



Message from Executive Director

Quality-oriented Society



4th Asia-Pacific Water Summit
Kumamoto Japan 2022

As the moderator of the special session
"Showcase" at the 4th Asia-Pacific Water Summit
in Kumamoto, Japan, April 23, 2022
第4回アジア・太平洋水サミットの特別セッション「ショーケース」のモデレータとして
(2022年4月23日、熊本市)

Let's consider the key components of a "quality-oriented society." For this purpose, the concept of "social common capital" defined by UZAWA Hirofumi, a Japanese economist, can give us great insight. He explains that social common capital provides members of a society with social services and institutional arrangements that secure an affluent society and maintain cultural and attractive human life. According to UZAWA, social common capital is comprised of three components: natural capital consisting of the natural environment and resources, including the Earth's atmosphere, land and ocean; institutional capital consisting of educational, medical and financial institutions; and social infrastructure consisting of roads, rivers and cities. Recently, the private sector has been promoting business activities based on the recommendations by the Task Force on Climate-related Financial Disclosures (TCFD). They have also been making efforts to incorporate the concepts of sustainability and climate mitigation and adaptation into the International Financial Reporting Standards (IFRS). These trends show that UZAWA's idea of social common capital has already been widely adopted in the private sector beyond the public sector.

Who can realize a quality-oriented society? UZAWA says that social common capital should be managed and operated by professional groups with adequate expertise and good ethics. Japan's new river management policy, "River basin disaster resilience and sustainability by all," stresses the involvement of all stakeholders in the basin in this mission. "By all," of course, should not be interpreted as guaranteeing that there is always someone assigned to do the job for others. Rather, it positively calls for professional groups to work together beyond sectoral divisions while cooperating with citizens and private enterprises. To promote this multilateral cooperation, the science and technology community and society need to foster "Facilitators," that is, catalytic beings who can lead the way toward resolving problems by providing professional advice on site using a broad range of scientific and indigenous knowledge.

質の高い社会

2015年2月に改訂された日本の政府開発援助（ODA）大綱では、新たな方向性として包摂性、持続可能性、強靭性で定義される「質の高い成長」が打ち出された。その約半年後に国連で合意された2030アジェンダの前文では、「だれ一人取り残さない」という包摂性を宣誓し、「持続的かつ強靭（レジリエント）な道筋への移行」を決意している。そして2022年4月、熊本市で開催された第4回アジア・太平洋水サミットの成果文書「熊本宣言」では、強靭性、持続可能性、包摂性を兼ね備えた「質の高い社会」への変革が謳われた。

「質の高い社会」の構成要素は何であろうか。経済学者の宇沢弘文は、ゆたかな経済生活を営み、すぐれた文化を展開し、人間的に魅力ある社会を持続的、安定的に維持することを可能にするような自然環境や社会的装置を社会的共通資本と定義している。この社会的共通資本は、道路・河川・都市などの社会的インフラストラクチャーに加えて、大気・陸地・海洋などの自然環境や、教育・医療・金融などの社会的制度資本から構成されるとしている。近年、気候関連財務情報開示に関するタスクフォース（TCFD）の提言に基づく企業活動が活発化している。また、国際会計基準（IFRS）においては、サステナビリティや気候関連の開示に関する基準づくりも進められている。これらの動向に鑑みると、宇沢の考えが公共セクターのみならず、民間セクターにも及んできていることが汲み取れる。

「質の高い社会」の構築にはどのような人材が必要であろうか。宇沢によれば、社会的共通資本は職業的専門家集団により、専門的知見と職業的倫理観にもとづき管理、運営されるべきとされている。さらに、我が国の新たな治水政策である「流域治水」では、全てのステークホルダーの協働が強調されている。「全てのステークホルダーによる」は、言うまでもなく「誰かがやるのだろう」という意味でなく、それぞれの分野に責任を持つ専門家集団の相互連携と、市民や企業との協力を求めている。そのためには、幅広い分野の科学的知識を統合化し、地域に根付く歴史や文化、経験と組み合わせ、地域の取り組みの推進を支える人材、触媒的存在であるファシリテータの育成が必要である。

April 28, 2022

KOIKE Toshio

Executive Director of ICHARM

Special Topics

3. Greeting from new PWRI President FUJITA Koichi / 土木研究所 藤田新理事長挨拶
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5. ICHARM's research projects under the next medium- to long-term plans of PWRI / 次期中長期計画における ICHARM の研究について
7. Follow-up seminar for ICHARM graduates / ICHARM 修了者のための follow-up seminar の開催

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 14. Maksym Gusyev, Research Specialist [Combining hydrologic modeling with environmental isotopes to improve assessment of present and future water-related disasters in Asia] / ゲシエフ マキシム 専門研究員「Combining hydrologic modeling with environmental isotopes to improve assessment of present and future water-related disasters in Asia」]

Training & Education

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18. Action Reports from ICHARM Graduates
 18. Islam Md Khairul, Chief Staff Officer (CSO) to Director General, Bangladesh Water Development Board

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20. Pre-sessions for the thematic session "Water and disasters/Climate change" at the 4th Asia-Pacific Water Summit / 第4回アジア・太平洋水サミット テーマ別セッション「水と災害/気候変動」のプレセッション
21. The 54th Annual Session of Typhoon Committee / 台風委員会第54回総会

Coming Events

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Miscellaneous

23. Results of Newsletter surveys (No. 60 - No.63) / ニュースレター読者アンケートの結果報告
24. Personnel change announcements / 人事異動のお知らせ
25. Publications / 発表論文リスト

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

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

このたび、一層の内容の充実を図るべく、読者の皆様にアンケートをさせて頂きたく存じます。

つきましては、以下のサイトにアクセス頂き、アンケートにお答え下さい。

<https://forms.gle/cHPjysbvQSDZCyzP8>

回答期限：2022年7月28日まで

回答時間（目安）：5分程度

Thank you for subscribing ICHARM Newsletter. ICHARM has been publishing the quarterly newsletter since its establishment in March 2006 to deliver the latest news about research, projects and other activities to readers around the world. As we are currently working on the improvement of the newsletter, we would be grateful if you could spare time to answer the following questions and let us hear your voices about our publication.

Survey posted at: <https://forms.gle/cHPjysbvQSDZCyzP8>

Survey to be done by: July 28 2022

Time required: about 5 minutes

Special Topics

Greeting from new PWRI President FUJITA Koichi

土木研究所 藤田新理事長挨拶

I am FUJITA Koichi, the new president of the Public Works Research Institute (PWRI) since April 1, 2022. I am happy to have this opportunity to greet the readers of the ICHARM newsletter around the world.

There is no doubt that the earth is irreplaceable to us humans. However, the earth is, in its original state, so unready to provide for us that we must have some kind of "interface" to access the planet, through which we can enjoy its bounty, develop our societies sustainably, and improve our living environment. Since the birth of civilization, we humans have been engaged for eons in the creation of such interfaces, i.e., social infrastructure, and it is civil engineering that has supported the foundation of this endeavor.

PWRI was initially established in 1922 as the Civil Engineering Laboratory of the Ministry of Home Affairs, taking an important part in social infrastructure development. Since then, for a century, it has contributed to the nation's growth as a core institute responsible for improving civil engineering.

We all agree that social infrastructure has been and will be indispensable in human society. However, what is expected from social infrastructure changes with the times. Over the past 100 years, PWRI has looked into the true social needs of the time and tried hard to fulfill them. This April, the institute has just turned a new page by starting its new six-year plan with three primary focuses as follows:

- (1) Contribute to national land development to protect lives and livelihoods from natural disasters.
- (2) Contribute to the smart, sustainable management of social capital.
- (3) Contribute to the creation of vibrant, attractive communities and lifestyles.

The new plan addresses these focuses in response to urgent issues that Japan faces today: increasingly severe and frequent natural disasters, a vast volume of aging infrastructure, and the fast shrinking working-age population. PWRI will be striving to break through barriers and achieve these goals by brushing up on existing technologies and coupling them with digital and other emerging technologies. While mainly considering meeting the citizens' expectations, it will break free from conventional thinking and frameworks and be flexible in finding its way to promote interdisciplinary research and development.

Since its establishment, the strength of PWRI has always been based on the two-way process between the laboratory and the field. Its engineers look into the needs on site by themselves and identify what they need to study. They always give back the results of research and development to the field and provide engineering support to those working on site. This mindset and behavior are deeply rooted in the institute's DNA and passed on from generation to generation. PWRI, in close cooperation with MLIT and other organizations, has also been a place to maintain and strengthen this tradition, which helps young researchers become independent engineers to lead the coming era. PWRI will maximize its strength and commit itself to efficiently developing quality social capital and providing better interfaces bridging the gap between humans and the earth while fulfilling international responsibilities expected from Japan.



令和4年4月1日に国立研究開発法人 土木研究所 理事長に就任した藤田です。

私たちにとってかけがえの無い地球。しかし、元のままの地球はとても野性的なので、私たちの暮らしが良くなり、人間社会が持続的に発展でき、自然の恵みを楽しむよう、地球と人間の間には“インターフェース”が不可欠です。文明の発祥以来、人類はこれをつくる営みを積み重ねてきました。このインターフェース（⇒社会インフラ）づくりの根幹を支えるのが土木技術です。

土木研究所は、大正11年（1922年）の内務省土木試験所としての設立から、この営みを担う重要な一員になり、爾来一世紀にわたって土木技術の向上を担う中核機関として我が国の発展に寄与してきました。

人類にとっての社会インフラの重要性は不易。しかし、時代とともに追求すべきことは変わります。土木研究所もこの百年間、時代毎に社会が求めるものを洞察し、取り組みを展開させてきました。その新たなページを開くのが次の3つを柱にする令和4年度から6年間の新「中長期計画」です。

- ①自然災害からいのちと暮らしを守る国土づくりへの貢献。
- ②スマートで持続可能な社会資本の管理への貢献。
- ③活力ある魅力的な地域・生活への貢献。

これらは、我が国が今日直面する自然災害の激甚化・頻発化、膨大なインフラの老朽化進行、急速な生産年齢人口の減少を見据えたものです。実施においては、既存技術を伸ばし、壁を突破し、デジタル技術など新興著しい技術を組み込み、分野間の越境・融合を図る道筋を、国民が期待する目標達成を基軸に、従来思考・枠組みにとらわれず柔軟に考えていきます。

土木研究所の強みは、研究開発の成果を現場に還元することが当初から活動の主流にあることです。自らの眼力で現場の本質的ニーズを見抜いて研究課題を特定し、技術支援を行うDNAが受け継がれ、国土交通省等との密接な連携をはじめ、この力を持続・発展させる仕組みが備わり、それは次代を担う技術者が主体的に育つ場の提供にもつながっています。土木研究所は、この強みをさらに発揮し、我が国に期待される国際的役割も踏まえつつ、良質な社会資本の効率的な整備、そして人類と地球との間のインターフェースをより良いものにしていくことに貢献していきます。

(Written by FUJITA Koichi)

Commemorative lectures of PWRI former president

西川・前理事長講演会

西川和廣・前土木研究所理事長は2017年4月から5年間、土木研究所の発展に尽力され、2022年3月31日で退職されました。これを期に、記念講演会が2022年3月28日に土木研究所 ICHARM 棟講堂で開催されました。

西川・前理事長はこれまでの44年間の様々なお立場からの経験を振り返り、鋼橋に係る防食材料の耐久性の証明や輪荷重走行試験機を用いた試験法に係る技術的な解説、「戦略的」と「計画的」の違いから紐解く戦略的維持管理についての考え方、将来予測される巨大自然災害・少子高齢化社会・社会資本の老朽化に対して「想定外」を克服するために、どのような心構えをすべきかについて、今後土木研究所としてどのように研究を行っていくべきか、研究理念、研究の心構えについて、さらには国際活動の重要性についてご示唆をいただきました。

また、西川・前理事長には土木研究所企画部長をされていた際に、ICHARM の設立にあたって庁舎整備を始め各種準備にご尽力いただくとともに、第3回から第5回の ICHARM 運営理事会で議長として、その円滑な運営・進行を行っていただくなど ICHARM の運営にも多くの業績を残されました。

The former president of the Public Works Research Institute (PWRI), NISHIKAWA Kazuhiro, retired on March 31, 2022. He was in the position for five years from April 2017 and made great contributions to the progress of PWRI. Prior to his retirement, he delivered a commemorative lecture on March 28, 2022, at the auditorium of ICHARM.

He reviewed his 44 years of experience in various positions at different institutes and gave a lecture on the technical explanations about the proof of durability of anti-corrosion materials for steel bridges and the test method using wheels load running tester, the concepts of strategic maintenance management from the grasping the difference nuance between "strategy" and "plan", and suggestions on how to overcome the "unexpected" against the future natural disasters, an aging society with fewer children, and aging infrastructure in the future. He also shared his research philosophy and attitude with the audience with insightful suggestions about how PWRI should lead research and development in the area of social infrastructure. He ended his talk by stressing the importance of international cooperation and contribution.

In addition, when he was the Director of the Planning Department of the PWRI, he made a great deal of effort to prepare for the establishment of ICHARM, including the preparation of its building, and he also chaired the 3rd to 5th meetings of the ICHARM Governing Board in smooth operation and progress of the organization.



A scene from the lecture
西川・前理事長のご講演の様子



Group photo with participants
参加者との記念撮影

(Written by KAWAMOTO Takatoshi)

ICHARM's research projects under the next medium- to long-term plans of PWRI

次期中長期計画における ICHARM の研究について

The Public Works Research Institute (PWRI) of Japan develops a medium- to long-term plan to maximize the production of research results and their use for society, thereby efficiently creating and improving high-quality social capital. As part of PWRI, ICHARM conducts research according to this plan. The fifth medium- to long-term plan (FY2022-2027) has been developed and started being implemented since this April. This article will explain ICHARM's research projects to be conducted under the new plan.

