United Nations
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From
the People
of Japan

INTERGOVERNMENTAL HYDROLOGICAL PROGRAMME

27th IHP Regional Steering Committee Meeting for Asia and the Pacific

Naypyidaw, Myanmar, 29–31 October 2019

FINAL REPORT

IHP-VIII | Regional Steering Committee Meeting | No. 27
Regional Steering Committee for Asia and the Pacific

UNESCO Jakarta Office, 2019

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Contents

27th IHP Regional Steering Committee Meeting for Asia and the Pacific (RSC–AP)

29–31 October 2019

Naypyidaw, Myanmar

Chair	Mr Ignasius Sutapa (Indonesia)
Secretary	Mr Yasuto Tachikawa (Japan)
UNESCO representatives	Mr Hans Thulstrup (Jakarta Office) Mr Philippe Pypaert (Beijing Office) Mr Bustamam Koetapangwa (Jakarta Office) Ms Naw Moo Moo Hsoe (Yangon Office)
Countries represented	China, India, Indonesia, Japan, Kazakhstan, Republic of Korea, Malaysia, Mongolia, Myanmar, Nepal, Pakistan, Philippines, Solomon Islands, Thailand, Uzbekistan, Viet Nam
UNESCO (Centres and Chairs)	Asia Pacific Centre for Ecohydrology (APCE), Indonesia Humid Tropics Centre Kuala Lumpur (HTCKL), Malaysia International Centre for Water Hazards and Risk Management (ICHARM), Japan Water, Energy and Disaster Management for Sustainable (WENDI), Japan International Centre for Water Security and Sustainable Management (i-WSSM), Republic of Korea UNESCO Chair on Water Resources Management in Central Asia in Kazakh-German University, Kazakhstan Water Diplomacy, Water Resources Management and Environmental Protection (WDWRMEP), Uzbekistan
Observing organizations	Japan Water Forum/Secretariat of Asia-Pacific Water Forum (APWF), Japan Japan International Cooperation Agency (JICA), Japan CTI Myanmar Co., Ltd, Myanmar International Centre for Water Resources and Global Change (ICWRGC) and Global Runoff Data Centre (GRDC), Germany.
(See Annex A for the list of participants)	

1. Welcome and opening remarks

Mr U Kyaw Myo, Myanmar Deputy Minister for Transport and Communications, welcomed all participants and thanked the International Hydrological Programme (IHP) for the opportunity given to Myanmar to host such an important meeting. Mr U Kyaw Myo noted that IHP in the Asia and the Pacific region has made progress in emphasizing the vital role of water resources management for achieving sustainable development. Using hydrological science to mitigate the effects of climate change will help countries meet Sustainable Development Goal (SDG) 6 on clean water and sanitation and other goals of the 2030 Agenda for Sustainable Development.

Mr Yasuto Tachikawa, RSC Secretary, delivered an opening statement on behalf of the RSC Chair. He thanked the Myanmar IHP National Committee, hosted by the Department of Meteorology and Hydrology (DMH) and Ministry of Transport and Communications, for their full support in organizing the meeting. Mr Hans Thulstrup, RSC Secretariat UNESCO Jakarta, reaffirmed that the meeting serves as a forum for sharing news and information, as well as a platform for identification and transmission of the region's priorities to the IHP Bureau and Council.

2. Adoption of the agenda

The Chair presented a draft agenda of the meeting, which was subsequently adopted with no changes proposed. The detailed agenda is included in Annex B.

3. Secretariat Reports

3.1 UNESCO Office Jakarta Report

Mr Hans Thulstrup outlined the following four activities in his presentation (Annex C):

a. Action points from the last meeting of the RSC.
b. Selected IHP activities of UNESCO Office Jakarta from November 2018 to October 2019:
    - International Initiative on Water Quality (IIWQ) of Asia Pacific Centre for Ecohydrology (APCE) International Training Workshop on Emerging Pollutants
    - World Water Day Celebration 2019
    - UNESCO International Ecohydrology Forum and UNESCO Ecohydrology Training Course
    - Workshop for the Drafting of Water Management Curriculum for Africa
    - Stockholm World Water Week: Asia Focus Session 2019
    - Regional Workshop on Water Education in Asia and the Pacific
    - Workshop on Groundwater Management Issues and Solutions in Timor-Leste: Building Capacity for Sustainability
c. Relevant publications
d. Upcoming IHP activities for 2019 and 2020

3.2 Report of IHP Bureau

Speaking via teleconference, Mr Farhad Yazdandoost, Vice-Chairperson of Group IV (Asia and the Pacific, IHP Council) summarized discussions and actions from the 58th Session of the IHP Bureau, which took place in Paris from 10–12 September 2019.

The Bureau discussed UNESCO's strategic transformation and medium–term strategy, progress on IX phase of IHP, and IHP's actions in the implementation and monitoring of SDG Indicator 6.5.4. In addition, Mr Yazdandoost outlined institutional developments for IHP, IHP Intergovernmental Council composition, and requests from the Bureau to the Secretariat. The complete IHP Bureau report is available in Annex D.

4. Towards the 4th Asia-Pacific Water Summit

Ms Yumiko Asayama, Secretariat of the Asia-Pacific Water Forum (APWF) in Japan, outlined background information about APWF, governance structure and history of past events. She presented detailed information for the upcoming 4th Asia-Pacific Water Summit (APWS) planned to take place in Kumamoto, Japan in October 2020, outlining its mission, expected outputs, challenges and international trends after the last APWS event in 2017.

The complete presentation is available in Annex E.

5. Country reports

RSC member countries briefly presented their activities since the last RSC meeting. Two countries, Australia and New Zealand, were not able to participate in the meeting and provided written reports. The full country reports can be found in Annex F. Highlights are presented below.

5.1 Australia

Mr Hans Thultrup presented the report on behalf of Australia. The report provided updates on the widespread drought and bushfires throughout Australia. On IHP-related activities, the presentation highlighted the contributions by the Australian IHP Committee in the Pacific and Indian Ocean fora. The following selected presentations have been delivered by members of the IHP Committee since the last RSC meeting:

- 8th Global FRIEND (Flow Regime from International Experimental and Network Data), Beijing, 6–8 November 2018
- Asia Oceania Geoscience Society 16th Annual Meeting, Singapore, 28 July–2 August 2019
- IRRD First Workshop, Atolls Futures, Paris, 3–5 September
- 46th International Association of Hydrogeologists Congress, Malaga, 22–27 September 2019
- UNESCO-CWWA High-Level Symposium on Achieving Water Security in Caribbean SIDS, Frigate Bay, St Kitts and Nevis, 15 October 2019.

5.2 China

The Chinese IHP National Committee outlined the following activities:

a. Attendance at IHP-related activities
   - 8th Global FRIEND
   - 8th International Groundwater Symposium
   - 8th International Conference on Water Resources and Environment Research
   - 2019 International Leadership Training Program for Young Professionals in Water Resources Management

The IHP Committee also continues to support the implementation of a multidisciplinary project, 'Grand Water Atlas', initiated by the Chinese Academy of Sciences (CAS) with the support of UNESCO and Third Pole Environment (TPE). This project has also enabled the Committee to strengthen the UNESCO working group on snow and ice in Asia, with TPE.

b. Belt and Road Initiative

A number of forums and meetings were held under the Belt and Road Initiative including Water Strategic Alliance, Water and Sustainable Development Forum, and Fund on Water and Sustainability. Given the importance of water security and sustainability for regional and international security, peace and stability, a component on Global Energy and Water Cycle Experiment contributes to the success of the initiative.

5.3 India

India's report outlined the composition of the Indian IHP Committee, activities carried out since the last RSC meeting, publications and future planned activities of the committee. The Indian IHP Committee is hosted by the National Institute of Hydrology (NIH), Roorkee, India and chaired by Dr Sharad Kumar Jain, who also is the Director of the Institute.

Updates on national activities and major international collaborative projects were provided, including scientific collaboration with countries e.g., Austria, Denmark, Germany, Japan, the Netherlands, Russia, United Kingdom and the United States.

Activities foreseen for 2020–2021 are summarized below:

- Indian National Committee for Intergovernmental Hydrological Programme (INC-IHP) will continue to encourage scientific and technical symposia and workshops.
- Enhancing activities under the framework of IHP-VIII.
- Implementation of integrated water resources management (IWRM) plans on a watershed/basin scale in different parts of the country.
- Participation in UNESCO Regional Steering Committee meeting, and international conferences/seminars.
- Establishment of Regional Centre for Water and Environment in South Asia at NIH, as a Category 2 Centre under the auspices of UNESCO.

5.4 Indonesia

The presentation outlined how the Indonesian IHP Committee categorized its activities according to six themes and focal areas of IHP-VIII. Each theme has mandated working groups at the national level led by line ministries. Selected activities for each theme and working groups are listed below.

1. Theme 1/Working Group I: Water-related disasters and hydrological change (led by the Ministry of Public Works and Housing). Activities: Construction of two dams to control flooding in greater Jakarta.
2. Theme 2/Working Group II: Groundwater in a changing environment (led by the Ministry of Energy and Mineral Resources). Activities: Mapping of groundwater conservation zones.

3. Theme 3/Working Group III: Addressing water scarcity and quality (led by the Ministry of Environment and Forestry). Activities: Pilot project for the construction of wastewater treatment plant for domestic wastewater and small-scale enterprises.
4. Theme 4/Working Group I: Water and human settlements of the future (led by the Ministry of Public Works and Housing). Activities: Conducts slum settlement programs, such as KOTAKU (KOta TAnpa KUmuh) Programme.
5. Theme 5/Working Group IV: Ecohydrology, engineering harmony for a sustainable world (led by Asia Pacific Centre for Ecohydrology (APCE) under the Indonesian Institute of Sciences (LIPI). Activities: Initiation and development of ecohydrology demonstration site for arid zones in East Nusa Tenggara Province.
6. Theme 6/Working Group V: Water education, key for water security (led by Indonesia National Commission for UNESCO under the Ministry of Education and Culture (KNIU). Activities: Campaign to save water for junior and senior high school students.

5.5 Japan

Major activities were conducted throughout Japan within the framework of Catalogue of Hydrologic Analysis (CHA), Asian Pacific FRIEND, International Centre for Water Hazard and Risk Management (ICHARM), International Flood Initiative (IFI), and UNESCO Chair on Water, Energy and Disaster Management for Sustainable Development.

A number of national activities from November 2018 to October 2019 were briefly summarized below:

1. Research on Integrated Research Program for Advancing Climate Models: MEXT TOUGOU Project (2017–2021).
2. Japan-ASEAN Science and Technology Innovation Platform (JASTIP).
3. Committee collaboration with the Science Council of Japan (SCJ), including the Sub-Committee on Integrated Research on Disaster Reduction (IRDR) of the International Science Union (ICSU), International Social Science Council (ISSC) and United Nations Office for Disaster Risk Reduction (UNISDR).
4. IHP training courses and graduate school at Nagoya University and Kyoto University and other universities and research institutes.

5.6 Republic of Korea

As of October 2019, Mr Ha-Joon Park, Ministry of Environment, is the new Chair and Mr Joo-Heon Lee, new Vice-Chair, of the Korean IHP National Committee (KNC).

Below are the highlighted IHP activities implemented and coordinated by the Committee since the last RSC meeting.

1. Regular participation in IHP Regional Steering Committees, workshops and working groups including the 26th RSC meeting held in Shanghai, China, in 2018.
2. Korea International Water Week (KIWW 2019) from 4–7 September 2019. Jointly organized with Korea Water Forum, Ministry of Environment, and K-Water.
3. Korea Water Resources Association (KWRA) annual conference in May 2019 with partners from Japan, China, Viet Nam and New Zealand.

4. Korea Water Resources Association (KWRA) launched the second half of research projects (2018–2021) on IHP Phase VII research topics:
    - Management of water-related disasters for climate change adaptation. Urban water cycle strategy through the establishment of sustainable water ecohydrological system.
    - Solutions for urban development and water challenges in developing countries.
    - Future strategies for water shortage challenge and water availability security.
    - Investigation of the characteristics of the IHP Experimental River Basins (2019–2021).

5.7 Malaysia

Most of the Malaysian IHP National Committee activities are aligned towards the IHP-VIII activities as follows:

- Theme 1: Water-related disaster and hydrological change
- Theme 3: Addressing water scarcity and quality
- Theme 6: Water education, key for water security

Selected activities are listed below:

- National Flood Forecasting and Warning System (NaFFWS) programme
- National Water Balance Management System (NAWABS) Programme
- National World Water Day 2019 celebration with the theme of 'Leaving No One Behind'
- Water Watch Programme for Young Leaders (WW4YL) and Reaching the Grassroots Programme

The Committee also provided updates on publication, research/applied projects and future activities for implementation beyond 2019.

5.8 Mongolia

The presentation from Mongolia outlined current water issues in the country including water resources, climate change and water policies. Reports have been produced on a national water programme and integrated water resources management plans for 29 river basins across the nation. A transboundary water commission was also described, addressing water issues with neighbouring countries China and Russia.

IHP activities undertaken recently include:

- Celebration of World Water Day (WWD) 2019.
- Organization of Mongolian Water Forum in June 2019.
- Increase capacity building for polluted water treatment plants.
- Implementation of 'Tuul River improvement' project.
- Implementation of 'Improving sanitation in area of households' project.

5.9 Myanmar

The national report from Myanmar outlined the following selected activities:

- Status of IHP VIII activities: Monitoring the river flow and river bed profile at specific hydrological monitoring sites.

- Activities at the national level in the framework of IHP: Training on hazard modelling was conducted in Nay Pyi Taw, organized by DMH and Asian Development Bank and Climate Project Team (10–18 December 2018).
- Collaboration with other national and international organization: Myanmar is collaborating with the Government of Canada and ADB in strengthening climate and disaster resilience activities.
- Contribution to IHP Course: Hydrological Grade I course was held at Department of Meteorology and Hydrology, Mandalay in November 2018.
- Participation in international scientific meetings: Workshop on Implementation of Synergized Standard Operating Procedures (SSOPs) for Coastal Multi-Hazard Early Warning System
- Participation in international meetings: 24th Session of the Conference of the Parties to United Nation Framework Convention on Climate Change (COP 24).
- Future activities: Developing the Impact-Based Flood Forecasting and Warning System for four priority areas in the Ayeyarwady river basin and Chindwin river basin in Myanmar.

5.10 Nepal

Nepal presented the results of a recent flood hazard mapping study. With support from Tribhuvan University, the study took place in Babai Basin, mapping a 3,335 km catchment area with three hydrological stations and 26 meteorological stations. The report outlined methodology and outputs (modelling and maps).

Another activity was the South-Asian Hydro-Meteorology Forum for Regional Co-operation Programme hosted by the Department of Hydrology and Meteorology.

5.11 New Zealand

New Zealand did not attend the meeting but submitted a report of activities undertaken from October 2018 – October 2019 as well as planned future activities (Annex F).

5.12 Pakistan

Pakistan briefly outlined activities undertaken to address major water sector issues in the country, listed below:

- Investigation and mapping of groundwater quality zones in the Upper and Lower Indus Plains.
- Launched satellite-based water resources management.
- Determined soil physical hydraulic properties of the Upper Indus Plain.
- Introduced irrigation advisory service to 20,000 farmers/week in 41 districts using SMS.
- Piloted Indus telemetry system in collaboration with the International Water Management Institute (IWMI) for trust-building on data collection.
- Implemented rainwater harvesting techniques in drylands.
- 'Karez Cultural Landscape' in the World Heritage List of UNESCO.
- Digital inventory of Karezes of Balochistan in IHP WINS.

Progress on the establishment of two UNESCO Category II Centres was outlined. The Cabinet of Pakistan has approved the signing of an agreement with UNESCO to establish:

1. Regional Centre for Water Management in Arid Zones, Islamabad
2. Regional Centre on Headwater Catchments

5.13 Philippines

The report highlighted activities carried out by members of the Philippine IHP National Committee. Among the 22 members (updated in October 2019), the activities of the most active seven members are briefly presented below:

1. National Economic Development Authority
   Funding and monitoring of the National Irrigation Master Planning conducted by UPLB Development Foundation (July 2018–November 2019).
2. Metropolitan Waterworks and Sewerage System
   Water supply project at Kaliwa Low Dam.
3. National Water Resources Board
   Operationalized new streamflow monitoring system in the Upper Agno River and Angat River basin.
4. Philippine Atmospheric, Geophysical and Astronomical Services Administration
   Improving its river forecasting model with more data available from newly established streamflow gauging stations.
5. National Irrigation Administration
   Focal agency for the International Committee on Irrigation and Drainage. Holds regular activities related to irrigation policies and practices in the Philippines.
6. Philippine Water Partnership
   Organized national forum on wetlands and flood management
7. University of the Philippines and National Hydraulic Research Center
   Angat Reservoir flow augmentation studies for Metro Manila's domestic water supply from Biliway and Sumag watersheds.

5.14 Solomon Islands

No country report was presented by the Solomon Islands. A report will be prepared for the next RSC meeting.

5.15 Thailand

Activities implemented by the Thai National Committee for IHP for the period of November 2018 to October 2019 are highlighted below. They were grouped according to the themes of IHP VIII.

1. Theme 1: Water-related disasters and hydrological changes
   - Awareness of local community on the impact of climate change and adaptation.
   - Climate change and its impacts on community water resources management.
2. Theme 2: Groundwater in a changing environment
   - Project implementation of groundwater and hydro-geological maps by the Department of Groundwater Resources with financial support from the Groundwater Development Fund.

3. Theme 3: Addressing water scarcity and quality
    - Model improvement for optimal reservoir operation in the Mekong River Basin.
    - Study on impact and monitoring for transboundary environment of the Mekong Mainstream Hydropower Project.
4. Theme 6 Water education key, for water security
    - Enhancing tertiary water education and professional capabilities in the water sector.
    - Water education for children and youth.

The report also presented collaborations with other national and international organizations and/or programmes, regional-level activities and future activities foreseen for 2019–2020.

5.16 Viet Nam

The Vietnamese IHP Committee's report summarized the following activities, carried out during October 2018 October 2019.

1. A number of scientific and technical meetings were held in collaboration with relevant entities including MONRE, Viet Nam National Advisory Council on Climate Change, and the Viet Nam Hydro-Meteorological Association.
2. Research/applied projects included flood forecasting (Red River Basin) and flash flood warning.
3. On-going projects include:
    - Research on science and technology solutions for multi-disaster management, to develop support decision-maker tools to respond to multiple natural disasters, pilot in central Viet Nam.
    - Research on flash flood risks in order to disaster prevention and mitigation for mountainous river basins. Pilot applied for Ngan Pho-Ngan Sau river basin.
4. Future activities:
    - Enhance activities that contribute to IHP-VIII.
    - Focus on water security and hydrology-related disaster risk management in Viet Nam.
    - Transfer technology and training course in hydrology and water resources.

6. Updates from the Centres and Chairs under the Auspices of UNESCO

In addition to the prevailing UNESCO Category 2 Centres and water-related Chairs, the 27th RSC meeting welcomes two new UNESCO Chairs from Central Asia subregions: Kazakhstan and Uzbekistan. Activities of all organizations are summarized below. Please find the complete report in Annex G.

6.1 Asia Pacific Centre for Ecohydrology (APCE), Indonesia

APCE's contribution to implementation of SDGs, particularly SDG 6, 12, and 15, were highlighted. Other achievements for the period 2016-2019 were summarized for the following areas:

1. Scientific research
2. Training and capacity building

3. Networking
4. Collaboration with other organizations including UNESCO Category II Centres and Chairs

6.2 Humid Tropics Centre Kuala Lumpur (HTC KL), Malaysia

Activities undertaken from November 2018 to October 2019 are presented below:

1. International meeting/conference/workshop/training
   - International Training Workshop on Integrated Sediment Management in River Basins, Beijing, China (5–10 November 2018)
2. National meeting/conference/workshop/training
   - 4th International Conference on Water Resources, Malaysia (27–28 November 2018)
3. Research activities
   - Debris Mud Flow Warning System (Phase II)
4. Technical visit
   - Visit by ecohydrology experts, UNESCO Water Families and UNESCO headquarters.
5. Publication
   - Journal of Water Resources Management
6. Future activities
   - Knowledge enhancement and awareness towards water security.

6.3 International Centre for Water Hazard and Risk Management (ICHARM), Japan

ICHARM's report recalled the three pillars of ICHARM's activities – innovative research, efficient information networking, and effective capacity building. The report highlighted the work on water resilience and disasters implemented under the International Flood Initiative (IFI) in Indonesia, Myanmar, Pakistan, Philippines, and Sri Lanka. Regional cooperation amongst IFI's implementing countries were also described. The organization also builds capacity and raises awareness by conducting PhD/Master degree courses, short-term group/country training programmes, technical workshops and advisories, and seminars.

6.4 Water, Energy and Disaster Management for Sustainable (WENDI), Japan

Recognized in April 2018, WENDI is a UNESCO Chair hosted by Kyoto University, Japan. Since its establishment, the Chair has contributed to the following activities:

- Participated in the side event at the UNESCO-IHP Intergovernmental Council Session in Paris (18–22 June 2018).
- Kick-Off International Symposium in Kyoto University, with UNESCO Chairs and UNESCO Centres (30–31 July 2018).
- Hosted the 28th IHP Training Course in Kyoto University (November–December 2018).
- Initiation of six higher education courses on sustainable development (HESD) courses, Japan (April 2019–present).
- Joined a summer school in Aral Sea (August 2019).
- Participated in World Water Week (August 2019).
- Participated in regional workshop on water education in Asia and the Pacific, Jakarta, Indonesia (September 2019).

6.5 International Centre for Water Security and Sustainable Management (i-WSSM), Korea

The report summarized activities for research and development; education and training; and global networks.

1. Research and development
   - Development of education and training programme modules.
   - Capacity building programmes for the improvement of water security in Asia.
2. Education and training programmes
   - Training programme for smart water grid operators (Nepal).
   - Knowledge and experience sharing programme of Korea's water resources for Central and South American officials and IDB, 2019.
   - Workshop for specialists on smart water management in Central Asia, 2019.
   - UNESCO workshop on groundwater management issues and solutions in Timor-Leste: Building Capacity for Sustainability.
3. Global networks
   Korean Water (K-Water), Asian Water Council (AWC), Korea Foundation, World Water Assessment Programme (WWAP).

6.6 UNESCO Chair on Water Resources Management in Central Asia in Kazakh-German University, Kazakhstan

Integrated water resource management (IWRM) in Central Asia was the main topic of the presentation, outlining water resource problems, biodiversity, desertification, climate change, and transboundary issues in the subregion. The history of the centre was described, as well as a MA graduate course offered by the university. Capacity building activities for young people and government officials are organized by the Chair and comprise training, water contests, summer schools and field exercises.

6.7 UNESCO Chair on Water Diplomacy, Water Resources Management and Environmental Protection (WDWRMEP), Uzbekistan

The Water Diplomacy, Water Resources Management and Environmental Protection (WDWRMEP) is a newly established UNESCO Chair hosted at the Tashkent Institute of Irrigation and Agricultural Mechanization Engineers (TIIAME), Uzbekistan, in November 2018. The report highlighted the Chair's activities for the first year:

1. Regional training workshop on water cooperation in Central Asia, 20–22 November 2018.
2. Participation in 'Water Initiative South and Central Asia' on 13–14 December 2018, in Astana, Kazakhstan.
3. Hosted an international summer school on water resource management, integration of theory, practice and innovation.
4. Hosted a new dual diploma graduate programme in environmental science and engineering, and water quality management.

6.8 Global Runoff Data Centre (GRDC), Germany

The status of the Global Runoff Database for the world as well as for Asia and the Pacific was outlined. The report also highlighted milestones in 2019 including the endorsement by the 18th World Meteorological Organization (WMO) Congress for GRDC to be amongst the initial 18 global data centres/datasets that were successfully assessed and included in WMO Catalogues for Climate Data.

7. Joint discussion on the Strategic Plan for IHP-IX strategy

A dedicated session was held to welcome participants' priorities and ideas for the next IHP-IX strategy plan. Following a brief presentation from Professor Zhongbo Yu, China, member of the regional taskforce team, the provisional first-order draft of the IHP-IX strategy plan was shared with IHP national committees for inputs and observations. Following this meeting, a second in-depth consultation with the UNESCO 'Water Family' was held to further develop the IHP-IX draft strategy to meet the needs of Member States and other Water Family members.

8. Regional consultations for IHP Bureau - Extraordinary Session of Council

A conference call with the IHP Secretariat at UNESCO headquarters took place during the meeting. The session was deemed a regional consultation to connect countries in the region with the Secretariat ahead of the Extraordinary Session of the Council of the IHP taking place on 28 November 2019. The IHP Secretariat provided updates on the revised statutes of IHP's Intergovernmental Council (IGC), to be adopted at the 40th UNESCO General Conference in November 2019.

9. Catalogue of Hydrologic Analysis: Workshop report and next steps

The RSC meeting was held in associated with the second Catalogue of Hydrologic Analysis (CHA) workshop. In this session, Mr Tachikawa briefly presented results from the workshop held one day before the Committee meeting. The main points discussed during the session are presented below (complete presentation is available in Annex H):

1. Updates from Indonesia, Japan, Republic of Korea, Myanmar and the Philippines who contributed to the first volume of CHA, 'Flood Hazard Mapping'. [1]
2. Agreed on the name of a new webpage for the CHA as well as mobile applications, developed by UNESCO Jakarta. The name of the website is http://ihp-rscap.org.
3. Proposals for publication, timeline and composition of the editorial team for volume 2.

10. Organization of the 28th (2020) and potential host for the 29th (2021) RSC meetings

As decided during the previous RSC meeting in Shanghai, China in 2018, Viet Nam will host the

1 Malaysia submitted its paper after the Committee meeting.

28th RSC meeting in 2020. Viet Nam presented a plan for the meeting including a draft agenda, possible dates and field trip sites. It was agreed by all participants that the next meeting will be held in the last week of October 2020. As per usual practice, there will be other events held with this meeting. The Vietnamese IHP will work with the RSC Secretariat to initiate the preparation of the meeting and associated sessions.

Malaysia and Pakistan expressed their interest to be the host for the meeting in the following years. More discussions on the future host will be discussed during the upcoming RSC meeting.

11. Election of the RSC's Chair for 2019–2021

The 27th RSC meeting marked the conclusion of the current period of RSC's Chair, Mr Ignasius Sutapa (2017–2019). Thanking Mr Sutapa, all member countries agreed to appoint Mr Zhongbo Yu of China to serve as the new Chair of the RSC from 2019 to 2021, where the new chair will be elected at the 21st RSC meeting. The new chair will work closely with the Secretariat and the whole Water Family in the region to ensure that all programmes are implemented in accordance with the objectives of the Committee.

12. Any other issues

No other issues were discussed in the meeting.

13. Adoption of resolutions

No formal resolution was adopted during the 27th RSC meeting.

14. Closure of the meeting

On behalf of the outgoing Chair, Mr Yasuto Tachikawa thanked all participants for a productive meeting and officially closed the meeting at 18.00. A technical field visit on the following day was organized to key water installations in the Nay Pyi Taw area.

Action points:

Actions	Responsible person	Deadline
Manuscript submission deadline for Catalogue of Hydrologic Analysis (CHA)	IHP countries	30 November 2019

ANNEX A - List of participants

No	Country	Full name		Position	Organization
1	China	Mr	Prof. Zhongbo Yu	Vice Chairman / Professor	Chinese National Committee for IHP / Hohai University
2	Germany	Mr	Ulrich Looser	Head GRDC	Global Runoff Data Centre (GRDC) at BfG
3	India	Ms	Dr Jyoti P Patil	Scientiest	National Institute of Hydrology (NIH), Roorkee
4	Indonesia	Mr	Prof Ignasius D.A. Sutapa	Chair RSC AP / Executive Director	Asia Pacific Centre for Ecohydrology (APCE)
5	Indonesia	Mr	Dr Hidayat	Member	IHP Indonesia
6	Indonesia	Ms	Maria Yustiningsih	Member	IHP Indonesia
7	Japan	Mr	Prof. Yasuto Tachikawa	Professor	Graduate School of Engineering, Kyoto University
8	Japan	Mr	Dr Kenichiro Kobayashi	Associate Professor	Research Center for Urban Safety and Security, Kobe University
9	Japan	Ms	Yumiko Asayama	Manager	Japan Water Forum / Secretariat of Asia-Pacific Water Forum (APWF)
10	Japan	Mr	Dr. Tetsuya Ikeda	Chief Researcher	International Centre for Water Hazard and Risk Management (ICHARM),Public Works Research Institute (PWRI), Japan
11	Japan	Mr	Prof Kaoru Takara	Chairholder	UNESCO Chair on Water, Energy and Disaster Management for Sustainable Development (WENDI)

No	Country	Full name		Position	Organization
12	Kazakhstan	Ms	Barbara Janusz-Pawletta	Chair	UNESCO Chair on Water Resources Management in Central Asia in Kazakh-German University, Kazakhstan
13	Korea	Mr	Prof Kyung Soo Jun	Professor	Sungkyunkwan University
14	Korea	Mr	Prof Giha Lee	Associate Professor	Kyungpook National University
15	Korea	Mr	Prof Yongwon Seo	Associate Professor	Yeungnam University
16	Korea	Ms.	Kyu Yeong Kim	Programme Specialist	International Centre for Water Security and Sustainable Management (i-WSSM)
17	Korea	Mr	Dr Yang Su Kim	Director	International Centre for Water Security and Sustainable Management (i-WSSM)
18	Malaysia	Mr.	Ir Nor Hisham Bin Mohd Ghazali	Deputy Director General	Department of Irrigation and Drainage / IHP malaysia
19	Malaysia	Mr	Tajudin Sulaiman	Director	Humid Tropics Centre Kuala Lumpur (HTC KL)
20	Mongolia	Mr	Munkhbat Dorjgotov	Senior Officer	Department of Land Management and Integrated Water Water Policy Coordination, Ministry of Environment and Tourism, Mongolia

No	Country	Full name		Position	Organization
21	Myanmar	Mr.	Dr Kyaw Moe Oo	Director General	Department of Meteorology and Hydrology
22	Myanmar	Ms	Khin Cho Cho Shein	Deputy Director General	Department of Meteorology and Hydrology
23	Myanmar	Ms	Tin Yi	Director	Department of Meteorology and Hydrology
24	Myanmar	Ms	Htay Htay Than	Director	Department of Meteorology and Hydrology
25	Myanmar	Mr	Myo Tun Oo	Assistant Director	Department of Meteorology and Hydrology
26	Myanmar	Ms	Khin War War Win	Staff Officer	Department of Meteorology and Hydrology
27	Myanmar	Mr	Seishi Nabesaka	Expert for Disaster Risk Reduction	Japan International Cooperation Agency (JICA)
28	Myanmar	Mr.	Hirotaka Hiyama	Director	CTI Myanmar Co., Ltd.
29	Myanmar	Ms.	Hnin Wityi	Senior Engineer	CTI Myanmar Co., Ltd.
30	Myanmar		Daw Nu Nu Tin	Director, IWUMD	IWUMD/ Myanmar
31	Myanmar		Dr. Zaw Zaw Latt	Assistant Director	IWUMD/ Myanmar
32	Myanmar		Dr. Khin Myo Thant	Staff Officer	DOA/ Myanmar
33	Myanmar		Daw Thandar Thatoe Nwe Win	Deputy Director	DWIR, Myanmar
34	Myanmar		U Myint Naing	Assistant Director	DHPI/ Myanmar
35	Myanmar		Daw Thiri Maung	Deputy Director	DDM/ Myanmar

No	Country	Full name		Position	Organization
36	Myanmar		U Myo Min Tun	Director	GAD/ Myanmar
37	Nepal	Mr	Rudra Bahadur Pariyar	Hydrologist	Hydrological data and Network section, Department of Hydrology and Meteorology
38	Nepal	Mr.	Narayan Prasad Gautam	Lecturer	Tribhuvan University
39	Pakistan	Mr	Dr Muhammad Ashraf	Chairman	Pakistan Council of Research in Water Resources (PCRWR), Ministry of Science and Technology, Islamabad
40	Philippines	Mr.	Prof. Guillermo III Tabios	Chairman of Philippines IHP / Professor of Civil Engineering	Institute of Civil Engineering, Univ of the Philippines
41	Solomon Islands	Mr	Michael Maehaka	Senior Hydrologist	Water Resources Division, Ministry Mines, Energy & Rural Electrification
42	Thailand	Ms	Khuawan Sangpho	Scientist, Professional level	Department of Royal Rainmaking and Agricultural Aviation
43	Thailand	Ms	Supaluck Dasom	Plan and Policy Analyst	Department of Royal Rainmaking and Agricultural Aviation
44	Thailand	Mr	Pakdee Chantraket	Director	Department of Royal Rainmaking and Agricultural Aviation
45	Thailand	Mr	Phoomjit Prodpran	Hydrologist Professional Level	Department of Water Resources

No	Country	Full name		Position	Organization
46	Thailand	Ms	Kunlaya Jaroenkitkaset	Hydrologist Professional Level	Roral Irrigation Department
47	Thailand	Mr	Atthaseen Paewsakul	Hydrologist	Roral Irrigation Department
48	Thailand	Ms	Nilobol Aranyabhuga	Expert and hydrologist	Office of Natural Water Resources
49	Thailand	Mr	Sarawut Jamrussri	Engineer Level 7	Electricity Generating Authority of Thailand
50	Uzbekistan	Mr	Prof Abdulkhakim Salokhiddinov	Chairman & Professor	Tashkent Institute of Irrigation & Agricultural Mechanization Engineers (TIIAME), Uzbekistan
51	Vietnam	Mr.	Prof Dr Tran Thuc	Chairman of Vietnam IHP	Vietnam Association of Meteorology and Hydrology
52	Vietnam	Mr.	Prof Nguyen Van Thang	Director General	Viet Nam Institute of Meteorology, Hydrology and Climate Change
53	UNESCO	Mr.	Hans Thulstrup	Senior Programme Specialist	UNESCO Office Jakarta
54	UNESCO	Mr.	Bustamam Koetapangwa	Project Assistant	UNESCO Office Jakarta
55	UNESCO	Mr	Philippe Pypaert	Programme Specialist for Natural Sciences	UNESCO Beijing Cluster Office
56	UNESCO	Ms	Naw Moo Moo Hsoe	Administrative Assistant	UNESCO Yangon Office

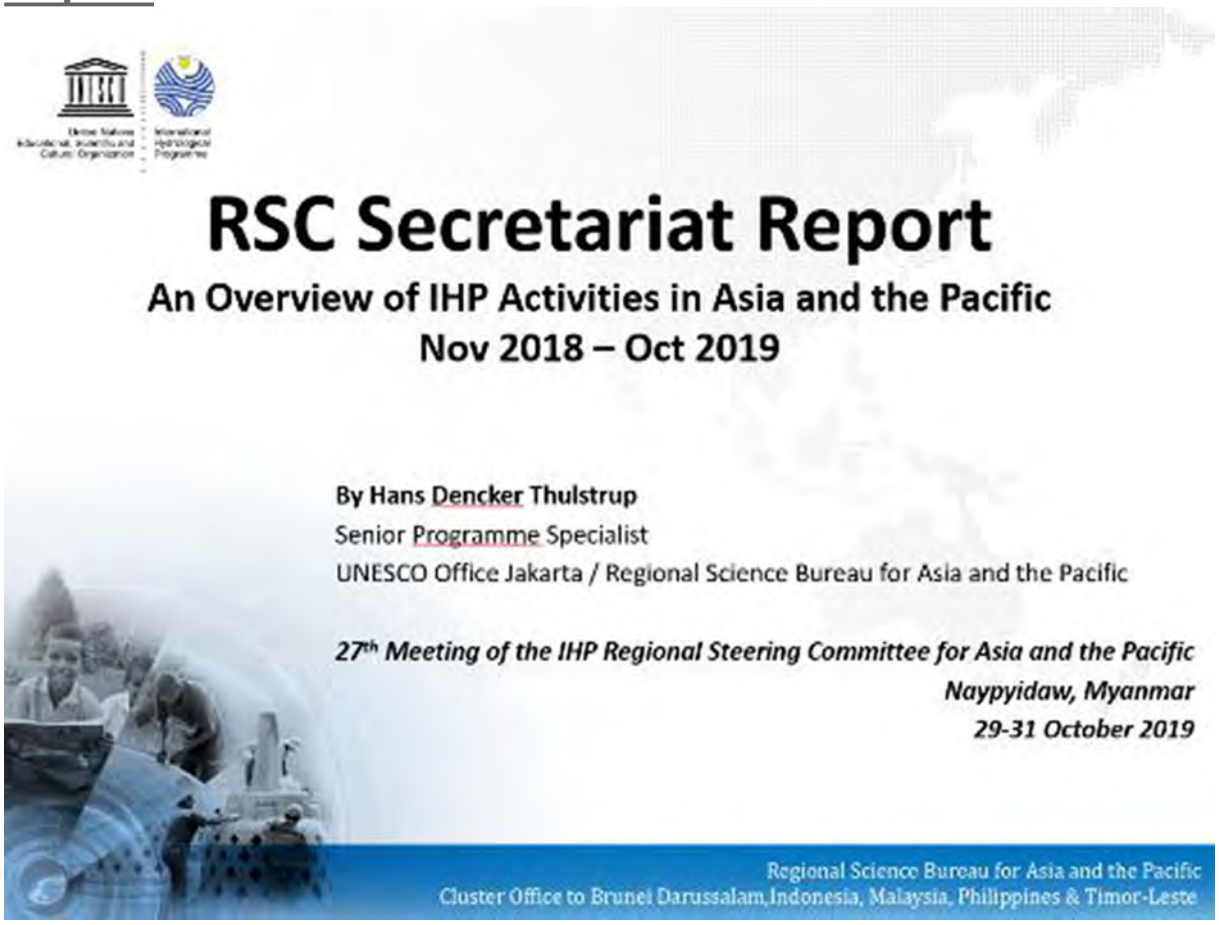
ANNEX B - Agenda of the Meeting

Time	Agenda item	Resource Person/PIC
Day 1: 28 October 2019 - *Arrival of participants*		
Day 2: 29 October 2019 - *Associated Thematic Workshops*		
08.30 – 09.00	Registration	
09.00 – 10.00	Joint discussion on the Strategic Plan for IHP-IX strategy	UNESCO and water family networks
10.00 – 10.15	Coffee break	
10.15 – 12.00	Catalogue of Hydrologic Analysis (CHA) discussion and publication with attached ***(the detailed programme is available on page 3)***	CHA editorial team
12.00 – 13.00	Lunch	
13.00 – 15.00	Workshop on water-related disasters in Myanmar	Department of Meteorology and Hydrology (DMH), Ministry of Transport and Communications, Myanmar Ms. Khin Wah Wah Win
	Water-Related Disaster in Myanmar (DMH)	Ms. Thandar Thatoe Nwe Win
	Water-Related Disaster in Myanmar (DWIR)	Dr. Zaw Zaw Latt
	Water-Related Disaster in Myanmar (IWUMD)	Dr. Khin Myo Thant
	Water-Related Disaster in Myanmar (DOA)	
15.00 – 15.30	Coffee Break	
15.30 – 17.00	Water-Related Disaster in Myanmar (DHPI)	Mr. Myint Naing
	Water-Related Disaster in Myanmar (DDM)	Ms. Thiri Maung
	Water-Related Disaster in Myanmar (GAD)	Mr. Myo Min Tun
17.00 – 17.15	Closing	UNESCO and DMH

Time	Agenda item	Resource Person/PIC
Day 3: 30 October 2019 – *IHP Regional Steering Committee for Asia and the Pacific*		
08.30 – 09.00	Registration	
09.00 - 09.10	Welcome Remarks	• Deputy Minister (MOTC) • Ignasius Sutapa, RSC Chairperson
09.10 - 09.25	Opening Remarks	• Yasuto Tachikawa, Secretary IHP-RSC SEAP • Hans Dencker Thulstrup, UNESCO Jakarta Office
09.25 – 09.50	Group photo & coffee break	
09.50 – 10.00	Adoption of the Agenda	• Ignasius Sutapa, RSC Chairperson
10.00 - 10.15	RSC AP Secretariat report	• Hans Dencker Thulstrup, UNESCO Jakarta Office
10.15 – 10.30	Report from the 58th IHP Bureau	• Farhad Yazdandoost (Vice-Chairperson, Group IV - Asia and the Pacific, IHP Council) – *video message*
10.30 – 11.00	Towards the 4th Asia-Pacific Water Summit	• Yumiko Asayama, Asia Pacific Water Forum (APWF)
11.00 - 12.30	Country reports (5min/country)	• IHP delegates
12.30 – 13.30	Lunch	
13.30 - 14.15	Updates from water-related Centres under the Auspices of UNESCO in Asia and the Pacific	UNESCO Category 2 Water Centres
14.15 – 14.45	Presentation by the foreseen host for the 28th RSC meeting and associated conference (2020)	Vietnam delegation
14.45 – 15.15	Identification of potential host for the 29th RSC meeting and associated conference (2021)	IHP delegates, RSC Secretariat
15.15 – 15.30	Coffee break	
15.30 – 15.45	Election of RSC Chair	IHP delegates, RSC Secretariat
15.45 – 16.15	Any other issues	IHP delegates, RSC Secretariat

Time	Agenda item	Resource Person/PIC
16.15 – 16.30	Adoption of Resolutions	IHP delegates, RSC Secretariat
16.30 – 16.45	Closing of the Meeting	Ignasius Sutapa, RSC Chairperson
18:00 – 20:00	Dinner hosted by Department of Meteorology and Hydrology (DMH)	
Day 4: 31 October 2019 – *Field Trip*		
07.30 – 08.00	Registration	
08.00 – 12.00	Field trip • Lower Paung Laung Dam	Delegates
12.00 – 13.30	Lunch	
13.30 – 15.00	• Yan Aung Myin Dam and Water Treatment Plant	Delegates
Day 5: 1 November 2019 - *Departure of participants*		

ANNEX C - Secretariat Report: UNESCO Office Jakarta Report



Action points from the 26th meeting of the RSC

Actions	Responsible person	Deadline
Manuscript submission deadline of Catalogues of Hydrologic Analysis (CHA) Volume 1	IHP countries	30 April 2019

➔Five countries submitted: Indonesia, Japan, RO Korea, Myanmar, and Philippines

Selected IHP Activities

1. **IIWQ APCE International Training Workshop on Emerging Pollutants, Jakarta, 27-29 November 2018**
   - organised by APCE, UNESCO IHP and UNESCO Jakarta
   - build capacity and raise the awareness on emerging pollutant in the region
   - organised within the framework of "Emerging Pollutants in Wastewater Reuse in Developing Countries" and part of the International Initiative on Water Quality (IIWQ) Regional Training Workshops in four region: Africa, Asia, Arab States and Latin America

Selected IHP Activities

2. World Water Day Celebration, 22 April 2019

- held in partnership with the University of Indonesia and the Indonesia Global Compact Network
- seminar and public lecture, brought 190 participants from national government stakeholders, experts, development partners, and students
- launched the World Water Development Report 2019, presented to representatives of the Government of Indonesia, private sector stakeholders, and academia, by the United Nations Resident Coordinator
- discussed and exchanged views on tackling the water crisis by addressing the reasons why so many people are being left behind.

http://www.unesco.org/new/en/jakarta/about-this-office/single-view/news/leaving_no_one_behind_indonesia_marks_world_water_day_2019/

Selected IHP Activities

3. UNESCO International Ecohydrology Forum (1-4 July 2019) and UNESCO Ecohydrology Traning Course (26-29 August 2019), Putrajaya, Malaysia

- gathered UNESCO Ecohydrology demosites to present the respective progress in proposing solutions to solve problems, current initiatives and research as well as achievements.
- shared best practices on Ecohydrology in each demosite, including their relationship with nature based solutions (NBS), potential cost/benefit analyses and enhancement of ecosystem services
- highlighted contribution of demosites to the 2030 Agenda (SDGs)
- evaluated and considered potential new demosites strategize the best approach for "Future Ecohydrology".

