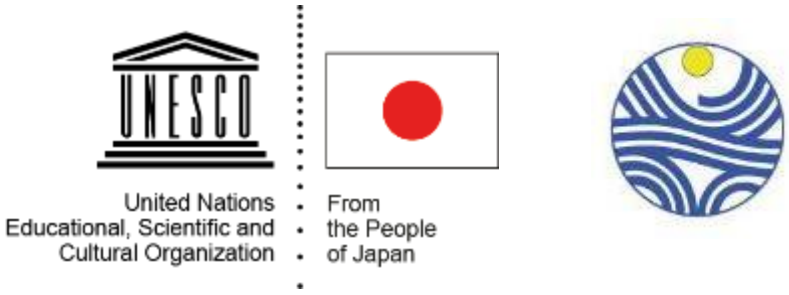


INTERNATIONAL HYDROLOGICAL PROGRAMME

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

Shanghai, China, 4-5 November 2018

(*draft*) FINAL REPORT

IHP-VIII │Regional Steering Committee Meeting │ No. 26
Regional Steering Committee for Asia and the Pacific

UNESCO Jakarta Office, 2018

Contents

The 26th IHP Regional Steering Committee Meeting for Asia and the Pacific (RSC–AP)

4-5 November 2018
Shanghai, China

Chair	Mr. Ignasius Sutapa (Indonesia)
Secretary	Mr. Yasuto Tachikawa (Japan)
UNESCO representative	Mr. Hans Thulstrup (Jakarta Office)
Countries represented	Afghanistan, Australia, China, Fiji, Indonesia, Iran, Japan, Korea, Lao PDR, Malaysia, Mongolia, Myanmar, Nepal, New Zealand, Philippines, Thailand, Timor Leste, Vietnam
Observing countries and organizations	Germany, Asia Pacific Centre for Ecohydrology (APCE) and Humid Tropics Centre Kuala Lumpur (HTCKL), International Centre for Water Hazards and Risk Management (ICHARM), International Centre for Water Resources and Global Change (ICWRGC) and Global Runoff Data Centre (GRDC), International Centre for Water Security and Sustainable Management (IWSSM), Regional Centre on Urban Water Management (RCUWM), Water, Energy and Disaster Management for Sustainable (WENDI)

(See **Annex A** for the list of participants)

1. Welcome and Opening Remarks

The Chair of the RSC, Mr. Sutapa, formally opened the meeting at 9 am, thanking and welcoming all participants. The Chair's welcoming remarks were followed with a speech by the President of Chinese National Committee for UNESCO-IHP, Mr. Cai Jianyuan, who is also the Director of the Hydrology Department, Ministry of Water Resources of the People's Republic of China.

Mr. Tachikawa and Mr. Thulstrup delivered opening remarks, thanking the host country, represented by Chinese National Committee for UNESCO-IHP, the main local organizer – the Shanghai Hydrology Administration - and all local partners for their contributions to the event. Mr. Thulstrup took note that the meeting was the first to follow the Committee's 2017 decision to expand its coverage to all of Asia and the Pacific for the first time, having served Southeast Asia and the Pacific for 25 years. Three countries from Central and South Asia - Afghanistan, Nepal, and Iran - were welcomed to the meeting for the first time.

2. Adoption of the Agenda

The agenda was presented by the Chair and adopted by the members with one modification – the deletion of the agenda item "Report from the 8th World Water Forum 2018". The revised agenda was adopted, and has been included as **Annex B** of this report.

3. Secretariat Reports

3.1 UNESCO Office Jakarta Report

Representing the RSC Secretariat, Mr. Thulstrup delivered a brief presentation outlining the action points from the 2017's RSC meeting, selected IHP activities implemented from November 2017 to October 2018, relevant publications, as well as upcoming activities planned by the Secretariat for 2018 & 2019.

The following summarizes key points from the presentation:

1. The circulation of the welcome message to all IHP National Committees and Focal Points in Asia and the Pacific region for their participation in the Committee was undertaken in March 2019.
2. UNESCO Office Jakarta coordinated a session on "Asia and the Pacific Ecosystems Theme" during the 8th World Water Forum 2018 in Brasilia, Brazil, with wide participation from the region.
3. UNESCO Office Jakarta contributed to a number of water-related events in the region, such as an International training course on coastal ecohydrology; Korea International Water Week; the regional strategic meeting on "Science to Enable and Empower Asia Pacific for Sustainable Development Goals"; World Water Day Celebration 2018; a training course on discharge and sediment transport assessment on Barito River, Banjarmasin, Indonesia; and activities towards raising public awareness on safe and accessible water in Timor-Leste.
4. The publication "Mobilizing *Science for Healthy Ecosystems",* was launched in the context of the 8th World Water Forum 2018.

The complete report is available in **Annex C** of this report.

3.2 Report of IGC Bureau

Mr. Tachikawa presented a short statement by Mr. Farhad Yazdandoost, the IHP Council Vice-Chair and Bureau member for Asia and the Pacific, summarizing the outcomes of the 23rd session of the Intergovernmental Council of the International Hydrological Programme (IHP) held at UNESCO Headquarters in Paris on 11-15 June 2018. A significant resolution adopted during the event was the change of the name of IHP from the "**International Hydrological Programme**" to the "**Intergovernmental Hydrological Programme**". By more explicitly reflecting the intergovernmental nature of the programme, noted Mr. Yazdandoost, the change will have implications on UNESCO member states' activities in the field of water by enhancing the visibility and recognition of the efforts by national IHP committees.

Other points made by Mr. Tachikawa during the presentation included:

1. Nomination of IHP-IX experts from AP region
2. Nomination of members for a Task Force on Publication on Water and Climate Change
3. IHP-WINS (Water Information Network System), an open-source and open-access platform that combines geo-localized data, developed by UNESCO's International Hydrological Programme to serve as a global reference in the design and support of

operations, management, and decision support functions for sound water resources governance. Further information about IHP-WINS is available at https://en.unesco.org/ihp-wins.

Please find a complete report of IGC Bureau in **Annex D**.

4. Country Reports

Each member country was invited to present their activities since the last RSC meeting for a maximum of five minutes. A short summary of the countries' presentations is provided below.

A compendium of complete country reports is presented as **Annex E** of this report.

4.1 Afghanistan

(Presented by Mr. Mohammad Qasim Seddiqy)

Mr. Seddiqy delivered a presentation focusing on climate and water resources status in Afghanistan, a study on precipitation distribution analysis and potential of runoff from glaciers over five river basins in the country.

The presentation was outlined as follows:

1. Introduction to meteorological history in Afghanistan
2. The current meteorological services in the country
3. Methodology for precipitation distribution analysis
4. Potential of runoff in five river basins
5. Glacier mapping and monitoring using Remote Sensing and GIS techniques.

4.2 Australia

(Presented by Mr. Ian White)

Mr. White highlighted Australia's contribution to the UN High-Level Panel on Water (HLPW) in 2018. The HLPW consists of 11 sitting Heads of State and Government and one Special Adviser, and has been convened to provide the leadership required to champion a comprehensive, inclusive and collaborative way of developing and managing water resources, and improving water and sanitation-related services.

He took note that Australia's appointment to the HLPW, co-convened by the United Nations and World Bank, has demonstrated the country's status as a leader in the sector and provides a platform from which to do even more. Australia has played a leading role in many specific HLPW initiatives on data, water use efficiency and innovation, highlighting its recognised global expertise in these critical fields.

The Australian IHP Committee have contributed to the following events:

- Engineers Australia and NCCARF Climate Adaptation 2018, Melbourne, 7-10 May 2018
- Asia Oceania Geoscience Society 15th Annual Meeting, Honolulu, 3-8 June 2018
- First International Meeting on Water Security, Toronto, 17-20 June 2018
- 45th International Association of Hydrogeologists Congress, Daejeon, 9-14 September 2018

- International Workshop of the Global Dryland Ecosystem Program, Beijing, 21-26 October 2018.

4.3 China

(Presented by Mr. Zhongbo Yu)

The presentation provided updates on the following topics:

1. UNESCO-IHP, Outreach & Communication Committee, covering a brief history of the establishment of the Committee by the IHP Council in 2014, as well as the implementation of a communication and outreach strategy, and the achievements of the Committee in last two years.
2. Global change challenges: water security and sustainability.
3. The 26th RSC meeting, including the preparation of the meeting since the last meeting in the Philippines.
4. FRIEND conference. Points discussed covered the preparation of the meeting - a back-to-back event with the RSC meeting held in Beijing with the full engagement of the Chinese IHP National Committee.
5. Funding opportunities and research projects relating to the "Belt and Road (B&R)", an initiative announced by the President of China. A component on Global Energy and Water Cycle Experiment contributes vastly to the success of the initiative, due to the importance of water security and sustainability which are closely linked with regional and international security, peace and stability. In conclusion, he recommended that research on these issues be highly regarded in the B&R implementation.

4.4 Indonesia

(*Presented by Mr. Fauzan Ali*)

The first part of the presentation focused on water resources issues in Indonesia including water resources condition, the utilization of water resources, and national policies on water resources. Mr. Ali further expressed the history and purpose of the establishment of the Indonesian National Committee for IHP, with an update on the newly-designed structure of the body.

Addressing the six themes and focal areas of IHP-VIII, Mr. Ali outlined detailed activities implemented between 2017 and 2018. Among others, he highlighted the following activities:

1. **Theme 1**: Ministry of Public Works and Public Housing is constructing two dams to control flooding in DKI Jakarta i.e., Ciawi Dam and Sukamahi Dam.
2. **Theme 2**: The Geology and Mineral Resources Agency constructed the artificial wells to provide a water supply for people living in water-scarce areas throughout Indonesia. As of October 2018, 138 boreholes have been constructed in over 111 districts/cities by the agency.
3. **Theme 3**: Revitalization of Muara Sanur Dam in 2017 in restoring the function of the reservoir for water supply in Kuta District
4. **Theme 4**: The Directorate General of Human Settlements, Ministry of Public Works and Housings conducts slum settlement programs, such as KOTAKU (KOta TAnpa KUmuh) Programme
5. **Theme 5**: Development and Application of Ecotechnology for Environmental and Freshwater Ecosystem Improvements in Saguling Reservoir Demosite.
6. **Theme 6:** Conducting a cleaning programme at Cibinong Lake and colouring contest for students in kindergarten and elementary school in the framework of the world water day 2018.

Future activities of Indonesia IHP were also presented, as follows:

1. Strengthen the networking with centres under UNESCO, universities, other institutions
2. Develop demonstration sites for selected and specific purpose, such as small island, karstic, ecohydrolody and Peatland demonstration sites.
3. Promote joint activities related to:
    a. Sustainable water management for developing resilient cities;
    b. Ecohydrology for water security in urban and rural areas;
    c. Development of appropriate technologies for water security in marginal areas;
    d. Strengthening water management capacity for local communities;
4. Periodic meeting with IHP members.
5. Attend the next RSC IHP Meeting in Myanmar.
6. Attend the IGC of IHP in Paris in 2019.
7. World Water Day celebration in March 2019.