The new medium- to long-term plans set three research and development themes:

- Contribution to the development and conservation of the national land that protects people's lives and livelihoods from natural disasters
- Contribution to the management of smart and sustainable social capital
- Contribution to vibrant and attractive communities and lifestyles

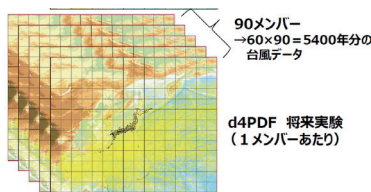
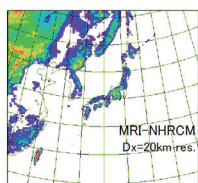
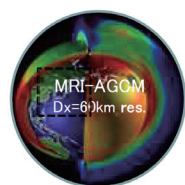
Concrete research and development programs are set under these themes.

ICHARM's research is categorized in the program of "Water disaster: Development of promotion support technology for River Basin Disaster Resilience and Sustainability by All against intensified water disaster" under Theme A. ICHARM will be conducting research to achieve the following four goals in response to increasingly more intense water disasters, taking into account the impact of climate change.

1. Predicting water-related disaster hazards accurately

- Development and improvement of technology to predict future water-related disaster hazards

Proposal of a rainfall-condition prediction method that contributes to making plans, etc.
計画等に資する降雨性状の推定方法の提案



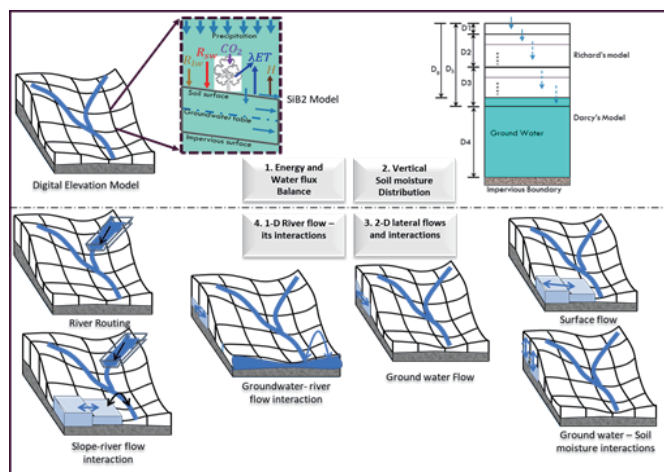
90 members
→60×90=5400年分の
台風データ
d4PDF 将来実験
(1メンバーあたり)

Dynamic downscaling method, sensitivity analysis of results produced using a bias correction method
力学的ダウンスケーリング手法、バイアス補正手法による結果の感度分析

Statistical evaluation of uncertainty using downscaling methods, etc.
ダウンスケーリング方法等による不確実性の統計的評価

2. Minimizing flood risk as much as possible

- Development of a method to appropriately implement and accurately evaluate the efforts to achieve "River Basin Disaster Resilience and Sustainability by All"



WEB-RR1 (Water and Energy based RRI) capable of considering water-energy balance and outflow flooding
水・エネルギー収支、流出氾濫を考慮できる WEB-RR1 モデル

土木研究所では、研究成果の創出を最大化し、その成果の社会への還元等を通じて良質な社会資本の効率的な整備等の推進を図るため、中長期にかかる計画を策定して、研究を推進しているところです。ICHARMにおいても、この中長期計画に基づき、研究を行っております。この4月、第5期（2022～2027年度）となる中長期計画が策定されました。この新しい計画の下でのICHARMの今後の取り組みについて紹介をさせていただきます。

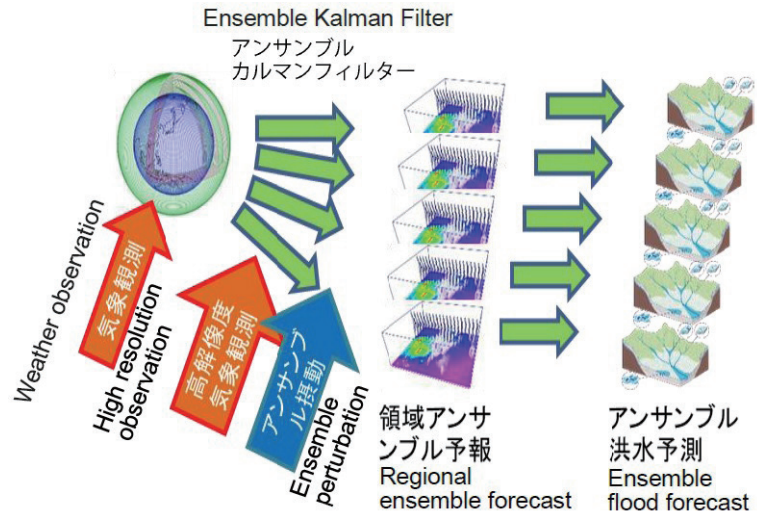
中長期計画では、A. 自然災害からのちと暮らしを守る国土づくりへの貢献、B. スマートで持続可能な社会資本の管理への貢献、C. 活力ある魅力的な地域・生活への貢献の3つの研究開発テーマが設定されており、このテーマの下に具体的な研究開発プログラムが複数設定されています。

ICHARMの研究は、“A. 自然災害からのちと暮らしを守る国土づくりへの貢献”テーマの中の、“水災害：水災害の激甚化に対する流域治水の推進支援技術の開発”のプログラムとして位置づけられております。具体的には、気候変動影響を踏まえつつ、水災害の激甚化に対して、次の4点の内容の研究を行うことを目的としております。

- 水災害外力を適切に想定
 - 将来の水災害外力の想定技術の開発・高度化
- 氾濫をできるだけ防ぐ
 - 流域治水による取り組みを的確に評価・実現する手法の構築
- 被害対象の減少
 - 適切な洪水氾濫リスク評価手法の開発
- 社会の強靱化
 - 水災害に対する社会の強靱化を図る技術開発

これらの研究を通じて、流域治水を推進するための技術開発を行い、自然災害からのちと暮らしを守る国土づくりへ貢献してまいります。

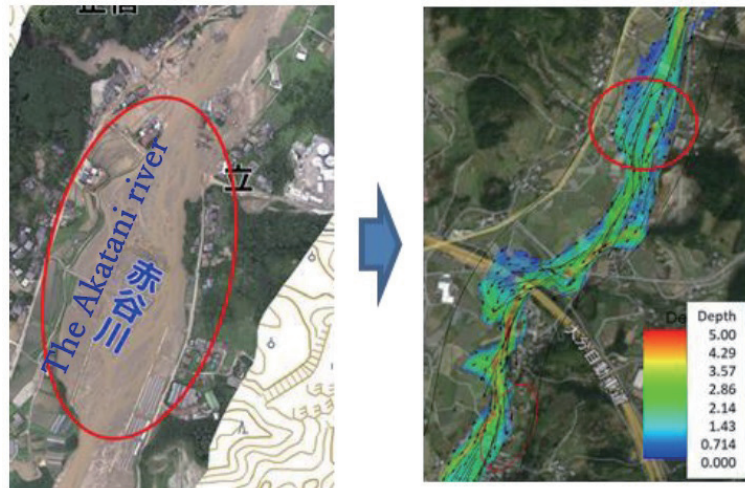
今後、ニュースレターにおいて成果を報告していきます。



Improvement of the forecasting accuracy of heavy rain locations by assimilating rain cloud areas
雨雲域の同化による豪雨位置の予測精度向上

3. Reducing flood damage risk areas

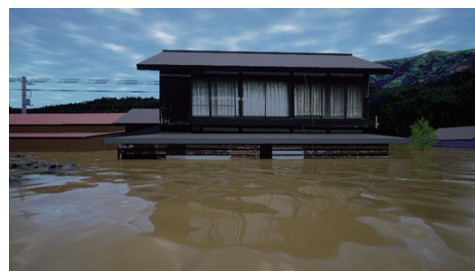
- Development of an accurate flood inundation risk assessment method



Sophistication and reliability improvement of a soil-driftwood-flood inundation simulation model
土砂・流木・洪水氾濫シミュレーションモデルの高度化と信頼性向上

4. Strengthening society's disaster preparedness and resilience

- Development of technology to help strengthen society's disaster preparedness and resilience against water disasters



A VR image of flooding and inundation
洪水・氾濫のVR



Raising awareness of flood risk reduction
水防意識醸成

Through these research projects, ICHARM will develop technologies to help achieve "River Basin Disaster Resilience and Sustainability by All" and contribute to the creation of a society that protects people's lives and livelihoods from natural disasters. Research results will be reported periodically in the ICHARM Newsletter.

(Written by YOSHINO Hirosato)

Follow-up seminar for ICHARM graduates

ICHARM 修了者のための follow-up seminar の開催

ICHARM was established in March 2006. One and a half years later, the Disaster Management Policy Program (master's program) was launched in October 2007, followed by the Disaster Management Doctoral Program in October 2010. As of September 2021, 157 students completed the master's program, and 15 students the Ph.D. program. They are active as leaders at their workplaces and communities in 37 countries, mainly in Asia, Africa, and Latin America. This year, a follow-up seminar was held on February 25, 2022, with all graduates participating online, aiming to further develop the capacity of the graduates and ICHARM. The total number of participants, including 80 graduates, exceeded 100.

The seminar, which began with an opening address by Mr. WATANABE Takeshi, the director general of JICA Tsukuba, consisted of three special lectures, two sessions of Focus Group Discussion, and General Sharing to share the discussion results with all participants. KOIKE Toshio, the executive director of ICHARM, concluded the event.

The first of the three special lectures was given by Dr. Johannes Cullmann, the director for Water and Cryosphere of the World Meteorological Organization. His lecture included facts about climate and water and analyses conducted by the World Meteorological Organization. He wrapped up his talk with powerful messages and expectations for ICHARM graduates and researchers for future contributions.

Dr. Ir. Muhammad Rizal, M.Sc, the director of the Ministry of Public Works Housing, Indonesia, also spoke for the seminar about a unique framework and activity called the Super Specialist Program. KOIKE followed. He talked about how difficult yet how critical it is to take bold, transformative steps to achieve a sustainable society by enhancing disaster resilience with concrete recommendations for action. These three special lectures were highly inspirational to all participants, including ICHARM graduates, leading them to enthusiastic discussions afterward.

The Focus Group Discussion consists of two sessions. In session-1, the participants were divided into six groups based on the topics they selected in advance at the time of registration. In each group, the members shared their issues and discussed possible solutions. Most of the topics they covered concerned climate change, hydrological processes, flood inundation, sediment, and river channel change, and disaster risk and response. These are the issues on which ICHARM has been working, and it was great to see them building on what they learned at ICHARM while working for their communities.

In session-2, six new groups were formed with different members and discussed how the graduates should keep in touch and cooperate and what should be done to make ICHARM's master's and doctoral programs more attractive. In the discussions, the participants agreed that opportunities like follow-up seminars are very important to strengthen cooperation among the graduates and improve each other's skills. They acknowledged that follow-up seminars are extremely effective, and many requested that they continue to be held once a year. Many valuable suggestions

ICHARM が設置されて一年半後の 2007 年 10 月に Disaster Management Policy Program (修士課程) が創設、さらに、2010 年 10 月には Disaster Management Doctoral Program (博士課程) が創設され、以降継続して教育活動が行われており、2021 年 9 月時点において 157 人の修士取得者および 15 人の博士取得者を輩出してきました。彼らはアジア、アフリカおよび中南米の地域を中心として 37 か国にまたがり、それぞれが自国の水防災に関するリーダーとして活躍しているところです。この修了者および ICHARM のさらなる発展を願い、2022 年 2 月 25 日に全修了者を対象にリモートにより follow-up seminar を開催しました。参加者は修了者 80 人に加え、教育に関わっている関係者等を含めて合計 100 人を超える規模となりました。

セミナーは、渡邊健 JICA 筑波所長のあいさつにより開会し、3 つの特別講演、Focus Group Discussion の 2 つのセッション、そしてそれらを全参加者で共有する General Sharing が行われ、小池俊雄 ICHARM センター長の結びにより閉会しました。

特別講演では、世界気象機関のヨハネス・クルマン部長からは、気候と水に纏わる事実と世界気象機関が行った分析について説明があり、さらに修了者および ICHARM の研究者に対して強い期待がメッセージとして表明されました。インドネシア公共事業・国民住宅省のムハマド・リザル局長からは、スーパー・スペシャリスト・プログラムなどのインドネシアにおける特徴的な取り組みが紹介されました。小池センター長からは、災害レジリエンス強化による持続可能な社会の実現に向けた大胆で変革的なステップの難しさと必要性、そしてそのための具体的な提言が伝えられました。これら 3 つの特別講演は、修了者のみならず、本セミナー参加者の高い関心を引き、それを受けて熱心な議論が交わされました。

2 つのセッションからなる Focus Group Discussion のうち、session-1 では、予め登録された topics に基づいて 6 グループに分かれて、課題を共有し課題解決の方法を議論しました。取り上げられたテーマは、気候変動、水文過程、洪水氾濫、流砂・河道変動、災害リスク・災害対応など、ICHARM が取り組んできた課題であり、修了者の現在の活動の中に ICHARM の独自性が反映されていることを知ることができました。session-2 においては、メンバーを組み換えて新たに 6 グループを再構成し、修了者の連携の在り方および修士・博士課程をより魅力的にするための方策に関する議論が行われました。その中で、連携を緊密にして互いを磨いていくためには、今回のような follow-up seminar は極めて



Special Lecture given by Dr. Johannes Cullmann, the director for Water and Cryosphere of the World Meteorological Organization
世界気象機関ヨハネス・クルマン部長による特別講演



Special lecture given by Dr. Ir. Muhammad Rizal, M.Sc, the Director of Directorate of Water Resources Technical Management, Ministry of Public Works and Housing, Indonesia
インドネシア公共事業・国民住宅省ムハマド・リザル水資源技術管理局長による特別講演

有効であり、年一回程度の開催要望が多く出されました。また、修士・博士課程の魅力の向上のための提案も多く出されました。いずれも貴重な提案であり、ICHARM内の技術相談の窓口の創設など実現が可能なものから、入学要件の変更など長期的に検討すべきものまで、多様な提案がありました。

General Sharing においては、二つの session において行われた各グループの議論について、12人の facilitator から報告され、議論及び提案の内容が報告されました。

参加者からの声

参加者 A :

Focus Group Discussion では大変良い議論ができました。気候変動と災害リスク軽減のグループでの最も興味深い論点の1つとして、主たる課題は市民から政策立案者まで等しく科学的データをコミュニケーション（伝達）することであるということでした。

参加者 B :

ICHARM のスタッフは、私たちの国々で行われている様々な活動の実施について知るためにもっと私たちの国を訪れるべきです。そうすることで博士課程と修士課程はより途上国の実情に沿えるものとなるでしょう。

参加者 C :

多くの卒業生が修士コースの期間をもっと長くすることを提案していました。数か月は長くすることを希望していました。

参加者 D :

今日私たちが参加しているような会議プラットフォームはとても有益です。なぜなら私たちは共に座り、会い、話し合い、そしてお互いから知識を得ているからです。このようなイベントは6か月毎、もしくは毎年開催するべきです。もっと非公式な催しで構いません。ICHARM 卒業生間の効果的な繋がりのためのもう一つのアイディアは、ポータルもしくはフォーラムを活用することです。

were voiced for making master's and doctoral programs more attractive, though some are feasible while others take a while to realize. Requests such as setting up a technical consultation window at ICHARM can be achieved relatively easily, but ones such as changing admission requirements may not be achieved in the short term.