Regional Science Bureau for Asia and the Pacific
Cluster Office in Brunei Darussalam,Indonesia, Malaysia, Philippines & Timor-Leste

Selected IHP Activities

4. Workshop for the Drafting of Water Management Curriculum for Africa, 24-25 July 2019, Jakarta, Indonesia

- organised by UNESCO Jakarta and participated by Five water-related Category 2 Centres and Chairs in Africa and Asia, and two Indonesian universities
- discussed the current state of water education in sub-Saharan Africa and the most critical water challenges in East and West Africa
- jointly draft a Water Management Curricula for Africa
- shared, discussed and advanced the development of a draft water management curricula that includes the concepts of ecohydrology, IWRM, and gender, and is tailored to African contexts and circumstances

Selected IHP Activities

5. Stockholm World Water Week: Asia Focus Session, 27 August 2019

- co-hosted by UNESCO Jakarta and partners: APWF, IWMI, JSC, ICEWaRM, CSIRO, SEI Asia
- facilitated a discussion on the contributions of water cycle management in Asia and the Pacific towards fulfilment of the targets under SDG6
- highlighted the state of water in Asia and showcased UNESCO's water science work
- underlining the need to invest in communication and partnership building
- emphasized the necessity to strengthen coordination and cooperation among multi-stakeholders in water and associated sectors, and to develop the complementary measures to enable transitions.

http://www.unesco.org/new/en/jakarta/about-this-office/single-view/news/asian_water_cycle_manage ment_in_focus_at_the_world_water_w eek/

Selected IHP Activities

6. Regional Workshop on Water Education in Asia and the Pacific, 4-5 September 2019, Jakarta, Indonesia

- hosted by UNESCO Office Jakarta with the participation of UNESCO water centres and chairs from Asia and the Pacific, water educators, researchers and managers from 10 countries
- took stock of the current state of water education in the region, identify significant gaps, and provide guidance and direction to the strengthening of its delivery
- drafted a new regional water curriculum informed by emerging and transdisciplinary concepts such as ecohydrology, integrated water resources management and sustainability science.
- mobilize and optimize the contributions of UNESCO's "water family towards attaining SDG6 on clean water and sanitation

http://www.unesco.org/new/en/jakarta/about-this-office/single-view/news/whereto_for_water_education_in_asia_and_the_pacific/

ureau for Asia and the Pacific
a, Philippines & Timor-Leste

IHP Activities

7. Workshop on Groundwater Management Issues and Solutions in Timor-Leste: Building Capacity for Sustainability, 1-3 October 2019, Dili

- co-hosted by UNESCO Jakarta and i-WSSM, a UNESCO Category II Centre, Korea

Regional Science Bureau for Asia and the Pacific
Cluster Office to Brunei Darussalam,Indonesia, Malaysia, Philippines & Timor-Leste

Relevant Publications

IHP Upcoming Activities for 2019 - 2020

1. Launching Workshop on Water Education Curriculum Africa
2. Introductory training on gender analysis applied to water management and governance
3. The SDG 6.5.2 (Proportion of transboundary basin area with an operational arrangement for water cooperation) Regional Workshop
4. World Water Day – 2020 WWDR launch

ANNEX D - Report from the 58th IHP Bureau

58th session of the IHP Bureau

Paris, 10-12 September 2019

Summary Report by

Farhad Yazdandoost

Vice-Chairperson for region IV

Main items of the agenda

- ✓ UNESCO'S STRATEGIC TRANSFORMATION AND MEDIUM-TERM STRATEGY
- ✓ PROGRESS ON THE NINTH PHASE OF IHP
- ✓ IMPLEMENTATION OF THE EIGHTH PHASE OF IHP (IHP-VIII)
- ✓ UNESCO INTERNATIONAL WATER CONFERENCE
- ✓ IHP FLAGSHIP INITIATIVES
- ✓ CATEGORY 2 INSTITUTES AND CENTRES – MANAGEMENT FRAMEWORK
- ✓ THE WORLD WATER ASSESSMENT PROGRAMME
- ✓ RELATIONS WITH UNITED NATIONS, IGOS AND NGOS
- ✓ IHP'S ACTIONS IN THE IMPLEMENTATION AND MONITORING OF THE SDG INDICATOR 6.5.2
- ✓ UNESCO WATER CERTIFICATE

INSTITUTIONAL DEVELOPMENTS

- the revised Statutes of the International Hydrological Programme's (IHP) Intergovernmental Council (IGC) will be presented for the approval of UNESCO's 40th General Conference (12-27 November 2019).
- The revised Statutes call for the election of new Bureau members as soon as the session of the General Conference elects the new Council Members.
- This translates in electing new Bureau Members as soon as November 2019.
- To this end, an extraordinary session of IHP's IGC will take place on 28 November 2019 (most probably attended by permanent delegations).

INSTITUTIONAL DEVELOPMENTS

Thus, the IHP Secretariat, in coordination with the Representatives of Regions to the IHP Bureau is organizing a series of Skype meetings in order to further elaborate on this new election procedure and to ensure that the National Committees' voices are taken into account for the election of the new IHP Bureau on 28 November 2019.

The need to coordinate views with permanent delegations.

IHP Intergovernmental Council Composition

Member States elected at the 38th session of the General Conference in 2015
(Term of office will expire at the end of the 40th session of the General Conference in 2019)

- Argentina
- Austria
- Cuba — VC (Group III — Latin America and the Caribbean)
- Germany
- Ghana
- Guatemala
- Hungary — VC (Group II - Eastern and Central Europe)
- Jordan
- Kazakhstan
- Kenya
- Morocco
- Nepal
- Nigeria
- Norway
- Pakistan
- Peru
- Poland
- Russian Federation
- Senegal — Chairperson (Group Va - Africa)
- Sudan
- Switzerland
- Tunisia

Member States elected at the 39th session of the General Conference in 2017
(Term of office will expire at the end of the 41st session of the General Conference in 2021)

- Chile
- Egypt — VC (Group Vb - Arab States)
- Ethiopia
- Iran (Islamic Republic of) — VC (Group IV - Asia and the Pacific)
- Japan
- Libya
- Netherlands
- Paraguay
- Republic of Korea
- Slovenia
- Sri Lanka
- Turkey
- UK — VC (Group I - Western Europe and North America)
- Zambia

The current composition of the Bureau

Itemized agreements

The Bureau requested that the Secretariat

- **facilitate the Task Force's work on creating a more concise version of the first order draft of IHP-IX document, more strategically oriented, and prepare an operational plan on the implementation of the strategy.**
- **to prepare a synthesis report of the achievements of UNESCO's Water Family activities during the implementation of IHP-VIII, a draft of which is to be presented at the 24th session of the IGC of IHP and the establishment of a Working Group to facilitate the coordination of such report.**
- **to continue its efforts towards the development of the Flagship Initiatives, in cooperation with the various partners involved, ensuring that they start the alignment of their status and *modus operandi* with the guidelines to be approved at the 24th session of the IGC of IHP.**
- **to continue efforts towards the preparation of a methodology for a new indicator on water education, as a substantial contribution to the 2030 Agenda, in cooperation with the various related partners involved.**

Itemized agreements

- The IHP Bureau also recommended that proposals for new Centres and Chairs related to water continue to be examined carefully by the IHP Bureau and the IHP Council.
- The Bureau decided that the Secretariat establish a working group to guide the finalization of the UNESCO Water Certificate project concept and its pilot phase.

ANNEX E - Towards the 4th Asia-Pacific Water Summit

Toward
4th Asia Pacific Water Summit (4th APWS)

Asia-Pacific Water Forum

4th Asia-Pacific Water Summit
Kumamoto Japan 2020

Yumiko Asayama

Secretariat of Asia-Pacific Water Forum (APWF) c/o Manager, Japan Water Forum

IHP Regional Steering Committee for Asia and the Pacific, 30 October 2019, Nay Pyi Taw, Myanmar

1. Asia-Pacific Water Forum (APWF)

- Established in 2006.
- APWF is an International Network, which consists of a variety of organizations that address water issues in Asia and the Pacific
  - A platform to contribute to sustainable social and economic development region from the water perspectives in the Asia-Pacific.
  - Collect and share good practices and knowledge on water issues in the region.
  - Promote the solutions to profound water-related problems.
  - Raise the priority of tackling water security issues highlighted in the development agenda throughout the region and world to solve the issues

H.E. Ryutaro Hashimoto, Former Prime Minister of Japan, declared the establishment of the APWF
(March 2006, 4th World Water Forum (Mexico)

APWF Inauguration Ceremony
(September 2006, ADB HQ (Manila)

Governance Structure of the APWF

President

H.E. Mr. Yoshiro Mori
Former Prime Minister of Japan / President of Japan Water Forum

Governing Council

Chair of APWF Governing Council
- Mr. Ravi Narayanan, Former Chief Executive of WaterAid



Vice-Chairs of APWF Governing Council
- Ms. Changhua Wu, Chair of China Redesign Hub, Office of Jeremy Rifkin
- Prof. Eduardo Araral, Lee Kuan Yew School of Public Policy, National University of Singapore

Key Member Organizations

- **Lead Organizations**

ADB, UNESCAP, FAO, **UNESCO**, UNHABITAT, FANSA, GWI UNSW, GWPO, GWP China, ICEWaRM, ICHARM, ICIMOD, IUCN, IWMI, IWC, JSC, NARBO, Singapore PUB, AIT, World Toilet Organization, etc.

- **Sub-regional Coordinators**

Secretariat of Pacific Community (Oceania & Pacific), GWP CACENA (Central Asia and Caucasus), GWP South Asia (South Asia), GWP Southeast Asia (Southeast Asia), Korea Water Forum (Northeast Asia)

Secretariat: Japan Water Forum

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2. Asia-Pacific Water Summit (APWS)

Primary Objective of the APWS

- Water issues often relate to various fields and sectors, and initiatives of ministers in charge alone do not always get fundamental solutions.
- Learning from such past experience, a platform for heads of state and government to take initiatives in solving water problems was strongly desired,

→ Commencement of APWS where heads of the Asia-Pacific countries get together to discuss water issues.

Three summits have been held so far…

- **The 1st APWS, Beppu, Oita, Japan December 2007**
- **The 2nd APWS, Chiang Mai, Thailand May 2013**
- **The 3rd APWS, Yangon, Myanmar, December 2017**

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2. Asia-Pacific Water Summit (APWS)

(1) The 1st APWS

– Water Security: Leadership and Commitment

- Organized in Japan in Dec. 2007
- 371 leaders (incl. **10 Heads of Country** & 32 Ministers) attended
- Adopted the **"Message from Beppu"**

- The first water summit which highlighted the necessity to address water-related disasters as higher priority of the global development agenda
- Set up a target to achieve universal access to safe water and sanitation by 2025


President of Tajikistan


President of Kiribati


HIH the Crown Prince of Japan


HRH Prince Orange of the Netherlands


Prime Minister of Japan


Prime Minister of Bhutan

2. Asia-Pacific Water Summit (APWS)

(2) The 2nd APWS

– Water Security and Water-related Disaster Challenges: Leadership and Commitment

- held in Thailand in May 2013
- Over 300 leaders (incl. **18 Heads of Country** & 14Ministers) attended
- Adopted the **"Chiang Mai Declaration"**

- To accord high priority to water and sanitation in national agendas and to allocate appropriate resources to water and sanitation sectors
- To minimize adverse impacts from water-related risks and disasters on people's livelihood, economy and environment.
- To encourage the inclusion of disaster risk reduction in the United Nations development agenda beyond 2015

2. Asia-Pacific Water Summit (APWS)

(3) The 3rd APWS

– Water Security for Sustainable Development

- held in Myanmar in Dec. 2017
- Over 700 leaders (incl. 20 Heads of Country & Ministerial-level delegates) attended
- Adopted the **"Yangon Declaration: the Pathway Forward"**

- Emphasized safe and affordable drinking water and basic sanitation for all in the region by 2025, five years in advance compared to the SDGs
- Showed the Pathways forward for sustainable development in terms of **Water Cycle management, Governance and Inclusive Development, and Financing the implementation of water-related SDGs**

3. 4th Asia-Pacific Water Summit

- ○ Date: **19 (Mon) - 20 (Tue) October 2020**
- ○ Location: **Japan （Kumamoto City, Kumamoto Prefecture）**
- ○ Theme: **Water for Sustainable Development -Best Practices and the Next Generation-**

※Venue: Kumamoto Castle Hall

4th Asia-Pacific Water Summit
Kumamoto Japan 2020

26th March 2019: Cabinet Approval to conduct the necessary cooperation in order to implement the 4th APWS smoothly (cooperative cabinet decision from Minister of Foreign Affairs; Minister of Education, Culture, Sports, Science and Technology; Minister of Health, Labour and Welfare; Minister of Agriculture, Forestry and Fisheries; Minister of Economy, Trade and Industry Minister of Land, Infrastructure and Transport; Minister of the Environment)

Progress and Gap of the region after the 3rd APWS

- The "Yangon Declaration" has become a signpost for the concerted endeavor of key stakeholders in the region to enhance water for sustainable development and accelerate actions and partnerships to deliver SDGs and inspire further commitments from municipalities, industries, multilateral financial institutions and private investors, and various groups, in addition to national governments.
- The dynamic transformation in the region in recent years generates over 60% of global GDP with a projected 5.7% growth in 2019.
- But, it has not sufficiently caught up with water infrastructure and the service needs, which responded to increased frequency of precipitation extremes and increased volume of precipitation in the coming decades.
- Severe water stress derived from water-related disaster and non-nature-induced risk will exacerbate poverty and inequality, as well as pollution and environmental degradation. These will significantly compromise growth potential in the region

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International trends after the 3rd APWS

- The detail scientific analysis of the necessary pre-investment for water fields, such as hydro-power, river improvement, flood controls, water & sanitation, and irrigation, has been increased to achieve water-related SDGs, responding to the 2 degree targets of Paris Agreement under the UNFCCC
- Disaster prevention and resilience was reconfirmed for its importance for the region including Sendai Framework for Disaster Risk Reduction 2015-2030 in the G20 Osaka Leaders' Declaration in June 2019. Investing in Pre-disaster prevention measures in line with the Sendai Framework becomes so significant to respond to the extreme catastrophes.
- Principle for Quality Infrastructure Investment was also adopted in the G20 Osaka Summit, which stipulates that private sectors' technologies, finances, and know-hows be utilized effectively, and fully considering life cycle costs including maintenance, management, and updates
- "Gearing up" actions and delivery of SDGs became a consensus and a reassured political commitment by heads of State and its all partners at the UN Sustainable Development Goals (SDGs) Summit in September 2019 to ensure ambitious and continuous action on the SDGs for the next 10 years and pass the best practices on to future generations.
- With the political commitments of no one left behind, a water sustainability strategy becomes crucial to **ensure quality growth that enhances resilience, inclusiveness, and sustainability**

The mission of the 4th APWS

Address key challenges remained in Asia and the Pacific

to mobilize more concerted actions for transformative change and gear up commitments to accelerate deployment of solution and how to pass on them to next generation, looking ahead to 2050 in addition to the SDGs:

- **Financing** water infrastructure and services lagging behind the real-life demand. Developing **financing mechanisms** is needed to fill the huge financial gap **in promoting quality infrastructure**
- **Governance** needs to be strengthened through include various stakeholders into decision making process with their capacity and awareness building, including for the younger generations, and
- **Role of the current technology revolution and science** has not been captured adequately mainly due to inadequate talents and expertise, which requires **urgent actions from all walks of life to invest in talents development through partnerships for cooperation and collaboration.**

The output of the 4th APWS: "Kumamoto Declaration"

- The 4th Summit will present its output in a format of the "Kumamoto Declaration" that is adopted by the heads of state and government of Asia and the Pacific
- The final document will be discussed among the participating government leaders of the 4th APWS for their adoption.
- A more detailed action plan to implement the Declaration will be summarized as an attachment to the Kumamoto Declaration.
- These will take consideration of the alignment of international SDG agenda including the mid-term review, and the World Water Forum-9, etc
- Moreover, the Asian Water Development Outlook (AWDO), a joint product of the ADB and APWF, conceptually underpins the 4th APWS. AWDO offers regional insights and assessments of both the progress and the gaps. It also provides guidance to design the Summit's agenda.

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4th APWS Tentative Agenda

	19 October 2020 (Day 1)		20 October 2020 (Day 2)	
Morning	Registration Opening ceremony - Greetings by the host country / city - Greetings by the previous host countries - Keynote speech		Registration Thematic sessions (3) Coffee break Thematic sessions (3)	Side Events Side Events
Noon	Lunch		Lunch	
Afternoon	- Head of state and Government roundtable conference - Adoption of the Outcome Document (tentatively named "Kumamoto Declaration") Coffee break Statements of the Heads of State and Government	Side events Side events	Thematic sessions (3) Coffee break Thematic sessions (3) Closing ceremony • Summary of the two-day Summit • Announcement of the 5th APWS • Report from the thematic sessions • Closing remarks	Side Events Side Events
Evening	Welcome reception			
All day	Exhibition		Exhibition	

Call for your feedback: **Options for concrete discussion topics**

- The 4th APWS aims to share the cases of practices and lessons from the region, discuss quality infrastructure and ways to pass on to the next generation looking ahead to 2050 for transformative change, by selecting the top priorities among each country of Asia and the Pacific, the APWF members and their collaborative networks from the topics listed below in terms of:
  - ✓ Governance
  - ✓ Finance
  - ✓ Science & Technologies
  - ✓ Cooperation and Collaboration

Topics options in terms of governance

- Inclusive decision-making and multi-stakeholder approach
- Master planning for the water cycle and its implementation to secure sound water cycle
- Openness, transparency, debt sustainability legal compliance
- Stability of each institution, safety, and resilience
- Reduction of disaster and political risks
- Decision-making based on science, collection of the data and publicity
- Economy and making use of the market (cost and benefit), the predictability
- Pro-poor policies
- Social environment, attention to gender
- Zero conflict over water
- Development of structure toward sustainable agricultural water management
- Strengths of cost competition and expansion of business opportunities
- Prior preparation for disaster prevention which responded to projected impacts of climate change

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Topics options in terms of finance

- Policy framework for private investment, Policy for water stewardship
- Dissemination of the judgmental standard based on Life-cycle included operation and maintenance
- Procurement for quick recovery from the disasters
- Proper risks allocation in public-private partnership contracts, which have a sense of ownership
- Promotion of the projects based on fiscal finance in case of difficulty to establish the public-private partnerships
- Prioritized investment for disaster prevention and preparedness, double the investments for water-related disasters

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Topics options in terms of science and Technologies

- Response to water management making use of ICTs
- Improvement of services, project operation and management which makes use of big data, such as observation data and data for climate change projection for water utilities, agriculture, river management, disaster prevention, support these project operations
- Improvement of efficiency of aging infrastructures' operation and management, which makes use of digital technologies
- Visualization of groundwater, equal groundwater use
- Conservation of water environment and ecosystem to secure sound water cycle

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Topics options in terms of cooperation & collaboration

- Job creation, capacity development, transfer of technologies and know-how to support quality growth
- Strengths of collaborative relationships to address transboundary river and water basin management
- Utilization of waterfront space toward job creation and the promotion of private investment
- Development of master plans, project operation, role allocations among each government-related organizations, private sector, and citizens in managing infrastructures
- Strength of international collaboration and cooperation to maintain and restore sound water cycle
- Ensuring water cycle management from source to sea.

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Preparation process of the Kumamoto Declaration document and thematic sessions

Nov - Dec, 2019	**- Preparation of "Kumamoto Declaration" zero draft and proposal of the topics of the Thematic Sessions in accordance with the comments from various stakeholders** **- Start of reviewing the Declaration document and topics of thematic sessions**
Jan, 2020	Discussion of the documents, and the approval of topics of thematic sessions and guideline for call for the lead organization of thematic sessions at the APWF 25th Governing Council Meeting
Feb, 2020 (a month)	Call for the lead organizations of the thematic sessions Review of further revised draft Declaration Document
The end of March, 2020	Decide the lead organizations of each thematic session and side events
May- June, 2020	Start of opinion inquiry to the declaration document to targeted countries of the 4th APWS
Aug- Sep, 2020	Finalize the agenda of the thematic sessions Get the basic consensus about the contents of declaration document
Oct 19-20, 2020	4th APWS: Final discussion of the declaration document, the adoption Organize the thematic sessions and side events

Expected Participating Countries and the targets for the Invitees

(Official invitation letter will be sent in November, 2019)

49 countries of Asia and the Pacific, including the host country (i.e. Japan):

Afghanistan, Armenia, Australia, Azerbaijan, Bangladesh, Bhutan, Brunei Darussalam, Cambodia, China, Cook Islands, Fiji, Georgia, India, Indonesia, Iran, Israel, Kazakhstan, Kiribati, Korea, Kyrgyz, Lao PDR, Malaysia, Maldives, Marshall Islands, Micronesia, Mongolia, Myanmar, Nauru, Nepal, New Zealand, Niue, Pakistan, Palau, Papua New Guinea, Philippines, Samoa, Singapore, Solomon Islands, Sri Lanka, Tajikistan, Thailand, Timor-Leste, Tonga, Turkmenistan, Tuvalu, Uzbekistan, Vanuatu, Viet Nam, and Japan

Other Invitees

(1) International

- Heads of UN organizations addressing water-related issues in the Asia-Pacific region, other international and interregional organizations, research institutions, NGO/NPOs, private companies, etc.

(2) Domestic (Japan):

- Top leaders and counterparts from the relevant government ministries and department, municipalities, water utilities, private sector, academic and research institutes, NGO/NPO

(3) Others

- Speakers, panelists, and audience of the Thematic Sessions, and participants of the side events

- **<Expected Participants> 300 to 400 participants**

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Thank you!

4th Asia-Pacific Water Summit
Kumamoto Japan 2020

Asia-Pacific Water Forum

For more information & comments
Please contact Asia-Pacific Water Forum Secretariat
office@apwf.org
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ANNEX F - Country Reports

Australia:

NATIONAL REPORT ON IHP RELATED ACTIVITIES AUSTRALIA

Drought and its Consequences in Australia

Much of Australia is in the grip of a major drought. Large areas of north and south west Western Australia, the Northern Territory, eastern South Australian, southern Queensland, New South Wales (NSW) and northern Victoria are in severe rainfall deficit over the past 18 months. Compared to other 33-month periods commencing in January, the 33 months from January 2017 to September 2019 has been the driest on record averaged over the Murray–Darling Basin. Since the Murray-Darling Basin supplies 50% of the irrigated agriculture in Australia, this is a major concern.

Consequences of the drought include towns and even some in-land cities running critically short of water with communities in them on severe water restrictions. There have been major demands for the construction of new dams and political unrest.

In December 2018-January 2019, there were 3 massive fish kills in the Darling River, one of the main river systems in the Murray-Darling Basin at Menindee in western NSW. These were caused by hypoxic conditions due to: blue-green algal blooms; very low river discharge; and a drop in air-temperature. The low river discharge was caused by over-extraction of river water due to relaxation of regulations for extraction. Previously, licenced extractions were only permitted provided the river level at a reference gauging site was above a specified level. Under pressure from irrigations the NSW government relaxed this restriction.

An additional consequence of the drought are 130 major bushfires which have broken out in southern Queensland and throughout NSW. Already 29 houses have been lost and two people have died in bushfires. This is only early in the bushfire season.

Most severe droughts in eastern and northern Australia are a consequence of significant El Niño events. What is unusual about this drought is that the Oceanic Niño Index (the SST anomaly in the Nino 3.4 region) shows ENSO remains in the neutral phase, however, the Indian Ocean Dipole (IOD) is in a near record positive phase (the Indian Ocean warm pool lies closer to southern Africa). In contrast the Southern Oscillation Index over the last 90 days is less than – 7 indicating an El Niño event.

Activities undertaken in the period November 2018 to October 2019

Australia was elected to the IHP Intergovernmental Council in Nov 2011 and ceased in June 2016. Australia continues to be an active member of the Regional Steering Committee for Asia-Pacific and contributes to UNESCO IHP's cross-cutting FRIEND and HELP programmes.

The Australian National University (ANU) hosts the UNESCO Chair in Water Economics and Trans-Boundary Water Governance whose focus is on water economics and governance in Africa and China and provides socio-economic expertise in water education and training, water economics, water governance, and water and society. The water-energy-economy-food nexus network, FE²W (www.fe2wnetwork.org/) the Geneva Actions on Human Water Security (www.genevaactions.org/), and the water justice hub (https://waterjusticehub.org/) are key initiatives of the Chair. The water justice hub was launched in October 2019 and its mission is to provide both 'voice' and truth-telling for the vulnerable and marginalised in relation to water. While the Hub would have a primary focus on Australia, especially its First Peoples, it would also respond to the global challenges of delivering 'water for all' or Sustainable Development Goal (SDG) 6 which is a UNESCO priority.

1.1 UNESCO Natural Science Programme

UNESCO Natural Science Programme has identified the following priorities:

a. Gender and Science
b. Indigenous Peoples, and
c. Small Island Developing States

http://www.unesco.org/new/en/natural-sciences/priority-areas/

Since its inception in 1995, the Australian IHP Committee has been a key contributor to water resource and sanitation assessment, design of supply systems, water resource management and policy, plan and drought management framework development with indigenous peoples in small island developing states, or as they prefer to be known, large ocean island states.

1.2 Australian National Commission for UNESCO

The Australian National Commission (NATCOM) for UNESCO currently has 7 Commissioners. NATCOM provides expert analysis and policy advice on UNESCO matters to the Australian Government; contributes to the development and implementation of programs in support of UNESCO priorities; and promotes and publicises UNESCO objectives and programmes. The priorities of NATCOM include:

- Attaining quality education for all and lifelong learning;
- Mobilizing science knowledge and policy for sustainable development;
- Addressing emerging social and ethical challenges;
- Fostering cultural diversity and intercultural dialogue; and
- Building inclusive knowledge societies through information and communication

www.dfat.gov.au/intorgs/unesco

1.3 Australian IHP National Committee

IHP activities in Australia are carried out under the guidance of the national UNESCO Science and Technology Network and NATCOM. In order to facilitate the implementation of UNESCO activities in Australia and the region, a national IHP Australian Network was established in 1995 and this network acts as the IHP National Committee for Australia. There are no formal meetings of the IHP Australian Network. Activities are conducted largely between the members by telecommunications (e-mail).

The Australian IHP Network is entirely voluntary and receives no support from the Federal Government or from NATCOM for UNESCO for its activities.

1.4 Composition of the INP Australian Network

The IHP Australian Network includes the following members listed below. Dr Dasarath Jayasuriya is the principal focus point for the National committee.

Name	Expertise	Organization
Dasarath Jayasuriya	Flood and Seasonal Forecasting	Bureau of Meteorology
Tony Falkland	Island Hydrology	
Trevor Daniell	Urban, Low and High Flow Hydrology UNESCO Chair in Water Economics and Transboundary	University of Adelaide
Quentin Grafton	Water Governance Hydrology, Water Policy Hydrology/Water Quality/Policy	Australian National University
Tariq Rana	Ecohydrology	MDBA
Ian White	HELP Coordination	Australian National University
Jeff Camkin	Flood/Drought Hydrology Groundwater	University of Western Australia Centre for Excellence for Ecohydrology
Ian Cordery	Ecotones	University of New South Wales
Peter Dillon	Groundwater	CSIRO Land and Water/ Flinders University
Anne Jensen		Wetlands Care Australia
Ray Volker		University of Queensland

Status of IHP-VIII activities

The IHP Australian Network brings together many of the key hydrological research groups within Australia. As such, Australia can contribute towards IHP activities through the research, education and training programs and projects currently existing in Australia. A description is provided below of some activities pertinent to IHP-VIII. As yet all the activities being carried out in Australia have yet to be mapped against IHP VIII Themes.

2.1 UN High Level Panel on Water

Australia has played a global leadership role, as one of eleven countries on the United Nations High Level Panel on Water (HLPW). The Panel was convened by the UN Secretary General and the President of the World Bank in March 2016 and consisted of 11 heads of states and governments and one special adviser. The core focus of the Panel was the commitment to ensure availability and sustainable management of water and sanitation for all, Sustainable Development Goal (SDG) 6, as well as to contribute to the achievement of the other SDGs that rely on the development and management of water resources. The Panel delivered its outcome document, "Making Every Drop Count, An Agenda for Water Action", on 14 March 2018. The Panel's Foundation for Action identifies:

1. Understand Water;
2. Value Water; and
3. Manage Water.

as key actions. Australia provided leadership to the HLPW on water data, water use efficiency and innovation. http://www.unwater.org/high-level-panel-on-water-outcome-document/

These free foundations for action provide a strong foundation for water governance

2.2 Water Accounting in Australia

The Commonwealth Water Act 2007 (Amended 2008) gave the Australian Bureau of Meteorology the additional responsibility for the annual publication of the National Water Account in addition to climate data and analysis. The Account reports on 10 national significant water regions, including the one million square kilometre Murray-Darling Basin. Reports are comprehensive and cover water stores, river flows, water rights, water use, volumes of water traded, extracted and managed for economic, social, cultural and environmental benefit. The Accounts covers surface and groundwater and water quality. The Bureau collects, analyses and stores data and makes it available on line. The Bureau's work in water accounting is a contribution to HLPW's Foundation for Action, first priority Understand Water. www.bom.gov.au/water/nwa

2.3 Australian Water Partnership

The Department of Foreign Affairs and Trade (DFAT) established the Australian Water Partnership (AWP) in May 2015 through the Australian aid program under an initial four-year, $20 million grant. The AWP has been extended to 2023. AWP was designed to respond to the water management needs of developing countries in the Indo-Pacific and beyond, specifically on topics where Australia has specialist expertise in short supply globally.

The vision of AWP is: Enhanced sustainable management of water in the Indo-Pacific and beyond. Its mission is: Through trusted partnerships, mobilise Australian water sector expertise to address demand from the Indo-Pacific and beyond. Its objectives are to:

- become a trusted adviser to governments and multilateral agencies;
- provide a world-class incubator and hub for information, modelling and capacity development for Australian and international water sectors;
- share resources, information, and lessons learned; and
- maximise Australia's contribution to the achievement of the Sustainable Development Goals.

AWP contributes to all three priorities for Action of HLPW. https://waterpartnership.org.au/about/

2.4 Water Information Research and Development Alliance

The Australian Bureau of Meteorology (BoM) and Commonwealth Scientific and Industrial Research Organisation (CSIRO) (http://www.csiro.au/) Water Information Research and Development Alliance (WIRADA) undertakes research of direct relevance to the activities of the IHP.

Theme 1: Water-Related Disasters and Hydrological Change

Theme 2: Groundwater in a changing environment

Theme 3: Addressing Water Scarcity and Quality

Theme 4: Water and human settlements of the future

Theme 5: Ecohydrology, engineering harmony for a sustainable world

Theme 6: Water Education, key for Water Security

WIRADA's science program underpins a number of activities that support the provision of national water information. These include:

- a national water information system (AWRIS) to collect and hold water data from formerly disparate sources that helps to standardise, organise, and deliver high quality national data and information to end-users
- periodic assessments of the status of water resources in Australia
- the annual National Water Accounts (NWA)
- water forecasting and prediction services.

WIRADA brings together CSIRO's research and development expertise in water and information sciences and the Bureau of Meteorology's operational role in hydrological analysis and prediction. The Alliance has covered fields of data interoperability, hydrologic modelling, water accounting and water resource assessment. The Water Data Transfer Standards project is defining and developing transfer standards and procedures for supply of specified data from water information providers and has contributed significantly to the development of an international data exchange standard named WaterML. Among the other significant contributions has been in improving the seasonal streamflow forecasting area using the Bayesian Joint Probability method which has been operationalised using the Bureau's operational systems and now well accepted in the industry. One further development is the Australian Hydrological Geospatial Fabric which is a specialised Geographic Information System (GIS). This identifies the spatial relationships of important hydrological features such as rivers, lakes, reservoirs, dams, canals and catchments and makes working with geodata in a hydrological context much easier. WIRADA contributes to priority 1 of the HLPW Framework for Action. http://www.bom.gov.au/water/about/waterResearch/wirada.shtml

Contributions to IHP-VIII Themes

Theme 1: Water-Related Disasters and Hydrological Change

Focal Area 1.1: Risk management as adaptation to global changes

Focal Area 1.2: Understanding coupled human and natural processes

Focal Area 1.3: Benefiting from global and local Earth observation systems

Focal Area 1.4: Addressing uncertainty and improving its communication

Focal Area 1.5: Improve scientific basis for hydrology and water sciences for preparation and response to extreme hydrological events

A subset of the hydrological data collected by State and Territory water agencies and the Bureau of Meteorology and CSIRO is contributing to international data centres for use in global and regional studies.

The Indian Ocean Climate Initiative (IOCI) (http://www.ioci.org.au) is a research partnership between the WA State Government, CSIRO and Bureau of Meteorology. The IOCI research program, formed in 1997, investigates the causes of the changing climate and develops projections of the future climate in WA. IOCI formally began its Stage 1 programs in January 1998, while Stage 2 started in July 2003. A partnership of research organisations is researching the impact of climate variability and climate change on the water resources of the southwest region of Australia. In March 2008, the three parties to the IOCI partnership signed the research agreement which indicated the formal start of Stage 3 of IOCI. Research work is carried out in the CSIRO and BoM facilities both in Perth and in Melbourne. Results from this research effort will be delivered in ways that will readily inform decision-making by the State Government, Local Governments, industry and the community.

The Australian Government has supporting Pacific Island countries to adapt to and mitigate the impacts of climate variability and change. A major part of Australia's assistance is the Climate and Oceans Support Program in the Pacific (COSPPac, http://cosppac.bom.gov.au/). Its aim is to enhance the capacity of Pacific Islands to manage and mitigate the impacts of climate variability and change and tidal events and sea level rise. COSSPac was implemented by the Bureau of Meteorology and is carried out in partnership with the Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Niue, Nauru, Papua New Guinea, Palau, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu as well as with Australian Government Department of Foreign Affairs and Trade, Geoscience Australia, the Secretariat of the Pacific Community (SPC) and Secretariat of the Pacific Regional Environment Programme (SPREP). Much of COSSPAC's tasks were transferred to SPREP and SPC in 2017, however sea level rise and tsunami warnings are still on-going commitments as well as regional seasonal forecasting including monitoring of ENSO and IOD for the region (http://www.bom.gov.au/climate/enso/).

COSPPAC provided a number of services and products including: Ocean Portal; Seasonal Climate Outlooks in Pacific Island Countries; On-line Climate Outlook Forum; Pacific Sea Level monitoring Project; Water storage Outlook Module; Malaria Early Warning System; Tide Calendar and Climate Bulletin. COSPPAC was been instrumental in improving capacity in Meteorology and water resource management in the Pacific region.

Island Hydrology Services (IHS) and Australian National University (ANU) together with colleagues in SPC and UNICEF have been researching vulnerability and adaptation to global change in small island countries and have contributed to AusAID's (now DFAT) Pacific vulnerability and adaptation project through water resource and sanitation assessment and management, policy and planning development and capacity building.

Theme 2: Groundwater in a changing environment

Focal Area 2.1: Enhancing sustainable groundwater resources management

Focal Area 2.2: Addressing strategies for management of aquifers recharge

Focal Area 2.3: Adapting to the impacts of climate change on aquifer systems

Focal Area 2.4: Promoting groundwater quality protection

Focal Area 2.5: Promoting management of transboundary aquifers

In Australia, groundwater accounts for around one third of our total water consumption. In the last few decades, Australia has more than doubled its groundwater use. The National Centre for Groundwater Research and Training's (NCGRT, http://www.groundwater.com.au) role is to advance understanding of Australia's groundwater resources, and to train the next generation of groundwater researchers. The NCGRT was established in 2009 as an Australian Research Council Centre of Excellence, co-funded by the National Water Commission. The NCGRT's other partners are:

Universities

Charles Sturt University

Edith Cowan University

Flinders University

La Trobe University

Monash University

The Australian National University

UNSW

The University of Melbourne

The University of Queensland

The University of Western Australia

University of South Australia

University of Technology, Sydney

Government departments and organisations

CSIRO

Geoscience Australia

NSW Department of Primary Industries

SA Department of Environment, Water and Natural Resources

Australian Nuclear Science and Technology Organisation

Commonwealth of Australia as represented by the Bureau of Meteorology

Murray-Darling Basin Authority

NT Department of Environment and Natural Resources

Office of Groundwater Impact Assessment

VIC Department of Environment, Land, Water and Planning

WA Department of Water

Private industry

Aquanty Inc

DHI

Golder Associates

RPS Aquaterra

SA Water

CDM Smith

Innovative Groundwater Solutions

Jacobs

Non-core research partner organisations and affiliates

University of Texas (Jackson School of Geosciences)

University of Neuchatel (Switzerland)

National Groundwater Association

Australian Water Association

International Association of Hydrogeologists

Water Industry Alliance

It has an extensive research program including research on groundwater/surface water interaction and is investigating how better to manage groundwater resources.

CSIRO is researching managed aquifer recharge, storage and recovery with urban stormwater and recycled water to sustain depleted groundwater resources (www.clw.csiro.au/research/urban/reuse). CSIRO has been a major player in UNESCO's and IAH's initiatives in managed aquifer recharge.

PHSIHS? and ANU are continuing investigating shallow groundwater management and harvesting, water supply and sanitation systems, socio-cultural aspects of groundwater management, water policy development and impacts of climate variability in low coral islands as a follow up to a UNESCO-IHP initiated project.

- ***Crosscutting Program Components – FRIEND and HELP***

Collaboration in the Asian Pacific FRIEND project by provision of data, hosting a node of the Internet based Water Archive, and assisting in research activities. HELP basins include the Lower Murrumbidgee catchment in the Murray Darling River Basin (coordinated by Awadesh Prasad, Murray Darling Basin Authority), Tully Basin (coordinated by Jim Williams, CSIRO), Lower Burdekin River Basin (coordinated by Keith Bristow, CSIRO), Fitzroy River basin (coordinated by Chris Carroll, Queensland Department of Environment Resources and Mines) and the Ord River Basin (coordinated by Jeff Camkin and Dick Pasfield, University of Western Australia). Overall coordination in Australia is through Prof. Jeff Camkin, University of Western Australia.

Theme 3: Addressing Water Scarcity and Quality

Focal Area 3.1: Improving governance, planning, management, allocation, and efficient use of water resources

Focal Area 3.2: Dealing with present water scarcity and developing foresight to prevent undesirable trends

Focal Area 3.3: Promoting tools for stakeholders involvement and awareness and conflict resolution

Focal Area 3.4: Addressing water quality and pollution issues within an IWRM framework - improving legal, policy, institutional, and human capacity

Focal Area 3.5: Promoting innovative tools for safety of water supplies and controlling pollution

A DFAT project has been carried out to facilitate development of water quality guidance for managed aquifers in India. UNESCO Delhi office is assisting in project establishment.

An IAH Commission on Managed Aquifer Recharge (MAR) project produced a monograph on clogging in MAR and the international publication is being led by an Australian editorial team from Australian Groundwater Technology (AGT) and CSIRO. This addresses an important constraint on the effectiveness of recharge enhancement.

Focal Areas 3.1, 3.2, and 3.4 Access to water for food security in environmentally stressed zones.

ANU is carrying out a project in collaboration with Wuhan University, the Water Resources Research Institute of Inner Mongolia and China Agriculture University on water use, salinity and climate change in the Hetao Irrigation District, one of China's three largest irrigation area.

Research on property rights of water and the structure, operations and social and economic impacts of water trading markets continues to receive a lot of attention in Australia and is a potential resource for similar projects in other countries.

Theme 4: Water and human settlements of the future

Focal Area 4.1: Game changing approaches and technologies

Focal Area 4.2: System wide changes for integrated management approaches

Focal Area 4.3: Institution and leadership for beneficiation and integration

Focal Area 4.4: Opportunities in emerging cities in developing countries

Focal Area 4.5: Integrated development in rural human settlement

Focal Areas 4.1, 4.2 and 4.3. Good Governance, capacity development and stakeholder participation. Empowerment of human resources.

- CSIRO with NCGRT and IceWARM are providing training on MAR including technical aspects, management policies and guidelines for health and environment protection
- Frameworks for determining sustainable yield of aquifers
- CSIRO and SKM are each developing a thematic paper on groundwater governance for GEF-FAO (on groundwater recharge/discharge and aquifer equilibrium and on surface water-groundwater interaction, respectively)
- French-Australian Initiative on Water and Land Management through the UNESCO Chair in Water Economics and Transboundary Water Governance at ANU conducted "Food and Water Security shaping Land-use Futures" 12-14th June 2013 which has developed a continuing program of research on relevant issues in this focal area.

Affordability, poverty alleviation and assured financing, for effective IWRM. Include 'water' in national PRSP'

- Implementation of IWRM in the Pacific Island Countries (assistance to SPC)
- Australian National Water Initiative

Shared Water resources and conflict

- Water markets and water trading approaches
- International exchange of data

As a result of a National Water Initiative (NWI) agreed by Australian federal and state governments, all Australian water agencies are required to develop comprehensive water management plans. The plans are being developed through a process of extensive stakeholder consultation and watershed modelling. The process being employed, and the resultant plans provide a valuable resource for similar projects elsewhere in the world.

The WIRADA water resources assessment and water use accounting project is developing methods and technologies, to enable BoM? to provide integrated surface and groundwater resource assessments, water accounts and water resource outlooks. The first 5 year agreement finished in 2012 and was extended for a period of 3 more years.

Theme 5: Ecohydrology, engineering harmony for a sustainable world

Focal Area 5.1: Hydrological dimension of a catchment – identification of potential threats and opportunities for a sustainable development

Focal Area 5.2: Shaping of the catchment ecological structure for ecosystem potential enhancement – biological productivity and biodiversity

Focal Area 5.3: Ecohydrology system solution and ecological engineering for the enhancement of water and ecosystem resilience and ecosystem services

Focal Area 5.4: Urban Ecohydrology – storm water purification and retention in the city landscape, potential for improvement of health and quality of life

Focal Area 5.5: Ecohydrological regulation for sustaining and restoring continental to coastal connectivity and ecosystem functioning

The Commonwealth Water Act 2007 (Amended 2008) committed the Australian Government to buy-back water entitlements from farmers to return up to 2750 GL of environmental water to the river system as part of the $A12 billion Water for the Future program. Approximately $3.1 billion is set aside for purchasing water entitlements from water holders, the remainder is for infrastructure improvement. The scheme is highly controversial with the target for return disputed by farmers and some state governments and the cost-benefits of the scheme disputed.

Theme 6: Water Education, key for Water Security

Focal Area 6.1 - Enhancing tertiary water education and professional capabilities in the water sector

Focal Area 6.2 - Addressing vocational education and training of water technicians

Focal Area 6.3 – Water education for children and youth

Focal Area 6.4 – Promoting awareness of water issues through informal water education

Focal Area 6.5 – Education for transboundary water cooperation and governance

Many universities and other research centres have educational and training programs. Some of the research centres are listed separately below.

National Centre for Groundwater Research and Training (http://www.groundwater.com.au)

The purpose of the centre is to provide research, education and specialist services for Australian and International land and water industries with the objective of improving the management of resources affected by groundwater processes.

Centre for Environmental Applied Hydrology (http://www.civag.unimelb.edu.au/ceah)

The Centre for Environmental Applied Hydrology is a research centre within the Departments of Civil and Environmental Engineering and Geography and Environmental Science at the University of Melbourne. Specific expertise covers all aspects of surface and groundwater hydrology, hydraulics and geomorphology.

Fenner School of Environment and Society, Australian National University (http://cres.anu.edu.au) conducts research and postgraduate training in spatial-temporal variability and characterisation of climate, integrated catchment management, groundwater modelling and hydrology, floods and droughts, coastal hydrology and land use, salinity, cultural and indigenous water issues, water and land policy and related socio-economic interactions, ecological economics.

The International Centre of Excellence in Water Resource Management (ICE WaRM) (http://www.icewarm.com.au/) is made up of a consortium of universities and has a strong focus on education and training. It promotes itself to international water resource management students to further their education in Australia and is also developing online courses for delivery in Australia and overseas. ICE WaRM was one of five International Centres of Excellence formed under the international education package in the 2003 Australian Federal Budget. The centres were given seed-funding of $35.5 million over four years, before becoming independent, self-sufficient organisations.

International Water Centre (www.watercentre.org/) is a joint venture between University of Queensland, Griffith University, Monash University, University of Western Australia, International River Foundation, Moreton Bay and Catchments Partnership and the Queensland Government. The Centre aims to take Australia's expertise in whole of water cycle management to organizations in the rest of the World through Applied Research, Education and Training and Knowledge Services.

Professor David Waite, Director of the Centre for Water and Waste Technology & Dr Ashish Sharma, from School of Civil & Environmental Engineering at UNSW, are collaborating with Hohai University of Nanjing to develop joint research & Masters' level training programs in water management through the Australia China Consortium for Water Research (ACCWR).

The University of Western Australia has entered into a Memorandum of Understanding with the International Centre for Coastal Ecohydrology (under the auspices of UNESCO). Prof. Jeff Camkin, who coordinates HELP in Australia, has designed and delivered new components of the Erasmus Mundus MSc in Ecohydrology course in 2010, 2011, 2012. These courses have involved UNESCO HELP network participants from Australia, New Zealand, Malaysia, Philippines, France, Portugal, Spain, providing a bridge between UNESCO Ecohydrology and HELP programs and basins.

- ***Crosscutting Program Components – FRIEND and HELP***

Collaboration in the Asian Pacific FRIEND project by provision of data, hosting a node of the Internet based Water Archive, and assisting in research activities. Australia currently has five UNESCO-IHP HELP basins (Ord, Murray Darling, Fitzroy (QLD), Burdekin and Tully. Further details are below.

Activities at a national level in the framework of the IHP

3.1 Australian Rainfall and Runoff (ARR)

Members of the Australian IHP Committee have actively contributed to the continual updating of ARR.

ARR is a national guideline document, data and software suite that can be used for the estimation of design flood characteristics in Australia. ARR 2016 is the 4th edition, after the 1st edition was released by Engineers Australia in 1958. This edition is published and supported by the Commonwealth of Australia. Geoscience Australia supports ARR as part of its role to provide authoritative, independent information and advice to the Australian Government and other stakeholders to support risk mitigation and community resilience.

ARR is pivotal to the safety and sustainability of Australian infrastructure, communities and the environment. It is an important component in the provision of reliable and robust estimates of flood risk. Consistent use of ARR ensures that development does not occur in high risk areas and that infrastructure is appropriately designed.

The digital delivery of ARR 2016 allows progressive updates to be made immediately for minor updates and the edition will not be updated. When major updates occur, the year will change in the title.

3.2 Professional Hydrology

One of the members of the Australian IHP Committee is Co-Editor Australasian Journal of Water Resources.

Two other members of the Committee convene the Hydrological Society (Canberra) which runs a monthly seminar series at ANU.

3.3 International Meetings

Members of the Australian IHP Committee have delivered talks at:

- 8th Global FRIEND Beijing 6-8 Nov 2018
- Asia Oceania Geoscience Society 16th Annual Meeting, Singapore, 28 July-2 August 2019
- IRRD First Workshop, Atolls Futures, Paris, 3-5 September.
- 46th International Association of Hydrogeologists Congress, Malaga, 22-27 September 2019
- UNESCO-CWWA High Level Symposium on Achieving Water Security in Caribbean SIDS, Frigate Bay, St Kitts and Nevis, 15 October 2019

3.4 Activities focussed on Small Island Developing States and Territories

Members of the Australian IHP Committee have participate in two projects involving small island states in the Pacific Ocean:

a. Assistance to the Government of Kiribati, through SPC and supported by EU Pacific, to augment and improve water supply in Kiritimati Atoll with design and construction of:
    - Solar-powered groundwater infiltration galleries

- New transmission & storage systems
- Improved groundwater & climate monitoring

b. Assistance to the government and Taupulega of Tokelau through the SPC project, ***Strengthening Water Security of Vulnerable Island States***, supported by NZ MFAT in developing:
   - Draft National Water and Sanitation Policy
   - Draft National Water and Sanitation Implementation Plan
   - Draft National Drought Management Framework

   A member of the Australian IHP Committee has undertaken a project involving two small island territories in the Indian Ocean.

c. Comprehensive review of water resource management in Cocos – Keeling Islands and Christmas Island for Department of Water and Environmental Regulation (WA)

China:

Report from Chinese National Committee

Zhongbo Yu

Oct. 30, 2019

CONTENT

Hydro-Lab

1 2019 Activities

2 The Belt and Road

1、International Conference

Global Change Challenges: Water Security and Sustainability
8th International Groundwater Symposium
support by IAHR/IHP

Nanjing, China

Oct 17-20, 2018

1、International Conference

The 26th UNESCO-IHP Regional Steering Committee Meeting for Asia and the Pacific

Shanghai, China

Nov 3-5, 2018

1、International Conference

8th Global FRIEDN-Water Conference

Beijing, China

Nov 6-9, 2018

Proceeding of 80 papers is in process with IAHS

1、International Conference

The 8th International Conference on Water Resources and Environment Research

Nanjing, China

Jun 14-18, 2019

1、International Conference

2019 International Leadership Training Program for Young Professionals in Water Resources Management (YGL-Water 2019)

Vientiane, Laos

Aug 11-17, 2019

1、International Conference

International Workshop on the Asian Water Towers

July 11-12, 2019
Beijing International Convention Center, Beijing, China

Background

The Third Pole is geomorphologically a high pole that covers the Tibetan Plateau and surrounding areas. It has an average elevation of over 4,000 meters above sea level and a total area of 5 million km². As home to numerous vast glaciers and the source of over 10 major Asian rivers, the region is widely known as the "Asian Water Towers".