4.5 Iran

(Presented by Mr. Ali Chavoshian)

Mr. Chavoshian began the report of the Iranian National Committee for IHP by outlining the Committee's composition. Corresponding to the six themes of the IHP-VIII, Mr. Chavoshian then presented in further detail activities implemented by Iranian entities as follows:

1. **Theme 1:** Update on Integrated Drought Monitoring/Prediction System in West and Central Asia.
2. **Theme 2:** Activities implemented by the International Centre for Qantas and Hydraulics Structure (ICQHS), as well as a pilot project on shared groundwater resources and conflict management.
3. **Theme 3 and Theme 4:** The organization of the 8th Asian G-WADI meeting and the 2nd International Drought Initiative expert group meeting in Mashhad, Iran.
4. **Them 5:** Tehran River Restoration and Improvement Plan, received an award of International Society of City and Regional Planners (ISOCARP) Awards for Excellence in 2017.
5. **Theme 6:** Between October 2017 and October 2018, a number of workshops (11), training courses (4), conferences (2) and exhibitions (1) have been organized in the country with a total participation of 7,830 people.

4.6 Japan

(*Presented by Mr. Yasuto Tachikawa*)

Mr. Tachikawa presented the current members (as of October 2018) of the Japanese National Committee for IHP, which consists of 13 academics representing different universities, as well as a representative of ICHARM, the Research Institute for Humanity and Nature, and the Water and Disaster Management Bureau of Ministry of Land, Infrastructure, Transport and Tourism, respectively. The Committee is chaired by Mr. Tachikawa.

The summary of updated activities is highlighted below:

1. Research on Integrated Research Program for Advancing Climate Models: MEXT TOUGOU Project (2017-2021)
2. The establishment of Kyoto UNESCO Chair on Water, Energy and Disaster Management for Sustainable Development (KUC-WENDI)

3. The 27th IHP Training Course on "Integrated Basin Management under Changing Climate", at DPRI Kyoto University during, from 4 December to 15 December 2017.
4. The 28th IHP Training Course on "Integrated Basin Management under Changing Climate" at DPRI Kyoto University between 28 November and 7 December 2018.

4.7 Korea

(Presented by Mr. Joo-Heon Lee)

Following a reshuffle in May 2018, the composition of the IHP National Committee has new management. The newly appointed Co-Chairs (Mr. Ha-Joon Park and Dr. Sung Kim) and the Vice-Chair (Mr. Joo-Heon Lee) will manage the Committee. New institutional members joining the Committee are the Ministry of Foreign Affairs and the Korea Forestry Service, the Korea Institute of Hydrological Survey, i-WSSM – a UNESCO Cat II Centre, and the Korea Water Forum.

Below are the highlighted activities implemented and coordinated by the Korean National Committee (KNC) for IHP:

1. Participation in the 23rd IHP Inter-Governmental Council during 11-15 June 2018 in Paris, France.
2. Regular participation the IHP Regional Steering Committee, Workshops and Working Group.
3. Korea International Water Week (KIWW 2018) during 12-15 September 2018, jointly organized with Korea Water Forum, Ministry of Environment, and K-Water.
4. Korea Water Resources Association (KWRA) annual conference in May 2018 in cooperation with partner association from Japan, China, Vietnam and New Zealand.

For future activities, the KNC will conduct the following activities:

1. The Korea Water Resources Association (KWRA) will carry out the second half of the research projects (2018-2021) on the IHP Phase 8 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).
2. Regular meetings will be organized and diverse activities will be discussed by the KNC.

4.8 Lao PDR

(Presented by Mr. Inthavy Akkharath)

Mr. Akkharath presented the status of water resources in Lao PDR in recent years. The presentation covered the utilization of water resources, accessibility to sanitation and water supply in the country, and the Integrated Water Resource Management approach (progress, challenges and achievements).

A concept called the Natural Resources and Environment Sector Vision towards 2030 was presented in dealing with the problems and challenges related to water resources. River Basin Management Strategy 2030 represented a significant element in this concept. The strategy was detailed in seven programmes, as follows:

1. Improvement of coordination mechanisms
2. Establish legislation for implementing river basin management
3. Develop River Basin Management
4. Establish a sustainable financial mechanism
5. Water Resources Data Information System and Management
6. Strengthen human resource capacity in water resources sector at all levels
7. Promote public awareness, genders and stakeholder participation in river basin management

4.9 Malaysia

(Presented by Mr. Abdullah bin Isnin)

The presentation focused on activities implemented by the Malaysian IHP in 2018, as follows:

1. National special water caring youth leaders camp for primary school children conducted on 7 March 2018 in Putrajaya
2. Technical talk on basic principles of isotope hydrology and application
3. National World Water Day Celebration in Kuala Kangsar, Perak on 24 March 2018
4. National Water Resources Expedition in Sungai Sedim, Kedah during 4-6 August 2018
5. Young Environmentalist Camp in Universiti Malaysia Perlis on 3-4 October 2018
6. H2O QUEST 2018 at Taman Wetland in Putra Jaya on 13 October 2018.

4.10 Mongolia

(*Presented by Ms. Nergui Chimeddulam*)

Ms. Chimeddulam provided updates on IHP-related activities undertaken in Mongolia in 2017 and 2018.

1. A celebration of 80th anniversary of Mongolia's water sector.
2. A five-year project, worth USD 350 million, signed between Mongolia and the USA for implementation between 2019 and 2023. The project covers the instalment of equipment to increase underground water reserves, the building of water recycling facilities for using grey water, and improvements of the legal environment regarding the water sector.
3. The establishment of River Basin Councils.
4. World Water Day Celebration 2018.

Ms. Chimeddulam also briefed the meeting on two new publications developed and produced in Mongolia, as follows:

1. A book with the title "Water is the key to development" was developed, published and disseminated in the scope of the Jubilee meeting.
2. A children's comic book "Bombooloi saved the river" was developed, published and disseminated to schools and kindergartens.

4.11 Myanmar

(Presented by Mr. Than Zaw)

Mr. Zaw presented the national report on IHP related activities in Myanmar between October 2017 and October 2018. Details were provided as follows.

Activities undertaken include:

1. Meeting of the IHP National Committee, including decisions regarding the composition of the IHP National Committee as well as the status of IHP-VIII activities, such as Developing the Operational Flood Forecasting Model (HEC-HMS) for the Ayeyarwady River and Sittoung River Basins.
2. Activities at the national level in the framework of IHP, such as a training on HEC RAS Modeling, Development and Implementation of Myanmar Flash Flood Guidance System, and Hazard Modeling Training organized by DMH, ADB and Climate Hazard Project Team
3. Educational and training courses, including Hydrological Grade I and Grade II training.
4. Participation in international scientific meetings and other activities at the regional level such as the 20th and the 21st National Monsoon Forum, held in Nay Pyi Taw in May and October 2018 respectively.

Planned activities for 2019:

1. The Myanmar IHP National Committee (MNC-IHP) will continue to encourage scientific and technical symposia and workshops.
2. Hydrological division try to monitor the river flow at some hydrological stations in order to modify the existing rating table at the respective station.
3. The MNC-IHP will try to implement the water-related activities in line with the themes of IHP.
4. Members of MNC-IHP will host the 2019's Regional Steering Committee for Asia and the Pacific..
5. Members of MNC-IHP will participate in the international and national activities of IHP.
6. The Hydrological Division of DMH will upgrade the flood early warning system and flood monitoring system.
7. The Remote Sensing and GIS Division of DMH will produce flood risk maps and flood assessment maps to reduce the loss of life and property.

4.12 Nepal

(*Presented by Mr. Bikram Shrestha Zoowa*)

The presentation of Nepal covered three major points: IHP-Nepal Special Committee, perspectives on water resources development, and a roadmap for future action. More detailed information is presented below.

IHP-Nepal Special committee updated the participation of the Committee members at the following events:

1. Workshop on "Climate Change and Water Resources of Kathmandu Valley" 5 April 2018 in Kathmandu, Nepal.
2. Workshop conducted on "Water Resource Management in Federal Nepal: Potential Conflict to Potential Cooperation" in February 2017 in Kathmandu, Nepal.

Perspectives on water resources development included information on the development strategy of water resources in Nepal's Federal System, as well as the current status of water resources, energy, irrigation and climate in the country. Responding to the current status of resources, a future roadmap called "The decadal plan on Energy and Water Resource (2018-2027)" was envisaged by the government, incorporating national water policy, multipurpose water project plans, groundwater conservation and regulation, and institutional frameworks at all levels, transboundary issues of water resources, modality of water allocation, technologies development, lift irrigation, capacity building measures, hydrological and meteorological network, research work, effective early warning system, and strategic and implementation planning.

4.13 New Zealand

(*Presented by Mr. Dennis Jamieson*)

The presentation focused on activities undertaken during October 2017 and October 2018:

1. Meeting of the IHP National Committee:
   a. The composition of the IHP National Committee.
   b. Status of IHP activities including the projects that will continue to receive funding such as Information on New Zealand's Freshwater: Water Resources Archive; Land Use Intensification: Sustainable Management of Water Quality and Quantity; and Reducing the Impacts of Weather-Related Hazards.
   c. Decision regarding contributions to and participation in IHP-VIII.
2. Activities at the national level in the framework of IHP, including national/local scientific and technical meetings, participation in IHP Steering Committee Working Groups, and collaboration with other national and international organizations and/or programmes such as Republic of Korea Water Resources Association (KWRA) – collaborative research strategy with NZ Hydrological Society (NZHS).
3. Education and training courses, including the organization of specific courses of the National Institute of Water and Atmospheric Research (NIWA).
4. Participation in international scientific meetings.
5. Publications:
   - The "Climate Update" monthly bulletin (http://www.niwa.co.nz/climate/publications)
   - The "Island Climate Update" (ICU) monthly bulletin (http://www.niwa.co.nz/climate/publications)
   - "Freshwater and Estuaries Update" bulletin (http://www.niwa.co.nz/freshwater-and-estuaries/freshwater-and-estuaries-update)

Future activities:

1. Activities foreseen until December 2018:
   - The annual conference of the NZ Hydrological Society to be held in Christchurch NZ in December 2018.
2. Activities planned for 2019:
   - A range of training courses will be offered by NIWA (the National Institute of Water and Atmospheric Research).
3. Activities envisaged in the long-term:
   Continuation of:
   a. Greater opportunities for partners in the Pacific, with increased NGO engagement.
   b. NZAID funded Pacific Hydrological Training Programmes as required.
   c. NZAID funded monthly "Island Climate Update" publication with stronger links to end users.
   d. Monthly NZ "Climate Update" and "Climate Outlook" (web) publications.
   e. Quarterly "Fresh Water and estuaries Update" (web) publication.

