems. The team returned to Japan on October 25, with plans to continue their analysis of the data collected during their fieldwork and further expand their research collaboration with UTP and other Panama-based institutions.

(Written by Ralph Allen Acierto)

The 24th IAHR-APD Conference in Wuhan, China

The 24th International Association for Hydro-Environment Engineering and Research Asia and Pacific Division Congress (the 24th IAHR-APD Congress) was held in Wuhan, China, from October 14 to 17, 2024. The theme of the congress was "Water for a Changing Future," focusing on discussing adaptation measures to rapid ongoing changes in the world. One of the conference sub-themes addressed critical topics regarding water-related hazards and risk reduction, which are also among the main research topics at ICHARM. Two research specialists, Menglu QIN and Kattia Rubi ARNEZ FERREL, joined the conference to present their investigations. Qin presented findings from her research, "Modeling of water-sediment inundation process incorporating with a rainfall-sediment runoff model," and Arnez delivered a presentation on her study, "Planform Evolution of a straight channel with non-uniform sediment." Arnez also served as moderator for one of the sessions about "Water-related hazard and risk reduction," where researchers from all over the world shared their investigations with various topics related to floods, their causes and impact on local populations.

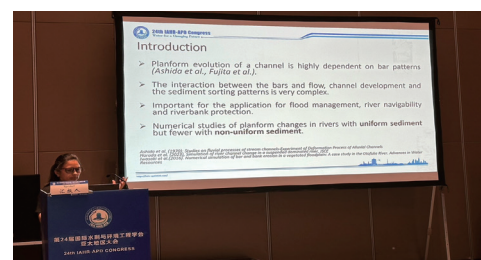


Figure 1. Research Specialist Arnez Ferrel presents her findings during the "Sediment Regulation and Management" session at the conference.

In addition, the participants visited the Changjiang River Scientific Research Institute (CRSRI) to view the Changjiang River Flood Protection Physical Model, the largest of its kind, designed to analyze changes in the river flow regime and erosion and deposition processes in the Changjiang River (formerly known as the Yangtze River) after the construction of the Three Gorges Dam.

The conference led to fruitful discussions with other researchers and left a positive impact on the participants, who exchanged technical knowledge based on their publications, and, overall strengthened ICHARM's international network. As a result, the research team of Prof. Junqiang XIA from Wuhan University will visit ICHARM to have a joint seminar on sediment transportation and associated issues this coming January, 2025.



Figure2. Technical visit to the Changjiang River Flood Protection Physical Model

(Written by Kattia Rubi ARNEZ FERREL)

Seminars on water-related disaster risk management in Malawi and Zambia マラウイとザンビアにおける水災害リスク管理についてのセミナー

The Embassies of Japan in Malawi and Zambia hosted seminars on water-related disaster risk management on October 21 and December 9, 2024, respectively. The seminars commemorated the 60th anniversary of establishing a diplomatic relationship between Japan and each country.

Executive Director KOIKE Toshio, ICHARM, was invited to each seminar to deliver an online lecture titled "Climate and water resilience and sustainability" to government officials, experts from international organizations, and university faculty and students. His presentation highlighted the mechanism of climate change and its impact on Africa, the Online Synthesis System for Sustainability and Resilience (OSS-SR), a flood early warning project in West Africa, and ICHARM's academic programs.

The seminar with Malawian participants was co-organized by the Department of Disaster Management Affairs (DoDMA) and the Malawi University of Science and Technology. The seminar with Zambian participants was co-organized by the Disaster Management and Mitigation Unit and the University of Zambia. Southern Africa suffers from historical droughts, which cause frequent blackouts due to the lack of hydropower and threaten food security. Several alumni of ICHARM's graduate programs participated in the Malawi seminar and offered insights into local disaster management practices.

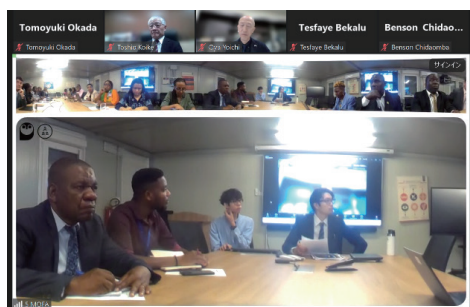
Through technical seminars, ICHARM contributes to building disaster-resilient societies in Africa by sharing Japan's expertise and experience in risk management.

2024年10月21日と12月9日に、在マラウイ日本大使館と在ザンビア日本大使館が、水災害リスク管理についてのセミナーを開催しました。これは日本と両国との国交樹立60周年を記念するものです。

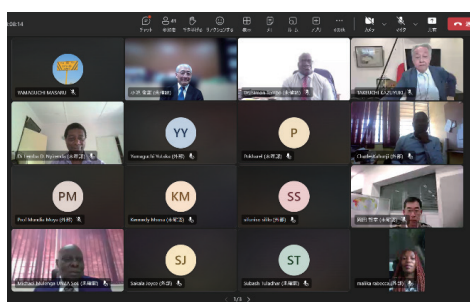
セミナーには ICHARM の小池俊雄センター長がオンラインで招かれ、政府職員、国際機関の専門家、大学教員や学生を対象に、「気候と水のレジリエンスと持続可能性」と題する講義を行いました。小池センター長は、気候変動の仕組みとアフリカへの影響、持続性と強靱性を実現する知の統合オンライン・システム、西アフリカの洪水予警報プロジェクト、ICHARM の学位プログラムを紹介しました。

マラウイのセミナーは、政府災害管理局とマラウイ科学技術大学、ザンビアは政府災害管理軽減局とザンビア大学が共催しました。アフリカ南部は歴史的な干ばつに見舞われ、水力発電が不足して停電が頻繁に発生し、食糧安全保障が脅かされています。現地では ICHARM の卒業生も数名参加し、災害管理の実践に関し意見を述べました。

ICHARM は、技術セミナーを通じて、日本のリスク管理の知見や経験をアフリカへ提供し、災害に対して強靱な社会の実現に貢献しています。



Participants in Malawi's seminar room
マラウイ・セミナー会場の参加者



Online participants in the Zambia seminar
ザンビア・セミナーのオンライン参加者

(Written by OKADA Tomoyuki)

The 13th Annual Meeting of the Working Group on Hydrology of the Typhoon Committee 台風委員会水文部会の第13回年次会合への参加

2024年10月22日から24日にかけて、中国 南京水利科学研究院 (NHRI) の主催により台風委員会 (TC) 水文部会 (WGH) の第13回年次会合が中国南京で開催されました。

会議には9カ国 (中国、日本、ラオス、マレーシア、フィリピン、韓国、シンガポール、タイ、アメリカ) と台風委員会事務局から約70人の参加者が集まりました。日本からは国土交通省、国際建設技術協会、また ICHARM から水文部会議長の宮本主任研究員と武川晋也研究員の2名が参加しました。

会合ではメンバー国から今年の台風による被害状況について報告されるとともに、本年のテーマである「Strengthen Standardization for Better National Hydrological Services」に係る取り組みが紹介されました。また、計9つの年次運用計画 (AOP: Annual Operation Plan) について、進捗と今後の計画が議論されました。これらの報告と活発な議論を通して、台風委員会を地域の重要枠組みとする各国の連携の重要性が参加者によって再認識されました。ICHARM からは宮本主任研究員が、AOP7「水強靱性と災害に関するプラットフォームを通じた洪水強靱性の強化」に関する発表を行い、中国や韓国から成果の公表や人材育成等に関する質問が寄せられ、国際共同プロジェクトの進展に向けて前向きな議論ができました。その他、水文部会の今後の運用体制についても議論が交わされ、日本が引き続き議長国を務めること、宮本主任研究員を含む現行の水文部会議長および副議長の体制が次期2年間も継続されることが承認されました。

会議の後半では、NHRI と南京水利水文自動化研究所 (NIHWA) を視察しました。NHRI では水文気象観測フィールドやハイドロヒル実験流域について、NIHWA では洪水に関する観測機器やモニタリングについて、詳細な説明を受け、メンバー国の関心を集めました。

ICHARM では、台風委員会を水災害リスク軽減のための最も重要な国際的枠組みの一つと位置づけ、引き続き地域間協力の強化のために貢献していきます。

The 13th annual meeting of the Working Group on Hydrology (WGH) of the Typhoon Committee (TC) was held in Nanjing, China, from October 22 to 24, 2024, hosted by the Nanjing Hydraulic Research Institute (NHRI).

About 70 participants gathered from nine countries (China, Japan, Lao PDR, Malaysia, the Philippines, the Republic of Korea, Singapore, Thailand, and the United States) and the TC Secretariat. From Japan, in addition to officials from the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) and the Infrastructure Development Institute (IDI), two researchers also attended from ICHARM: Senior Researcher MIYAMOTO Mamoru, the current chair of WGH, and Researcher TAKEGAWA Shinya.

At the meeting, the member countries reported on this year's typhoon events and damage. They also presented their efforts related to this year's theme, "Strengthen Standardization for Better National Hydrological Services." Additionally, the meeting discussed the progress and plans regarding the nine Annual Operation Plans (AOPs). Miyamoto made a presentation on AOP7 "Flood Resilience Enhancement through the Platform on Water Resilience and Disasters." Overall, positive discussions took place to accelerate the progress of international joint projects, including questions from China and Korea regarding the publication of the meeting results and human resource development. The meeting also talked about the future operation structure of WGH and approved that Japan would continue to serve as the chair country and that the current chair and vice chair of WGH, including Miyamoto, would continue to lead the group during the next term of two years.

In the latter half of the meeting, the participants took a tour of NHRI and the Nanjing Research Institute of Hydrology and Water Conservation Automation (NIHWA). While receiving detailed explanations, they particularly showed strong interest in the hydrometeorological observation field and the hydrohill experimental catchment at NHRI, as well as the instruments and monitoring related to flooding at NIHWA.

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



Participants in the WGH meeting
水文部会全体写真



Senior Researcher Miyamoto speaking
during the WGH meeting
水文部会で発表する宮本主任研究員



Participants receiving an explanation at the Nanjing
Hydraulic Research Institute
南京水利科学研究院にて説明を受ける様子

(Written by TAKEGAWA Shinya)

The 31st UNESCO-IHP Regional Steering Committee Meeting for Asia and the Pacific 第31回ユネスコ IHP アジア太平洋地域運営委員会

The UNESCO Intergovernmental Hydrological Programme Regional Steering Committee for Asia and the Pacific (IHP RSC-AP) was established in 1993 to shape UNESCO's water programmes to address water issues, such as water scarcity, water-related disasters, and water education at a regional level.

The 31st IHP RSC-AP meeting was held in Seoul, the Republic of Korea, from October 29 to 31. The meeting was hosted by the Water Resources Policy Bureau of the Ministry of Environment of Korea and the UNESCO IHP National Committee of Korea, facilitated by the IHP RSC-AP Secretariat at the UNESCO Jakarta Office, and supported by the Japan Funds-in-Trust (JFIT).

On the first day, five groups joined roundtable discussions to enhance experiences and efforts in tackling water-related disasters in alignment with the 9th Phase of the IHP Strategic Plan (IHP-IX). The results of the roundtable were presented on the next day as "Call to Action: Water-resilient Asia and the Pacific," which aims at climate-resilient and water-secure Asia-Pacific and contributes to the IHP's 50th Anniversary in 2025.

Furthermore, six speakers, including one from the Ministry of Land, Infrastructure, Transport and Tourism of Japan, made presentations at the workshop on the 7th Catalogue of Hydrologic Analysis (CHA), a regional IHP report with the theme of "Water Shortage and Drought" to be published in 2026.

During the IHP RSC session on the second day, the IHP member countries and the UNESCO Water Family, such as Category 2 Centres, Chairs, and Networks, shared updates on their activities. Professor SAYAMA Takahiro, Kyoto University, represented Japan and reported on cascading disasters of earthquakes and floods that occurred on the Noto Peninsula of Ishikawa Prefecture, Japan, the SENTAN program, and the SATREPS project. Chief Researcher OKADA Tomoyuki, ICHARM, introduced applications of the WEB-RRI model, master's and doctoral courses, optimized dam operations, and International Flood Initiative (IFI) platforms.

On the 3rd day, participants visited the Han River Flood Control Office under the Ministry of Environment and learned about the flood warning bulletins and the development of artificial intelligence technology to better forecast floods. Then, the party moved to the Sinwol-dong Rainwater Tunnel, which measures 4.7 kilometers in length and 10 meters in diameter. This is the only operational underground floodwater storage tunnel in Korea. The tunnel was constructed by Seoul City

ユネスコ政府間水文学計画 (UNESCO-IHP) アジア太平洋地域運営委員会 (RSC-AP) は、1993年に設立され、ユネスコ水プログラムを通じて、水不足、水災害、水教育といった水問題を地域レベルで議論しています。

10月29日～31日に、韓国ソウルで、第31回地域運営委員会が開催されました。会議は韓国環境省水資源政策局と韓国 IHP 国内委員会が主催し、ユネスコ・ジャカルタ事務所が事務局を務め、日本信託基金が開催を支援しました。

初日は、第9次 IHP 戦略計画 (IHP-IX) に沿って、5つのグループによる水害対策の強化に関する円卓討議が行われました。その結果は、「行動提言：水に関して強靱なアジア太平洋地域」としてまとめられ、翌日の運営委員会で報告されています。この提言は、気候事象に対して強靱で、水の安全が確保されたアジア太平洋地域の実現と、2025年の IHP 50周年記念への貢献を目的としたものです。

また、国土交通省の代表を含む6名が、「水文分析カタログ」第7版を策定するワークショップにおいて、活動事例を発表しました。今回の IHP 地域報告書は、「水不足と渇水」をテーマとして、2026年に出版される予定です。

2日目は、IHP 加盟国とユネスコ水ファミリー（カテゴリ2センター、チェア、ネットワークを含む）が、最近の活動内容を報告しました。日本からは、京都大学の佐山敬洋教授が、石川県能登半島で発生した地震と洪水の複合災害、気候変動予測先端研究プログラム (SENTAN)、地球規模課題対応国際科学技術協力プログラム (SATREPS) について報告しました。ICARM からは、岡田智幸上席研究員が WEB-RRI モデルの応用事例、修士・博士コース、ダム運用の最適化、及び国際洪水イニシアティブ (IFI) プラットフォームを紹介しました。

3日目は環境省漢江治水事務所を訪れ、洪水予警報発令システムや、人工知能による洪水予測の改良手法について説明を受けました。続いてシノルドン雨水トンネル（長さ4.7キロメートル、直径10メートル）を視察しました。これは現在韓国で運用されている唯一の洪水貯留地下トンネルです。2010年9月に6千軒の被害をもたらした大洪水を契機に、ソウル市が2013年から2020年にかけて建設しました。2022年8月の豪雨では、その治水効果が発揮されています。トンネルの排水ポンプ場近くでは、ソウル市がモクトン災害体験館を運営しています。ここでは、仮想現実体験ゲームや学習教材を使って、子供たちが災害対応や防災について学ぶことができます。



Presentation on ICHARM's achievements
ICARM 活動成果の報告



Sinwol-dong Rainwater Tunnel 40 meters underground
地下40メートルのシノルドン雨水トンネル



Floodwater storage facility connected to the outlet
排水施設に繋がる洪水貯留槽



Mok-dong Disaster Experience Center
モクトン災害体験館

IHP アジア太平洋地域運営委員会は、関係機関が互いに経験を学び、協力して第9次 IHP 戦略計画を実現するために開催している重要な年次ネットワーク会合です。次回は、2025 年にベトナムで開催が予定されています。

between 2013 and 2020 after the severe flood disaster in September 2010, which caused damage to 6,000 houses. The tunnel proved its effectiveness at a heavy rainfall event in August 2022. Near the tunnel pump station, Seoul City operates the Mok-dong Disaster Experience Center, which offers children lessons on disaster response and preparedness through virtual reality simulation games and other learning materials.

The IHP RSC-AP is a valuable annual networking event to help IHP organizations learn from each other and develop collective actions to implement IHP-IX. The next IHP RSC-AP meeting is scheduled in Vietnam in 2025.

(Written by OKADA Tomoyuki)

Visit by water ministers from seven African countries アフリカ 7 か国の水関係閣僚等ご訪問

アフリカ開発銀行 (AfDB) の支援によりアフリカ 7 ヶ国 (ケニア、カメルーン、モーリタニア、モザンビーク、ブルキナファソ、セネガル、ベナン) の水関係閣僚等及び AfDB 職員計 18 名が 10 月 30 日に土木研究所を訪問し、ICHARM 職員から講義を受け、施設見学を行いました。今回のアフリカ水関係閣僚等の訪日は、2024 年 6 月に開催した国交省と AfDB との技術会合等をきっかけに、アフリカにおける日本の具体的な協力方策を検討するために実現したものです。

講義では、小池俊雄センター長が「Climate and Water Resilience and Sustainability in Africa」と題し、西アフリカ諸国を対象とした洪水被害の回避・軽減のためのプロジェクトやファシリテーター育成を目的とした知の統合オンラインシステム (OSS-SR) 等の ICHARM の取組を紹介しました。続いて、Hote Hassan Haren 博士課程研修生がパキスタンにおける水関連災害リスクに対するガバナンスと政策における学際的アプローチを紹介しました。行程の都合もあって質疑の時間はほとんど取れなかったものの、参加者の講義中の真剣な眼差しや講義後に個別で小池センター長に熱心に質問する姿が印象的でした。

施設見学では水理実験施設を訪れ、施設概要、ダム模型実験、橋脚洗掘実験について板垣河道保全研究グループ長から説明を受けました。

本イベントはアフリカの水関係閣僚等に ICHARM や土木研究所の技術を知ってもらい、連携を深める良い機会となりました。今後もこのような取り組みを通じて、ICHARM の活動や成果を世界に発信していく予定です。

On October 30, 2024, fourteen ministers from seven African countries (Kenya, Cameroon, Mauritania, Mozambique, Burkina Faso, Senegal, and Benin) visited the Public Works Research Institute (PWRI), accompanied by African Development Bank (AfDB) officials, to discuss possible cooperation measures between Japan and African countries. The visit was planned with support from AfDB following the technical meeting in June 2024 between AfDB and Japan's Ministry of Land, Infrastructure, Transport and Tourism. At PWRI, the ministers attended lectures presented by ICHARM staff and participated in a facility tour.