The livelihood of over 3 billion people served by these rivers is under threat; however, due to rapidly warming temperatures. In fact, temperatures in the Third Pole are rising twice as fast as the global average. The result is warming-induced glacial melt, ice collapses, glacial lake expansions and glacial lake outburst floods that are rapidly destabilizing the Asian Water Tower and the socioeconomic health of the region.

Recent studies have found accelerated melting of the Asian Water Tower, resulting in imbalanced water storage. The ever-increasing glacial retreat is considered the biggest threat as it caused a tremendous decrease in solid water, which then led to extensive lake expansion in the Asian Water Tower. With these changes, new disasters such as ice collapse have emerged. Two glacier collapses in 2016 destroyed pastures and buried nine local people and hundreds of livestock. A new ice collapse in the Yarlung Tsangpo River in the southeastern Tibetan Plateau in 2018 blocked the river. A dammed lake subsequently formed, destroying the bridge and highway in the area.

The changing Asian Water Tower is also closely related to the environment of the Central Asia and South Asia through big rivers and big lakes. The disappearing Aral Sea is a typical example of human activity impact and the Asian Water Tower change is a bitter lesson to urge scientists to study Asian Water Tower change at the earliest possibility as immediate adaptation is needed by the society affected.

Led and organized by TPE, an invite-only workshop with some 40 participants will be gathered in Beijing during July 11-12, 2019. This workshop will build on the work of two other programs: 1) The Pan-Third Pole Environment Change Study for a Green Silk Road (Pan-TPE), an international research project initiated in 2018; and 2) The Second Tibetan Plateau Scientific Expedition and Research (STEP), an initiative recently launched focusing on environment changes and their impact and adaptation on the Tibetan Plateau. Both Pan-TPE and STEP aim to investigate the processes underlying environmental changes in

STEP the best minds in the region and beyond will be able to address the problem of Asian Water Tower change and its local to regional impacts. It also aims to provide scientific advice to policy makers to ensure green development in the region.

Objectives

- Review the current status of observation and modeling studies on Asian Water Tower change and its impact.
- Identify the main gaps in our understanding of the science with a focus on integration between the observation and modeling studies on Asian Water Tower change and its impact.
- Plan actions to promoting integration of observation and modeling studies of Asian Water Tower change and its impact.

Topics

1. Latest understanding of Asian Water Tower change based on existing observations of glaciers, snow cover, lakes, precipitation, river runoff and other related phenomena.
2. Performance and applicability of various models for studying Asian Water Tower regime and change.
3. Impact assessment of Asian Water Tower change based on observation-modeling integration.

Expected outcomes

1. Identify hotspots/key regions for further observation in order to better understand Asian Water Tower change.
2. Identify model(s) offering the best potential for studying Asian Water Tower change and propose further improvement strategies.
3. Make a comprehensive plan for dealing with Asian Water Tower change based on the progress after the *International Workshop on Cryosphere and Water Cycle Observation-Modeling Integration over the Third Pole.*
4. Discuss and cooperate on publishing the results of this workshop.

Grand Water Atlas of the Third Pole

The Third Pole = Asian Water Tower

- the Tibetan Plateau, the Himalayas, the Hindu Kush, the Pamirs and the Tien Shan Mountains
- 14 highest mountain peaks and about 100,000 km² of glaciers, largest reservoir of ice and snow after the Arctic and Antarctic
- melt-water feeds over ten great rivers, i.e. Indus, Brahmaputra, Ganges, Yellow and Yangtze etc., large lakes of Nam Co and Selin Co,
- one-fifth of the world's population depends on these rivers

The Grand Water Atlas

- multidisciplinary project initiated by the Chinese Academy of Sciences (CAS) and aided by UNESCO together with the Third Pole Environment (TPE)
- TPE - an international research programme focused on multi-sphere interaction of earth system in the Third Pole region
- "Pan-Third Pole Environment Study - facilitate efforts for green development in the Pan-Third Pole by integrating science, technology innovation and policy-advising
- Atlas to illustrate the changes in the tens of thousands of glaciers, more than thousand lakes, over ten great rivers in the Third Pole region, and shrinking lakes in Central Asia experiencing ecological deterioration

Specific goals

- demonstrate water disasters, such as floods, drought, GLOFs and ice collapse
- highlight the impact of changing environment on water availability and security
- produce a series of assessment reports on the Third Pole environment changes
- develop evidence-based recommendations to address the issues of water vulnerability and security in the Third Pole region
- improve the understanding of climate change impacts on water availability, in order to strengthen local capacities for adaptation planning
- directly support the implementation of the Sustainable Development Goals (SDGs), the Paris Agreement and the Sendai Framework for Disaster Risk Reduction

Implementation

- international cooperation beyond the region
- establishing observation networks to better monitor and model cryospheric and hydrologic changes
- assessing the uncertainty and risk related to water issues
- mitigating climate change through global emission reductions, integration between green development and disaster risk reduction

Role of IHP-UNESCO

- continue its support to the TPE, as part of its Eight Phase (2014–2021) "Water Security - Responses to Local, Regional, and Global Challenges"
- provide platform to strengthen the UNESCO working group on snow and ice in Asia with TPE by focusing on the Grand Water Atlas

2、The Belt and Road

2、The Belt and Road

Water and Sustainable Development Forum on "The Belt and Road Initiatives"

2、The Belt and Road

"The Belt and Road" Fund on Water and Sustainability

2、The Belt and Road

World Water Valley Institute，Laos Center, and West African Center

Thanks !

India:

INDIAN NATIONAL COMMITTEE FOR IHP

National Report for the 27th IHP Regional Steering Committee Meeting for Southeast Asia and the Pacific (Naypyidaw, 29-31 October, 2019)

Period: June, 2018 to October, 2019

Submitted by

National Institute of Hydrology Roorkee- 247667, India

1. ACTIVITIES UNDERTAKEN IN THE PERIOD JUNE 2018 – OCTOBER 2019

1.1 Meetings of the IHP National Committee

1.1.1 Decisions regarding the composition of the IHP National Committee

The present composition of the Indian National Committee for International Hydrological Programme (INC-IHP) consists of a Chairman, Member-Secretary, Deputy Coordinator, and 13 members from various research institutes, universities, and respective ministry.

The composition of National Committee is as follows:

Chairman: Dr. Sharad Kumar Jain, Director, National Institute of Hydrology, Roorkee

Member-Secretary: Dr. V.C. Goyal, Scientist- 'G', National Institute of Hydrology, Roorkee

Deputy Coordinator: Dr. Jyoti P. Patil, Scientist- 'C', National Institute of Hydrology, Roorkee

Members: Representatives from concerned agencies and experts are as follows:

1. Prof. K. Srinivasan, IIT Madras, Chennai
2. Prof. N.K. Goel, IIT Roorkee, Roorkee
3. Director (R&D), Department of Water Resources, River Development & Ganga Rejuvenation, Ministry of Jal Shakti, New Delhi
4. Director (Training), Central Water Commission, New Delhi
5. Representative of Chairman, Central Ground Water Board, Faridabad
6. Representative of Director General, India Meteorological Department, New Delhi
7. Representative of Chairman, Central Pollution Control Board, New Delhi
8. Representative of Director, Snowand Avalanche Study Establishment, Chandigarh
9. Representative of Director, Wadia Institute of Himalayan Geology, Dehradun
10. Director (Technical), National Water Development Agency (NWDA), New Delhi
11. Joint Director, Central Water & Power Research Station (CWPRS), Pune
12. Representative of Director, CSIR-National Environmental Engineering Research Institute, Nagpur
13. Director, National Water Academy, Pune

1.1.2 Status of IHP-VIII activities

The activities related to IHP-VIII are undertaken through the strategies, and implementation plans focused mainly on organizing Brainstorming Sessions, International/National Training Courses, National Symposium, International Conferences, and Promotion of education, training, and manpower development programmes in the field of Hydrology.

1.2.1 International/National/local scientific and technical meetings

- A two-day training course on "IWRM, Water Security and Climate Change for Developing Economies" was organised for the participants from Bangladesh, Bhutan, India, Maldives, Nepal and Sri Lanka at NIH, Roorkee during 15-16 November, 2018.
- A brainstorming session on theme#4 of the IHP i.e. – "Water and Human Settlements of the Future" was organized on 21st December, 2018 during HYDRO-2018 INTERNATIONAL, held at National Institute of Technology, Patna.
- A five-day training course on "Water Security Assessment for Nation Building" was organised jointly by National Institute of Hydrology, Roorkee and National Institute of Urban Affairs, New Delhi at NIH, Roorkee during 23-27 July, 2019.
- A brainstorming session on "Ecologically Sustainable Water Management: Challenges in Water Scarce Regions" under theme#5 of the IHP i.e. – "Ecohydrology- Engineering Harmony for a Sustainable World" was organised on 27th September, 2019 during Waterfuture Conference- 2019, "Towards a Sustainable Water Future", held at Indian Institute of Science, Bengaluru.

1.2.2 Participation in IHP Steering Committees/Working Groups

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1.2.3 Research/applied projects supported or sponsored

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

INC-IHPs' secretariat is housed in National Institute of Hydrology (NIH), Roorkee. It is the premier Institute in the area of hydrology, and water resources. The Institute was established in 1978 with the main objective of undertaking, aiding, promoting, and coordinating systematic and scientific work in all aspects of hydrology. NIH has signed a MoU with National Institute of Urban Affairs (NIUA), Ministry of Urban Development, Government of India to enable cooperation between NIH and NIUA to undertake joint action research, capacity building, and knowledge generation in the areas of mutual interest.

National Institute of Hydrology interacts closely with foreign organizations, and agencies through international cooperation. These projects involve scientific collaboration with countries like Austria, Denmark, the Netherlands, Germany, Japan, Russia, USA, and UK etc. and funding from various organizations like the World Bank, UNESCO, and IAEA etc.

Major International Collaborative Projects (Completed)

- Hydrology Project-II (World Bank)

Major International Collaborative Projects (Ongoing)

- National Hydrology Project-III (World Bank)
- Centre for Ecology & Hydrology (CEH U.K.)
- Groundwater Fluctuations and Conductivity Monitoring in Punjab- New Evidence of Groundwater Dynamics in Punjab from High Frequency Groundwater Level and Salinity Measurements (BGS U.K.)
- Improving our Understanding of the Aquifer Systems in Sunderbans (India-UK Water Centre, funded by NERC U.K. and MoES, Govt of India)
- Dating very old ground waters of deeper aquifers in Ganga Plains, India (IAEA-CRP)
- Sustaining Himalayan Water Resources in a Changing Climate (SusHi-Wat) (funded by NERC U.K. and MoES, Govt of India, under Newton-Bhabha)
- High Performance Advanced Septic System (HPAS) along the villages and Roadside Restaurants (under IC-IMPACTS, Indo-Canada Project)
- Impact of Rainwater Harvesting on Groundwater Quality in India with Specific Reference to Fluoride and Micro-pollutants (funded by NERC U.K. and DST, Govt of India, under Newton-Bhabha Water Quality Research Programme)
- Future Secular Changes and Remediation of Groundwater Arsenic in the Ganga River Basin-FAR GANGA (funded by NERC U.K. and DST, Govt of India, under Newton-Bhabha Water Quality Research Programme)

1.2.5 Other initiatives

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1.3 Educational and training courses

1.3.1 Contribution to IHP courses

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1.3.2 Organization of specific courses

Sl. No.	Name of Course	Period	Venue
1.	Training Course on "Hydrologic Modelling using SWAT"	June 11-22, 2018	NIH, Roorkee
2.	Training Workshop on "Reservoir simulation using NIH_ReSyP"	June 25-29, 2018	BITS, Pilani (Hyderabad campus)

Sl. No.	Name of Course	Period	Venue
3.	UNDP sponsored International Training Course on "Hydrology, Water Resources Management and Climate Change" for the participants of Pacific Island Countries	June 25-July 20, 2018	NIH, Roorkee
4.	A 01-day Stakeholders Workshop for DST sponsored Networking Project on "Revival of Village Ponds through Scientific Interventions"	July 13, 2018	Banda Block, Sagar, M.P.
5.	Workshop on "DSS(H): Demonstration of Modules"	July 20, 2018	TPSIPRD, Nimora, Raipur, Chhattisgarh
6.	Workshop under NNWP on "DSS(H): Demonstration of the modules"	July 20-21, 2018	Raipur, Chhattisgarh
7.	Training course on "Basics of Hydrology" under NHP	July 23-27, 2018	NIH, Bhopal
8.	Inception Workshop on "Ground water Salinity Source Identification in Godavari Delta, Andhra Pradesh" under PDS-NHP	July 25, 2018	NIH, Kakinada
9.	A 04-day Training Course on "Overview of Water Resources Sector" organized for Non-Technical officers of Ministry of MoWR, RD & GR	August 06-09, 2018	NIH, Roorkee
10.	Training on "Hydrological modeling using HEC-RAS and HEC-HMS"	August 27-31, 2018	NIH, Roorkee
11.	Training Workshop on "Ground Water Modelling"	September 04-06, 2018	WALMI Campus, Bhopal
12.	National Inception Workshop on "State Specific Action Plan (SSAP) for Water Sector"	September 14, 2018	Pune
13.	Modellers Meet under NHP	September 26-27, 2018	New Delhi
14.	R&D Session of INCCC at MoWR, RD & GR	September 27, 2018	New Delhi
15.	Training Course on "Environmental Isotopes for Climate Resiliency of Mountain Watersheds"	October 22-26, 2018	NIH, Roorkee
16.	Training Course on "Estimation of Flood and Yield"	November 11-16, 2018	Nashik

Sl. No.	Name of Course	Period	Venue
17.	A 03-day Training Course on "Water Conservation: Practices, Security and Sustainability- A Practitioners Approach"	December 26-28, 2018	NIH, Roorkee
18.	Training Workshop on "River Basin Modelling"	January 07-11, 2019	SIHFW, Jaipur
19.	A 03-day Training Course on "Water Conservation: Practices, Security and Sustainability- A Practitioners Approach"	January 14-16, 2019	NIH, Roorkee
20.	Customized Training Course on "Groundwater Flow Modelling using MODFLOW"	January 14-18, 2019	Kerala
21.	Training Course on "Flood and Drought Risk Management"	January 21-25, 2019	NIH, Roorkee
22.	Training Course on "Water Security: Best Practices for Conservation, Safety and Sustainability"	January 23-25, 2019	NIH, Jammu
23.	Training programme on "Water Quality Monitoring of Surface, Ground, Waste Water/ Effluent, Data Interpretation and Quality Assurance" sponsored by CPCB	February 11-13, 2019	NIH, Roorkee
24.	Training Course on "Coastal Zone Water Resources: Challenges, Investigation Techniques and Management"	February 11-15, 2019	NIH, Roorkee
25.	Training Course on "Conservation and Management of Lakes, Wetlands and Springs"	February 25- March 01, 2019	NIH, Roorkee
26.	Training Course on "Sediment Yield and Reservoir Sedimentation"	February 25- March 01, 2019	NIH, Roorkee
27.	Training Course on "Advanced Hydrology"	March 05-09, 2019	NIH, Roorkee
28.	A 01-day Workshop on "High Performance advanced Septic system (HPAS) for Villages and Roadside Restaurants" under IC-IMPACTS (Indo-Canada Project)	March 15, 2019	NIH, Kakinada
29.	A Brainstorming Session on "Water for All by 2030: Leaving no one behind"	March 22, 2019	NIH, Roorkee

Sl. No.	Name of Course	Period	Venue
30.	First Stakeholder Workshop on the PDS under NHP titled "Impact Assessment of the upcoming Irrigation Projects and Climate Change on the Drought and Densification Scenario for Chambal Basin in Western M.P."	March 27, 2019	State Water Data Centre, Bhopal
31.	Training Course on "Hydrologic Modelling using SWAT"	May 20-31, 2019	NIH, Roorkee
32.	Training Course on "Groundwater Quality Monitoring and Assessment" under NHP-PDS	June 03-07, 2019	NIH, Roorkee
33.	Training Course on "Groundwater Quality Monitoring and Assessment" under NHP-PDS	June 17-21, 2019	NIH, Roorkee
34.	Training Course on "Conservation and Management of Lakes, Wetlands and Springs"	June 24-28, 2019	NIH, Roorkee
35.	National Level Training Programme on "Flood Risk Management and Water Sector DRR" jointly organized by NIDM and NIH	July 08-12, 2019	NIH, Roorkee
36.	Training Course on "Groundwater issues of Punjab with special emphasis on GW Salinity" under NHP	July 16-18, 2019	Forest Complex, Mohali
37.	Training Course on "Geospatial Technology for decision maker (Theme: water resources)" sponsored by DST	July 19-21, 2019	NIH, Roorkee
38.	DST sponsored Workshop on "Inception cum-Need Assessment" of IC-EcoWS project	August 08-09, 2019	NIH, Roorkee
39.	Training of Trainers Course on "Water Budgeting Tool for River Basins using Google Earth Engine Applications"	August 19-23, 2019	NIH, Roorkee
40.	Workshop on "Integrated Water Resources Management" jointly organised by CWC and NIH	September 04-05, 2019	NIH, Roorkee
41.	Training Course on "New Features of ArcGIS & Introduction to ArcGIS Pro"	September 11-12, 2019	NIH, Roorkee
42.	Inception Workshop on "SSAP (water) for Andaman"	September 27, 2019	Port Blair
43.	National Training Program on "Flood Risk Management and Water Sector DRR" jointly organized by NIDM and NIH	October 14-18, 2019	NIH, Roorkee

1.3.3 Participation in IHP courses

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

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1.5 Publications

1. Climate Change and Its Impacts on Water Resources with Focus on India
2. Pioneering Hydrological Research in India
3. A Glimpse of Research & Development at NIH
4. Hydrological Knowledge in Ancient India

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

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1.6.2 Participation in meetings abroad

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1.7 Other activities at regional level

1.7.1 Institutional relations/cooperation

-

1.7.2 Completed and ongoing scientific projects

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2. FUTURE ACTIVITIES

2.1 Activities planned until March 2020

- A 02-day workshop on "Role of Biomimicry in ecologically sustainable water management" in collaboration with the Hard Rock Regional Centre, National Institute of Hydrology, Belagavi is proposed in the month of January, 2020.
- 5-days training programme on 'Hydrology and Water Management' for the officers of Climate Smart Irrigated Agriculture Project (CSIAP), Sri Lanka during 20-24 January, 2019.
- Indo-German Workshop on "Nature Based Solutions for Water Pollution Management", at NIH, Roorkee during 5-7 February, 2020.

- Special session on theme#6 of the IHP *i.e.* – "Water Education- Key for Water Security" which is proposed during Roorkee Water Conclave 2020, to be held during 26-28 February, 2020.
- Capacity building programmes on water related issues.

2.2 Activities foreseen for 2020-2021

- INC-IHP will continue to encourage the scientific and technical symposia, and workshops.
- Enhancing the activities under the framework of IHP-VIII.
- Implementation of Integrated Water Resources Management (IWRM) plan on a watershed/ basin scale in different parts of the country.
- Participation in UNESCOs' Regional Steering Committee Meeting, and Conferences/ Seminars at international level.
- Establishment of Regional Centre for Water and Environment in South Asia at National Institute of Hydrology (NIH), a premier institute in the area of hydrology and water resources located at Roorkee, as a Category 2 Centre under the auspices of UNESCO.

2.3 Activities envisaged in the long term

- It has been planned to establish a network among different government departments, agencies, academic institutions, universities, and NGOs working on water resources and its management.
- Efforts will also be made to aware school going children on the importance of water and its other aspects.
- Public participation will also be involved in safeguarding the scarce water resource.

Indonesia:

United Nations Educational, Scientific and Cultural Organization

International Hydrological Programme

IHP INDONESIA

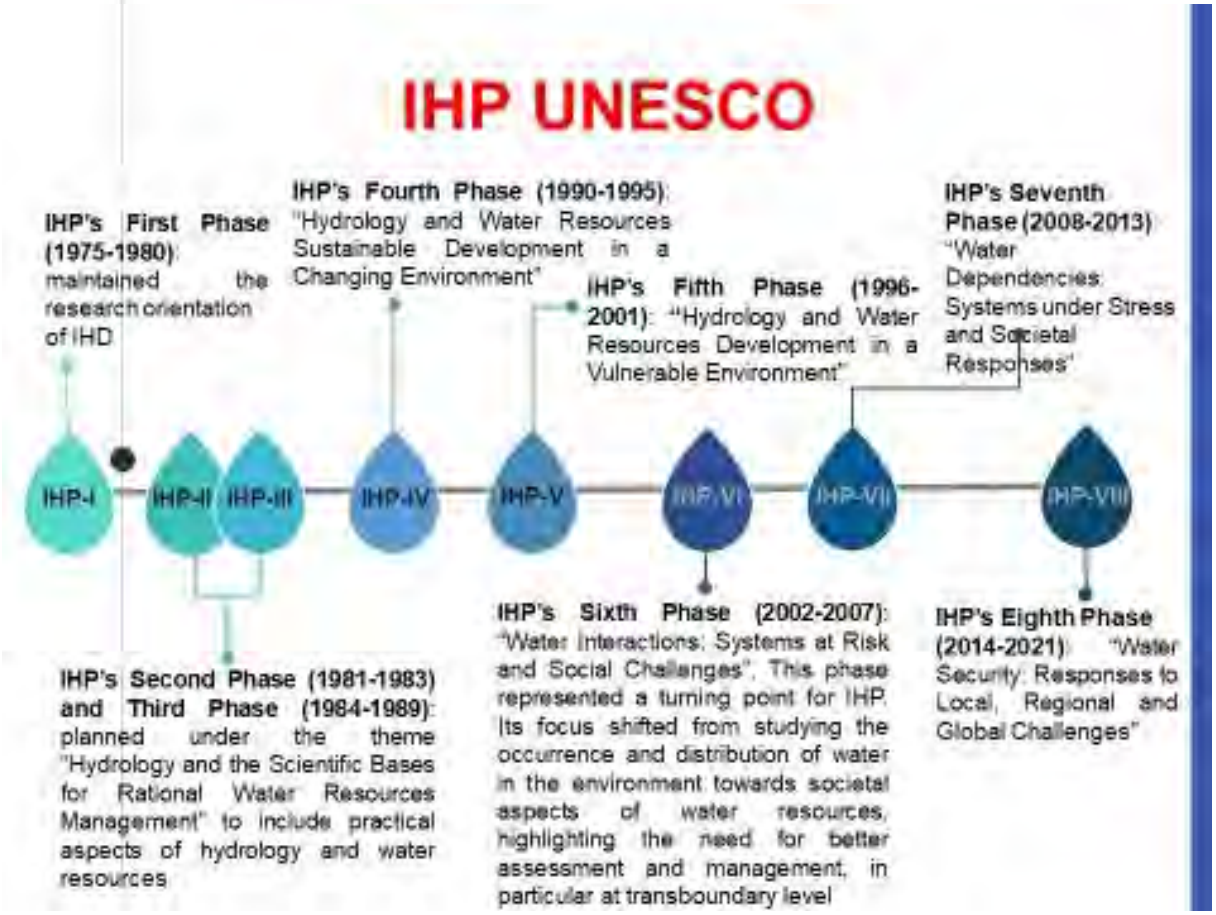
LIPI

27th UNESCO RSC IHP for Asia Pacific Region, Naypyitaw Myanmar, 28 – 31 October 2019

Water Security – Mid Term of IHP VIII

UNESCO INTERNATIONAL HYDROLOGICAL PROGRAM (IHP)

IHP Indonesia



INTRODUCTION

- Indonesia National Committee for IHP was established in the period of 1975 – 1980. Indonesia IHP supports activities related to :

- Synthesizing information and knowledge gaps for addressing issues related to critical water environment systems;
- Promoting the understanding of concepts and systems
- Enhancing knowledge regarding tools and technologies for the past experiences and on-going research projects related to terrestrial ecosystems processes, water issues in landscapes, rivers, floodplains, wetlands, reservoirs, coastal and urban areas.

THE PURPOSE OF THE ESTABLISHMENT

1. To foster, encourage and coordinate research activities concerning water issues conducted by various agencies.
2. Establish a national program in hydrology research to support national development inlining with UNESCO IHP
3. Acting as an advisory body to the Indonesian Institute of Sciences in matters related to research topics on water issues.
4. Acting as the National Committee in the relationship and cooperation with international agencies in the field of water issues, in particular with UNESCO IHP.
5. Acting as an information center for activities and research outcomes related to water issues in Indonesia

INTERNATIONAL HYDROLOGICAL PROGRAMME (IHP)

EIGHTH PHASE

"WATER SECURITY: RESPONSES TO LOCAL, REGIONAL, AND GLOBAL CHALLENGES"

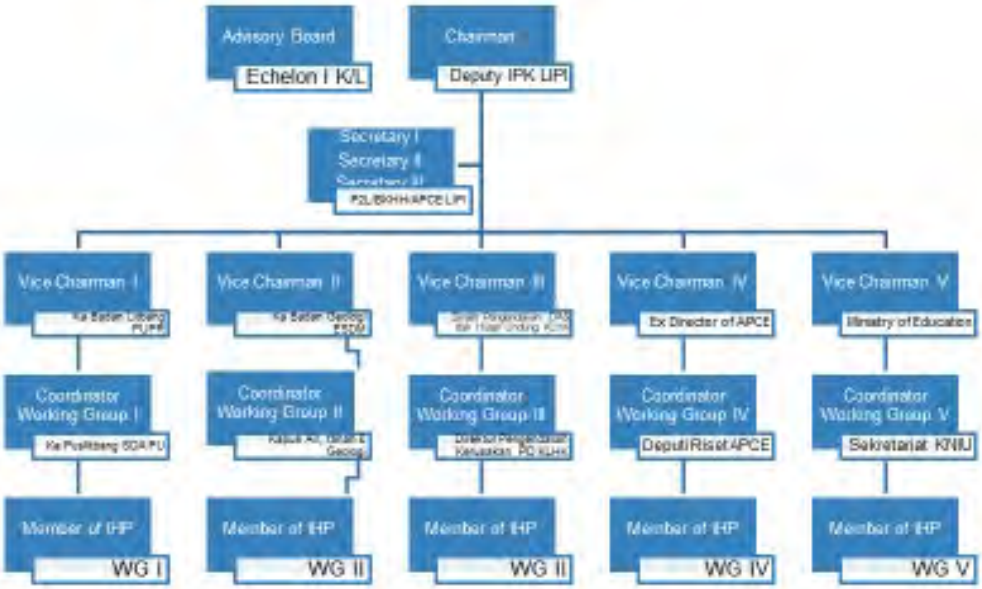
STRATEGIC PLAN

IHP-VIII (2014-2021)

Structure of IHP Indonesia

- National Advisory Board
  - Related Ministries
  - Related National Agencies
  - University
- Chairman: Deputy Chairman for Earth Science LIPI
- Vice Chairman
  - Chairman of Badan Litbang SDA – Public Works Ministry
  - Chairman of Badan Geologi – Energy and Mineral Resources Ministry
  - Director General of Watershed Management - Environment and Forestry Ministry
  - Executive Director of APCE
  - Director General of Ministry of Education and Culture
- Secretary
  - Director of RC LimnologiyLIPI
  - Director of Bureau for cooperation, Law and Public Relations LIPI
  - Executive Secretary of APCE - UNESCO
- Working Group Coordinator
  - Director of Research and and Development Centre Water – Ministry of Public Works
  - Director for Water, Land and Geology – Ministry of Energy and Minerals Resources
  - Director of Watershed and Environment Management – Ministry of Environment and Forestry
  - Executive Secretary of APCE – UNESCO
  - Deputy for Education Division - KNIU
- Member
  - Member form each Working Group

Structure of IHP National Committee



Water issues in Indonesia

Although Indonesia enjoys 21 % of total freshwater available in the Asia-Pacific region, many of the country's water security issues are tied to its rapid development and poor urban infrastructure:

1. Lack access to safe/clean water and sanitation
2. Many areas vulnerable to floods as a result of land-use change and deforestation
3. Wastewater from industrial, domestic and agriculture sectors contaminated both surface water and groundwater supplies. This exposure greatly increases human susceptibility to water-related diseases.
4. The dry season may become more arid, driving water demand; while the rainy season may condense higher precipitation levels into shorter periods, increasing the possibility of floods (effects of climate change)

WORKING GROUP of IHP National Committee

THEME 1/WORKING GROUP I : WATER-RELATED DISASTERS AND HYDROLOGICAL CHANGE : Ministry of Public Works and Housing

THEME 2/WORKING GROUP II : GROUNDWATER IN A CHANGING ENVIRONMENT : Ministry of Energy and Minerale Resources

THEME 3/WORKING GROUP III : ADDRESSING WATER SCARCITY AND QUALITY : Ministry of Environment and Forestry

THEME 4/WORKING GROUP II: WATER AND HUMAN SETTLEMENTS OF THE FUTURE : Ministry of Public Works and Housing

THEME 5/WORKING GROUP IV: ECOHYDROLOGY, ENGINEERING HARMONY FOR A SUSTAINABLE WORLD : APCE-UNESCO LIPI

THEME 6/WORKING GROUP V: WATER EDUCATION, KEY FOR WATER SECURITY : Ministry of Education and Culture (KNIU)

NATIONAL STRATEGIC ISSUES 4

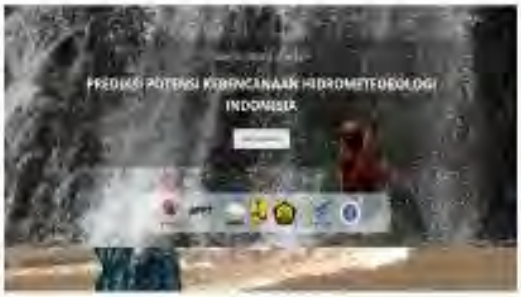
Enhancement of Water Resources Security

Accessibility to Uneven Water (Right to Water)	Water Balance Imbalance and Water Quality Declines	Unclear Water Resources Law and Spatial Issues	Reduced Groundwater Availability Especially in Urban Areas
• Caused by : • Fulfillment of unmet water needs for households, industry and agriculture • Institutions and authorities that have not been built • Access to Sanitation and Drinking Water that is not evenly distributed and sufficient	• Caused by : • Upstream critical water catchment (Erosion: floods, landslides) • Water supply decreases Surface water deficits, especially in NTT and Java • Economic pressure Capacity of SDA (infrastructure) • storage is not proportional to water needs Lack of understanding of the community	• Caused by : • Institutions and authorities that have not been built • Limitations of Funding Lack of law enforcement • Spatial planning is out of sync with the concept of Water Resources and Watersheds Regional Commitments that are still lacking	• Caused by : • Excessive groundwater exploration in urban areas • Land subsidence • The policy of recharging groundwater is not comparable to the speed of exploration

Theme 1
Water Related Disasters and Hydrological Changes

- Ministry of Public Works and Public Housing is constructing two dams to control flooding in DKI Jakarta, (Ciawi Dam and Sukamahi Dam)
- In addition, Ministry of Public Works and Housing also perform normalization of Ciliwung River located at Jakarta Outer Ring Road (JORR) to Manggarai.

- The National Disaster Management Agency through the Directorate of Preparedness in collaboration and the Bandung Institute of Technology (ITB) has succeeded in developing a predictable information system for the potential of a national Hazard Early Warning System (MHEWS) that can be accessed through links; http://mhews.bnpb.go.id



Theme 2
Groundwater in a Changing Environment

- The Geology and Mineral Resources Agency provides the aid of wells to fulfill the water needs of people living in water-poor areas throughout Indonesia. As of October this year 138 borehole points spread over 111 districts / cities have been completed by Geological Agency, such as vilagges in Yogyakarta, Magelang and North Minahasa.

Inauguration of groundwater well in Yogyakarta

- Mapping of Groundwater Conservation Zone by The Geology and Mineral Resources Agency.

Inauguration of groundwater well in Magelang

Theme 3
Addressing Water Scarcity and Quality

- The Ministry of Environment and Forestry (MoEF) has a number of programs to improve water quality in 15 priority rivers. The program includes installing an online monitoring system on the entire river.
- MoEF also develop a pilot project for the construction of Wastewater Treatment Plant for domestic wastewater and small-scale enterprises. The goal is to reduce the pollution load from domestic waste.

- MoEF held a clean action of Ciliwung together with the community working together to reduce river pollution in the form of waste and garbage.

- Drinking Water Supply Program in 2018, Ministry of Public Works and Housing (MoPWH) will Provides Water Access for 4.5 Million people (Low Income Communities).

Theme 3
Addressing Water Scarcity and Water Quality

- During 2015-2016 498 embung (small-scale water reservoar) had been built. The year 2017 has built nine new dams from the target of 65 dam construction (including 16 dams which continued from previous government) in the period 2015-2019.
- In support of water and food security, in 2016 that the Ministry of PWH successfully completed the construction of 7 natural resource management infrastructure such as Payaseunara Dam in Aceh, Teritip Dam in East Kalimantan, Irrigation Area (D.I) Karau in Central Kalimantan, DI. Selingsing in Bangka Belitung, Bend Gerakan Sembayat in East Java and raw water supply support Bregas Regional Water Supply System in Central Java.

- Revitalization of Muara Sanur Dam in 2017 to restore function of reservoir of water reservoir for water supply in kab. Kuta.
- development of monitoring system and environmental pollution prevention technology by Indonesia Institute of Sciences

Theme 4
Water and Human Settlement of the Future

- The Directorate General of Human Settlements, Ministry of Public Works and Housings conducts slum settlement programs, such as KOTAKU Program.
- This program uses a collaborative platform synergy between local government and other district stakeholders as well as Community-Based Infrastructure Development to accelerate urban slum handling and 100-0-100 (100 percent clean water, 0 percent of slums, and 100 percent access to proper sanitation) movements in order to realize habitable, productive and sustainable settlements.

Theme 5
Ecohydrology: Engineering Harmony for a sustainable World

- Asia Pacific Center for Ecohydrology (APCE) program & activities related to theme 5 IHP phase VIII:
- Development of ecohydrological demosite in Saguling Reservoir
- National Workshop "Ecohydrologycal Approach to support Sustainable Management of Peatland in Ex-Mega Rice: Central Kalimantan"
- Workshop "Sustainable Water Resources Management in Yogyakarta"
- Workshop on "Integrated Water and Environmental Management for Water Conservation in East Nusa Tenggara".
- Consultation workshop and training on water and urban initiative case study in Jakarta.
- Initiation Development of Ecohydrology Demosite for arid zone in East Nusa Tenggara Province.
- Clean action of Cibinong lake, essay, story-telling and coloring contest for kindergarten and elementary school students in the framework of the world water day.

Theme 8
Water Education Keys for Water Security

APCE teaches the students to keep the water source and use the water as wisely as possible at junior high school and senior high school

207th UNESCO EB in Paris, October 2019

Some interventions conducted by IHP Indonesia include:

- Indonesia supports draft decision as presented in the document 207 EX/5.II.B as we welcome the mid-term evaluation of the eighth phase of the IHP and takes note, with interests, of its findings and recommendations.
- The lack of accumulated data and information regarding water resources in the world needs to be addressed because this data serves as the basis for sustainable water management.
- The amount of water in the world is always constant. However, there have been pressures that affect the quality and quantity of clean water. Therefore, in order to protect, conserve and manage water well, all relevant stakeholders need to put forward integrated efforts and employ various approaches by using big and satellite data, ICT as well as modelling and forecasting..

Next Activities

- In the new phase of IHP, Indonesia IHP National Committe will actively engage by planning, coordinating and collaborating related to International Hydrological Program
- Getting more support from the Government (Relationship, Institutionally, Financially)
- Strengthening the networking with the center under UNESCO, Universities, other institutions
- Developing demosite in selected and specific purpose (Urban Demosite, Karst Demosite, Ecohydrology Demosite)
- Promoting joint activities related to:
  - [illegible]
  - [illegible]
  - [illegible]
  - [illegible]
- Period ic meeting of IHP members
- Attend to ISC IHP Meeting
- Attend to GC at UNESCO in Paris
- World water day celebration

Thanks!

Japan:

NATIONAL REPORT ON IHP RELATED ACTIVITIES

Japan

1. ACTIVITIES UNDERTAKEN IN THE PERIOD OCTOBER 2018–OCTOBER 2019

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 October 2019

	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
	MURASE Katsuhiko	Water and Disaster Management Bureau, MLIT
	FUKAMI Kazuhiko	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)

3-2-2 Kasumigaseki, Chiyoda-ku, Tokyo 100-8959, Japan

E-mail: "Natcom Japan" <jpnatcom@mext.go.jp>

TEL: +81-(0)3-6734-3087 / FAX: +81-(0)3-6734-3679,

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**.ICHARM participated in the Strategy Planning Meeting of IHP-VIII on hydrological systems and water scarcity section, at which the Theme 1 and 3 of IHP-VIII was reviewed, IHP-VIII's future implementation and IHP-IX's preparation was discussed, held on 22 and 23 October 2018 in UNESCO headquarters. In Japan, Dr. Sinjiro Kanae, Professor of Tokyo Institute of Technology, attended the IHP-XI Task Force meeting on January 15-16, 2019 to develop a draft of IHP IX strategy as one of younger experts. 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.

(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.] For the 1st volume of CHA, Japan provided the manuscript for the flood hazard mapping in Japan. Dr. Kenichiro Kobayashi, Associate Professor of Kobe University contributed as the chief editor of the 1st volume. 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

International Centre for Water Hazard and Risk Management (ICHARM) 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 33rd 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.

(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 for Sustainable Development (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. The signing ceremony and a special seminar was held on February 13 in 2018 at Kyoto University, and the international inaugural symposium for UNESCO WENDI was held at Kyoto University on July 30 in 2018.

(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 Geoecology, Mongolian Academy of Sciences]. Also, the business meeting was held on 6th to 10th 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 33rd IHP National Committee meeting was held at MEXT on 23 October 2019 to discuss various issues relating to the 27th IHP Regional Steering Committee Meeting (October 2019), IHP-IX and related issues.
- CHA technical meeting on June 2019 at Kyoto University.

1.2.2 Participation in IHP Steering Committees/Working Groups

- The 26th session of the IHP Regional Steering Committee (RSC) for Asia and the Pacific, Shanghai, China, 4-5 November 2018 [Tachikawa, Sayama, Kobayashi]
- The 1st CHA workshop, Shanghai, China, 3 November 2018 [Tachikawa, Sayama, Kobayashi]

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, 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 "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** "SC 109094 REG: Climate Change and Flood Hazard Simulations Tools for ADB Spatial Application Facility, July 2017-June 2018 [ICHARM]
- **World Bank Project** "Technical Assistance in Implementing a Pilot of Agriculture Drought Monitoring and Prediction", April 2018 – May 2019 [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.Adding to the UNESCO IHP Japan Training Course, IAEA(International Atomic Energy Agency)/RCA(Regional Cooperation Agreement) Regional Training Course was organized at the University of Tsukuba suppported by various institutions including Japanese National Committee for UNESCO-IHP, UNESCO-Chair on Sustainable Groundwater Management in Mongolia, and International Centre for Water Hazard and Risk Management under the auspices of UNESCO (ICHARM).

- The 28th IHP Training Course with the theme "Integrated Basin Management under Changing Climate" was held at DPRI, Kyoto Univ. from 28 November to 7 December, 2018.
- The IAEA/RCA Regional Training Course with the title of Isotopic Data Processing and Interpretation -Hands on Exercises "Open Lecture Series on Frontier of Tracer Hydrology" was held at the University of Tsukuba from December 3 - December 12, 2019.

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.

1.5 Publications

- Integrated Basin Management under Changing Climate, Textbook for the 28th IHP Training Course at Kyoto University, November 2018.
- Report on 26th IHP Regional Steering Committee Meeting for Southeast Asia and the Pacific Manila, Philippines, November 2018.

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

- The 4th Global Summit of Research Institute for Disaster Risk Reduction was held at DPRI, Kyoto University on March 2019.
- The international inaugural symposium for UNESCO WENDI was held at Kyoto University on July 30 in 2018.

1.6.2 Participation in meetings abroad

- The 8th International Conference on Water Resources and Environment Research (8th ICWRER), Nanjing, China, 14-18 June 2019 [Takara, Nakakita, Tachikawa, Sayama, Yorozu, Tanaka]
- Launch of International Decade for Action "Water for Sustainable Development"2018-2020, New York, 20th 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 2019

- The 29th IHP Training Course with the theme "Changing Global Water Cycle and the Regional Response" will be held at ISEE, Nagoya Univ., 27 November 12 December, 2019.
- The 29th IHP Training Course with the theme "Integrated Basin Management under Changing Climate" will be held at DPRI, Kyoto Univ., 3 to 12 December, 2019.

2.2 Activities foreseen for 2020-2021

- The 28th Session of the IHP Regional Steering Committee (RSC) for Asia and the Pacific will be held in Vietnam in 2020.
- The 30th IHP training course in 2020 and 2021 at Nagoya University and Kyoto University.

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 activates 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] from2017 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.
- Technical Assistance in Implementing a Pilot of Agriculture Drought Monitoring and Prediction (Prof. Koike, ICHARM) under the World Bank Project from 2018-2019.

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 [Tsujimura]
- 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)

- 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)

Republic of Korea:

Recent Changes in the KNC (Korea National Committee)

- As of October 2019, the composition of the IHP National Committee has a new change.
- Mr. Ha-Joon Park of Ministry of Environment as the Chair and Mr. Joo-Heon Lee as the Vice Chair will manage the Committee.

Highlighted Activities of the KNC in Korea

1. Regular participation of the IHP Regional Steering Committee, Workshops and Working Group including the 26th meeting at Shanghai, China.

2. Korea International Water Week (KIWW 2019) during 4-7 September 2019, jointly organized with Korea Water Forum, Ministry of Environment, and K-Water.

3. Korea Water Resources Association (KWRA) annual conference in May 2019 in cooperation with the partner association from Japan, China, Thailand and New Zealand.

Highlighted Activities of the KNC in Korea

4. The Korea Water Resources Association (KWRA) launched the second half of the research projects (2018-2021) on the IHP Phase VIII research topics:
   - ✓ Management of water-related disasters for climate change adaptation.
   - ✓ Urban water cycle strategy through the establishment of sustainable water system.
   - ✓ Solutions for urbanization and water challenges in developing countries
   - ✓ Future strategies for water scarcity and water security
   - ✓ Investigation of the basic properties of the IHP Experimental River Basins (2019-2021).

The KNC will continuously organize diverse activities next year.

Malaysia:

MALAYSIA
COUNTRY REPORT

of the

NATIONAL COMMITTEE FOR

MALAYSIA INTERNATIONAL HYDROLOGICAL PROGRAMME

27th IHP REGIONAL STEERING COMMITTEE MEETING

FOR ASIA AND THE PACIFIC

NAYPHIDAY, MYANMAR

29-31 OCT 2019

[ACTIVITIES UNDERTAKEN FOR THE PERIOD OF OCT 2018 – OCTOBER 2019]

NATIONAL REPORT ON IHP RELATED ACTIVITIES

Name of the Centre		UNESCO - International Hydrological Programmes Malaysia
Name of Chairman		Dato' Ir. Hj. Abdullah bin Isnin
Name and title of contact person (for cooperation)		Dato' Ir. Mohd. Azmi bin Ismail
E-mail		ihp@water.gov.my/azmiismail@water.gov.my lina@water.gov.my/ceara@water.gov.my nasarudin@water.gov.my
Address		Water Resource and Hydrology Division, Dept. of Irrigation and Drainage Malaysia, KM 7 Jalan Ampang, 68000 Kuala Lumpur.
Website		h20.water.gov.my/ihp
Location of centre		City/town : Kuala Lumpur country : Malaysia
Geographic orientation *		Regional
Year of establishment		1975
Themes	Focal Areas •	☑ groundwater ☑ urban water ☑ arid / semi-arid zones ☑ humid tropics ☑ droughts and floods ☑ sediment transport and management ☑ water and environment ☑ ecohydrology ☑ water law and policy ☑ transboundary river basins/ aquifers ☑ IWRM ☑ global and climate change ☑ mathematical modelling ☑ social and cultural dimensions of water ☑ water education ☑ other: stormwater management, ☑ water hazard.
	Scope of Activities •	☐ vocational training ☐ postgraduate education ☐ continuing education ☑ research ☑ institutional capacity-building ☐ advising/ consulting ☐ software development ☐ other: (please specify) _____

Support bodies [1]	The Government of Malaysia
Hosting organization [2]	Department of Irrigation and Drainage Malaysia/ Ministry of Water, Land and Natural Resources
Sources of financial support [3]	The Government of Malaysia/ UNESCO National Commission of Malaysia
Existing networks and cooperation [4]	UNESCO/ICHARM/RCUWM/RSC for Southeast Asia and The Pacific/ Partner of the GWP/ IWA/ APAC Water-related Centre Category II/MyWP/Malaysian Stormwater Organization / AWGWRM
Governance	☑ Director and Governing board ☐ other: Frequency of meetings: 2x-3x every year ☐ Existence of UNESCO presence at meetings (UNESCO Jakarta Office)
Institutional affiliation of director	IWA/IAHS/Partner of the GWP/Malaysia Nuclear Agency/MyWP/ Board of Engineers Malaysia
Number of staff and types of staff	Total number of staff (full-time, or equivalent): Full time : 3 persons, on the need basis: up to 15 person Number of staff who are water experts: 3 persons. Number of visiting scientists and postgraduate students: 3-5 persons.
Annual turnover budget in USD	Operational = USD 30,000.00 Programmes and Activities = USD 100,000.00

* check on appropriate box

• check all that apply

[1] please specify bodies that cover the operational costs of the centre, and other essential costs such as salaries and utility bills, and that provide institutional support to ensure centre's sustainability

[2] if different from support bodies

[3] please specify sources of main budgetary and extrabudgetary funds to implement projects

[4] please write international networks, consortiums or projects that the centre is part of, or any other close links that the centre has with international organizations or programmes, which are not already mentioned above

ABOUT UNESCO – IHP MALAYSIA

1.0 BACKGROUND

- UNESCO-IHP (International Hydrological Programme) Malaysia is an entity of the cooperation program between government agencies under UNESCO's membership of more than 40 Ministries, Departments and Institutions of Higher Learning related to water in Malaysia.
- Program established in 1975, led by the Department of Irrigation and Drainage Malaysia.
- The main function of this committee is to coordinate the investigation, research and information gathering hydrological besides advising the government on the adoption of national water resources.