4.14 The Philippines

(*Presented by Mr. Guillermo III Tabios*)

Mr. Tabios provided an update on membership of the Philippine National Committee for IHP. The Committee now comprises 22 entities including universities, national centres, and departments as well as non-government water-related organizations - some of which are among the most active members.

Reporting on activities implemented across the country during October 2017 – October 2018, Mr. Tabios highlighted the following:

1. Water and Climate Development Programme (WACDEP)
    - Consultation on the results of a Gap Assessment of Philippine policies and programs on flood management.
2. 2018 World Water Day in the Philippines
    - The 2018 World Water Day and Water Week 2018 celebration in the Philippines was held from March 15 to 22, 2018 under the theme “Nature for Water”.
3. Launching of the Wetlands Bioblitz Program
    - The launch of the Wetlands Bioblitz Program at Panguil River Ecotourism Park took place on 16 March 2018
4. NWRB, Nangangalaga ng Water Resources ng Bansa, an Educational Campaign
    - An Information, Education and Communication (IEC) Campaign organized by the National Water Resources Board (NWRB) and the PWP on 19 March 2018 in Nagcarlan, Laguna Lake.
5. Preparation for the 4th International River Summit to be held on 22-24 November 2018 in Cebu.

Participation of Philippine National Committee for IHP in Steering Committees and Working Groups is summarized below:

1. The 25th Regional Steering Committee Meeting of the UNESCO International Hydrological Programme for Asia and Pacific (UNESCO-IHP AP) and the Joint UNESCO-JASTIP International Conference at Quezon City, Metro Manila, 13-16 November 2017.
2. Regional Shared Vision Planning and Collaborative Modelling Training on 23-24 October 2018, Vientiane - Lao PDR.
3. Pre-Steering Committee Meeting on 22 October 2018, Vientiane - Lao PDR.
4. The 2nd WACDEP Regional Workshop, on 18-19 July 2018, Ho Chi Minh City, Viet Nam
5. National Watershed Conference on 26 March 2018.
6. Financial Training in Yogyakarta, Indonesia on 27-28 February 2018.
7. WACDEP Regional Workshop on 7-8 December 2017, Bangkok, Thailand.
8. Consultation-Workshop on the preparation of the Philippine National Report on the implementation of RAMSAR Convention on 1 December 2017.

4.15 Thailand

(*Presented by Mr. Somphop Intaraksa*)

The report of the Thai National Committee for IHP highlighted the following:

1. Activities at the national level in the framework of the IHP:

- The 23rd Session of the IHP Intergovernmental Council: IHP-IC-XXIII on 11-15 June 2018 in Paris, France.
- The 25th RSC and associated conference on 13-15 November 2017, in Manila, Philippines

2. Supported research/applied projects, corresponding to the six themes of IHP VIII**:**
   - Theme 1 Water Related Disasters and Hydrological Changes (10 projects)
   - Theme 2 Groundwater in a Changing Environment (7 projects)
   - Theme 3 Addressing Water Scarcity and Quality (7 projects)
   - Theme 6 Water Education Key, for Water Security (3 projects)
3. Participation in international scientific meetings and projects:
   - Thailand Country Report "Public Policy" at the International Conference on Water Demand Management among Competing Sectors in Bangkok, Thailand
   - Mekong River Commission Preparatory Meeting of the Joint Committee for the 24th Meeting of the MRC Council, 28 November 2017 in Thailand.
   - The 3rd Asia-Pacific Water Summit (3rd APWS) on 11-12 December 2017 in Myanmar.
   - The 5th Green Mekong Forum (Water Resources Management and Disaster Risk Reduction) on 12 February 2018 in Thailand.
   - Typhoon Committee 50th Session (TC 50th) on 25 February - 4 March 2018 in Vietnam.
   - The 8th World Water Forum during 18-23 March 2018 in Brasilia, Brazil.
   - The 3rd Mekong River Commission Summit and International Conference on 2-5 April 2018 in Cambodia.
   - The 4th International Conference "Water Resources and Wetlands" on 6-8 September 2018 in Romania.
   - ESCAP/WMO Panel of Tropical Cyclones 45th Session (PTC 45th) during 23-27 September 2018 in Oman.
   - The 10th Mekong – Japan Summit on 8-9 October 2018 in Japan.
4. Future activities
   - Continuation of collaboration with RSC-IHP for Asia and the Pacific.
   - Enhancing activities contributed to IHP-VIII.
   - Enhancing activities on flood and drought management.
   - Continuation of the promotion of integrated water resources management.
   - 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.

4.16 Timor Leste

(*Presented by Mr. Osorio Belo da Piadade*)

The presentation addressed water resources conditions in Timor-Leste and included a case study. The report outlined the characteristics of Timor Leste, including climate and a study on dye tracing. The condition of hydrology and geology in the country was briefly presented. Timor-Leste's groundwater hydrology is closely linked with the study conducted in Bacau District and Atauro Island. Under the dye tracing study, laboratory analysis was carried out on samples taken from Baucau Limestone. The results revealed the flow and direction of groundwater movement around the research locations.

4.17 Vietnam

(*Presented by Ms. Thi Lan Huong Huynh*)

Ms. Huynh summarized the undertaken and planned IHP-related activities Vietnam. Details are provided below.

Activities undertaken:

1. National/local scientific and technical meetings:
   - Close coordination with water-related organizations within relevant line ministries such as the Ministry of Natural Resources and Environment, Ministry of Agriculture and Rural Development, Ministry of Construction, and the Ministry of Transportation.
   - Meetings with professional societies, particularly the Vietnam Panel on Climate Change, Vietnam Fluid Mechanics Society, and Vietnam Geography Society.
   - Regular meetings amongst the Chair and Members of the IHP National Committee to discuss IHP activities and other related matters.
   - Organization of a training course on applying and using flash flood warning systems to develop flash flood risk maps.
2. Research/applied projects supported or sponsored:
   - Finalized the Project on “Developing of Flash Flood Risk Maps to 19 provinces in Central and Central Highland of Vietnam”.
   - Other projects are ongoing or have just been implemented on issues such as the updating of climate change scenarios for Vietnam, developing the national climate assessment, developing a project of climate adaptation and sustainable development for the central Vietnam, conducting a study on water security and assessment of groundwater (especially on saline intrusion).
   - Submission to the Vietnam Ministry of Science and Technology a national project with the title: "Combining top-down and bottom-up approaches in assessing water resources risks due to changes in hydrological systems”.
3. Cooperation with international/regional water centres under the auspices of UNESCO:
   - Worked closely with the International Center for Water Hazard and Risk Management (ICHARM) from Japan and the Institute of Technology Bandung from Indonesia to submit a joint project proposal within the e-Asia "Disaster Risk Reduction and Management" platform.
4. Publications:
   - Published a special issue on the IHP-VIII and researches under the IHP-VIII themes: A special issue on UNESCO’s IHP in Journal of Climate Change Science, No.3-2017, Ha Noi, Viet Nam.

Future Activities

1. Activities planned for 2019-2020
   - Corresponding towards the goal of IHP-VIII period 2014-2021, IHP Vietnam is focusing planned activities on the following issues:
     (i) Water resources security; water for sustainable cities; disaster preparedness for schools and communities; sustainable water resources management; effective management of rivers, national aquifers and transboundary aquifers; and raising awareness of climate change at all levels.
     (ii) Water, energy and food nexus to improve the capacity of integrated water resources management.
     (iii) Propagate and disseminate themes of the eighth phase of UNESCO-IHP activities to relevant agencies and schools.
   - Participate in the IHP Asia-Pacific activities and contribute to Annual Scientific Conferences and Workshops.

- Propose the RSC Committee to organize the 28th IHP-RSC meeting in Vietnam in 2020.

2. Activities envisaged in the long-term

   - Enhance activities that contribute to IHP-VIII, with focus on water security and scarcity in Vietnam.
   - Upgrade flash flood warning systems and develop detail flood forecasting maps for Vietnam.
   - Transfer technology and undertake training courses in hydrology and water resources.

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

Six water-related UNESCO Category 2 Centres and one water-related Chair took part and reported their activities to the meeting. While the complete reports of these organizations are available in **Annex F** of this report, brief summaries of the presentations are outlined below.

5.1 Asia Pacific Centre for Ecohydrology (APCE)

(*Presented by Mr. Ignasius D.A. Sutapa*)

The first part of the presentation consisted of information on background, formation, management, and 2017-2012 roadmap of the organization. APCE's workplan (including the undertaken and future activities) and its contribution to the implementation of SDGs made up the second part of the presentation.

Activities implemented as a contribution towards the 2030 Agenda and the Sustainable Development Goals (SDG) are outlined below.

1. SDG #6:
   - Advanced development of Ecohydrology Demosite in Saguling Reservoir
   - Symposium and Scientific Advisory Committee of Ecohydrology, 27 February–1 March 2018, in Faro, Portugal
   - UNESCO IGC IHP, Paris, 10–16 June 2018
   - International Symposium and Inaugural of Kyoto University Chair of WENDI, 29 July-1 August 2018
   - A visit to State Key Laboratory of Hohai University, Nanjing, August 29 2018
2. SDG #11:
   - Consultation Workshop And Training On Water And Urban Initiative Case Study In Jakarta, Indonesia (Water Quality, Wastewater management, flood risk management)
3. SDG #13:
   - A preliminary study to construct an Ecohydrology Demosite in the arid zone
   - Workshop "Initiation of the Ecohydrology demosite development in arid zone in Timor Tengah Utara, East Nusa Tenggara
   - International Training Course on Coastal Ecohydrology Yogyakarta – Indonesia, 6–10 August 2018
4. SDG #15:
   - Focus Group Discussion (FGD) on "Implementation of the ecohydrological concept for sustainable management of peatland, arid zones and Subak irrigation system"

- A joint collaborative research program focused on ecohydrology in peatland with National Peatland Restoration Agency.

Providing an update of the results of APCE's periodic review and evaluation in 2017, Mr. Sutapa reported that the status of the organization as a UNESCO Category II Centre has been extended for the next 6 years.

5.2 Humid Tropics Centre Kuala Lumpur (HTCKL)

(*Presented by Ms. Rohani Ahmad*)

Ms. Ahmad delivered a presentation outlining the activities undertaken by the centre - including participation in seminars, workshops, training, meetings, research, as well as updates on publications and future programmes.