Executive Director KOIKE Toshio delivered a lecture entitled "Climate and Water Resilience and Sustainability in Africa." In his presentation, he explained ICHARM's initiatives, such as a project to prevent and mitigate flood damage in West African countries and the Online Synthesis System for Sustainability and Resilience (OSS-SR) to train facilitators. Hote Hassan Haren, currently enrolled in the doctoral program at ICHARM, introduced a transdisciplinary approach to governance and policy for water-related disaster risk reduction in Pakistan. The participants were intensely engaged during the presentations and, despite the tight schedule, continued to ask the executive director many questions even after the session, highlighting their enthusiasm to solve water issues in their countries.

After that, the participants toured the hydraulic experiment facility, where ITAGAKI Osamu, the deputy director of PWRI's Hydraulic Engineering Research Group, provided an explanation of the facility, including a dam model experiment and a bridge pier scouring experiment.

This event provided a good opportunity for African ministers and others involved in water-related issues to learn about ICHARM and PWRI's technologies and deepen cooperation with ICHARM. We will continue to promote ICHARM's activities and achievements to the world through these efforts.



The participants and ICHARM staff gathering for photos
参加者の集合写真



Executive Director Koike delivering a lecture
講義の風景



The participants touring an experimental facility
実験施設見学風景

(Written by TAKEGAWA Shinya)

ICHARM welcomed Deputy Director-General of Hydrology Department of Ministry of Water Resources, China 中国水利部水文司副司長ご訪問

A six-member Chinese delegation led by Zhiyu Liu the deputy director-general of the Hydrology Department of the Ministry of Water Resources, visited the Public Works Research Institute (PWRI) on October 31, 2024. Their visit was part of their tour to Japan to promote technical exchange between China and Japan. PWRI and ICHARM welcomed them by providing lectures with Q&A sessions.

Two researchers delivered lectures. Senior Researcher Mohamed RASMY gave an overview of ICHARM and research on the RRI hydrological modeling, and YOROZUYA Atsuhiko, a senior researcher of PWRI's Hydraulic Engineering Research Group, presented research on flow velocity measurement. Showing keen interest in the presentations, the visitors asked many questions during the Q&A sessions regarding the future development of the RRI hydrological modeling and the accuracy of the flow velocity measurement equipment.

This event provided a good opportunity for the Chinese delegation to learn about the technologies of ICHARM and PWRI and deepen cooperation with the two institutes. We will continue to promote the dissemination of ICHARM's activities and achievements to the world through these occasions.



Lecture by Senior Researcher Mohamed Rasmy
ICHARM 研究者による講義



Chinese visitors with PWRI and ICHARM researchers
参加者の集合写真

(Written by TAKEGAWA Shinya)

Urban Transitions 2024 (UT2024) in Spain スペインで行われた Urban Transitions 2024 (UT2024) に参加

Senior Researcher DENDA Masatoshi participated in "Urban Transitions 2024 (UT2024)," an international conference held on November 5-7, 2024, in Sitges, Spain. UT2024 gathered researchers and administrators from around the world to discuss community development and transportation issues. He has been involved in one of ICHARM's research projects concerning community development and risk communication and found this conference an excellent opportunity to learn about the latest trends in relevant research fields.

Effective flood risk communication with residents, who have diverse values and usually pay little attention to flood risks in their daily lives, is crucial for promoting

中国水利部水文司副司長率いる代表団 6 名が 10 月 31 日に土木研究所を訪問し、職員から講義を受けて意見交換を行いました。今回の代表団の訪日は、日中間の技術交流を目的としたものです。

講義では、モハメッド・ラスミー主任研究員から ICHARM の概要及び RRI 水文モデルに関する研究を、河道保全研究グループの萬矢主任研究員から流速計測に関する研究を紹介しました。意見交換では、RRI 水文モデルの今後の発展や流速計測機器の精度に関する質問が多く出され、中国側の関心の高さを感じました。

本イベントは中国代表団に ICHARM や土木研究所の技術を知ってもらい、連携を深める良い機会となりました。今後もこのような取組を通じて、ICHARM の活動や成果を世界に発信していく予定です。

流域治水の取り組みを進めるには、日頃水災害の危険に関心が薄く、多様な価値観を持つ地域住民との水災害リスクコミュニケーションは重要です。そのコミュニケーションの手段として、「地域づくり」との連携は有効な方法と考えています。ICHARM は、約 2 年前から、茨城県つくば市が取り組む周辺市街地活性化*の地域づくりに参加し、地域づくりと連動した水災害リスクコミュ

ニケーションの有効性の検証を実施しています。この取り組みでは、筑波大学の研究者と連携し、ロゲイニング（地図に指定されたポイントをまわり、地域の魅力に応じたポイントの得点取得を競うナビゲーションスポーツ）と仮想洪水体験システム（VR空間上で再現・予測した水災害を疑似体験できるシステム）を用いながら、地域の魅力と水災害に関する歴史、及び水災害時に適切な対応行動を伝達する取り組みを行い、その有効性を確認しつつあります。

この連携を通して、日本国内における地域づくりの研究・取り組みの動向は把握できていますが、国際的な地域づくりの研究・取り組みの調査は十分でない状況でした。そのため、スペインのシッチェスで開かれた国際会議「Urban and Transition2024（以下「UT2024」と記述）」に参加しました。UT2024は世界の地域づくりや交通問題に関する研究者・行政関係者が集う国際会議です。ICHARMが取り組む仮想洪水体験システムを用いたリスクコミュニケーションに関する研究にも親和性が高く、地域づくりの最新動向を把握するのに適した会議でした。

UT2024に参加した結果、①SDGsが良い地域づくりのための世界の共通認識になっていることの再確認、②学術的な解析をする際の都市空間を分割する空間境界の重要性、の2点が印象に残る成果でした。①に関しては、多くの研究発表は、SDGsのどのゴールに該当するかを、まず示し、その実現に向けた研究・取り組みを紹介していました。より良い地域づくりへの共通認識としてのSDGsと、SDGsの17のゴールのどの部分を行っているかを示すことの有効性を把握できました。

②に関しては、多様な価値観を持つ人が生活し、様々な歴史、情報・地物を対象とする地域づくりの研究を行う際には、地域をどのように分割し分析するかが重要な検討事項です。発表された多くの研究では、市町村などの行政区画の境界等を用いて、地域を分割し、様々なデータを属性値とし、統計的な分析を行っていました。

筆者らは、国のオープンデータである農林業センサスで提供される農業集落界を、地域を分割する境界として採用し、その境界に農林業センサス情報を関連づけ、ロゲイニングで高く評価される地域の特徴の関係を分析しました。その結果、ロゲイニングで高く評価される地域の特徴、特に農業に関する特徴は、農地の面積、農業従事者と活動の活性度との関連が高いことが把握しました。印象に残る成果②「学術的な解析をする際の都市空間を分割する空間境界の重要性」の把握によって、本研究の方向性が、妥当であることを確認できたことは、大きな自信となりました。また、日本政府が提供する農林業センサスを代表するオープンデータは、他の国にも誇れる優良かつ詳細なオープンデータでもある点を確認できた点も大きな成果と

basin-wide flood management. One effective way to address this challenge is through collaboration with community development projects. Tsukuba City, Ibaraki Prefecture, Japan, is carrying out such a project aiming at revitalizing its suburban areas*, and ICHARM has been part of this initiative for about two years while exploring effective flood risk communication approaches. More specifically, ICHARM has teamed up with the researchers from Tsukuba University and has been testing a novel approach that combines “rogaining” and the Virtual Flood Experience System (VFES). “Rogaining” is an outdoor sport similar to orienteering, in which participants compete for higher scores by gaining points given to each designated location based on their attractiveness. VFES, developed by ICHARM, provides simulations of past or potential flood situations for users to experience virtually. The project team designed disaster education events where participants can learn how to communicate appropriate behaviors during a flood event while also learning about the community's appealing points and history of water-related disasters. Through a series of experimental events, the research team has received positive responses, proving the effectiveness of their proposed approach using VFES.

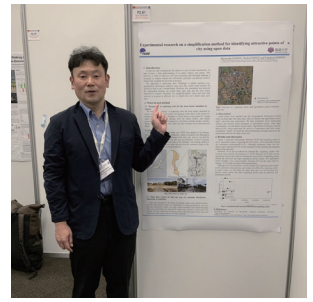
Through this research project, Denda and other project members have updated themselves with community development research and initiatives across Japan. However, this is not necessarily the case with those overseas. For this reason, he attended UT2024 since the conference was intended to discuss issues related to their research on risk communication using VFES, which often requires considering community factors.

Denda brought back two important takeaways from UT2024. The first is the significance of SDGs as a globally shared framework in community development. He noticed that many presentations first identify which of the seventeen SDGs their research or initiatives addressed, and then proceeded to describe their work toward achieving those goals. These presentations highlighted the role of the SDGs as a common framework for better community development and the importance of specifying the relevant SDG targets to enhance research validity.

The second takeaway was the importance of defining spatial boundaries for academic analysis of urban environments. In community development research, which often considers diverse values and lifestyles, historical context, geographical features, and other data, how to divide the study area is a key consideration. Many studies presented at UT2024 segmented study areas using administrative divisions, such as city boundaries, and then used various data as attributes for statistical analysis.

In the research project led by Denda, the team divided the study area using agricultural settlement boundaries available in the Agricultural Census, a national open-access database. By linking Agricultural Census data to these boundaries, they analyzed the relationships among the area's characteristics that are highly rated in rogaining, an orienteering-like sport. The results revealed a strong correlation between these highly rated characteristics. For example, among those related to agriculture, the size of farmland, the number of agricultural workers, and the activity level of the community exhibit a high correlation. Since the validity of the team's area segmentation approach has been supported by the second takeaway from UT2024, they are more confident about their research procedures and outcomes so far. The team has also confirmed that open data provided by the Japanese government, such as the Agricultural Census, maintain a very high level of quality and detail, compared to data from other countries.

ICHARM will continue this research and further promote collaboration between community development and water-related disaster risk communication. Attending UT2024 provided valuable insights and highlighted the need to disseminate research findings widely through academic publications and other accessible formats.



Senior Researcher Denda
at UT2024
UT2024 会場の傳田主任研究員

* Tsukuba City Regional Development Homepage

<https://www.city.tsukuba.lg.jp/syuhenshigaichi/index.html>

* つくば市周辺市街地のまちづくりホームページ

<https://www.city.tsukuba.lg.jp/syuhenshigaichi/index.html>

(Written by DENDA Masatoshi)

なりました。

今後は、これらの取り組みを継続し、地域づくりと水災害リスクコミュニケーションの連携の取り組みを進めるとともに、論文として多くの人が見やすい形で研究成果を発信する必要性を再認識できた有意義な国際会議出席でした。

Participation in Sub-Regional Meeting on Safeguarding Intangible Cultural Heritage in East Asia 東アジアにおける無形文化遺産の保全に関する地域会合への参加

On November 5 and 6, 2024, the Sub-Regional Meeting on Safeguarding Intangible Cultural Heritage in East Asia was held in Ulaanbaatar, Mongolia, hosted by the UNESCO Regional Office for East Asia and the International Information and Networking Centre for Intangible Cultural Heritage in the Asia-Pacific Region under the auspices of UNESCO (ICHCAP). Senior Researcher MIYAMOTO Mamoru participated in the meeting. Under the theme "The Role and Risks of Intangible Cultural Heritage in the Face of Climate Change," the event brought together experts, researchers, and policymakers from the fields of culture, climate change, and disaster prevention to discuss strategies for strengthening the safeguarding of intangible cultural heritage against the escalating climate change in East Asia.

On the first day, experts on climate change and intangible cultural heritage presented their significant initiatives, deepening the participants' understanding of both the importance and seriousness of the issues in their fields. Miyamoto introduced interdisciplinary efforts underway in the Philippines and Thailand to address the impacts of climate change and enhance water-related disaster management, capturing the interest of the participants. Given that floods occurred in Ulaanbaatar in 2023, discussions also took place regarding the potential to initiate efforts to strengthen water disaster resilience in Mongolia.

On the second day, a workshop-style meeting was held, focusing on the impacts of climate change and the preservation of intangible cultural heritage. Group discussions were conducted from five perspectives: 1) Awareness rising, 2) Partnership building, 3) Collaborative research, 4) Policy and advocacy, and 5) Communication, education, training, and exchange. The participants agreed to develop a concrete international action plan for future policy integration based on the discussions on these focused issues.

This meeting did not only discuss the items listed on UNESCO's intangible cultural heritage list but also addressed a wide range of themes, including indigenous lifestyles and local agricultural practices, in conjunction with the impacts of climate change. This diverse coverage of discussion topics made the forum a valuable opportunity for participants, especially those who typically discuss climate change focusing on severe rainfall and disasters, to open their eyes to new research directions and values.



A scene of the Sub-Regional Meeting on Safeguarding Intangible Cultural Heritage in East Asia

東アジアにおける無形文化遺産の保護に関する地域会合の様子

(Written by MIYAMOTO Mamoru)

2024年11月5、6日にモンゴルのウランバートルにおいて、ユネスコ東アジア地域事務所とアジア太平洋無形文化遺産国際情報ネットワークセンター主催の東アジアにおける無形文化遺産の保護に関する地域会合が開催され ICHARM から宮本守主任研究員が参加しました。「気候変動に直面した無形文化遺産の役割とリスク」をテーマとした本会合には、文化、気候変動、防災分野の専門家、研究者、政策立案者が集まり、東アジアの気候変動下における無形文化遺産保護を強化するための戦略について議論しました。

1日目(11月5日)の会議では、気候変動の専門家と無形文化遺産の専門家がそれぞれ顕著な取り組みを発表し、双方の重大さと深刻さについて理解を深めました。宮本主任研究員からは、フィリピンとタイにおける気候変動影響と水災害マネジメントに関する学際的な取り組みを紹介し、参加者の関心を集めることができました。ウランバートルにおいても2023年に洪水が発生したことため、モンゴルにおける水災害レジリエンスの強化のための取り組みを始動する可能性についても議論されました。

2日目(11月6日)に開催されたワークショップ形式の会議では、気候変動影響と無形文化遺産の保全について、①気候変動と無形文化遺産保全の意識の向上、②主要ステークホルダーとの連携・協力強化、③共同研究とケーススタディ開発の促進、④政策と提唱の共同デザインと実装、⑤コミュニケーションや教育、研修、意見交換を通じた能力強化、の5つの観点でグループディスカッションが行われました。これらの各焦点に基づいて今後の政策統合に向けた具体的な国際的な行動計画を策定することが予定されています。

本会議は UNESCO の無形文化遺産のリストに登録されている対象だけを議論するのではなく、先住民の生活様式や地域の農業形態など幅広いテーマと気候変動の影響を合わせて議論されたため、普段は降雨や災害の激甚化に焦点を当てて気候変動影響を議論とする者にとって新たな研究の方向性や価値観が得られる貴重な機会となりました。

The 19th Integrated Workshop of the Typhoon Committee 第19回台風委員会統合部会への参加

2024年11月19日から22日にかけて、台風委員会（TC）の第19回統合部会（IWS）が、中国・上海のLin-gang Centerで開催されました。台風委員会の中には気象部会（WGM）、水文部会（WGH）、防災部会（WGDRR）、トレーニング・研究連絡部会（TRCG）の4つの作業部会がありますが、今回はそのうち3つの部会（気象、水文、防災）が一室に会し、各部会の年間実行計画（AOP）の進捗や来年度の計画などについて報告がなされ、台風委員会全体で議論されました。

会議には14のメンバー国・地域のうち11か国（中国、香港、マカオ、日本、ラオス、マレーシア、フィリピン、韓国、タイ、ベトナム、アメリカ）と世界気象機関（WMO）、国連アジア太平洋経済社会委員会（ESCAP）、台風委員会事務局（TCS）から総勢約160人が参加しました。日本からは、国土交通省水管理・国土保全局、気象庁、国際建設技術協会、東北大学の小野裕一教授、京都大学の伊藤耕介准教授およびICHARMから水文部会議長を務める宮本守主任研究員と武川晋也研究員の2名が参加しました。

会議初日には、台風委員会事務局長等の開会挨拶の後、アジア太平洋台風共同研究センター（AP-TCRC）Forumが開催され、日本からは3名が基調講演を行いました。ICHARMからは宮本主任研究員が「An Operational Flood Forecasting System with Improved Accuracy using Data Assimilation」と題する発表を行い、解析結果の信頼性評価に関する質問が寄せられるなど、注目を集めました。

会議2日目には、「Strengthening the Value Chain within the UN EW4All Framework for the Typhoon Committee Region.」のテーマに沿って、技術発表が行われました。日本からは国土交通省水管理・国土保全局の丸山和基国際河川技術調整官の発表を含む2件のプレゼンテーションが行われ、いずれも参加者から高い関心が寄せられました。

会議3日目には、気象、水文、防災の各部会の会議が開かれました。水文部会では、10月の南京での会議を欠席した香港とベトナムから、2024年の台風による被害状況や対応策についての報告がありました。また、日本とアメリカの共催で、2025年にグアムにて開催される第14回水文部会に関する議論、第3期標準作業手順の共同策定事業（SSOP）の進捗報告等が行われるとともに、9つの年間実行計画の今年度の実績報告や来年度の計画が議論されました。最終日には、各部会の会議と全体会議が実施され、宮本主任研究員が水文部会の取組を総括し、全体セッションで報告しました。

会議全体を通して、ICHARM、土木研究所そして国交省の国際的なプ

The 19th Integrated Workshop (IWS) of the Typhoon Committee (TC) was held at Lin-gang Center in Shanghai, China, from November 19 to 22, 2024. There are four working groups within TC: the Working Group on Meteorology (WGM), the Working Group on Hydrology (WGH), the Working Group on Disaster Risk Reduction (WGDRR), and the Training and Research Coordination Group (TRCG). In the 19th conference, the first three working groups met together to report on the progress of each group's Annual Operation Plan (AOP) and plans for 2025, which were also discussed by all participants at the plenary session.