2.0 OBJECTIVES

The objectives of the UNESCO – IHP Malaysia are:

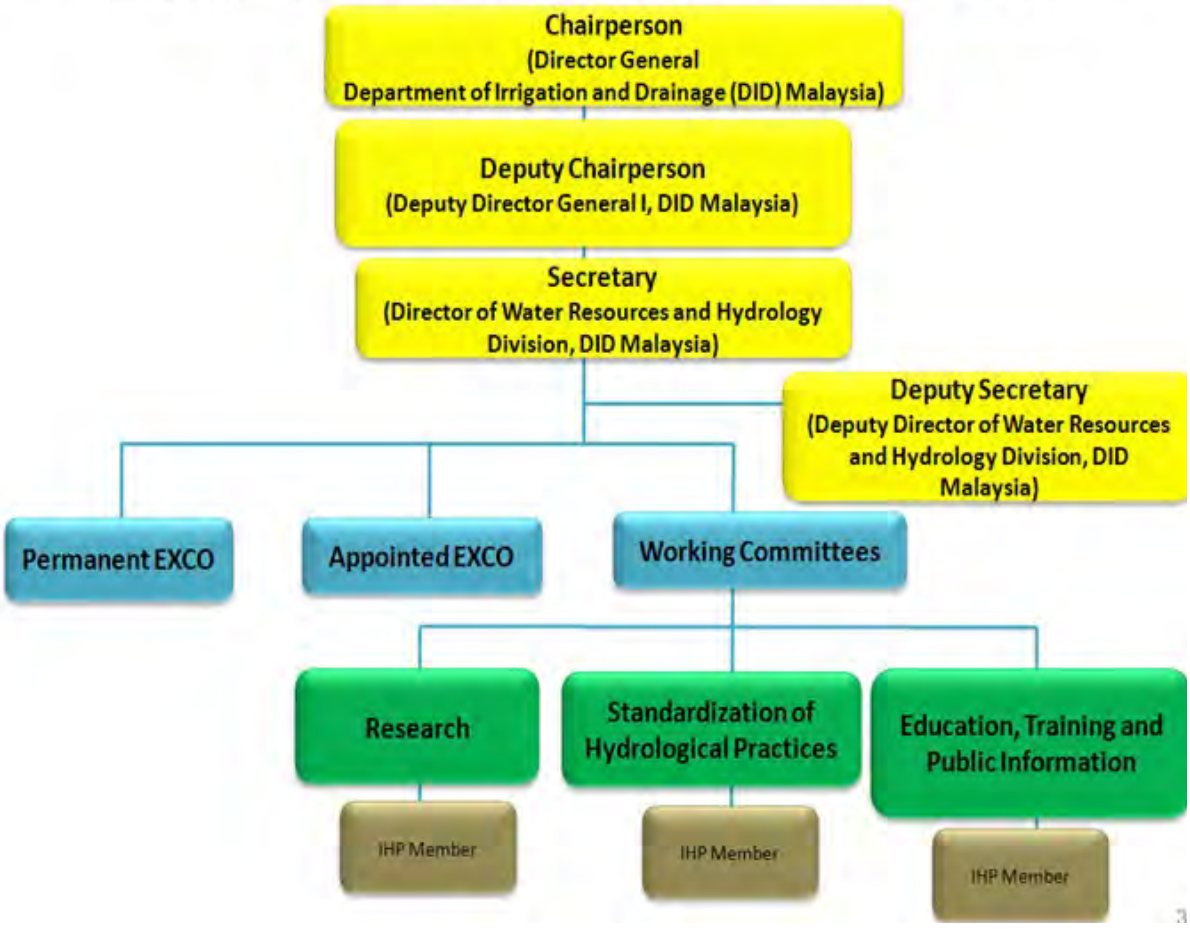
i. To represent Malaysia on all issues related to programmes of IHP under the UNESCO and participate actively in those programmes
ii. To promote and coordinate research programmes on hydrology and water resources in the country and region
iii. To promote and coordinate practices on hydrology and water resources
iv. To promote and coordinate programmes on education, training and public information on hydrology and water resources.

3.0 ORGANIZATION STRUCTURE

The programme structure of the Malaysia National Committee for IHP is as follow: -

a. The Chairman
b. The Vice Chairman
c. The Committee Secretary supported by a Vice Secretary
d. Eight (8) Executive Committees (EXCO) members and
e. Other partners' members (as listed in Appendix A)

EXECUTIVE COMMITTEE (EXCO) OF UNESCO-IHP MALAYSIA



The present composition of the UNESCO-IHP Malaysia Committee is as follows:

Chairperson	**Secretary**	**Deputy Secretary**
Director General, Department of Irrigation and Drainange (DID) Malaysia *Dato' Ir. Hj Abdullah bin bin Isnin* **Deputy Chairperson** *Dato' Ir Hj. Nor Hisham bin Mohd. Ghazali*	Director Division of Water Resources and Hydrology, DID Malaysia *Dato' Mohd Azmi bin Ismail*	Deputy Director Division of Water Resources and Hydrology, DID Malaysia *Ir. Roslina binti Yusop*
Permanent EXCO	**Appointed EXCO**	**Working Comittee**
Department of Irrigation and Drainange (DID) Malaysia *Dato' Ir. Hj Abdullah bin bin Isnin* Malaysian National Commission for UNESCO (MNCU) *Mohammad Sanusi bin Abdul Karim* Ministry of Water, Land and Natural Resources *Abdul Hadi bin Omar* UNESCO-Humid Tropics Center Kuala Lumpur *Ir. Tajudin bin Sulaiman*	Ministry of Education *TBA* Forestry Department Peninsular Malaysia *Dato' Mohd Ridza bin Awang* Malaysian National Hydraulic Research Institute *Dato' Ir. Dr Md Nasir bin Md Noh* Putrajaya Cooperation *En. Ahmad Zubir bin Sapian*	**a) Research** Chairperson - UNESCO-Humid Tropics Center Kuala Lumpur *Tajudin bin Sulaiman* Deputy Chairperson Malaysian National Hydraulic Research Institute *Dr Mohd Khairul Nizar bin Shamsuddin* **b) Standardization of Hydrology Practices** Chairperson - Department of Irrigation and Drainange (DID) Malaysia *Dato' Mohd Azmi bin Ismail* Deputy Chairperson Universiti Malaysia Pahang *Dr Edriyana binti Abdul Aziz* **c) Education, Training and Public Information** Chairperson - Universiti Sains Malaysia *Prof. Madya. Dr. Nabsiah Abd Wahid* Deputy Chairperson Putraya Cooperation *Normaliza binti Nordin*

4.0 UNESCO-IHP MALAYSIA SECRETARIAT

The Secretariat provides secretarial support and many other supporting roles for all activities carried out by MIHP. It includes:-

i. Planning and managing all EXCO meetings including preparation of minutes, logistics needs and slides presentation;
ii. Provide secretariat support and act as liaison officers in organisation of student camps including transfers of funds;
iii. Provide secretariat support and provide input in planning and execution of World Day for Water events and other related events;
iv. Organisation of three technical talks session per year;
v. Preparation of all documentation for UNESCO IHP related proposal;
vi. Organisation of events to raise funds for IHP Malaysia;
vii. Managing IHP Secretariat including looking into finance, office documentation, web page and Facebook accounts and others.

The MIHP office is currently managed by four officers on a full time basis:-

- Ir. Roslina binti Yusop : Deputy Director
- Haji Mohamad Shiham Ab Ghapar : Senior Engineer
- Mrs. Ceara Cecily Clarence J. : Engineer
- Mr Nasaruddin Nazir : Assistant Engineer

UNESCO – IHP ACTIVITIES FROM OCTOBER 2018 – OCTOBER 2019

1.0 MEETINGS

1.1 ANNUAL GENERAL MEETING (AGM)

As of 2010, IHP Malaysia did not hold any more AGM but consider one of the EXCO meetings held as the AGM. The Administration Procedures of IHP Malaysia also requires that the Non-Permanent EXCO and the chairman and vice person of the working committee Members Committee to be elected every two years and at EXCO meeting, the nomination and selection was made.

1.2 THE NATIONAL COMMITTEE MEETING

The National Committee on average holds three annual coordination meetings. The Working Committee and special committee set up for special assignment hold more regulars meeting.

The National Committee meeting is normally attended by the Chairman, the Permanent and Non-permanent EXCO members as well as the Partner Members of Malaysia Committee of IHP. In this meeting, all past activities were reported and proposed activities are tabled.

The objective of the meetings is review program and activities and to align them with IHP objectives. It also looks into proposed collaboration with other organisation within the country.

The partners of UNESCO – IHP Malaysia are relevant water related ministries, Government departments and agencies, water research institution, universities, and government-led private entities. Meetings were periodically held to discuss and implement programs and projects in line with the IHP—VIII (2014-2021) UNESCO strategic plan. More projects related to IHP-VIII themes are to be supported by Ministry of Natural Resources and Environment, Ministry of Science and Innovation and Malaysian National Commission for UNESCO (MNCU) through IHP National Committee.

Between Oct 2018 and Oct 2019 two meetings were held or to be held on dates as listed below dates:-

- 14th November 2018
- 16th April 2019
- 19th August 2019

1.3 WORKING COMMITTEES MEETING

UNESCO-IHP Malaysia plans its activities through its Committee and they are carried out by the three standing committees which are:

1. Committee on Research under the chairmanship of the Director of Humid Tropics Centre, Kuala Lumpur (HTC KL) and vice-chaired by National Hydraulic Research Institute of Malaysia (NAHRIM);
2. Committee on Education, Training and Public Information headed by the University Science Malaysia (USM) and vice-chaired by Putrajaya Cooperation (PPj); and
3. Committee on Standardization of Hydrological Practices headed by the Department of Irrigation and Drainage Malaysia (DID) and vice chaired by Univesiti Tenaga Malaysia Pahang (UMP).

2.0 ACTIVITIES UNDER IHP – VIII (2014 - 2021)

Most MIHP are aligned towards IHP-VIII activities and selected related activities for 2015-2016 sessions are as follows:-

2.1 THEME 1 : WATER-RELATED DISASTER AND HYDROLOGICAL CHANGE

(i) Name of programme: National Flood Forecasting and Warning System (NaFFWS)

Malaysia topography especially in Peninsular Malaysia had flat and generally low-lying coastal plains and is subjected to frequent severe flooding. The flooding which normally occurs during the northeast monsoons is both widespread and frequent. Serious flooding problems have to a certain extent dampened full development of Kelantan, Terengganu and Pahang total socio-economic potentials. In line with Integrated Flood Management (IFM) concept, both structural and non-structural measures are needed to manage flood risks. Structural measures has been designed in place to mitigate flood, while non-structural measures are used to support sustainable development plan and to reduce damages and losses of life during floods. DID have taken this initiative to develop the National Flood Forecasting and Warning System (NaFFWS) mainly to increase preparedness in managing flood. The objectives are to provide a 7 days flood forecast, 2 days advice warning to National Disaster Management Agency (NADMA) for the whole Kelantan River Basin, Terengganu River Basin and Pahang River Basin and at designated forecast area with minimum or less than +0.5m difference between observed and forecasted flood level and generate a flood hazard map based on forecast result.

The duration for NaFFWS development is 18 months from January 2016.

2.2 THEME 3 : ADDRESSING WATER SCARCITY AND QUALITY

(i) Name of programme : National Water Balance Management System (NAWABS)

A comprehensive plan for the assessment and management of water resources across Malaysia is required to ensure that water resources are managed in a holistic and sustainable manner, so as to ensure the continued provision of water in the face of increasing water demand and growing concern regarding the future reliability of water supplies.

Improving the security and sustainability of water resources, as outlined in the Strategic Action Plan of National Water Resources Policy (2012), is seen by the Federal Government as a key driver to ensuring continued sustainable socio-economic development in the nation. The development of the National Water Balance Management System (NAWABS) is to fulfill the key areas identified in the Strategic Action Plan of National Water Resources Policy, 2012 (From Thrust 1 to Thrust 6, and Thrust 9). These strategic action plans shall satisfy the water resources security and water resources sustainability elements within the basin.

NAWABS will form as a project known as Projek Pembangunan Water Balance bagi Pengurusan Sumber Air Negara (Fasa 1). NAWABS once developed, shall assist and support Department of Irrigation and Drainage and Water Resources Manager to manage their water resources in the river basin more efficiently through an updated and state-of-the-art operational management and planning tools. The development of NAWABS for the Muda River Basin will also include the development of a Decision Management Support System (DMSS). The Mike HydroBasin, Mike She and Mike Customised will be used for NAWABS development system.

NAWABS' Objectives

The development of NAWABS for the Muda River Basin is to fulfill the key core areas under the Strategic Action Plan of National Water Resources Policy, 2012 and the Integrated Water Resources Management under the management tools. Thus the objectives of the project are as follows:-

- To provide information on water resources:
  Forecasting - 2 months in advance while
  Advice warning to NADMA - 2 weeks in advance;
- Develop water accounting up to 2030, including effects of future climate change and accounting for possible water development projects.
- Quantify current and future demand for water resources taking into account population growth and planned agricultural and industrial development.
- Develop a comprehensive Water Resource Conservation Plan (WRCP) for Muda River Basin based on the above findings.
- Develop a DMSS consistent with the WRCP, utilizing the models developed above and findings from the water availability assessment. The DMSS will form part of the National Water Balance and Management System (NAWABS). Further to that the DMSS will have the capacity to provide decision management support to river operators in the short to medium term (forecast horizon of one-year), as well as to provide a platform for undertaking and assessing longer term basin development scenarios (forecast horizon to 2030).
- Develop the capacity building among the DID staff especially on-job-training.

Water resources information are as follows :

1. Water Accounting System
2. Water Availability System
3. Water Demand Options system
4. Water Prioritisation and demand management options
5. Water Allocation System
6. Water Quality System
7. Water Storing and releasing during high and low flows
8. Water Resources Index (WRI) and Drought Index (DI)
9. Water Auditing System

The duration for NAWABS development is 18 months from 1.1.2017.

(ii) Overview study on Water, Energy and Food Nexus for Malaysia

Objective

The objective of this study is to identify a preliminary assessment of the status and challenges of water security, energy security and food security in Malaysia from the security parameters of availability, accessibility, affordability, quality, efficiency and sustainability

Scope of work

- This study offers a predominantly qualitative analysis of the Nexus challenge of water security, energy security and food security in Malaysia.
- Focus on nexus elements for Bernam, Perak and Kelantan River basin

Recommendation From WFE Nexus Study

- Deepen understanding of 'internal' and 'external' water- energy-food nexus
- Encode the design principles in Water Resource Law or State Enactments that encourage and support initiative across water-energy-food nexus
- Prioritise on water stress area, and conduct modelling of the interlinkages
- Create a platform and mechanism to break down silos
- Decentralise decision-making for to govern discharge level
- Institutionalise a long-term view
- Review and enforce existing environmental legislation to control river pollution

2.3 THEME 6 : WATER EDUCATION, KEY FOR WATER SECURITY

MIHP and DID Malaysia organize several program to increase capacity building and awareness of water resources as follows including:

i. National World Water Day 2019 celebration with the theme of "Leaving No One Behind". The launching ceremony by the Minister of Water, Land and Natural Resources in conjunction with World Water day 2019 was held in Pantai Merdeka, Kedah on the 23rd March 2019. Participation: 800 people (Students, Teachers, Publics)

ii. Water Watch Programme for Young Leaders (WW4YL) and Reaching the Grassroots Programme

- WW4YL (Malaysia) on 2 – 4 April 2019 at Putrajaya, Malaysia
- WW4YL (West Zone) on 20 – 22 August 2019 at Terengganu, Malaysia
- 24 Programmes (2009 – 2019) Participation: 2800 Students & 500 Teachers

Water Watch Programme for Young Leaders (West Zone),
University Malaysia Terengganu, Malaysia
Participation 86 people (Teachers, Students and & UNESCO-IHP Members)

iii. Young Environmentalist Camp 2019 was held at University Malaysia Perlis on the 27th – 28th February 2019 with participation of 80 people (Teachers, Students and & UNESCO-IHP Members)

iv. Between the periods of October 2016 to October 2017 Malaysia IHP held two technical talk. The details of the technical talk session are as follows:-
    - Expert Mission on Groundwater Modelling, 7th March 2019 with participation of 85 people (Universities Lecturers, Private and Government Sectors)
    - Water Quality Issues – Correcting the Wrongs, 23rd April 2019 with participation of 35 people (Private and Government Sector)

v. Terengganu River Expedition, 9 -12 September 2019 with participation of 80 people (Media, Researcher, Government Servants)

3 ACTIVITY AT REGIONAL / NATIONAL LEVEL IN THE FRAMEWORK OF THE IHP

3.1 National Level

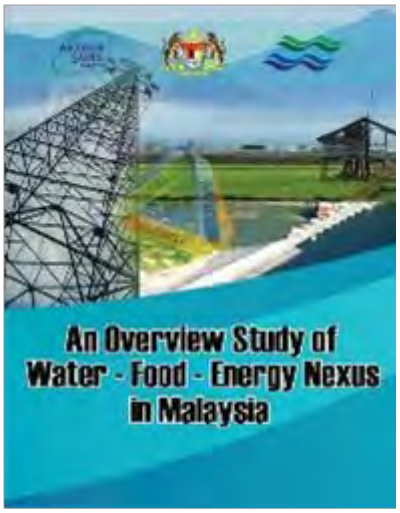
(a) UNESCO Malaysia Day 2019

UNESCO Malaysia Day 2018 was held at Bulatan Sultan Azlan Shah, Ipoh Perak on 29th – 30th September 2018.

4 PUBLICATIONS

- Monthly Updates of IHP activities in DID Bulletin
- Module for National Water Watch Programme for Young Leader by Committee on Education, Training and Public Information, IHP Malaysia

- Awareness Posters and Facebook of UNESCO-IHP Malaysia



5 RESEARCH/APPLIED PROJECTS SUPPORTED OR SPONSORED

i. Collaboration with other national and international organizations and/or programmes
   - UNESCO Jakarta Office
   - Malaysian National Commission for UNESCO (SKUM)
   - Humid Tropics Center Malaysia (HTC)
   - University of Science Malaysia (USM)
   - National Hydraulic Research Institute Malaysia (NAHRIM)
   - Universiti Tenaga Nasional Malaysia (UNITEN)
   - Universiti Teknologi MARA (UITM)
   - National Oceanography Department

- Putrajaya Corporation (PPJ)
- University of Technology Malaysia (UTM)
- University of Malaysia Sarawak (UNIMAS)

ii. Cooperation with the UNESCO-IHE Institute for Water Education and/or international/ regional water centres under the auspices of UNESCO
A number of Malaysian students are currently pursuing post-graduate studies at master's and PhD levels at this institute.

6 FUTURE ACTIVITIES

6.1 Activities planned until December 2019

- National Water Watch Programme For Young Leaders (Borneo Zone)
- IHP Technical Talk
- Participation of IHP Malaysia in the 27th Regional Steering Committee Meeting for Southeast Asia and the Pacific - UNESCO IHP

6.2 Activities foreseen for 2018 - 2019

- Participation in IHP-RSC meeting Asian Pacific FRIEND and Catalogue of Rivers
- Cooperation between Malaysia Universities and Non-Governmental Organisation (NGOs) with IHP Malaysia on several matters for capacity building in hydrology and water resources fields
- Participation in IHP-Training course
- Implementation of projects related to IHP-VIII (2014 – 2021)

6.3 Activities envisaged in the long term

- Long-term cooperation between The Regional Centre of Expertise on Education for Sustainable Development (RCEs) Penang and IHP Malaysia for Regional Sejahtera ESD Network (RSEN) and other activities
- Malaysia National committee for IHP will promote activities to public coordinate participations at national level to augment people's awareness through, educations and trainings on hazards caused by global warming, as well as hazards caused by geological events, These include sea level rise, flood and drought hazard, debris control, tsunamis, water and food security, and access to save water. Area of priorities is mega cities, and coastal areas.
- Participation in IHP-VIII projects and RSC activities.
- Information dissemination through a web page of the National Committee.
- Participation in IHP-RSC activities and IHP Inter-Governmental Council meetings in Paris.
- Malaysia IHP commitment to IHP Phase VIII (2014-2021)
- Scientific Researches by Malaysia IHP Standing Committee
- Collaboration with many other agencies for the purpose of scientific researches and public outreach programmes.

Appendix A

Other IHP Partners Members

Ministry of Treasury Malaysia
Ministry of Agriculture Malaysia
Ministry of High Education Malaysia
Ministry of Health Malaysia

Department of Environment Malaysia
Department of Forestry Malaysia
Department of Metrology Malaysia
Department of Ministry Malaysia
Department of Water Supply
Local Government Department
Mineral& Geoscience Department Malaysia

Nuclear Agency Malaysia
Malaysia Remote Sensing Agency (MACRES)
Forest Research Institute Malaysia
National Security Council, Malaysia

FELDA Agriculture Services Sdn. Bhd
FELCRA Berhad
Tenaga Nasional Berhad

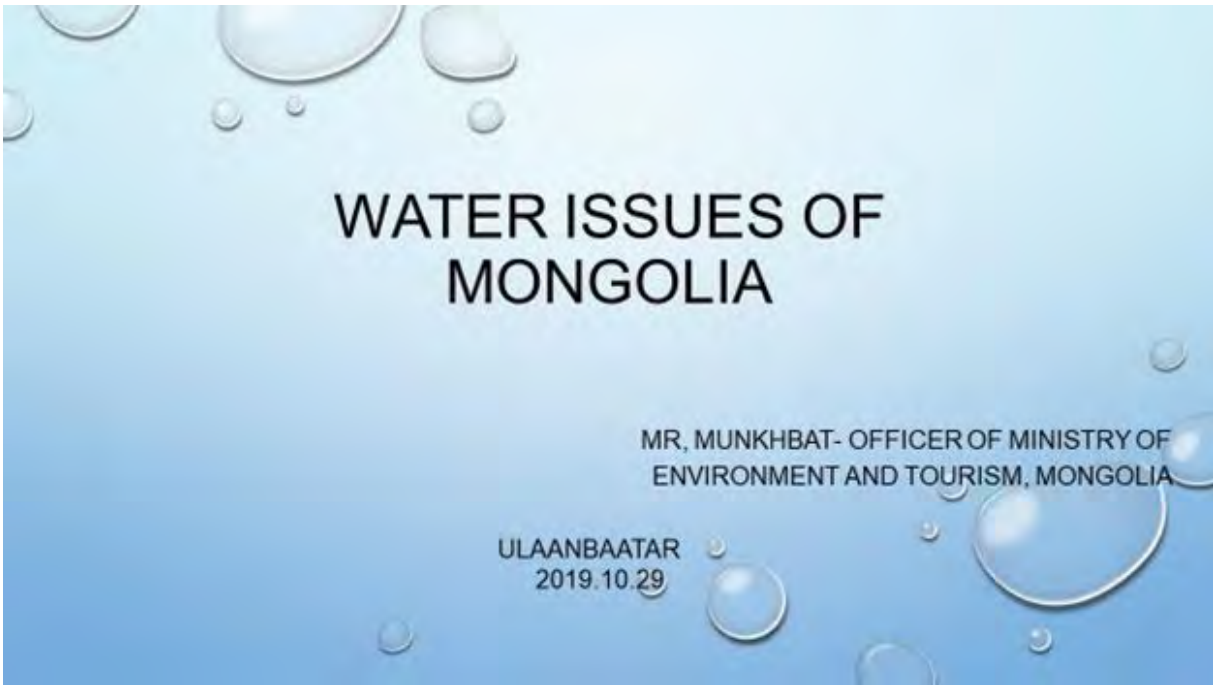
Universiti Malaysia Perlis (UniMAP)
Universiti Teknologi Malaysia
Universiti Kebangsaan Malaysia
Universiti Tun Hussein Onn Malaysia
Universiti Teknologi MARA
Universiti Malaya
Universiti Putra Malaysia
Universiti Sains Malaysia
Universiti Pendidikan Sultan Idris
Universiti Malaysia Terengganu
Universiti Malaysia Pahang
Universiti Malaysia Sarawak

Contact us:

1.	Chairman	Dato' Ir. Hj Abdullah bin Isnin Director-General Department of Irrigation and Drainage Malaysia Jalan Sultan Salahuddin 50626 Kuala Lumpur Malaysia Tel : 60-3-2616 1501 Fax: 60-3-2697 2411 Email: abdullahisnin@water.gov.my

2.	Deputy Chairperson	Dato' Ir Hj. Nor Hisham bin Mohd Ghazali Deputy Director-General Department of Irrigation and Drainage Malaysia Jalan Sultan Salahuddin 50626 Kuala Lumpur Malaysia Tel : 60-3-2616 1502 Fax: 60-3-2697 2585 Email: hisham@water.gov.my
3.	Secretariat	Dato' Ir. Mohd Azmi bin Ismail Director Director for Water Resource Management and Hydrology Division Department of Irrigation and Drainage Malaysia KM 7, Jalan Ampang 68000 Ampang Kuala Lumpur Tel: +603 4289 5500 Fax: +603 4256 4037 Email: azmiismail@water.gov.my
4.	Deputy Secretary	Ir. Roslina binti Yusop Deputy Director Division of Water Resources and Hydrology Department of Irrigation and Drainage Malaysia KM 7, Jalan Ampang 68000 Ampang Kuala Lumpur Tel: +603 4289 5507 Mobile: +6019 600 3898 Fax: +603 4256 4037 Email: lina@water.gov.my
5.	Secretariat Office	UNESCO-IHP Malaysia Water Resources Management and Hydrology Department of Irrigation and Drainage Malaysia KM 7 Jalan Ampang 68000 Ampang Kuala Lumpur, MALAYSIA E-mail :ihp@water.gov.my Tel : +603 4289 5566 Fax: +603 4260 1289 Facebook: UNESCO-IHP Malaysia

Mongolia:


WATER ISSUES OF MONGOLIA
MR, MUNKHBAT- OFFICER OF MINISTRY OF ENVIRONMENT AND TOURISM, MONGOLIA
ULAANBAATAR
2019.10.29


CONTENTS
1. BRIEF INTRODUCTION
2. WATER RESOURCES MONGOLIA
3. CLIMATE CHANGE
4. WATER POLICES MONGOLIA
5. IHP MONGOLIA
6. CONCLUSION

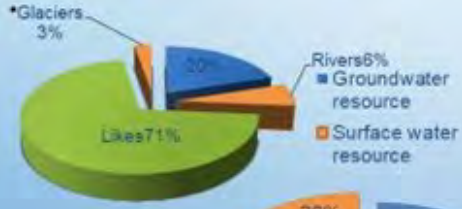
BRIEF INTRODUCTION
Geography & Population

- 1,56 million km²
- Boundaries and border countries; China 4677 km. Russia 3543 km.
- Capital city is; ULAANBAATAR
- Population is; 3,2 million
- Climate: There are four well-defined seasons, and on average, the sun shines for well over 250 days a year. The climate is extremely continental with low precipitation. Average summer temperature is +20˚C, average winter temperature is -26˚C, average rainfall -200-220 mm. winter lasts from November to late April. Although winter is cold with lot of snowfall, it also has many sunny days.

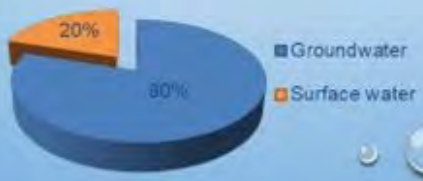
WATER RESOURCES MONGOLIA

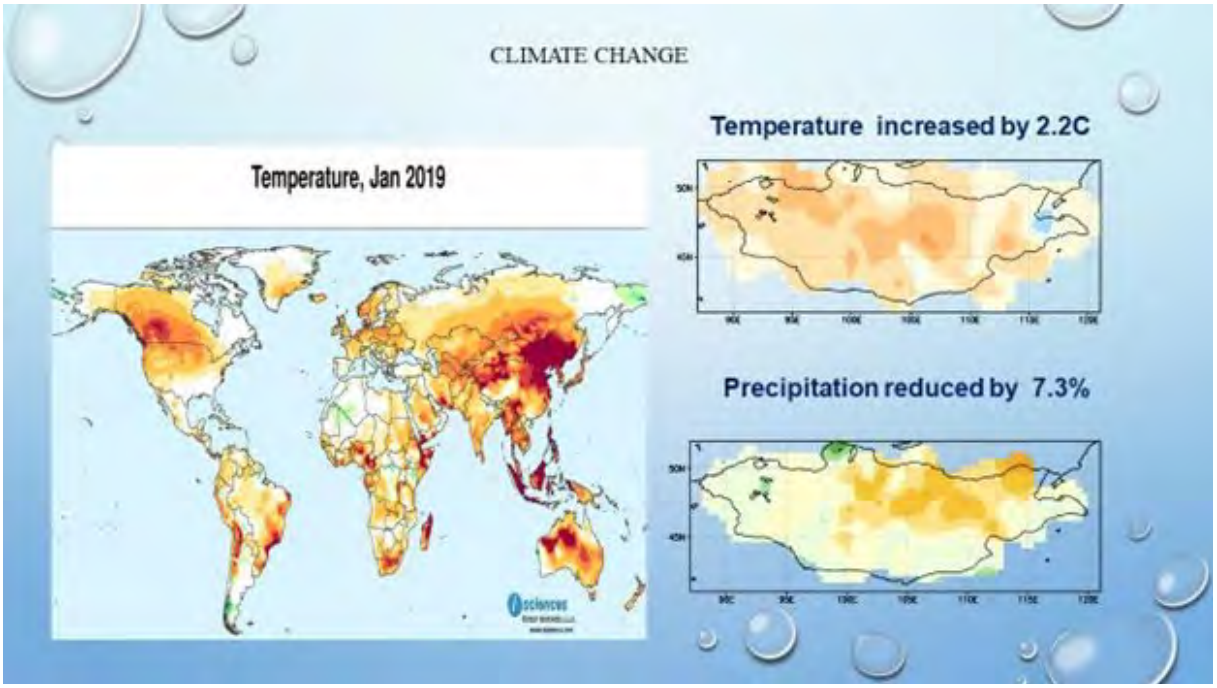
Water resources

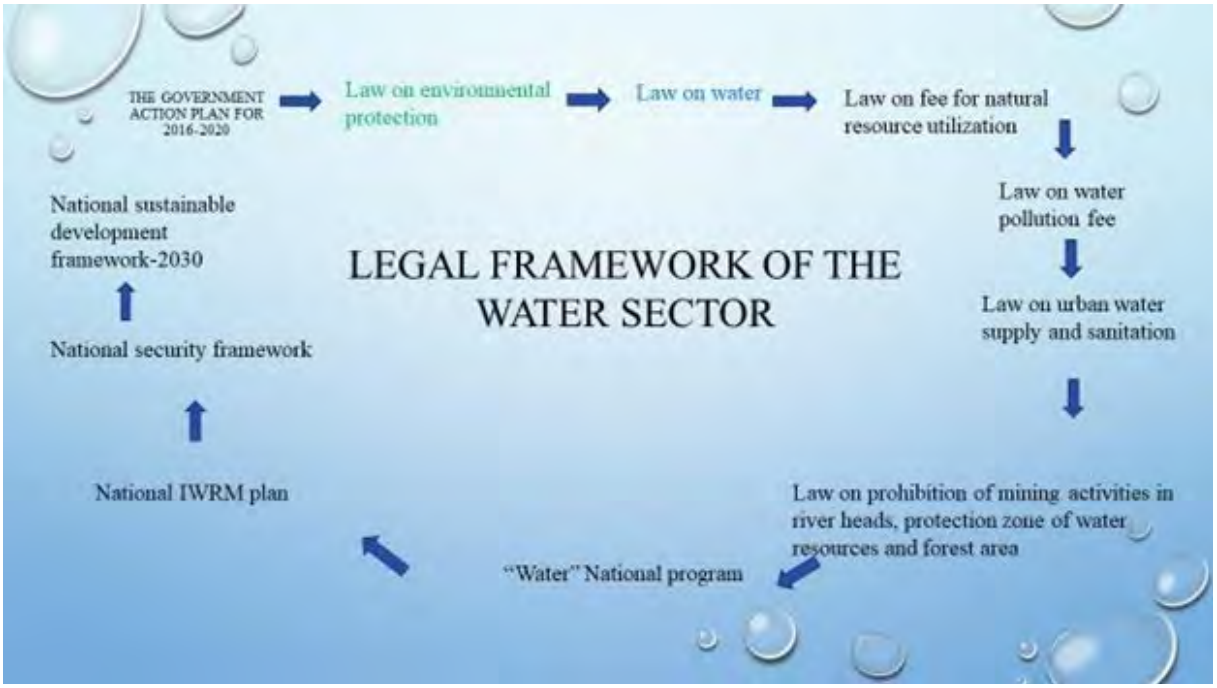
Water resource 564,800.0 million.m³/year

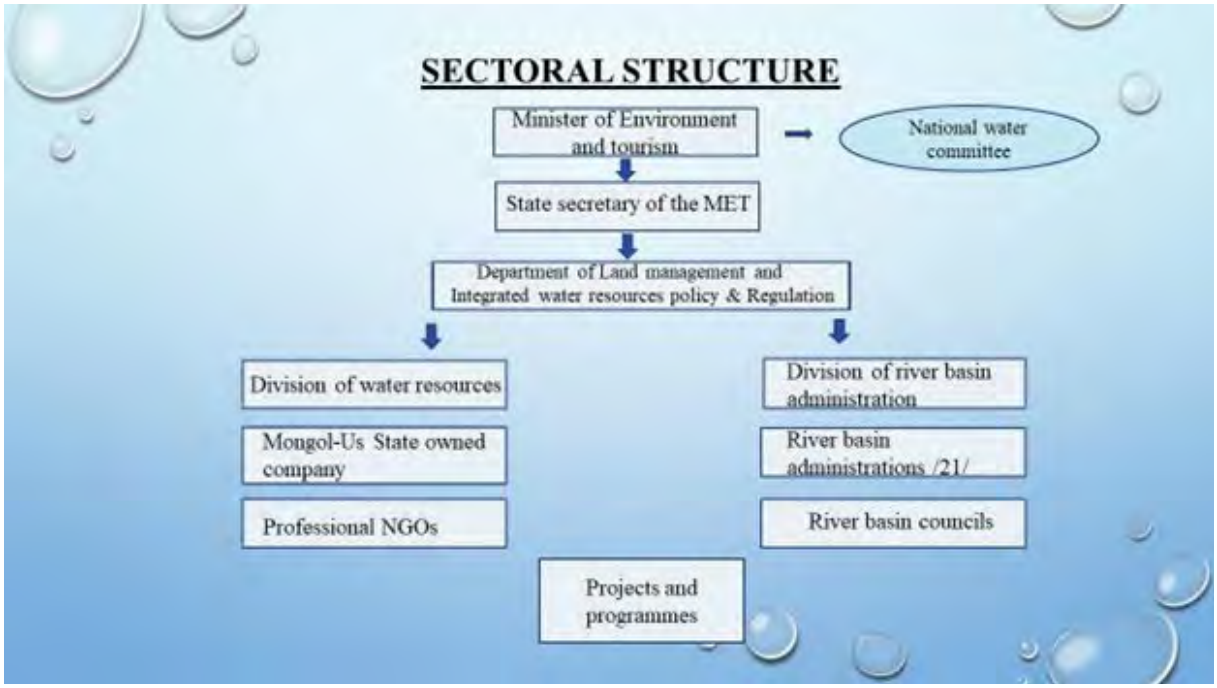


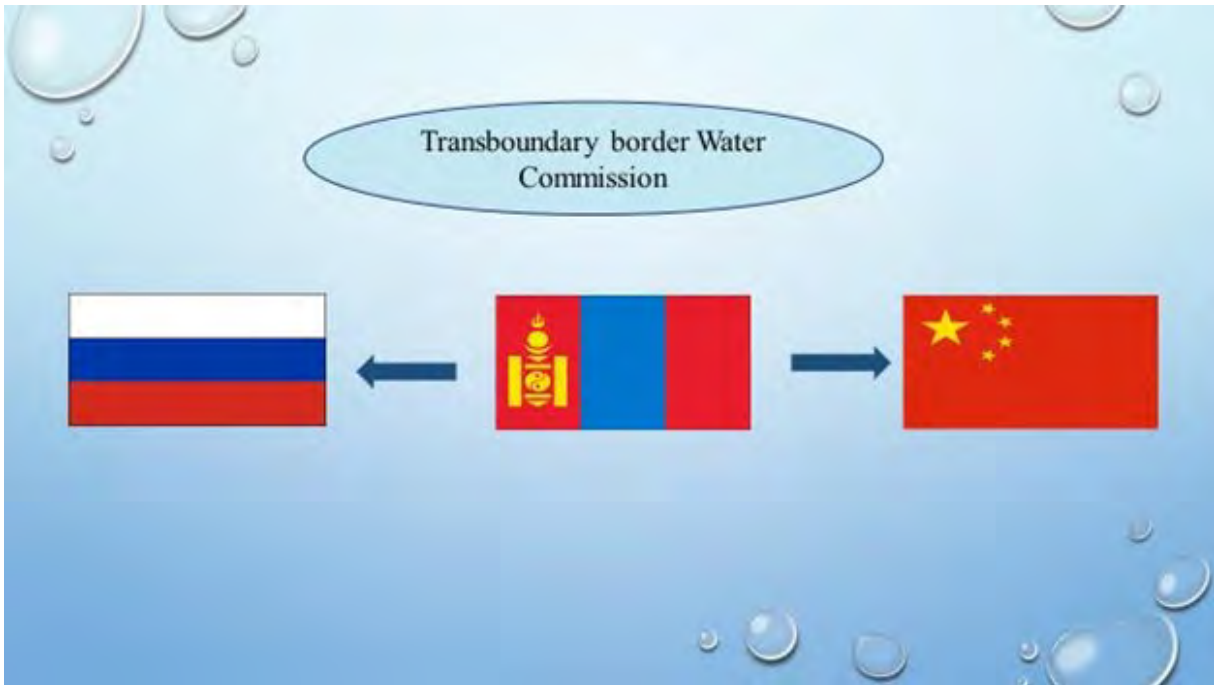
29 River Basins and
21 River Basin Authorities



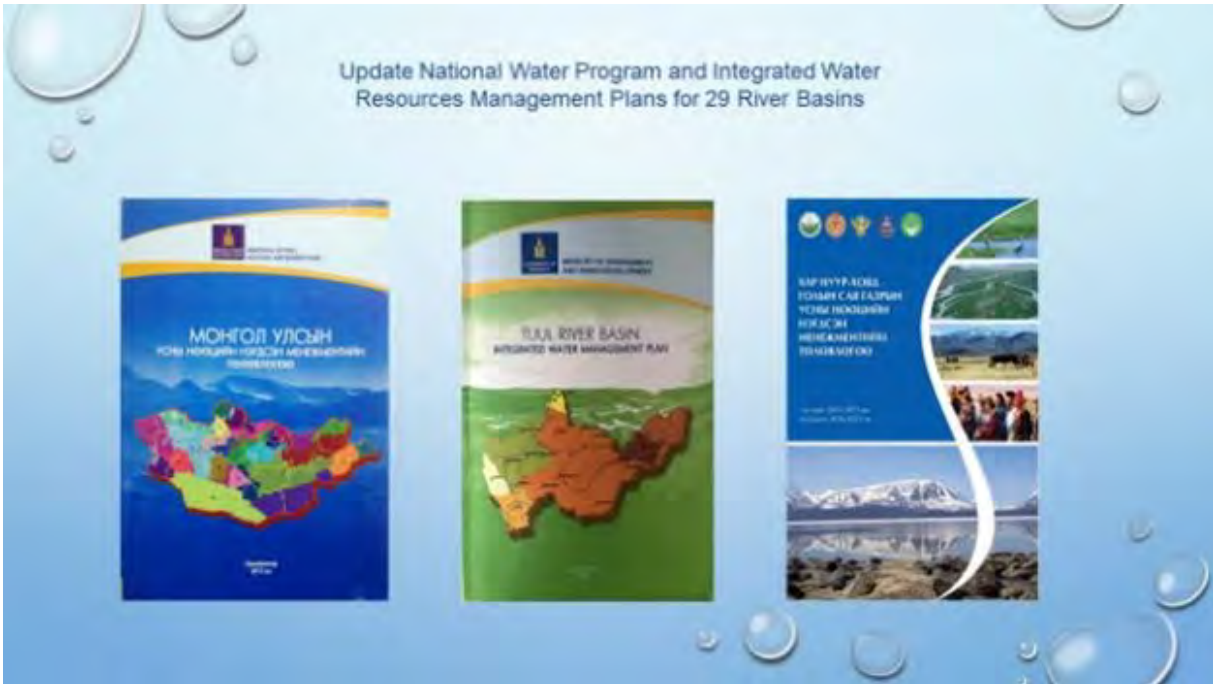

CLIMATE CHANGE
Temperature, Jan 2019
Temperature increased by 2.2C
Precipitation reduced by 7.3%


THE GOVERNMENT ACTION PLAN FOR 2016-2020
Law on environmental protection
Law on water
Law on fee for natural resource utilization
Law on water pollution fee
Law on urban water supply and sanitation
Law on prohibition of mining activities in river heads, protection zone of water resources and forest area
"Water" National program
National IWRM plan
National security framework
National sustainable development framework-2030
LEGAL FRAMEWORK OF THE WATER SECTOR


SECTORAL STRUCTURE
Minister of Environment and tourism
National water committee
State secretary of the MET
Department of Land management and Integrated water resources policy & Regulation
Division of water resources
Mongol-Us State owned company
Professional NGOs
Division of river basin administration
River basin administrations /21/
River basin councils
Projects and programmes


Transboundary border Water Commission


HYDROLOGICAL PROGRAMM
Mongolia has divided 29 river basins
RBA Mongolia
Монгол орны усны сав газар


Update National Water Program and Integrated Water Resources Management Plans for 29 River Basins
МОНГОЛ УЛСЫН
TUUL RIVER BASIN

IHP MONGOLIA

- WATER WORKS
- WORLD WATER DAY
- MONGOLIAN WATER FORUM/UNDER THE PRESIDENT/
- DATA HACKATHON /WATER & MINING/
- PROGRESS ON INTEGRATED WATER RESOURCES MANAGEMENT 2018
- COUNTRY WATER PARTNERSHIPS OF THE GLOBAL WATER PARTNERSHIP (GWP)

29-RBA, OVER 29 -/ MSP/-900 people

Because rivers are an important source of water in Mongolia, /WRG 2030, World Bank, IHP Mongolia,/ enabled a Multi-Stakeholder Platform (MSP) at the local river basin level and reformed existing River Basin Councils by establishing river basin MSPs – an approach that has never been used before.

Groundwater monitoring network

119 underground water monitoring network established by the MINIS project, Australian Government Grant. 2019

WHAT WE HAVE DONE

1. Celebration of World Water Day (WWD) 2019.
2. June 6,7. 2019 organized "Mongolian water forum" under the Mongolian president, including 1000 of professionals.
3. Revisions to the national water policy.
4. Updated of the law on water pollution fees. Including the implementation rules.
5. Increasing capacity building of "Polluted Water Treatment plants"
5. Implementing a project on "Tuul River Improvement".
6. Implementing a project on "Improving sanitation in area households".
7. Under the 29 RBA's established over 29 MSRBG.

The revised guidelines on the reformation of existing RBCs into RB MSP Councils (RBMSPC) was officially accepted by the government as an official administrative act on March 13, 2018. These guidelines cover critical issues such as the establishment of the RBMSPC, the facilitation of stakeholder participation in the planning and implementation of basin-level IWRM plans, collaboration and engagement with basin authorities, financing of the Councils, and identification of stakeholder responsibilities.

8. Training on strengthening participation of local communities in water management.
9. Strengthening and improving cooperation with the 2030 Water Resource Group and WWF of Mongolia.
11. Strengthening groundwater quality monitoring. In Gobi region we taking the hydrogeological information from 110 wells.
12. Successfully concluded report on SDG indicator 6.5.1. Degree of IWRM implementation.

What the…

Almost 90% of total water consumption is being supplied from the ground water resources, which occupies only 2% in the total water resources. Hence, it is needed to increase use of surface water for all purposes. However, there is no a comprehensive water infrastructure that can accumulate surface water, produce energy resources and provide water for all sectors So, it is needed to apply advanced water saving technologies in all sector for increasing water resources, reusing and recycling water in order to adapt climate change impact.

