

# NATIONAL REPORT ON IHP RELATED ACTIVITIES

## *Japan*

### 1. ACTIVITIES UNDERTAKEN IN THE PERIOD JUNE 2016 – MAY 2018

#### 1.1 Meetings of the IHP National Committee

##### 1.1.1 Decisions regarding the composition of the IHP National Committee

The composition of the Japanese IHP National Committee is as follows:

Members of the IHP National Committee as of May 2018

	Name	Position
	CHIKAMORI Hidetaka	Prof., Okayama University
	HARUYAMA Shigeko	Prof., Mie University
	HIYAMA Tetsuya	Prof., ISEE, Nagoya University
	HORI Tomoharu	Prof., DPRI, Kyoto University
*	ISODA Hiroko	Prof., University of Tsukuba
	KANAE Shinjiro	Prof., Tokyo Institute of Technology
	KAZAMA Futaba	Prof., University of Yamanashi
	KAZAMA So	Prof., Tohoku University
	KAWAMURA Akira	Prof., Tokyo Metropolitan University
	KOSUGI Yoshiko	Prof., Kyoto University
*	KURODA Reiko	Prof. The Tokyo University of Science
	MATSUKI Hirotada	Water and Disaster Management Bureau, MLIT
	SAWANO Hisaya	Deputy Director, ICHARM, PWRI
Chair *	TACHIKAWA Yasuto	Prof., Kyoto University
	TANIGUCHI Makoto	Prof., Research Institute for Humanity and Nature (RIHN)
	TSUJIMURA Maki	Prof., University of Tsukuba

**Notes:**

- \* Member of the Japanese National Commission for UNESCO;
- DPRI: Disaster Prevention Research Institute, Kyoto University;
- ICHARM: The International Centre for Water Hazard and Risk Management (UNESCO Category II Centre);
- ISEE: Institute for Space-Earth Environmental Research;
- MLIT: Ministry of Land, Infrastructure and Transport and Tourism;
- PWRI: Public Works Research Institute.

**Secretariat of the Japanese National Committee for IHP, UNESCO:**

c/o Ms. HATA Eri

Japanese National Commission for UNESCO,

Ministry of Education, Culture, Sports, Science and Technology (MEXT)

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**Web page:**

- Japanese National Committee for IHP  
<http://hywr.kuciv.kyoto-u.ac.jp/ihp/japan/index.html>
- IHP RSC for Asia and the Pacific  
<http://hywr.kuciv.kyoto-u.ac.jp/ihp/rsc/index.html>

### 1.1.2 Status of IHP-VIII activities

Japan has been actively engaged in the IHP-VIII since its establishment through implementing wide range of scientific research projects at both a national and regional level. These projects contribute to a range of the IHP-VIII themes and Focal Areas. A list of activities is attached as **ANNEX 1**.

In addition, regional and cross cutting activities have been carried out/ supported by Japanese institutions including the UNESCO Category 2 centre (ICHARM) and UNESCO Chairs (Kyoto University and Tsukuba University). Major activities are detailed as follows.

#### Regional and cross-cutting activities

##### (1) Catalogue of Hydrologic Analysis (CHA)

As an activity for the post Catalogue of Rivers for Asia and the Pacific, development of Catalogue of Hydrologic Analysis (CHA) has been launched since 2016 with the support of Japan-ASEAN Science, Technology and Innovation Platform JASTIP. [Kobe Univ., Okayama Univ., and Kyoto Univ.] The information on CHA locates at <http://hywr.kuciv.kyoto-u.ac.jp/ihp/rsc/cha.html>

##### (2) Asian Pacific FRIEND:

With the dissemination of information from the SEAP region it is hoped that there will be better understanding and co-operation on matters related to water resources within each country as well as regionally. Of particular importance was the establishment of the Asian Pacific FRIEND, a UNESCO-IHP regional collaborative project, and the Asian Pacific Water Archive (APWA) that archives and makes available hydrometeorological and related data for Asian Pacific FRIEND projects and other IHP related activities in the region. Japan has been contributing to Asian Pacific FRIEND since its first Technical Sub-Committee (TSC) meeting in Kuala Lumpur in May 1997.

##### (3) International Centre for Water Hazard and Risk Management (ICHARM) under auspices of UNESCO

ICHARM International Centre for Water Hazard and Risk Management under the auspices of UNESCO was established in Tsukuba, Japan in March 2006, after getting accreditation as UNESCO Category 2 Centre by the member states of UNESCO at the 33<sup>rd</sup> General Conference of UNESCO. ICHARM has been playing core roles in research, training, and information networking activities on water-related disasters at global levels. The activities are expected to contribute in the prevention and reduction of water-related disasters, focusing on flood disasters at the initial stage.

The mission of ICHARM is to serve as the Global Centre of Excellence for Water Hazard and Risk Management by, inter alia, observing and analyzing natural and social phenomena, developing methodologies and tools, building capacities, creating knowledge networks, and disseminating lessons and information in order to help governments and all stakeholders manage risks of water-related hazards at global, national, and community levels. The hazards to be addressed include floods, droughts, landslides, debris flows, tsunamis, storm surges, water contamination, and snow and ice disasters. ICHARM envision a Center of Excellence housing a group of leading people, superior facilities, and a knowledge base which enables conducting i) innovative research, ii) effective capacity building, and iii) efficient information networking. Based on these three pillars, ICHARM will globally serve as a knowledge hub for best national/local practices and an advisor in policy making.