The meeting was attended by approximately 160 participants from 11 of the 14 member countries and regions (China, Hong Kong, Macao, Japan, Lao PDR, Malaysia, the Philippines, Korea, Thailand, Vietnam, and the United States), the World Meteorological Organization (WMO), the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), and the Typhoon Committee Secretariat (TCS). Japan's delegation included representatives from the Water and Disaster Management Bureau of the Ministry of Land, Infrastructure, Transport and Tourism (MLIT), the Japan Meteorological Agency (JMA), and the Infrastructure Development Institute (IDI), as well as Professor ONO Yuichi from Tohoku University, Associate Professor ITO Kosuke from Kyoto University, and two members from ICHARM, Senior Researcher MIYAMOTO Mamoru, the current chair of WGH, and Researcher TAKEGAWA Shinya.

On the first day, after opening remarks by TC's secretary general and others, the Asia-Pacific Typhoon Collaborative Research Center (AP-TCRC) Forum was held, where three keynote speakers from Japan gave presentations. Miyamoto was among them, delivering a presentation titled "An Operational Flood Forecasting System with Improved Accuracy using Data Assimilation" and answering questions regarding the reliability evaluation of the analysis results. His presentation was well-received by the participants.

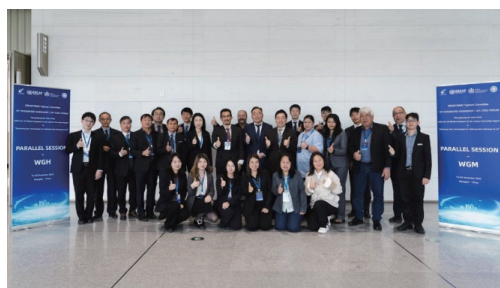
On the second day, technical presentations were made under the theme of "Strengthening the Value Chain within the UN EW4All Framework for the Typhoon Committee Region." Among the two Japanese speakers was MARUYAMA Kazuki, the director for International Coordination of River Engineering of the Water and Disaster Management Bureau, MLIT, whose presentation was attracted a great deal of interest from the participants.



Participants in the IWS meeting
統合部会全体写真



Senior Researcher Miyamoto speaking
during the APTC-RC Forum
APTC-RC の会議で発表する宮本主任研究員



Participants in the WGH meeting
水文部会全体写真



The IWS meeting
統合部会全体会議の風景

On the third day, each working group had a meeting separately. At the WGH meeting, Hong Kong and Vietnam, which did not participate in the October meeting in Nanjing, reported on the damage situation and response measures regarding the 2024 typhoons. They also discussed the 14th WGH, which is scheduled to be held in Guam in 2025 under the joint sponsorship of Japan and the United States. The meeting also included progress reports on the third phase of the project on the Synergized Standard Operating Procedures (SSOP) and reports on the nine annual operation plans for 2024 and new plans for 2025. On the final day, a plenary session was held after another round of working group meetings, and Miyamoto presented a summary of the WGH activities.

ICHARM, PWRI, and MLIT successfully demonstrated their international presence throughout the conference, and Japan was able to take the lead in strengthening international collaboration and technical exchanges among the TC members, especially in the area of hydrology. ICHARM will continue to lead interregional cooperation for water-related disaster risk reduction and resilience enhancement through TC and other international frameworks.

(Written by TAKEGAWA Shinya)

Discussion on flood management with the State of Rio Grande do Sul, Brazil 治水対策について、ブラジル国リオ・グランデ・ド・スール州との意見交換

A delegation of 20 representatives from Rio Grande do Sul, the southernmost state of Brazil, led by Governor Eduardo Leite, visited ICHARM on November 20 to explore potential collaborations with Japanese and international institutions specializing in risk assessment and natural disaster management.

The discussion started with an introduction of ICHARM by Chief Researcher OKADA Tomoyuki, followed by a presentation by Governor Leite on the worst flood disaster in the state's history, which lasted from April to May 2024. This catastrophic event resulted in 210 casualties, affected 2.4 million people, and displaced 0.6 million individuals. In response to the disaster, the state developed the "Rio Grande Plan," a comprehensive strategy focused on preparation, reconstruction, adaptation, and climate resilience.

As part of the discussion, Senior Researcher Mohamed Rasmy, ICHARM, presented a case study on the river-lagoon-flood nexus under climate change in Sri Lanka's Batticaloa Lagoon. With future rainfall projections indicating a 20 to 30% increase, the study evaluated three policy options for flood management: (1) diverting floodwaters to neighboring river basins, (2) developing additional openings to discharge floodwaters from the lagoon to the sea, and (3) optimizing dam operations by incorporating new reservoirs and other means. The delegation expressed keen interest in topics such as data acquisition and its reliability in the case study, as well as the lagoon usage in fisheries and navigation.

The discussion concluded with ICHARM offering to provide support for the state's recovery efforts in any feasible capacity.



Participants in the meeting
会議参加者



The Governor's presentation on the 2024 Rio Grande do Sul floods
2024年リオ・グランデ・ド・スール州洪水に関する知事の発表

レゼンスを大いに示すとともに、台風委員会のメンバー間の国際的な連携や技術交流を強化し、特に水文に関して日本がリードすることが出来ました。ICHARMは、台風委員会などの国際的枠組みを通して、水災害リスク軽減やレジリエンス強化のための地域間協力を引き続き主導していく予定です。

11月20日、ブラジル最南部に位置するリオ・グランデ・ド・スール州のエドゥアルド・レイテ知事一行20名がICHARMを訪れました。訪問の目的は、リスク評価や自然災害対応に従事する日本の組織や国際機関との連携を探るものです。

当日は、岡田智幸上席研究員によるICHARMの紹介の後、レイテ知事が、2024年4月から5月にかけて発生し、同州で過去最悪となった洪水災害を紹介しました。この洪水は210名の死者・行方不明者をもたらし、240万人が影響を受け、60万人が避難しました。この災害を受けて州政府は、防災、復興、適応、気候への強靭性を高める包括的な施策からなる「リオ・グランデ計画」を策定しました。

続いてICHARMから、モハメッド・ラスミー主任研究員が、スリランカのバティカロア・ラグーンを事例として、気候変動下における河川・ラグーン・洪水の連関を紹介しました。このラグーンでは、将来雨量が20%から30%増加すると見込まれる中、1) 隣接する河川流域への洪水放流、2) 新たな開削路によるラグーンから海への洪水放流、3) 新規貯水池等を含むダム操作の最適化、という3つの洪水対策が検討されました。知事一行からは、スリランカのデータ入手方法や精度、ラグーンの利用形態（漁業、船舶航行）について高い関心が示されました。

意見交換は最後に、同州の災害復興に向けたできる限りの協力をICHARMから申し出て終了しました。

(Written by OKADA Tomoyuki)

The International Conference on Integrated Flood Management Strategy in Hong Kong 統合洪水管理戦略国際会議（香港）

香港特別行政区排水事業部と香港技術者協会土木部が、2024年12月3日に香港で統合洪水管理戦略国際会議を開催しました。「極端な気象による洪水から市民を守り、適応力のある強靱な都市を作る」をテーマとした本会議には、400名の参加がありました。ICHARMの岡田智幸上席研究員は、会議と共に、12月4日～6日にハイレベル参加者を対象として行われた、中国本土への技術視察に招待されました。

会議において、排水事業部は、過去35年間にわたる315億香港ドル（今の為替レートで約6,400億円）の投資により、香港の浸水危険箇所数が着実に減少したことを紹介しました。こうした努力にも関わらず、2023年9月に超大型台風サオラーが、香港で1884年以来最大となる時間雨量（158.1 mm/h）を記録し、深刻な高潮被害を引き起こしました。新たな気候問題に対応するため、排水事業部は「海面上昇と極端降雨に備えた洪水管理に関する戦略計画調査」を実施中です。

技術視察は、中国本土での治水事業を知る貴重な機会となりました。主な訪問先は、広州市の靈山島スーパーエコロジカル堤防、桂平市の大藤峡水利中枢プロジェクト、仏山市の珠江水利科学研究院です。特に、黔江に位置する大藤峡ダムは、15億立方メートルの治水容量をもち、珠江水系の洪水リスク低下に重要な役割を果たしています。

本国際会議と技術視察を通じて、中国や各国の治水対策の知見を共有し、気候変動の影響に備えた協力関係を築くことができました。

The Drainage Services Department (DSD) of the Government of the Hong Kong Special Administrative Region and the Civil Division of the Hong Kong Institution of Engineers co-hosted the International Conference on Integrated Flood Management Strategy on December 3, 2024, in Hong Kong, China. The event brought together four hundred participants under the theme “Building an Adaptive and Resilient City to Safeguard the Public Against Flooding under Extreme Weather.” OKADA Tomoyuki, ICHARM chief researcher, was invited to the conference, as well as a high-level technical tour to mainland China from December 4 to 6.

During the conference, the DSD highlighted its investments of HKD 31.5 billion (approximately JPY 640 billion at the current exchange rate) over the past 35 years, which have steadily reduced the number of inundation risk spots in Hong Kong. Despite these efforts, Super Typhoon Saola in September 2023 caused an unprecedented rainfall of 158.1 mm/hour – the highest record in the area since 1884 – leading to severe storm surge damage. In response to emerging climate challenges, the DSD is undertaking the “Strategic Planning Study on Flood Management against Sea Level Rise and Extreme Rainfall.”

The technical tour provided participants with valuable insights into flood management practices in mainland China. Key visits included the Lingshan Island Super Ecological Dike in Guangzhou, the Dateng Gorge Water Conservancy Project in Guiping, and the Pearl River Water Resources Research Institute in Foshan. Notably, the Dateng Gorge hydro dam on the Qianjiang River, with a flood control capacity of 1.5 billion cubic meters, plays a critical role in mitigating flood risks within the Pearl River system.

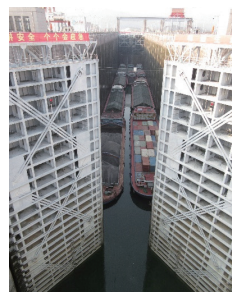
Both the conference and the technical tour facilitated the exchange of expertise on flood management between China and other countries, fostering collaborative ties to prepare for the growing impacts of climate change.



High-level speakers at the opening ceremony
開会式のハイレベル参加者



Lingshan Island Super Ecological Dike
靈山島スーパーエコロジカル堤防



Ship lock gates with a maximum 41-meter rise (view from downstream of the Dateng Gorge hydro dam)
最大水位差 41 メートルの閘門
(大藤峡ダム下流より望む)



Hydraulic model of the Pearl River Delta near Macau
珠江デルタの水理モデル（マカオ付近）

(Written by OKADA Tomoyuki)

● Research

Introduction of ICHARM research projects / 研究紹介

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

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

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

In this issue, Senior Researcher MIYAMOTO Mamoru reports on the creation of flood risk information contributing to business continuity management (BCM).

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、(2)に関する取組例として宮本 守主任研究員より「事業継続性マネジメント (BCM) に資する水害リスク情報の創出」を紹介いたします。



Creation of flood risk information contributing to business continuity management (BCM)

事業継続性マネジメント (BCM) に資する水害リスク情報の創出

MIYAMOTO Mamoru, Senior Researcher
宮本 守主任研究員

ICHARM participated in an international research project entitled "Regional Resilience Enhancement through Establishment of Area-BCM at Industry Complexes in Thailand (Principal investigator in Japan: WATANABE Kenji, professor at the Nagoya Institute of Technology)," which was conducted from 2018 to 2024. The project was part of the Science and Technology Research Partnership for Sustainable Development (SATREPS), a research program led by the government of Japan. ICHARM was involved in creating information that companies in industrial parks needed to assess flood risks and plan and implement business continuity management (BCM). BCM has been recognized as an important tool for reducing primary damage, such as loss of life and property, as well as for maintaining economic activities, including industrial productivity and supply chains.

In this project, we first developed a rainfall-runoff-inundation (RRI) model targeting the entire Chao Phraya River basin in Thailand, calibrating the model with the 2011 flood data and validating it with the 2008 flood data. We also developed a high-resolution inundation analysis model with a 40-meter grid for the Rojana Industrial Park in Ayutthaya Prefecture, which suffered significant damage during the 2011 flood. Then, the two models were connected using the results of the basin-scale model as boundary conditions. Figure 1 shows the inundation area and river discharge simulated by the basin-scale model. The reproducibility of the river flow shows high agreement; although slightly underestimating the inundation area, the simulated results were generally consistent with the range detected by satellites.

After experiencing the 2011 flood, flood walls were constructed around the Rojana Industrial Park to prevent floodwaters from entering the site. The industrial park scale model highlighted the effects of these flood walls, demonstrating that they can effectively protect the industrial park from floods similar to the 2011 flood.

ICHARMは2018年から2024年まで実施された地球規模課題対応国際科学技術協力プログラム (SATREPS) 「産業集積地における Area-BCM の構築を通じた地域レジリエンスの強化 (日本側代表: 渡辺研司名古屋工業大学教授)」を通して、工業団地における水害リスクの評価と工業団地に入居する企業の事業継続性マネジメント (BCM) に必要な情報の創出に取り組みました。BCMへの貢献は、生命や財産等の一次的被害の軽減に加え産業の生産性やサプライチェーンを含む経済活動の維持のために重要な課題です。

まずは、タイのチャオプラヤ川流域全体を対象とした降雨流出氾濫 (RRI) モデルを開発し2011年洪水でキャリブレーション、2008年洪水でバリデーションを行いました。さらに、2011年洪水で甚大な被害が発生したアユタヤ県に位置するロジャナ工業団地を対象に40mグリッドの高解像度氾濫解析モデルを開発し、流域スケールモデルの結果を境界条件として与えることで2つのモデルを接続しました。図-1は流域スケールモデルによる氾濫域と河川流量の計算結果です。河川流量の再現性は良く、氾濫域もやや過小評価ではあるものの概ね衛星から検知された範囲と整合する結果が得られました。

ロジャナ工業団地では 2011 年洪水を経験したことで、氾濫水の敷地内への侵入を防ぐための洪水防壁が建設されました。工業団地スケールモデルでは、この洪水防壁の効果をモデルに反映し、2011 年洪水と同程度の規模の洪水であれば洪水防壁により工業団地内部への氾濫水の侵入を防ぐことができることを示しました。ただし、より極端な洪水、例えば、あらゆるエリアで同時に既往最大規模降雨が発生したような場合には洪水防壁を越えるような浸水深となることも示されました(図-2)。このように、様々な降雨パターンを想定したシナリオ解析を実施し、洪水氾濫の開始タイミング、浸水範囲、浸水深、浸水期間、収束タイミング、洪水擁壁の治水効果と限界値等を分析することで企業用地や住宅地、通勤経路等の浸水リスクを明らかにしました。これらのリスク情報は工業団地に入居する企業のリスクコミュニケーションと 10 段階の事業継続性計画 (BCP) に活用され、操業停止判断のタイミングやリソースの確保、前倒し生産計画、他工場への移転等を通じたサプライチェーンの強靱化に繋がることが期待されます。

However, the simulation also revealed that in more extreme flood scenarios, such as when the maximum historical rainfall occurs simultaneously across all areas in the Chao Phraya River basin, the inundation depth could exceed the height of the flood walls (Figure 2). Like these simulations, we conducted multiple scenario analyses assuming various rainfall patterns, clarifying flood risks for industrial sites, residential areas, and commuting routes by examining the timing of flood onset and cessation, inundation extent, depth, and duration, and the flood control effects and limits of flood walls. The risk information created through this project is expected to be utilized for companies in industrial parks to improve risk communication and prepare a 10-step business continuity plan (BCP), thereby helping them ensure resilient supply chains through making informed decisions on operational suspension timing, resource allocation, advanced production planning, and relocation to other factories.