1. International Workshop/Seminar:
   - Disaster Management Course in Taiwan.
   - International Symposium for Official Launch of UNESCO Chair WENDI, Kyoto Japan
   - Korea International Water Week 2018 (KIWW) in Daegu, Republic of Korea.
   - International Training Course on Coastal Ecohydrology in Yogyakarta, Indonesia.
   - Periodic Review and Evaluation Meeting for Category 2 Institutes and Centres.
   - 25th Regional Steering Committee meeting UNESCO-IHP Asia and the Pacific, Manila, Philippines.
   - 23rd Session of the IHP Intergovernmental Council UNESCO in France.
   - 3rd Istanbul International Invention Fair – ISIF 2018, ICEC, Turkey.
   - Expert Meeting on Establishment of a Regional Platform on Member States' SETI Capacity in Jakarta, Indonesia.
2. Activities at the national level:
   - Malaysia World Water Day 2018 (WWD 2018) in Kuala Kangsar, Perak.
   - Malaysia UNESCO Day in Ipoh, Perak.
   - The Potential of Groundwater in Malaysia's Resilient Urban Future at Heriot-Watt University.
   - Regional Workshop: Pathway Towards Improved Water Education Curricula. Penang.
   - Ekspedisi Sumber Air Negara 2018 programme in Kedah, Malaysia.
   - Soft Launching Mobile Flood Wall Barrier (MFWB) NAHRIM-DID at SK Kajang, Selangor.
3. Research activities:
   - Debris Mud Flow Warning System.
   - Mobile Flood Wall Barrier (MFWB).
   - Biodiversity Flow at Jenderam River, a tributary of Sg Langat (subject to budget availability).
   - Biodiversity Flow at Tasik (lake) Chini.
   - Development of Soil Water Index (SWI) for Highland Areas.
4. Publications:
   - Journal of Water Resources Management.
   - Water Management Curricula & Customising IWRM.
   - Technical report on Artificial Bio-Macropore for Enhancing Soil Infiltrability for Urban Catchment.
   - Technical report on Study on River Water Quality Treatment Using Phytoremediation Technique.
5. Future programme:
   - Memorandum of Agreement between Government of Malaysia and UNESCO.

- Dissemination of Modular Curricula to UNESCO Water Centres and the UNESCO Water Family.
- Training on Urban Stormwater Management (MSMA) for Ethiopia.
- Re-Engineering Program for Malaysia Water Security Project.
- Workshop on Water Security – 27-28 Feb 2019; invitation to UNESCO Institutes & Water Centres, Higher Learning Institutions & Stakeholders.

5.3 International Centre for Water Hazard and Risk Management (ICHARM)
(*Presented by Mr. Mamoru Miyamoto*)

The report recalled the three pillars of ICHARM's work: a) research and technology, b) information and networking, and c) training. In terms of the capacity building activities, the centre had as of 2017 trained 118 masters' students and 7 doctoral students. In addition, the centre has organized a number of workshops, training, seminars, and meeting including workshops and lectures on the principals of hydrological modeling, including the Integrated Flood Analysis System (IFAS) and the Rainfall-Runoff-Inundation (RRI) model as applied in Japan and overseas.

Turning to information and networking, Mr. Miyamoto provided updates on the activities of the International Flood Initiative (IFI) as well as the establishment of cooperative platforms in each country through IFI. IFI platform activities in the region include - but are not limited to - river basins in Indonesia, Myanmar, Pakistan, Philippines and Sri Lanka.

Other information presented included the platform concepts on water resilience and disasters, data integration and analysis system (DIAS), real-time archiving data on DIAS, data integration activity (Philippines), ICHARM's hydrological simulation models, flood information sharing support (Sri Lanka), and regional coordination of the platform initiative.

Concluding his presentation, Mr. Miyamoto explained the nexus of water-related frameworks (including the SDGs, Paris Agreement and Sendai Framework) with the Kyoto Statement established during the 11th GEOSS Asia-Pacific Symposium in October 2018.

5.4 International Centre for Water Resources and Global Change (ICWRGC)
(*Presented by Mr. Ulrich Looser*)

Mr. Looser delivered a brief presentation encompassing an introduction of the ICWEGC centre, which became a UNESCO Category 2 water centre and renamed as ICWRGC in 2014. Based at the Federal Institute of Hydrology (BfG) Koblenz, Germany, the Centre undertakes.water programmes and strategic planning, research, and networking.

Mr. Looser also provided an update of the Global Runoff Data Centre (GRDC), also based at BfG. The presentation covered details of GRDC's main functions, data users, data policy, the status of the global runoff database, and GRDC data requests.

5.5 International Centre for Water Security and Sustainable Management (i-WSSM)
(*Presented by Mr. Kwang-Suop Lim*)

The presentation by i-WSSM was framed in five topics: water security, research, education and training, global networked cooperation platform, and the way forward. Below follows a summary of the presentation.

1. Water Security:

- The centre was formally opened on 2 May 2017, based at the K-Water Institute, in Daejeon, Republic of Korea.
- The centre works predominantly in support of Theme 6 (Water Education, Key for Water Security) of IHP-VIII.

2. Research
   - Objective: integrated problem-solving research systems.
   - Act through global collaborative research for water security.
   - 8th World Water Forum side event: "Green Transition for Enhancing Water Security for All" (with WWC, P4G, and Nautilus).
   - Publishing the Global Water Security Issues (GWSI) journal.
   - Implementing the International Collaborative Study on Water Security & Sustainable Growth.
   - Establishment of Integrated Global Water Network Database.
3. Education & Training
   - Knowledge & Experience Sharing Programme of Korea Water Resources for Central and South American Officials & IDB.
   - Global Technical Exchange in Floodplain Modeling and Shared Vision Planning (44 participants from Asia, Middle East and Africa).
   - Workshop for Specialist on Smart Water Management in Central Asia.
   - On-site Diagnosis Programme for Cambodia.
4. Globally Networked Cooperation Platform
   - Domestic UNESCO CAT 2 Centre Cooperation Meeting (2017 and 2018).
   - IHP Regional Steering Committee Meeting for Asia and the Pacific.
   - Cooperation with the US Army Corps of Engineers, ICIWaRM, and the World Bank.
   - Cooperation with the Int'l Water Resource Research Institute of Chungnam National University.
5. The Way Forward
   - Cooperation with the global/regional water centres under auspices of UNESCO to achieve SDG6 on Clean Water and Sanitation.
   - Stimulating international cooperation to improve knowledge, education, and global networking to address water security challenges in line with IHP-VIII.

5.6 Regional Centre on Urban Water Management (RCUWM)

(*Presented by Mr. Ali Chavoshian*)

Mr. Chavoshian outlined the objectives of the RCUWM centre, which was established in 2002. The activities of the RCUWM covers the following topics: urban river restoration, non-revenue water reduction, unconventional water resources development, drought prediction and monitoring, groundwater management, water reuse and wastewater treatment, water-related public awareness in cities, and water and media and hydro-journalism.

From November 2017 to October 2018, the centre organized nine workshops, three training courses, seven seminars, one conference, one exhibition and established one MoU. In addition, RCUWM has produced the publication "Water Economics – Application of Economic Theories and Policies in the Water and Sewage Sector". All activities contributed to Theme 3 (Addressing water scarcity and quality) and Theme 4 (Water and human settlements of the future) of the IHP-VIII framework.

In addition to providing updates on the centre's activities, Mr. Chavoshian also briefly presented a general overview of UNESCO Category II Centres, taking note that two-thirds of 115 centres are not operational in conformity with the current framework, with almost half in process of

seeking confirmation of their status from UNESCO. The took further note that the lengthy approval and establishment process remains a challenge for many centres.

5.7 Water, Energy and Disaster Management for Sustainable (WENDI)

(*Presented by Mr Takahiro Sayama*)

WENDI is a newly established UNESCO Chair, hosted by Kyoto University, Japan. Mr. Sayama provided an update on the establishment process of WENDI. The signing agreement between UNESCO and Kyoto University took place during a special seminar on 13 February 2018. A related event called "International Inaugural Symposium for UNESCO Chair on Water, Energy and Disaster Management for Sustainable Development" was then organized on 30 July 2018, resulting in the development of action plans by WENDI's eight co-chairs.

Mr. Sayama added that the overall objective of WENDI is to promote a multi-disciplinary and holistic approach for research implementation, knowledge transfer and capacity building in the fields of water, energy, and disaster management with linkages to other sectors (food, forestry, biodiversity, climate change and data science). This will be done through establishing a comprehensive and trans-disciplinary programme on Education for Sustainable Development (ESD) at the graduate school-level, by and implementing international collaborative research utilizing UNESCO-designated sites such as UNESCO Global Geoparks, Biosphere Reserves and Cultural, Natural and Mixed World Heritage Sites.

Planned WENDI curriculum courses (as of Nov. 2018) are listed below:

- Water Resources Management
- Water Environment
- Energy Science
- Sustainable Bioresource Utilization
- Ecosystem Management
- Resilient Society Management

6. Report from the Pacific SIDS

(*Presented by Mr Amini Loco*)

Representing the Secretariat of the Pacific Community (SPC), Mr. Loco of Fiji presented a summary report on Pacific-SIDS recent progress and challenges relating to water-related issues. Important points from the presentation are summarized below. Please see the **Annex G** for a more detailed presentation.

1. Introduction - Pacific SIDS update on water-related hazards:
   - The region needs support to establish appropriate technologies, compatible and accessible observation systems and to build adequate human and infrastructural capacity to help prepare and develop resilience in the disaster-prone region.
   - The role of national hydrology (NH) and meteorology services (MS) is central for the prediction, early warning, and responses associated with hydro-meteorological hazards.
   - Key progress and achievements in the NH/MS sector up until now includes the formation of the Pacific Meteorological Council (PMC), which has a number of the

panel or key areas, including the recently endorsed Hydrological Services Panel (HSP), a process towards which UNESCO contributes alongside other agencies.

2. Pacific SIDS – Context:
   - The region is characterized by an extensive ocean and relatively small islands with populated by small communities, however in some cases with very high population density in urban areas. Local autonomy is relatively high, with self-governing bodies established at the community, island/local, and national level.
   - Surrounded by a vast ocean, Pacific climate and weather conditions are strongly influenced by ENSO conditions and hence is vulnerable to frequent and severe climatic extremes, such as prolonged dry periods, torrential rainfall and strong winds
   - The ability of the Pacific governments to withstand or reduce the impacts of these water-related conditions is often worsened by the lack of capacity in the NH/MS sector to properly monitor water resources and rainfall and to provide reliable prediction and adequate warning.
3. Governance and institutional arrangements:
   - Under the auspices of the Pacific Island Countries and Territories' (PICT) ministerial declaration in 2015 and 2017, the support by agencies including the Secretariat of the Pacific Regional Environment Programme (SPREP), Pacific Community, the University of the South Pacific (USP) and the World Meteorological Organization (WMO) is critical to improving NH and MS for water resources management, sound early warning systems and disaster reduction.
   - Currently, the PMC has 6 technical areas, namely climate services, communication and infrastructure, ocean and marine services, aviation services, educations, training and research and hydrological services.
4. Major challenges:
   - Lack of coordination between NH and MS to undertake periodical monitoring and data sharing;
   - Lack of capacity to confidently design monitoring programs and lack of long-term data to undertake modelling;
   - Lack of resources within government to be mobilised for NHMS data collection during disaster periods;
   - Lack of joint initiatives and opportunities for capacity building within the NHMS;
   - Lack of infrastructural and telecommunication; and
   - Inadequate forecasting system to predict and warn potentially vulnerable communities of looming disasters for appropriate response and/or actions.
5. Activities and progress in water-related disaster space:
   - A UNESCO IHP work plan meeting was undertaken in Nadi, in November 2017.
   - JICA supported DRM work in the Solomon Islands where one of its major rivers is currently equipped with monitoring and telemetered stations – this is a possible pilot for Catalogue of Hydrology Analysis publication.
   - A partnership between Fiji NHMS with SPC to undertake peak flood flow estimation after Tropical Cyclone Josie early in the year – the approach used was the slope area methods where R10 Survey grade GPS was used to capture elevation of high flood mark.
   - A partnership between India, UNDP and SPC that enabled the training of 17 participants from 9 countries at the Roorkee National Hydrological Institute, in July 2018.
   - A Pacific Hydrology Panel meeting was undertaken in August 2018 in partnership with the New Zealand funded Water Security project – the meeting resulted in the

panel members workshopping the Pacific IHP work plan with key country needs and actions established.
- Numerous early warning and early action initiatives, including the training on TB3 rain gauges installation and data collection and analysis around the region
- Groundwater investigation in a number of countries in response to drought and cyclone disasters where new and/or alternative groundwater sources were identified through the use of electrical resistivity geophysics.