In the General Sharing session, the issues raised in the two sessions were shared and discussed. Twelve facilitators reported on their discussions and proposals.

Voice of participants

Participant A:

We had good discussions during the session of Focus Group Discussion. In the group on climate change and DRR, one of the most interesting things was that the main challenge means the communication of scientific data equally to citizens and policy-makers.

Participant C:

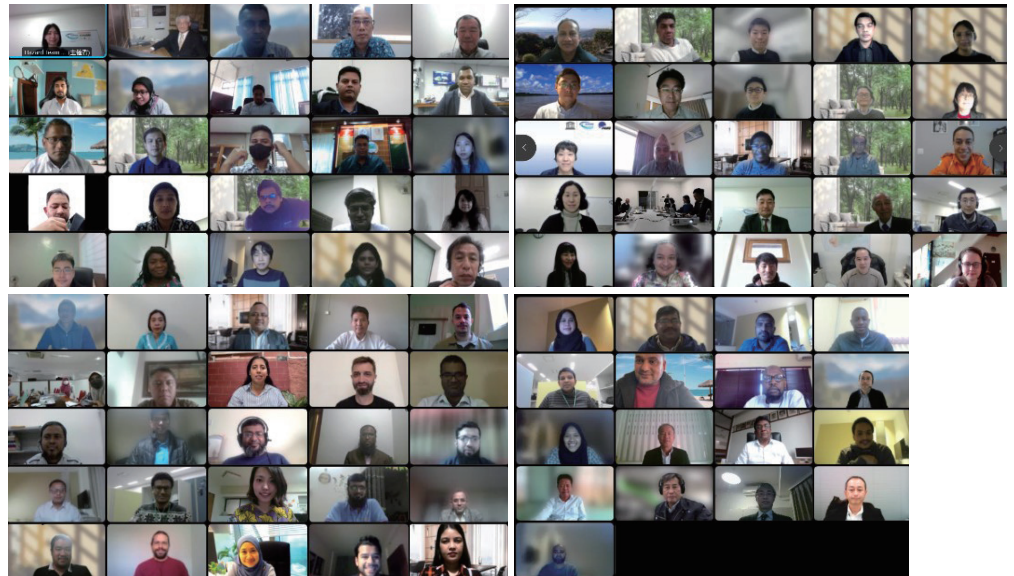
Many people proposed increasing the master's course duration. Several months should be added to the course.

Participant B:

ICHARM staff should visit our countries more to know about implementing various interventions. Then, the doctoral and master's course will be more tailor-made.

Participant D:

A meeting platform like we have today is very useful because we are sitting together, meeting, discussing, and getting knowledge from each other. We should keep this kind of event for every 6 months or every year. A more informal one is also fine. Another idea for effective linkage is the use of Portal/Forum.



Group photo
グループフォト

(Written by EGASHIRA Shinji and MIYAMOTO Mamoru)

Research

“Integrated Research Program for Advancing Climate Models (TOUGOU)” research report of ICHARM

文部科学省「統合的気候モデル高度化研究プログラム」研究成果の報告

ICHARM took part in the “Integrated Research Program for Advancing Climate Models” (TOUGOU) Research Program, a five-year research program sponsored by the Ministry of Education, Culture, Sports, Science and Technology of Japan (MEXT), from FY2017 to FY2021. In this program, ICHARM conducted practical research to assess flood and drought risks under climate change and implement climate change adaptation measures in two river basins: the Davao River basin in the Philippines and the Solo River basin in Indonesia.

As the TOUGOU Program ended in FY2021, the TOUGOU FY2021 Research Results Meeting was held on February 3, 2022 to report the part of research results among fellow researchers. The TOUGOU Final Report was also compiled in March. The following is a summary of the research reports made by ICHARM over the past five years.

1. ICHARM’s assignments in the TOUGOU Program

ICHARM conducted research on prototype development to support local implementation of climate change adaptation measures in the TOUGOU Program under Area Theme D, “Integrated Hazard Prediction (Area Theme Representative: Prof. NAKAKITA Eiichi, Kyoto University)” and Sub Area Theme iv, “Hazard Assessment for Asia-Pacific Countries and International Cooperation (Sub Area iv Representative: Prof. TACHIKAWA Yasuto, Kyoto University).”

The purpose of the research was to contribute to planning and implementing climate change adaptation in the Asia-Pacific region by predicting future climate changes that cause water-related disasters in the target region, establishing a platform for conducting risk assessment studies in cooperation with local researchers and practitioners, and promoting the implementation of climate change adaptation measures based on water-related disaster predictions performed using climate change prediction products.

2. Outline of the five-year research results

ICHARM conducted water-related disaster risk analyses in the Davao River Basin in Mindanao, Philippines, and the Solo River Basin in Java, Indonesia, and also supported them in implementing climate change adaptation and capacity building based on the current situation in the target areas.

Specifically, we selected Global Climate Models (GCMs) that fit the climate characteristics in each river basin and estimated the prediction range by statistical downscaling. We also conducted dynamical downscaling for the present climate (1979-2003) and the future climate (2075-2099) of the RCP 8.5 scenario using MRI-AGCM 3.2S and 3.2H, which are global atmospheric climate models developed by the Meteorological Research Institute of the Japan Meteorological Agency.

We also developed WEB-RRR models that can analyze both flood inundation and drought and estimated flood and drought damage risks.

In addition, an implementation plan was discussed with key stakeholders of the Platform on Water Resilience and Disasters in the Davao and Solo River basins to support the implementation of climate change adaptation measures.

As a result, they agreed to develop the “Online Synthesis System for Sustainability and Resilience (OSS-SR),” which integrates data, knowledge, information, experience, know-how, and technology for water-related disaster risk reduction. By using this system as an online e-learning platform, they also decided to promote a prototype initiative to foster “Facilitators,” who have the capability to translate science and

ICHARM では 2017 年度から 2021 年度までの 5 年間、文部科学省による研究プログラム「統合的気候モデル高度化研究プログラム（以下、統合プログラム）」に参画し、水災害に脆弱なアジアの 2 流域（フィリピン・ダバオ川、インドネシア・ソロ川）を対象に、気候変動下における洪水および渇水リスクの評価、気候変動適応策の実装に向けた実践的研究を実施してきました。

統合プログラムは 2021 年度で最終年度となり、2022 年 2 月 3 日に統合プログラム令和 3 年度研究成果報告会が開催され、研究内容の一部が報告されるとともに、3 月には統合プログラム報告書が取りまとめられました。以下、ICHARM が担当した 5 年間の研究内容を紹介します。

1. ICHARM の担当課題

ICHARM は、統合プログラムの研究のうち、「領域テーマ D. 統合的ハザード予測（領域テーマ代表：中北英一・京都大学教授）」、「領域課題 iv. ハザード評価のアジア・太平洋諸国への展開と国際協力（領域課題 iv 代表：立川康人・京都大学教授）」の下で、気候変動適応策の現地実装支援のためのプロトタイプ開発に関する研究を担当いたしました。

研究目的は、アジア・太平洋諸国の地域において気候変動適応に貢献するため、当該地域で水災害を引き起こすハザードの将来変化を予測するとともに、現地の研究者・実務者と協力して影響評価研究を実施する土台を形成の上、気候変動予測プロダクトを利用して、水災害予測を踏まえた気候変動適応策の実装を推進することとしました。

2. 5か年の研究内容の概要

ICHARM では、フィリピンのミンダナオ島ダバオ川流域及びインドネシアのジャワ島ソロ川流域を対象とし、水災害リスク解析を実施するとともに、対象地域の現況に応じた気候変動適応策ニーズ・能力の把握や現地実装支援を実施しました。

具体的には、両河川の流域において気候特性に適合する GCM（全球気候モデル）の選択と統計的ダウンスケーリングによる予測幅の推定を行い、MRI-AGCM（気象庁気象研究所が開発した全球大気気候モデル）3.2S および 3.2H の現在気候（1979～2003）と将来気候 RCP8.5（2075～2099）について力学的ダウンスケーリングを行いました。また、洪水氾濫・渇水ともに解析できる WEB-RRR モデルを構築し、洪水・渇水被害リスクの推定を行いました。

加えて、ダバオ川流域及びソロ川流域における気候変動適応策の実装支援を目的として、「水のレジリエンスと災害に関するプラットフォーム

ム」の主要関係者と実施計画について協議を行い、適応策策定のための手段として、水災害リスク軽減のためのデータ、知識、情報、経験、ノウハウ、技術を集結した「オンライン知の統合システム (Online Synthesis System for Sustainability and Resilience: OSS-SR)」を構築し、これをオンライン学習の場で活用することにより、最新科学技術を社会に翻訳する能力を持つファシリテーターを育成する取組をプロトタイプとして進めることとしました。

フィリピン・ダバオ市においては、OSS-SRの開発について、リアルタイム洪水監視・予測と気候変動影響の定量的評価に関する科学技術的な情報および知見を OSS-SR 上で閲覧できる機能を開発しました。さらに、これらに関連する10コマの入門講義とそれらに対する試験、4コマの実践研修を学習可能なeラーニング機能も開発しました。また、インドネシアにおいては、気候変動に適応した水関連災害のレジリエンスの確保や持続可能な開発のための担当者の人材育成及び関連行政機関間の連携の強化を目的とし、インドネシア公共事業・国民住宅省 (PUPR)、国家防災庁 (BNPB)、気象気候・地球物理庁 (BMKG)、環境・森林省 (KLHK)、農業省 (KP)、国立航空宇宙研究所 (LAPAN) の計6機関を対象とした能力開発プログラムを実施しました。このようなプログラムを通じ、分野横断的な政策立案が求められる気候変動適応策の検討にあたり、特に省庁間の連携に焦点を当てた適応策の検討や実装に貢献しました。

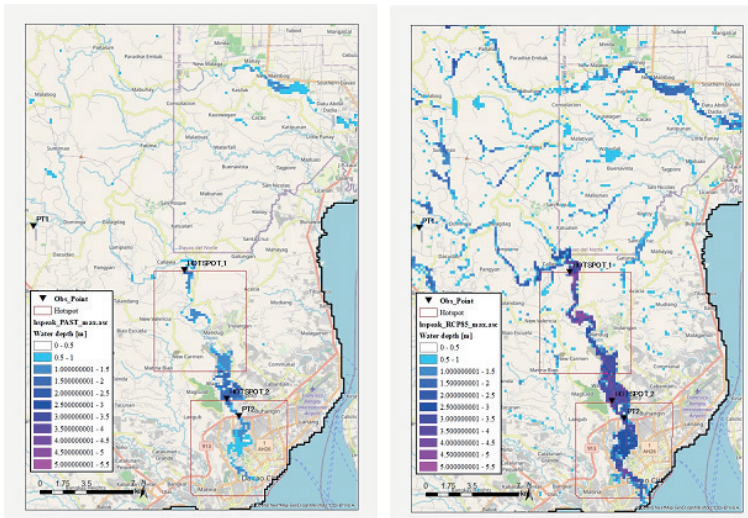
統合プログラムの計画年度は終了し、大きな節目を迎えますが、ICHARMは引き続き、これらの機関と協働しながら、アジア各国の水災害リスクの軽減を目的とした活動に取り組んでまいります。

technology into practical solutions to social issues.

In Davao City, the Philippines, the OSS-SR was developed to provide access to scientific and technical information and findings on real-time flood monitoring and forecasting and quantitative assessment of climate change impacts. In addition, an e-learning function has been developed to support users in learning ten introductory lectures and taking an exam for these lectures, as well as four related practical training sessions.

In Indonesia, capacity building programs were conducted for the purposes of developing human resources in charge of ensuring resilience to water-related disasters, promoting sustainable development adapted to climate change, and strengthening collaboration among six government agencies: the Ministry of Public Works and National Housing (PUPR), the National Disaster Management Agency (BNPB), the Meteorology, Climate, and Geophysics Agency (BMKG), the Ministry of Environment and Forests (KLHK), the Ministry of Agriculture (KP), and the National Institute of Aeronautics and Space (LAPAN). Through these programs, we have contributed to the research and implementation of adaptation measures with a particular focus on interagency collaboration in planning climate change adaptation measures that require cross-sectoral policymaking.

The TOUGOU Program came to an end, marking a major milestone. ICHARM will continue to build on its accomplishments and cooperate with these ministries and agencies to reduce water-related disaster risks in Asian countries.