The events/activities ICHARM has been actively involved in/participating to since June 2016 are summarized in **ANNEX 2**.

##### (4) International Flood Initiative (IFI)

ICHARM has been serving as the secretariat of the International Flood Initiative (IFI), a joint initiative with international organizations such as UNESCO (IHP), WMO, UN/ISDR, UNU, IAHS, IAHR, ICLR and IIASA. ICHARM manages the IFI website (<http://www.ifi-home.info/>) and compiles inputs, materials and tools provided by member agencies, while also providing its own outputs. With respectful contributions from participatory organizations, IFI has been making an

effort to conceptualize, design and implement flood mitigation and protective actions and activities. Being intimately aware of the achievements that have been made in flood management in the last decade, the IFI has also tried to foster the mobilization of resources and networks of the UN system, non-governmental organizations and so on in order to assist communities and governments in developing culturally sensitive flood management strategies and thereby addressing sustainable development, such as through IFI flagship project “to support benchmarking flood risk reduction at global, national and local levels” since 2013.

In October 2016, the Jakarta Statement was adopted by the organizations participating in the IFI to establish interdisciplinary cooperation for further promoting flood risk reduction and sustainable development. Based on this agreement, IFI, while keeping close ties with countries and other organizations, will support activities at each country to implement integrated flood management by incrementally moving from “Phase 1: Demonstration,” to “Phase 2: Prototyping,” and finally to “Phase 3: Operation.” After the “Implementation Planning Workshop on IFI in Asia-Pacific” held in Tokyo in January 2017, ICHARM has been supporting to establish a “Platform” to formulate strategies for the reduction of disasters by facilitating close communication between relevant organizations, both domestically and internationally. The framework of implementation has been confirmed and action was started in the Asian countries, such as the Philippines, Myanmar, Pakistan and Sri Lanka for the data management to identify and manage water related risks.

(5) UNESCO Chair on Water, Energy and Disaster Management (WENDI) [Kyoto University]:

WENDI has been launched on April 1 in 2018. Under this UNESCO Chair, many Graduate Schools and Research Institutes of Kyoto University provide students with interdisciplinary, systematic graduate school level educational courses in English dealing with water and energy as well as related issues such as disaster, the environment, ecosystems, and food with common subjects of climate change and data science. The Chair utilizes Geoparks, Biosphere Reserves and World Heritage sites designated by UNESCO as study fields.

(6) UNESCO Chair on Sustainable Groundwater Management in Mongolia (Phase 3) [University of Tsukuba]:

Phase 3 has been launched in August 2015 (for next 4 years) between Mongolian Academy of Sciences and the University of Tsukuba. The new phase of the chair focuses on the monitoring of the groundwater and the surface water interaction and the consultant on the sustainable groundwater resources governance in Ulaanbaatar, capital city of Mongolia.

The business meeting was held on 24th to 26th November, 2016 at Ulaanbaatar, Mongolia [Univ. Tsukuba, Institute of Geography and Geocology, Mongolian Academy of Sciences]

Also, the business meeting was held on 6<sup>th</sup> to 10<sup>th</sup> November, 2017 at Colombo, Sri Lanka to discuss on collaboration research and training course on isotope tracer hydrology in Mongolia.

The method of this UNESCO Chair project has been shared with other countries in Asia and Pacific region at an occasion of international conference so that the project model can be utilized to develop a water related policy in each country.

## **1.2 Activities at national level in the framework of the IHP**

### **1.2.1 National/local scientific and technical meetings**

- The 30<sup>th</sup> IHP National Committee meeting was held at MEXT on 30 May 2016 to discuss various issues relating to the 22<sup>nd</sup> Session of IHP Intergovernmental Council (June 2016) .
- The 31<sup>st</sup> IHP National Committee meeting was held at MEXT on 4 September 2017 to discuss various issues relating to the 25<sup>th</sup> IHP RSC and related issues.
- The 32<sup>nd</sup> IHP National Committee meeting was held at MEXT on 28 May 2018 to discuss various issues relating to the 23<sup>rd</sup> Session of IHP Intergovernmental Council (June 2018), the 26th IHP RSC and related issues.
- CHA technical meeting on July 2016 at Kobe University.

- CHA technical meeting on June 2017 at Kyoto University.
- CHA technical meeting on 21 May 2018 at Kyoto University.