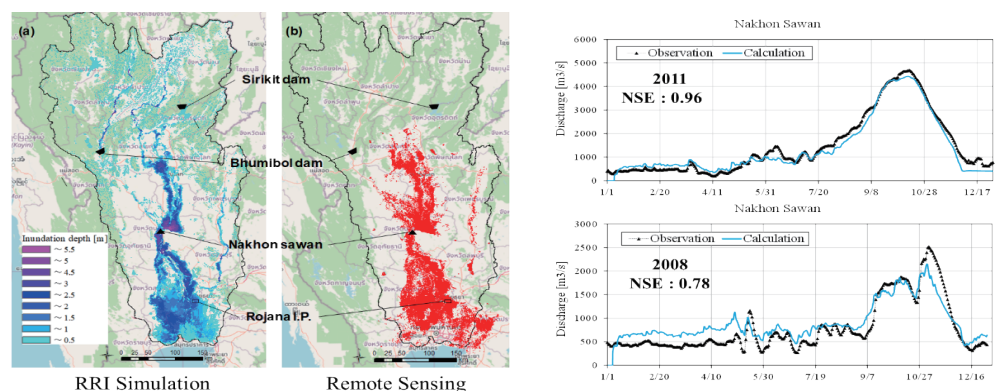


Figure 1 Results of simulations at the scale of the entire Chao Phraya River basin

図-1 チャオプラヤ川流域スケールモデルの解析結果

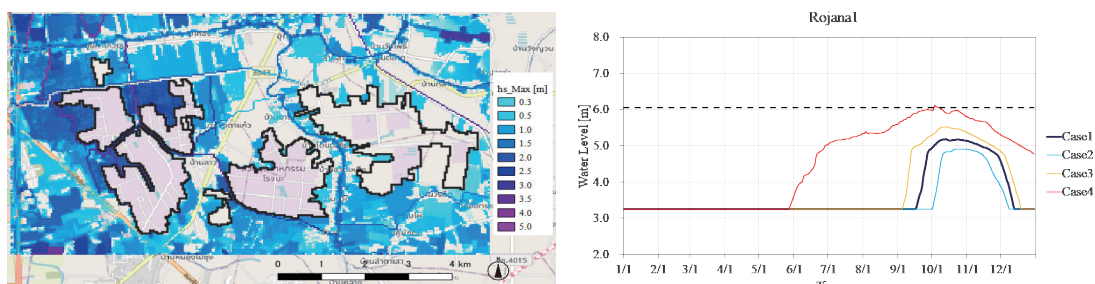


Figure 2 Estimated inundation depth in the Rojana Industrial Park

図-2 ロジャナ工業団地における浸水深の推定

Starting a SATREPS project in the Republic of Ghana ガーナ共和国における SATREPS プロジェクトの開始に向けて

ICHARM は、ガーナ共和国の海岸侵食問題を対象に、JICA と JST の国際共同研究プログラムである「地球規模課題対応国際科学技術協力プログラム (SATREPS)」に基づく研究課題「沿岸域の持続的な保全、防災、生活改善を実現する総合土砂および環境管理手法の構築」(研究代表者: 田島 芳満 東京大学大学院工学系研究科教授)に参加しています。

ICHARM is participating in the SATREPS research project titled "The Project for the Development of Integrated Sediment and Environmental Management Towards Sustainable Conservation, Disaster Risk Reduction, and Livelihood Improvements in Coastal Areas." Led by Professor TAJIMA Yoshimitsu of the University of Tokyo, the project aims to address coastal erosion challenges in the Republic of Ghana.

From September 28 to October 11, 2024, QIN Menglu, a research specialist at ICHARM, visited Ghana as a member of the Japanese research team to discuss and reach an agreement on the project implementation structure with the Ghanaian

counterpart, the Cape Coast University Center for Coastal Management (ACECoR: the Africa Centre of Excellence in Coastal Resilience, Centre for Coastal Management), and local partner organizations.

In addition to the meetings, the team, in collaboration with ACECoR, visited various study sites, including Volta River reaches downstream of Akosombo Dam and Densu River reaches downstream of Weija Dam, as well as coastal areas, for three days from October 3 to 5. During these site visits, the team assessed sediment erosion and deposition conditions in the riverbeds and coastal areas and examined the characteristics of flood hazards in those areas. They also selected observation sites to monitor the water level, flow velocity, and sediment transport rate.

On October 7, based on the findings from the field visits, a joint meeting was held to present the project's objectives and framework to the Ghanaian research partner organizations. Following this, the team visited each research partner organization to sign the Minutes of Meeting (M/M), discuss data sharing and monitoring collaboration with relevant agencies and university experts, and secure their approval.

Through these activities, the project's implementation structure, as well as detailed research plans and schedules for both Japan and Ghana, were finalized, ensuring a smooth initiation of the project.



Professor Tajima (second from left) at the M/M signing ceremony with local counterparts
現地代表者と議事録に署名する田島教授（左から2番目）



Site selection for water-level and flow-velocity monitoring
水位・流速観測地点選定のため現地確認



The trash breakwater built by residents to protect their land from coastal erosion in the Densu Delta region
デンス・デルタ地帯で進行する海岸侵食から土地を守るために住民が作ったゴミ防波堤



Visiting the lagoon area at the river mouth of the Volta River
ボルタ川河口部のラグーン地帯の視察



A case of severe coastal erosion (left: October 2022; right: October 2024):
A house was isolated from land in the last two years due to coastal erosion in the Volta River coastal area
ボルタ川河口周辺で進行する海岸侵食により、最近2年間で陸地から切り離された家屋
(左図：2022年10月、右図：2024年10月)

研究代表機関である東京大学からの依頼を受け、2024年9月28日から10月11日まで、ICHARMの秦夢露専門研究員が日本側の研究代表チームに参加し、ガーナ共和国に渡航しました。今回の渡航では、主にプロジェクトの実施体制について、ガーナ側の代表機関であるケープコースト大学沿岸域管理センター（ACECoR: Africa Centre of Excellence in Coastal Resilience, Centre for Coastal Management）および現地の協力機関と協議・合意を行いました。

また、ACECoRと協力して、10月3日から10月5日まで、研究対象地域であるボルタ川のAkosomboダム下流およびDensu川のWeijaダム下流の河川区間、ならびに海岸沿いを視察しました。視察では、河道や海岸部での土砂の侵食・堆積状況、下流部における水害の特徴を把握し、水文・水理・土砂の観測サイトを選定しました。さらに、現地視察の結果を踏まえ、ガーナ側の研究協力機関に本プロジェクトの内容と基本的な枠組みを説明するため、Joint Meetingを開催しました。その後、各研究協力機関を訪問し、Minutes of Meeting (M/M)の署名を行い、関係機関や大学の専門家とデータ提供および観測の協力について協議し、了承を得ました。

これらの活動を通じて、今後、両国におけるプロジェクトの実施体制および詳細な研究内容・スケジュールを確定し、プロジェクトが円滑に開始されることが保証されました。

(Written by QIN Menglu)

A business trip to the Philippines for the HyDEPP-SATREPS Project フィリピン HyDEPP-SATREPS プロジェクト出張報告

JICA および JST の SATREPS 事業（地球規模課題対応国際科学技術プログラム）として進めている研究プロジェクト「気候変動下での持続的な地域経済発展への政策立案のためのハイブリッド型水災害リスク評価の活用（研究代表者：大原美保 東京大学教授、プロジェクト略称：HyDEPP-SATREPS）」の活動の一環として、玉川勝徳専門研究員と南雲直子専門研究員が、2024 年 10 月にフィリピンに出張しました。このプロジェクトでは、マニラ首都圏近郊のパンパンガ川流域と、パシグ・マリキナ川・ラグナ湖流域を対象に、気候変動下での水災害レジリエンスの向上と均衡のとれた国土発展による持続可能な経済発展のための政策提言を行います。今回の渡航の主な目的は、日本からフィリピンに供与する機材の搬送・設置とマリキナ川流域の視察です。

10 月 16 日には、南雲専門研究員がリザール州サンマテオ市を訪問しました。サンマテオ市は、マリキナ川中流左岸に位置しており、しばしば洪水による被害を受けています。洪水経験や住み方に関する住民へのインタビュー調査を計画していることから、サンマテオ市の災害リスク軽減管理事務所の Braulio Villanueva 所長をはじめとするスタッフと、市内の洪水常襲コミュニティの災害リスク軽減管理担当者に面会し、近年の洪水による被害や地域の洪水特性について情報収集と意見交換を行いました。また、インタビュー調査に向け、対象とする洪水常襲コミュニティを視察しました（Fig. 1）。

同日には、玉川専門研究員がプロジェクトの主なカウンターパートである、フィリピン大学ロスバニョス校を訪問しました。そして、日本から供与したコンピューターサーバーの設置と、稼働に向けた設定、動作確認を完了することができました。フィリピン側メンバーが主体的にこのサーバーを運用し、データ共有や氾濫シミュレーション等の解析のために活用していくよう、今後も協力していきます（Fig. 2）。

10 月 17 日には、南雲専門研究員がプロジェクトの連携機関の一つであるメトロマニラ開発公社（MMDA）の効果的洪水制御運用システム事務所（EFCOS）を訪問し、Marc Navarro 所長とスタッフから、JICA が支援するパシグ・マリキナ川の改修事業の進捗や、2024 年 7 月の台風 Carina による洪水の発生状況について説明を受けました（Fig. 3）。

ICHARM では、フィリピン側メンバーと協力しながら、プロジェクトの目標達成に向けて今後も研究活動に取り組んでいきます。

In October 2024, Research Specialists TAMAKAWA Katsunori and NAGUMO Naoko visited the Philippines as part of a research project entitled “Development of a Hybrid Water-Related Disaster Risk Assessment Technology for Sustainable Local Economic Development Policy under Climate Change (HyDepp-SATREPS).” This project is led by Principal Investigator Professor Miho Ohara of the University of Tokyo and conducted under the Science and Technology Research Partnership for Sustainable Development (SATREPS), a joint initiative of the Japan International Cooperation Agency (JICA) and the Japan Science and Technology Agency (JST). The project aims to provide policy recommendations for enhanced resilience to water-related disasters caused by climate change and sustainable economic development through balanced national development. The main purposes of this trip were to deliver equipment prepared by Japan for the Philippines and conduct a field survey in the Marikina River Basin.

On October 16, Research Specialist NAGUMO Naoko visited San Mateo Municipality in Rizal Province. The city is located on the left bank of the Marikina River and frequently affected by floods. As the project team, consisting of Japanese and Philippine researchers, is planning to conduct interview surveys in this municipality to better understand the flood experience of local people and their way of life, the project members met with Mr. Braulio Villanueva, the head of the San Mateo Municipality Disaster Risk Reduction and Management Office, and his staff, as well as disaster risk reduction officers from other flood-prone communities within the municipality. In this meeting, they gathered information about the damage caused by recent flood disasters and local flood characteristics and had discussions with participants. After the meeting, they took a tour of flood-prone communities in the municipality, for future interview survey (Fig. 1).

On the same day, Research Specialist TAMAKAWA visited the project office located at the University of the Philippines Los Baños, one of the main counterpart



Fig. 1 Photos at San Mateo Municipality

Left: Discussion with municipal and community officers; Right: Field survey in a flood-prone community



Fig. 2 Server Setup at project office



Fig. 3 Group photo at EFCOS, MMDA

organizations, and completed the setting adjustments and testing of the new computer server they delivered on this trip, getting it ready for its installation and operation. The Japanese project members will continue to provide support to ensure that the Philippine members can independently operate this server and utilize for data sharing and analyses including flood simulations (Fig. 2).

On October 17, Research Specialist NAGUMO visited the Effective Flood Control Operation System Office (EFCOS) of the Metropolitan Manila Development Authority (MMDA), one of the cooperative organizations of the project. During the visit, she met Director Marc Navarro and other staff members and were briefed on the progress of the Pasig-Marikina River improvement project supported by JICA, as well as the flood situation caused by Typhoon Carina in July 2024 (Fig. 3).

To achieve the project's objectives, ICHARM will continue to be committed to research activities in collaboration with the members on the Philippine side.

(Written by NAGUMO Naoko and TAMAKAWA Katsunori)

RRI model training was conducted in Lima, Peru

ペルー・リマにて RRI モデルの研修を実施

Senior Researcher NAITO Kensuke delivered an RRI model training course in Lima, Peru, from November 18 to 22, 2024. The training was conducted alongside a hydraulic modeling course led by Associate Professor IWASAKI Toshiki of Hokkaido University and attended by 21 participants from the National Meteorology and Hydrology Service of Peru (SENAMHI).

The main objective of the training was to build SENAMHI's capacity to implement hydrological and hydraulic models in their operations and issue early flood warnings. This initiative was launched in response to frequent flooding in the coastal areas of Peru caused by El Niño events.

The first two days of the training focused on hydraulic modeling using the iRIC model, and the following two days focused on hydrological modeling using the RRI model.

During the RRI model training, the participants were first introduced to the fundamentals of the model's usage. They then applied the models to the Chillón River, located in the northern part of Lima, an area that has been prone to frequent flooding. The training included converting model results into KML format to visualize outputs in Google Earth or other GIS platforms as a time series.

The training concluded with an introduction to Japan's early warning systems, such as Disaster Information for River Systems, followed by discussions on potential applications and future directions.

The training was well received by the participants. In particular, they appreciated the ability to generate model results in KML format and the discussions that identified specific obstacles to model implementation.

ICHARM will continue to assist Peru and other countries in building resilience against water-related disasters through training, technical support, and collaborative research.



Photo1. Senior Researcher Naito (fifth from left) with the participants
写真 1. 内藤主任研究員（左から 5 番目）と参加者

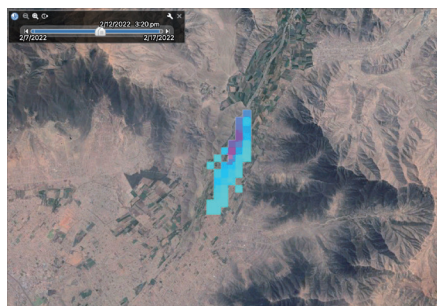


Photo2. Example of a RRI model result visualized on Google Earth
写真 2. Google Earth に出力された RRI モデル結果の例

(Written by NAITO Kensuke)

2024 年 11 月 18 日から 22 日にかけて、内藤健介主任研究員が、ペルー・リマにて RRI モデル研修コースを実施しました。本研修には、ペルー国立水文気象局（SENAMHI）の 21 名の参加者が出席し、北海道大学の岩崎俊樹准教授が指導する水理モデル研修と併せて行われました。

本研修の主な目的は、SENAMHI が水文モデルおよび水理モデルを業務に導入し、洪水の早期警報を発信できるよう支援することで、エルニーニョ現象による沿岸地域の頻繁な洪水被害への対応を目指しています。

研修 1～2 日目には iRIC モデルを用いた水理モデルの研修、3～4 日目には RRI モデルを用いた水文モデルの研修が実施されました。

RRI モデルの研修では、モデルの基本的な使い方を学んだ後、リマ北部に位置し、頻繁に洪水が発生している Chillón 川にモデルを適用しました。また、研修では、モデル結果を KML 形式に変換し、Google Earth やその他の GIS プラットフォーム上で時系列データとして可視化することも行いました。

研修の最終日には、日本における早期警報システム（例：川の防災情報）の紹介が行われ、モデルの潜在的な応用や今後の方向性についての議論が行われました。

本研修は参加者から高く評価されました。特に、KML 形式でモデル結果を生成する技術や、モデル導入における具体的な課題を特定するための議論が大変好評でした。

今後もペルーや他地域における同様のトレーニングや継続的な支援、共同研究により、水災害レジリエンスの向上に貢献していく所存です。

Field survey of the September 2024 flood disaster in Nepal

In late September 2024, Nepal experienced the highest rainfall recorded in at least the last 50 years. Continuous extreme precipitation on September 27-28 caused severe flood and sediment disasters in 44 districts across the country, claiming at least 249 lives, with 18 people missing and 178 injured, according to the Ministry of Home Affairs. More than 2.5 million people were affected, and the estimated economic loss was approximately 46.6 billion Nepalese Rupees. The bowl-shaped Kathmandu valley, where the capital city lies, received 240-350 mm of rainfall in 24 hours. According to the Department of Hydrology and Meteorology, 25 gauging stations recorded new 24-hour precipitation records on September 28, with the Daman station recording the highest 3-day rainfall of 517 mm.

To understand the characteristics of the 2024 flood and collect damage data, as part of the JSPS KAKENHI Research (Grant number: 24K07692), Research Specialist Badri Shrestha conducted field and questionnaire surveys in the flood affected areas of the Bagmati River basin in November 2024 (Figure 1), with collaboration of local governments of the Rautahat district (Madhav Narayan Municipality, Gadhimai Municipality, Rajdevi Municipality, and Durga Bhagawati Rural Municipality) and other related organizations (Photo 1). He also visited several organizations, such as the Water and Energy Commission Secretariat, the Institute of Engineering, Tribhuvan University, and the Water Resources and Irrigation Development Division (Rautahat), to discuss flood disaster situations and related issues. To collect flood damage data and socio-economic information at the household level, intensive questionnaire surveys were conducted for local households in the flood-prone areas in the Rautahat district (i.e., the district's three municipalities and one rural municipality) (Photo 2). These areas, located in the southern lowland part of the Bagmati River basin (Tarai region), sustained significant damage to houses and household contents.

The damaged or destroyed houses were primarily temporary mud-thatch houses (MT-houses) (Photo 3). The poor people are highly vulnerable to floods in the areas because they live in temporary MT houses, which are more likely to be destroyed by floods. The research team also observed severe flood damage to rice crops and some damage to sugarcane in the flood-prone areas (Photo 4).