A-10 Progress on IWRM 2018 FinalDraft /PRG/ 2018-06-29C.
National 6.5.1 data: IWRM implementation

C. National 6.5.1 data: IWRM implementation

IWRM implementation categories and score thresholds

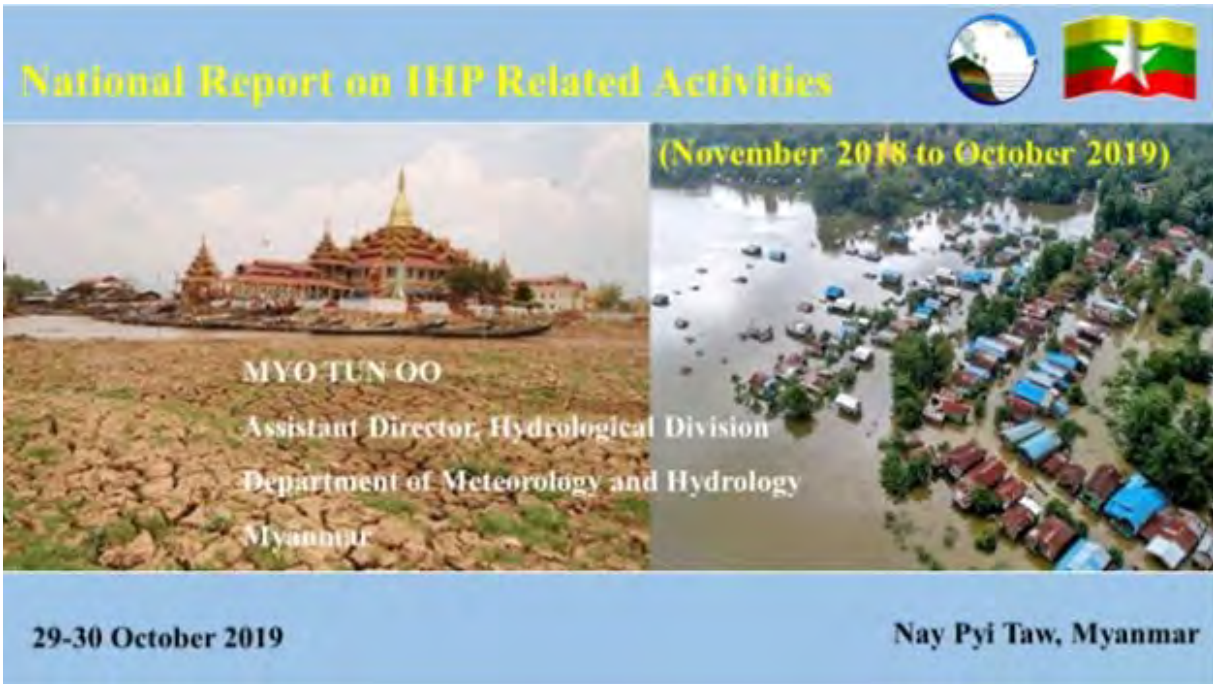
Very low	Low	Medium low	Medium high	High	Very high
0 - 10	11 - 30	31 - 50	51 - 70	71 - 90	91 - 100

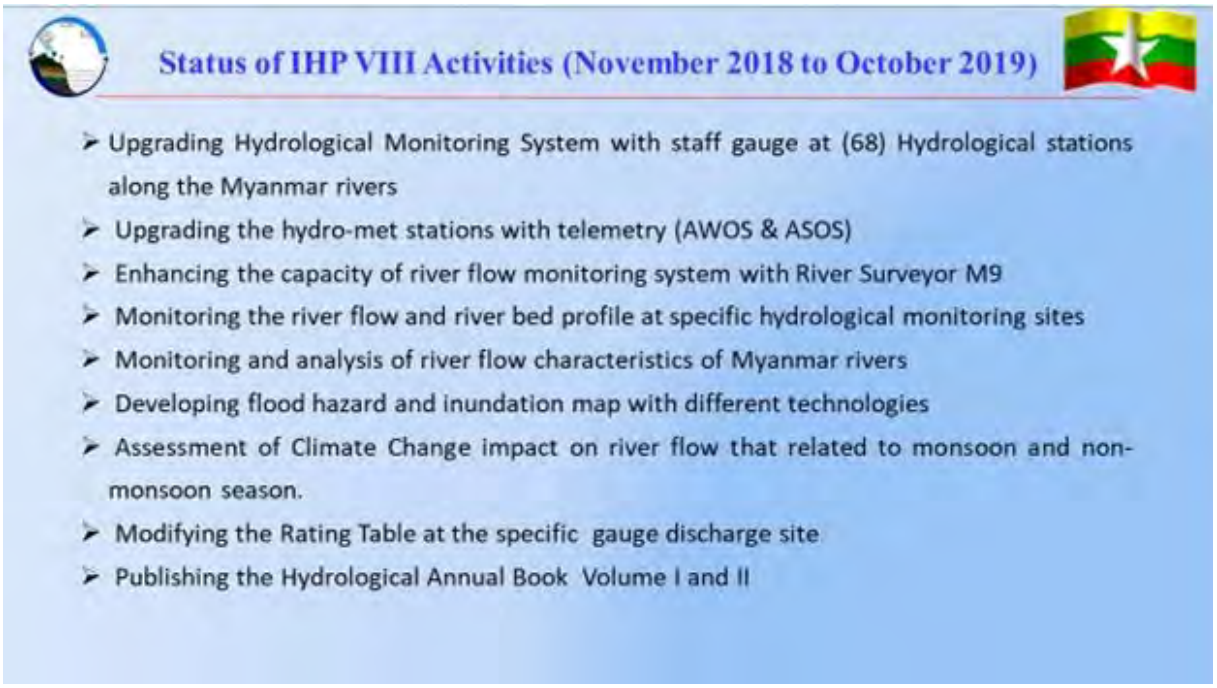
Scores based on 33 questions across 4 sections (see Annex A). For full results for each question for each country, see http://iwrmdataportal.unep.org/

Country name	Final IWRM Score	Section 1 Average Enabling Environment	Section 2 Average Institutions and participation	Section 3 Average Management instruments	Section 4 Average Financing
Afghanistan	32	23	33	9	9
Albania	43	40	65	51	16
Algeria	48	40	42	51	60
Andorra	36	23	41	43	35
Angola	37	45	36	38	28
Antigua and Barbuda	30	32	33	40	15
Argentina	38	39	46	34	32
Armenia	36	42	40	28	34
Australia	85	83	88	88	83
Austria	91	100	91	100	70
Azerbaijan	66	55	59	72	78
Bahamas	33	34	31	36	33
Bahrain	40	28	46	43	40
Bangladesh	50	50	43	56	45


THANK YOU

Myanmar:


National Report on IHP Related Activities
(November 2018 to October 2019)
MYO TUN OO
Assistant Director, Hydrological Division
Department of Meteorology and Hydrology
Myanmar
29-30 October 2019
Nay Pyi Taw, Myanmar


Status of IHP VIII Activities (November 2018 to October 2019)
Upgrading Hydrological Monitoring System with staff gauge at (68) Hydrological stations along the Myanmar rivers
Upgrading the hydro-met stations with telemetry (AWOS & ASOS)
Enhancing the capacity of river flow monitoring system with River Surveyor M9
Monitoring the river flow and river bed profile at specific hydrological monitoring sites
Monitoring and analysis of river flow characteristics of Myanmar rivers
Developing flood hazard and inundation map with different technologies
Assessment of Climate Change impact on river flow that related to monsoon and non-monsoon season.
Modifying the Rating Table at the specific gauge discharge site
Publishing the Hydrological Annual Book Volume I and II

Activities at National Level in the Framework of IHP

DMH conduct the following national/ local scientific and technical trainings and meetings

- Training on Hazard Modeling was conducted in Nay Pyi Taw which organized by DMH and ADB and Climate Project Team (10-18 December 2018)
- Python and SOBEK Modeling Training was conducted in Nay Pyi Taw which organized by ADB Canada, Deltares (19-22 February 2019)
- Disaster Monitoring and Response System (DMRS) Administration Training was held at Nay Pyi Taw, (1-3 May 2019), to cooperate with PDC and USAID
- DMRS user Training was held at Royal ACE hotel, Nay Pyi Taw, to cooperate with PDC and USAID
- DMRS Administrative User and Command Post Training was conducted in Nay Pyi Taw which was organized by DMH, PDC and USAID (6-9 August 2019)

Collaboration with other national and international organization

- Myanmar is the member country of EANET (Acid Deposition Monitoring Network in East Asia) since 2005. Therefore, Myanmar collaborate in EANET's activities.
- Myanmar is also the member of Panel on Tropical Cyclone (PTC) since 1972. So, DMH collaborate with activities of PTC.
- DMH is collaborating with ADPC, RIMES , NVE and MetNo in Hydrometeorology, Seismology and Climate Change sectors.
- DMH is also collaborating with Pacific Disaster Center in Strengthening Multi-hazard Early Warning System activities
- DMH is collaborating with Government of Canada and ADB in Strengthening Climate and Disaster Resilience activities.

Other initiatives

- DMH have a plan to install the 34 hydrological monitoring stations with telemetry (radar or bubble senor) during the AIRBM project.
- DMH also have a plan to install the 66 hydro-met monitoring stations with Automatic Weather Observation System (AWOS) during the AIRBM project.
- DMH is implementing the Hydro-met observation and information system modernization during AIRBM Project.

Contribution to IHP Course

- Hydrological Grade I course was held at Department of Meteorology and Hydrology, Mandalay in November 2018
- Hydrological Grade II and III courses were held at Department of Meteorology and Hydrology, Yangon in December 2018 to March 2019.

Participation in the International Scientific Meetings

The following meeting hosted by the country

- 22nd National Monsoon Forum was held at Nay Pyi Taw which was organized by DMH and RIMES
- Workshop on Implementation of Synergized Standard Operating Procedures (SSOPs) for Coastal Multi Hazard Early Warning System was held on Nay Pyi Taw on 1-2 November 2018 which was jointly organized by WMO, UNESCAP and DMH
- Final Stakeholder Workshop for Disaster Monitoring System (DMRS) was held at Royal ACE Hotel, Nay Pyi Taw on 9 August 2019 which was jointly organized by USAID, PDC and DMH
- 46th Session of the Panel on Tropical Cyclone was held at Royal ACE Hotel, Nay Pyi Taw on 9-13 September 2019 which was jointly organized by WMO, UNESCAP and DMH
- WMO Inception Meeting was held at Nay Pyi Taw on 8 – 9 October 2019 organized by World Bank, AIRBM Project Component 2, GFDRR/ NIRAS and DMH

Participation in the Meeting Abroad

The Secretary of MNC-IHP is a Permanent Representative of WMO. Therefore, he has closely contacted and coordinated with WMO's activities.

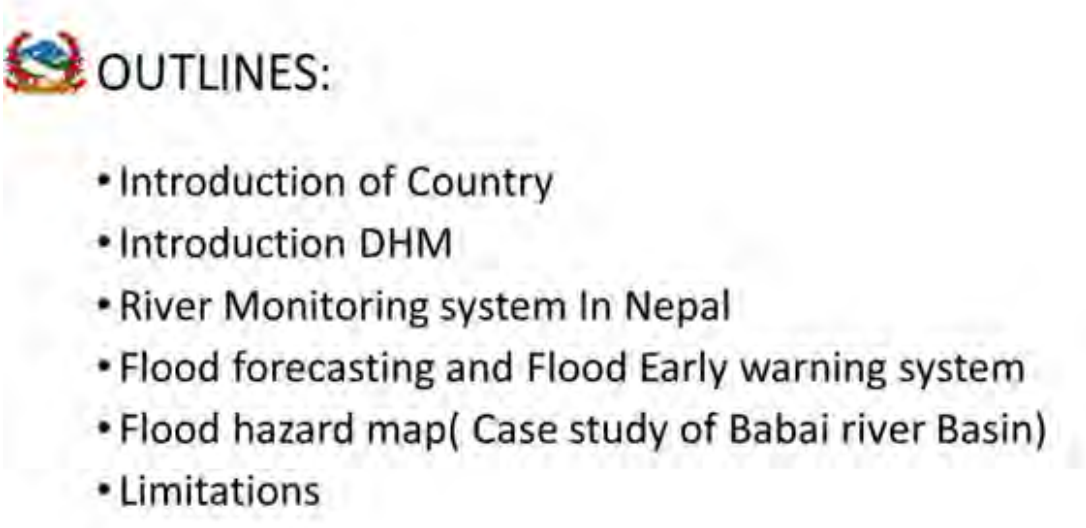
- 10th the RIME Council Meeting, Thailand (12-13 November 2018)
- 24th Session of the Conference of the Parties to United Nation Framework Convention on Climate Change (COP 24), Poland (2-14 December 2018)
- WMO Second Multi-Hazard Early Warning Conference (MHEWC-II), UNISDR Sixth Session of the Global Platform for DRR 2019, Geneva (15-17 May 2019)
- Working Group Meeting on Preparation of the next EANET Median Term Plan, Thailand (20-21 August 2019)
- Asian Water Leader's Round Table in the Korea International Water Week 2019, Korea (4-9 September 2019)

Future Activities

- Developing the Impact Based Flood Forecasting and Warning System for four priority areas in the Ayeyarwady river basin and Chindwin river basin in Myanmar
- Enhancing the capacity of National Flood Forecasting System with advanced technology
- Developing the Flood Hazard and Inundation map at some city in order to mitigate the flood disaster impact
- Monitoring the river flow at some hydrological station in case of modifying the rating table at respective hydrological station
- Conducting the training and On Job Training related to hydrological fields especially for Junior staff of DMH
- Extending the hydrological monitoring network at some river basin in Myanmar

Nepal:


Government Of Nepal
Ministry of Energy, Water Resources and Irrigation
Department of Hydrology and Meteorology
Status Of Hydrological Activities In Nepal
27th IHP Regional Steering Committee Asia-Pacific Meeting
Nay Pyi Taw, Myanmar


OUTLINES:
• Introduction of Country
• Introduction DHM
• River Monitoring system In Nepal
• Flood forecasting and Flood Early warning system
• Flood hazard map(Case study of Babai river Basin)
• Limitations

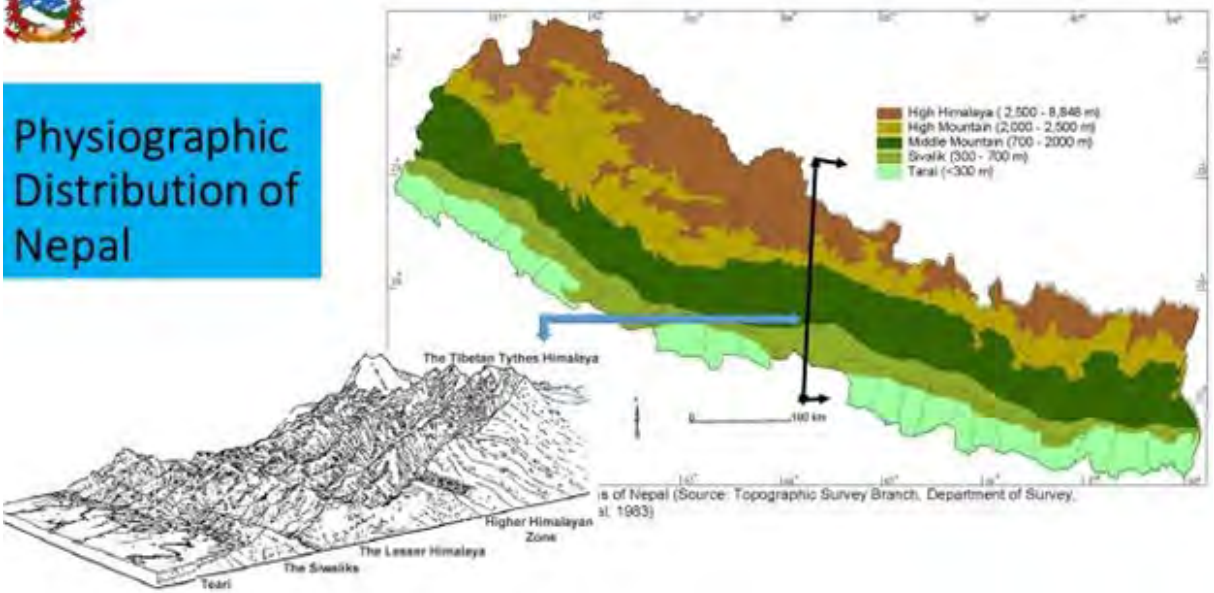
Introduction of Nepal

- South East Asian country
- Capital City: Kathmandu
- Government: Federal Parliametary system
- Area: 1,47,181 SQ KM
- Time Zone: UTC + 05:45
- Landlocked country

Contribution of Nepal in Global Perspective

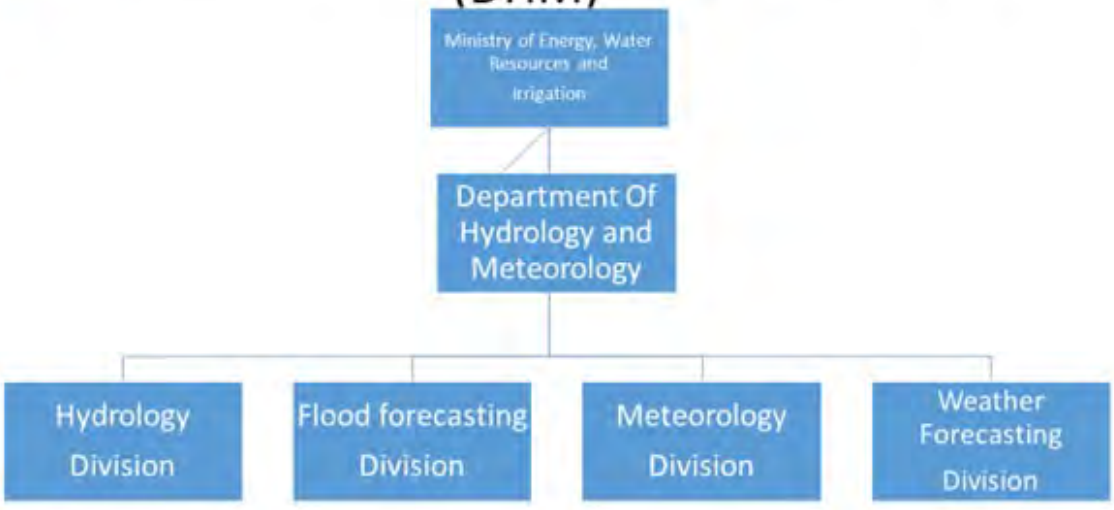
Fig. 1.1
The Hindu Kush Himalayan region and 10 major river basins

Physiographic Distribution of Nepal

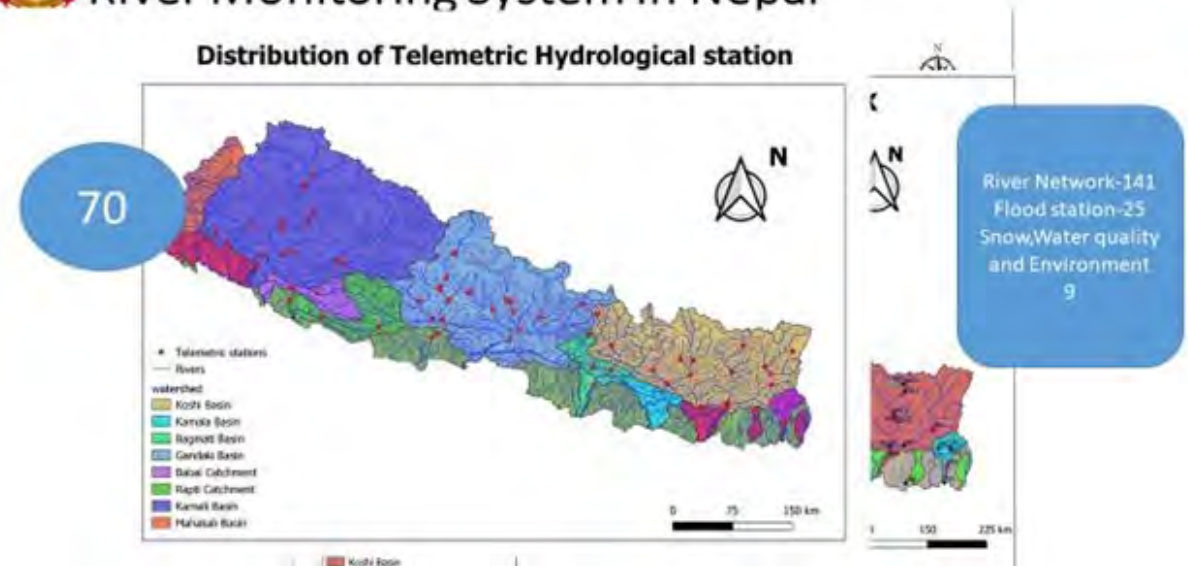


s of Nepal (Source: Topographic Survey Branch, Department of Survey, l, 1983)

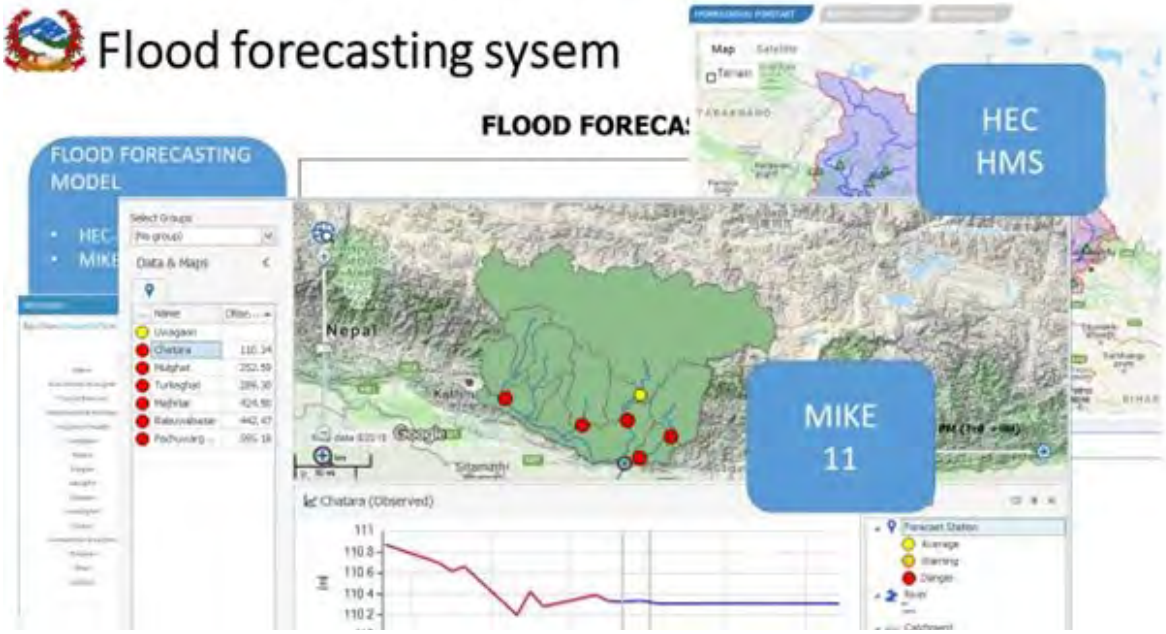
Department of Hydrology and Meteorology (DHM)



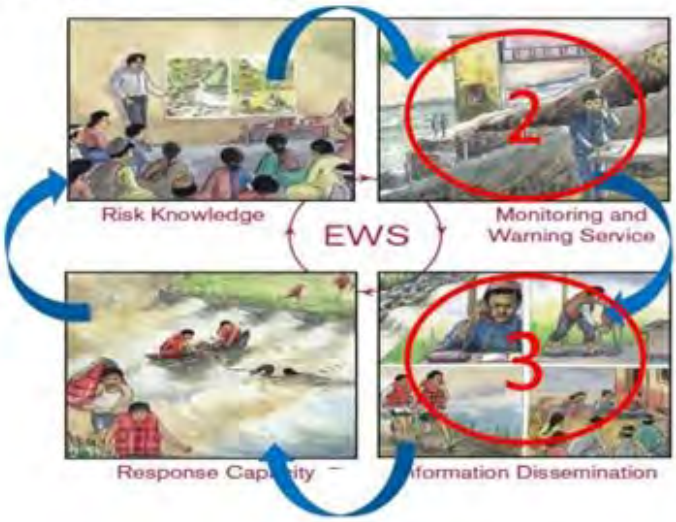
River Monitoring System In Nepal



Flood forecasting sysem



Flood Early Warning System

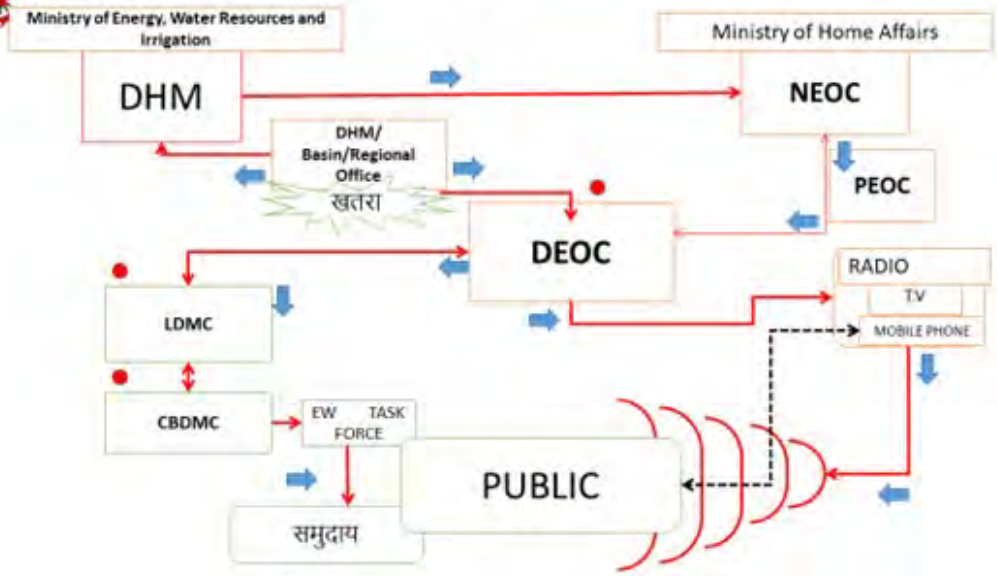


Flood Early Warning System

- Good practice of EWS in Big rivers system like Kosi, Narayani and karnali
- Most of the EWS are monitoring based.
- But our goal is to go into forecast based EWS

Communication

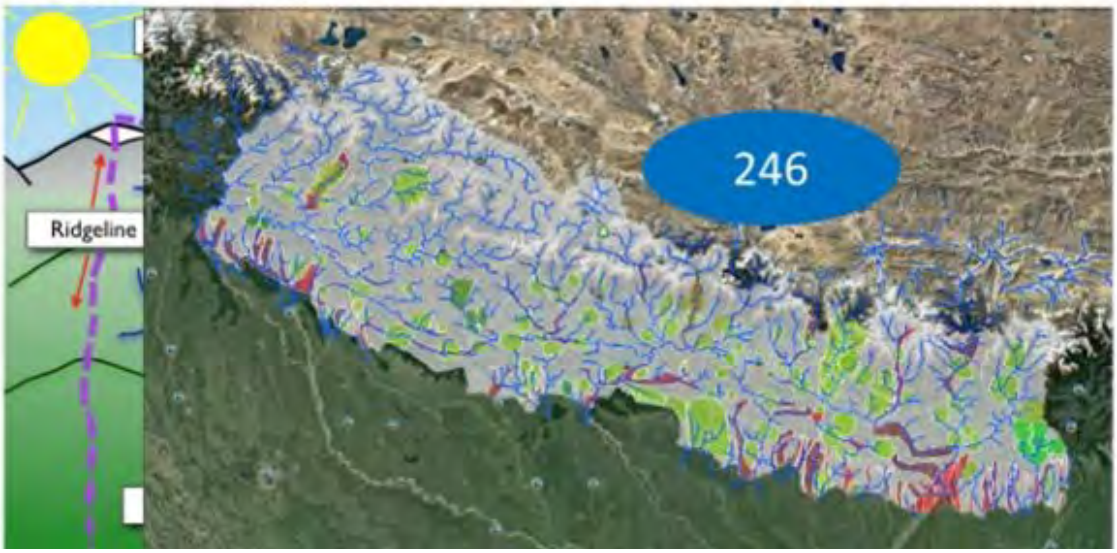
Flood Warning Dessimination Mechanism

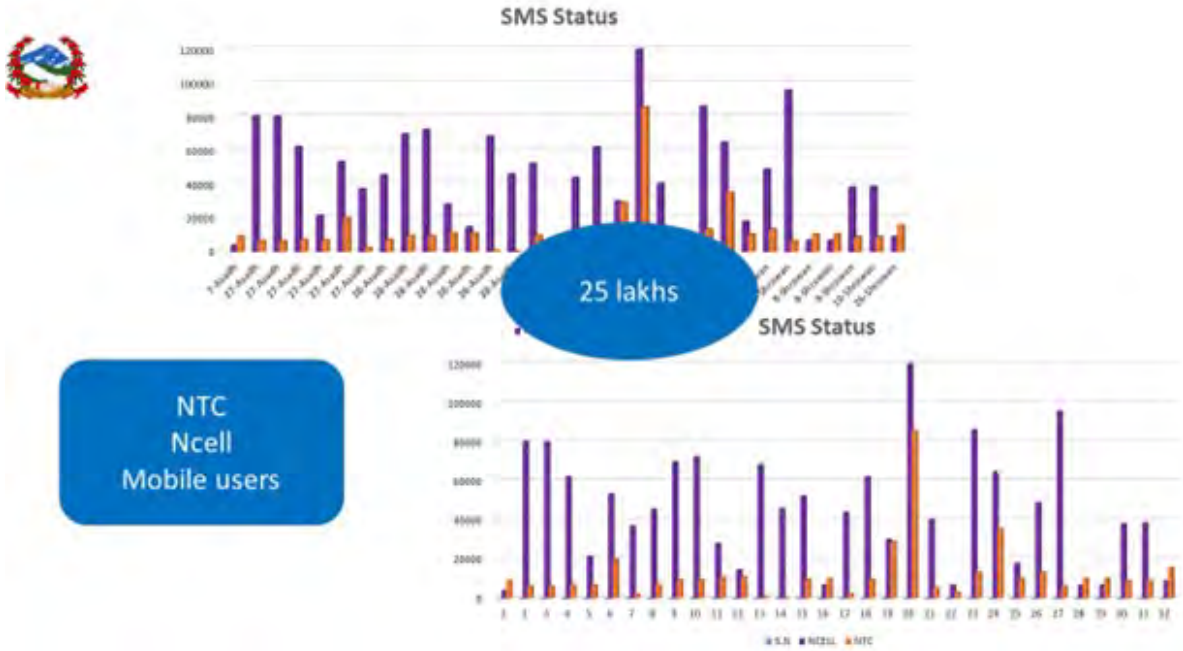


Methodologies For Warning Dessimination

1. Flood Bulletins
2. Toll Free No. 1155
3. Mobile SMS /(Mass SMS) Services
4. Facebook Page
5. Twitter

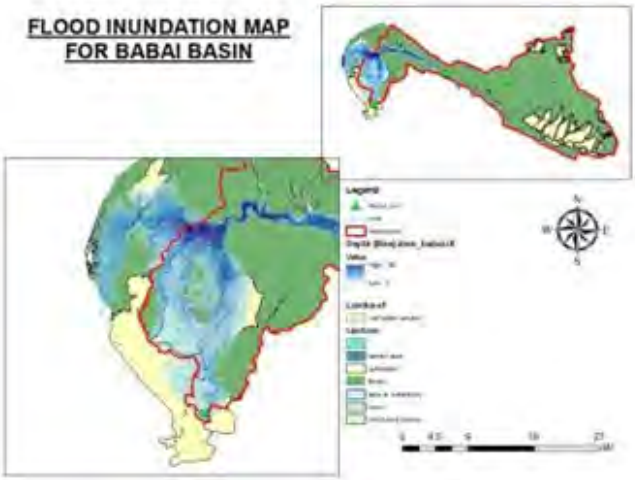
Flood SMS / Mass SMS





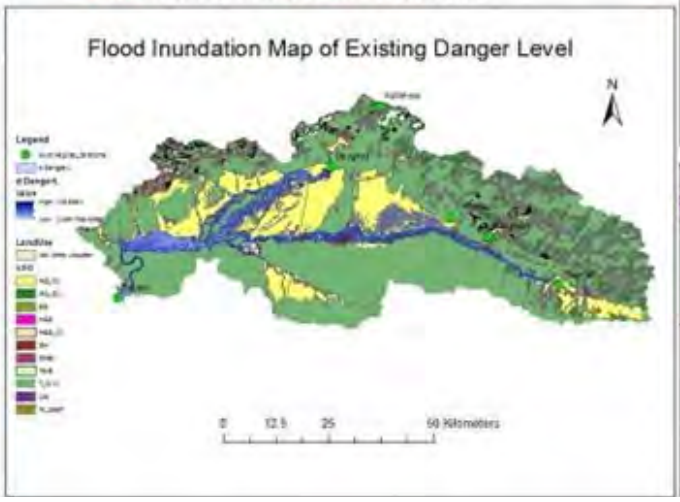
Flood inundation map
A case study of Babai basin for year 2017

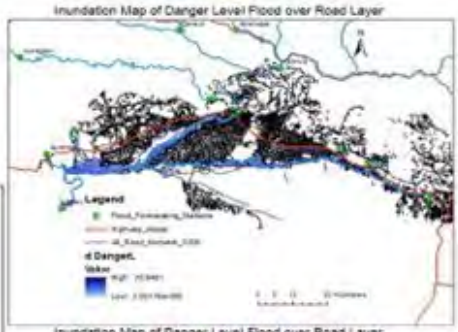
- **A case study of Babai basin**
- **Maximun recorded water level at 13th Aug 2017.**

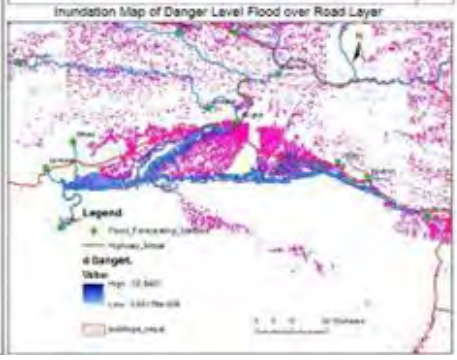


Flood inunation map

8.3m for Narayani and 3.4m for East Rapti







Limitation For Hydrological Study:

- High resolution DEM to represent the plain area.
- Recent land-use data (To represent changing scenarios due to urbanization)
- Remote sensing data
- Limited Expertise in hydrological studies.
- Limited research and development in the field of hydrology withing department.
- Baseline survey data for vulnerability risk assessment and ana

New Zealand:

27th IHP REGIONAL STEERING COMMITTEE MEEETING FOR ASIA AND THE PACIFIC

Nay Pyi Taw, Myanmar

(October- November 2019)

NATIONAL REPORT OF NEW ZEALAND

Activities undertaken in the period October 2018– October 2019

1.1 Meetings of the IHP National Committee

1.1.1 Composition of the IHP National Committee

Mr. Dennis D Jamieson and MS Srinivasan have continued to maintain a watching brief of developments and act in the role of Chairman and Secretary respectively as per their previous formal roles in the IHP National Committee during the reporting period.

1.1.2 Status of IHP activities

The following projects continue to be funded:

- Information on New Zealand's Freshwaters: Water Resources Archive;
- Land Use Intensification: Sustainable Management of Water Quality and Quantity;
- Reducing the Impacts of Weather Related Hazards;
- Information on New Zealand's Freshwaters: Climate and Water Resources Archives is a national programme of climate and hydrometric data collection. The data produced from this programme are of increasing importance to guide decision-making on development (especially proposed hydropower and expanded irrigation) and to contribute to the assessment of effects of human related activities on rivers and lakes. In addition, there is wide interest in the effects of climate change on water resources and consequent effects on hydropower and agriculture.
- Land and Water Aotearoa (LAWA). (https://www.lawa.org.nz/). This is an initiative set up with a view to helping local communities find the balance between using natural resources and maintaining their quality and availability. It was initially set up by all local government that has evolved to have credibility with central government and university and philanthropic support.
- As reported in previous years, the implementing agency (National Institute of Water and Atmospheric Research - NIWA) continues a policy of "free" data access for most users although budget pressures resulting from reviews of government science make this approach difficult to sustain

1.1.3 Decisions regarding contribution to participation in IHP-VIII

Components of the New Zealand hydrological research programme have increasingly good alignment with IHP-VIII themes in eco-hydrology and IWRM. These approaches have been prominent in some regional council regions in New Zealand (particularly Canterbury and Waikato), but are of increasing relevance to Central Government work.

A change in Central Government in October 2017 has led to a stronger focus on improving water quality. An outline of this is given at: https://www.mfe.govt.nz/fresh-water/fresh-water-and-government/freshwater-work-programme (link checked 20191028). Approaches taken are increasingly aligned with IWRM/Ecohydrology. An important aspect of this is to give effect to "Te Mana o te Wai", a concept for fresh water that encompasses several different aspects of the integrated and holistic health and wellbeing of a water body. When Te Mana o te Wai is given effect, the water body will sustain the full range of environmental, social, cultural and economic values held by iwi (Maori tribaes) and the community. The concept is expressed in te reo Maori, but applies to freshwater management for and on behalf of the whole community. Participation and inclusion of indigenous people are an important aspect of implementation of what is essentially IWRM in NZ with its consequent addressing of water SDG's.

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

Core principles of IHP-VIII align with priorities for New Zealand. Central Government is responding to strong public and political pressure to improve water quality and flow regimes in rivers. A change in central government in 2017 has resulted in a government with greater empathy towards NGO's and multilateral agencies such as UNESCO, although actual engagement may continue to be limited due to the scale of changes being taken domestically..

Scientific and technical meetings are generally held within the context of professional societies (particularly the New Zealand Hydrological Society) and resource management affairs (e.g. workshops to brief groups established to guide government decisions on future land and water use).

1.2.2 Participation in IHP Steering Committees Working Groups

New Zealand attended the 2018 RSC meeting enabled by support from UNESCO – Jakarta.

1.2.3 Research/applied projects supported or sponsored

None directly sponsored by IHP.

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

Republic of Korea Water Resources Association (KWRA) – collaborative research strategy with NZ Hydrological Society (NZHS)

The KWRA and NZHS have had a Memorandum of Understanding (MOU) in place since 2007. Regular exchanges between the organisations continue.

Links with other International and Regional organisations

Regular contact is maintained with Charles Pearson, the Regional Hydrological Advisor to the President of the WMO Region V (Asia Pacific). Contact is also maintained with the Pacific Community (SPC) through its role of representing the SW Pacific Island states on water related issues.

1.2.5 Other initiatives

Ecohydrology and NZ government priorities for infrastructure

Significant themes are adapting infrastructure to deliver desired environmental and cultural outcomes rather than just economic opportunities and to incorporate climate change effects.

Update of New Zealand Flood design methods

Progress has been made and a nationwide flood estimation website launched. This initiative is aligned with the APFRIEND activities over many years. Actions to update lifelines in NZ are directly linked to the Sendai Framework for Disaster Risk Reduction and the United Nations Office for Disaster Risk Reduction (UNDRR), which is being used to encourage additional central government engagement with IWRM and UNESCO IHP.

Application of IHP-VIII approaches to urban water

Central government is fully engaged with considering how to improve stormwater (including flooding), wastewater and drinking water practices. It is anticipated that enforcement of ": Good Infrastructure Practices" will include adoption of methods developed through IHP activities. This includes engagement with communities to deal with issues "at source" rather than build more structures.

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

None.

1.3.2 Organization of specific courses

Courses and workshops run in New Zealand generally meet national needs. Because of the country's relative remoteness and distinctive resource management requirements, courses are not always suitable for participation by people from overseas. However, institutions in New Zealand that provide training often do so in partnership with other organisations in the Pacific and increased NZ central government support is expected to increase opportunities for activities that meet the needs of participants.

National Institute of Water and Atmospheric Research (NIWA) Courses / workshops

Over the course of a year NIWA provides many courses for regional government agencies and their own staff. These cover many topics from general hydrological training to courses on specific topics of wide interest.

1.3.3 Participation in IHP courses

See 1.3.1.

1.4 Publications

Contributions to IHP publications have been principally through the Regional Steering Committee and the Asia-Pacific FRIEND. Other publications related to IHP activities include:

The "Climate Update" monthly bulletin

See http://www.niwa.co.nz/climate/publications

The "Island Climate Update" (ICU) monthly bulletin

The ICU, produced by NIWA's National Climate Centre in collaboration with Pacific agencies, is a multi-national project with important contributions from the meteorological services of countries around the region. The bulletin provides El Nino/Southern Oscillation and seasonal rainfall forecasts, discusses climate developments each month and provides a tropical rainfall outlook for the next three months and tropical cyclone outlooks during the cyclone season. It also includes an editorial on some topical aspect of relevance and interest to end-users.

http://www.niwa.co.nz/climate/publications

"Freshwater and estuaries update" bulletin

This is published to cover developments in the freshwater to estuaries zone. Estuaries are increasingly incorporated in joint programme given the direct connection to freshwater issues in NZ.

http://www.niwa.co.nz/freshwater-and-estuaries/freshwater-and-estuaries-update

1.5 Participation in international scientific meetings

1.5.1 Meetings hosted by the country

NZ Hydrological Society Annual Symposium

The annual conference of the New Zealand Hydrological Society 2017 was held in Napier. This event has wide participation, particularly noting the attendance of the Korea Water Resources Association.

1.5.2 Participation in meetings abroad

A wide range of science conferences and events were attended. Alignment with IHP activities is a common theme of topics, given alignment with IHP-VIII.

1.6 Other activities at regional level

1.6.1 Institutional relations/co-operation

Contact continues between New Zealand and other UNESCO Member Countries in the Asia-Pacific region, especially with the Pacific Island countries. For example, NIWA is working with agencies in many countries on updating hydrological information and database management systems. Many useful contacts have been enabled via the IHP, even though subsequent work has been in the context of bi-lateral arrangements and Pacific HYCOS.

1.6.2 Completed and ongoing scientific projects

Science programs are subject to ongoing change and reorganization. The "Science Challenge" programme in Land and Water sciences is being further rolled out and is providing a framework for coordinated work amongst may institutions on effective work on diffuse pollution and required flow regimes. Work under other science challenges (e.g. "Deep South" is tackling other important related subjects such as improved decision making about water under climate change scenarios.

2. Future Activities

2.1 Activities foreseen until December 2019

An important driver for activities is the evolving priorities for the new (from late 2017) central government. Central government agencies have limited water issue capacity and capability hence patience is requirement. However, a more balanced approach to four well beings" (social, economic, environmental and cultural) rather than a bias towards economics is expected to provide opportunities to apply advances in international thinking.

The annual conference of the NZ Hydrological Society is to be held at Rotorua NZ in December 2019.

2.2 Activities planned for 2020

Generally scientific activities planned at the national level are within the context of the research programme funded by NZ government. A significant proportion of this activity will be in areas that are included within the IHP but are not explicitly implemented as a component of the IHP.

NIWA Courses

A range of training courses will be offered by NIWA. For a full list of courses refer to the NIWA web site. These courses are also open to overseas participants.

2.3 Activities envisaged in the long term

Continuation of the:

- Greater opportunities for partners in the Pacific, with increased NGO engagement.
- NZAID funded Pacific Hydrological Training Programmes as required;
- NZAID funded monthly "Island Climate Update" publication with stronger links to end users.
- Monthly NZ "Climate Update" and "Climate Outlook" (web) publications.
- Quarterly "Fresh Water and estuaries Update" (web) publication.