### 1.2.2 Participation in IHP Steering Committees/Working Groups

- The 22nd session of the IHP Intergovernmental Council and IFI side event, 12th Kovacs Colloquium, Paris, France, 13-17 June 2016 [Koike, Tachikawa, Takara, Sayama,]
- The 24<sup>th</sup> session of the IHP Regional Steering Committee (RSC) for Southeast Asia and the Pacific, Ulaanbaatar, Mongolia, 24-26 October 2016. [Takara, Tachikawa, Kobayashi, Takeuchi, Sayama, Tsujimura]
- The 25<sup>th</sup> session of the IHP Regional Steering Committee (RSC) for Southeast Asia and the Pacific, Manila, The Philippines, 13-16 November 2017 [Takara, Tachikawa, Sayama, Kobayashi, Takeuchi, Ikeda]
- The 55th session of the IHP Bureau, Paris, 20-22 June 2017 [Tachikawa]
- The 56th session of the IHP Bureau, Paris, 20-22 February 2018 [Tachikawa]

### 1.2.3 Research/applied projects supported or sponsored

Variety of researches/projects are supported/sponsored by national institutions such as Ministry of Education, Culture, Sports, Science and Technology (MEXT), Japan Science and Technology Agency (JST), Japan Society for the Promotion of Science (JSPS). A sample of the researches/projects is listed below with the name of sponsoring institution shown in bold.

- “Precise Impact Assessments on Climate Change” **supported by MEXT TOUGOU Program** “Integrated Research Program for Advancing Climate Models” 2017-2021 [ICHARM, PWRI, Kyoto Univ., Univ. Tokyo and others]
- Japan-ASEAN Science and Technology Innovation Platform(JASTIP) **supported by JST**. [Prof. K. Takara, T. Sayama, Y. Tachikawa, Kyoto Univ.]
- Program for Leading Graduate Schools “Inter-Graduate School Program for Sustainable Development and Survivable Societies” (GSS) 2011-2018 **sponsored by MEXT-JSPS** [Prof. Kaoru Takara, DPRI, Kyoto Univ.]
- Research Project "New frontiers in global hydrology" supported by **Grant-in-Aid for Scientific Research of JSPS**. (2016-2022) [T. Oki, The Univ. of Tokyo]
- Research Project "Spatio-temporal dynamics of residence time in groundwater at headwater catchments using multi-tracer and modeling” **Grant-in-Aid for Scientific Research of JSPS**. (2016-2018) [M. Tsujimura, Univ. Tsukuba]
- Bilateral Joint Research Project, “Quantifying groundwater residence time and storage volume by isotope and noble gas as tracers between Japan and New Zealand” **JSPS**, 2017-2018 [M. Tsujimura, Univ. Tsukuba]
- Research Project “A tracer simulator of fallout radionuclides for safe and sustainable water use” Core Research for Evolutional Science and Technology (CREST), 2011-2017, **JST**. [T. Oki, University of Tokyo]
- Research Project “Hydro-microbiological Approach for Water Security in Kathmandu Valley, Nepal” supported by the Science and Technology Research Partnership for Sustainable Development (SATREPS), 2013-2018, **JST-JICA** [F. Kazama, Univ. of Yamanashi]
- Research Project “Disaster Prevention/Mitigation Measures against Floods and Storm Surges in Bangladesh” supported by the Science and Technology Research Partnership for Sustainable Development (SATREPS), 2013-2018, **JST-JICA** [H. Nakagawa, DPRI, Kyoto Univ.]
- Research Project “Development of a Comprehensive Disaster Resilience System and Collaboration Platform in Myanmar” supported by the Science and Technology Research Partnership for Sustainable Development (SATREPS), 2014-2019, **JST-JICA** [K. Meguro, IIS, The Univ. of Tokyo]

- Research Project “Advancing of Co-Design of Integrated Strategies with Adaptation to Climate Change (ADAP-T)” supported by the Science and Technology Research Partnership for Sustainable Development (SATREPS), 2015-2020, **JST-JICA** [T. Oki, IIS, The Univ. of Tokyo]
- **UNESCO Pakistan project** “Strategic Strengthening of Flood Warning and Management Capacity of Pakistan” supported by the UNESCO office Jakarta [Phase 2: from 2015 to 2018] [ICHARM]
- **Asian Development Bank Project** “TA-8456: Transformation of Urban Management - Part II Flood Management” in the Republic of the Union of Myanmar, July 2014-November 2016 [ICHARM]
- **Asian Development Bank Project** “SC 109094 REG: Climate Change and Flood Hazard Simulations Tools for ADB Spatial Application Facility, July 2017-June 2018 [ICHARM]

#### **1.2.4 Collaboration with other national and international organizations and/or programmes**

The Japanese IHP National Committee has been closely collaborating with organizations/institutions listed below.

- The national government and its branches relating to hydrology and water resources administration,
- Some committees in the Science Council of Japan (SCJ), including the Sub-Committee on IRDR (Integrated Research on Disaster Reduction) of ICSU (International Science Union), ISSC (International Social Science Council) and UNISDR (United Nations Office for Disaster Risk Reduction).
- Nagoya University and Kyoto University for IHP Training Courses and Graduate School and other universities and research institutes,
- The Japan Water Forum (JWF),
- World Meteorological Organization (WMO), and
- International NGOs/NPOs such as the International Association of Hydrological Sciences (IAHS), the International Water Resources Association (IWRA), the International Association for Hydro-Environment Engineering and Research (IAHR), the World Water Council (WWC) especially for World Water Forum (WWF), the Asia Pacific Association of Hydrology and Water Resources (APHW), Asia Oceania Geosciences Society (AOGS) and the International Consortium on Landslides (ICL).
- International Atomic Energy Agency (IAEA): M. Tsujimura, Univ. Tsukuba and M. Gusyev, ICHARM contribute to IAEA RCA (Regional Cooperative Agreement) Project on “Assessing Deep Groundwater Resources for Sustainable Management through Utilization of Isotopic Techniques (RCA) RAS/7/030” as NPC (National Project Coordinator)