During this survey, Shrestha and the local experts also conducted field investigations in the Kathmandu valley. Photo 5 shows the infrastructure and house damage along the Bagmati River and its tributaries. Field observations and discussions with local residents in the flood-affected areas revealed that the houses along these rivers were directly affected by floodwaters, and that the household contents were more significantly affected than the houses themselves. Observations confirmed that the Nakkhu River, one of the tributaries of the upper Bagmati River, caused significant impact and damage to life and property due to a massive flash flood with sediment-water mixture flows. The channel capacity of the Nakkhu River in the low-lying areas decreased due to riverbed aggradation resulting from a huge amount of mud and sediment carried from upstream (Photo 6), exacerbating the flood's impact.

The collected data and information from the field survey will be used to develop appropriate flood risk assessment methodologies and to provide science-based solutions for future flood disaster mitigation.

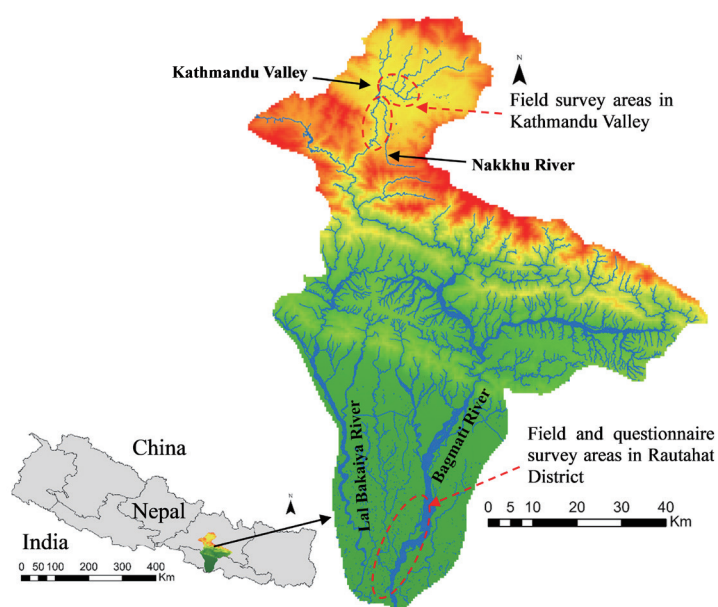


Figure 1: Location map of field and questionnaire survey areas in the Bagmati River basin.



Photo 1: Discussion and group photos with Mr. Bajinath Prasad Yadav, the mayor of Madhav Narayan Municipality (left and middle photos) and with Mr. Bhikhari Prasad Yadav, the mayor of Rajdevi Municipality (right photo)



Photo 2: Conducting household questionnaire surveys



Photo 3: Mud-thatch (MT) houses and damaged MT houses in Madhav Narayan Municipality



Photo 4: Rice crops and sugarcane affected by the flood



Photo 5: Damaged infrastructure and houses in the Kathmandu valley



Photo 6: Riverbed aggradation in the Nakkhu River

(Written by Shrestha Badri Bhakta)

SIP program Activity report SIP に関する活動報告

ICHARM ニュースレター第 71 号で報告させて頂いたように、ICHARM では、「戦略的イノベーション創造プログラム（Cross-ministerial Strategic Innovation Promotion Program：SIP）」第 3 期に位置付けられた課題「スマート防災ネットワークの構築」を構成するサブ課題の一つである「リスク情報による防災行動の促進」に共同研究機関として参加しています。

ICHARM は主として研究開発テーマ 2)「水災害リスク・被害影響可視化技術の開発」において、将来にわたって直面する水災害リスクや、事前の防災対策によって軽減されるリスクを企業等が定量的に評価するシステム（水災害リスク・レジリエンス評価支援基盤システム）や、仮想洪水体験システムを用いて住民の水災害に対する経験値を上げる技術の開発および実装を通して、水災害が「ジブンゴト」として捉えられ、事前の防災行動が促進される社会づくりに取り組んでいます。

以下、最近の活動について報告します。

<民間企業へのヒアリング>

日常の経営・業務内容や日常意識されているリスク、水災害対策、2015 年常総水害時での対応、および企業の社会的責任などについて 13 社（主な業種：製造業）にヒアリングを行いました。その結果、日常のリスクとして人員不足を挙げる企業が多い一方で、水災害を含む自然災害を経営上の大きなリスクと捉える企業は少ないことが分かりました。これはハザードマップの浸水エリアに立地する企業でも同様で、多くの企業が浸水リスクを認識しているものの、具体的な対策まで実施している企業は限られていました。ただし、防災対策への意志は示されており、防災対策の意思決定においては、「TCFD 提言における物理リスク評価の手引き」において償却資産や在庫資産に分類される項目を、勘定科目レベルまで細分化することで、リスクのイメージが明確になり、意思決定が進みやすくなるとの意見も得られました。本ヒアリングでのご意見を踏まえ、水災害リスク・レジリエンス評

As this newsletter reported in its 71st issue, ICHARM is participating in the Cross-ministerial Strategic Innovation Promotion Program (SIP) the 3rd period, "Development of a Resilient Smart Network System against Natural Disasters," which is a 5-year project starting in September 2023 and funded by the Cabinet Office of Japan.

ICHARM mainly contributes to the second theme by developing and implementing technologies that enable quantitative assessments of water-related disaster risks to which companies might be exposed and risks that can be reduced through preventative measures. ICHARM also explores practical approaches to help people understand water-related disasters as personal concerns and encourage voluntary risk reduction actions, such as early evacuation, by providing an opportunity to experience simulated flood situations using virtual reality technology. The following is a report on its recent activities.

Interviews with private companies

ICHARM conducted interviews with 13 manufacturers in the Joso City area of Ibaraki Prefecture, Japan, covering topics such as daily business operations, risks they regularly pay attention to, flood control measures, responses during the 2015 Joso flood, and corporate social responsibility. The interviews revealed that while many of them cited staff shortages as a risk, few mentioned natural disasters, including floods, as a significant threat to their businesses. Even companies located in the flood risk zones on hazard maps shared this view. Although the companies know that floods could cause damage, only a few had put concrete measures in place. Despite the slow movement toward concrete actions, they are aware of the need for them. In fact, some suggested subdividing items classified as depreciable or inventory assets in "A Guide to Flood Risk Assessments for Enhanced TCFD Disclosures" down to the level of general ledger accounts, pointing out that this breakdown would help companies develop a clearer risk profile and facilitate faster decision-making. Based on the feedback from these interviews, ICHARM will continue working on the development of a support system assess corporate water-related disaster risks and resilience.

Virtual Flood Experience System

ICHARM has developed the Virtual Flood Experience System (VFES), which recreates real-world environments in virtual space, reproduces flood conditions from hazard maps, and provides virtual experiences of potential flood scenarios. Currently, the staff are conducting a disaster education project using this system with secondary school students. Educational theory suggests that conveying knowledge to children in the developmental stage is generally more challenging than conveying it to adults with more established knowledge. To address this challenge, they are experimentally providing educational sessions. During the sessions, students receive background information on the area, including its geography and other natural features, the

formation and development of local communities, and the history of flood events and their impact. They also learn about water-related disasters and how their severity is increasing due to climate change. With this background information, they virtually experience potential flood scenarios in their cyber communities using VFES and learn effective ways to communicate flood risks they and other residents may face and respond to those risks.

On July 20 and August 10, in Nagano City, Nagano Prefecture, the project team conducted a two-day workshop for about 20 elementary and junior high school students in collaboration with the Shinshu University River Basin Flood Management Research Center. They provided a disaster education session as part of this workshop, in which the students experienced flood situations reproduced based on a hazard map using VFES. The team observed active engagement from the participants, as they did in previous sessions. The session received high praise from parents and local media. It was also featured on local television, garnering positive feedback from the public.

Between July and August, in Matsumoto City, Nagano Prefecture, the project team collaborated with the city's community development center and a secondary school to provide disaster education sessions for about 30 students over four days. The students first learned about local rivers, the Narai and Susuki Rivers in the Sai River basin, including the basin's characteristics and the history of river improvement and local communities, and then experienced simulated flood situations using VFES. As in Joso City, the students actively engaged in the flood disaster learning activities. Staff at the community development center highly praised this attempt as a novel approach to community development and water-related disaster education, and they have decided to continue offering the sessions.

Since September, the project team has launched an initiative with about 40 students at the junior high school affiliated with the Ibaraki Prefectural Mitsukaido First High School. While learning about the Kinu and Kokai Rivers, which flow through their area, including their basin characteristics and the history of river improvement and local communities, they are also using VFES to design their own ideal flood-resilient community. This unique approach engages participants in both passive and active learning by combining lectures with hands-on experience simulating flood scenarios and designing a flood-resilient community. The team believes the initiative has been well-received by the school, as it has hosted numerous visitors to observe and learn about this new approach.

Based on the examples from the three cases mentioned above, the project team confirmed that the educational approach using VFES can effectively convey disaster-related knowledge to young students, especially elementary and junior high school students, who are still in a developmental stage. Moving forward, the team plans to collaborate with experts in social sciences, particularly in education, to quantify the effectiveness of this approach. Through implementing practical water-related disaster education, the team also aims to conduct research that contributes to realizing early evacuation decisions by residents.



Students trying out VFES at a community development center in Matsumoto
松本市地域づくりセンターでの学習風景



Students listening to Senior Research Denda at a junior high school in Ibaraki Prefecture
茨城県立水海道第一高等学校附属中学校での講義の様子

価支援基盤システムの構築に取り組んでいます。

<仮想洪水体験システム>

仮想洪水体験システムに関しては、現実世界を仮想空間に再現し、ハザードマップの浸水状況を再現し、想定される洪水状況を仮想体験してもらう取り組みをしています。教育分野においては、知識が多い大人に比べ、成長途上にある学生の方への知識伝達は、一般的に難しいとされています。そのため、対象地域の自然環境、自然環境に対応した地域社会の成立・発展、洪水発生と地域社会被害の歴史、気候変動に起因するとされる水災害の激甚化の傾向などを伝えながら、体験者の地域に想定される洪水状況を仮想体験し、水災害の危険が体験者に降りかかる可能性の伝達、対応方法等を訓練する取り組みをしています。

長野県長野市においては、信州大学流域治水研究センターとの協業により、7月20日および8月10日の2日間コースとして、『めざせ！「逃げ遅れゼロ」防災・ラジオ工作教室』において、仮想洪水体験システムを用いたハザードマップで示される水災害状況の体験を約20名の小学生・中学生に対して行いました。他の地域と同様に、能動的な学習状況が確認され、保護者・マスコミの方にも高い評価をいただきました。この取り組みは、地元テレビでも紹介される等、一般の方にも高い評価をいただくことが出来ました。

長野県松本市においては、7月から8月にかけて4日間、松本市の地域づくりセンターや中等教育学校と連携し、犀川流域の奈良井川・薄川を対象に、流域特性・河川改修と地域社会の歴史を補助教材で紹介し、想定される水災害状況の仮想洪水体験システムを用いた体験学習を行いました。常総市の取り組みと同様、約30名の中等学生の方は能動的に水災害学習に取り組み、松本市地域づくりセンターの方からは、地域づくりや水災害教育の新しい取り組みとして高く評価いただき、継続的な取り組みとして採用いただけています。

茨城県立水海道第一高等学校附属中学校においては、9月以降、鬼怒川・小貝川の流域特性、河川改修と地域社会の歴史、2015年の常総水害に関すること等の講義と並行し、仮想洪水体験システムを用いた学習として、水災害に強い中等学校生の理想の街を仮想空間上に創出する取り組みを行っています。約40名の中学生は、受動的な学習だけでなく、仮想空間上での洪水体験、自分達の理想の街をつくる能動的学習に、積極的に取り組んでいます。学校関係者にも高く評価され多くの授業視察を受ける等、好評を得ていると考えています。

3地域における事例により、知識が多い大人に比べ、成長途上にある学生、特に小学生・中学生への知識伝達に、仮想洪水体験システムを用いた学習は有効であることが確認されました。今後は、社会科学分野、特に教育関係者と連携し、その効果を定量化し、効果的な水災害教育の実践を通して、地域住民の早期避難の実現に向けた研究を行う予定です。

(Written by KURIBAYASHI Daisuke, DENDA Masatoshi and YAMASHITA Daiki)

● Training & Education

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


ICHARM では、2007 年以降、(独) 国際協力機構 (JICA) 及び政策研究大学院大学 (GRIPS) と連携して、主に外国人行政職員を対象として、約 1 年間で学位を取得できる修士課程「防災政策プログラム水災害リスクマネジメントコース」(JICA 研修「洪水防災」) を実施しています。例年、10 月から翌年 3 月までの 6 カ月は主に講義や演習が行われ、4 月から 8 月にかけて学生は論文執筆に取り組みます。今年度は第 18 年目を迎え、2024 年 10 月 1 日より新たに 7 名 (バングラデシュ 1 名、メキシコ 1 名、ペルー 2 名、フィリピン 1 名、スリランカ 1 名、東ティモール 1 名) の修士学生が本コースに参加しています。

また、ICHARM では、2010 年から GRIPS と連携して、博士課程の学生も受け入れており、2015 年からは JICA による奨学金制度の導入がなされるなど財政的サポートも充実させてきました。今年度は 10 月 1 日より 3 名 (スリランカ 1 名、ネパール 2 名) の博士学生が加わり、三学年合わせて 10 名となりました。

Since 2007, ICHARM, in cooperation with the Japan International Cooperation Agency (JICA) and the National Graduate Institute for Policy Studies (GRIPS), has provided a master's program, "Water-related Disaster Management Course, Disaster Management Policy Program (JICA Knowledge CO-Creation Program on Flood Disaster Risk Reduction)," which is mainly designed for foreign government officers to obtain a degree in one year. The students learn theories and practices in the first half from October to March and work on their theses in the second half from April to August. The program has started its 18th year, welcoming seven new students (one from Bangladesh, one from Mexico, two from Peru, one from the Philippines, one from Sri Lanka, one from Timor-Leste) on October 1, 2024.

In addition, ICHARM has been accepting doctoral students in collaboration with GRIPS since 2010. In 2015, the doctoral program upgraded its financial support, including a scholarship from JICA. In October, three new students (one from Sri Lanka, two from Nepal) joined, which adds up to a total of 10 students enrolled in this three-year program.

Comments from new doctoral course students

博士課程 新入学生からのコメント



Ms. Ranapura Dewage Thilini Kaushalya
from Sri Lanka

Supervisor: Abdul Wahid Mohamed RASMY

My name is Ranapura Dewage Thilini Kaushalya, and I am from Sri Lanka. I am a Chartered Civil Engineer who worked in the Irrigation Department of Sri Lanka, where my primary responsibilities included water resource planning and management. I hold a Bachelor of Science in Civil Engineering and a Master of Science in Water and Environmental Engineering from the University of Peradeniya, Sri Lanka. In 2023, I pursued a Master's degree in Disaster Management from GRIPS, Japan, through the ICHARM/GRIPS Master's program.

Currently, I am pursuing a Ph.D. at GRIPS/ICHARM/PWRI while working as a Research Assistant at ICHARM/PWRI. I am honored to have been selected for this PhD program, which offers exposure to cutting-edge knowledge, techniques, and state-of-the-art facilities in disaster risk reduction. My research focuses on climate change impacts, flood-drought management, and sustainable adaptation to hydro-meteorological disasters in the Dry Zone of Sri Lanka.

Studying at ICHARM, PWRI, and GRIPS provides a unique environment that fosters both academic excellence and sociocultural enrichment. It is a great privilege to continue my academic journey in Japan, a country renowned for its rich culture and cutting-edge advancements. I am deeply grateful to ICHARM, PWRI, GRIPS, and the people of Japan for providing me with this invaluable opportunity to further my education and professional development.



Mr. LAMSAL Prakash from Nepal

Supervisor: HARADA Daisuke

I am Prakash Lamsal from Nepal, pursuing a Ph.D. in the Disaster Management Program at ICHARM/GRIPS. I am working as a Senior Divisional Engineer at the Ministry of Energy, Water Resources, and Water Supply, Gandaki Province, Nepal. My work primarily focuses on water resource management, flood risk assessment, and monitoring critical infrastructure projects, including irrigation, landslide protection, and river training initiatives.

I am grateful for the opportunity to advance my research at this globally recognized research center. This program provides a transformative platform to deepen my knowledge of disaster risk reduction and develop innovative solutions to pressing challenges. My doctoral research analyzes the characteristics of flood and sediment hazards in

the Koshi River Basin, Nepal, a region significantly impacted by climate change and extreme hydrological events. Leveraging cutting-edge methodologies and collaboration opportunities at ICHARM, I aim to promote disaster resilience and sustainable water resource management, contributing to the well-being of Nepal and other disaster-prone regions worldwide.



Mr. Sunil Pokharel from Nepal

Supervisor: KOIKE Toshio

I am Sunil Pokharel and have been working at the Department of Hydrology and Meteorology as a Senior Divisional Hydrologist under the Ministry of Energy, Water Resources and Irrigation in Nepal. I worked for monitoring of sediment and discharge measurement, development of rating curves and operational flood forecasting and early warning for the public in my organization. I completed my master's degree in water resources engineering in 2014 at Tribhuvan University, Nepal.

I would like to thank ICHARM, GRIPS and JICA for providing me with the opportunity to study and work closely with the experts in the field of water related hazard and management at ICHARM, the global center of excellence for water related disaster management. I am interested in the research related to the impacts of climate change on the discharge of snow- and glacier-fed river basins in Nepal, and their potential effects on hydropower generation. My enhanced skills and learnings from Japan's advanced Disaster Risk Reduction (DRR) practices will be valuable for the betterment of my department and my country.