Pakistan:

Pakistan's Country Report on IHP-related Activities

Dr. Muhammad Ashraf
Chairman, PCRWR/Convener, PNC-IHP

Pakistan Council of Research in Water Resources

October 30, 2019

Existing Water Resources of Pakistan

- Major storage reservoirs: 3
- Live storage capacity (designed): 15 MAF
- Barrages, headworks and siphons: 23
- Main irrigation canals: 45
- Command area: 16.6 Mha
- Total geographical area = 80 Mha
- Culturable land = 30 Mha
- Rainfed farming = 12 Mha
- Rainfall – less than 200 mm to over 1000 mm

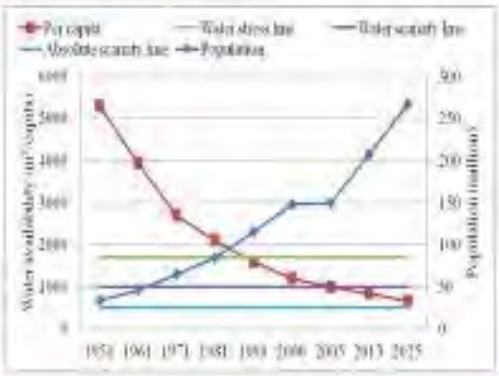
World's Largest Surface and Groundwater Resources

- One of the largest contiguous irrigation systems of the world
- One of the largest groundwater resources of the world (4th after India, USA and China)
- Groundwater supplement over 60% of the surface water supplies
- Over 90% drinking water and 100% industrial water comes from groundwater

Major Water-Sector Issues

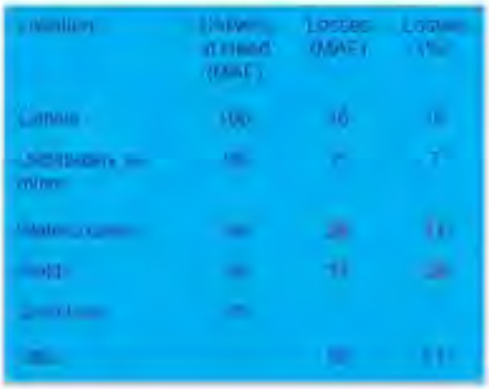
Water Resources Development

- Growing water scarcity
- Recurring floods (2010, 2011, 2014) ≈ 90 MAF
- Inadequate storage facility
- Sedimentation in storage reservoirs – 0.2 MAF per year
- Unutilized potentials – hill torrents, sailaba – 18 MAF



Water Resources Management

- Low system efficiency (less than 40%)
- Low Productivity per unit of water
- Groundwater depletion/degradation
- Disposal of drainage effluent (10 MAF)
- Wastewater use and disposal



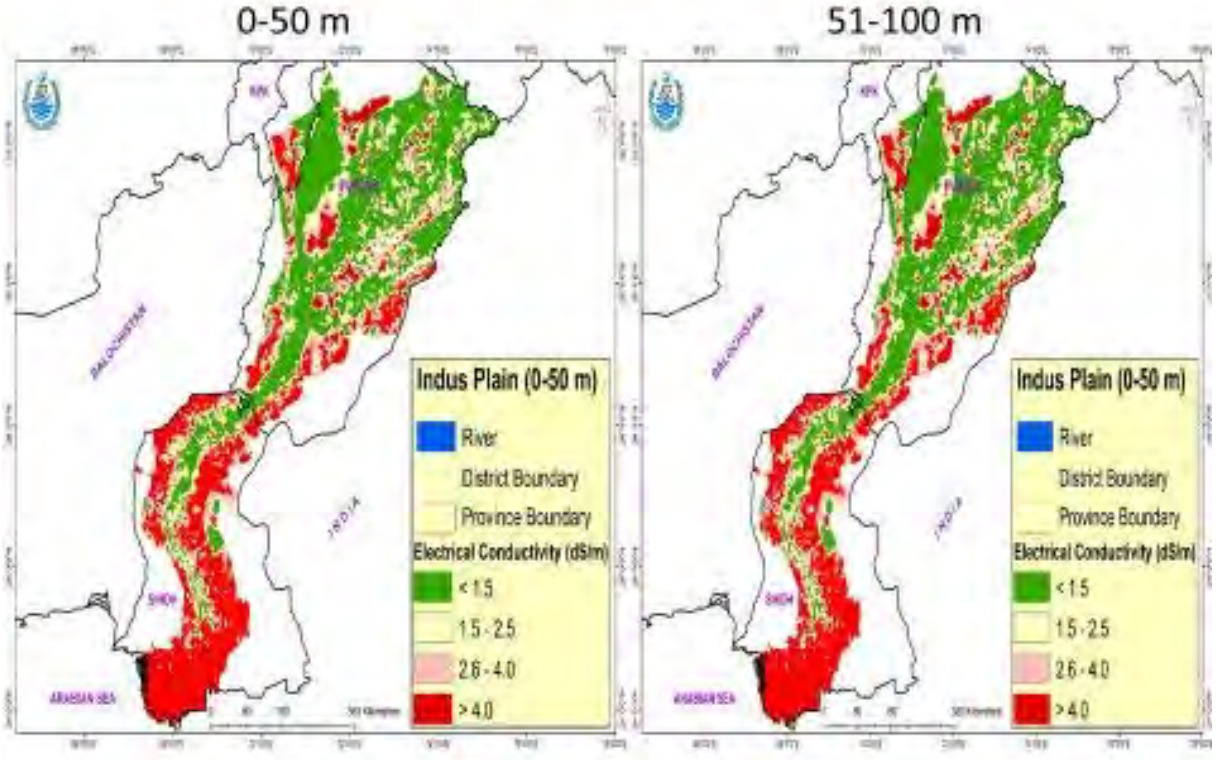
Water Governance

- Low water pricing
- No groundwater regulatory framework
- Lack of crop zoning

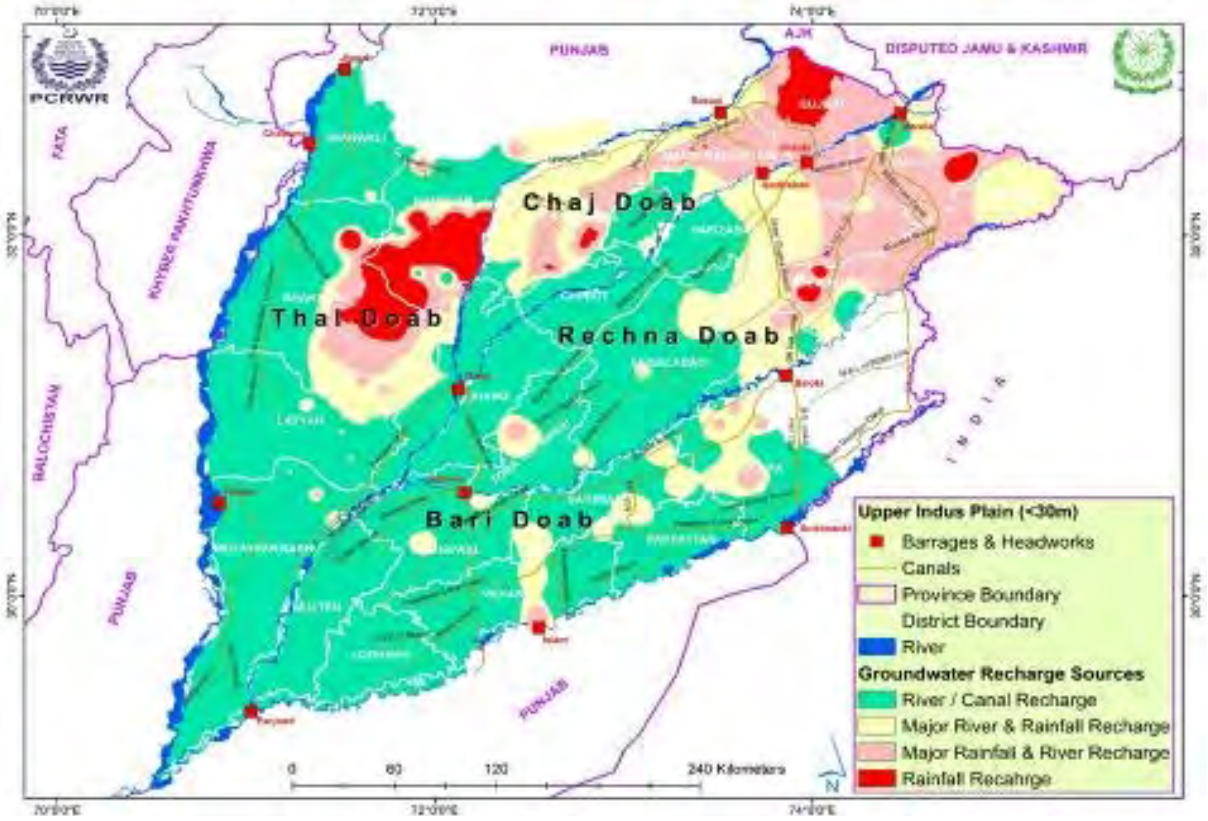
Some Recent Activities Related to IHP

- Investigation and mapping of groundwater quality zones in the Upper and Lower Indus Plains
- Launched satellite based water resources management
- Determined soil physical hydraulic properties of the Upper Indus Plain
- Introduced irrigation advisory service to 20,000 farmers/week in 41 districts through SMS
- Piloted Indus telemetry system in collaboration with International Water Management Institute (IWMI) for trust building on data collection
- Implemented rainwater harvesting techniques in drylands
- "Karez Cultural Landscape" in World Heritage List of UNESCO
- Digital inventory of Karezes of Balochistan in IHP WINS

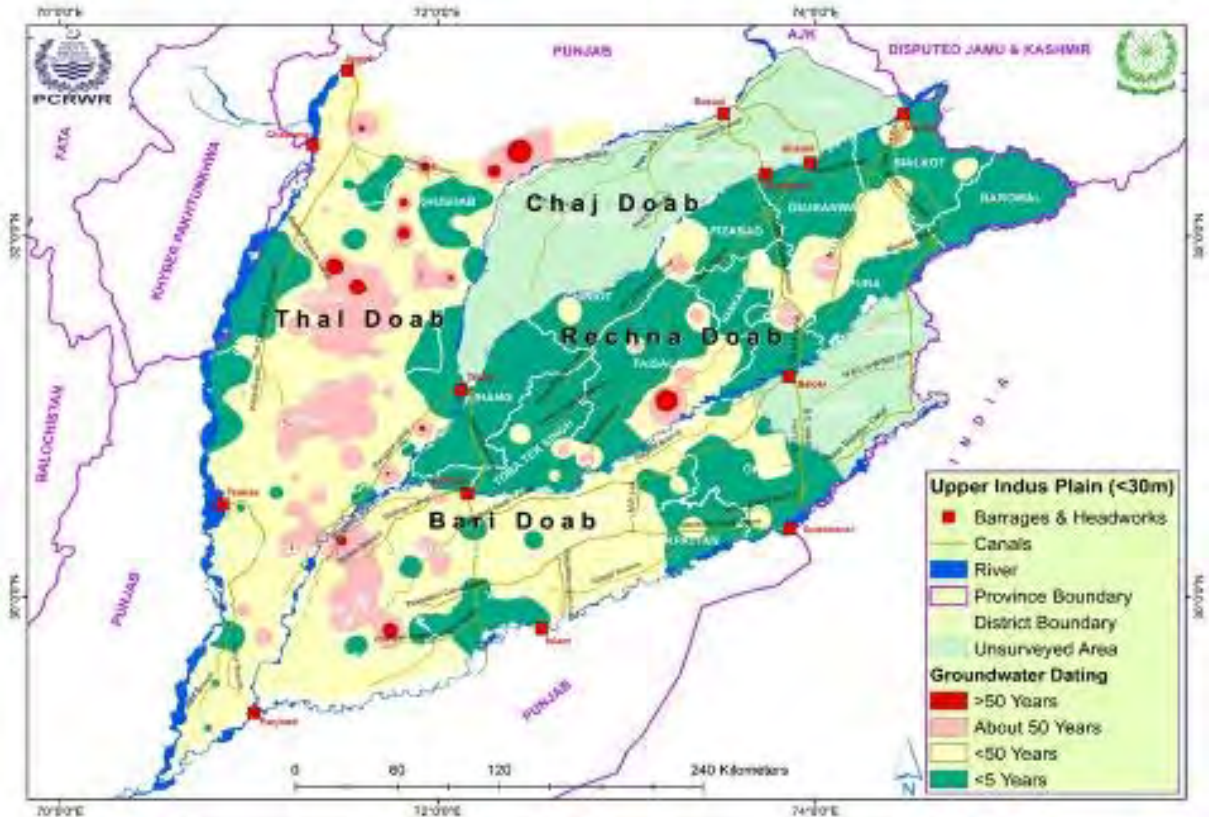
Groundwater Atlas of Pakistan



Sources of Groundwater Recharge in the Upper Indus Plain

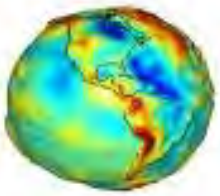


Age of Groundwater Recharge in Upper Indus Plain

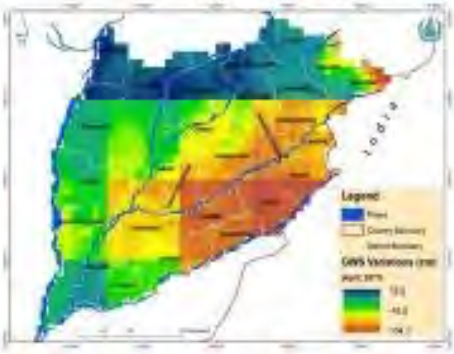


Satellite Based Groundwater Monitoring

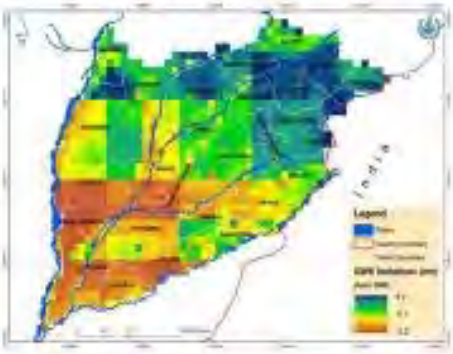
- Monthly Monitoring of Groundwater Storage with gravity satellite "GRACE" for effective groundwater resource management at doab scale
- *PCRWR is the first organization in the history of NASA which has developed capacity to independently operationalize GRACE based groundwater monitoring*
- *GRACE-FO launched by NASA in March, 2018 – data will be distribution by early 2020*



April, 2017

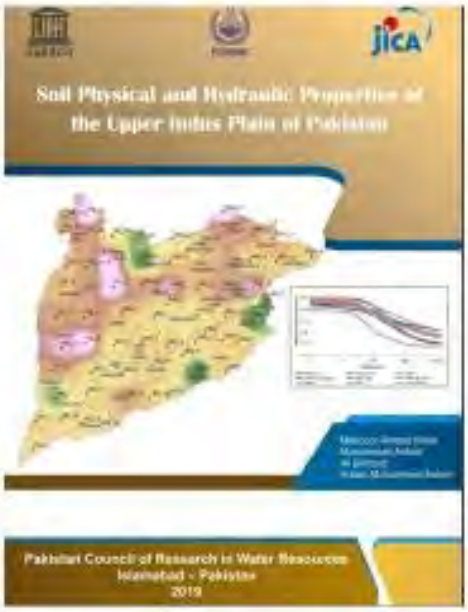


June, 2018



Soil physical hydraulic properties of the Upper Indus Plain

- Soil texture
- Moisture retention curves
- Infiltration rate
- Soil chemical properties
- Development of a manual



Irrigation Advisory Services through SMS

(20,000 farmers of 41 districts)

ICT Based Technologies (Real Time Flow Measurement)

Flow is continuously measured by instrumenting 4 canals:

- Lower Bari Doab Canal (Punjab)
- Upper Sawat Canal (KP) ← **Pilot Sites**
- PAT Feeder Canal (Balochistan)
- Kirthar Canal (Sindh)

The flow data is displayed remotely using advance communication technology

In collaboration with IWMI, IRSA and Provincial Irrigation Departments

Rainwater Harvesting in Drylands – DI Khan

- Rainwater harvesting ponds with pumping from hand pump coupled with filter (local material) for human and livestock
- Solar pumping linked with low pressure drip irrigation
- Rooftop rainwater harvesting
- Use of saline water agriculture development
- Capacity building of the farmers, professionals, NGOs etc.

Rehabilitation and Management of Karezes in Balochistan

- Declaration of "Karez Cultural Landscape" as World Heritage
- Development of management plan and dossier to be submitted to UNESCO
- Development of GIS based inventory of existing Karezes of Balochistan

Progress on Category-II Centers

Cabinet of Pakistan has accorded approval to sign an agreement with UNESCO regarding:

- Establishment of Regional Center for Water Management in Arid Zones, Islamabad (Category – II)
- Establishment of Regional Center on Headwater Catchment (Category – II)

Thank You

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Visit us @: http://www.pcrwr.gov.pk

Philippines:

NATIONAL REPORT ON IHP RELATED ACTIVITIES

PHILIPPINES

27th Regional Steering Committee Meeting

UNESCO International Hydrological Programme

(UNESCO IHP)

for Asia and the Pacific

held at Nay Pyi Taw, Myanmar

30 OCTOBER 2019

Philippine National Committee

for the

UNESCO International Hydrological Programme

Republic of the Philippines

1. ACTIVITIES UNDERTAKEN IN THE PERIOD NOVEMBER 2018 - OCTOBER 2019

1.1 Meetings of the IHP National Committee

1.1.1 Update of the composition of the IHP National Committee

The institutional members of the Philippine National Committee for the UNESCO-IHP are agencies and organizations (public and private) which are mandated with, and are engaged in research, development and management activities in the water sector:

Bureau of Soils and Water Management (BSWM), Department of Agriculture (DA)

Bureau of Research and Standards (BRS), Department of Public Works and Highways (DPWH)

Environmental Management Bureau (EMB), Department of the Environment and Natural Resources (DENR)

Flood Control & Sabo Engineering Center (FCSEC), Department of Public Works and Highways (DPWH)

Laguna Lake Development Authority (LLDA)

Local Water Utilities Administration (LWUA)

Metropolitan Waterworks and Sewerage System (MWSS)

Mines and Geoscience Bureau (MGB), Department of the Environment and Natural Resources (DENR)

National Economic and Development Authority (NEDA)

National Hydraulic Research Center, University of the Philippines (UP-NHRC)

National Irrigation Administration (NIA)

National Mapping and Resource Information Authority (NAMRIA)

National Power Corporation (NPC)

National Water Resources Board (NWRB)

Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA), Department of Science and Technology (DOST)

Philippine Water Partnership (PWP)

Mapua Institute of Technology, School of Civil Engineering, Manila

University of Santo Tomas (UST), Department of Civil Engineering (UST), Manila

University of the Philippines (College of Engineering, Diliman Campus and College of Engineering and Agricultural Technology, Los Banos Campus)

Ateneo De Manila University (ADMU) - Manila Observatory, Quezon City

Central Luzon State University (CLSU), Muñoz, Nueva Ecija

De La Salle University (DLSU), Department of Civil Engineering (DLSU), Manila

Officers of the Philippine National Committee for UNESCO-IHP:

Chairman: Guillermo Q. Tabios III (UP Diliman)

Secretariat: NHRC and PWP staff (on secondment)

The following persons have been designated as lead representatives and agencies represented:

Sevillo David, NWRB

Charito Menguito, NWRB

Jesusa Roque, NWRB

Leonor Cleofas, MWSS

Noemi Bautista, PWP

Maria Karisma Bea Agarao, UNESCO Jakarta – Manila Liaison Office

Mark Abelon, NAMRIA

Christopher Ilagan, MWCI

Lennie Santos-Borja, LLDA

Emiterio Hernandez, LLDA

Rodora Gamboa, PWP and Maynilad Water Academy

Mara Ramos, Maynilad Water Academy

Dolores Hipolito, DPWH-FCSEC

Resito David, DPWH-FCSEC

Guillermo Q. Tabios III, UP-NHRC & I.C.E.

Roberto S. Soriano, UP-NHRC & I.C.E.

Othello Razon, NIA

Maria Gracia Ramos, NIA

Anne Bernice Baetiong, NIA

Venus Valdemoro, DOST-PAGASA

Pat Labitoria, DENR-BMB

Araceli Oredina, DENR-CCO

Aldrin Maranan, DENR-EMB

Mariella Salang, DENR-MBCO

Ashley Catlien Arguelles, DENR-RBCO

Nery Alba, DENR-ERB

Anna Lim, DENR-PPS

Status of IHP activities

1.1 The Philippines Country Priorities has always been in response to the UNESCO-IHP Paris office as well as Jakarta Office. Since the

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

Philippine National Committee

Highlights of Activities of Most Active Member of Philippine National Committee

National Economic Development Authority
Spearheads and pushing for legislation to create the Department of Water Resources as the country's apex body to manage the water resources of the country and the Water Regulatory Commission for economic regulation especially water tariff setting.

Funded and completed the National Sanitation and Sewerage Master Planning of the country March 2019.

Funded and monitoring of the National Irrigation Master Planning of the country conducted by UPLB Development Foundation (July 2018 – November 2019).

Metropolitan Waterworks and Sewerage System (MWSS)
Water Supply Projects

- Awarded contract to construct Kaliwa Low Dam as part of New Centennial Water Supply Project 2015-2035 with China Loan as new water source for Metro Manila's increasing water demand. Also intended to provide a redundant dam for Metro Manila's domestic water supply.
- Originally, this project was opposed by local communities in the area but finally an Environmental Compliance Certificate was issued by the Dept of Environment and Natural Resources.

National Water Resources Board
Operationalized new streamflow monitoring system in the Upper Agno River and Angat River basin (starting December 2018). Long-term data monitoring useful for long-term planning of water resources infrastructures and operation studies and short-term data acquisition useful for real time operations especially during typhoon season. NWRB remains to be the country's national water agency for water-related policy planning, regulation and permitting.

Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA):
In coordination with the National Water Resources Board, the PAGASA's Flood Forecasting Branch are improving its river forecasting model especially with more data available from the newly established streamflow gaging stations.

National Irrigation Administration
Focal agency International Committee on Irrigation and Drainage holding regular activities related to irrigation policies and practices in the Philippines.

Philippine Water Partnership (PWP)
Conduct of a National Forum on Wetlands and Flood Management
This was held on December 14, 2018 at Crowne Plaza, Ortigas Center, Pasig City and attended by participants from the National Government Agencies (NGAs), Private Sector, Academe, Scientists and other concerned stakeholders.

Roundtable Discussion (RTD) on Philippine Water Sector: Gaps and Opportunities

In line with the observance of the World Water Day, a Roundtable Discussion (RTD) on the Philippine Water Sector: Gaps and Opportunities was held on 20 March 2019 at the Joy Nostalg Hotel in Ortigas Center, Pasig City, Philippines. The event, which was a multi-stakeholder dialogue was jointly organized by the Department of International Trade of the British Embassy Manila in partnership with the Society for the Conservation of Philippine Wetlands, Inc., (SCPW) and the Philippine Water Partnership (PWP).

National Water Summit
The Summit was held on 21 March 2019 at Novotel Manila in Araneta Center, Cubao, Quezon City. There were two major clusters: (1) Cluster A - Governance, Resilience and Environment Sectors presented by Mr. Christopher Matthew A. Ilagan; (2) Cluster B - Domestic and Urban Sectors presented by Mr. Ramon B. Alikpala; and, (3) Cluster C - Agriculture and Economics Sectors presented by Dr. William D. Dar.

University of the Philippines and National Hydraulic Research Center (NHRC)
Two-Dimensional Modeling and Simulation of Flow-Salinity Interaction of Agno River to Determine Optimal Location for Domestic Water Supply Diversion and Extraction (September 2018-Febraury 2019)

Angat Reservoir flow Augmentation Studies for Metro Manila's Domestic Water Supply from Biliway and Sumag Watersheds (October 2019 – December 2020).

Enhancement of Flow Control at Novaliches Portal for Optimal and Proper Allocation of Water to MWCI and MWSI Water Concessionaires of Metro Manilla. (February 2019 – September 2019).

Participation in the senate hearings and technical consultations on Metro Manila's water crisis last March-April 2019 which has affected half of the city's population of about 7 million people. Certain areas has no water service for 1-2 weeks and most of the affected areas has 10-12 hours water service interruptions for the months of March-April.

1.2.2 Participation in IHP Steering Committees/Working Groups

- Country Representative, Attended 26th Regional Steering Committee Meeting of the UNESCO International Hydrological Programme for Asia and Pacific (UNESCO-IHP AP) in Shanghai, China, November 4, 2018. Also attended Regional Workshop on Water Education in Asia and the Pacific on 4-5 September 2019 in Jakarta Indonesia.
- World Water Day Celebration (March 2019)
- Buhay KYUT (Kalusugan, Yamang Ugnay sa Tubig) Celebration held at Bingao National High School (BNHS) and Bingao Elementary School (BES) in San Nicolas, Ilocos Norte on June 25, 2019. The program includes lectures on health and hygiene, water conservation and care for the environment.
- UTAK (Ugnayang Tubig at Kasaysayan) IEC Activity held in Old Mnaila on September 10-12, 2019
- World Handwashing Data Celebration held on October 7, 2019 at Buhay na Tubig Elementary School in Imus, Cavite.
- IEC Activities of Local IHP as follows: (1) Water and Sanitation Education on October 24, 2019 at Far Eastern University in Morayta, Manila; (2) Teachers' Training on Water Education Modules for K-12 held on July 25, 2017 in Bacolod City; and, (3) Baguio City - Training of Trainers for the Save Water Advocacy Program (SWAP) launch of LWUA and the Benefits of Bamboo in watershed protection held on October 3, 2019.
- Consultation-Workshop on the preparation of the Philippine National Report on the implementation of RAMSAR Convention December 1, 2017

1.2.3 Research/applied projects supported or sponsored

Same information highlited above.

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

No information available.

1.2.5 Other Initiatives

No information available.

1.3 Educational and training courses

1.3.1 Contribution to IHP Courses

No information available.

1.3.2 Organization of specific courses

No information available.

1.3.3 Participation in IHP courses

No information available.

1.3.4 Papers and Publications

No information available.

1.4 Participation in international scientific meeting

No information available.

1.4.1 Major Meetings hosted by the country

Same information mentioned above.

1.4.2 Participation in meetings abroad

No additional information is available.

1.5 Other activities at regional level

1.5.1 Institutional relations /co-operation

No complete information is available.

1.5.2 Completed and ongoing scientific projects

No additional information is available.

2.0 Future Activities

2.1 Activities planned for 2019-2020

Participation in currently RSC-supported programs and activities such as Catalogue of Hydrologic Analysis spearheaded by Kyoto University.

Evaluation by the national committee of the proposed IHP-VIII Themes, Focal Areas and Activities.

2.2 Activities in the long term

Concerted efforts and initiatives for research and extension activities in flood management, water-related multi-hazard risk assessment and mitigation, climate change mitigation and adaptation, and sustainable development in the context of integrated water resources management (IWRM).

Continued support of, and participation in the UNESCO-IHP in general and the RSC in particular, in all present and future: activities: Catalogue of Hydrological Analysis (CHA) and IHP training courses conducted by host countries, and joint hydrologic training courses and researches among member countries.

NATIONAL REPORT ON IHP RELATED ACTIVITIES

THAILAND

For

27th UNESCO IHP Regional Steering Committee Meeting for Asia and the Pacific:

28 October - 1 November 2019

Naypyidaw, Myanmar

Contents

1 ACTIVITIES UNDERTAKEN IN THE PERIOD of November 2018 – October 2019

1.1 Meeting of the IHP National Committee

1.1.1 Decision regarding the composition of the IHP National Committee

Remark : To be revised

1.1.2 Status of IHP-VIII activities

The activities related to IHP-VIII on water resources are undertaken through the long-term Strategic Plan on Thailand's Water Resources Management focused on public participation in 25 river basins in Thailand.

1.1.3 Decisions regarding contribution to/participation in IHP-VIII

The secretariat of TNC – IHP encourages the members to continue on knowledge and technology sharing, and cooperate in various ways to promote hydrological improvement and water resources criteria.

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

Thai representatives attended in various meetings particularly on hydrology, meteorology, flood forecasting and warning system, water resources and environmental management.

1.2.2 Participation in IHP Steering Committees/Working Groups

Representatives from TNC – IHP participated in the 26th Regional Steering Committee Meeting for Asia and the Pacific: UNESCO IHP RSC for SEAP 3 - 5 November 2018 in Shanghai, PR China.

1.2.3 Research/applied projects supported or sponsored

Research projects have implemented by concerned agencies of the Thai government for the Fiscal year of 2018 (B.E.2560) according to the IHP VIII are as following:

Theme 1 Water Related Disasters and Hydrological Changes

TNC - IHP has implemented various activities according to the Theme 1 as follows;

- Telemetry system installation for water monitoring.
- Awareness of local community to the impact of climate change and adaptation.
- Climate change and its impacts on water resources management of community
  (Multiple case studies: tributaries of the Mun River basin)

- The effect of climate change on community based water management: Case study in the Mun River sub watershed area.
- Benefiting from global and local earth observation systems.
- Advancing Co-Design of Integrated Strategies with Adaptation to Climate Change in Thailand (ADAP-T) in cooperate with JICA /JST Japan
- Climate Change Adaptation – Green Climate fund Proposal (CCGCF) in cooperate with UNDP
- Operational System for Urban Flood Forecasting and Inundation Mapping (OSUFFIM) project under ESCAP/WMO Typhoon Committee
- (MK-HYCOS): Follow up & Monitoring Hydrological Observation System in Mekong River
- River Monitoring & Flood Forecasting in The Mekong River
- Research Project on Hydrological Service of Khoa Yai Headwaters (2015-2018)
- Operations on rain enhancement and hail suppression in Thailand
- Research and development on weather modification technology in Thailand
- Rainmaking operation, research and development
- The Study of Probable Maximum Flood and Spillway Operation for Dam Safety of EGAT's Dams
- The 1st IFAS Workshop for Flood Forecast (4 – 8 Mar 2019)
- The 2nd IFAS Workshop for Flood Forecast (17 – 21 Jun 2019)

Theme 2 Groundwater in a Changing Environment

TNC - IHP has implemented various activities according to the Theme 2 as follows;

- Project implementation on groundwater and hydro-geological map by the Department
  of groundwater resources with financial support of Groundwater Development Fund
- Installation of telemetry system for water monitoring.
- Installation of simple water gauges with message boards for early warning to community.
- Selection of the location for disaster victim center and assistance route for flood mitigation.
- Study on using lateritic by mixture of soil and cement for road restoration after flood.
- Addressing strategies for management of aquifers recharge.
- Promoting management of trans-boundary aquifers.

Theme 3 Addressing Water Scarcity and Quality

TNC - IHP has implemented various activities according to the Theme 3 as follows;

- Improvement of Electricity Generating Authority of Thailand (EGAT) Reservoir Operation Rule Curve.
- Model Improvement for optimal reservoir operation in the Mekong River Basin.
- Local wisdom on water resources management in the upper northeastern Mekong river basin.
- Study the efficiency on water resources management in paddy field due to the change of water storage in the Mun river basin, Phase III in Samrong District, Ubon Ratchathanee province.
- Study on sustainable water resources management in household according to the philosophy of sufficiency economy.
- Strategy review on water resources management for preparedness on climate change in Thailand.
- Study on Impact and Monitoring for Transboundary Environmental of the mekong mainstream Hydropower Project.
- Strengthening of water user group.

Theme 4 Water and Human Settlements of the Future

-

Theme 5 Ecohydrology, Engineering Harmony for a Sustainable World

-

Theme 6 Water Education Key, for Water Security

TNC - IHP has implemented various activities according to the Theme 6 as follows;

- Enhancing tertiary water education and professional capabilities in the water sector
- Water education for children and youth
- Education for transboundary water cooperation and governance

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

- Collaborate with German Agency for International Cooperation (GIZ) under the Thai-German Climate Programme- Water (TGCP –Water)

- Collaborate with the Netherlands Embassy in Thailand in The Dutch Water Boothcamp on the topic " Management of water for sustainable development"

1.2.5 Other initiatives

-

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

-

1.3.2 Organization of specific courses

- The 13th Integrated Workshops of Typhoon Committee 5 – 9 November 2018, Thailand
- The 8th Global FRIEND-Water Conference 6 – 9 Nov 2018, China
- The 8th Asian G-WADI & 2nd IDI Expect Group Meetings 10 -12 December 2018, Mashhad-Iran
- The 46th session of the WMO/ESCAP Panel on Tropical Cyclones
- The 51st Session of Typhoon Committee 26 February – 1 Mar 2019 , Myanmar

1.3.3 Participation in IHP courses

-

1.4 Cooperation with UNECSCO-IHE Institute for Water Education and/or international/regional water center under the auspices of UNESCO

-

1.5 Publications

-

1.6 Participation in international scientific meeting

1.6.1 Meetings hosted by the country

-

1.6.2 Participation in meetings abroad

Representatives from Thailand participated in the meeting abroad as follows:

- 13th Integrated Workshops of Typhoon Committee 5 – 9 November 2018, Thailand

- The 2019 International Conference on Water Management and Climate Change towards Asia's Water-Energy-Food Nexus and SDGs on 23-25 January 2019 Bangkok, Thailand
- Typhoon committee 51th Session (TC 51th) on 26 February 2019 Guangzhou, China.
- The 6th Green Mekong Forum (Water Resources Management and Disaster Risk Reduction) 8 July 2019 Bangkok, Thailand.

1.7 Other activities at regional level

1.7.1 Institutional relations /cooperation

TNC-IHP has remained coordination closely and contacts with UNESCO Jakarta Office.

1.7.2 Completed and ongoing scientific projects

- Implementation of Joint-Discharge and Sediment Transport and Bed load Measurements in Mekong River in Thailand.
- Nam Pong project: Series of training for national modeler under IWRM principles.
- Lam Ta Kong project: Series on the job training/workshop for capacity building for the application of ArcSWAT.

2 FUTURE ACTIVITIES

2.1 Activities planned until December 2019

- Strategy for Environmentally-Friendly Growth for Sustainable Development "The 12th National Economic and Social Development Plan (2017-2021)"
- Smart Water Operation Center (SWOC) which is purposes to be the Single Command for monitoring the weather and rainfall.
- The Ad Hoc Crisis Center which is purposed to be the Single Command for National Water Situation Operations Centre (regulator)

2.2 Activities foreseen for 2019-2020

- Continuation of Collaboration with RSC for Southeast Asia and the Pacific
- Enhancing activities contributed to IHP-VIII
- Enhancing activities on flood and drought management
- Continuation on promotion of integrated water resources management
- Expansion on implementation of integrated water resources management to the rest of the country
- Promotion on capacity building on water resources management for River Basin Committee for regulating 22 new river basin.
- Participate in the international forum/conference on water resources management or Environmental Aspects.

- The 2019 International Conference on Water Management and Climate Change towards Asia's Water-Energy-Food Nexus and SDGs on 23-25 January 2019 Bangkok, Thailand
- National Water Situation Operations Centre which is purposes to deal with the water situation during the rainy season in the Single Command.
- Covering stations of the Rain Gauge Stations and River Gauge Stations to sufficiently cover all areas needed.
- Creating a unified data base, for a one-stop source.

2.3 Activities envisaged in the long term

- Enhancing activities contributed to IHP-VIII
- Enhancing activities in Flood and Drought Management
- Highlight on Integrated Water Resources Management in 25 river basins
- Continuation of raising public awareness and education on water resources management
- Continuation of raising public participation on water resources management
- Covering stations of the Rain Gauge Stations and River Gauge Stations to sufficiently cover all sub-basin area needed

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Thailand National Committee for IHP
October 2019

Vietnam:

The 27th UNESCO-IHP Regional Steering Committee

Viet Nam – Country Report

Naypyidaw, Myanmar, October 2019

1. ACTIVITIES UNDERTAKEN IN THE PERIOD OCT 2018 – OTC 2019

1.1. National/local scientific and technical meetings

In collaboration with MONRE, MARD, MOST, Viet Nam National Advisory Council on Climate Change, and the Viet Nam Hydro-meteorological Association:

- Revising the Law on Environmental Protection.
- Reviewing and updating the Nationally Determined Contribution (NDC) to the UNFCCC.
- Preparing National Adaptation Plan (NAP).
- Preparing the Third National Communication to the UNFCCC.
- Preparing the Biennial Update Report (BUR) to the UNFCCC.
- Co-ordinating the National Research Program on Env. Protection and Disaster Prevention.
- Training courses on applying the Flash Flood Operational Guidance System.
- Training courses on determining flood warning levels in Viet Nam.
- Training courses on hydro-meteorological related disaster prevention.

1. ACTIVITIES UNDERTAKEN IN THE PERIOD OCT 2018 – OTC 2019

1.2. Research/applied projects supported or sponsored

- **Flood alarming levels for rivers in Viet Nam.**
- **Flood forecasting** (Red River Basin) and **Flash flood warning.**
- Updating CC and sea level rise scenarios for Viet Nam.
- Developing the National Climate Assessment Report.
- Drought risk for the Central Highlands in the context of climate change.
- Flood risk mapping.
- Ground water; water resource security.
- Methodology for multi-disaster assessment and the development of decision support system for multi-disaster management, a pilot study for the Central Region

1. ACTIVITIES UNDERTAKEN IN THE PERIOD OCT 2018 – OTC 2019

The role of surface hydro-meteorological characteristics and water use in Sai Gon – Dong Nai River basin in the formation of underground water resources in the downstream

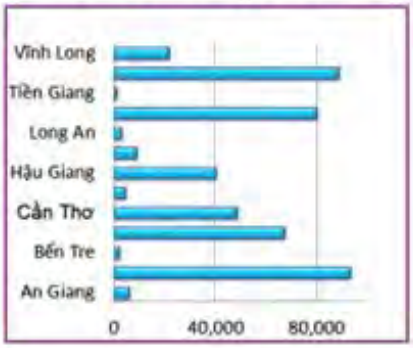
Ground water recharge in Dong Nai River Basin

1. ACTIVITIES UNDERTAKEN IN THE PERIOD OCT 2018 – OTC 2019

Impact of CC on ground water resources in the Mekong Delta

TT	Activities
1	Field survery on ground water use(1: 200.000 scale)
2	Overview of ground water resources (1/200.000)
3	CC scenario for Mekong river delta
4	Ground water recharge assessment
5	3 zoning map for ground water impacts under 3 climate change scenarios (1/200.000)

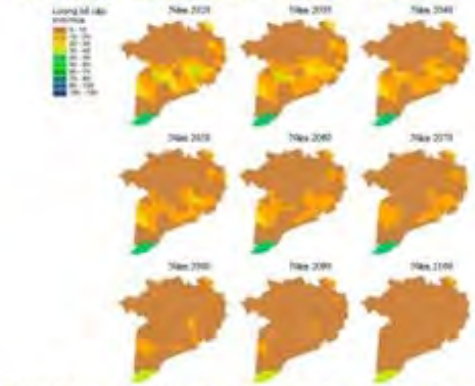
Extraction well based on provinces (no.)



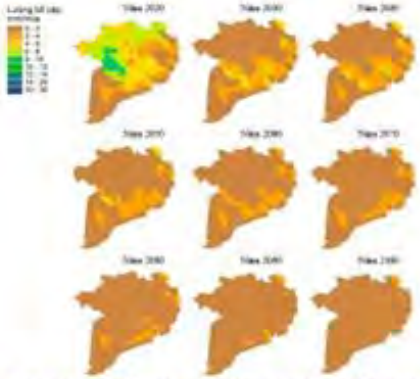
1. ACTIVITIES UNDERTAKEN IN THE PERIOD OCT 2018 – OTC 2019

Impact of CC on ground water resources in the Mekong delta

Recharge assessment 2020-2100



Rainy season Recharge , mm/season- B2 scenario



Dry season recharge, mm/season - B2 scenario

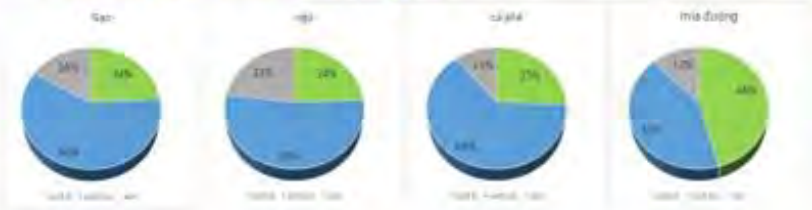
1. ACTIVITIES UNDERTAKEN IN THE PERIOD OCT 2018 – OTC 2019

Scientific basis for adjusting water usage using virtual water concept in main crop produce

Water usage in cropping (million m3)

Produce	Nation	Red River Delta	Northern Mountainous	Northern Central	South Central	Tây Nguyên	Eastern South	Mekong
Rice	53007	6140	3852	4034	4009	1606	2085	31282
Corn	5134	250	2062	567	149	1254	671	181
Coffee	9001		62	81	36	8132	690	
Sugar	4694	19	364	797	862	701	797	1155

Water foot print ratio in cropping (%)



1. ACTIVITIES UNDERTAKEN IN THE PERIOD OCT 2018 – OTC 2019

1.3. On-going Project

- Research on developing level of disaster risks caused by flood:
  - Pilot applied for the Kon - Ha Thanh river basin;
  - Pilot applied for Son La province;
- Research on science and technology solutions for multi-disaster management, develop support decision maker tool in responding to multiple natural disasters, pilot in Central of Viet Nam.
- Research on flash flood risks in order to disaster prevent and mitigate for mountainous river basins - Pilot applied for Ngan Pho - Ngan Sau river basin;
- Study on water security; ground water; water quality;

2. FUTURE ACTIVITIES

2.1. Activities foreseen for 2019-2020

- Oriented towards the goal of IHP-VIII period 2014-2021, IHP Viet Nam focuses on:
  - ✓ Flood risk management, Disaster preparedness for schools and communities
  - ✓ Upgrade of Flash Flood Risk Maps and Viet Nam Operational Flash Flood Guidance System
  - ✓ Water resources security; Sustainable water resources management; Effectively managing rivers, national aquifers and transboundary aquifers;
  - ✓ Raise awareness of all levels on climate change;
  - ✓ Improve the capacity of integrated water resources management;
  - ✓ Propagate and disseminate themes of the eighth phase of UNESCO-IHP activities: 2014-2021 in agencies and schools.
- Participate in the IHP Asia-Pacific activities and contribute to Annual Scientific Conferences and Workshops.
- **Organize of the 28th IHP-RSC meeting in Viet Nam.**

2. FUTURE ACTIVITIES

2.2. Activities envisaged in the long term

- Enhance activities that contribute to IHP-VIII.
- Focus on **water security** and **hydrology related disaster risk management** in Viet Nam.
- Transfer technology and training course in hydrology and water resources

2. FUTURE ACTIVITIES

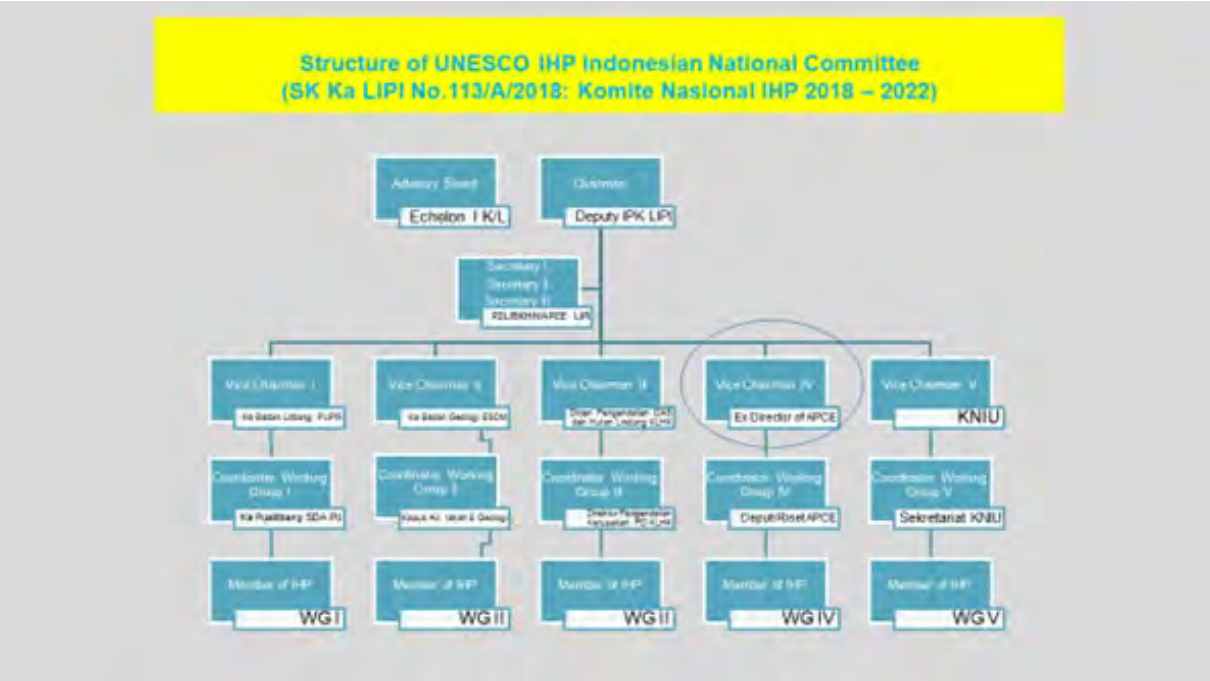
2.3. Future research activities related to hydrology and water resources

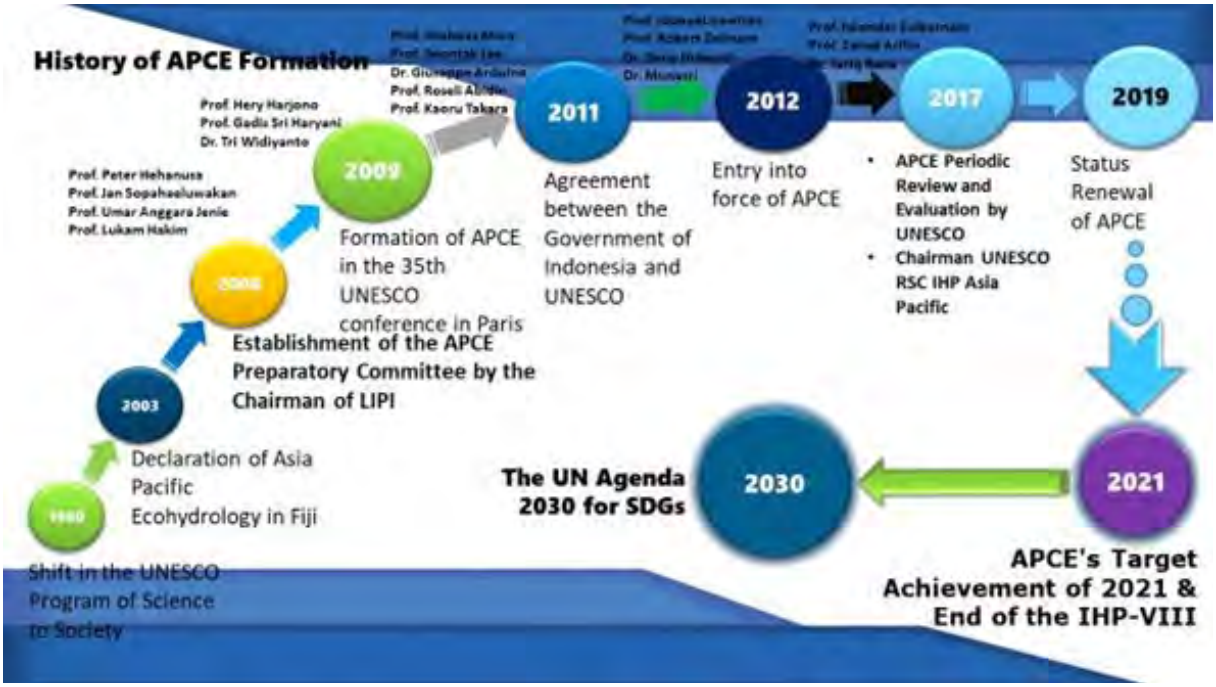
- Improve the policy for management of WR;
- Natural disaster management; early warning of hydrology related disasters;
- AI application in natural disaster warning;
- Transboundary water resources security;
- Integrated WR management on the basin level;
- Manage and reduce water pollution;
- Find new groundwater sources in mountainous and water scarce areas;
- Develop hydrology and water resources bulletin and database of hydrology and water resources

Thank you!