#### **1.2.5 Other initiatives**

### **1.3 Educational and training courses**

#### **1.3.1 Contribution to IHP courses**

The UNESCO IHP Japan Training Course (TC) was initiated as UNESCO IHP Nagoya Training Course by Nagoya University in 1991 and has been held every year since then. Topics of the course are selected to fit the IHP themes. The host or convener body is the Hydrospheric Atmospheric Research Center (HyARC), Nagoya University (Note that the HyARC has been reorganized as the ISEE (Institute for Space-Earth Environmental Research, Nagoya University) since 1 October 2015). After the 19th TC, the Water Resources Research Center, Disaster Prevention Research Institute (DPRI), Kyoto University joined as a co-convener both Nagoya University and Kyoto University are taking the convener role alternatively. This made the TC have wider scope including water resources and disaster prevention.

- The 26<sup>th</sup> IHP Training Course with the theme “Coastal Vulnerability and Freshwater Discharge” was held at ISEE, Nagoya Univ., 27 November to 10 December, 2016.
- The 27<sup>th</sup> IHP Training Course with the theme “Integrated Basin Management under Changing Climate” was held at DPRI, Kyoto Univ., 4 December to 15 December, 2017.

### **1.3.2 Organization of specific courses**

ICHARM has been conducting a one-year master’s program, “Water-related Disaster Management Course of Disaster Management Policy Program,” since 2007 in collaboration with JICA and the National Graduate Research Institute for Policy Studies (GRIPS). The doctoral program in disaster management started in October 2010 in collaboration with GRIPS. A new doctoral program will start from October 2018 in collaboration with JICA and GRIPS and will combine natural science knowledge with policy aspect in order to cultivate leaders in a government. ICHARM provided a short-term training course with JICA as Capacity Development for Flood Risk Management. This training program was launched in FY2012 and designed to provide opportunity for meteorologists, river administrators and disaster management officers in flood-vulnerable developing countries to learn the use of the Integrated Flood Analysis System (IFAS), developed and upgraded by ICHARM. The other important purposes are to learn about disaster management and evacuation plans and flood response cases in Japan, and to develop an action plan for local flood management of flood-vulnerable areas in the participants’ countries. These training activities aim to enhance individual flood-coping capacities and eventually to contribute to flood damage mitigation in the countries.

### **1.3.3 Participation in IHP courses**

## **1.4 Cooperation with international/regional water centres under the auspices of UNESCO**

- Under the MEXT TOUGOU Program “Integrated Research Program for Advancing Climate Models” 2017-2021, Kyoto University has collaborated with the Asia-Pacific Centre for Ecohydrology (APCH) in Indonesia.
- Kyoto University invited Prof. B. Janusz-Pawletta (UNESCO Chair Holder in Water Management in Central Asia) to discuss UNESCO Chair collaboration at the International Symposium on Utilization of Field Sites in Research and Education (FREE2017), 8-9 December 2017.

## **1.5 Publications**

- Coastal Vulnerability and Freshwater Discharge, Textbook for the 26th IHP Training Course at Nagoya University, November 2016.
- Integrated Basin Management under Changing Climate, Textbook for the 27th IHP Training Course at Kyoto University, November 2017.
- Report on 24<sup>th</sup> IHP Regional Steering Committee Meeting for Southeast Asia and the Pacific Manila, Mongolia, October 2016.
- Report on 25<sup>th</sup> IHP Regional Steering Committee Meeting for Southeast Asia and the Pacific Manila, Philippines, November 2017.

## **1.6 Participation in international scientific meetings**

### **1.6.1 Meetings hosted by the country**

- The 3<sup>rd</sup> Global Summit of Research Institute for Disaster Risk Reduction was held at DPRI, Kyoto University on March 2017.
- The 7th International Conference on Water Resources and Environment Research (7<sup>th</sup> ICWRER), Kyoto, Japan, 5-9 June 2016.
- International Symposium on Utilization of Field Sites in Research and Education (FREE2017), Kyoto, Japan, 8-9 December 2017.