Comments from new master's program students

修士課程 新入学生からのコメント



Mr. FARUKUZZAMAN from Bangladesh

I am Farukuzzaman, a Sub-Divisional Engineer at the Bangladesh Water Development Board (BWDB). My work focuses on designing hydraulic structures, analyzing hydrological data, developing riverbank protection solutions, designing river excavation for drainage and irrigation, applying advanced FEM tools for embankment design, and leveraging GIS for efficient project planning. These activities are integral to disaster risk reduction and sustainable water resource management in Bangladesh.

My research interests include sediment transport, with a particular focus on the Teesta River. I aim to address critical challenges in river management and contribute to effective disaster mitigation strategies.

I am deeply grateful to JICA, PWRI, and ICHARM for providing me with the opportunity to further enhance my expertise in disaster risk reduction, an area that aligns with my aspiration to contribute to a disaster-resilient Bangladesh.

Outside of my professional life, I enjoy gardening, exploring history, playing table tennis, and savoring diverse cuisines.

I look forward to contributing to ICHARM's efforts toward building safer and more sustainable communities globally.



Ms. Nina Danae Ramírez González from Mexico

My name is Nina Danae Ramírez González. I am from Mexico, and before coming here, I worked at the National Center for Disaster Prevention (CENAPRED) for six years, carrying out various activities related to flood prevention. My last position was as Head of the Flood Scenario Department. Every year, Mexico suffers human and economic losses due to floods, which is why my purpose in studying at ICHARM is to acquire new knowledge and tools to help address this issue in my country.

The Japanese society, its culture, and its country have enriched various aspects of my life today. I would like to express my gratitude to Japan, JICA, GRIPS, and ICHARM for giving me the opportunity to pursue a master's degree in the Water-related Disaster Management Course of the Disaster Management Policy Program. Furthermore, the support I have received from the senseis and Miki San has been invaluable and fundamental in this new challenge. Thank you for your time and teachings.



Mr. Jhon Alex Bautista Mejia from Peru

My name is Jhon Alex Bautista Mejia, and I am from Peru. In 2016, I graduated with a bachelor's degree in Hydraulic Engineering from the Universidad Nacional de Cajamarca. Since then, I have worked with various institutions, including the Municipality of Bambamarca – my hometown, the National Hydraulics Laboratory (LNH), the Universidad Continental S.A. (teaching assistant), and the National Water Authority (ANA), where I currently serve as a professional for the water resource models operativity within the Directorate of the National Water Resources Information System (DSNIRH). My responsibilities include managing water resources information to provide technical support for informed decision-making using hydrological and hydraulic modeling tools, all in the context of Integrated Water Resources Management (IWRM). Additionally, I serve as the technical coordinator for the operation and maintenance of ANA's national water quality and quantity monitoring equipment.

This experience provided me with a deep understanding of Peru's complex geography and hydrological challenges, as well as the strengths, limitations, and obstacles to achieving effective IWRM. These experiences have fueled my determination to prepare at the highest level to address my country's critical challenges. In this regard, I am deeply grateful to JICA, GRIPS, and PWRI-ICHARM for granting me this invaluable opportunity to enhance my technical skills. Pursuing a master's degree at ICHARM, one of the world's leading water-related research centers, will greatly strengthen my expertise and empower me to contribute more effectively to solving my country's pressing water resource issues.

Thank you for making my dream a reality.



Mr. James Dean Vidal Moreno from Peru

Rimaykullay, I am James Dean Vidal Moreno. I am from Peru, specifically from Tarapampa, which is located in Ancash, a place far from Lima. I am an Agricultural Engineer, and I studied at the National University of Santiago Antúnez de Mayolo (UNASAM). When I was a child, I was always surrounded by mountains, trees, and nature. For this reason, my purpose was to understand how rivers help us but also how they can be very dangerous. Wanting to understand that dynamic allowed me to join the Hydrology Department of the National Meteorology and Hydrology Service of Peru (SENAMHI), where I was able to share experiences and learn a lot about rivers. I was then able to apply for the Master's degree in Disaster Management Policy, where I was selected. I believe this is a unique opportunity and a great responsibility as a representative of my country. I would like to sincerely thank JICA, ICHARM-PWRI, and GRIPS for this opportunity. I hope to gain valuable experience in Japan regarding natural disaster management and how it relates to state policies.



Mr. Dean Aldrene Omo Badua from The Philippines

Hello! This is Dean Aldrene Omo Badua from the Institute of Agricultural and Biosystems Engineering (IABE), Don Mariano Marcos Memorial State University (DMMMSU), Bacnotan, La Union. I am an educator, researcher, and extensionist specializing in agricultural land and water resource management, as well as policy studies. I earned my Bachelor's degree from DMMMSU in 2013. In 2020, I earned a master's degree in Agricultural Engineering with a focus on Land and Water Resources from the University of the Philippines Los Baños.

I'm grateful to the DMMMSU community and CHED for their ongoing support. I am especially grateful to JICA for the opportunity to study at GRIPS and PWRI-ICHARM, two internationally recognized knowledge powerhouses, and collaborate with world-class water researchers, scientists, and engineers.

The skills and expertise that I will obtain will be extremely useful in our country, which experiences frequent flooding. The Japanese people's technology, practices, and attitudes will be important in guiding my research on floods and assisting decision- and policymakers in developing more sustainable, rational, and science-based policies and plans to prevent losses and damages to properties, resources, and lives.



Ms. Ushali Lenora from Sri Lanka

"Aayubowan"!

My name is Ushali Lenora. I am from Sri Lanka. I am a Chartered Engineer (Civil). I work as a Chief Engineer for the Construction Division of the Sri Lanka Land Development Corporation attached to Ministry of Urban Development and Housing. I also play a key role as the Deputy Project Director of one of the national projects regarding flood control in Colombo called Weras Ganga Storm Water Drainage & Environment Improvement Project.

Currently I have over sixteen years of professional experience in the designs, construction and management of infrastructure projects.

Japan has been one of my dream countries since my childhood due to its wonderful nature and its holistic Japanese culture. I am very fortunate to have this prestigious opportunity to study the Flood Disaster Risk Reduction Master's Program offered by JICA, GRIPS, ICHARM, and PWRI in 2024-2025. This will allow me to gain expert knowledge in theories, strategies, and research of water-related disasters as well as the rich Japanese culture during my stay in Japan.

The dedication of ICHARM professors and staff has truly inspired me. I will learn enthusiastically and immerse myself in advanced technology, a wide range of field experiences, and the high-tech/modern infrastructure of a developed nation. I am really excited about the modern technology used to develop infrastructure in Japan. Therefore, if I get a chance, I will further explore opportunities to learn more about it.

Upon my return to Sri Lanka, I will apply the knowledge and experiences I gain to future infrastructure development projects undertaken by my organization, benefiting the Sri Lankan community at large. I will actively participate in decision-making processes to contribute to making a better Sri Lanka.



Ms. Flaviana Pinto Fernandes from Timor-Leste

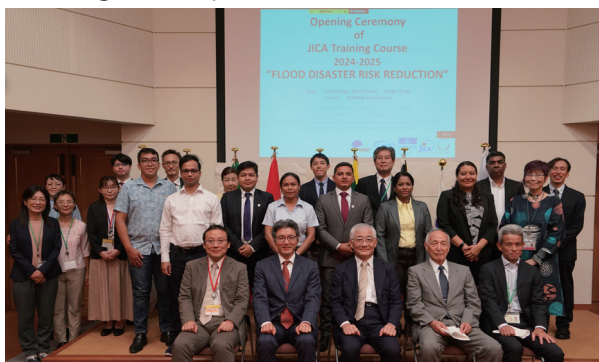
Olá, I am Flaviana Pinto Fernandes from Timor-Leste. I work as a head of the Meteorology Department at the National Directorate of Meteorology and Geophysics, under the Ministry of Transport and Communications. I am responsible for ensuring the coordination between observers and technicians of meteorologists in preparation of weather forecast information for Aviation, Maritime, and Public, coordinating with the civil protection authority, Ministry of Public Works, and other line ministries particularly when anticipating extreme weather events. I am truly honored to have been selected as a recipient of the Disaster Management Policies Program and to join the Flood Disaster Risk Reduction initiative at GRIPS and ICHARM. These education and research centers, which focus on water-related disasters, are incredibly relevant to my current work as a weather and hydrometeorological disaster informant.

This is an excellent opportunity for me and my institution to develop detailed policies involving various sectors and especially to enhance the understanding of water-related disasters as well as improve my ability to respond to critical issues effectively. By concentrating on flood forecasting, I aim to develop strategies that will better prepare our community for the challenges posed by flooding, ultimately enhancing our overall disaster response efforts. The insights I gain in these critical areas will be invaluable in our mission to protect our community from the impacts of hydrometeorological disasters every rainy season. Thanks again to JICA, GRIPS and ICHARM for the opportunity. Best Regards!

Educational program updates 教育・研修活動報告

October 1: Opening ceremony

On October 1, the 18th opening ceremony of the master's course for the academic year 2024 was held at the ICHARM auditorium. JICA Tsukuba Deputy Director General TAKAHASHI Makoto, GRIPS Professor KATAYAMA Koji, and PWRI President FUJITA Koichi gave a warm welcome speech to the new students. In return, Mr. Farukuzzaman from Bangladesh spoke on behalf of the students.



The 18th opening ceremony of Master's course
第 18 期修士課程開講式

10月1日：第18期研修 開講式

10月1日に ICHARM 講堂において、2024 年度修士コース開講式を実施しました。JICA 筑波からは高橋亮所長、GRIPS からは片山耕治教授、土木研究所からは藤田光一理事長より歓迎の挨拶を頂きました。また、学生を代表して、Farukuzzaman 氏(バングラデシュ)が挨拶を行いました。

(Written by KOBORI Kosaku)

講義

通常講義は、原田大輔専門研究員による「Hydraulics」、小池俊雄センター長及び宮本守主任研究員による「Hydrology」、内藤健介主任研究員による「Open Channel Hydraulics and Practice」から始まりました。10月中旬からは江頭進治研究・研修指導監及び秦夢露専門研究員による「Sediment transport mechanics」と、Abdul Wahid Mohamed RASMY 主任研究員による「Geographic Information Systems and Remote Sensing Technique」が始まり、川崎昭如東京大学未来ビジョン研究センター教授にも講義を担当いただきました。

また、11月1日から11月15日まで GRIPS 集中講義が対面で開催されました。学生たちは JICA 東京に滞在しながら、建築研究所国際地震工学センター (IISEE) の学生や他所属機関の日本人学生と共に、出席しました。11月下旬には、牛山朋来主任研究員、原田大輔専門研究員及び Abdul Wahid Mohamed RASMY 主任研究員による「Numerical Analysis Method and Practice」の講義が始まりました。また、南雲直子専門研究員による「Geography on Flood Disaster Management」の講義も始まり、講義内では国土地理院を視察したほか、須貝俊彦東京大学教授も講義を担当しました。

12月には清水義彦群馬大学教授による「River Engineering」の講義が始まり、講義内では、福岡捷二中央大学研究開発機構教授も講義を担当しました。また、12月末には Abdul Wahid Mohamed RASMY 主任研究員による「Hydrological Modeling for Water and Sediment Disaster Management under Climate Change」も始まりました。

10月23日～25日：鬼怒川流域視察

3日間の現地視察において、国土交通省関東地方整備局の職員、ICHARM の原田専門研究員、秦専門研究員同行のもと、学生は、渡良瀬川流域と鬼怒川流域を訪れました。渡良瀬川流域では、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、そして砂防事業を含む復興や渡良瀬遊水地の整備など、渡良瀬川流域の歴史が紹介されました。

鬼怒川流域では、最上流部のダム建設及びダム群連携事業、上流部の霞堤、下流部の連続堤防の整備、さらに2015年の堤防決壊と洪水氾濫

Lectures

The regular lectures started with “Hydraulics” by Research Specialist HARADA Daisuke, “Hydrology” by Executive Director KOIKE Toshio and Senior Researcher MIYAMOTO Mamoru, and “Open Channel Hydraulics and Practice” by Senior Researcher NAITO Kensuke. From mid-October, “Sediment Transport Mechanics” by Research and Training Advisor EGASHIRA Shinji and Research Specialist QIN Menglu and “Geographic Information Systems and Remote Sensing Technique” by Senior Researcher Abdul Wahid Mohamed RASMY with Professor KAWASAKI Akiyuki of the Institute for Future Initiatives, the University of Tokyo, started.

The intensive lectures at the National Graduate Institute for Policy Studies were held face-to-face from November 1 to 15. The students attended the lectures while staying at the Tokyo office of the Japan International Cooperation Agency, together with students from the International Institute of Seismology and Earthquake Engineering (IISEE) of the Building Research Institute and Japanese students from other organizations.

In late November, “Numerical Analysis Method and Practice” by Senior Researchers Rasmy and USHIYAMA Tomoki and Research Specialist Harada began. “Geography on Flood Disaster Management” by Research Specialist NAGUMO Naoko and Professor SUGAI Toshihiko of the University of Tokyo also started. As part of this lecture, the students visited the Geospatial Information Authority of Japan, located in Tsukuba City.

In December, Professor SHIMIZU Yoshihiko of Gunma University began lecturing on “River Engineering” with Professor FUKUOKA Shoji of Chuo University. At the end of December, “Hydrological Modeling for Water and Sediment Disaster Management under Climate Change” by Senior Researcher Rasmy also started.



Scenes from the lectures
講義風景

(Written by KOBORI Kosaku)

October 23-25: Field trip to the Watarase and Kinugawa River basins

October 23-25, the students took a three-day field trip to the Watarase and Kinugawa river basins, accompanied by Research Specialists HARADA Daisuke and QIN Menglu and officials from the Kanto Regional Development Bureau of the Ministry of Land, Infrastructure, Transport and Tourism. In the Watarase River basin, the students were briefed about the basin's history. The lecture covered copper mining in the Ashio area, including its contributions to Japan's rapid economic development after World War II and the resulting environmental destruction. It also discussed erosion control and other reconstruction projects, as well as the development of the Watarase Retarding Basin.

In the Kinugawa River basin, the students learned about dam projects in its uppermost reach and the Kinugawa Dam Network, which aims to coordinate multiple

dams to control water storage for effective water use. They were also given an overview of river improvement projects, in which open levees were installed in the upper reach and continuous levees in the lower reach. In addition, they received explanations about the levee breach and flood inundation in 2015 and the subsequent restoration project, as well as about non-structural flood control measures.

The trip was also a good opportunity to learn about Japanese culture. The students visited the Nikko Toshogu Shrine, which enshrines Tokugawa Ieyasu, the founder and first shogun of the Tokugawa Shogunate of Japan, who started the Tone River Improvement project.

そしてその復興やソフト水防災対策について学びました。

また、利根川改修の祖である徳川家康を偲び、日光東照宮を参拝し、日本の文化についても触れました。



In the Observation Deck at the Watarase River Reservoir
渡良瀬川遊水池の展望台にて



In the Ashio Environment Study Center
足尾環境学習センターにて



At the Kawaji Dam Management Office
川治ダム管理室にて

(Written by NAKABAYASHI Hideaki)

December 3: Visit to Ninomiya Sontoku Museum

On December 3, the students visited the Sontoku Ninomiya Museum in Moka City, Tochigi Prefecture, accompanied by Executive Director KOIKE Toshio. On the same day before the trip, they received a lecture from the executive director on NINOMIYA Sontoku, Japan's famous social reformer in the 19th century, and learned a lot about Sontoku and his accomplishments. This included his four teachings ("Act sincerely to others," "Work hard to repay for the virtue of others," "Keep the living standard within your income," and "Invest the residuals for the future") and the restoration of many towns and villages across Japan that were devastated by floods and famines using his extensive agricultural knowledge, civil engineering talent, and unique administrative skills. Through this visit, the students also learned how the spirit of Sontoku has been inherited in ICHARM's mission of "Localism and Human Empowerment."



At the Ninomiya Sontoku Museum
二宮尊徳資料館にて

(Written by NAKABAYASHI Hideaki)

12月3日：二宮尊徳資料館視察

12月3日、小池センター長による二宮尊徳に関する講義が行われ、栃木県真岡市にある二宮尊徳資料館を視察しました。学生は尊徳の教えである「至誠」「勤労」「分度」「推譲」などについて説明を受けました。二宮尊徳は、19世紀の著名な社会改革者で、その豊富な農業知識、土木の才能及び独特な管理力により、洪水、飢饉等で荒廃した多くの町村を復興させた人物です。学生は、二宮尊徳の精神が ICHARM の使命である「ローカリズムとヒューマンエンパワメント」に、どのように受け継がれているかについて学びました。

12月10日～12日：四国河川流域視察

12月中旬、学生は、小池俊雄センター長、宮本守主任研究員同行のもと、3泊4日で四国地方を訪れました。

1日目は、高知県職員による案内のもと、南海トラフ巨大地震の津波から高知市内を守る三重防護による対策について学びました。まず、高知市内と浦戸湾を一望できる五台山展望台において、津波による市街地の浸水を防ぐため浦戸湾に整備された第三ラインの護岸について説明を受けました。その後は高知新港に移動し、三重防護のうち津波エネルギーの減衰と高知新港の港湾機能の確保を目的とする第一ラインの防波堤、津波の浸入防止と低減を目的とする第二ラインの海岸堤防を見学しました。

2日目は、まず、日高村にて仁淀川に架かる名越屋沈下橋を視察しました。その後、近代土木の礎を築いた廣井勇の生誕地で記念像がある佐川町を訪れました。その後、高知河川国道事務所の職員による説明のもと、昨年6月から運用を開始した新日下川放水路を見学しました。その後は早明浦ダムに移動し、水資源機構の職員から、ダムの役割と再開発事業について説明を受け、続けて早明浦ダムで蓄えた水資源を配分するための池田ダムを視察しました。

3日目は、引き続き水資源機構職員の説明を受けながら香川用水東西分水工を見学しました。その後は、香川県職員及び満濃池土地改良区事務局長より日本最大級であり、歴史的建造物でもあるため池の満濃池について説明を受けました。

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。

December 10-12: River basins in Shikoku

On December 10-12, accompanied by ICHARM Executive Director KOIKE Toshio and Senior Researcher MIYAMOTO Mamoru, the students took a three-day study trip to the Shikoku region.