7. Catalogue of Hydrologic Analysis (CHA): Report from the workshop and next steps

Mr. Kenichiro Kobayashi of Kyoto University provided updates resulting from the workshop on the Catalogue of Hydrologic Analysis (CHA), which took place immediately prior to the 26th RSC meeting on 3 November 2019. The workshop shared the information on water-related issues such as disaster preparedness, water environment conservation, and water resources management in Asia and the Pacific. It featured a broad range of presentations on hazard mapping developed by countries in the region, focusing on technologies, theories, experiences, good practice and lesson learned.

Attending by 32 participants, the workshop yielded a template for CHA contributions in the form of a Development Plan on the first CHA topic, flood hazard mapping. A long-term schedule of CHA development, as well as future topics for subsequent catalogue volumes, were agreed to by the participants.

Please find a complete presentation of CHA workshop in the **Annex H** of this report.

8. Organization of the 27th (2019) and potential host for the 28th (2020) RSC Meetings

Myanmar presented a plan to host the 27th RSC meeting Naypyidaw in late October or early November 2019. Vietnam expressed its interest in hosting the 28th meeting in 2020, while Malaysia and Iran expressed tentative interest in organizing the event in the following years.

All participants agreed and have no objections to this proposal by Myanmar to host the 27th meeting in 2019. The hosts will work closely with the Chair, Secretary and the Secretariat of the RSC in UNESCO Office in Jakarta. The hosts will in due course identify a suitable scientific conference or symposium event to be associated with the RSC meeting.

9. Election of the RSC's Secretary

The RSC agreed that the current Secretary of the RSC, Mr. Yasuto Tachikawa of Kyoto University, will remain in the position for the next period. Nominated by the RSC Chairperson, Mr. Ignas Sutapa, the meeting unanimously agreed for Mr. Tachikawa to continue as Secretary. Mr. Tachikawa will work closely with the RSC Chair and the Secretariat, making sure that all programmes are in line with the objectives of the Committee.

10. Any Other Issues

No other issues were raised by the meeting.

11. Adoption of Resolutions

There were no formal resolutions adopted in the 26th RSC meeting.

12. Closure of the Meeting

The 2018's meeting was among the largest and most comprehensive meetings of the RSC to date, with 25 presentations from country delegations, centres, and chairs. In addition, delegations showed considerable interest in hosting upcoming meetings of the Committee.

The RSC Chairperson, Mr. Ignasius Sutapa, officially closed the meeting at 18.00, thanking all parties for a productive discussion. The RSC meeting was followed by a field visit to the Songpu Bridge Hydrologic Monitoring Station at Ye Xie Town, Song Jiang District, in the city of Shanghai held on 5 November. The visit, organized by the Shanghai Hydrologic Administration, allowed participating delegates an insight into the techniques, procedures and equipment employed in the monitoring of water resources in one of the largest urban areas of the world.

Action points:

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

All presentations of the meeting can be downloaded at http://jfit-for-science.asia/the-26th-ihp-regional-steering-committee-meeting-for-asia-and-the-pacific/

ANNEX A - List of participants of the 26th IHP RSC

No.	Name	Gender	Country	Position	Organization
1	Mohammad Qasim Seddiqy	Mr.	Afghanistan	Professor and Co-Chair of NHCA	National Hydrology Committee of Afghanistan (NHCA)
2	Prof. Ian White	Mr.	Australia	Emeritus Professor Water Resources	Australian National University
3	Prof. Zhongbo Yu	Mr.	China	Vice Chairman / Professor	Chinese National Committee for IHP / Hohai University
4	Prof. Dazheng Yu	Mr.	China	Chairman / Director	Chinese National Committee for IHP / Bureau of Hydrology, Ministry of Water Resources, P.R. China.
5	Cai Jianyuan	Mr.	China	Director / President	Hydrology Department, Ministry of Water Resources
6	Jun Wang	Mr.	China	Director / Senior Professor	Hydrology Bureau, Changjiang Water Resource Commission
7	Yuanze Gu	Mr.	China	Director / Senior Professor	Hydrology Bureau, Yellow Ricer Conservancy Commission
8	Jinta Wu	Mr.	China	Director / Senior Professor	Fujian Province Hydrology and Water Resources Investigation Bureau
9	Yunyi Tang	Mr.	China	Vice Director / Senior Professor	Jiangsu Province Hydrology and Water Resources Investigation Bureau
10	Amini Loco	Mr.	Fiji	Senior Hydrogeologist	Geosciene, Energy and Maritime Division, Pacific Community (SPC)
11	Ulrich Looser	Mr.	Germany	Head GRDC	Global Runoff Data Centre (GRDC) at BfG

No.	Name	Gender	Country	Position	Organization
12	Dr. Fauzan Ali	Mr.	Indonesia	Secretary	IHP Indonesia
13	Dr. Ignasius D.A. Sutapa	Mr.	Indonesia	Chair RSC AP / Executive Director	Asia Pacific Centre for Ecohydrology (APCE)
14	Dr. Seyed Ali Chavoshian	Mr.	Iran	Director	Regional Centre on Urban Water Management (RCUWM) & Iran IHP Nat. Com
15	Dr. Takahiro Sayama	Mr.	Japan	Associate Professor	DPRI, Kyto University
16	Prof. Yasuto Tachikawa	Mr.	Japan	Professor	Graduate School of Engineering, Kyoto University
17	Prof. Kenichiro Kobayashi	Mr.	Japan	Associate Professor	Research Center for Urban Safety and Security, Kobe University
18	Dr. Mamoru Miyamoto	Mr.	Japan	Researcher, Executive Manager of IFI secretariat	ICHARM
19	Dr. Sung Kim	Mr.	Korea	Senior Research Fellow	Korea Institute of Civil Engineering and Building Technology
20	Bitna Lee	Ms.	Korea	Programme specialist Committee	UNESCO i-WSSM
21	Yang Su Kim	Mr.	Korea	Director	UNESCO i-WSSM
22	Youngseok Song	Mr.	Korea	Programme Specialist	UNESCO i-WSSM
23	Kwang-Suop Lim	Mr.	Korea	Programme Manager	UNESCO i-WSSM
24	Prof. Joo-Heon Lee	Mr.	Korea	Vice chair / Professor	IHP Korea National Committee / Joongbu University
25	Inthavy Akkharath	Mr.	Lao PDR	Director General	Department of Water Resources, MoNRE
26	Ir Hj Abdullah bin Isnin	Mr.	Malaysia	Deputy Director General	Department of Irrigation and Drainage
27	Ir. Rohani Ahmad	Ms	Malaysia	Director	Humid Tropics Centre Kuala Lumpur (HTC KL)
28	Chimeddulam Nergui	Ms.	Mongolia	Programme specialist for Natural Science	Mongolian National Commission for UNESCO
29	Than Zaw	Mr.	Myanmar	Deputy Director	Department of Meteorology and Hydrology
30	Myo Tun Oo	Mr.	Myanmar	Assistant Director	Department of Meteorology and Hydrology
31	Bikram Shrestha Zoowa	Mr.	Nepal	Senior Divisional Hydrologist	Snow, Water Quality and Environment Section, Department of Hydrology and Meteorology
32	Dennis	Mr.	New Zealand	Water	Canterbury Water Management

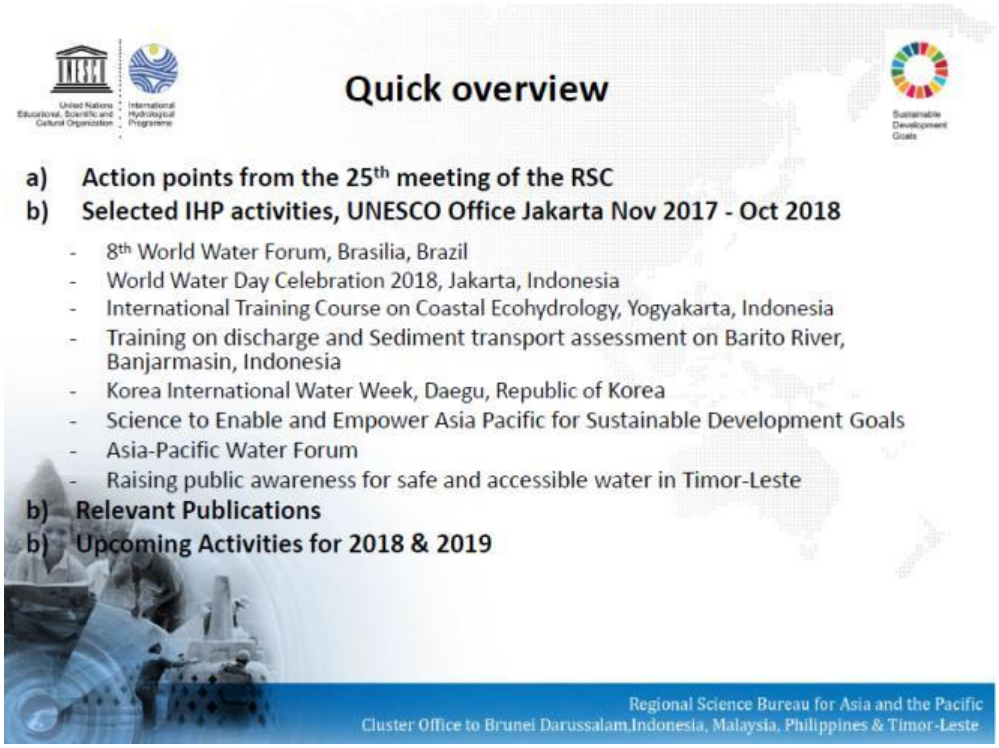
No.	Name	Gender	Country	Position	Organization
	Jamleson			Infrastructure	Strategy
33	Prof. Guillermo III Tabios	Mr.	Philippines	Professor of Civil Engineering	Institute of Civil Engineering, Univ of the Philippines
34	Kanokwan Yoowong	Ms.	Thailand	Plan and Policy Analyst	Department of Water Resources, Bureau of International Cooperation
35	Supranee Runghirunviroj	Ms.	Thailand	Expert	Water Resources Research and Development
36	Phoomjit Prodpran	Mr.	Thailand	Hydrologist	Bureau of Research, Development and Hydrology
37	Somphop Intaraksa	Mr.	Thailand	Senior Hydrologist	Royal Irrigation Department
38	Thattanaporn Khomsri	Ms.	Thailand	Professional Hydrologist	Royal Irrigation Department
39	Duangrutai Mongkolkeha	Ms.	Thailand	Practitioner Hydrologist	Royal Irrigation Department
40	Ekaphop Thera-Oran	Mr.	Thailand	Engineer	Electricity Generating Authority of Thailand
41	Pennapa Perawongsakul	Ms.	Thailand	Engineer	Electricity Generating Authority of Thailand
42	Osorio Belo da Piadade	Mr.	Timor Leste	Chair	Department of Water Resources Management, National Directorate of Water Resource Management (NDWRM)
43	Prof. Thi Lan Huong Huynh	Ms.	Vietnam	Secretary of Vietnam IHP / Deputy Director General	Vietnam Institute of Meteorology, Hydrology and Climate Change
44	Nguyen Van Hieu	Mr	Vietnam	Officer	Ministry of Natural Resources and Environment of The Socialist Republic Viet Nam
45	Dr. Hans Thulstrup	Mr.	UNESCO	Senior Programme Specialist	Water and Environmental Sciences, UNESCO Office, Jakarta
46	Prof. Dr. András Szöllösi-Nagy	Mr.	Hungary	IHP Vice-Chairperson Group II - Eastern and Central Europe	Governing bodies of the International Hydrological Programme