### **1.6.2 Participation in meetings abroad**

- Budapest Water Summit, Budapest, Hungary, 28<sup>th</sup> -30<sup>th</sup> July 2016 [Matsuki]
- Expert Meeting on “Water Harvesting and Groundwater Recharge” organized by the Regional Center on Capacity Development and Research in Water Harvesting, UNESCO Category 2 Center, 10<sup>th</sup> – 11<sup>th</sup> December 2016, Khartoum, Sudan [Tsujimura]
- The Governing Board Meeting of the Regional Center on Capacity Development and Research in Water Harvesting, UNESCO Category 2 Center, Khartoum, Sudan, 12<sup>th</sup> December 2016 [Tsujimura]
- IAHS (International Association of Hydrological Sciences) 2017 Scientific Assembly, Port Elizabeth, South Africa, 10<sup>th</sup> - 14<sup>th</sup> July 2017 [Tsujimura]
- The Third UN Special Thematic Session on Water and Disasters, New York, USA, 20<sup>th</sup> July 2017 [Matsuki]
- 9<sup>th</sup> Jeju Water World Forum “Sustainable Development and Value Creation of Water Resources in the Asia-Pacific Region”, Jeju City, Korea, 20<sup>th</sup> – 22<sup>nd</sup> September 2017 [Taniguchi, Tsujimura]
- 3<sup>rd</sup> Asia-Pacific Water Summit, Yangon, Myanmar, 11<sup>th</sup> -12<sup>th</sup> December 2017 [Matsuki]
- The 8<sup>th</sup> World Water Forum at Brasilia on 18-23 March 2018 [Koike, Takara, Watanabe, Ikeda, Tachikawa, Yamashiki, Matsuki]
- Launch of International Decade for Action “Water for Sustainable Development” 2018-2020, New York, 20<sup>th</sup> March 2018 [Matsuki]

### **1.7 Other activities at regional level**

- 1.7.1 Institutional relations/cooperation  
See the appendix section of report.
- 1.7.2 Completed and ongoing scientific projects  
See the appendix section of report.

## **2. FUTURE ACTIVITIES**

### **2.1 Activities planned until December 2018**

- The 26<sup>th</sup> Session of the IHP Regional Steering Committee (RSC) for Asia and the Pacific will be held at Shanghai, China on 3-5 November 2018.
- The 28<sup>th</sup> IHP training course on December 2018 at Kyoto University.

### **2.2 Activities foreseen for 2019-2020**

- The 27<sup>th</sup> Session of the IHP Regional Steering Committee (RSC) for Asia and the Pacific will be held in Myanmar in 2019.
- The 29<sup>th</sup> IHP training course in 2019 and 2020.

### **2.3 Activities envisaged in the long term**

- Participation in IHP-VIII projects and RSC activities.
- International collaborative activities relating to Catalogue of Hydrologic Analysis in the Asia and the Pacific region.
- Activities relating to “Sustainability Science” that is a key promotion by the Japanese Commission for UNESCO.
- International education activities relating Kyoto University UNESCO Chair on Water, Energy and Disaster Management (WENDI)

## **IHP-VIII RELATED RESEARCH PROJECTS CONDUCTED BY JAPANESE RESEARCH INSTITUTIONS**

### **THEME 1: Water Related Disasters and Hydrological Changes**

- FA 1.1 – Risk management as adaptation to global changes
  - FA 1.2 – Understanding coupled human and natural processes
  - FA 1.3 – Benefiting from global and local earth observation System
  - FA 1.4 – Addressing uncertainty and improving its communication
  - FA 1.5 – Improve scientific basis for hydrology and water sciences for preparation and response to extreme hydrological events
- Climate change research under the MEXT TOUGOU program “Integrated Research Program for Advancing Climate Models (2017- 2021).
  - Development of a new flood management method utilizing paddies into river management against global warming [National Institute for Rural Engineering (NIRE), Univ. of Tsukuba, The Univ. of Tokyo]
  - Hydrogeological and sociological survey on development processes of East-Asian cities co-existing with floods [Kyoto Univ.]
  - UNESCO Pakistan project “Strategic Strengthening of Flood Warning and Management Capacity of Pakistan” [Phase 2: from 2015 to 2018] [ICHARM]
  - Inundation analysis and Flood/drought risk assessment [ICHARM, PWRI, JMA and universities]
  - Research Project on Disaster Prevention/Mitigation Measures against Floods and Storm Surges in Bangladesh [Prof. Nakagawa, DPRI, Kyoto Univ.] under the Science and Technology Research Partnership for Sustainable Development (SATREPS) from 2013 to 2018.
  - Research to develop methodologies to observe, predict and analyze water-related hazards, supporting assessment of water-related risks [ICHARM/PWRI] from 2017 to 2019.
  - Research to pioneer new methods and models to assess, analyze and monitor exposure and vulnerability to water-related hazards, supporting risk management at both local and global scales [ICHARM/PWRI] from 2017 to 2019.
  - Japan-ASEAN Science and Technology Innovation Platform (JASTIP) supported by Japan Science and Technology Agency (JST) from 2015-2019 [Kyoto Univ.]

### **THEME 2: Groundwater in a Changing Environment**

- FA 2.1 – Enhancing sustainable groundwater resource management
  - FA 2.2 – Addressing strategies for management of aquifers recharge
  - FA 2.3 – Adapting to the impacts of climate change on aquifer systems
  - FA 2.4 – Promoting groundwater quality protection
  - FA 2.5 – Promoting management of transboundary aquifers.
- GWES (Groundwater in Emergency Situations).  
Great Eastern Japan Earthquake and Tsunami showed the importance of groundwater use in emergency situation during disasters.
  - UNESCO Chair on Sustainable Groundwater Management in Mongolia at the Institute of Geography and Geo-ecology, Mongolian Academy of Sciences and the University of Tsukuba, Japan. UNESCO has decided to launch Phase 3 activity (for next 4 years) of this chair between Mongolian Academy of Sciences and the University of Tsukuba in August 2015. The new phase of the chair will focus on the monitoring of the groundwater and the surface water interaction and the consultant on the sustainable groundwater resources governance in Ulaanbaatar, capital city of Mongolia.
  - Research Group on Groundwater Governance in Japanese Association of Groundwater Hydrology launched in October 2017 to summarize domestic and international



groundwater governance situation and propose perspectives for future tasks considering SDGs. [Jap. Assoc. Groundwater Hydrol.]