ANNEX G - Updates from the Centres and Chairs under the Auspices of UNESCO

Asia Pacific Centre for Ecohydrology (APCE)


Structure of UNESCO IHP Indonesian National Committee
(SK Ka LIPI No.113/A/2018: Komite Nasional IHP 2018 – 2022)
Echelon I K/L
Deputy IPK LIPI
Ex Director of KPCE
KNIU
WG I
WG II
WG II
WG IV
WG V


History of APCE Formation
Prof. Hery Harjono
Prof. Gadis Sri Haryani
Dr. Tri Widiyanto
Prof. Peter Hehanussa
Prof. Jan Sopaheluwakan
Prof. Umar Anggara Jenie
Prof. Lukam Hakim
2009
Formation of APCE in the 35th UNESCO conference in Paris
2011
Agreement between the Government of Indonesia and UNESCO
2012
Entry into force of APCE
2017
APCE Periodic Review and Evaluation by UNESCO
Chairman UNESCO RSC IHP Asia Pacific
2019
Status Renewal of APCE
2021
APCE's Target Achievement of 2021 & End of the IHP-VIII
2030
The UN Agenda 2030 for SDGs
2003
Establishment of the APCE Preparatory Committee by the Chairman of LIPI
Declaration of Asia Pacific Ecohydrology in Fiji
Shift in the UNESCO Program of Science to Society

Task & Function of APCE as Category II Centre of UNESCO

1. **Scientific Research**: Create the Research Program & Coordinating the Collaborative Research Projects in the Field of Ecohydrology in the Asia Pacific Region
2. **Training & Capacity Building:** Create and Conducting the Training Program and Public Awareness related Ecohydrology Field in the Asia Pacific Region & International
3. **Networking:** Participate and Organizing the Scientific Community Meeting and Initiating Ecohydrology Field-based Collaborative Works
4. **Scientific Reference:** Publications

UNESCO C2C MANDATES
- SCIENTIFIC RESEARCH
- CAPACITY-BUILDING
  - KNOWLEDGE-SHARING
  - RAISING PUBLIC AWARENESS
- NETWORKING

ECOHYDROLOGY

is An Integrative Science that Focuses on the Interaction between Hydrology & Biota.

Ecohydrology is **A Concept** which Seeks to Reinforce Ecosystem Services at Catchment Scale.

Aiming to Achieve **Sustainability in both Ecosystem & Human Populations**, as well as to Enhance **Integrated Water Resource Management**


APCE DIRECTIVE
VISION
To be an Internationally Reputed Asia Pacific Centre in Urban and Rural Ecohydrology by 2021
MISSION
Develop understanding and practices of ecohydrology through research, training and knowledge exchanges, information systems and public awareness.
VALUE
Harmony, Integrity, Wisdom
7


APCE Terms and Conditions
Infrastructures
Building and facilities (APCE Building CSC)
Ecohydrology Demonstration Site
Human Resources
Scientific research
Capacity building
Networking
Secretariat
Budget Commitments
Support daily activities (operational, travel, training, seed funding)
Baseline USD 200 000
8


STRATEGIC GOALS
To promote local resources base ecohydrological research
To strengthen local capacity to adopt ecohydrological concept and approach
To provide easy access to local resources based ecohydrological information and knowledge
To enhance public awareness of local resources based ecohydrological practices


ROAD MAP OF APCE STRATEGIC PLAN
2017
2018
2019
2020
2021
Mapping strategic programs and strategic partner support related to the growth of awareness and strengthening of public participation
Preparing and implementing activities is both substantial and long term
Implementation and assistance of various activities, particularly related to the affirmative action impetus of government policy and related
Re-formulating the program based on the evaluation results, and carrying out some annual technical activities
Deliver References and models of Ecohydrology best practices based on research, training and knowledge exchanges, information systems and public awareness


Focus Areas:
TRADITIONAL IRRIGATION SYSTEM
Local Knowledge
Traditional Irrigation System
Water Resource Management
Soil-Water-Culture Conservation
ARID & SEMI ARID ZONES
Short Period of Rainy Season
Rainfall Harvesting
Limited Water Resources
Water Resource Management
Soil & Water Conservation
Irrigation System
URBAN
Heat Island
Urban Flood
Clean Water & Sanitary
Organic & Unorganic Waste
Water Pollution
Drainage System
Social-related Problem
WATERSHED SYATEM/LAKES & RESERVOIRS
Global to Local Climate Change Impacts
Rapid Land Use Change
Land Degradation
Flood, Drought, High Erosion & Sedimentation Rates
Water Quality & Eutrophication
Loss of Biodiversity
Social Problem
Water Security
PEATLAND
Rapid Peat Forest Area Conversion
Extreme Water Table Fluctuation
Loss of Biodiversity
CO2 Sink
Peat Fires & Haze
SMALL ISLANDS
Limited Freshwater Resources
Sanitary
Salt Water Intrusion
Water Quality & Clean Water
Sea Level Rise & Climate Change


ORGANIZATION STRUCTURE
12


APCE Contribution to the implementationf of SDG's
SUSTAINABLE DEVELOPMENT GOALS
Goal 6: Ensure access to water and sanitation for all
Goal 13: Take urgent action to combat climate change and its impacts
Goal 15: Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss


APCE GOVERNING BOARD MEMBERS
Prof. Dr. Zainal Arifin
Chairman, (Indonesia)
Prof. Dr. Soontak Lee
Member (Korea)
Prof. Dr. Kaoru Takara
Member (Japan)
Prof. Dr. Shahbaz Khan
Member (UNESCO)
Prof. Dr. Quentin Grafton
Member (Australia)
Prof. Dr. Hidayat Pawitan
Observer (Indonesia)

Main Achievement & Contribution of APCE 2016-2019 : SCIENTIFIC RESEARCH

Advanced Development Saguling Ecohydrology Demonstration Site for Water Quantity & Quality Improvement	Ecohydrology Concept Implementation at the Peatland Ecosystem:	Ecohydrology Concept Implementation to Arid-semi arid region
Institution Partners: IPB, UGM, Indonesia Power Saguling, Pemda Kabupaten Bandung Barat, Local Community (Islamic Boarding School) **Outputs:** 1. **Ecohydrology Demonstration Site** as a Place for Insitu Dissemination related Ecohydrology Concept and Ecotehnology, Information & Knowledge (Research, Training, Education), Cooperation for Solving Problems 2. **Ecotechnology** (Phytotechnology, Vegetative Filter, Constructed Wetland) for Water Quality Control, Trapping Runoff & Pollutant 3. **Ecohydrological Modeling System** as a Tool for Prediction, Process Mechanism Understanding, Scenario-Based Management Plan, Decision Support System (DSS) ➔ **Improvements on Hydrological Responses and Ecosystem Services of River Catchment (Cibitung River - Citarum)**	**Institution Partners:** Pangkaraya University, Lambung Mangkurat Univ., Public Works, Kementerian Pertanian, BRG **Outputs:** 1. Scientific Information & Knowledge of Peatland Ecosystem, which covers: *Hydrophysics, Water System Management, Agriculture Aspect, Carbon Dynamics Microbial Aspect, GHGs Emission and Peatland Configuration* 2. Ecohydrolology Concept for Better Peatland Ecosystem Management ➔ **Improvements on Hydrological Characteristic and Ecosystem Services of Peatland Ecosystem in Ex-Mega Rice Project Location (South Kalimantan)**	**Institution Partners:** IPB, Unimor, Kabupaten TTU, SMA, SMP **Outputs:** 1. Ecohydrology as subject in IPB and University of Timor 2. Ecohydrology as sylabus in Junior and Senior High School 3. Ecohydrology concept for water resources management in arid-semi arid region ➔ **Improvement and sustainability of water resources**

Main Achievement & Contribution of APCE 2011-2019: TRAINING & CAPACITY BUILDING

Training & Workshop On Water And Urban Initiative Case Study In Jakarta, 2017 APCE with UNU-IAS Tokyo (40 participants from different institutions)	Workshop on Ecohydrology for Water Related Disaster Risk Reduction, 2017 APCE with UTM Malaysia	Water Initiative for World Water Day APCE with Kabupaten Bogor, 2017
International Training on Coastal Ecohydrology : APCE with ICCE Portugal, UNESCO, UGM, DIY Province, 2018 (40 participants from 7 countries)	Workshop on Sustainable Peatland Management APCE with UPR, ULM, Balittra, Balai Rawa, 2016	Water Use : Scientific and Fiqh Point of View, 2016 APCE, MUI Ciamis, Ar-Risalah IBS
Asia Regional Training Workshop on Water Quality and Emerging Pollutants APCE, UNESCO, DKI Province, 2018 (40 participants from 13 countries)	Workshop on Sustainable Water Resources Management Based on Ecohydrology, 2017 APCE with UGM, DIY Province	Integration of Ecohydrology to SUBAK System in Bali island APCE, Pekaseh Subak, Udayana University, Kabupaten Badung, 2016
		

Main Achievement & Contribution of APCE 2011-2019 : Networking

MoU/MoA	As the Host of International Events/Activities	Visibility
1. HTC KL Malaysia 2. RCURBM Nigeria 3. Qanat Centre Iran 4. ICHARM Japan 5. ICCE Portugal 6. UNU Tokyo 7. Unesco Chair Wendi Kyoto 8. UTM Malaysia 9. USM Malaysia 10. UNIMOR 11. UPR 12. UGM 13. ULM 14. IPB 15. Kemenlu 16. KNIU 17. Indonesia Power 18. Balittra – Kementan 19. Balai Rawa – PUPR 20. BRG 21. GNRSI	 1. **The 16th Word Lake Conference** The 16th Word Lake Conference was held in Bali, Indonesia on November 2017 2. Hosting International Conference on Ecohydrology in conjunction with the 22nd IHP-RSC Meeting on November 11-14, 2014 3. International Workshop on New Ecohydrology Demonstration Site Projects. Jakarta, Indonesia, 21 – 23 March 2011. 4.	 Attend to 39th General Conference of UNESCO in Paris Attend to Regional Steering Committee IHP Meeting 

Achievement & Contribution of APCE 2019: Networking

Co-organizing the International Conference on Tropical Limnology, Bogor, 28-29 August 2019

Invited Speaker for UNESCO World Water Day, Depok 22 April, 2019

Keynote Speaker and Facilitator for Workshop on Program Strengthening Strategy of CHEADSEA as UNESCO Category II Centre, Yogyakarta 11 - 14 September 2019

Invited Speaker for Coordination Meeting and Workshop on National Priority Lakes Management II, Jakarta 2 - 3 October 2019

Achievement & Contribution of APCE 2019: Networking

Increasing APCE contribution to SDGs achievement through strengthening global network and connectivity, Jakarta, September 2019

Resource Person for River Management & Restoration Tech. Workshop, Indonesia Rivers Congress 4.0, March 2019

Invited Speaker for UNESCO Regional Workshop on Water Education in Asia and the Pacific, Jakarta, September 2019

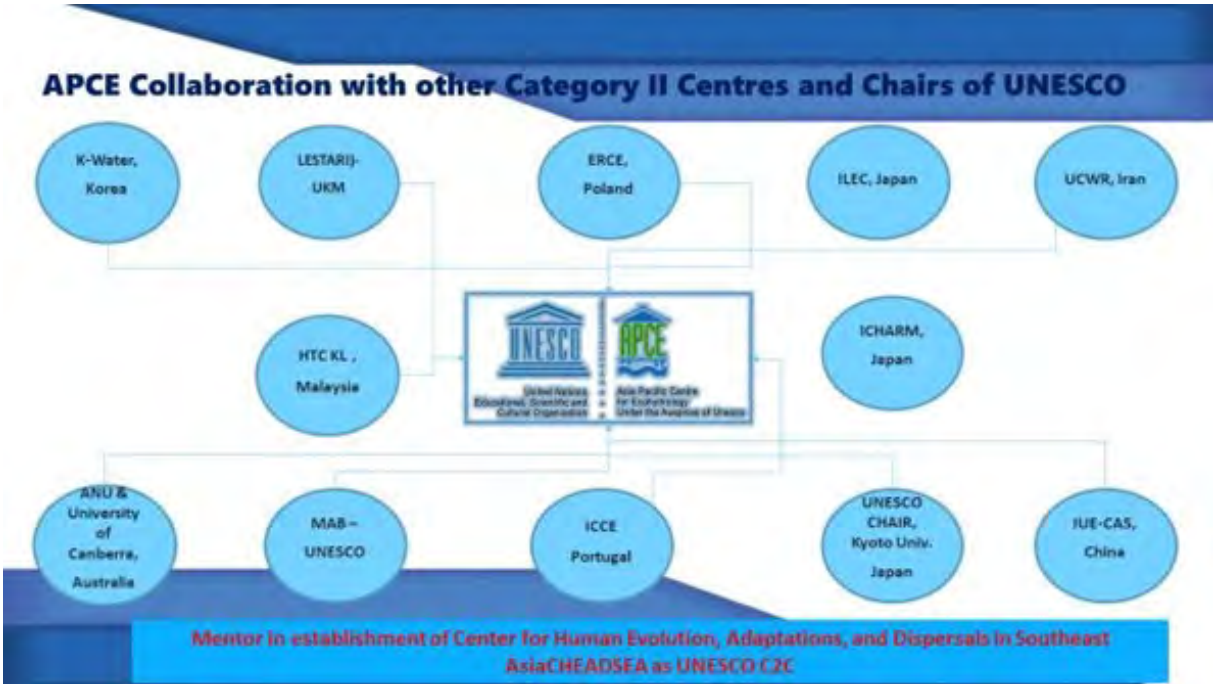
Achievement & Contribution of APCE 2019: Networking

Invited Speaker for THA 2019 - Advancing Partnership for Sustainability, Bangkok, Jan 2019

Invited Speaker for UNESCO session of World Water Week, Stockholm, August 2019

Promoting Capacity Building on Ecohydrology as Science Diplomacy to Ministry of Foreign Affairs, Jakarta, September 2019

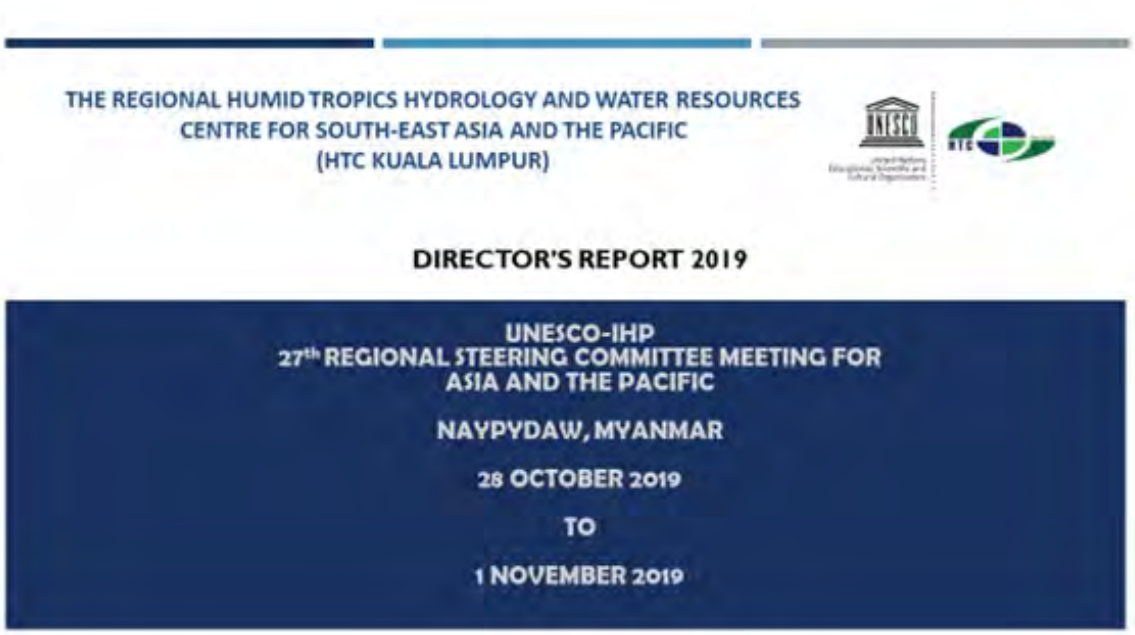
Lecturer of International Leadership Training Program in Water Resources Management in Vientiane, August 2019



Closing Remarks

- Ecohydrology is a new approach for sustainable water resources and ecosystem management
- APCE plays an important role as catalysator for implementing ecohydrology to variuos institutions in order to enhance ecosystem services and sustainable water resources
- Therefore, APCE should stand in a position to coordinate those 3 determining components (scientific research, capacity building and networking)

Humid Tropics Centre Kuala Lumpur (HTCKL)



THE REGIONAL HUMID TROPICS HYDROLOGY AND WATER RESOURCES CENTRE FOR SOUTH-EAST ASIA AND THE PACIFIC (HTC KUALA LUMPUR)

DIRECTOR'S REPORT 2019

UNESCO-IHP
27th REGIONAL STEERING COMMITTEE MEETING FOR ASIA AND THE PACIFIC

NAYPYDAW, MYANMAR

28 OCTOBER 2019

TO

1 NOVEMBER 2019

INTRODUCTION

- This report covers HTC KL activities from November 2018 to 31st October 2019 and future activities


INTERNATIONAL MEETING/CONFERENCE/ WORKSHOP/TRAINING
10 Activities
International Training Workshop On Integrated Sediment Management In River Basins in Beijing China (5th to 10th Nov 2018)
UNESCO Asia and Pacific Regional Training Workshop on Water Quality and Emerging Pollutant in Jakarta Indonesia (27th to 29th Nov 2018)
26th UNESCO IHP Regional Steering Committee Meeting for Southeast Asia and the Pacific in Shanghai, China (2nd to 6th Nov 2018)
2018 International Conference on Forward-Looking Water Management, in Taipei, Taiwan (7th to 9th Nov 2018)
2019 International Short Course on Disaster Risk Management Debris Flow Professional Training in Tainan, Taiwan (16th to 22nd June 2019)


INTERNATIONAL MEETING/CONFERENCE/ WORKSHOP/TRAINING
10 Activities
National Dialogue on Women in Science in Pakistan, Lahore (11th to 12th Feb 2019)
Signing of the agreement between the Government of Malaysia and UNESCO For Regional Humid Tropics Hydrology and Water Resources Centre for South-East Asia and the Pacific (Humid Tropics Centre Kuala Lumpur) in Paris (6th March 2019)
Workshop for the Drafting of Water Management Curriculum for Africa in Jakarta, Indonesia (24th to 25th July 2019)
Regional Workshop on Water Education in Asia and the Pacific in Jakarta, Indonesia (4th to 5th September 2019)
UNESCO Regional Strategic Coordination Meeting "Science to Enable and Empower Asia Pacific for SDGs II" in Jakarta, Indonesia (16th to 19th Sept 2019)

NATIONAL MEETING/CONFERENCE/ WORKSHOP/TRAINING

6 ACTIVITIES

- 4th International Conference on Water Resources Malaysia in Langkawi Kedah (27th to 28th Nov 2018)
- Introduction to Water Footprint Training in Kuala Lumpur (19th Feb 2019)
- Malaysia World Water Day 2019 (23rd March 2019) in Pantai Merdeka, Kedah
- 4th Biennial International Conference on Women in Science, Technology and Innovation: Empowering Women Through Technology in Kuala Lumpur (22nd to 23rd July 2019)
- Knowledge Enhancement and Awareness of Water Security (KEA) (28th to 29th Aug 2019)
- The Second Malaysia-UNESCO Cooperation Programme Expert Synthesis Meeting (23rd to 24th Sept 2019)

RESEARCH ACTIVITIES

No	Title	Objective Remarks		
		Phase IHP-VIII	SDGs (No.6)	Status
1	Debris Mud Flow Warning System (Phase II)	THEME 1: Water-related Disasters and Hydrological Change	6.6 Protect and restore water-related ecosystems	In progress
2	Mobile Flood Wall Barrier (MFWB)	THEME 1: Water-Related Disasters and Hydrological Change	6.5 Implement integrated water resources management at all levels, including through transboundary cooperation as appropriate 6.6 Protect and restore water-related ecosystems	In progress
3	Biodiversity Flow at Jenderam River,a tributary of Sg Langat	THEME 5: Ecohydrology, Engineering Harmony for a Sustainable World	6.3 Improve water quality	Completed

TECHNICAL VISIT

Visit by Experts of Ecohydrology UNESCO Water Families and UNESCO Headquarters Paris

13 visitors

2019 (5th Ju

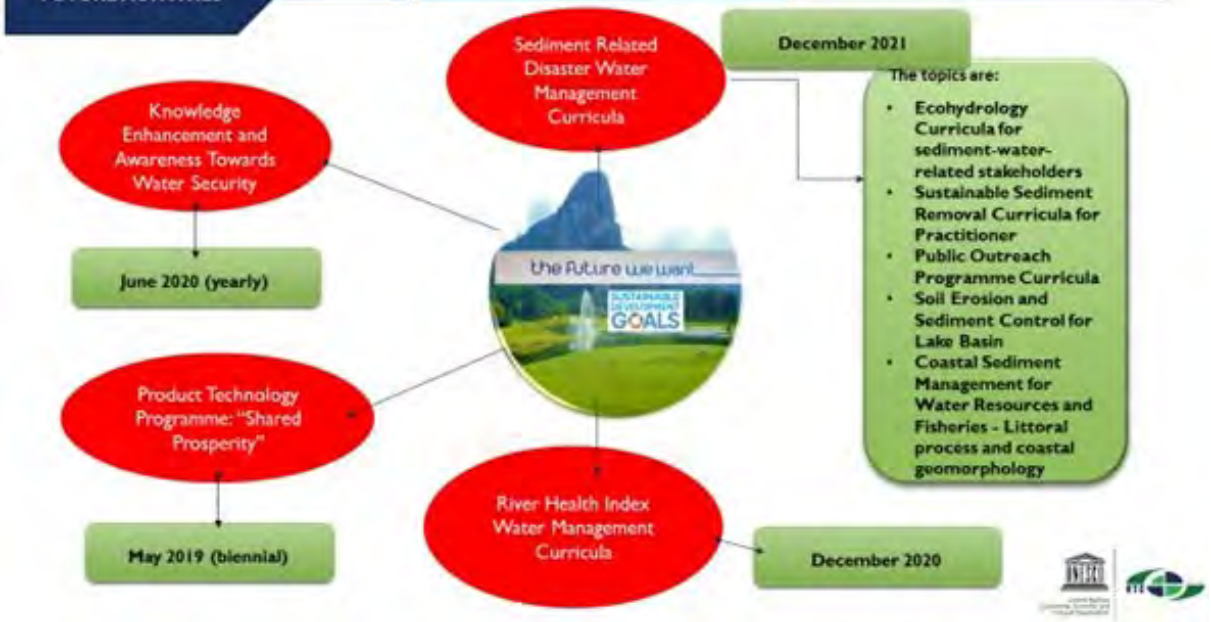
2 Visits

Visit by Institute of Information Industry (III) Taipei, Taiwan

2 visitors

2018 (15th N

FUTURE ACTIVITIES



PUBLICATION

Water Management Curricula

Journal of Water Resources Management (JoWRM)

Proceeding

FORTHCOMING ACTIVITIES

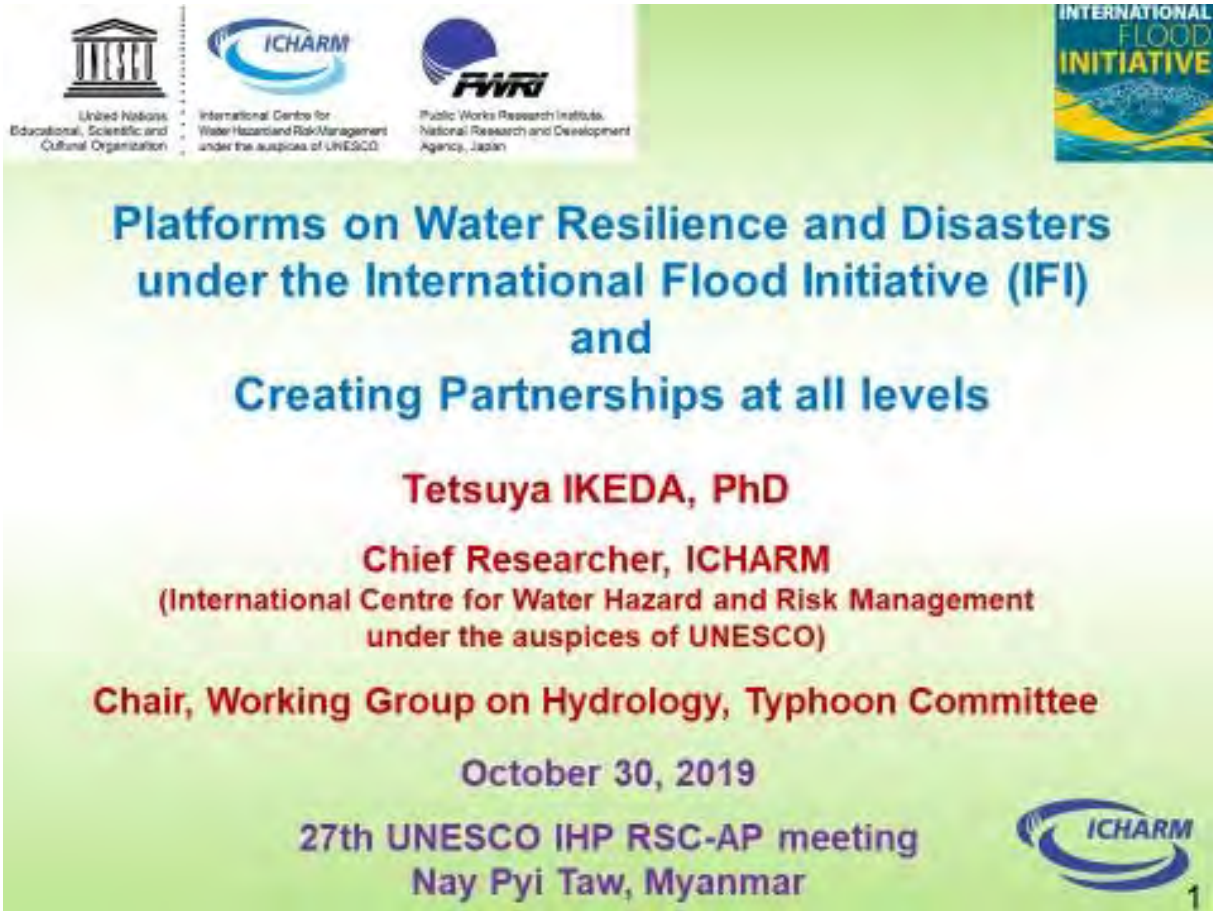
1st The Regional Humid Tropics Hydrology and Water Resources Centre for South-East Asia and The Pacific Governing Board Meeting will be organised in October 2020.

THANK YOU

The Regional Humid Tropics Hydrology and Water Resources Centre for South-East Asia and The Pacific (HUMID TROPICS CENTRE KUALA LUMPUR)

No. 2, Jalan Ledang off Jalan Duta, 50480 Kuala Lumpur
Tel 603 20958700 Fax 603 20953366
Email : tajudin@water.gov.my

International Centre for Water Hazard and Risk Management (ICHARM)



Platforms on Water Resilience and Disasters Under International Flood Initiative (IFI)

Platform on Water Resilience and Disasters

Sri Lanka

Pakistan

Philippines

Myanmar

3

Indonesia

Establishment of

NEW!!

"Platform on Water Resilience and Disasters"

ICHARM **facilitates and supports the establishment of the Platform on Water Resilience and Disasters** together with the relevant government organizations in Indonesia.

2018.1.15~2019.3.12

Consultation Meetings for establishing the Platform for five(5) times

2019.4.9-13 **1st meeting on the Platform** and Field Survey

2019.8.5 **2nd meeting on the Platform**

Participated Stakeholders

- Ministry of Public Works and Housing (PUPR): River Management
- National Disaster Management Authority (BNPB): Disaster Information
- Meteorological, Climatological, and Geophysical Agency (BMKG): Meteorological Observation
- Ministry of Environment and Forestry (KHLK): River Basin Management (Forest)

Participants for the 2nd Platform meeting

Report to PUPR Minister Dr. Basuki

4

Philippines

Activities for "Platform on Water Resilience and Disasters"

Meetings on "Platform on Water Resilience and Disaster"

- Three Plenary Meetings since March 13, 2017
- Sub meeting for Representative, Stakeholder together with the key organizations (DPWH, DOST, PAGASA, etc.)

Participated Stakeholders

Hydro-Met	DOST	: Department of Science and Technology
	PAGASA	: Philippine Atmospheric, Geophysical and Astronomical Services Administration
River Bureau	DPWH	: Department of Public Works and Highways
Disaster	OCD	: Office of Civil Defense
Economy	NEDA	: National Economic and Development Authority
Statistics	PSA	: Philippine Statistics Authority
Geology	NAMRIA	: National Mapping and Resource Information Authority
Academia	UP (3)	: University of Philippines (3)

ICHARM

5

Outcomes from the recent meeting in the Philippines

- More than 70 participants at the 3rd IFI Platform Meeting on February 7, 2019 at Manila, including TC-WGH members.
- Activities: 1) Data integration, 2) Flood forecasting and early warning, 3) Climate change, 4) Economic assessment, 5) Contingency planning, and decided to include 6) Capacity development.
- Target rivers: Pampanga, Davao, and decided to include Cagayan

Plenary Meeting of Platform on Water Resilience and Disasters

7th, Thursday, February, 2019

Luxent Hotel, Quezon City, Metro Manila

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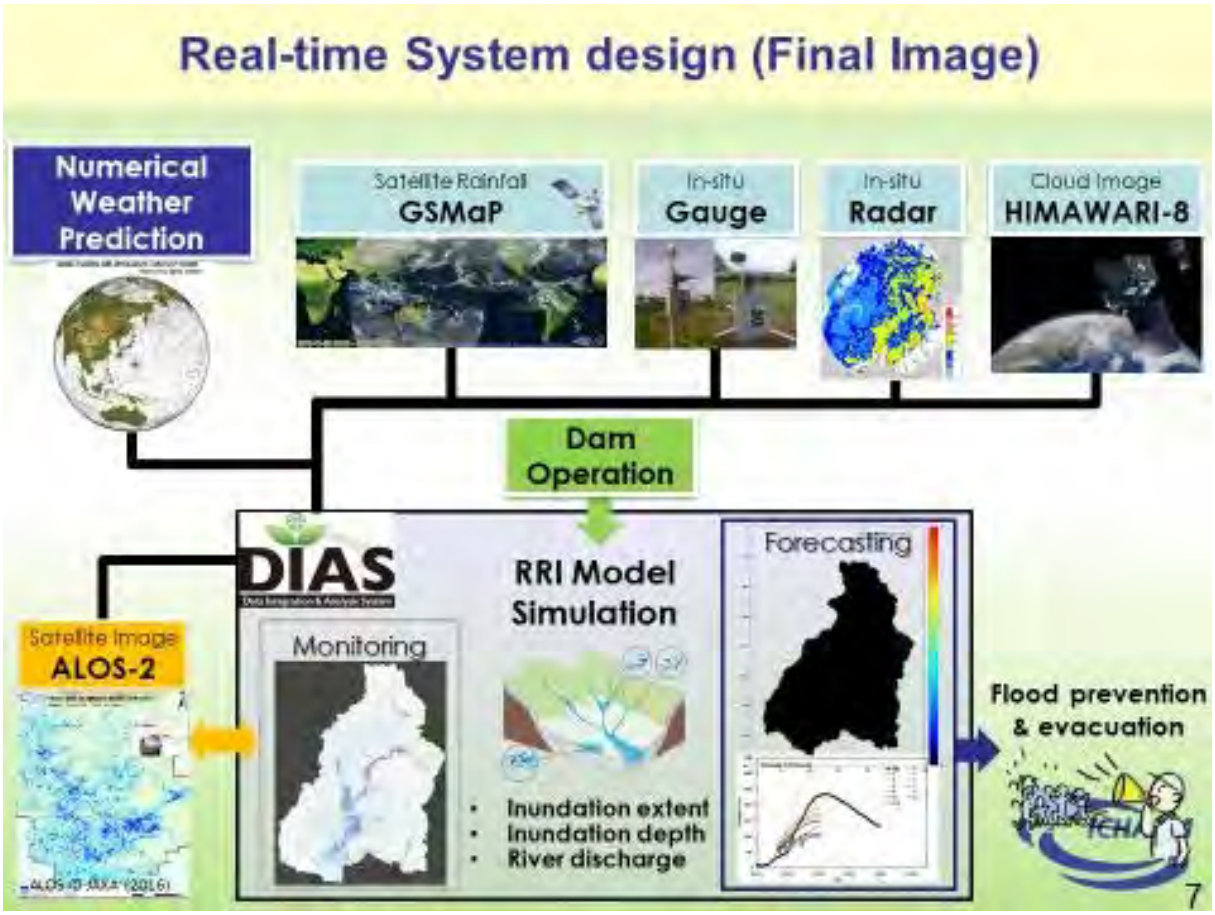
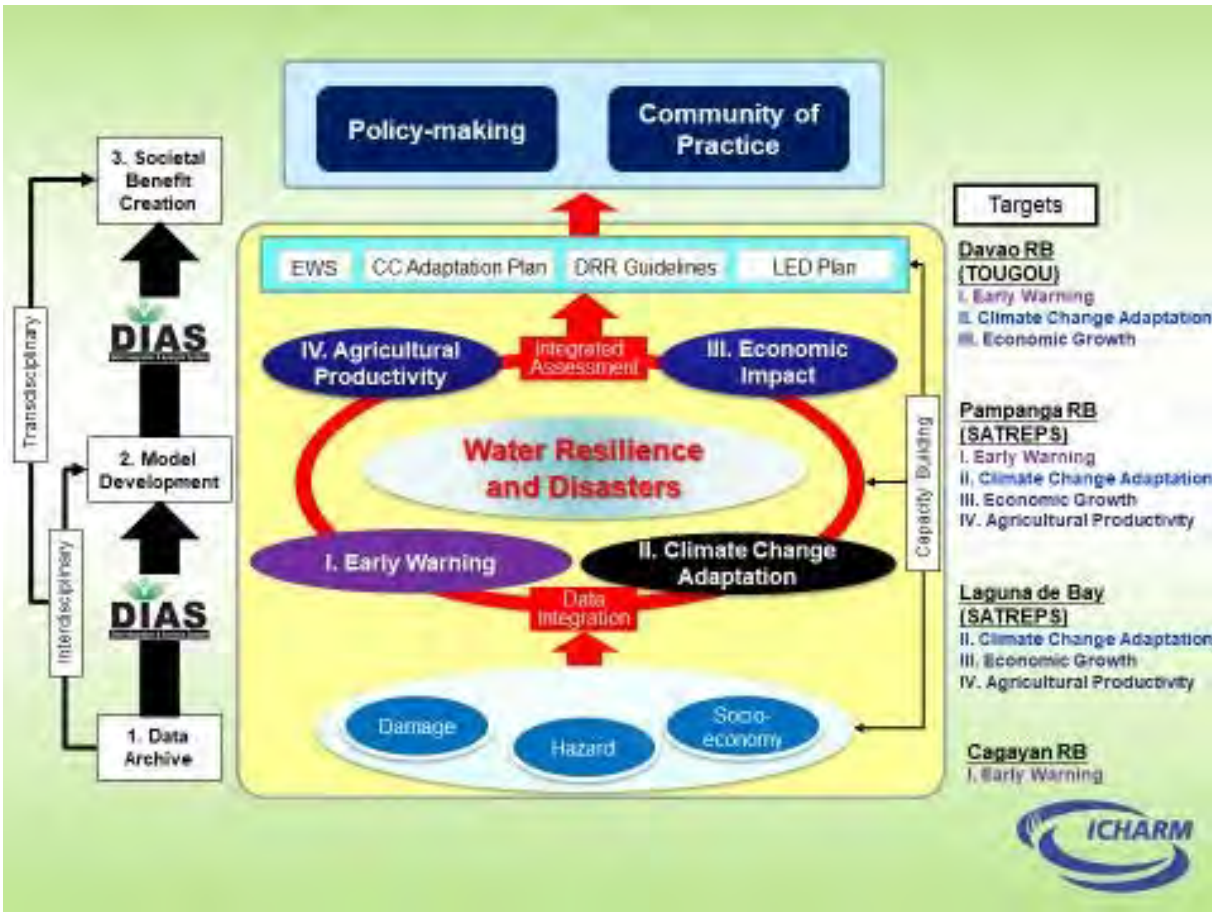

Real-time System design (Final Image)
Numerical Weather Prediction
Satellite Rainfall GSMaP
In-situ Gauge
In-situ Radar
Cloud Image HIMAWARI-8
Dam Operation
DIAS
RRI Model Simulation
Forecasting
Monitoring
Satellite Image ALOS-2
Inundation extent
Inundation depth
River discharge
Flood prevention & evacuation
7


Policy-making
Community of Practice
3. Societal Benefit Creation
DIAS
2. Model Development
DIAS
1. Data Archive
Transdisciplinary
Interdisciplinary
EWS
CC Adaptation Plan
DRR Guidelines
LED Plan
IV. Agricultural Productivity
Integrated Assessment
III. Economic Impact
Water Resilience and Disasters
I. Early Warning
II. Climate Change Adaptation
Data Integration
Damage
Hazard
Socio-economy
Capacity Building
Targets
Davao RB (TOUGOU)
I. Early Warning
II. Climate Change Adaptation
III. Economic Growth
Pampanga RB (SATREPS)
I. Early Warning
II. Climate Change Adaptation
III. Economic Growth
IV. Agricultural Productivity
Laguna de Bay (SATREPS)
II. Climate Change Adaptation
III. Economic Growth
IV. Agricultural Productivity
Cagayan RB
I. Early Warning
ICHARM

Orientation on Climate Change in Davao City
(25 October 2019)
Suggested Activity Design

Experiencing Climate Change

Climate change impact assessment based on S&T

Visualization

Experiencing Events

Infrastructure design

Strengthening Resilience

Predict climate change impact and scenario

Resilient society beyond saving lives

"Nudging" psychological process to disaster risk

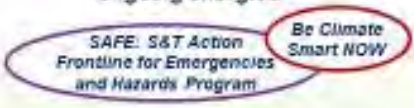
Resilient communities

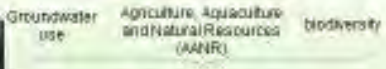
Incentive for investment

Toward the Prosperous Davao

Design a brilliant future

Coordination with relevant ongoing energies





Setting All

Attractive policy proposal

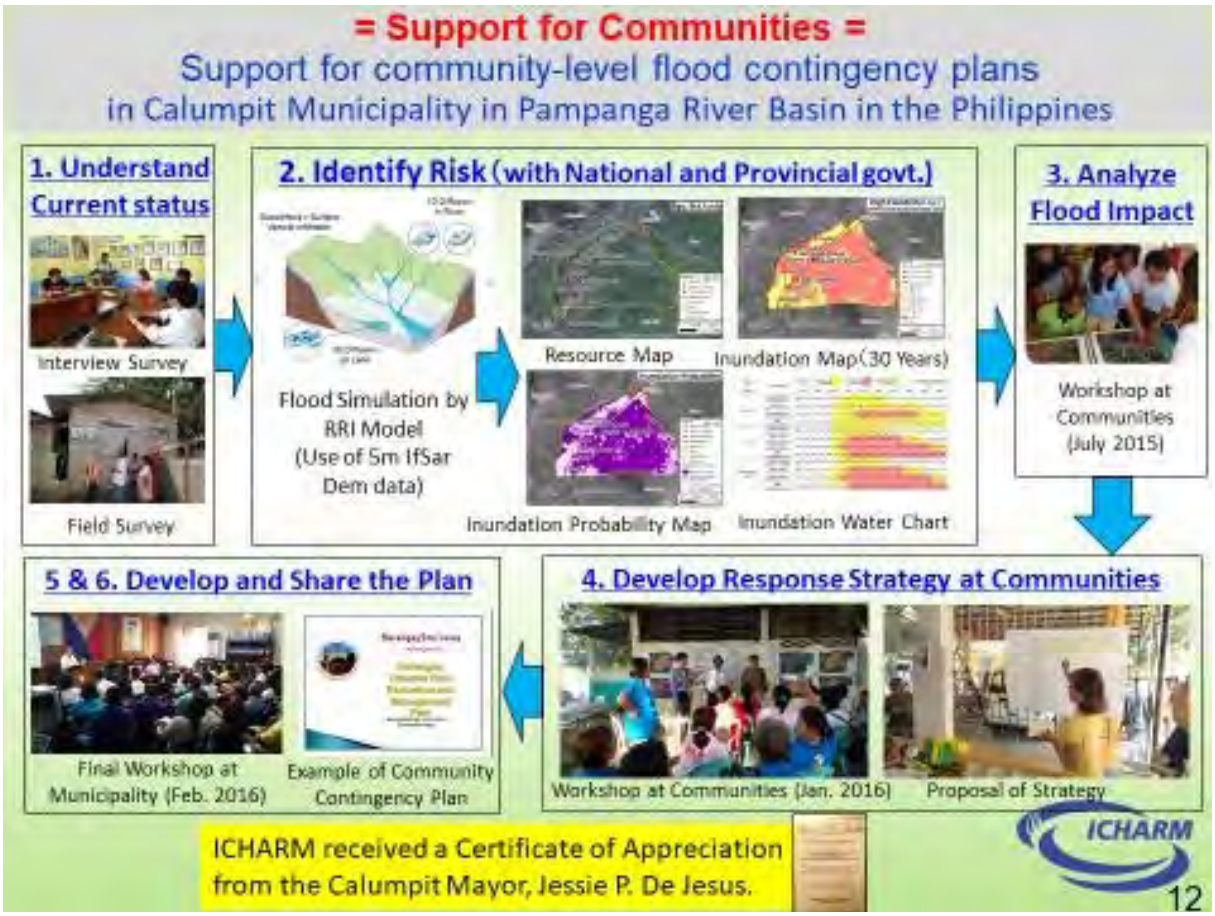
Bright tomorrow of Davao

Regional Cooperation among IFI implementing countries

- **Regional Cooperative Implementation Meeting** of "Platforms on Water Resilience and Disasters" was held at GEOSS Asian Water Cycle Initiative (AWCI) on October 24-25, 2018 in Kyoto, Japan.
- The high-levels and representatives from the IFI implementing countries (*) participated, notably attended by **Honorable State Minister** of the Ministry of Irrigation and Water Resources & Disaster Management of Sri Lanka.

  (*) Philippines, Myanmar, Sri Lanka and Indonesia
- During the meeting, activities and progress of each country were reported, and the future cooperation was discussed together with all the participants.
- On 2-4 November 2019, this cooperative meeting will continuously be organized at AOGEO in Canberra, Australia.


Creating Partnerships at all levels
for water-related disaster risk reduction
Global level
Regional level
Country level
Local government level
Community level
ICHARM
11


= Support for Communities =
Support for community-level flood contingency plans
in Calumpit Municipality in Pampanga River Basin in the Philippines
1. Understand Current status
Interview Survey
Field Survey
2. Identify Risk (with National and Provincial govt.)
Flood Simulation by RRI Model (Use of 5m IfSar Dem data)
Resource Map
Inundation Map(30 Years)
Inundation Probability Map
Inundation Water Chart
3. Analyze Flood Impact
Workshop at Communities (July 2015)
4. Develop Response Strategy at Communities
Workshop at Communities (Jan. 2016)
Proposal of Strategy
5 & 6. Develop and Share the Plan
Final Workshop at Municipality (Feb. 2016)
Example of Community Contingency Plan
ICHARM received a Certificate of Appreciation from the Calumpit Mayor, Jessie P. De Jesus.
ICHARM
12

= Support for Local Governments =

Support for local governments (municipalities) on water-related disaster risk reduction through joint research agreement

- ICHARM supports local governments on water-related disaster risk reduction through joint agreement or MoU.
- For this purpose, ICHARM has developed ICHARM Disaster Risk Information System (IDRIS) which is utilized for disaster mitigation not only in emergency but also in normal time.
- IDRIS contains "Real time information viewer" and "Risk information map viewer", indicating various real time information on one screen to be used for disaster management.


Flood damage in Iwaizumi Town on August 2016


MoU with Aga Town on June 2018


Joint agreement with Iwaizumi Town on February 2019

13

= Support for Local Governments =

Support to Kerala State of India for improvement of flood management

- On August 2018, Kerala State of India suffered an unprecedent flood disasters.
- ICHARM conducted a field survey in March 2019, and then took a leadership to dispatch a study team composed of Japanese experts on flood management and dam operation in May 2019.
- Based on these results, Japan side (Japan Water Agency) submitted a proposal to the World Bank to implement improved flood management and dam operation under DRIP (Dam Reconstruction and Improvement Project).
- Also Kerala State submitted a proposal to the Government of Japan to start a training program for the Kerala State officials.
- These activities are recognized as key components of bilateral cooperation on DRR between the Governments of India and Japan.


Overflow of Poringalkuthu Dam (Source: https://sandrp.in/2018/10/04/role-of-dams-in-kerala-2018-floods/)


Meeting with Kerala State officials


Study Team from Japan

14

= Support for Countries =
ADB Vietnam Project for evaluation of climate change impacts

- The future flood risk associated with climate change in three cities (Hue, Ha Giang and Vinh Yen) in Vietnam was estimated.
- For the evaluation, General Circulation Models (GCMs) from CMIP5 (5th phase of the Coupled Model Intercomparison Project) were selected which more appropriately expresses the climate characteristics of the target area.
- The uncertainty of the future results was evaluated by statistically downscaling the selected GCMs.
- In addition, the results of MRI-AGCM was physically downscaled to create future climate scenario and using RRI model, the increase in flood area and inundation depth in the future was evaluated.

Flood inundation depth in Hue city of 100-year return period simulated with RRI model for past (1979-2003) and RCP8.5 future (2075-2099) climate.

15

= Regional Cooperation =
Contribution to WMO/UNESCAP Typhoon Committee

- Typhoon Committee (TC) was established in 1968 as a joint intergovernmental body under the auspices of WMO and UNECAFE (now UNESCAP), currently involving 14 members countries from typhoon affected area.
- TC is consisted of Working Group on Meteorology (WGM), **Working Group on Hydrology (WGH)**, Working Group on Disaster Risk Reduction (WGDRR) and Training and Research Coordination Group (TRCG)
- Japan has contributed since its establishment through seconding the experts, leading Flood Hazard Mapping and sediment disaster forecasting & warning project.