Comparison of maximum inundation depths in basin-scale past and future climates using the WEB-RRI model (Davao River Basin)
WEB-RRI モデルによる流域スケールの過去気候と将来気候における最大浸水深の比較 (ダバオ川流域)

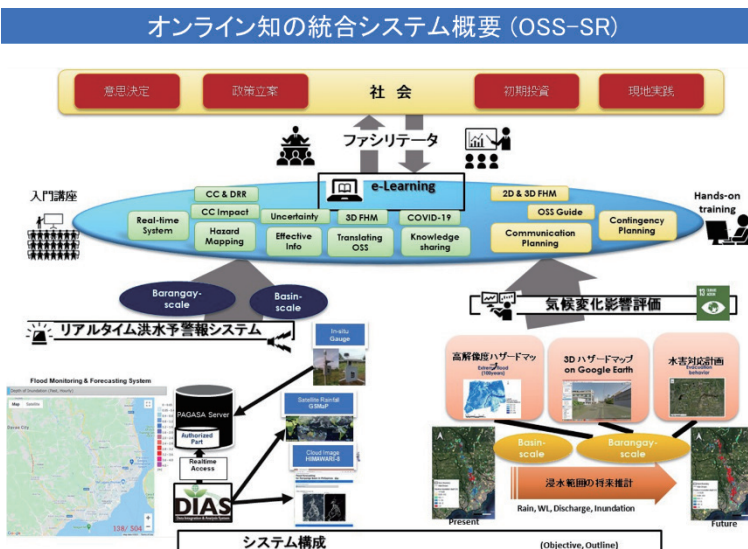


Image of the Online Synthesis System for Sustainability and Resilience
オンライン知の統合システムのイメージ

(Written by KAWAMOTO Takatoshi)

HyDEPP-SATREPS project updates: UAV training HyDEPP-SATREPS プロジェクト活動報告：UAV 研修

The Project for Development of a Hybrid Water-Related Disaster Risk Assessment Technology for Sustainable Local Economic Development Policy under Climate Change in the Republic of the Philippines (HyDEPP-SATREPS) is a 5-year joint research project between Japan and the Philippines under the Science and Technology Research Partnership for Sustainable Development (SATREPS). Since the kick-off of the project in June 2021, ICHARM and collaborative institutions, both in Japan and the Philippines, have been conducting various activities.

In October and December 2021, the projects members of ICHARM and Tohoku University participated in a series of training on data collection using an unmanned aerial vehicle (UAV or drone). In the first training, held on October 26 and 27 in the Tone River floodplain in Gunma Prefecture, they learned how to create topography data using aerial images taken by a drone. The automated drone flew using a flight application, taking photos at certain distance intervals. These photos were then processed using software to generate a digital surface model (DSM), which is 3D representation of elevation data (Figure 1). Such an elevation map can then be used, for example, for high resolution runoff modelling and flood modelling.

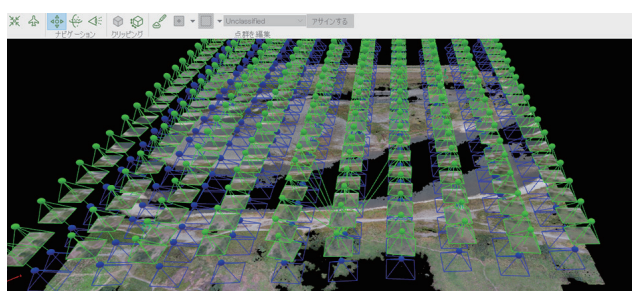


Figure 1 A software to process a series of aerial images to create DSM
図1 空撮写真から3次元標高モデル(DSM)を作成する様子

The next training was held on December 16 and 17 at the Tohoku University in Miyagi Prefecture to learn about agricultural crop monitoring using a drone mounted with a multispectral camera. First, we took aerial images as we did in the previous training. However, this time, they were taken using a multispectral camera with five different sensors. Each sensor captures a different range of the electromagnetic spectrum. Unhealthy plants reflect a specific spectrum range, which can be captured by one of the five sensors. In this way, crop conditions can be mapped and monitored. This technique will be used to validate a crop simulation model coupled with flood and drought models, which is currently under development as a part of the project.

These knowledge and skills, including those about drones and relevant software, will be shared with the project members in the Philippines to conduct studies. The members on the Japan side are looking forward to the day when restrictions related to COVID-19 will be lifted, so that we can meet in person for face-to-face knowledge sharing and field measurements to achieve the project goals.



Picture 1 Operating a drone with an application.
写真1 アプリケーションを用いてドローンを操縦する様子



Picture 2 A group photo from the training in December
写真2 12月に東北大学で行われた研修での集合写真

ICHARMは「地球規模課題対応国際科学技術協力プログラム(SATREPS)」でのフィリピンとの共同研究課題「気候変動下での持続的な地域経済発展への政策立案のためのハイブリッド型水災害リスク評価の活用(略称:HyDEPP-SATREPS)」の日本側研究代表機関として、2021年6月のキックオフ会議より日比両国の共同研究機関とともに様々な活動を行っています。

2021年10月と12月には、UAV(無人航空機、ドローン)を用いたデータ収集に関する研修を群馬県の利根川河川敷および宮城県仙台市の東北大学キャンパスにて実施し、ICHARMならびに東北大学のプロジェクトメンバーが参加しました。10月26～27日に行われた研修では、UAVによる空撮により広い空間の標高を簡単に精度よく計測する方法を学びました。UAVを専用のアプリケーションを用いて自動操縦することにより、一定の間隔で空撮を行い、それら一連の画像をソフトウェアで処理することにより、3次元標高モデル(DSM)を作成しました(図1)。これらの技術により、高精度な氾濫解析を実施することができます。

12月16～17日に東北大学で行われた研修では、UAVに搭載したマルチスペクトルカメラを用いて、農作物の育成状況をモニタリングする方法を学びました。マルチスペクトルカメラには5つのセンサーがあり、各センサーが電磁スペクトル中の固有の波長を計測できるようになっています。例えば、健康な植物と病気にかかった植物とでは、異なる波長の電磁スペクトルを反射しますので、これを利用して農作物の育成状態をモニタリングすることができます。研修ではまず、標高の測量と同様にアプリケーションによってUAVを自動操縦し、一定間隔で画像を撮影しました。それらの画像を専用のソフトウェアで処理し、各々のセンサーが計測した電磁スペクトルの反射を分析し、植生量分布をマッピングしました。これらの技術は、本研究プロジェクトで開発中である洪水・渇水状況を考慮した農作物成長予測モデルの精度検証に活用することができます。

今回の研修で学んだ技術を、今後、本研究プロジェクトに活用していく予定です。新型コロナウイルスを取り巻く状況が改善し、フィリピン側のメンバーとの対面での共同研究や観測実施ができる日を、メンバー一同心待ちにしています。

(Written by NAITO Kensuke)

Special contribution / 特別寄稿

ICHARM では、設立以来、100 名を超える研究者が従事してきました。その中でも岡田智幸氏は 2019 年 9 月～2020 年 9 月までの間、ICHARM の様々な活動に携わってこられました。現在は国連の経済社会局に勤務されており、このたびその業務について寄稿いただきましたので、ここに紹介いたします。

ICHARM has had more than 100 researchers since its establishment. Among them, Mr. OKADA Tomoyuki was engaged in various activities of ICHARM from September 2019 to September 2020. Presently working at the United Nations Department of Economic and Social Affairs, he kindly contributed a special article on his work to this edition of ICHARM Newsletter. It is our great pleasure to share it with readers across the world.



Progress and actions towards achieving SDGs SDGs の進捗状況と達成のための取り組み

OKADA Tomoyuki, United Nations Department of Economic and Social Affairs
岡田智幸 国連経済社会局

私は現在、国連経済社会局に上級プログラム担当官として勤務しています。前職の ICHARM では、リスクマネジメントチーム、続いて研修チームに約一年間、上席研究員として在籍しました。経済社会局では、持続可能な開発目標 (SDGs)、特に水と災害に関係した目標とターゲットが担当です。経済社会局の水分野の主要担当者として、様々な水関連会議や能力開発プロジェクトを、企画内容とロジ面から支援しています。本稿では、SDG6「安全な水と衛生」関連の目標とターゲットの進捗状況と、国連の取り組みについて紹介します。

まず、SDGs モニタリング情報の入手方法を述べます。経済社会局は毎年、SDGs の主な進捗状況を伝える目的で、「持続可能な開発目標 (SDGs) 報告」を公表しています。例えば、SDG1.5「経済、社会、環境面の災害への強靱化」では、2021 年 4 月時点で 118 国が国家 (地方) 防災戦略を報告しており、2015 年の 45 国から増えています。

SDGs とそのターゲットは、国連機関や国際機関が、モニタリング手法や国別データ収集を担当しています。SDG6 は 8 つのターゲットがあり、11 の指標で計測されています。UN-Water (淡水と衛生に関する業務をもつ国連機関の集まり) は、SDG6 の国際データを基に、「2018 年水と衛生に関する SDG6 統合報告書」と「2021 年 SDG6 進捗状況概要」のモニタリング報告書を公表しています。次は、2023 年に公表される予定です。また、UN-Water は、SDG6 モニタリングウェブサイト (<https://www.sdg6monitoring.org>) において、データのグラフや国の分類地図を提供しています。

持続可能な開発に関する国連ハイレベル政治フォーラム (HLPF) は、SDGs を評価する年次会議です。毎年 7 月開催のこのフォーラムには、中央政府や地方政府、市民団体が参加し、その年のテーマに選ばれた SDGs を詳しく議論します。SDG6 は 2018 年に評価され、次回は 2023 年です。SDGs の進捗をまとめた自発的 (国家地方) レビュー報告書を発表する国もあります。日本は 2017 年と 2021 年に、第 1 回目と第 2 回目の報告書を提出しました。

次に、水関連 SDGs の進捗状況を

My current position in the United Nations is Senior Programme Management Officer, Department of Economic and Social Affairs (DESA). Previous to this post, I had worked at ICHARM for about one year as a chief researcher in the Risk Management Team and then the Training Team. In DESA, I oversee the Sustainable Development Goals (SDGs), especially water and disaster related goals and targets. As the principal official in DESA's water sector, I provide substantive and logistical support to various water related conferences and capacity development projects. This article summarizes the progress of SDG 6 "Clean water and sanitation" and its related goals and targets, and the UN's actions towards the goals.

Firstly, I would like to introduce where to find SDGs monitoring information. DESA publishes "Sustainable Development Goals Report" every year to disseminate the key progress information on SDGs. For example, regarding SDG Target 1.5 "Build resilience to economic, social and environmental disasters", 118 countries reported national and/or local disaster risk reduction strategies as of April 2021, up from 45 countries in 2015.

SDGs and their targets are supervised by custodian agencies, namely UN or international organizations, responsible for monitoring methodologies and country data collection. SDG 6 has eight targets and 11 indicators to measure these targets. "UN-Water", the UN inter-agency coordination mechanism for freshwater and sanitation related issues, conducted two global data surveys on SDG 6, and issued monitoring reports, "Sustainable Development Goal 6 Synthesis Report on Water and Sanitation 2018" and "Summary Progress Update 2021: SDG 6". The next SDG 6 monitoring report is scheduled to be issued in 2023. UN-Water also operates the SDG 6 monitoring website (<https://www.sdg6monitoring.org>) providing SDG 6 data charts and country progress maps.

The UN High-level Political Forum on Sustainable Development (HLPF) is an annual review process of SDGs. Every July, national and local governments and civil society groups participate in HLPF to follow up on specific SDGs in depth. SDG 6 was reviewed in 2018 and will be reviewed again in 2023. Some governments release



United Nations Headquarters in New York
ニューヨークの国連本部



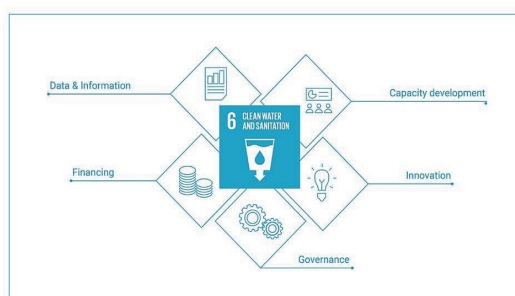
UN Conference Room 4
国連第 4 会議室

Voluntary National/Local Review reports on SDGs progress. Japan submitted its 1st and 2nd reports in 2017 and 2021, respectively.

Secondly, the current progress of water related SDGs could be assessed by the following data. Two billion people, a quarter of the global population, still live without safely managed drinking water. Furthermore, 3.6 billion people live without safely managed sanitation; namely, toilet facilities are shared with other households and excreta are not safely disposed of. The COVID-19 pandemic has highlighted the fact that 2.3 billion people worldwide lack basic handwashing facilities with soap and water at home. Over 80% of wastewater is released into the environment without adequate treatment, posing threats to environmental water quality. Some arid regions rely heavily on nonrenewable water resources that will eventually run out. Floods and droughts caused economic damage of almost US\$ 700 billion in the past 20 years. The world is not on track to meet the water related SDGs and targets by 2030. Estimates show that up to quadruple rates of progress are immediately required.

Lastly, the United Nations is leading global actions towards SDG 6. The UN General Assembly adopted the resolution to declare the period from 2018 to 2028 as the International Decade for Action "Water for Sustainable Development" to achieve sustainable development and integrated management of water resources. DESA in collaboration with UN-Water supports national progress on water related goals through the SDG 6 Global Acceleration Framework and the SDG 6 Capacity Development Initiative. In March 2023, the UN 2023 Water Conference will be convened in New York to assess progress in the first half of the Decade and to identify necessary actions for the second half. The Water Conference is expected to become a game changer packed with actions and commitments of governments and stakeholders to realize a greener, safer and better society. I encourage all UN Member States and a wide range of stakeholders to actively join the Water Conference and its preparatory process.

*The views expressed herein are those of the author and do not necessarily reflect the views of the United Nations.