- UNESCO Chair on Sustainable Groundwater Management in Mongolia at the Institute of Geo-ecology, Mongolian Academy of Sciences and the University of Tsukuba, Japan. The chair activity has been continued actively focusing on the monitoring of the groundwater and the surface water interaction and the consultant on the sustainable groundwater resources governance in Ulaanbaatar, capital city of Mongolia.
- Research project on Artificial Groundwater Recharge using paddy field [Ono City, Fukui Prefecture, University of Tsukuba]
- Groundwater resources assessment under the pressure of humanity and climate change (GRAPHIC) [Research Institute for Humanity and Nature (RIHN)]
- UNESCO-GRAPHIC organized several international activities including symposiums and training courses to evaluate the effects of climate change and human activities on groundwater resources.
- The Social Implementation Program on Climate Change Adaptation Technology (SI-CAT) by MEXT collaborates with local governments of Japan in developing technologies that comprehensively assess precise climate predictions and the effectiveness of its countermeasures according to their respective regional characteristics.

Collaboration research between Univ. Tsukuba and Suntory Global Innovation Center, Ltd. on "A New Approach to Assess the Groundwater Resource Using Age and Microbe Information (2017-2019)

### **THEME 3: Addressing Water Scarcity and Quality**

- FA 3.1 – Improving governance, planning, management, allocation and efficient use of water resources
  - FA 3.2 – Dealing with present water scarcity and developing the foresight to prevent undesirable trends
  - FA 3.3 – Promoting tools for stakeholder involvement and awareness, and conflict resolution
  - FA 3.4 – Addressing water quality and pollution issues within an IWRM framework, improving legal, policy, institutional and human capacity
  - FA 3.5 – Promoting innovative tools for the safety of water supplies and controlling pollution.
- Hydro-microbiological Approach for Water Security in Kathmandu Valley, Nepal [Prof. Kazama, Univ. of Yamanashi] under the Science and Technology Research Partnership for Sustainable Development (SATREPS) from 2013-2018.
  - The G-WADI (Global Network on Water and Development Information for Arid Lands) Global Conference "G-WADI more than a decade enhancing water and sustainable development for arid regions" on 25-27 October 2016 in Beijing, China [Prof. Koike, ICHARM]
  - The Water Environment Partnership in Asia (WEPA) is an initiative proposed by the Ministry of the Environment (MOE), Japan in 2003 at the Third World Water Forum held in Kyoto-Shiga-Osaka, Japan, and it became official in 2004. WEPA aims to improve the water environment in Asia by strengthening water environmental governance.

### **THEME 4: Water and Human Settlements of the Future**

- FA 4.1 – Game-changing approaches and technologies
  - FA 4.2 – System-wide changes for integrated management approaches
  - FA 4.3 – Institution and leadership for beneficiation and integration
  - FA 4.4 – Opportunities in emerging cities in developing countries
  - FA 4.5 – Integrated development in rural human settlements
- Development of a Comprehensive Disaster Resilience System and Collaboration Platform in Myanmar [Prof. Meguro, IIS, The Univ. of Tokyo] under the Science and

Technology Research Partnership for Sustainable Development (SATREPS) from 2014 to 2019.

- Research to propose policy tools for integrated and comprehensive water and risk management to enhance human and ecosystem resilience, for instance through preparedness, early warning, and hard-soft integration [ICHARM/PWRI] from 2017 to 2019.
- Sustainable Urbanisation Global Initiative (SUGI)/ Food-Water-Energy Nexus, Belmont Forum CRA : 2018-2020 (RIHN)

### **THEME 5: Ecohydrology, Engineering Harmony for a Sustainable World**

- FA 5.1 – Hydrological dimension of a catchment - identification of potential threats and opportunities for a sustainable development
- FA 5.2 – Shaping of the catchment ecological structure for ecosystem potential enhancement - biological productivity and biodiversity
- FA 5.3 – Ecohydrology system solution and ecological engineering for the enhancement of water and ecosystem resilience and ecosystem services
- FA 5.4 – Urban Ecohydrology – storm water purification and retention in the city landscape, potential for improvement of health and quality of life
- FA 5.5 – Ecohydrological regulation for sustaining and restoring continental to coastal connectivity and ecosystem functioning

- Hydrological and ecological impact assessment of long-term global warming on river basins in the world [Kyoto Univ.]
- Valorization of Bio-resources in Semi- arid and Arid Land for Regional Development [Univ. Tsukuba]  
Univ. Tsukuba has performed an international collaboration research on the relationship between the bio-resources and surface water/ groundwater resources in semi-arid regions in Tunisia funded by the Science and Technology Research Partnership for Sustainable Development (SATREPS) of the Japan International Cooperation Agency (JICA) and the Japan Science and Technology Agency (JST).
- Human-Environmental Security in Asia-Pacific Ring of Fire: Water-Energy-Food Nexus, 2013-2018 (RIHN)