On the first day, the students visited Kochi City, Kochi Prefecture. Guided by prefectural officials, they learned about the triple protection system installed to protect the city from tsunamis likely to follow a Nankai Trough mega-earthquake. They first visited Mt. Godai Observation Deck, which offers a panoramic view of the city and the Urado Bay. The officials explained the third-line protection, seawalls installed to prevent tsunamis from reaching downtown Kochi City. After that, they moved to Kochi New Port and observed the first-line protection, breakwaters built offshore to attenuate tsunami energy and ensure the port functions, as well as the second-line protection, tsunami walls designed to prevent and reduce tsunami intrusion into the bay.

On the second day, the students visited the Nagoya chinka-bashi bridge, a type of submersible bridge over the Niyodo River in Hidaka Village, Kochi Prefecture. After that, they visited Sagawa Town, the birthplace of HIROI Isamu, where his commemorative statue stands. He is credited for laying the foundation for Japan's modern civil engineering. Afterwards, they toured the New Kusaka Floodway, which began operation in June 2023, where they listened to explanations provided by the staff of the Kochi River and National Highway Office of the Ministry of Land, Infrastructure, Transport and Tourism. The students then moved on to the Sameura Dam, a multi-purpose dam completed in 1973 to serve as a water source for Shikoku. They were briefed by officials from the Japan Water Agency on its role and the dam restoration project, followed by a visit to the Ikeda Dam, which is used to distribute the water resources stored at the Sameura Dam.

On the third day, the students first visited the Kagawa Irrigation East-West Diversion Works in Kagawa Prefecture with officials from the Japan Water Agency. Afterwards, they went to the Manno Pond, a reservoir over 1,000 years old and recognized as one of Japan's largest and historic structures. They received explanations from Kagawa prefecture officials and the executive director of the Mannou-ike Land Improvement District.

ICHARM was very thankful to all the staff and officials for their excellent cooperation during the field trip.



Students receiving explanations at the Mt. Godai Observation Deck
五台山展望台にて説明を受ける学生たち



Students touring the inside of the New Kusaka Floodway
新日下放水路トンネル内を見学する学生たち



Students observing the improvement construction of the Sameura Dam
早明浦ダムの工事状況を見学する学生たち



At the Manno Pond
満濃池にて

(Written by KOBORI Kosaku)

Mr. Sanjeewa received two awards サンジーワ イランガシंगा氏が2つの賞を受賞

Mr. Sanjeewa Illangasingha of Sri Lanka, who earned his Ph.D. in disaster management at ICHARM in September 2024, received two awards in September and November.

The first award was the Dean's Award, which he received at the GRIPS graduation ceremony on September 11. This award had been reserved for master's students with outstanding academic achievements until last year but was extended to doctoral students this year. Mr. Sanjeewa became the first Ph.D. student to receive this prestigious award.

The second was the ICHARM Best Paper Award. This award is established to honor ICHARM researchers who have published a distinguished refereed paper in the previous year. The selection committee led by Executive Director Toshio Koike is in charge of this award.

Mr. Sanjeewa received the 2023 ICHARM Best Paper Award for his research paper entitled "A Holistic Approach for Using Global Climate Model (GCM) Outputs in Decision Making," which has been published in the *Journal of Hydrology*, 626, 130213. In commemoration of the award, Mr. Sanjeewa gave a special lecture on his research online on November 5, 2024, at the awarding ceremony. In this research, he examined historical and projected precipitation from 44 GCMs, calculated under the Representative Concentration Pathways (RCP) 8.5 scenario considering regional, geographical, and temporal variability, to establish a decision-making support system based on the degree of confidence for nine diverse main river basins in tropical Sri Lanka as a case study. His research predicted that the annual precipitation is extremely likely to increase in the Mahaweli basin, the largest basin neighboring most of the other basins. He also suggested that simply charting detailed climate change analyses would more effectively communicate scientific findings to scientists and policymakers.



Mr. Sanjeewa receiving the Dean's Award
Dean's Awardを受賞するサンジーワ氏



Mr. Sanjeewa receiving
the ICHARM Best Paper Award
ICHARM 最優秀論文賞を受賞するサンジーワ氏

(Written by KOBORI Kosaku)

2024年9月に博士課程「防災学プログラム」を修了したサンジーワ イランガシंगा氏（スリランカ）は、この9月と11月に2つの賞を受賞しました。

1つ目は、9月11日、GRIPSにて学位記授与式で受賞したDean's Awardです。Dean's Awardは、これまで修士課程の成績優秀な学生にのみ授与されていました。今年からは博士課程の学生にも賞が贈られることとなり、サンジーワ氏は栄えある第一回目の博士学生受賞者となりました。

2つ目は、ICHARM 最優秀論文賞です。ICHARM 最優秀論文賞は、その前年に優れた査読付き論文を執筆した ICHARM 研究員に対して授与される賞であり、受賞者は小池センター長が委員長を務める選考委員会により決定されます。2023年度最優秀論文賞は、研究論文『A holistic approach for using global climate model (GCM) outputs in decision making』を執筆したサンジーワ氏に授与されました。11月5日には受賞を記念して授与式が開催され、オンラインでサンジーワ氏の特別講演が行われました。スリランカの多様な主要9河川流域をケーススタディとして取り上げた本論文で、サンジーワ氏は、信頼度に基づく意思決定支援システムを構築するために、地域的、地理的、時間的変動を考慮しつつ、RCP 8.5 シナリオ条件下で44の異なるGCMを使って計算した過去および将来降水量を分析し、国内最大流域であり、他の対象流域のほとんどと接しているマハウエリ流域では、年間降水量が極めて高い確率で増加するという予測結果を得ました。また、気候変動の詳細な解析結果をシンプルに表したチャートを利用した情報提供のほうが、意思決定を行う主要公共機関や科学関連団体に科学的根拠をもつメッセージを伝えるのに効果的であると示唆しています。

● 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 210 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. Mr. Paul Luching Lusabia, a Filipino student who was enrolled in the master's course from 2022 to 2023, 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210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を寄稿していただいています。本号では2022-2023年 修士課程卒業生である Paul Luching Lusabia氏（フィリピン）の寄稿文をご紹介します。



John Paul Luching Lusabia

Local Government Unit – Municipality of Mambusao, Capiz, the Philippines
Municipal Government Department Head I (Local Disaster Risk Reduction Management Officer)

My journey from my master's graduation at the International Centre for Water Hazard and Risk Management (ICHARM) to my return to the Municipality of Mambusao as Local Disaster Risk Reduction and Management Officer (LDRRMO) has been both transformative and fulfilling. This experience has not only allowed me to apply the knowledge and skills I acquired abroad but also propelled me toward significant professional accomplishments, including awards, organizational improvements, and leadership growth. Among the milestones were the Gawad Kalasag Fully Compliant Award in 2023 and 2024, the formal creation of the Information, Education, and Communication (IEC) Unit in the Municipal Disaster Risk Reduction and Management (MDRRM) Office, my promotion to Municipal Government Department Head I (LDRRMO), and my part-time teaching role at the Capiz State University (CAPSU). These accomplishments have solidified my commitment to disaster risk reduction and management (DRRM) and climate action while fostering the development of the next generation of public administrators, all thanks to the Japan International Cooperation Agency (JICA) Knowledge Co-Creation Program (KCCP), the Graduate Institute for Policy Studies (GRIPS), the Public Works and Research Institute (PWRI) of Japan, and ICHARM.



In 2023, upon completing my master's degree in disaster management (water-related disasters) under the JICA-KCCP, I returned to my hometown of Mambusao, Capiz, eager to apply the global best practices I had learned during my studies at ICHARM. The experience in Japan deepened my understanding of disaster risk management, particularly the integration of technology, community engagement, and comprehensive risk assessment. I knew that implementing these insights in Mambusao could address long-standing challenges and elevate the municipality's capacity to prepare for and respond to disasters.

One of the first initiatives I led was enhancing our early warning systems and disaster preparedness programs. I recognized that effective disaster management requires not just technical tools but also an informed and engaged community. This insight led to the creation of the IEC Unit within the MDRRM Office. The IEC Unit was designed to bridge the gap in disaster awareness and knowledge within local communities. Through this unit, we organized information campaigns, workshops, and training sessions to raise awareness about the importance of disaster preparedness, response, and climate resilience.

The IEC initiatives were well-received, especially in rural barangays (villages) where access to information was previously limited. By promoting disaster preparedness through various media, such as posters, social media, and face-to-face interactions, we were able to foster a more resilient mindset among residents, empowering them to take proactive steps in disaster risk reduction.

In 2023 and 2024, the municipality of Mambusao was honored with the prestigious Gawad Kalasag Fully Compliant Award, a recognition of our effective disaster risk management strategies and community engagement efforts. The award highlighted the significant strides we made in integrating disaster preparedness, climate resilience, and sustainable development practices into the local governance structure.

Receiving the Gawad Kalasag Award was a testament to the hard work of our team and the support of our local stakeholders. It validated the comprehensive approach we had taken to disaster management, which combined risk assessment, preparedness training, community involvement, and continuous improvements to our disaster response systems. The recognition also underscored the importance of collaboration, as we worked closely with local government units, non-governmental organizations, and other sectors to enhance the municipality's overall disaster resilience.

This achievement not only boosted the morale of the MDRRM Office but also reinforced the importance of taking a holistic approach to disaster risk management. The recognition motivated us to further refine our systems, strengthen our partnerships, and ensure that we continued to meet the needs of our communities in the face of evolving disaster risks.

In 2024, my role as Municipal Government Assistant Department Head II (LDRRMO) expanded significantly when I was promoted to Municipal Government Department Head I (LDRRMO), solidifying my leadership position within the local government structure. This promotion was a turning point in my career, as it gave me greater

authority and responsibility in shaping the disaster risk management agenda for the municipality.

As the head of the MDRRM Office, I spearheaded initiatives aimed at enhancing disaster preparedness, response, and recovery, focusing particularly on addressing the challenges posed by climate change. This included advocating for the integration of DRRM into all aspects of local governance, from infrastructure development to public health and social services. My new role allowed me to work closely with other department heads to ensure that DRRM and climate action were prioritized in the municipal development plan.

In my leadership capacity, I also continued to advocate for increased funding for disaster risk reduction programs and better coordination with national agencies. This effort was essential in ensuring that Mambusao remained well-equipped to handle future disasters and that our strategies were in line with national and global best practices.

In addition to my work in disaster risk management, I took on a part-time teaching position at the Capiz State University (CAPSU) in the 3rd quarter of 2024, where I taught graduate-level courses in Climate Action, DRRM, and Public Policy to master's students in Public Administration. This teaching opportunity allowed me to share my expertise and experiences with the next generation of public administrators, equipping them with the knowledge they need to contribute to effective governance and disaster management.

Teaching was a deeply rewarding experience. It gave me the chance to reflect on my own learning and practice, while also fostering a new generation of leaders who could contribute to strengthening disaster resilience and addressing the complex challenges of climate change. I emphasized the importance of integrating disaster risk reduction into public policy and the need for a multi-disciplinary approach to solving the issues of disaster resilience and sustainable development.

One of the highlights of my teaching experience was developing a module that linked the theories of climate change adaptation, sustainable developmental goals and disaster management to real-world applications, using cases from both Japan and the Philippines. My students were particularly engaged in discussions about the cultural and socio-economic dimensions of disaster risk, and I encouraged them to think critically about how they could implement local solutions to global problems.

The journey back to Mambusao was not without its challenges. Despite the knowledge I gained in Japan, local conditions posed unique obstacles. Apart from issues on community awareness, support of local leaders and securing funding for DRR initiatives, one of the unique hurdles is additional manpower who is as committed to enforcing DRRM initiatives, if not an expert on the field. In response, I initiated a partnership with JICA's Japan Overseas Cooperation Volunteers (JOCV), which I am hoping to materialize soon. The goal is to increase our network of resources through an established international organization, help develop strategies and advocate for effective and efficient disaster risk reduction and climate adaptation programs, and, ultimately, aid in materializing the establishment of a local disaster education center.

Reflecting on my post-graduation journey, I realize how much I have grown both personally and professionally. My time at ICHARM and the JICA-KCCP program gave me the foundation to take on leadership roles and introduce innovative ideas to the municipality of Mambusao. The recognition through the Gawad Kalasag Award, my promotion to Municipal Government Department Head I, the creation of the IEC Unit within the MDRRM Office, and the partnership with JICA's JOVC are all milestones that reflect the hard work and dedication of the entire Mambusao disaster risk management team.

Looking ahead, my focus remains on improving Mambusao's resilience to climate-related disasters by continuing to strengthen community engagement, advancing the use of technology in disaster response, and ensuring that disaster risk reduction is integrated into all facets of local governance. I also remain committed to teaching and mentoring future public administrators, ensuring that they are well-prepared to lead the next generation of DRRM efforts.

This journey—from my international studies to my leadership role in Mambusao and my part-time teaching—has been a testament to the power of continuous learning, collaboration, and a shared commitment to improving the lives of communities. As I continue to serve both as a local government officer and an educator, I am more motivated than ever to contribute to building safer, more resilient communities in the face of growing environmental and climate challenges.

Public Relations

Local students visited ICHARM 常総市の中学生が ICHARM を来訪

2024年10月15日、茨城県立水海道第一高等学校附属中学校の1年生約40名が土木研究所及び ICHARM を来訪しました。今回の来訪は、今年9月から始まった同校の課題探究学習の一環として行われ、土木研究所及び ICHARM での取り組みを講義や見学、体験を通じて学んでいただく貴重な機会となりました。

当日は、傳田正利主任研究員による講義を皮切りに、ダム実験施設の見学、そして仮想洪水体験システムを用いた浸水体験が実施されました。

傳田正利主任研究員の講義では、2015年に発生した常総市の洪水災害を例に挙げ、洪水の原因やその被害について説明がありました。さらに、洪水被害を軽減するための国際的な取り組みについて、国連、ユネスコ、世界気象機構、日本政府や ICHARM の事例を交えながら紹介されました。

続いて、水工チームの協力のもと、ダム実験施設の見学を行いました。特に利賀ダムの模型実験は、緊急放流を想定した迫力あるものであり、生徒たちはそのスケール感に圧倒され、終始興味深く見学している様子でした。

最後に行われた仮想洪水体験システムによる浸水体験では、仮想空間上に再現されたつくば市上郷地区で、アバター（仮想空間における自分の分身）を操作しながら浸水範囲や浸水深を直感的に体験しました。平常時、既往最大時、計画想定規模、想定最大規模の4つのシナリオで体験が可能で、生徒たちはその違いを実感しながら洪水災害について学んでいました。本体験は、仮想空間上でアバターを自分自身で操作する特性上、浸水範囲や浸水深を地形特性とともに学べ、平面的なハザードマップでは理解しにくい3次元的な視点で洪水を捉える貴重な学びの場となりました。

今回の来訪を通じて、生徒たちの土木や災害に関する知識と関心が深まる良いきっかけになれば幸いです。

On October 15, 2024, about 40 first-year students visited PWRI and ICHARM from the junior high school affiliated to the Ibaraki Prefectural Mitsukaido First High School. The visit was part of the school's problem-solving study program, which they introduced for the first time this past September. It was a valuable opportunity for the students to learn about the efforts of the two institutes through a lecture, a laboratory tour, and a virtual experience.

The day began with a lecture by Senior Researcher DENDA Masatoshi, followed by a tour of the dam experimental facility and a flooding experience using a virtual flood simulation system.

In his lecture, the senior researcher explained how water-related disasters occur and what damage they bring about, using the 2015 flood disaster in Joso City as an example. He also spoke about international efforts to reduce water-related disaster damage, including various cases initiated by the United Nations, UNESCO, the World Meteorological Organization, the Japanese government, and ICHARM.

The students then took a tour of the dam experimental facility, which was planned with the cooperation of the Hydraulics and Sediment Transport Engineering Team of PWRI. The team demonstrated a model experiment simulating an emergency discharge at the Toga Dam in Toyama Prefecture, Japan, and the students were overwhelmed by the scale of the experiment and intently looking at the phenomenon taking place before them.