SDG 6 Global Acceleration Framework
SDG 6 国際推進枠組

データで示します。世界人口の4分の1を占める20億人が、安全な飲み水のない生活を送っています。さらに、36億人が安全な衛生施設を有していません。つまり、トイレが他の家族と共有され、排泄物が安全に処理されていないのです。また、コロナ禍により、23億人の家庭で、石けんと水を備えた基本的な手洗い設備がないことが浮き彫りになりました。汚水の8割以上が、適切に処理されずに自然界に放出され、水質環境に害を及ぼしています。乾燥地帯では、非再生の水資源（将来枯渇するような地下水など）に頼り過ぎている所があります。洪水と渇水は過去20年間に、約7,000億ドルの経済被害をもたらしました。水関連のSDGsとターゲットを、目標年の2030年までに全世界で達成するのは、困難であると見込まれています。達成するには、直ちにこれまでの4倍の速度で進捗を図る必要があります。

最後に、国連はSDG6実現に向けた世界的な取り組みを主導しています。国連総会は2018年から2028年を、「国際行動の10年『持続可能な開発のための水』」とする決議を採択し、持続可能な開発や水資源の統合管理を進めています。経済社会局はUN-Waterと協力しながら、SDG6国際推進枠組やSDG6能力開発イニシアティブを通じて、各国の水関連目標の達成を支援しています。2023年3月にニューヨークで開催される2023年国連水会議では、水の10年の前半を評価し、後半に必要な活動を決める予定です。この水会議は、政府や関係者が取り組みや計画を発表する画期的な場となり、環境に優しく、安全でより良い社会を実現できる機会となるよう期待されています。全ての国連加盟国や多くの関係機関が、積極的に水会議やその準備プロセスに参加することを望みます。

*本文の意見は筆者個人のもので、必ずしも国連の見解を反映したものではありません。

Introduction of ICHARM research projects / 研究紹介

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

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

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

This issue introduces a researcher as listed below:

Maksym Gusyev, Research Specialist

Combining hydrologic cycle modeling with environmental isotopes to improve assessment of present and future water-related disasters in Asia

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、グシエフ マキシム専門研究員の「Combining hydrologic cycle modeling with environmental isotopes to improve assessment of present and future water-related disasters in Asia」を紹介いたします。



Combining hydrologic modeling with environmental isotopes to improve assessment of present and future water-related disasters in Asia

Maksym Gusyev, Research Specialist

Numerical models of the water cycle are useful tools to simulate water infrastructure, such as dams, under various climate extremes of droughts and floods, while environmental isotopes provide unique information on water circulation for enhancing hydrologic modeling. In ICHARM, I have greatly expanded my modeling research to characterize the water cycle, floods and droughts, water infrastructure management, and climate change in various river basins of Asia, Europe and West Africa regions. Being a researcher in Theme D of the 5-year Program for Risk Information on Climate Change (SOUSEI program), I developed new standardized indices of soil moisture, groundwater recharge, and dam inflow to investigate natural and socio-economic droughts in the dams of the Pampanga (the Philippines), Chao Phraya (Thailand), and Solo (Indonesia) River basins [1] by improving the dam module in the distributed hydrologic block-wise TOP (BTOP) model [2]. These indices were listed in the WMO (2016) "Handbook of Drought Indicators and Indices", making it a valuable research contribution. I also contributed to the development of a "comparative" standardized index concept to be utilized for climate change assessment [3]. For flood research, I confirmed the good performance of the Global BTOP model, which was developed on 20-km grids globally [4], with the 0.5-km grid BTOP model in the Rhine River basin [5].

Using the Global BTOP model of the Indus (Pakistan) river basin, I achieved a good performance of hydrologic modeling with snow accumulation and melt processes in the Upper Indus based on the Tarbela Dam inflow data (see Fig 1), and the calibrated BTOP model was applied for assessing the climate change impacts of the RCP8.5 scenario between the 1979-2003 and 2075-2099 periods (Fig 2). As shown in Figure 2, the flood peak inflow decreases in magnitude for all four cases of the RCP8.5 far-future period while increasing Tarbela Dam inflow during the non-flood season. This result indicates the need to adjust dam operation rules and storage volume for flood control and water supply of the Tarbela Dam and was demonstrated to Government officials during face-to-face meeting at Pakistan Meteorological Department, Islamabad. In addition, I have been transferring my methods to ICHARM's students studying many river basins for their research of Master theses [6-9].

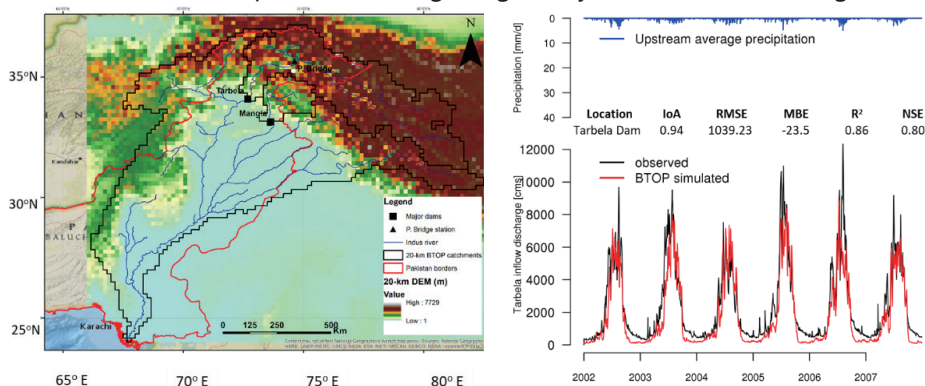


Figure 1 The Indus River basin elevation of the 20-km global BTOP model (left) and the BTOP-simulated daily inflow of Tarbela Dam from 2002 to 2008 (right).

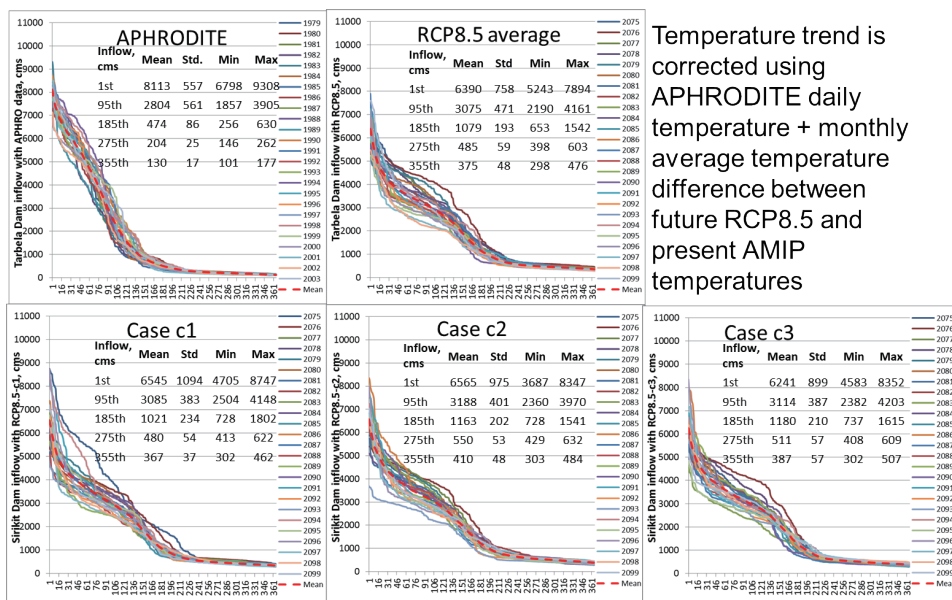


Figure 2 Sorted daily Tarbela Dam inflows with present APHRODITE (01/1979-12/2003), and future RCP8.5 average (01/2075-12/2099), c1, c2 and c3 cases [1, 3].

Temperature trend is corrected using APHRODITE daily temperature + monthly average temperature difference between future RCP8.5 and present AMIP temperatures

Bringing my knowledge of environmental tracer modeling from GNS Science to Public Works Research Institute (PWRI) allowed me to advance numerical modeling technology with environmental tracers to better characterize the subsurface groundwater storage, which is the main contributor to baseflow river discharge, especially during droughts, and it is usually lacking representation in distributed catchment-scale hydrological and rainfall-runoff-inundation models. In Japan, my PWRI research in radioisotope hydrology focused on integrated surface water, groundwater flow, and mass transport modeling to be combined with the BTOP model, which has a calibration parameter of groundwater mean travel distance that can be estimated with environmental isotope data. To achieve this, I implemented a pilot PWRI-funded project (2014-2016) to apply GNS Science tritium ultra-low level analysis capabilities in the headwater

catchments of the Ishikari River basin, Hokkaido [10], while monitoring tritium with other isotopes in precipitation across Japan as well as in snowpack of the Ishikari basin, Hokkaido [11] (see Figure 3). As the result of my research, environmental tritium-tracer with the ultra-low level analysis have been re-introduced to Japan, leading to the follow-up PWRI-funded project (2017-2020) in the Chikuma and Tone river basins including tritium-radioisotope monitoring in precipitation using medium-level tritium analysis at Hirosaki University to confirm natural tritium concentrations. These radioisotopic research activities have been recognized by the International Atomic Energy Agency (IAEA), leading to my IAEA Expert/Lecturer appointment, and the IAEA, jointly with the Ministry of Foreign Affairs, appointed me as the Alternate National Project Coordinator (ANPC) of Japan for the Asia-Pacific Region under the RAS/7/030 (2016-2019) and RAS/7/035 (2020-2023) Projects with my IAEA activities listed in ICHARM's Governing Board reports. In summary, my research in radioisotope hydrology utilized young and old groundwater tracers to evaluate fresh groundwater potential in fractured rocks (deep wells) and alluvium (shallow wells) and to examine the recharge mechanism of spatially groundwater-surface water linked systems by developing numerical models for the study areas of interest [12-15].

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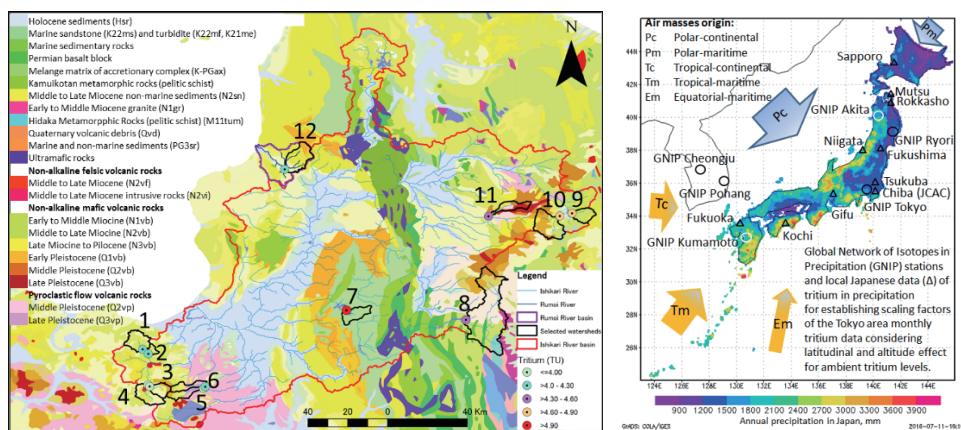


Figure 3 Tritium analysis results of the river water samples in Hokkaido (left) and evaluated tritium in precipitation data across Japan (right).

Training & Education

Educational program updates

研修活動報告

ICHARMでは2007年以降、国際協力機構(JICA)、政策研究大学院大学(GRIPS)と連携し、主に外国人行政職員を対象として、約1年間で学位を取得できる修士課程研修コースを設けています。例年、10月から翌年3月までの6カ月は主に講義や演習が行われ、4月から8月にかけては論文執筆に取り組めます。

<実習>

●Project Cycle Management研修 (1月5日~7日)

年明け早々3日間に渡り、学生は専門のモデレーターのもとで「Project Cycle Management」(PCM)のワークショップに参加しました。このPCM手法は、あるプロジェクトを手掛ける際に適用される計画・実行・評価のサイクルの管理に役立つ実用的かつ論理的なアプローチ手法です。学生全員にとって新たに学ぶ手法であり、研修当初は与えられた様々な課題に戸惑っていましたが、研修終了後は、「帰国後に予想されるプロジェクトの企画立案で活用したい。」「予算・時間・権限が限られている中で代替的なアプローチや手段の検討につながることを期待できる。」「修士論文の執筆に関しても、課題の論理的な分析ができるPCM手法を用いて研究計画を錬磨させたい」などの肯定的な意見がありました。

また多くの学生が論理性のメリットを強調している一方で、ある学生はPCM手法の別の特徴である「参加型」に着目し、講義・調査・コミュニティサービス等あらゆるステージで活用でき、特にコミュニティベースのプロジェクトの立案において非常に有用であるとの特徴的な意見もあり、本研修の重要性が改めて認識されることとなりました。

<視察>

●都市河川流域他視察 (3月2日~3日)

3月には、講義で学んだ都市型の河川防災対策及び気象に関する現場の最前線を訪問するため1泊2日の視察を実施しました。

1日目は、始めに国土交通省荒川下流河川事務所を訪問し、早川潤事務所長より、首都東京を流れる大川川である荒川の洪水被害の歴史や現在の治水対策及び防災情報システムの取り組みについて、資料館、災害対策室及び新田高規格堤防において説明を受けました。特に日本の新たな治水政策である流域治水と持続可能な開発目標であるSDGsの概念を取り入れた取り組みに学生も深い関心を示しておりました。

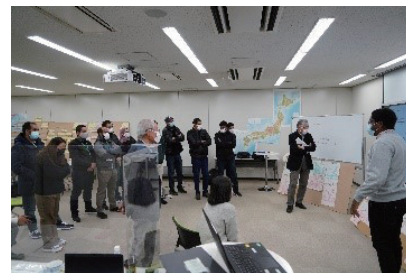
次に江東区中川船番所資料館を訪れました。当資料館には、江戸時代、関東一円の川筋と江戸を結ぶ、水運の大動脈である小名木川を通る船の取り締まりを行った中川番所

Since 2007, ICHARM has provided a one-year master's program, in collaboration with the Japan International Cooperation Agency (JICA) and the Graduate Institute for Policy Studies (GRIPS), which is designed mainly for officers of overseas government organizations. Students mainly attend lectures and practices in the first term from October to March and work on their individual theses in the second term from April to August.

<Practice>

●Project Cycle Management Training (January 5-7)

In early January, the students participated in a three-day workshop on "Project Cycle Management" (PCM) under the supervision of a professional moderator. This PCM method is a practical, logical approach to help manage the cycle of planning, execution, and evaluation when applied to undertake a project. Since all of the students were new to this method, they were puzzled at first when various tasks were given to them. However, after the training, they voiced positive comments: for example, "I want to use this method in the planning of their anticipated projects after returning to my home country," "I expect it will lead to the consideration of alternative approaches and means given the limited budget, time, and authority," and "With regard to writing my master's thesis, I would like to refine my research plan by using the PCM method, which allows for logical analysis of issues."