### **THEME 6: Water Education, Key for Water Security**

- FA 6.1 - Enhancing tertiary water education and professional capabilities in the water sector
- FA 6.2 - Addressing vocational education and training of water technicians
- FA 6.3 - Water education for children and youth
- FA 6.4 - Promoting awareness of water issues through informal water education
- FA 6.5 - Education for transboundary water cooperation

- Promoted UNESCO's "IWRM Guidelines at river basin level (IWRM Guidelines)" by NARBO (Network of Asian River Basin Organizations)
- Preparation for Educational material of IWRM guidelines for UNESCO by Japan Water Agency, secretariat of NARBO.
- International Environment Leaders Training Program funded by Ministry of Education, Culture, Sports, Science and Technology (MEXT) [Univ. Tsukuba, Kyoto Univ., Univ. Tokyo, Kumamoto Univ. et al.]
- Japan supports the activities of the Regional Center on Capacity Development and Research in Water Harvesting, UNESCO Category 2 Center, Sudan as a member of the Governing Board [Tsuji-mura]
- Kyoto University is implementing a Leading Graduate Schools Program "Inter-Graduate School Program for Sustainable Development and Survival Societies" (2011-2018)
- Kyoto University implemented a collaborative education programs with universities in Asia "International Program on Resilient Society Development under Changing Climate" under Re-inventing Japan Project supported by MEXT (2016-2020)

- ICHARM Training Programmes and a one-year Master Degree Program on water-related risk management in cooperation with the National Graduate Institute for Policy Studies (GRIPS) supported by JICA.
- ICHARM Training Programmes and a three-year Doctoral degree program on “Disaster Management Program” cooperation with the National Graduate Institute for Policy Studies (GRIPS)
- Joint international summer program “Sustainable Water Management in an Era of Big Data” co-organized with the University of Tokyo, July27-August 7, 2016 [ICHARM]
- University of Tsukuba has launched a new graduate level English course “SUSTEP (Sustainability Science, Technology and Policy) Program” to educate global leaders having comprehensive capacity of environment and sustainable development since April 2014.
- University of Tsukuba performs English education program on environmental sciences at the Master’s level in the framework of JDS (The Project for Human Resource Development Scholarship) and ABE-Initiative (African Business Education Initiative for Youth) funded by JICA (Japanese International Cooperation Agency), Japanese Government.
- University of Tsukuba launched an International Joint Master’s Degree Program of Sustainability and Environmental Sciences with Malaysia-Japan International Institute of Technology (MJIIT), University of Technology, Malaysia (UTM) in September, 2017.
- Tohoku University is established a Leading Graduate Schools Program “Inter-Graduate School Doctoral Degree Program on Science for Global Safety” (2012-2019)
- Tohoku University hosted the 2017 Asia Pasific Rim University – International Research Institute of Disaster Science (APRU-IRIDeS) Multi-Hazards Summer School in July, 2017.

## EVENTS/ACTIVITIES OF ICHARM SINCE JUNE 2016

- The 7th International Conference on Water Resources and Environment Research (ICWRER) on 5-9 June 2016 in Kyoto, Japan
- The 22nd session of the Intergovernmental Council of the International Hydrological Programme (IHP) of UNESCO and IFI side event, 12th Kovacs Colloquium on 13-17 June 2016 in France, Paris
- The Kick-off Meeting of the 8th World Water Forum on 26-28 June 2016 in Brasília, Brasil
- Fostering Collaboration between UNESCO in the Field and Networks towards the Agenda 2030 on 21-24 July 2016 in Bali, Indonesia
- The 5th Working Group of Hydrology of the UNESCAP/WMO Typhoon Committee on 6-7 September 2016 in Seoul, Korea
- The Advisory and Management Committee meetings of the WMO/GWP Associated Programme on Flood Management (APFM) on 12-14 September 2016 in Geneva, Switzerland
- Regional Training for Flood Forecasting in Transboundary River Basins on 3-6 October 2016 in Bangkok, Thailand
- The 11th Integrated Workshop of the UNESCAP/WMO Typhoon Committee session on 24-28 October 2016 in Cebu, Philippines
- The Eighth Meeting of High-Level Experts and Leaders Panel on Water and Disasters (HELP) and IFI side event on 31 October - 1 November 2016 in Jakarta, Indonesia
- COP22 and side events on 8-11 November 2016 in Marrakech, Morocco
- 1st Regional Training Course (RTC) of the International Atomic Energy Agency (IAEA)/Regional Cooperative Agreement (RCA) RAS/7/30 Project on the use of isotope techniques for water characterization on 14-25 November 2016 in Xian, China
- The International Conference "Asia Pacific Policy Dialogue on Water, Energy and Food Security for Poverty Alleviation in Dryland Regions", co-hosted by UNESCO and PMAS-AAUR on 23-25 November 2016 in Islamabad, Pakistan
- The Budapest Water Summit 2016 on 28-30 November 2016 in Budapest, Hungary
- □ World Meteorological Organization, Commission for Hydrology Fifteenth Session on 6-15 December 2016 in Roma, Italy
- Implementation Planning Workshop on International Flood Initiative (IFI) in Asia-Pacific on 10 January 2017 in Tokyo, Japan
- The 9th GEOSS Asia-Pacific Symposium AWCI session (WG1) on 12 January 2017 in Tokyo, Japan
- The 49th Session of the UNESCAP/WMO Typhoon Committee session on 21-24 February 2017 in Tokyo
- 6th NARBO General Meeting on 23 February 2017 in Jakarta, Indonesia
- IFI Coordinating Meeting in Philippines on 13 March 2017 in Davao, Philippines
- Joint Workshop on Climate Change Impact Assessment in the Solo River Basin on 21 March 2017 in Jakarta, Indonesia
- Workshop "Strategic Data for Reliable Models and Flood Forecasts" funded the UNESCO Pakistan project, flood modelling training funded by the UNESCO Pakistan project on 6-12 April 2017 in Lahore and Islamabad, Pakistan
- The High Level Consultation Meeting on IFI Coordination in Myanmar on 9 May 2017 in Nay Pyi Taw, Myanmar
- Ninth Meeting of the High-level Experts and Leaders Panel on Water and Disasters (HELP) and its Technical Session/ Side Event on 18-19 May 2017 in Chengdu, China
- 2017 Global Platform for Disaster Risk Reduction organized by UNISDR on 22-26 May 2017 in Cancun, Mexico
- 17th Conference of the Science Council of Asia, 14-16 June, 2017 in Manila, Philippines