ANNEX B - Agenda of the Meeting

Time	Agenda item	Resource Person/PIC
08:30-09:00	Registration	
09:00-09:10	Welcome Remarks	Ignasius Sutapa, RSC Chairperson Cai Jianyuan, Director of Hydrology Department, Ministry of Water Resources Zhou Jianguo, Deputy Director of Water Affairs Bureau
09:10-09:25	Opening Remarks	Yasuto Tachikawa, Secretary IHP-RSC SEAP Hans Dencker Thulstrup, UNESCO
09:25-09:30	Adoption of the Agenda	Ignasius Sutapa, RSC Chairperson
09:30-10:00	Group photo & coffee break	
10:00-10:15	Secretariat report RSC AP Secretariat	Secretariat report RSC AP Secretariat
10:15-10:30	Report from the 23rd IHP Council	Prof. Farhad Yekeh Yazdandoost, IGC Vice-Chair
10:30-10:45	Updates from IHP AP region -Nomination of IHP-IX experts from AP region -Nomination of Task Force on Publication on Water and Climate Change	Ignasius Sutapa, RSC Chairperson Yasuto Tachikawa, Secretary IHP-RSC SEAP
10:45-12:30	Country reports (5min/country) IHP delegates	IHP delegates [Afghanistan] [Australia] [China] [Indonesia] [Iran] [Japan] [Korea] [Lao PDR] [Malaysia] [Myanmar] [Nepal] [New Zealand] [Philippine] [Thailand] [Timor Leste] [Vietnam]
12:30-14:00	Lunch break	
14:00-14:15	Updates from water Chairs and water-related Centres under the Auspices of UNESCO in Asia and the Pacific	IHP delegates [APCE] [HTCKL] [ICHARM] [ICWRGC] [IWSSM] [RCUWM] [WENDI]
14:15-15:15	Catalogue of Hydrologic Analysis (CHA): report from workshop and next steps	Yasuto Tachikawa, Secretary IHP-RSC AP Hans Dencker Thulstrup, UNESCO Jakarta
15:15-15:30	Coffee break	
15:30-15:35	Presentation by the proposed host country of the 27th RSC meeting	IHP delegates, RSC Secretariat

	and associated conference (2019)	
15:35-15:40	Identification of potential host for the 28th RSC meeting and associated conference (2020)	IHP delegates, RSC Secretariat
15:40-16:00	Election of the Secretary IHP RSC	Ignasius Sutapa, RSC Chairperson (RSC Chairperson nominates a person for the Secretary for the next two years for consideration by the members).
16:00-16:30	Any other issues	IHP delegates
16:30-16:45	Adoption of Resolutions	IHP delegates
16:45-17:00	Closing of the Meeting	Ignasius Sutapa, RSC Chairperson

ANNEX C - Secretariat Report: UNESCO Office Jakarta Report



Action points from the 25th meeting of the RSC

Actions	Responsible Person	Deadline
The circulation of the welcome message to all IHP National Committees and Focal Points in Asia and the Pacific region for their participation in the Committee	Chair	ASAP

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

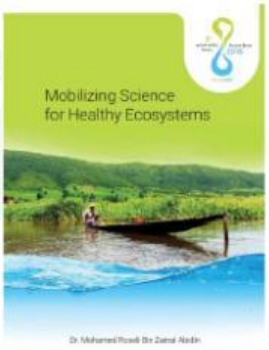
Selected IHP Activities

1. 8th World Water Forum, 18-23 March 2018

UNESCO Office Jakarta coordinated the WWF **Asia and the Pacific Ecosystems Theme**, published the regional report "Mobilizing Science for Healthy Ecosystems" prepared by Dr. Mohamed Roseli of Malaysia, and organized a corresponding session on 20 March 2018.

Focus on optimizing the **mobilization of science, technology and innovation for cost effective and rapid implementation of the 2030 Agenda and the SDG 6 targets.**

Presenters and panelists from **Malaysia, Republic of Korea, Indonesia, Nepal, Japan, Australia, Thailand, Fiji, Portugal, and the UNESCO IHP Secretariat.**



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

Selected IHP Activities

2. World Water Day Celebration, 4 April 2018

- Partner Atma Jaya University and the Indonesia Global Compact Network (IGCN) with keynote speech by UNRC for Indonesia
- Attended by 90 representatives from Government, students, UN agencies, water experts, development partners and business sectors
- Concluded with the observation that *effective delivery of nature-based solutions will require* ***new knowledge and coordinated investment*** *by both government and private sector, new and innovative partnerships, community engagement and leadership at all levels.*

http://www.unesco.org/new/en/jakarta/about-this-office/single-view/news/world_water_day_2018_celebration_seminar_and_global_launchi/

Selected IHP Activities

3. International Training Course on Coastal Ecohydrology

Hosted by **APCE** during 6-10 August 2018 and jointly organized with ICCE (the International Centre for Coastal Ecohydrology, Portugal) with the support of the IHP Secretariat and the UNESCO Office Jakarta

- Attended by water managers, government officials, and researchers from Malaysia, Thailand, Timor Leste, Vietnam, and Indonesia.
- Aim: a working understanding of estuarine and coastal ecohydrology - an integrated approach to ecohydrology and economic valuation of the ecohydrology solutions.

For more information:
http://www.unesco.org/new/en/jakarta/about-this-office/single-view/news/international_training_course_on_coastal_ecohydrology_launch/

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

Selected IHP Activities

4. Training on discharge and sediment transport assessment on Barito River, 24-27 July 2018, Banjarmasin, Indonesia

- Hosted by UNESCO Office Jakarta and ICHARM/PWRI under JICA-supported Flood Management project
- River engineers from Afghanistan, India, Indonesia and Pakistan were trained on river discharge, water and sediment sampling as well as the use of analysis software.

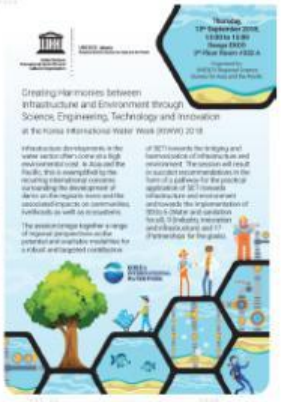
For more information:
http://www.unesco.org/new/en/jakarta/about-this-office/single-view/news/discharge_and_sediment_transport_assessment_on_barito_river/

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

Selected IHP Activities

5. Korea International Water Week, 12-14 September 2018

- UNESCO Jakarta session on "*Creating Harmonies between Infrastructure and Environment through Science, Engineering, Technology and Innovation*"
- Presenters from Republic of Korea, Nepal, and Malaysia
- Resulted in succinct recommendations to optimize the application of SETI towards infrastructure and environment.



for more information:
http://www.unesco.org/new/en/jakarta/about-this-office/single-view/news/can_science_engineering_technology_and_innovation_create_h/

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

Selected IHP Activities

5. Korea International Water Week (cont.)

i-WSSM and UNESCO Jakarta hosted 2 sessions:

1. The Science, Economic, Policy and Practice of Nature-based Solutions for Achieving SDGs Forum: From Innovation to Common-Use
   - Presenters and panelists from i-WSSM, UNESCO Jakarta, several Korean universities, Convergence Institute and Korea Research Institute for Environment and Development
2. The Rising Tide: a new look at Water and Gender
   - Presenters and panelists from i-WSSM, Earth Forever, WWAP, several Korean universities, Tongyeong Education Foundation for Sustainable Development, Korean Women's Development Institute

Participants at the SDGs forum

Participants at the Water and Gender session

Presenters at the SDGs forum

Selected IHP Activities

6. Science to Enable and Empower Asia Pacific for Sustainable Development Goals (SEE-AP), 30 July – 1 August

- A strategic coordination meeting to strengthen partnerships among UNESCO and its science partners and stakeholders across Asia and the Pacific across all science programmes
- Key water-related recommendations and ideas included: development practical guidelines on integrated vulnerability assessment of urban water systems; organization of a "UNESCO Economic Water Forum"; as well as the development of practical guidelines for water management challenges.