A student presentation at PCM Training
PCM研修における学生発表

While many students emphasized the logical aspect of the approach, a student pointed out the "participatory" nature of the PCM method, which can be used in a wide variety of scenes, including lectures, surveys, and community services, and is especially useful in the planning of community-based projects. The training brought the students to a deeper understanding of the PCM method.

<Field trip>

●Urban river basins and other sites (March 2-3)

In March, the students went on an overnight trip to take a close look at the frontlines of urban river disaster prevention measures and weather-related topics learned in the lectures.

On the first day, they visited the Arakawa Downstream River Office of the Ministry of Land, Infrastructure, Transport, and Tourism (MLIT), where Mr. HAYAKAWA Jun, the director, gave them a short explanation of disaster prevention measures for the Tokyo metropolitan area.

He showed them around the museum, the Disaster Management Headquarters, and the Shinden High-Standard Levee, while speaking about past flood disasters in the Arakawa River area and current flood control measures, including their disaster management information system. The students were particularly interested in Japan's new flood control policy, "River Basin Disaster Resilience and Sustainability by All," and the efforts incorporating the concept of the Sustainable Development Goals (SDGs).



Listening to an explanation about the Shinden District High-Standard Levee
新田高規格堤防にて

Next, the students visited the Koto-ku Nakagawa Ship Guard Station Museum holding a special exhibition on "Water Transportation around Edo." The museum exhibits a diorama reproducing part of the Nakagawa Funabansho (ship guard station), which oversaw ships passing through the Onagi River, a major artery of water transportation connecting Edo (Tokyo) and other streams in the Kanto Region. The students learned about how a river network was developed, how rivers helped the people distribute goods, how river ships were made, how unique culture grew around rivers, and so on, in old Tokyo.

The students then moved on to the Edo Tokyo Museum, where they learned about 400 years of the history and culture of Edo and Tokyo. Besides the exhibitions, they were deeply impressed to learn that the museum built in a stilted-house style has functions to treat rain water for securing water resources and reducing domestic water use. It is designed to store and use rainwater to save tap water and to contribute to flood control when necessary.



At the Tokyo Metropolitan Edo Tokyo Museum
東京都江戸東京博物館にて

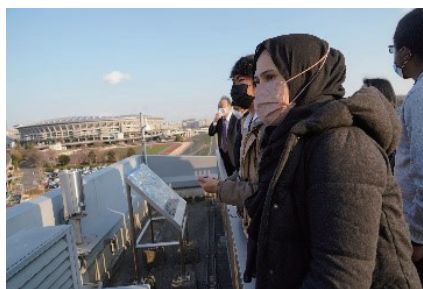
On the second day, students visited the Japan Meteorological Agency (JMA) of MLIT. First, they were given a brief explanation about weather and flood forecasting. They learned that JMA also plays a critical role in national disaster management as a provider of meteorological information essential for disaster prevention and preparedness. Then, they visited the Meteorological Science Museum, where they tried out various kinds of models and equipment actually used at JMA.

They then visited the Tsurumi River Basin Information Center, a regional disaster prevention facility managed by the Keihin River Work Office of MLIT in Kanagawa Prefecture. First, they attended a lecture on "Integrated River Basin Management on Urban Rivers in Japan" by Mr. IMBE Masahiro, the chief advisor of the Association for Rainwater Storage and Infiltration Technology. After that, a staff member from the Keihin River Work Office explained the river and basin development of the Tsurumi River. The Tsurumi River basin is an area of rapid urbanization and dense housing, which makes river construction difficult, and thus once a flood occurs, the impact can be extremely severe. Because of that, they have developed a system using riverside recreational spaces to control flooding; When the river water rises and overflows weirs and levees, the floodwaters flow into the recreational spaces that hold it temporarily. After the lecture, students went up to the rooftop of the center to view the Tsurumi River and a multipurpose retarding basin, which helped them deepen their understanding of comprehensive flood control consisting of various facilities and structures.

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



Answering quizzes at the Meteorological
Science Museum
気象科学館にてクイズに挑戦



Viewing a multipurpose retarding basin from the roof-
top of the Tsurumi River Basin Information Center
鶴見川流域センター屋上から多目的遊水地を眺望

の一部を再現したジオラマなどがあり、学生は「江戸をめぐる水運」をテーマに、かつての日本の中心都市における川の整備・流通・川舟・文化等について学びました。

その後、東京都江戸東京博物館に移動し、約400年にわたる江戸東京の歴史と文化について、実物資料や復元模型等を目にしながら学ぶことができました。特に館職員より、この高床式の倉をイメージした博物館自体が雨水処理設備として利用されており、水資源の確保を図り、水道水の使用を節減するとともに、雨水を一時的に保水することにより、治水対策に寄与する建物である旨の説明を受け、学生も深い関心を示しておりました。

2日目は、国土交通省気象庁を訪れました。まず、本庁職員より気象予報業務及び洪水予報業務に関する講義を受けました。学生は、気象庁が防災・気象情報の提供者として、国の防災に重要な役割を担っていることを学びました。その後、庁内にある気象科学館を訪れ、気象庁で実際に使われている様々な模型や機材に触れる機会を得ました。

その後、神奈川県にある国土交通省京浜河川事務所管轄の地域防災施設である鶴見川流域センターを訪れました。始めに公益社団法人雨水貯留浸透技術協会の忌部正博水循環アドバイザーによるIntegrated River Basin Management on Urban Rivers in Japanの講義を受講しました。その後、京浜河川事務所の職員より、鶴見川の河川・流域整備について説明を受けました。鶴見川流域は急速に都市化が進み住宅等が密集する地域であることから、河川工事が難しいことに加え、ひと度洪水が起こればその影響は非常に大きいため、その対策の一つとして新横浜地区に多目的遊水地が整備されました。鶴見川の水位が上がると越流堰から遊水地に水が流れ込み鶴見川の氾濫を抑える役目を果たしています。講義後、学生は同センターの屋上に上がり、実際の鶴見川や多目的遊水地を見渡しながら、流域の各施設が一体となった総合治水対策について理解を深めました。

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。

(Written by MIYAZAKI Ryosuke)

Action Reports from ICHARM Graduates

ICHARMでは、政策研究大学院大学 (GRIPS)、国際協力機構 (JICA) と連携して、世界各国から洪水対策の行政官を対象として、1年間の修士課程「防災政策プログラム 水災害リスクマネジメントコース」を実施するとともに、3年間の博士課程「防災学プログラム」を実施しています。これまで100名を超える実務者・研究者の方々が各課程を修了し、帰国後、本研修で習得された知識や経験を生かして、様々な分野において活躍されています。

ICHARMニュースレターでは、こうした修了者の方々から、ご活躍の様子について寄稿していただくこととしております。本号では2018年度 (6期) 博士課程卒業のMd Khairul Islam氏 (バングラデシュ) から寄稿いただきましたので、ご紹介します。

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

Since their launches, over 100 practitioners and researchers have completed either of the programs. They have been practicing knowledge and experience acquired through the training in various fields of work after returning to their home countries. This section is devoted to such graduates sharing information about their current assignments and projects with the readers around the globe. Md Khairul Islam (Bangladesh), who graduated from the doctoral program in 2018, has kindly contributed the following article to this issue.

Md Khairul Islam

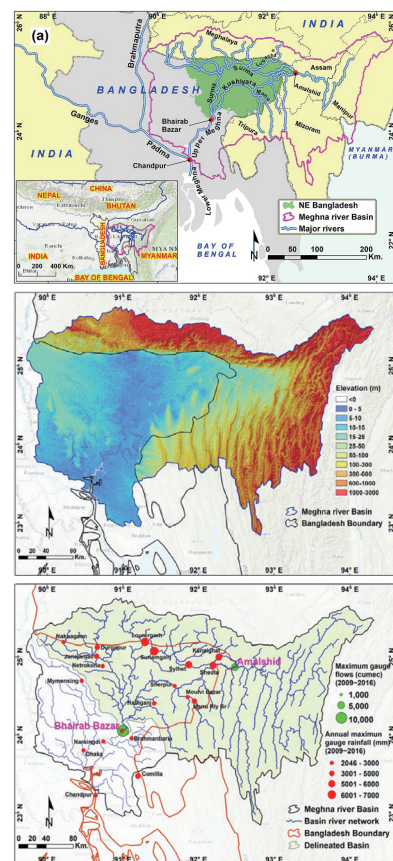
Chief Staff Officer (CSO) to Director General, Bangladesh Water Development Board



Japan was the first foreign country I had ever visited to pursue my higher study, and it was made possible by a collaborative research program of JICA, GRIPS, and ICHARM. I had spent four years of my academic life at ICHARM. In 2013, I enrolled in an MS program in water-related disaster management and completed it in 2014. Later in 2016, I began working as a research assistant at ICHARM for a Ph.D. program, directly under the supervision of Professor Mohamed Rasmy. I was on leave from my job at the Bangladesh Water Development Board (BWDB) to pursue my Ph.D. at ICHARM. In 2018, the Ph.D. program was successfully completed.

"Developing a methodology for integrated flood risk assessment in a trans-boundary river basin using multi-platform data under global change – the case of the Meghna river basin" was the title of my Ph.D. thesis. The downstream of the Meghna basin is located in northeastern Bangladesh (Haor areas – low lying draining depressions), which contributes approximately 20% of the national economy through agriculture and aquaculture activities. However, the area is prone to flooding during both the pre-monsoon and monsoon seasons, making it vulnerable to flood disasters. The study's findings suggested several policy implications and countermeasures, both structural and non-structural, to reduce such disasters and improve preparedness and recovery.

Following the completion of my Ph.D., I returned home and rejoined BWDB in the Directorate of Planning-1's office. As an Executive Engineer of this office, I had the opportunity to work on several research projects: for example, (i) Feasibility study for flood and drainage management of Haor areas in Sunamganj District of Bangladesh; (ii) Feasibility study for integrated water resources management and development of the Surma-Kushiyara River basin in Sylhet District; and (iii) Comprehensive study for flood and drainage management of the upper Meghna basin within Bangladesh. These projects aim at focusing on the Haor region of Bangladesh. The overall goal is to find a long-term sustainable and realistic solution to pre-monsoon and post-monsoon floods and drainage management of the Meghna basin with special emphasis on the agriculture of the area, facilitating safe harvesting of Boro rice (main crop of the area) as well as exploring the potentiality of fisheries, environmental conservation, ecological balance and overall improvement of people's livelihood of the area. BWDB will undertake development projects to achieve the above-mentioned objectives based on the findings and outcomes of these ongoing studies.

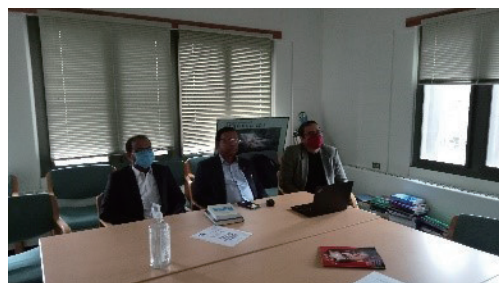
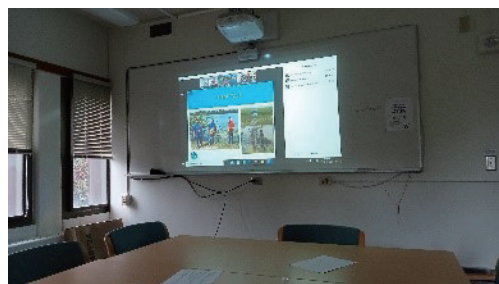
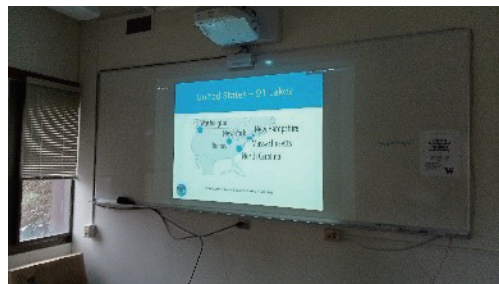


Topographic features of the Meghna basin with a detailed river network

While working in the Directorate of Planning-1, I was given the additional charge of the Chief Staff Officer (CSO) to the Director General (DG) of BWDB. A few months later, I was promoted to Superintending Engineer and assigned full-time as the CSO to DG. As CSO, I have the opportunity to be involved in BWDB's overall administrative and technical activities. As a result, I have gained a thorough understanding of several development projects (both Government of Bangladesh funded and Foreign aided) relating to riverbank protection, flood control & drainage, water resources management, projects under Bangladesh Delta Plan-2100: for example, (i) Haor Flood Management and Livelihood Improvement Project; (ii) Coastal Embankment Improvement Project; (iii) Char Development and Settlement Project; (iv) Flood and River Bank Erosion Risk Management Program; and (v) Climate Smart Agriculture and Water Management Project. In connection with these projects, I am required to attend a number of meetings and workshops and interact with national and international officials, delegates, and technical people, all of which provide me with opportunities to gain multi-dimensional experiences and thus improve my professional efficiency.

I've recently been working as one of the focal points of some collaborative projects with the University of Washington (UW) in the United States. Last February, I attended a seminar and consultation workshop on "Strategic Research Collaboration with the University of Washington to Strengthen Water Resources Management in Bangladesh." The workshop primarily focused on the flash flood forecasting system in the northeast region of Bangladesh, Sentinel-1 SAR data based inundation map generation, surface water storage volume estimation using satellite data, the introduction of Citizen Science in Bangladesh, and the development of a smart irrigation system in BWDB projects. Researchers from the University of Houston and University of Alabama and NASA scientists took part in the workshop via the Zoom platform. We talked about the progress and outcomes of the aforementioned collaborative studies, as well as the possibility of future collaboration between BWDB and the UW. Some of these include: (i) determination of upstream water level information using satellite data during the pre-monsoon and monsoon seasons; (ii) technical support for the development of a coastal model, a storm surge model, and a groundwater model; and (iii) the development of a system to calculate seasonal volume changes in various water bodies (Haors, Ponds, etc.) using satellite data. As the CSO to DG, I've taken advantage of the opportunity to be involved with these projects as one of the focal points for the past couple of years.