- Meeting for SATREPS Proposal and meeting for the Platform on Water-related Disasters on 14-15 June 2017 in Manila, Philippines
- UNESCO Regional Workshop “Building Resilience to Climate Change Risk and Vulnerability to Meet Water Security Challenges” on 10-11 July 2017 in Langkawi, Malaysia
- Third UN Special Thematic Session on Water and Disasters on 20 July 2017 in New York, USA
- UNESCO special session in the 14th Annual Meeting Asia Oceania Geosciences Society (AOGS) on 8-11 August 2017 in Singapore
- Plenary Session for the Platform on Water and Disasters in Sri Lanka on 24 August 2017 in Colombo, Sri Lanka
- Advisory Committee (AC) and Management Committee (MC) meetings of the Associate Programme on Flood Management (APFM) on 4-5 September 2017 in Geneva, Switzerland
- 7th International Conference on Flood Management (ICFM7) on 6-7 September 2017 in Leeds, UK
- The 10th GEOSS Asia-Pacific Symposium and Asian Water Cycle Initiative (AWCI) group session on 18-20 September 2017 in Hanoi, Vietnam
- 2nd Implementation Roadmap Review Meeting on the results of the 7th World Water Forum during Korea International Water Week 2017 (KIWW2017) on 20-23 September 2017 in Gyeongju, Republic of Korea
- The 10th Meeting of the High-Level Experts and Leaders Panel on Water and Disasters (HELP) on 21 September 2017 in Gyeongju, Korea
- The 6th Working Group of Hydrology of the UNESCAP/WMO Typhoon Committee on 26-27 September 2017 in Seoul, Korea
- The 12th Integrated Workshop of the UNESCAP/WMO Typhoon Committee session on 30 October - 3 November 2017 in Jeju, Korea
- ESCAP Expert Group Meeting on Regional Cooperation in Early Warning for Transboundary River Basin Flood, Flash Floods and Landslides in Asian and the Pacific on 9-11 October 2017 at Bangkok, Thailand
- Global Forum on Science and Technology for Disaster Resilience 2017 on 23 – 25 November 2017 at Tokyo, Japan
- Technical session “Platform on Water and Disasters – ICT, Economy, Community, Dynamics –” at the World Bosai Forum on 28 November 2017 in Sendai, Japan
- ASEAN Regional Forum Workshop on Typhoon Disaster Risk Reduction and Damage Mitigation on 5-6 December 2017 at Guangzhou, China
- Thematic session “Water and Disasters in the Context of Climate Change – From the Mountains to the Islands –” at the 3<sup>rd</sup> Asia-Pacific Water Summit on 11 December 2017 in Yangon, Myanmar
- 3rd ICHARM Governing Board meeting on 14 February 2018 in Tokyo, Japan
- The 50th Session of the UNESCAP/WMO Typhoon Committee session on 28 February-3 March 2018 in Hanoi, Vietnam
- The 8th World Water Forum on 19-22 March 2018 in Brasilia, Brazil
- 2nd Plenary Session for the Platform on Water Resilience and Disasters in Sri Lanka on 28 March 2018 in Colombo, Sri Lanka
- Global Conference for Prosperity through Hydrological Services on 7 – 9 May 2018 at Geneva, Switzerland
- The 13<sup>th</sup> Annual Meeting ESCAP/WMO Typhoon Committee Working Group of Disaster Risk Reduction on 29 May to 1 June 2018 at Ulsan, Korea
- The 11th Meeting of the High-Level Experts and Leaders Panel on Water and Disasters (HELP) on 3-4 May 2018 in Geneva, Switzerland
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