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

Selected IHP Activities

7. Asia Pacific Water Forum – Water Cycle Management

- UNESCO Office Jakarta serves as **Champion** of the Asia-Pacific Water Forum's thematic pillar on **Water Cycle Management**, and will lead a Working Group to carry out the related tasks as defined in the APWF three-year Action Plan (2018-2020)
- Focus on issues including IWRM, monitoring innovation, transboundary issues, governance, mobilizing science: **will work with RSC network** to seek inputs and contributions

Asia-Pacific Water Forum

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

Selected IHP Activities

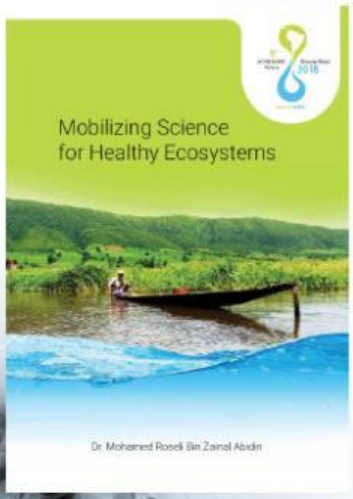
8. Exhibition at United Nations Day celebration on October 24, 2018

- Raising public awareness for safe and accessible water in Timor-Leste
- Remarks made from Minister of Legislative Reform and Parliamentary Affairs, Timor Leste

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

Regional Science Bureau for Asia and the Pacific
unei Darussalam,Indonesia, Malaysia, Philippines & Timor-Leste

Relevant Publications



Roseli, ZA, 2018. *Mobilizing Science for Healthy Ecosystems*. UNESCO, Jakarta. Published for the 8th World Water Forum 2018, under the coordination of UNESCO Office Jakarta.

http://www.worldwaterforum8.org/pt-br/file/2769/download?token=dHHioc4d

Upcoming Activities 2018

1. International Training Workshop on Integrated Sediment Management in River Basins, Beijing, 5-10 Nov 2018
   - Organized by IRTCES, UNESCO Office Beijing and Jakarta, and International Sediment Initiative (ISI)-IHP-UNESCO
2. 8th Asian G-WADI & 2nd IDI Expert Group Meetings, organized in conjunction with International Workshop on "Adaptation to Water Scarcity and Basin-connected Cities", Mashhad-Iran, 10-12 Dec 2018
   - Organized by UNESCO IHP, UNESCO Tehran, UNESCO Jakarta, and UNESCO New Delhi, International Drought Initiative (IDI), Asian G-WADI, and Regional Centre on Urban Water Management (RCUWM-Tehran)
   - http://rcuwm.ir/idi-gwadi-workshop/

United Nations Educational, Scientific and Cultural Organization | International Hydrological Programme

Upcoming Activities 2018

Sustainable Development Goals

6. **IIWQ APCE International Training Workshop on Emerging Pollutants**

Jakarta, 27-29 November 2018

- Organized by APCE, UNESCO IHP's IIWQ (International Initiative on Water Quality) and UNESCO Jakarta
- Build capacity and raise the awareness on emerging pollutant in the region
- In the framework of the "Emerging Pollutants in Wastewater Reuse in Developing Countries" project and part of the IIWQ Regional Training Workshop Series in four region: Africa, Asia, Arab States, and Latin America and the Caribbean

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

United Nations Educational, Scientific and Cultural Organization | International Hydrological Programme

IHP Upcoming Activities for 2019

Sustainable Development Goals

1. World Water Day – 2019 WWDR launch
2. Regional training on reporting for SDG 6.5.2 (Proportion of transboundary basin area with an operational arrangement for water cooperation) Regional Workshop
3. Regional Expert's consultation/workshop on Water Education Curricula for Asia and the Pacific
4. Designing local ecohydrology and IWRM educational resources for Africa – upcoming drafting workshop and publication
5. New joint activity with i-WSSM to address water security challenges in SIDS.

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

ANNEX D - Secretariat Report: Report of IGC Bureau

Short statement
by Farhad Yazdandoost,
Vice-Chairperson of IHP Council for the Asia and the Pacific Region

RSC meeting,
4 November 2018, Shanghai

Dear colleagues, respected delegates, ladies and gentlemen,
It is with great regret and apologies to address the esteemed RSC meeting in absence. I take the honor to present a brief report on the 23rd session of the IHP Council.

The twenty-third session of the Intergovernmental Council of the International Hydrological Programme (IHP) was held at UNESCO Headquarters in Paris on 11-15 June 2018.

The session was attended by 253 participants overall, 95 women and 153 men. 74 Member States, including 36 Members of the Council, were represented. 5 non-governmental organizations, 18 water-related category 2 centres (C2Cs), 5 UN Agencies as observers and 2 UNESCO Programmes and 2 Sectors were present.

Perhaps the most important agreement and resolution adopted during the 23rd session of the IHP Council must be the programme name change as an update of the Statutes of the IHP Intergovernmental Council.

As a result, the council adopted a resolution to change the name of IHP from "International Hydrological Programme" to "Intergovernmental Hydrological Programme". This will in turn have implications on UNESCO member states activities in the field of water and the efforts by national IHP committees will be more enhanced nationally and internationally.

Implementation of various programmes and initiatives was closely examined and reviewed during the 23rd session. Evaluation of the eighth phase of IHP (IHP-XIII) and its regional perspectives, the IHP-Water information network system, strategic planning of the 9th phase of IHP (IHP-IX), initiatives on "Land Subsidence", "Water Museums" and the "World Large River Initiative" were amongst main topics of discussion and deliberation during the 23rd session.

Specific focus were placed on sustainable development goal 6 relating to water and sanitation, UNESCO's water family and the World Water Assessment Programme during the session and cooperation with other intergovernmental and non-governmental organisations was closely examined.

It is sincerely hoped that the activities of Natcoms in our vast region and closer cooperation at regional scale will lead the way for global achievements in this much needed and revered programme within UNESCO.

I wish every success for this RSC meeting and would avail myself of this opportunity to extend a cordial invitation to all to host one of the future RSC meetings in the Islamic Republic of Iran.

Farhad Yazdandoost

Vice-Chairperson of IHP Council for the Asia and the Pacific Region

Updates from IHP AP region

- Nomination of IHP-IX experts from AP region
- Nomination of Task Force on Publication on Water and Climate Change

TASK FORCE FOR IHP-IX

The Task Force will follow the Terms of Reference approved by the Intergovernmental Council of IHP at its 23rd session and will consist of 3 parts:

1. Two consultants who will coordinate the input received
2. The group of 6 young scientists provided by the Bureau Members
3. A group of 24 Experts based on suggestions of Member States (EoMS)

Nomination of IHP-IX Task force from AP region

Young expert:
Prof. Dr. Shinjiro KANAE at Tokyo Institute of Technology

Expert:
Prof. Ignasius Sutapa
Chairperson of IHP RSC in AP and Chair of APCE Indonesia

Prof. Zhongbo Yu
Vice Chair, Chinese National Committee for IHP
State Key Laboratory of Hydrology-Water Resources and Hydraulic Engineering, Hohai University

Prof. Yasuto TACHIKAWA
Department of Civil and Earth Resources Engineering,, Kyoto University

Dr Asnor Muizan Ishak
Senior Hydrologist, Water Resources & Hydrology Division Dept. of Irrigation & Drainage Malaysia, Kuala Lumpur.

Dr Norlida M. Dom
Deputy Director, Regional Humid Tropics Hydrology and Water Resources Centre for SEA & the Pacific, % Dept. of Irrigation & Drainage Malaysia, Kuala Lumpur.

Nomination of Task Force on Publication on Water and Climate Change

Dr. Yiping Li

Professor, Ph.D., Assistant Dean
Director, Department of Environmental Science
College of Environment,
Hohai University

IHP-WINS

https://en.unesco.org/ihp-wins

IHP-WINS

HOW TO CONTRIBUTE TO IHP-WINS

To contribute to IHP-WINS, Member States and Institutions could request user accounts at: ihp-wins@unesco.org

IHP-WINS also welcomes questions, comments or suggestions from users. Please contact UNESCO's IHP-WINS team at: ihp-wins@unesco.org

IHP-WINS is designed, implemented and maintained by the International Hydrological Programme of UNESCO.

For more information on IHP initiatives contributing to IHP-WINS, please visit our website: http://en.unesco.org/ihp-wins

https://en.unesco.org/ihp-wins

ANNEX E – Country Reports

Afghanistan:

Climate and water status of the country

Climate and Water Resource Status in Afghanistan (Precipitation Distribution Analysis And Potential of Runoff ,Glaciers Over Five River Basins)

Prof .Dr M.Q.Seddiqy

Prepared by: NHCA MEW

Table of contents

Introduction to hydro-met history in Afghanistan

- Hydrology department was established in 1943 under the ministry of Water and power, Department of soil and water and started measurement of stream water flows in Helmand river basin
- Later this program expanded to other basins totally 148 hydrological stations has been installed
- After 1980 all the hydrology networks destroyed
- In 2004 the rehabilitation of hydrological network with the installation of three cable way stations stared in KRB
- In 2007 the practical works for installation of most modern Automatic hydro-met stations started and 174 stations installed in entire the country.

Sources:

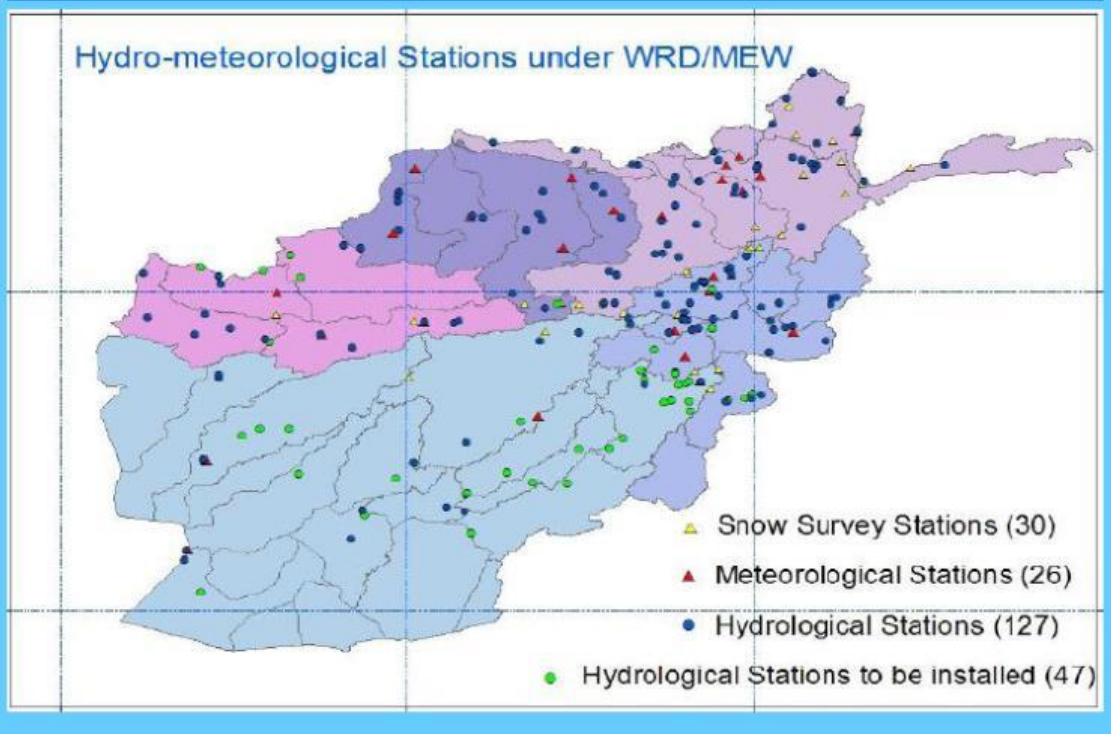
1. http://moi.gov.af/Content/files/PoliceLaw.pdf
2. Halimi, 2016-Department of water resources, Ministry of Energy and Water

- Afghanistan meteorological department was established in 1955 and it became the member of WMO at 1956.
- Between the year of 1979-1990 it was the most powerful meteorological department in Asia region at meteorological observations
- On the previous the met department of Afghanistan had 70 synaptic station, 200 climate stations,3 aero logical station, 32agriculture stations with 600 professional staffs .