It was a fantastic opportunity for me to study and work at ICHARM, and I was delighted to spend time there. I'd like to take this opportunity to thank all of the ICHARM professors, researchers, and staff for their kindness and support during my time in Japan. I wish you the best of luck in this pandemic situation.



Consultation workshop on collaborative projects in the UW

Information Networking

Pre-sessions for the thematic session “Water and disasters/Climate change” at the 4th Asia-Pacific Water Summit

第4回アジア・太平洋水サミット テーマ別セッション「水と災害／気候変動」のプレセッション

第4回アジア・太平洋水サミット (APWS4) が2022年4月23～24日に日本・熊本で開催されました。このAPWS4において、他の国内・海外機関と協働しつつ、ICHARMはテーマ別セッション「水と災害／気候変動」のリード・オーガナイザーに任命されました。APWS4に向けて、各現場や国内・国際的な経験についてレビューを行い、今後の方向性や行動を模索していくため、科学技術 (S&T)、ガバナンス、ファイナンスの観点からのプレセッションがオンラインで開催されました。

科学技術のプレセッション (2月15日開催)

科学技術のプレセッションは、ICHARMの小池俊雄センター長が進行を務め、ネパールや日本、スリランカ、中国からの国別報告とIWMI、ICIMOD、GWP、JAXAといった国際的な機関からの報告がなされました。その後のパネルディスカッションでは、科学技術コミュニティはどのようにして知識を統合するシステムを開発すべきか、人材を育成すべきか、一貫通貫の解決策が提供できるよう、当事者がどのように協働すべきか、といったカギとなる質問について議論がなされました。

ガバナンスのプレセッション (2月18日開催)

ガバナンスのプレセッションは、HELP事務局の廣木謙三教授の進行により、バングラデシュ、ラオス、ベトナム、ウズベキスタンからの国別報告とIUCN Asia、UN-HABITAT、GWP東南アジア、OECDといった国際的な機関からの報告がなされました。ICHARMからは宮本守研究員が国際的な活動としてIFIの発表を行い、小池センター長が閉会挨拶を行いました。

ファイナンスのプレセッション (3月30日開催)

ファイナンスのプレセッションは、ICHARMの小池センター長が進行を務めました。セッションでは水災害のレジリエンスの向上や気候変動適応策に取り組むADB及び関係する民間セクターの専門家から発表が行われ、小池センター長が取りまとめを行いました。

これらプレセッションの成果は、4月23日に開催されたテーマ別セッションに活かされました。詳細については、次号のニューズレターでご紹介したいと思います。

The 4th Asia-Pacific Water Summit (APWS4) was held in Kumamoto, Japan, on April 23-24, 2022. For this conference, ICHARM was assigned as a lead organizer of the thematic session, “Water and disasters/Climate change,” in collaboration with other Japanese and international organizations. Toward APWS4, pre-sessions were held online to review local, national, and international experiences and seek directions and actions to be taken in terms of science and technology (S&T), governance, and finance.

Science and Technology Pre-session (February 15)

Executive Director KOIKE Toshio, ICHARM moderated the pre-session on S&T, which included country reports from Nepal, Japan, Sri Lanka, and China and international reports from IWMI, ICIMOD, GWP, and JAXA. The panel discussion followed to talk about the key questions: how the S&T community develops a system to integrate knowledge and foster human resources, and how stakeholders work together to provide end-to-end solutions.

Governance Pre-session (February 18)

Prof. HIROKI Kenzo of the HELP secretariat moderated the pre-session on governance, which included country reports from Bangladesh, Lao PDR, Vietnam, and Uzbekistan, and international reports from IUCN Asia, UN-HABITAT, GWP Southeast Asia, and OECD. From ICHARM, Researcher MIYAMOTO Mamoru gave a presentation on IFI as an international activity, and KOIKE made closing remarks.

Finance Pre-session (March 30)

KOIKE moderated the pre-session on finance. Presentations were given by experts from ADB and relevant private sectors working on the enhancement of water-related disaster resilience and climate change adaptation. At the end of the session, KOIKE summarized the presentations.

The outcomes of the pre-sessions were provided as inputs for the actual thematic session on April 23. The details will be reported in the next edition of the ICHARM newsletter.



(Written by IKEDA Tetsuya)

The 54th Annual Session of Typhoon Committee

台風委員会第54回総会

The 54th Annual Session of the Typhoon Committee was held online on February 23-25, 2022, hosted by Lao PDR. The meeting was attended by 11 members (China, Hong Kong, Japan, Lao PDR, Malaysia, Philippines, Korea, Singapore, Thailand, Vietnam, and the United States) and the Typhoon Committee Secretariat. Two researchers attended from ICHARM: Researcher MIYAMOTO Mamoru, who presently serves as the chair of the Working Group on Hydrology (WGH), and Senior Researcher KAWAMOTO Takatoshi.

At the meeting, the status of typhoons for the current fiscal year was reported, and each WG presented its activities and proposals. Budget plans for the next fiscal year were discussed and approved. The participants also had discussions on priority activities and a new strategic plan for 2022-2026, as well as the proposed draft agreement between the Typhoon Committee and the Asia-Pacific Cooperation Research Center, which will be newly established based on a proposal by China. On behalf of the WGH, MIYAMOTO reviewed the previous AOPs and proposed new AOPs for the next year and priority actions in hydrology for the new strategic plan. The meeting also decided that the 55th Annual Session be hosted by Macau, China, and the 56th Annual Session by Malaysia.

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

(Written by KAWAMOTO Takatoshi)

2022年2月23日から25日にかけて、ラオスの主催により台風委員会第54回総会がオンラインで開催されました。会議には11のメンバー国・地域（中国、香港、日本、ラオス、マレーシア、フィリピン、韓国、シンガポール、タイ、ベトナム、アメリカ）と台風委員会事務局が参加しました。ICHARMからは、宮本守研研究員（水文部会議長）と河元隆利主任研究員の2名が参加しました。

会合では、今年度の台風の状況報告や各WGから活動報告・提案の発表が行われ、次年度の予算計画が決定されたほか、2022年から2026年までの優先課題や新たな戦略計画、中国からの提案により新たに設置されるアジア太平洋協力研究センターと台風委員会との協定案について議論が交わされました。宮本水文部会議長からは、水文部会を代表し、これまでのAOPsのレビューや来年度からの新たなAOPsの提案、新たな戦略計画の水文に関する優先行動の提案を行いました。次年度開催される第55回総会はマカオが主催するとともに、次々回の第56回はマレーシアが主催することが決まりました。

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

Coming Events

Introduction of the 9th International Conference on Flood Management

第9回洪水管理国際会議のご紹介

The 9th International Conference on Flood Management (ICFM9) will be held in Tsukuba, Japan, from February 18 to 22, 2023.

The overall theme of ICFM9 is "River Basin Disaster Resilience and Sustainability by All: Integrated Flood Management in the Post COVID-19 Era." The conference will hold ten parallel sessions to discuss a broad range of issues from scientific, technological, social, economic, and other viewpoints. The topics cover recent water-related disaster cases, water-related disaster management, data integration, modeling, forecasting and warning technologies, governance and finance, and education. Also listed among the session topics are efforts on interlinkage between flood disaster resilience and the SDGs and the introduction of a systems approach to flood management.

On March 10, 2022, the first ICFM9 local organizing committee was convened with domestic committee members representing government organizations, universities, academic societies, and other organizations. The meeting was held to discuss matters for the smooth preparation and operation of the international conference, including the High-Level Symposium, which will be held in conjunction with ICFM9 inviting high-level government officials from Japan and abroad. The committee

第9回洪水管理国際会議 (ICFM9) が2023年2月18日から22日まで、茨城県つくば市で開催されます。

ICFM9のテーマは、「River Basin Disaster Resilience and Sustainability by All; Integrated Flood Management in the Post COVID-19 Era (全ての当事者による流域での災害レジリエンスと持続可能性—ポストコロナ時代における統合的洪水管理)」であり、近年の水災害事例、水災害管理、データ統合・モデリング、予測及び警報技術、ガバナンスとファイナンス、教育、水災害の強化とSDGsへの融合、洪水管理の体系的アプローチ等に関して10の平行セッションが企画されており、科学的、技術的、社会的、経済的観点から幅広い問題について議論することを予定しています。

ICFM9の円滑な準備・運営を図るべく、3月10日に関係する日本国内の行政機関、大学、学会等の代表者

を委員とする国内委員会の第1回会合を開催しました。同委員会では、ICFM9と連携し、国内外から政府高官を招いて開催される「ハイレベルシンポジウム」に関して併せて議論がなされました。委員からは企画運営に係るご助言をいただくとともに、会議開催に向けてご協力いただけることとなりました。

このたび、ICFM9のロゴマークを決定しました。デザインのコンセプトとして、山から海までの流域の関係当事者が災害レジリエンスと持続可能性について議論するスタートとなるよう期待が込められております。

またアブストラクトについてはお蔭様で約260件の応募いただきました。改めまして皆様の積極的な投稿に対して、厚くお礼を申し上げます。今後はICFM9国際科学技術委員会で審査を行い、5月末を目途に結果をお知らせする予定としております。ICFM9で採択されたAbstractは、10月末までにExtended Abstractとして提出いただくこととしており、それらは国際水文科学協会(IAHS)の論文誌PIAHSで出版されるとともに、国際誌WaterでもICFM9特集号が出版されることになりました。

なお、会議への参加登録受付は5月から開始する予定です。皆様方の積極的なご参加を心よりお待ちしております。

ICHARMではICFM9の事務局として、より魅力的、有意義なものになるよう準備に取り組んでまいります。

主要な日程

2022年3月31日:
Abstractの募集〆切
2022年5月:
参加登録の受付開始
2022年5月31日:
Abstractの採否通知
2022年10月31日:
参加登録(早期)の〆切、
Extended Abstract投稿〆切
2022年12月31日:
参加登録(通常)の〆切

詳細は、ICFM9 WEB サイトをご参照ください。

<https://www.icfm9.jp/index.html>

members agreed to cooperate in organizing the conference and provided useful advice on the planning and operation.

Some great news has come in for ICFM9. First, we are pleased to announce the ICFM9 logo, as shown below. We designed the logo to express our hope that this conference will be the start of discussions on disaster resilience and sustainability while involving all stakeholders in river basins ranging from mountains to sea. We are also pleased to have received about 260 abstracts. We thank the authors very much for all these positive submissions. The ICFM9 International Scientific Committee will review them and announce the results by the end of May. As to the abstracts accepted by ICFM9, the authors will be asked to submit an extended abstract by the end of October. To our delight, the International Association of Hydrological Sciences (IAHS) has decided to publish them in its journal PIAHS. WATER, another international journal, has also agreed to publish a special issue on ICFM9.

In May, we will open the online registration for the ICFM9, and we are very much looking forward to your active participation.

As a secretariat of ICFM9, ICHARM will continue our efforts to make ICFM9 more attractive and meaningful.



Logo of the ICFM9
ICFM9のロゴ

Key dates:

March 31, 2022: Deadline for abstract submission
May, 2022: Start of online registration
May 31, 2022: Notification of accepted abstracts
October 31, 2022: Deadline for online registration (early bird) and extended abstract submission
December 31, 2022: Deadline for online registration

For more details, please visit the ICFM9 website.

<https://www.icfm9.jp/index.html>

(Written by KAWAMOTO Takatoshi)

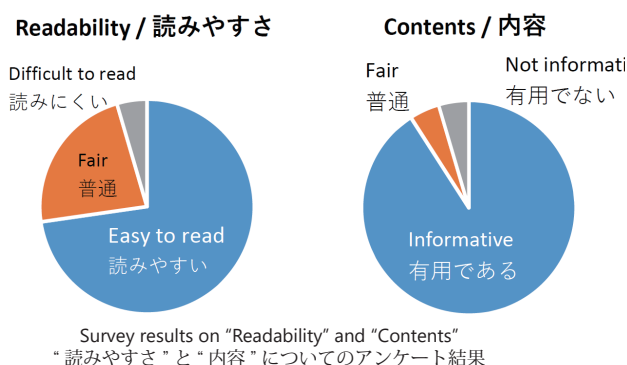
Miscellaneous

Results of Newsletter surveys (No. 60 - No.63)

ニュースレター読者アンケートの結果報告

We conducted a questionnaire survey for each of the last four volumes of the ICHARM Newsletter (No. 60 – No. 63) to collect evaluations and comments from readers in Japan and abroad. In this article, we would like to share some of the results and comments from the 22 responses we received from the four surveys.

The survey revealed that the readers are highly diverse in terms of nationality, age, and affiliation, and that the readers are satisfied with the Newsletter in terms of readability and contents (Figure).



Among articles, "A Message From Executive Director," which appears on the front page, is always the most popular one in our newsletter. Particularly, "End-to-End Science" (No. 61) and "Shifting the world onto a sustainable and resilient path" (No. 62) were the most well-received by the respondents. This is followed by "Research Introduction." Among the pieces that appeared in this section, the following were particularly popular: "The effect of the transported sediment conditions from upstream area on the behavior of sediment and flood inundation in fluvial plain" (No. 61) and "Japan's strategies to expand its infrastructure systems and other technologies and expertise to overseas countries" (No. 63).

Next, we would like to address three readers' comments with ICHARM's responses.

Reader 1: Please provide graduate scholarship information.

->ICARM: There are two main financial support for graduate scholars (Ph.D). One is JICA scholarship and the other is Research Assistantship (RA). The information can be found in the application guide, which is released around October every year on the ICHARM Website (https://www.pwri.go.jp/icharm/training/phd/phd_index.html) and GRIPS Website (<https://www.grips.ac.jp/en/admissions/apply/>).

Reader 2: It is a very informative material where readers can learn about the latest research on water related hazards and disaster risk reduction.

->ICARM: It is our great honor to receive positive feedback. We will continue our best efforts to progress innovate research and keep our readers updated with the latest outcomes.

Reader 3: As a Japanese reader, I would appreciate if the volume of Japanese texts could be increased.

->ICARM: The articles are structured in the way that English and Japanese are equal in volume (1:1), unless they are written by non-Japanese. This is mainly because we would like to reach out to not only domestic but also international readers, including the ICHARM graduates and potential partners of our activities worldwide. We highly appreciate your feedback and your understanding.