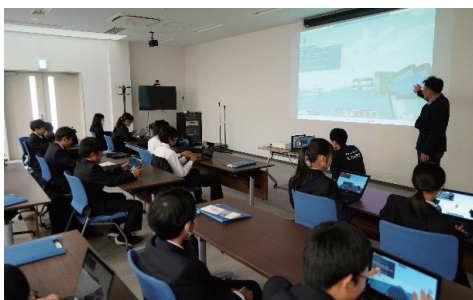
Their visit ended with trying out the Virtual Flood Experience System. Using this system, the students virtually experienced how flooding spreads and deepens while controlling avatars (their virtual selves) in the Kamigo district of Tsukuba City, which was recreated in cyber space. They were provided with four flood scenarios (i.e., normal-time river conditions and flood events of the maximum historical scale, design scale, and maximum anticipated scale) and learned about flood disasters while experiencing the differences between them. Because the experience involved controlling avatars in virtual flood situations, the students were able to learn about flooded areas and depths associated with topographical characteristics. The system



A lecture by Senior Researcher Denda
傳田主任研究員による講義の様子



Students at the dam experimental facility
ダム実験施設見学の様子



Students trying out the Virtual Flood Experience System
仮想洪水体験システムを体験する中学生の様子



offered a rare learning opportunity for them to understand flooding from a three-dimensional perspective, which is difficult using a usual two-dimensional hazard map. We hope that this visit inspired the students to deepen their knowledge and interest in civil engineering and disasters.

(Written by YAMASHITA Daiki)

The 73rd ICHARM R&D Seminar 第 73 回 ICHARM R&D セミナーを開催

ICHARM continuously holds R&D (Research and Development) Seminars to help researchers enhance their skills and stay up-to-date with the latest research findings by inviting domestic and international experts in various fields of water-related disaster management. The 73rd seminar, held on December 26, 2024, invited Mr. OKA Hiroshi as a speaker. He was the former ambassador extraordinary and plenipotentiary of Japan to the Arab Republic of Egypt, the Ministry of Foreign Affairs of Japan.

Mr. Oka was stationed in Egypt from November 2021 to November 2024, dedicating himself to strengthening Japan's partnership with Egypt and the Arab League. He has been at the forefront of diplomacy for many years, serving important positions, including Ambassador Extraordinary and Plenipotentiary to Malaysia and Turkey. In this R&D Seminar, based on his diplomatic experience in countries of the Middle East, Asia, Europe, and others, he delivered a talk on Japan's international cooperation and the regional characteristics, challenges, and needs of Africa.

In his talk, Mr. Oka addressed water issues in the Nile River Basin. He explained that while Egypt's population is rapidly increasing, the water supply from the Nile River, the country's only source of surface water, has not increased, raising concerns about a water crisis. The need to strengthen food security was also emphasized. Regarding these circumstances, he shared a successful case in which the country increased its rice productivity to 10 t/ha, a globally high level of productivity, by introducing Japanese rice and rice cultivation techniques and conducting local training. Given that a large part of Africa lies in an arid region, where droughts constantly threaten food security, improving productivity without expanding cultivated land contributes significantly to the stability of society. He also pointed out that Japan has the potential to offer more support for African societies through knowledge sharing, which is consistent with ICHARM's activities to share Japan's experiences, science and technology, and education with the world.

Mr. Oka also mentioned the Renaissance Dam, newly build in the Ethiopian part of the Nile River Basin, upstream of Egypt. He explained that if both countries



Mr. OKA, the former ambassador extraordinary and plenipotentiary of Japan to the Arab Republic of Egypt

岡 前駐エジプト特命全権大使

ICHARM では、水災害分野に関する国内外の専門家に最新の研究や知見についてご講演いただき、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)」を継続的に開催しています。第 73 回となる今回は 2024 年 12 月 26 日に開催し、講演者として外務省前駐エジプト特命全権大使の岡浩氏をお招きしました。

岡氏は、2021 年 11 月から 2024 年 11 月までエジプトに駐在され、エジプトならびにアラブ連盟と日本の関係強化のためにご尽力されました。また、これまでに駐マレーシア特命全権大使、駐トルコ特命全権大使なども務められ、長く外交の最前線で活躍されてきました。今回の R&D セミナーでは、中東、アジア、ヨーロッパなどでの外交経験を基に、日本の国際協力や、アフリカの地域的特徴や課題、現地のニーズなどについてご講演いただきました。

講演では、ナイル川流域の水問題について触れられ、エジプトでは人口が急増している一方、唯一の表流水源であるナイル川の水の供給量は増えていないために水危機の到来が懸念されていること、食料安全保障の強化が求められていることが紹介されました。こうした中、日本の米および米作技術を導入するとともに、現地で研修を行った結果、10t/ha と世界的にも生産性の高い米づくりが行われた事例があったとのこと。乾燥地帯であり、干ばつが起こる中で、耕地面積を広げずとも生産性を向上させることができれば社会の安定につながります。日本は知の共有の面で、今後もアフリカ社会に貢献することが可能であり、ICHARM が取り組んでいる、日本の経験や、科学技術、教育を世界と共有するための活動はこれと同じである、と述べられました。

また、ナイル川流域において、エジプトの上流、エチオピアに新たに建設されたルネサンスダムを紹介もありました。仮に両国がダムのオペレーションで協力し、エチオピアの洪水をダム貯水量の増加に結び付けることができれば、ナイル川下流域の水不足緩和に役立つと考えられます。日本は両国と良好な関係を築いており、日本の科学的知見を活かして課題を解決していくことは、アフリカの安定と繁栄にとっても素晴らしい貢献になる、との説明がありました。講演後、会場からは、気候変動に関する現地の関心、などについて質問がありました。

ICHARM では、幅広い分野から水



Mr. Oka (center, front row) with the seminar participants
岡氏とセミナー参加者の集合写真

災害・リスクマネジメントに関わる知見を伝えるべく、今後も R & D セミナーを開催していく予定です。

cooperate in dam operations, for instance, by channeling floodwaters from Ethiopia to increase the water storage of Egyptian dams, it could help reduce water shortages in the lower Nile River Basin. Citing the strong relations Japan has built with both countries, the former ambassador added that if the challenges can be addressed using Japan's scientific knowledge, it would be a remarkable contribution to the stability and prosperity of Africa. He also answered questions asked after his talk regarding local interests about climate change and other related topics.

ICHARM will continue organizing R&D Seminars in the future to update researchers with the latest knowledge and skills on water-related issues across a wide range of perspectives.

(Written by NAGUMO Naoko)

Miscellaneous

Business trips / 海外出張リスト

* October - December 2024

- October 2-7, KOIKE Toshio, Washington DC, USA, (1) World Bank- Meeting on the transboundary rivers in Africa and Meeting on Doctor course program (2) NOAA/NESDIS- Meeting on GEO
- October 8-12, KOIKE Toshio, Geneva, Switzerland, to participate at the WMO Scientific Advisory Panel 3 and joint Research Board-Scientific Advisory Panel Meeting
- October 13-19, KOIKE Toshio, Cairo, Egypt, to participate in the Cairo Water Week 2024 and 9th Africa Water Week
- October 13-18, NAGUMO Naoko and TAMAKAWA Katsunori (October 14-18), The Philippines, (1) to participate in APMCDRR (2) field visit to the Marikina River Basin (Rizal Province) to conduct a survey (3) bring and install servers to UPLB
- October 13-23, QIN Menglu and Kattia Rubi ARNEZ FERREL (October 13-20), Wuhan, China, to participate in 24th IAHR Asia and Pacific Division Congress
- October 14-25, USHIYAMA Tomoki and Ralph Allen Acierto, Panama city, Panama, to conducting observations and participating in international conferences under the JICA Chair Program
- October 21-24, MIYAMOTO Mamoru and TAKEGAWA Shinya, Nanjing, China, to participate in ESCAP/WMO Typhoon Committee The 13th Working Meeting of TC Working Group on Hydrology
- October 28-November 1, OKADA Tomoyuki, Seoul, Korea, to participate in the 31st IHP Regional Steering Committee Meeting for Asia and the Pacific
- November 3-9, DENDA Masatoshi, Sitges, Spain, to participate in Urban Transitions 2024
- November 4-7, MIYAMOTO Mamoru, Ulaanbaatar, Mongolia, to participate in 2024 Sub-regional Meeting on Safeguarding Intangible Cultural Heritage in East Asia
- November 15-21, FUKUWATARI Takashi, Surabaya, Indonesia, to participate field survey and courtesy call by ACECC TC21 in East Java, Indonesia
- November 16-25, NAITO Kensuke, Lima, Peru, to deliver lectures at the follow-up training program on "Comprehensive Disaster Management in Latin America" a theme-specific training program in Peru at the request of JICA
- November 18-23, MIYAMOTO Mamoru and TAKEGAWA Shinya, Shanghai, China, to participate in ESCAP/WMO Typhoon Committee 19th INTEGRATED WORKSHOP / AP-TCRC FORUM
- November 18-29, Shrestha Badri Bhakta, Kathmandu and Gaur, Nepal, to conduct field investigation and household surveys in the flood-prone areas of Bagmati River Basin
- November 19-25, KOIKE Toshio, Budapest, Hungary, to participate in World Science Forum invited by Hungarian Academy of Sciences
- December 2-7, OKADA Tomoyuki, Nansha, Guangzhou, Guiping, China and Hong Kong, to participate in International Conference on Integrated Flood Management Strategy
- December 4-8, KOIKE Toshio, Geneva, Switzerland, (1) The 24th Meeting of The High-level Experts and Leaders Panel on Water and Disasters (HELP) and of which advisor's meeting (2) Dialogue Session "From the Bandung Spirit Water Summit to the UN 2026 Water Conference"
- December 16-20, MIYAMOTO Mamoru, Bangkok, Thailand, to participate in Typhoon Committee Roving Seminar 2024

Visitors / 訪問者リスト

* October - December 2024

- Visited by water ministers from seven African countries (Kenya, Cameroon, Mauritania, Mozambique, Burkina Faso, Senegal, and Benin), October 30
Purpose: the visit was planned with support from AfDB following the technical meeting in June 2024 between AfDB and Japan's Ministry of Land, Infrastructure, Transport and Tourism
*See "**Visit by water ministers from seven African countries**" on page 8
- Visited by Deputy Director-General of Hydrology Department of Ministry of Water Resources, China, October 31
Purpose: part of tour to Japan to promote technical exchange between China and Japan
*See "**ICHARM welcomed Deputy Director-General of Hydrology Department of Ministry of Water Resources, China**" on page 9
- Visited by delegates of State of Rio Grande do Sul, Brazil, November 20
Purpose: to explore potential collaborations with Japanese and international institutions specializing in risk assessment and natural disaster management
*See "**Discussion on flood management with the State of Rio Grande do Sul, Brazil**" on page 13
- Visited by Mr. OKA Hiroshi (Former Ambassador Extraordinary and Plenipotentiary of Japan to Egypt), December 26
Purpose: invited speaker for the 73rd ICHARM R&D Seminar
*See "**The 73rd ICHARM R&D Seminar**" on page 35

Publications / 対外発表リスト

* October - December 2024

1. Journals, etc. / 学術雑誌 (論文誌、ジャーナル)

- Shrestha Badri Bhakta, Abdul Wahid Mohamed RASMY, USHIYAMA Tomoki, Ralph Allen ACIERTO, KAWAMOTO Takatoshi, FUJIKANE Masakazu, SHINYA Takafumi, KUBOTA Keijiro, Assessment of future risk of agricultural crop production under climate and social changes scenarios: A case of the Solo River basin in Indonesia, *Journal of Flood Risk Management*, Wiley, November, 2024, <https://onlinelibrary.wiley.com/doi/epdf/10.1111/jfr3.13052>

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

- QIN Menglu, HARADA Daisuke, EGASHIRA Shinji, Modeling of Water-Sediment Inundation Process Incorporating with a Rainfall-Sediment Runoff model, 24th IAHR Asia and Pacific Division Congress (2024), IAHR, October 14-17, 2024
- Kattia Rubi Arnez Ferrel, HARADA Daisuke, EGASHIRA Shinji, Bar formation and bank erosion processes with non-uniform sediment, 24th IAHR Asia and Pacific Division Congress (2024), IAHR, October 14-17, 2024
- Ralph Allen ACIERTO, Analysis of extreme-rain-induced flood events in Panama Canal Watershed, The 9th International Engineering, Sciences and Technology Conference (IESTEC 2024), Panama City, Panama, October 23-25
- USHIYAMA Tomoki, Ralph Allen ACIERTO, Dynamic downscaling of large ensemble climate projection in Southeast Asia, The 9th International Engineering, Sciences and Technology Conference (IESTEC 2024), Panama City, Panama, October 23-25
- Denda Masatoshi, Experimental research on a simplification method for identifying attractive points of a city using open data, *Urban Transitions* 2024, Elsevier, Barcelona, Spain, November 5-7, 2024
- 牛山 朋来, Ralph Allen ACIERTO, インドネシア・ソロ川とフィリピン・ダバオ川流域におけるd4PDFダウンスケールリング (その2)、気象学会2024年度秋季大会、気象学会、2024年11月12~15日
- USHIYAMA Tomoki, Development of regional ensemble prediction system by cloud water assimilation over land from AMSR microwave radiometer, JAXA PI workshop (AMSR3&GCOM-W), November 20, 2024
- 江頭 進治, 土石流と掃流砂と浮遊砂について、2024年度分野横断型研究集会 地球表層における粒子重力流: 理論・実験・観測と防災への応用に向けて、粒子重力流研究会、2024年11月26日
- EGASHIRA Shinji, Robin Kumar Biswas, HARADA Daisuke, MIYAMOTO Kuniaki, Responses of bed-slope ratio to bed-load formulas in open channels with abruptly widening /narrowing approaches, The 69th Conference on Hydraulic Engineering, JSCE, Toyama Prefectural Civic Hall, December 2-4, 2024
- Md. Shahinur RAHMAN, HARADA Daisuke, EGASHIRA Shinji, CHARACTERISTICS OF MORPHOLOGICAL CHANGE RESULTING FROM TIDAL CURRENTS IN THE MEGHNA ESTUARY, The 69th Conference on Hydraulic Engineering, JSCE, Toyama Prefectural Civic Hall, December 2-4, 2024
- Narayan Prasad Subedi, OHARA Miho, EGASHIRA Shinji, Damages resulting from floods inundation with active sediment transportation and their assessments in the floodplain of the West Rapti River, Nepal, The 69th Conference on Hydraulic Engineering, JSCE, Toyama Prefectural Civic Hall, December 2-4, 2024

3. Poster Presentations / ポスター発表

- Shrestha Badri Bhakta, Abdul Wahid Mohamed RASMY, USHIYAMA Tomoki, Ralph Allen ACIERTO, KURIBAYASHI Daisuke, KUBOTA Keijiro, Assessment of Human Flood Exposures and Flood Impact on Residential Households under Climate Change, AGU Annual Meeting 2024, December 9-13
- NAITO Kensuke, Catherine Gigantone, Revealing sediment dynamics in the Laguna Lake, the Philippines, using high temporal resolution satellite datasets, AGU Annual Meeting 2024, December 9-13

4. Magazines, Articles / 雑誌、記事 (土技資含む)

None / 該当者無し

5. PWRI Publications / 土研刊行物 (土研資料等)

- ICHARM, ICHARM Activity Report FY2023, PWRI Technical Note No. 4453, ISSN 0386 - 5878, December, 2024
- 水災害・リスクマネジメント国際センター (ICHARM)、ICHARM Activity Report FY2023 (日本語版)、土木研究所資料 第4453号、ISSN 0386 - 5878、2024年12月

6. Other/ その他

None / 該当者無し

Notice of IFI website URL change IFI のホームページの URL 変更のお知らせ

The URL for the International Flood Initiative (IFI), for which ICHARM serves as the secretariat, has been changed as follows:

Old URL <http://www.ifi-home.info>

New URL <https://www.pwri.go.jp/icharm/ifi/index.html>

The full transition will be completed on March 31, 2025. Please note that the old URL will no longer be accessible after this date.

ICHARM が事務局を務める国際洪水イニシアティブ (IFI) のホームページの URL を以下の通り変更しました。

【変更前】<http://www.ifi-home.info>

【変更後】<https://www.pwri.go.jp/icharm/ifi/index.html>

2025 年 3 月 31 日をもって完全移行します。以降は変更前の URL にアクセスできなくなりますので、ご注意ください。

編集後記

昨年は、1月に能登地震が発生し、同じ場所が9月には洪水被害を受けるという、これまでに想定されていなかった被災を経験しました。

日本では、これまで地震と洪水は同時に生起しないことを前提に防災対策をしてきました。

しかし、現在は大雨がいつでも、どこでも発生し得る状況にあり、能登のように地震被害からの復興の最中に洪水被害を受けることがある、ということが改めて認識されました。

本年のお正月は例年通りの穏やかなものでしたが、水災害はいつでもどこでも発生するということを忘れてはいけません。

本年も、ICHARMは多様化する水災害のリスク軽減に向けて、UNESCOのカテゴリー2センターとして世界に貢献してまいります。

皆様の、引き続きのご理解とご協力をどうぞよろしくお願いいたします。

Last year, 2024, Japan experienced an unexpected disaster; the Noto peninsula was hit by a strong earthquake in January and a flood in September. The same area suffered devastating damage from two natural hazards in one year.

In Japan, disaster prevention measures have been discussed based on the assumption that earthquakes and floods do not occur at the same time.

However, the Noto case has woken Japanese people to the fact that the climate is now drastically changing. Extreme rains can occur anytime, anywhere, increasing the chance of floods, even in the midst of recovery from earthquake damage.

Luckily, Japan enjoyed a peaceful New Year's Day this year, but it is crucial to remember that water disasters can occur anywhere at any time.

In 2025, too, ICHARM, a UNESCO Category 2 Center, will continue to contribute to global efforts to reduce diverse water-related disaster risks.

Your continued understanding and cooperation will be greatly appreciated.

ICHARM Newsletter Editorial Committee
FUKUWATARI Takashi

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