16

Japan's Contribution to TC-WGH
- Flood Hazard Mapping (FHM) Project -

Japan, especially ICHARM contributed to FHM project of TC-WGH through cooperative activities.

- Flood Hazard Map Manual, March 2003
- Flood Hazard Mapping Training in Pyongtaek City, Seoul, Korea in July 2004
- JICA/ICHARM "Flood Hazard Mapping" Training Course (2004 ~ 2008) -> Introducing Town Watching
- Manual for Making Flood Hazard Map Ubiquitous
- Flood Hazard Map Help Desk (FHM-HD)
- Technical support to the Asian countries

ICHARM

17

= Regional Cooperation =
Participation in WMO/UNESCAP Panel on Tropical Cyclone

- Panel on Tropical Cyclones (PTC) has been convening annual sessions since its establishment in 1973 as a joint intergovernmental body of WMO and UNESCAP.
- PTC originally started with 6 countries and until 2018, it was joined by 7 more countries (Now 13 member countries).
- 46th session of PTC was held in Nay Pyi Taw, Myanmar on September 9-13, 2019 where ICHARM participated.
- ICHARM & IFI is expected to build a bridge toward a regional cooperative partnership within PTC member countries and between PTC and TC as well.

ICHARM

18

= Regional Cooperation =

Water Disaster Platform to Enhance Climate Resilience in Africa (WADiRE-Africa)

- In collaboration with UNESCO and AGRHYMET, focusing on the West Africa from Niger Basin Authority (NBA) and Volta Basin Authority (VBA) including 11 countries of the basins. (Benin, Burkina, Cameroon, Chad, Cote d'Ivoire, Ghana, Guinea, Mali, Niger, Nigeria and Togo)
- ICHARM support to enhance flood risk management in this region and receive a trainee/expert, who will then work as a trainer in his/her own organization.
- The expected outputs are:
  - Regional flood early warning for Niger and Volta river basins
  - Capacity building for >300 persons on flood risk management (incl. >100 women)
  - Establishment of community early warning systems in two areas
  - Training for >3,000 persons at community level (incl. >1,000 women)

Rainfall observation in Volta river basin

Inundation simulated by WEB-RRI model during Oct. 2015

19

Global Agenda for water-related risk reduction

Sendai Framework for Disaster Risk Reduction 2015-2030

Sustainable Development Goals (2016-2030)

Paris Agreement

UN International Decade for Action: Water for Sustainable Development (2018-2028)

Contribution

UNESCO-IHP VIII (2014-2021)

International Flood Initiative (IFI)

UNESCO-IHP Centres & Chairs

Platform on Water Resilience and Disasters

Endorsement

Outcome document of UN/WB High Level Panel on Water (HLPW) (14 March 2018)

20

Capacity Development and Awareness Raising

- ICHARM conducts several capacity development and awareness raising programs in collaboration with UNESCO, JICA, GRIPS, Governments, etc.
  - PhD and Master degree courses
  - Short-term group/country training programs
  - Technical workshops and advisories for engineers and residence
  - Follow-up seminars inviting the ex-trainees in each country
- **"Town watching"** has been introduced as a useful risk assessment method through grouped field survey to check potential risk spots & vulnerable areas.

IFAS training workshops

Advisory for local engineers

Follow-up seminar

VR demonstration on flood awareness raising through simulated flood by using VR goggle

Town watching – field survey & group discussion

ICHARM

21

Advocate & Dissemination

3rd APWS, Yangon, December 2017

UN Special Thematic Session, June 2019

UNESCO IWC, Paris, May 2019

WWF9, Brasilia, March 2018

TC 51th Annual Session, Guangzhou, February 2019

Side Event at UNESCO-IHP IGC, Paris, June 2018

Side Event at HLPF, New York, July 2018

ADB Water Forum, Manila, October 2018

22

ICHARM organizes a technical session at World BOSAI Forum 2019 @ Sendai, Japan (November 9~12, 2019)

World BOSAI Forum IDRC 2019 in SENDAI

- Time & Date: 15:30-17:00, **11 November 2019**
- Title: **Contribution from meteorology, hydrology and DRR** for the Platform on Water Resilience and Disasters
- Keynote: Prof. Fumihiko Imamura, Director, IRIDeS, Tohoku University
- Chair: Prof. Toshio Koike, Director, ICHARM
- Speakers: JMA (meteorology), MLIT (hydrology), ADRC (DRR) & Experts from KICT(Korea), RID(Thailand) and AFAD(Turkey)
- Panel Discussion with speakers

IRIDeS 気象庁 Japan Meteorological Agency アジア防災センター Asian Disaster Reduction Center (ADRC) 国土交通省 ICHARM

23

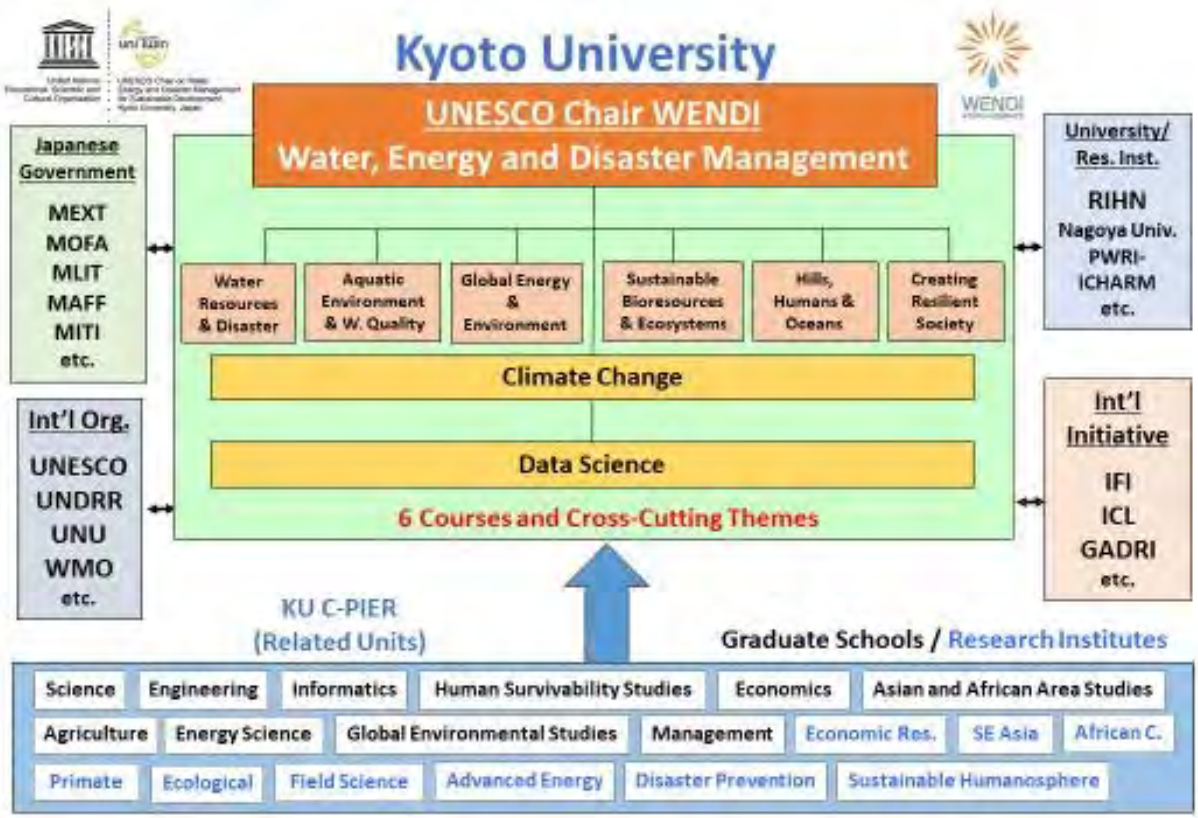
Thank you very much for your kind attentions

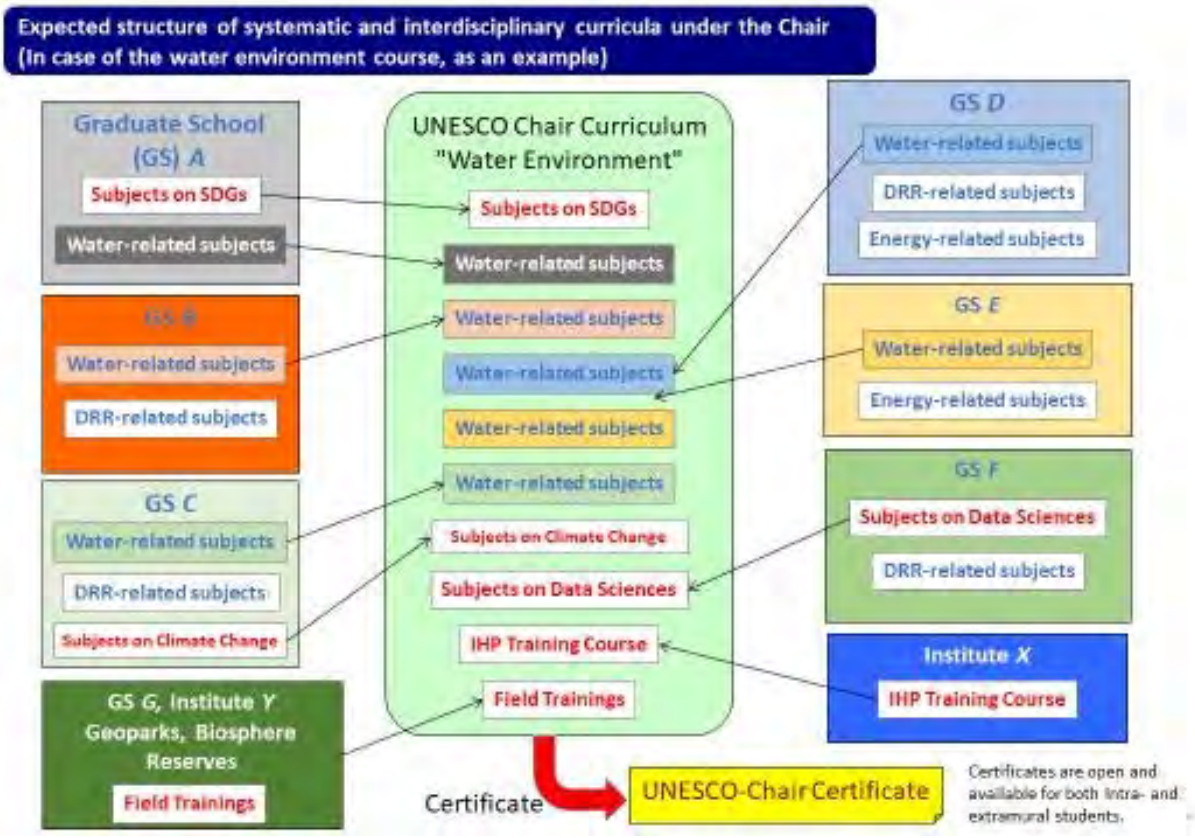
URL: http://www.icharm.pwri.go.jp/index.html
http://www.ifi-home.info/
E-mail: te-ikeda@pwri.go.jp

ICHARM

24

Water, Energy and Disaster Management for Sustainable (WENDI)


Kyoto University
UNESCO Chair WENDI
Water, Energy and Disaster Management
WENDI
Japanese Government
MEXT
MOFA
MLIT
MAFF
MITI
etc.
University/ Res. Inst.
RIHN
Nagoya Univ.
PWRI-
ICHARM
etc.
Water Resources & Disaster
Aquatic Environment & W. Quality
Global Energy & Environment
Sustainable Bioresources & Ecosystems
Hills, Humans & Oceans
Creating Resilient Society
Climate Change
Data Science
6 Courses and Cross-Cutting Themes
Int'l Org.
UNESCO
UNDRR
UNU
WMO
etc.
Int'l Initiative
IFI
ICL
GADRI
etc.
KU C-PIER
(Related Units)
Graduate Schools / Research Institutes
Science
Engineering
Informatics
Human Survivability Studies
Economics
Asian and African Area Studies
Agriculture
Energy Science
Global Environmental Studies
Management
Economic Res.
SE Asia
African C.
Primate
Ecological
Field Science
Advanced Energy
Disaster Prevention
Sustainable Humanosphere


Expected structure of systematic and interdisciplinary curricula under the Chair
(In case of the water environment course, as an example)
Graduate School (GS) A
Subjects on SDGs
Water-related subjects
GS B
Water-related subjects
DRR-related subjects
GS C
Water-related subjects
DRR-related subjects
Subjects on Climate Change
GS G, Institute Y
Geoparks, Biosphere Reserves
Field Trainings
UNESCO Chair Curriculum
"Water Environment"
Subjects on SDGs
Water-related subjects
Water-related subjects
Water-related subjects
Water-related subjects
Water-related subjects
Subjects on Climate Change
Subjects on Data Sciences
IHP Training Course
Field Trainings
GS D
Water-related subjects
DRR-related subjects
Energy-related subjects
GS E
Water-related subjects
Energy-related subjects
GS F
Subjects on Data Sciences
DRR-related subjects
Institute X
IHP Training Course
Certificate
UNESCO-Chair Certificate
Certificates are open and available for both intra- and extramural students.

699 Biosphere Reserves from 120 countries

http://unesdoc.unesco.org/images/0025/002596/259695M.pdf

WENDI, a new UNESCO Chair: Its activities so far

- Establishment of a Preparatory Committee for WENDI (- March 2018)
- Special Lectures by IHP Representatives in Kyoto Univ. (13th February 2018)
- Announcement at WWF8 in Brasilia, Brazil (19-23 March 2018)
- Establishment of WENDI (April 2018) and its Steering Committee
- Side Event at the UNESCO-IHP Intergovernmental Council Session in Paris (18-22 June 2018)
- Kick-Off International Symposium in Kyoto University, gathering some UNESCO Chairs and UNESCO Centres (30-31 July 2018)
- 28th IHP Training Course in Kyoto University (Nov.-Dec. 2018)
- UNESCO MAB Seminar by Prof. Dr. Enny Sudarmonowati (8 Dec. 2018)
- Initiation of six HESD courses (April 2019 -)
- Joining a summer school in Aral Sea (Aug. 2019, Takara)
- Participating in IIWQ session at World Water Week (Aug. 2019, Yamashiki)
- Participating in Regional Workshop on Water Education in Asia and the Pacific, Jakarta, Indonesia (Sep. 4-5, 2019, Tachikawa)

京都大学
KYOTO UNIVERSITY

UNESCO Chair on Water, Energy and Disaster Management (WENDI)

Higher Education and Research for Sustainable Development (HESD) Programme

Guideline of Registration for the Academic Year 2019

International Centre for Water Security and Sustainable Management (I-WSSM)

RESEARCH AND DEVELOPMENT

- Development of Education & Training Programme Modules

Capacity Building Programmes for the Improvement of Water Security in Asia

- Smart Water Management
- Nature-based Solutions
- Groundwater

EDUCATION & TRAINING PROGRAMMES

Training Programme for Smart Water Grid Operators (Nepal)

2019 Knowledge and Experience Sharing Programme of Korea's Water Resources for Central and South American Officials and IDB

2019 Workshop for Specialists on Smart Water management from Central Asia

UNESCO Workshop on Groundwater Management Issues and Solutions in Timor-Leste: Building Capacity for Sustainability

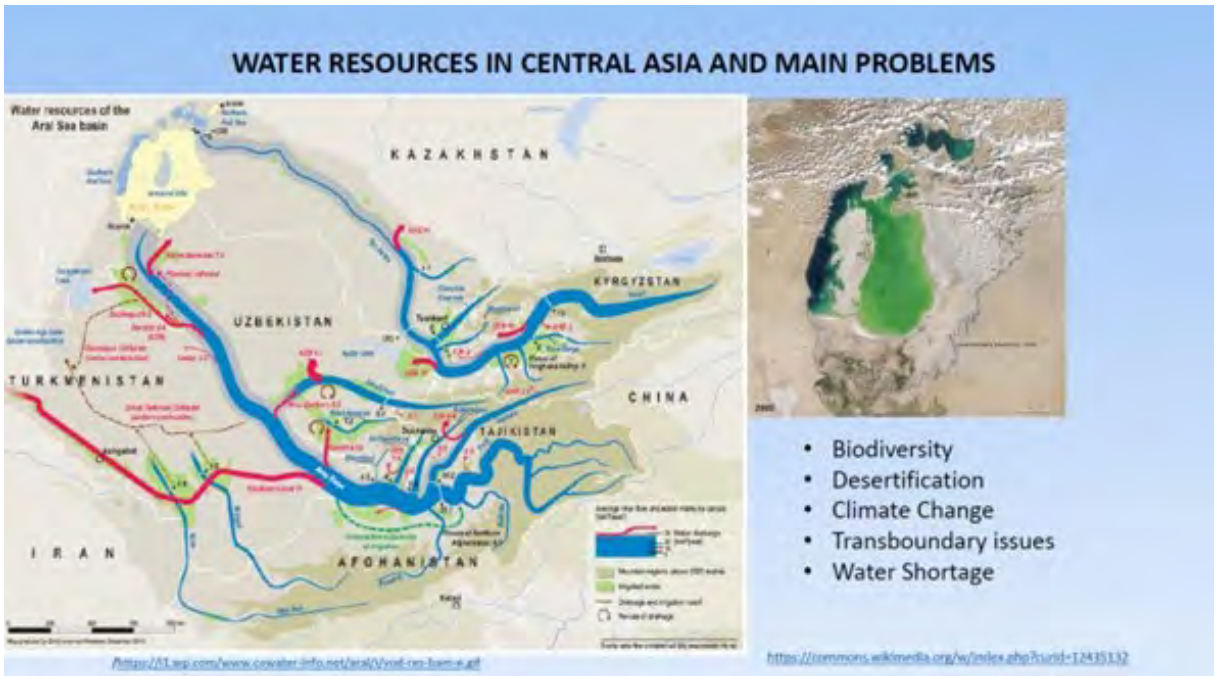
OUR PROGRESS IN FIGURES

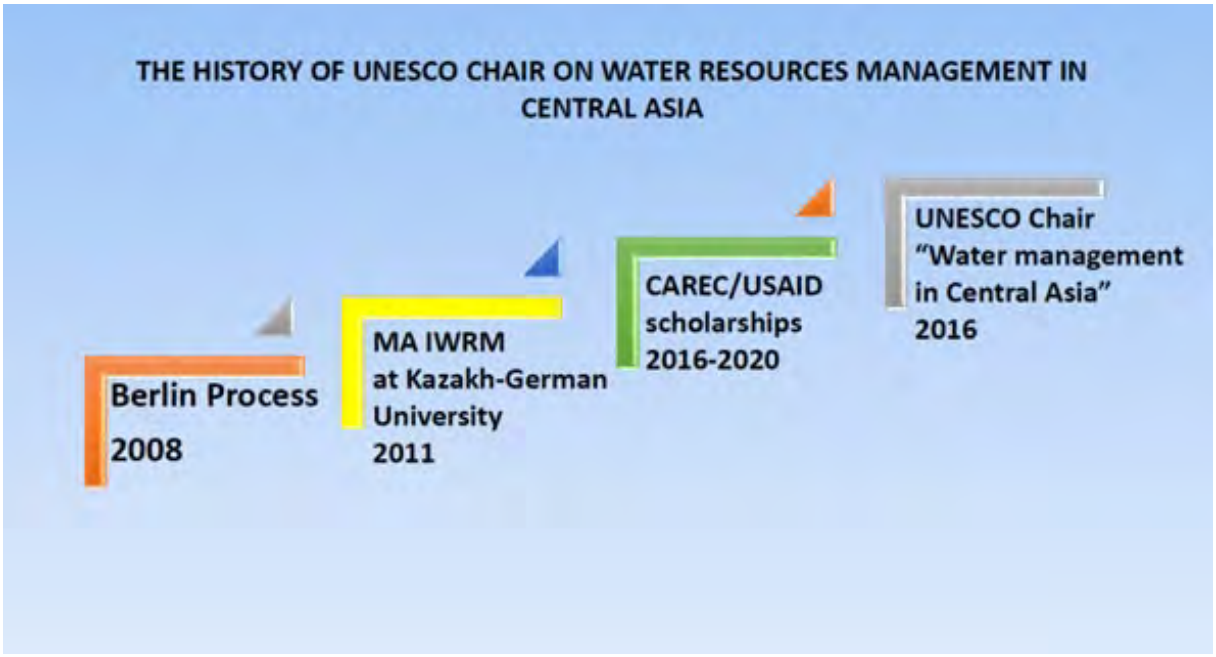
OUR GLOBAL NETWORK

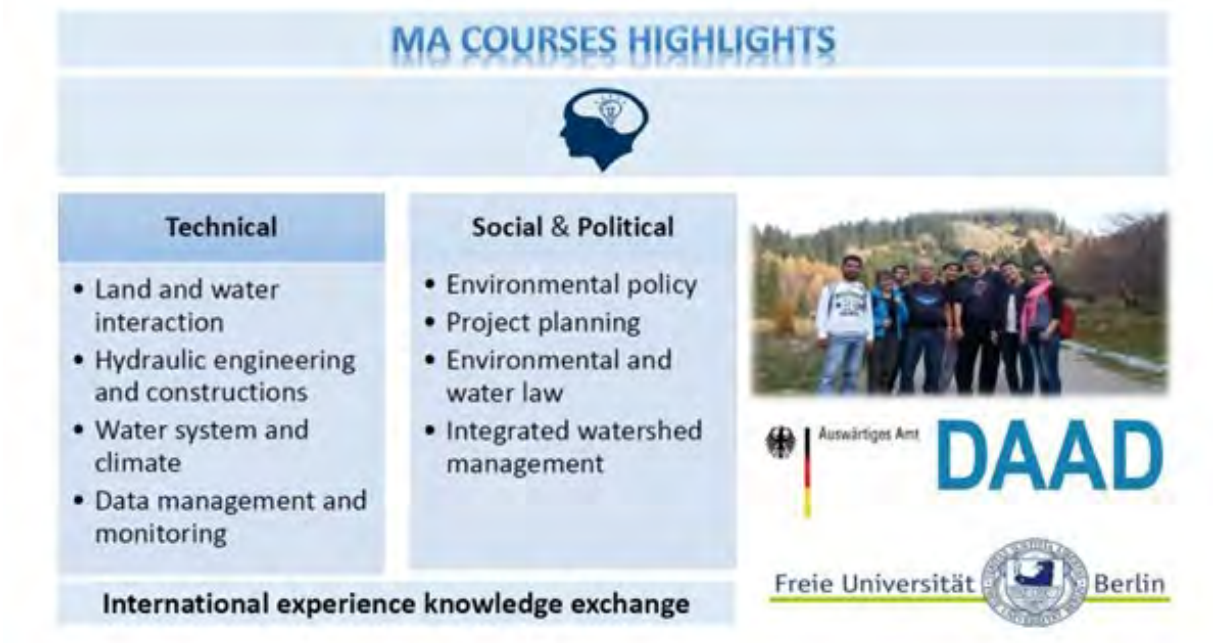

THANK YOU
KIM5625@UNESCO-IWSSM.ORG

UNESCO Chair on Water Resources Management in Central Asia in Kazakh-German University, Kazakhstan

Naypyidaw, Myanmar




THE HISTORY OF UNESCO CHAIR ON WATER RESOURCES MANAGEMENT IN CENTRAL ASIA
Berlin Process
2008
MA IWRM
at Kazakh-German
University
2011
CAREC/USAID
scholarships
2016-2020
UNESCO Chair
"Water management
in Central Asia"
2016


MA COURSES HIGHLIGHTS
Technical
• Land and water interaction
• Hydraulic engineering and constructions
• Water system and climate
• Data management and monitoring
Social & Political
• Environmental policy
• Project planning
• Environmental and water law
• Integrated watershed management
International experience knowledge exchange
Auswärtiges Amt
DAAD
Freie Universität Berlin

MA COURSES HIGHLIGHTS

Target groups

Young Professionals

Students

Teachers

Goal:

- support for the countries of Central Asia
- capacity building in IWRM for future

UNESCO CHAIR/IWRM CA: POLITICAL EMPOWERMENT

World Water Week, 2018

Central Asian Youth for Water - CAY4W
Summer school on Issyk-Kul lake, Kyrgyzstan

Dushanbe World Water Forum pre-conference event of civil society , 2018

Participation at the Youth Session, World Water Forum, Brazil 2018

UNESCO CHAIR/IWRM CA: FIELD EXPERIENCE

The youth scientific research expedition "From Glaciers to the Aral Sea", 2018

Educational trip to explore renewable energy best practices in Central Asia, 2018

UNESCO CHAIR/IWRM MA PROGRAM IN CA: CAPACITY BUILDING

Training for Young civil servants from Central Asia and Afghanistan

Water Contest in Central Asia, National level, Tajikistan

CAJWR

ELECTRONIC JOURNAL

Central Asia

Central Asian Journal of Water Research, open peer-reviewed interdisciplinary e-Journal

CAWa Summer school, "Methods and Tools for the Assessment and Monitoring of Central Asian Water and Land Resources"

UNESCO IN CENTRAL ASIA

Kazakhstan National Committee of UNESCO Programme "Man and Biosphere"

- UNESCO Chair for Sustainable Development in Al-Farabi Kazakh National University

IHP National Committees in Kazakhstan

- UNESCO Chair on Water Resources Management in Central Asia

Central Asian Regional Glaciological Centre Under The Auspices Of UNESCO (to be established)

Aral Sea basin: UNESCO Barsakelmes bio reserve park/Geopark

IHP National Committees in Kazakhstan, Kyrgyzstan and Uzbekistan

UNESCO Chair on Water Diplomacy, Water Resources Management and Environmental Protection, TIIAME (2018)

ARAL SEA BASIN: BARSAKELMES BIO RESERVE PARK/GEOPARK

ARAL SCIENTIFIC TOURISTIC CENTER ON KAMYSTYBAS LAKE

Aims of the project: Establishing "Aral" scientific touristic center with the facilities and resources for coordination of scientific research work on the territory of Kazakhstan part of the Aral Sea region and infrastructure for the development of the scientific and educational tourism.

Expected results:

Enhancement of the scientific research

Infrastructure of the designed region and surrounding territory was improved;

New workspaces were created;

Coordination of all types of researches of the Aral sea basin Kazakhstan part.

ANCIENT HERITAGE OF ASB HYPHEN GEOPARK?!

The East Aral and Syrdarya basins are the largest negative structures of the earth's crust in the southern part of Kazakhstan (South Kazakhstan and Kyzylorda oblasts).

These depressions are made of a thick sedimentary sequence of Mesozoic-Cenozoic deposits, to which deposits of hydrocarbons, coal, uranium, iron ores, phosphorites, building materials and groundwaters are confined.

In addition, unique locations of fossil flora and fauna of the Cretaceous-Paleogene age have been identified here

FIRST SUMMER SCHOOL IN THE ARAL SEA (AUGUST 10-18, 2019)

26 PARTICIPANTS FROM 9 COUNTRIES

- Jordan
- Germany
- Italy
- Afghanistan
- Kazakhstan
- Kyrgyzstan
- Tajikistan
- Turkmenistan
- Uzbekistan

DIRECTIONS

- Ecosystem based disaster risk reduction
- Conservation agriculture
- Energy: hydropower and bioenergy

8 INTERNATIONAL EXPERTS

- Kyoto University
- University of Wuerzburg
- World Bank
- Kazakh-German University

- GWP CACENA
- The International Fund for Saving the Aral Sea in the Republic of Uzbekistan
- The International Fund for Saving the Aral Sea in the Republic of Kazakhstan

Thank you!

janusz-pawletta@dku.kz

Water Diplomacy, Water Resources Management and Environmental Protection (WDWRMEP), Uzbekistan

INTERNATIONAL HYDROLOGICAL PROGRAMM

27th IHP Regional Steering Committee Meeting for Asia and the Pacific

28 October - 1 November 2019, Naypyidaw, Myanmar

Report of UNESCO Chair on «Water Diplomacy, Water Resources Management and Environmental Protection» at the Tashkent Institute of Irrigation and Agricultural Mechanization Engineers

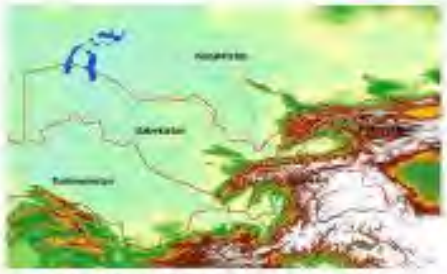
(TUC-WDWRMEP)

Outlines of TUC-WDWRMEP activities results for the first year

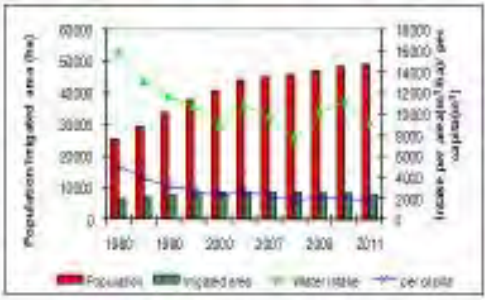
- Contemporary water challenges of the Aral Sea basin.
- The Tashkent Institute of Irrigation and Agricultural Mechanization Engineers (TIIAME).
- Establishment of the UNESCO Chair at TIIAME with support of UNESCO National Commission and partners– February 2018
- Goal, objectives and impact of the UNESCO Chair. Approval of TUC-WDWRMEP logo and Chair holder – November 2018.
- Report on TUC-WDWRMEP activities conducted for the first year

Contemporary water challenges of the region

- ✓ **Limited and uneven distributed of water resources;**
- ✓ **Decreased access to water** (Climate change, reduction of river runoff and increased frequency of extreme events)
- ✓ **land and ecosystems degradation** (~31% of irrigated lands waterlogged and salinized)
- ✓ **Increasing demands and competition for water resources** between:
  - agriculture,
  - energy
  - environment and etc.
- ✓ **Need for development of problem solving mechanisms**



Decreased access to water



The Tashkent Institute of Irrigation and Agricultural Mechanization Engineers (TIIAME)

- 1920 - Engineering-meliorative facultet within the Turkestan State University ;
- 1934 - Formation of the Tashkent Institute of Irrigation and Agricultural Mechanization (TIIAME).
  - Rapid development and establishment of one of the main centers of higher engineering education and science in the field of water and agriculture;
  - Widely known, more than 16,000 students were trained annually, including more than 2000 from Africa, Asia and Latin America;
- 2004 - New important stage of development (TIIM). Special attention of the government to water and environmental problems;
- 2017 - Transformation into TIIAME. Development of the Institute, focused on international standards.


AXBOROT RESURS
MARKAZI

Establishment of UNESCO Chair on Water Diplomacy, Water Resources Management and Environmental Protection at TIIAME (TUC-WDWRMEP)

•Proposal on TUC-WDWRMEP establishment - to stands for university twinning and networking scheme (February 2018);

•Functions:

- To build the capacities of higher education and research institutions.
- To foster collaboration among Higher Education, Research Community and UNESCO to achieve the SDGs.
- To act as "think tanks" and "bridge builders" between the academic world, civil society, local communities, research and policy-making;

• Activities:

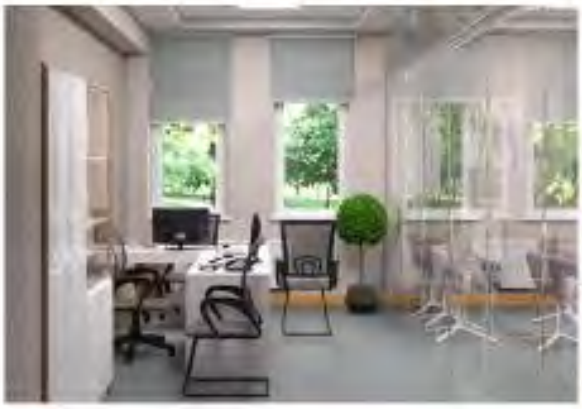
- Training, research and exchange of academics.
- Information sharing in the fields of WDWRMEP within the competence of UNESCO
- Interdisciplinary and Intersectoral collaboration

Approval of TUC-WDWRMEP (November 2018)

United Nations Educational, Scientific and Cultural Organization

UNESCO Chair on Water Diplomacy, Water Resources Management and Environmental Protection, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Tashkent, Uzbekistan

Office and negotiation room of the TUC-WDWRMEP



Laboratory of the TUC-WDWRMEP

Participation in Presentation of UN World Water Development Reports in Uzbekistan

- ✓ **Nature-Based Solutions for Water – UN WWDR 2018** within framework of International Conference in collaboration with UNESCO representation in Uzbekistan;

- ✓ **UN WWDR 2019 -Leaving no one behind-** to inform policy and decision-makers, inside and outside the water community

Organizing, Hosting and Participating in Regional Training Workshops on Water Cooperation in Central Asia

- ✓ **A regional training workshop on "Water Cooperation in Central Asia" on 20-22 November 2018 organized in collaboration with UNESCO IHP:**
  - SETTING THE SCENE AND STATUS OF COOPERATION ON WATER IN CENTRAL ASIA;
  - FOCUS ON NEGOTIATION
  - FOCUS ON TRANSBOUNDARY WATERS AND NEXUS
- ✓ **Participation in Water Initiative South and Central Asia 13 -14 December 2018, Astana, Kazakhstan**

-Research in cooperative water management:
-Challenges and opportunities for cooperative water management in Central and Southern Asia's transboundary river basins
-Exploring Research Opportunities to improve cooperative management of transboundary river basins

Training instructors

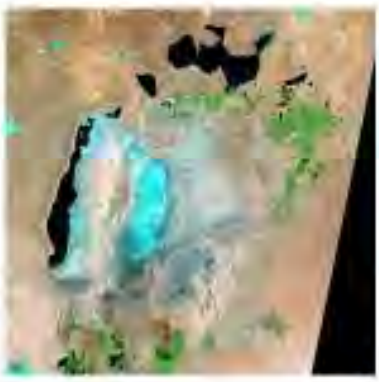
- Dr. Aaron Wolf, Oregon State University (OSU), USA
- Dr. Todd Jarvis, Oregon State University (OSU), USA
- Dr. Christian Brethaut, University of Geneva, Switzerland

New Graduate Degree Programs and International Summer Schools

- **New dual diploma MSc. Degree Programs:**
  - "Environmental Science and Engineering" (with Slovenian Nitra University);
  - "Water Quality Management" (with Michigan State University, USA).
- **International Summer Schools organized on:**
  - Water Resources Management: Integration of theory, practice and innovations. 2018 and 2019. Participants: Students of Kazakh-German University coming from countries o the region, Students from Russian Moscow Construction University and TIIAME student
  - Summer Scholl on Water-Energy-Food nexus for PhD students from 8 countries (in collaboration with German Agricultural Research Institute and IWMI)

New Membership and Planned Activities

- **TIIAME became member of the University Partnership on Water Cooperation and Diplomacy (UPWCD):**
- **Planned participation on the Symposium on Coping with Hydrological Extremes: Floods and Droughts during the 40th General Exhibition on 18th November and on the Digital Exhibition- Drought in the Anthropocene co-organized by UNESCO with NOAA and Grid Arendal.**



14

Global Runoff Data Centre (GRDC)

United Nations Educational, Scientific and Cultural Organization

International Hydrological Programme

World Meteorological Organization

Global Runoff Data Centre (GRDC)

Facilitator between Data Providers
and
Data Users

Ulrich Looser

Global Runoff Data Centre at the

Federal Institute of Hydrology (BfG) Koblenz, Germany

GRDC Main functions

Acquisition, harmonisation *and* ***storage*** *of global historical river discharge data and associated metadata*

Including data rescue

Dissemination of historical discharge data and derived data products of more than 9800 stations in 160 countries to science and research ("One-stop shop"; Data policy based on WMO Resolutions applicable)

Note:

GRDC does not have its own monitoring infrastructure and thus fully depends on the function of National Hydrological Services as reliable data providers

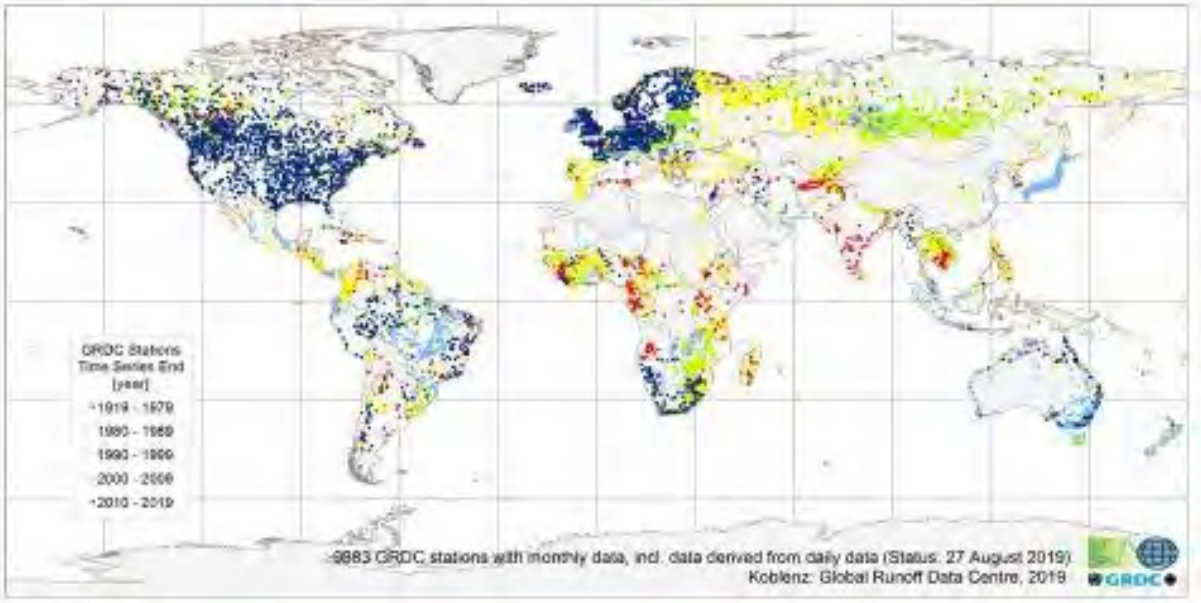
Ownership of data remains with original Data Provider (National Hydrological Services)

27th UNESCO-IHP RSC Meeting for Asia and Pacific, 29 - 31 October 2019, Nay Pyi Taw, Myanmar

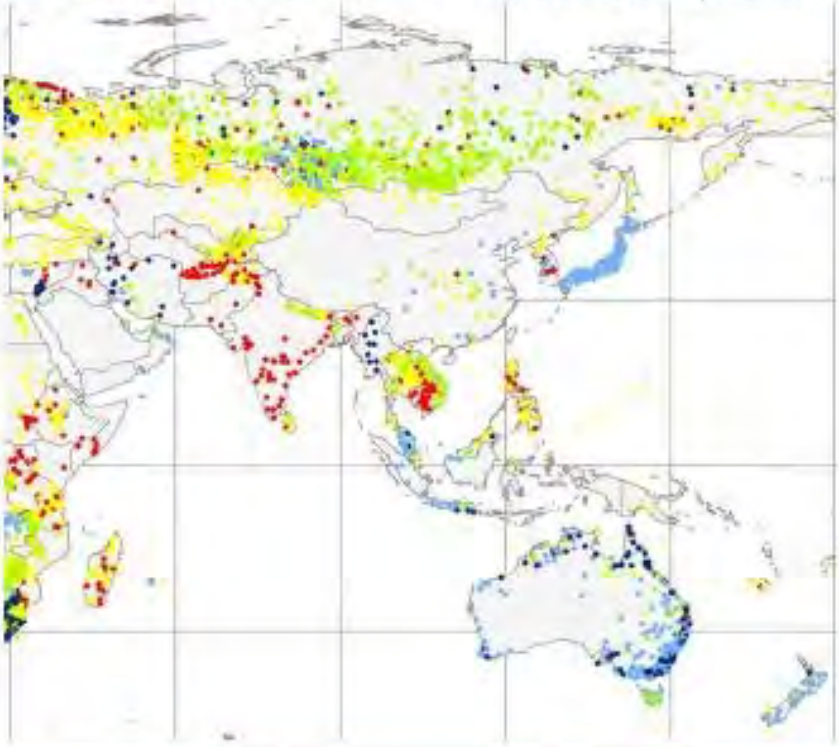
GRDC

Status of the Global Runoff Database

*Global Coverage of GRDC Stations indicated by **time series end***



Status of the Global Runoff Database (Asia/Pacific)



GRDC data providers 2019 (10 months)

Plus data delivered but not yet in database:
Greenland, Iceland, Norway, Sweden, Canada, USA, Eswatini, Mauritius, Latvia, Jamaica

GRDC Data Acquisition

GWSP WORLD BANK GROUP

GRDC Milestones
2019

Jun 2019

Eighteenth WMO Congress (Cg-18) endorses Manual, Matrix and Catalogue of the "High Quality Global Data Management Framework for Climate (HQ-GDMFC)"

GRDC was amongst the initial 18 global data centres/datasets that were successfully assessed and included in the WMO Catalogue for Climate Data.
https://climatedata-catalogue.wmo.int

June 2019

Eighteenth WMO Congress approves Resolution 25 (Cg-18) "Major hydrological Initiatives"

WMO Congress approves" ...the contributions of global data centres (GRDC, GPCC, IGRAC, HYDROLARE, federated under the Global Terrestrial Network – Hydrology (GTN-H)) are relevant for the GCOS Implementation Plan..."

GTN-H Coordination

- The **Global Terrestrial Network for Hydrology (GTN-H)** is a joint project of the World Meteorological Organization (WMO) and the Global Climate Observing System (GCOS)
- GTN-H is listed in several activities of the 2020-2022 GEO Work Programme.
- A **network of global data centres** working on freshwater issues
  - Support scientific advance and operational applications for climate variability/change, water resources assessment and management.
  - Support current and emerging technologies and available infrastructure. Sharing standards and best practices.
  - Develop integrative data products

International Centre for Water Resources and Global Change

ICWRGC

https://www.waterandchange.org/en/

Global water quality database

GEMStat

https://gemstat.org

...more than 30 years GRDC

Global Runoff Data Centre (GRDC)
Ulrich Looser (Head, Liaison, Data Acquisition)
Thomas de Couet (Requests & GIS Products)
Irina Dornblut (Data & Metadata QC, Website, Portal Development)
Thomas Recknagel (Product Development)

e-mail: grdc@bafg.de
web: http://grdc.bafg.de

Thank you for your attention!

ANNEX H - Catalogue of Hydrologic Analysis (CHA)

Catalogues of Hydrologic Analysis

The CHA 2nd Workshop

United Nations Educational, Scientific and Cultural Organization

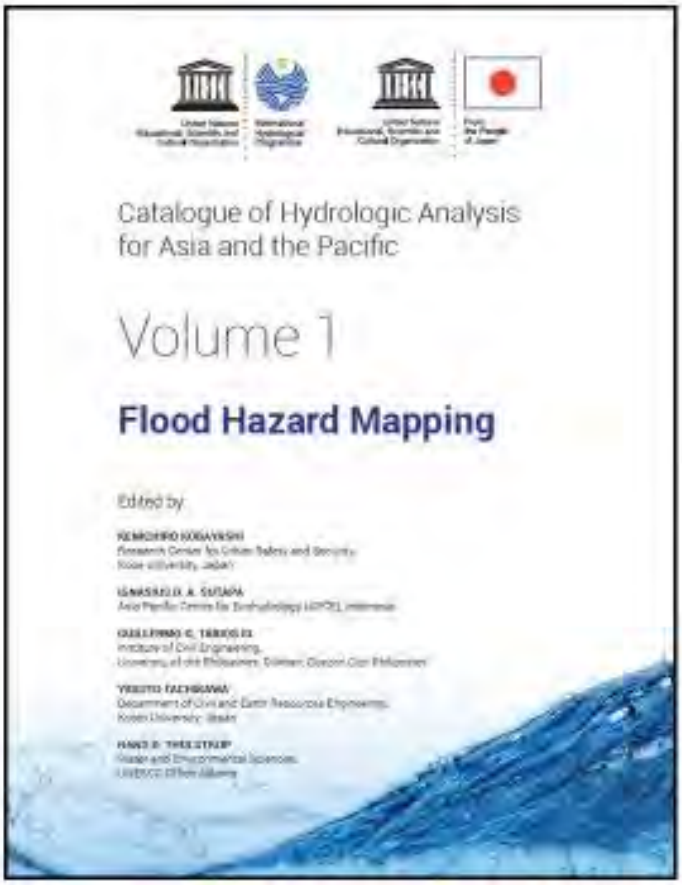
Japanese National Committee for the International Hydrological Programme

27th IHP Regional Steering Committee Meeting for Asia and the Pacific

29-31 October 2019, Nay Pyi Taw, Myanmar

Editorial Team for the 1st volume

● Editor in chief	Ken Kobayashi
● RSC chair	Ignasius Sutapa
● Former RSC chair	Guillermo Q. Tabios III
● RSC secretary	Yasuto Tachikawa
● RSC secretariat	Hans Thulstrup



- Indonesia
- Japan
- Korea
- Myanmar
- Philippine

New web page of RSC-AP

http://ihp-rscap.org

Long term CHA publication as a main activity of IHP RSC-AP

- Every two years, we will publish one volume of CHA under a leadership of RSC chair.
- Editorial team will be formed under a RSC chair.

Proposal of the Publication schedule for the volume 2

Activities from October 2019 to October 2021 for the CHA 2nd volume	
RSC in 2019	We will discuss the main theme of the CHA 2nd volume. Vol.1: Flood hazard mapping related to IHP-XIII THEME 1: water related disasters and hydrological changes Vol. 2: Topic related to THEME 3: Addressing water scarcity and quality
May in 2020	Decide the theme of the CHA 2nd volume by the task force under the new RSC Chair.
RSC in 2020	We will organize the 3rd CHA workshop to make a presentation by each country for the topic of the 2nd volume. We will form the editorial team under the new RSC Chair.
	Until the end of May, each country will submit documents.
RSC in 2021	The 4th CHA workshop will be organized to introduce the contends of the CHA 2nd volume; and discuss the contents of the 3rd volume.

Editorial Team for the 2nd volume

● Editor in chief	???
● RSC chair	???
● Former RSC chair	Ignasius Sutapa
● RSC secretary	Yasuto Tachikawa
● RSC secretariat	Hans Thulstrup

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