Once again, thank you very much for providing us with the valuable feedbacks. We will continue to hear readers' voices through newsletter questionnaire surveys. We will be happy to receive any comments or requests and do our best to accommodate your feedback on our newsletter.

(Written by NAITO Kensuke)

ICARM ニュースレターでは、過去4号（第60号～63号）にわたって、内容の充実を図るべく読者アンケートを実施しました。今回は、頂いた22件の回答から、その一部をご紹介します。

アンケートから、ニュースレターが幅広い国籍、年代、および所属の方々に読んで頂いており、また、読みやすさや内容についても満足頂いていることがわかりました（図）。

数ある記事の内、小池俊雄センター長の巻頭言は常に一番人気でした。その中でも特に好評だったのが、“一気通貫の科学”（第61号）と“持続可能でレジリエントな道筋への移行”（第62号）でした。その次は研究紹介です。第61号掲載の“土砂の量的・質的供給時条件の違いが土砂・洪水氾濫現象に及ぼす影響”や、第63号掲載の“インフラシステム海外展開戦略の紹介”が特に人気でした。

また、寄せられたコメントについて、次の3つをICARMからのレスポンスを添えてご紹介いたします。

読者 1. 大学院コースの奨学金についての情報を掲載して欲しいです。

->大学院コース（博士課程）における経済的サポートとしては、JICA 奨学生となるコースと、ICARM のリサーチアシスタント（RA）として給与を受け取るコースの2種類があります。詳細は、毎年10月頃にICARM ホームページ (https://www.pwri.go.jp/icharm/training/phd/phd_index.html) および政策研究大学院大学（GRIPS）ホームページ (<https://www.grips.ac.jp/en/admissions/apply/>) に掲載される募集要項をご参照いただければと思います。

読者 2. 水災害やリスク・マネジメントに関して、今どのような研究が行なわれているか、その一端を知ることができればとても有益だと思います。

->前向きなコメントを頂きまして、大変ありがとうございます。今後とも革新的な研究に努め、それらを読者の皆様に共有できるよう、より一層精進して参ります。

読者 3. 日本語の文章を少し増やしていただけるとありがたいです。

->貴重なご意見を頂き、ありがとうございます。本ニュースレターでは筆者が日本語ネイティブでない場合を除き、日本語と英語の割合が等しくなるようにデザインされております。これは国内の方々のみならず、ICARM 修了者やICARM の活動に興味のある海外の方々にもぜひ読んで頂きたいと考えているためです。この点につきまして、ご理解を頂けると幸いです。

改めて、貴重な評価やコメントを頂きまして、大変ありがとうございます。読者アンケートは今後も継続いたしますので、お気軽にご意見、ご要望をお寄せ下さい。今後のICARM ニュースレターづくりに可能な限り反映させて頂きたいと思っております。

Personnel change announcements 人事異動のお知らせ

New ICHARM Members

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



MATSUKI Hirotada / 松木 洋忠

Deputy Director / グループ長

During my long travel to Lao PDR, Vietnam, and rivers in Japan in my past career, I kept finding the importance of traditional techniques for river channel management. I have also kept realizing how difficult it is to practice good flood/drought/environmental risk communication with residents in river basins. So I have set myself to consider this theme more in terms of how to share historical changes of local rivers with communities and how to maintain river systems in harmony with nature. I hope to study these topics deeply with ICHARM members and fellow researchers around the world.



KUBOTA Keijiro / 久保田 啓二郎

Chief Researcher / 上席研究員

I have worked as an administrative bureaucrat in 20 different posts at MLIT-HQ and other ministries with different responsibilities, such as lawmaking, national budget, and HR. During the crisis due to the Great East Japan Earthquake on March 11, 2011, I was the only one in charge of tsunami issues among those involved in enacting a new disaster-related law. At that time, I realized afresh that the speedy legislation owed a lot to research institutes in Tsukuba and that analyzing and organizing data on a daily basis is so important. Good legislation requires preparing large volumes of data and information from a long-term perspective and having them readily available for urgent needs, while the benefits they produce should be shared with the public from time to time in an easy-to-understand manner. I would like to contribute to ICHARM from this standpoint.



SHINYA Takafumi / 新屋 孝文

Chief Researcher / 上席研究員

It's my pleasure to be a member of the ICHARM family again for the first time in 4 years. Before coming back, I was at JR-East, one of the major public transport service providers, as well as one of the biggest private companies in Japan. I'm looking forward to trying something new by making use of that experience.



IWASAKI Takahiro / 岩崎 孝広

Deputy Head of General Affairs Division / 副参事

I have never worked in Tsukuba, but I have climbed Mt. Tsukuba four times. I'm very happy to have a chance to work in a city with such beautiful nature and to be a member of ICHARM. I worked at MLIT, the Cabinet Office (I was at the disaster management section), and the Embassy of Japan in Zambia. I would like to contribute to ICHARM by making use of my experiences.

Leaving ICHARM

- **ITO Hiroyuki:** Deputy Director
Executive Director for River Management,
Public Works Research Institute

- **ONUMA Katsuhiko:** Chief Researcher
College of Land, Infrastructure, Transport and Tourism

- **KOBAYASHI Hajime:** Chief Researcher
Chief Researcher, Construction Technology Research Department,
Public Works Research Institute

- **Maksym Gusyev:** Research Specialist
Project Associate Professor,
Institute of Environmental Radioactivity (IER),
Fukushima University

○ **伊藤 弘之** グループ長
国立研究開発法人 土木研究所
河川総括研究監

○ **大沼克弘** 上席研究員
国土交通大学校

○ **小林 肇** 上席研究員
国立研究開発法人 土木研究所
技術推進本部 上席研究員

○ **グシエフ マキシム** 専門研究員
国立大学法人 福島大学
環境放射能研究所 特任准教授

- **MARUYAMA Osamu:** Deputy Head of General Affairs Division
Deputy Head of Audit Office,
Public Works Research Institute
- **SAITO Akemi:** Senior Staff
Senior Staff, General Affairs Division, General Affairs Department,
Public Works Research Institute

- **丸山 修** 副参事
国立研究開発法人 土木研究所
監査室副参事
- **齊藤明美** 指導員
国立研究開発法人 土木研究所
総務部総務課指導員

Position Change

- **FUJIKANE Masakazu:** Chief Researcher (Risk team)
Chief Researcher (Training team)
- **MIYAMOTO Mamoru:** Researcher
Senior Researcher
- **KAKINUMA Daiki:** Research Specialist
Researcher

- **藤兼 雅和** 上席研究員 (リスクチーム)
上席研究員 (研修チーム)
- **宮本 守** 研究員
主任研究員
- **柿沼 太貴** 専門研究員
研究員

Publications / 発表論文リスト

* January - March 2022

1. Journals, etc. / 学術雑誌 (論文誌、ジャーナル)

- *Islam Md Masbahul, Atsuhiko Yorozuya, Daisuke Harada and Shinji Egashira, A Numerical Study on Bank Erosion of a Braided Channel: Case Study of the "Tangail and Manikganj Districts Along the Brahmaputra River", Journal of Disaster Research (JDR), pp.263-269, Vol.17, No.2, February, 2022*
- *Miyamoto, M.; Kakinuma, D.; Ushiyama, T.; Rasmay, A.W.M.; Yasukawa, M.; Bacaltos, D.G.; Sales, A.C.; Koike, T.; Kitsuregawa, M. Co-Design for Enhancing Flood Resilience in Davao City, Philippines. Water 2022, 14, 978. <https://doi.org/10.3390/w14060978>*

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

- 小池俊雄、将来における風水害の発生の可能性について、第10回建設フォーラム「災害激化とその対策、そしてSDGsへ」未来を担う建設業、一社) 神奈川県建設業協会、神奈川県立青少年センター、2022年1月13日
- 小池俊雄、気候の変化と水災害の激甚化への対応、エコひろば市民講座、あったかホール、2022年1月19日
- 小池俊雄、治水ルネッサンス ―新しい河川像を目指して―、信州大学工学部 連続講演会「防災と水環境」、信州大学工学部水環境・土木工学科、2022年1月21日
- 小池俊雄、特別講義 治水ルネッサンス、河川講習会 (オンライン)、(公社)日本河川協会、オンデマンド
- 小池俊雄、治水ルネッサンス ―流域治水による防災・減災と質の高い成長―、令和3年度 防災セミナー (オンライン)、(公社)全国防災協会、オンデマンド
- KOIKE Toshio, *Climate Change and Flood Disasters*, "THINKING ABOUT CLIMATE CHANGE AND DISASTERS" (Online), GRIPS, February 7, 2022
- KOIKE Toshio, *Learning from Japan Experience on Water Sector Adaptation*, "THINKING ABOUT CLIMATE CHANGE AND DISASTERS" (Online), マレーシア環境・水省, February 8, 2022
- 小池俊雄、Keynote speech "Climate Change and its Impact on Water Problem"、気候変動と水問題をテーマとしたオンライン講演会 (オンライン)、在ヨルダン日本大使館及びバシラ応用大学、2022年2月28日
- 会田健太郎、柿沼太貴、大沼克弘、伊藤弘之、小池俊雄、ダム決壊事例に基づく衛星情報を活用した水文情報不足地域における流出氾濫解析手法の提案、土木学会論文集B1 (水工学)、水工学講演会 (オンライン)、土木学会、Vol.77, No.2, pp.173-178, 2021年12月8日~10日
- Mohamed Rasmay, *Maximize the value of GPM and GSMaP data for integrated water resources & disaster managements in the developing regions, The Joint PI Meeting of JAXA Earth Observation Missions FY2021 (Online)*, January 12-14, 2022
- KOIKE Toshio, *Transformative Steps, "Digital Transformation (DX) for Resilience Regional Webinars Series Second Webinar "DX Advanced Technologies and Innovations" (Online)*, 国連開発計画(UNDP), February 23, 2022

3. Poster Presentations / ポスター発表

- *Ralph Allen Acierto, Tomoki Ushiyama, Comparison of PMP Estimates under climate change in Solo River: Towards creating an ensemble of worst-case precipitation scenarios, The Fifth Convection-Permitting Modeling Workshop 2021 (CPM2021) (Online)*, Tougou, September 7-14, 2021

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

- 伊藤弘之、藤兼雅和、大沼克弘、流域治水の推進のための技術開発、土木技術資料、pp.12-15、2022年1月号
- 小池俊雄、巻頭言 流域治水の具現化 治水のあるべき姿を求めて、土木施工、2022年2月号
- *Islam M. Khairul, M.Rasmay, M. Ohara and K. Takeuchi, Developing Flood Vulnerability Functions through Questionnaire Survey for Flood Risk Assessments in the Meghna Basin, Bangladesh, Water, Vol.14(3), No.369, January, 2022*
- *Islam Md Masbahul, Atsuhiko Yorozuya, Daisuke Harada, Shinji Egashira, A Numerical Study on Bank Erosion of a Braided Channel: Case Study of the "Tangail and Manikganj Districts Along the Brahmaputra River", Journal of Disaster Research (JDR), Vol.17, No.2, pp.263-269, February, 2022*
- *Hiroyuki Tsutsui, Yohei Sawada, Katsuhiko Onuma, Hiroyuki Ito, Toshio Koike, Drought Monitoring over West Africa Based on an Ecohydrological Simulation (2003-2018), Hydrology, pp.1-16, Vol.8, No.155, October, 2021*
- 小池俊雄、1章防災の哲学 科学・技術と防災、自然災害科学・防災の百科事典 (分筆)、丸善出版、pp.34-37、2022年1月
- 小池俊雄、15章防災の将来・ガバナンス・防災投資 レジリエンスとSDGs の関係、自然災害科学・防災の百科事典 (分筆)、丸善出版、pp.682-683、2022年1月

5. PWRI Publications / 土研刊行物 (土研資料等)

None / 該当者無し

6. Other/ その他

None / 該当者無し

Editor's Note

編集後記

日頃より ICHARM ニュースレターをご愛読いただき、厚く御礼申し上げます。

新型コロナウイルス感染症が世界的に拡大し始めてから2年以上が経過しました。日本においては「自粛」という言葉が当たり前となっておりますが、その時々々の感染状況によって、自身の行動を自身の判断で決めることが多くなっているように思われます。

当方が担当する「研修活動報告」の記事において、今回は講義のことにあまり触れませんでした。講義形態として、オンラインにて行うか感染対策を徹底したうえで対面にて行うかの選択について、最後まで悩まれた講師も多かったように感じます。

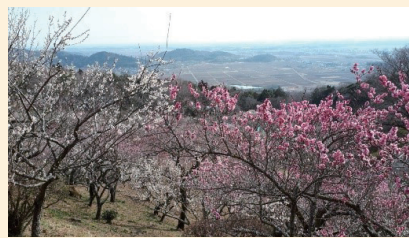
まだ、しばらくこのような自粛生活は続くかと思われませんが、引き続きご愛顧の程よろしくお願いたします。

ICCHARM ニュースレター
編集委員会
宮崎 了輔

I thank you all for reading the ICHARM Newsletter every time.

More than two years have passed since COVID-19 began spreading worldwide. The word "jisyuku (self-restraint)" has been heard too many times in the past few years in Japan. Although the word elicits similar actions from different individuals at the beginning, it seems that the word has come to have a somewhat different meaning to different persons. More and more people decide to act differently in a "jisyuku" period, depending on their own perception of the situation.

In the "Educational program updates" article that I am in charge of, I did not mention much about the lectures this time, but the staff and faculties had to make tough decisions from time to time. I saw many lecturers torn until the last minute about whether to give the lectures online or face to face with thorough infection prevention measures.



At Mt. Tsukuba Plum Grove in March
3月 筑波山梅林にて

Recent news reports that many countries have started lifting restrictions, but in Japan, we may have to put up with some degree of "jisyuku" for a little longer.

Meanwhile, I hope you look forward to the next newsletter just as you always have.

ICCHARM Newsletter Editorial Committee,
MIYAZAKI Ryosuke

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<https://www.pwri.go.jp/icharm/mailmag/index.html>

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

For those who want to unsubscribe the Newsletter, please contact us:
icharm@pwri.go.jp

We welcome your comments and suggestions.