Source (s)

1. http://www.gfcs-climate.org/sites/default/files/S3-P1-06-Afghanistan.pdf

Introduction to hydro-met history in Afghanistan

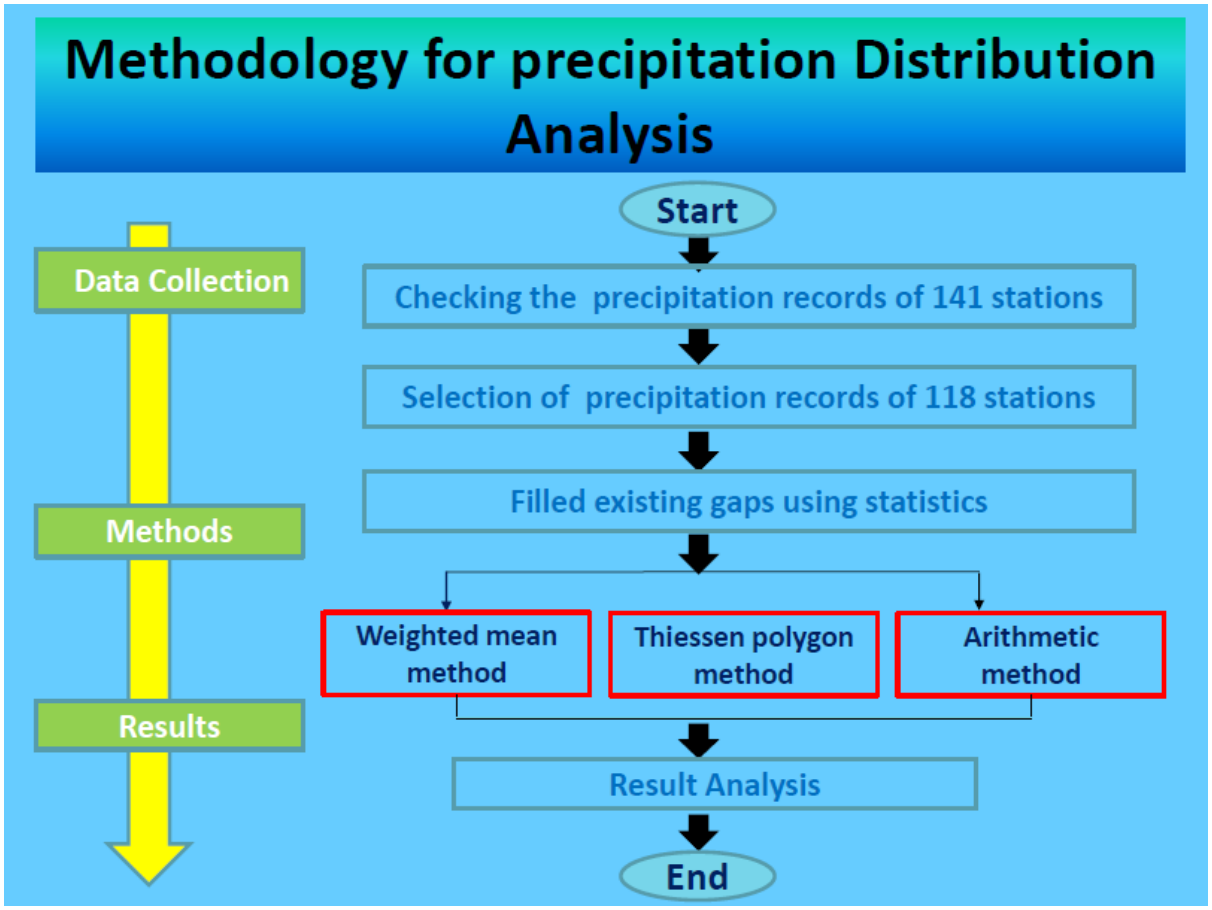


The Current meteorological services in MEW/WRD

- Since 2008, we are collecting and analyzing the hydro-met data for the purpose of surface and ground water assessment, flash flood and drought forecasting (water law 10:3:4)
- **Main activities done in this year**
  - Development and drafting the policy of data and information sharing
  - Preliminary Assessment of surface water potential based on the source hydrological stations
  - Preparation of Hydrological year books
  - QCDP of 40 Hydro-met stations by HYMEP and WRD Staff
  - Water balance assessment using the SWAT Model in the Upper and Lower Harrirod Murghab sub-river basins
  - Flood probability and return time analysis
  - Precipitation distribution analyzing in the five river basins (Afghanistan)

Objective

- To assess main annual precipitation distribution using observed datasets in the sub-river basins, major river basins and Afghanistan.



Result.1: annual mean precipitation distribution in the sub-river basins

Annual Mean Precipitation of Five River Basin of Afghanistan (2008-2016)

S.No	River Basins	Sub-basins	Arithmatic Mean	Weighted Mean	Thiessen polygons	No.Stations
1	Helmand River Basin	Lower Helmand Sub River basin	129.29	166.27	102.68	4
2		Uper Helmand Sub River Basin	353.66	364.01	322.42	4
3		Arghandab Sub River basin	153.55	154.49	148.34	2
4		Farah Rud Sub River Basin	135.52	135.52	135.52	1
5		Ab-i- Astada Ghazni Sub River Basin	319.10	319.10	319.10	1
6		Uper Jilga Sub River basin	275.29	275.29	275.29	1
7		Middle Helmand Sub River basin	121.00	121.10	120.01	2
8		Tirin Kot Sub River basin	156.00	156.00	156.00	1
Mean _HLRB			205.43	222.39	165.5	16

Continue....

S.No	River Basins	Sub-basins	Arithmatic Mean	Weighted Mean	Thiessen polygons	No.Stations
1	Panj-e-Amu River Basin	Kokcha	429	441	447	13
2		Upper Panj	496	505	492	9
3		Taluqan	329	338	298	10
4		Lower panj	433	433	433	1
5		Kunduz	226	260	223	5
6		Lower Kunduz (Baghlan)	297	302	305	7
7		Upper Kuduz (Bamyan)	380	386	344	3
Mean_PARB			370.08	388.92	396.00	48
1	Harirud_Murghab River Basin	Lower Harirod	209	226	213	4
2		Upper Harirud	296	298	290	3
3		Kush wa kashan	200	200	198	2
Mean_HMRB			234.92	244.20	234.07	9

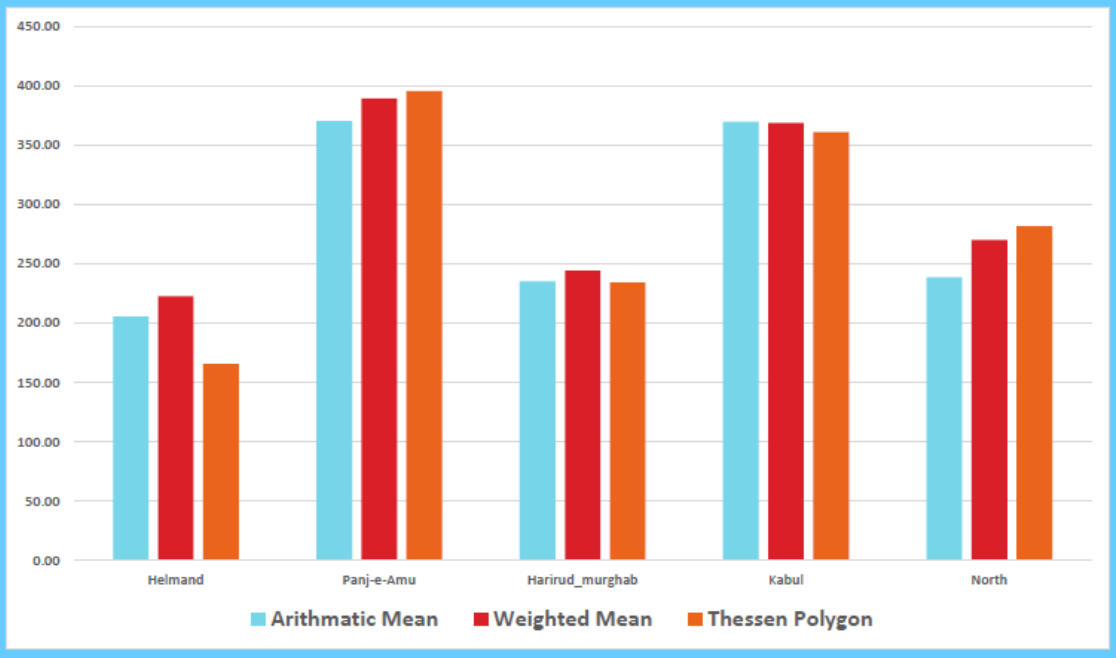
Continue.....

	Kabul River Basin	Kabul Wasati	381.9	386.2	380.6	3
		Panjshir Balayi	419.35	435.40	405.01	5
		Shamal	286.30	289.47	289.12	5
		Maidan	327.83	327.83	327.83	1
		Logar	258.88	258.88	258.88	1
		Kabul Payini	275.33	283.13	290.86	2
		Kabul Balayi	458.50	458.50	341.22	1
		Kunar	529.6	529.96	534.24	2
		Laghman	258.6	258.73	259.64	2
		Ghorband	498.85	498.85	498.85	1
Mean _KRB			369.51	368.29	360.55	23.00
	North River Basin	Balkhab	264.6	299.1	248.6	9.0
		Shirin Tagab	267.8	270.3	263.5	5.0
		Sar-i-pul	274.6	277.7	258.8	3.0
		Khulm_Aibak	275.2	280.1	251.2	3.0
		Dasht-i-Shor Tepa	109.6	110.4	105.7	2.0
Mean_NRB			238.38	269.88	**281.28**	22.00

Result.2:Precipitation grand mean of five river basins (2008 – 2016)

S.No	River Basins	Arithmatic Mean	Weighted Mean	Thiessen Polygon	No.Stations	Area(%)
1	Helmand	205.43	222.39	165.50	16	46.99
2	Panj-e-Amu	370.08	388.92	395.16	48	15.10
3	Harirud_murghab	234.92	244.20	234.07	9	15.49
4	Kabul	369.51	368.29	360.55	23.00	10.53
5	North	238.38	269.88	281.28	22.00	11.89
Grand Mean (Five Basins)		283.66	298.73	287.31	118	100.00

Result3: Comparison of precipitation distribution in the five river basin

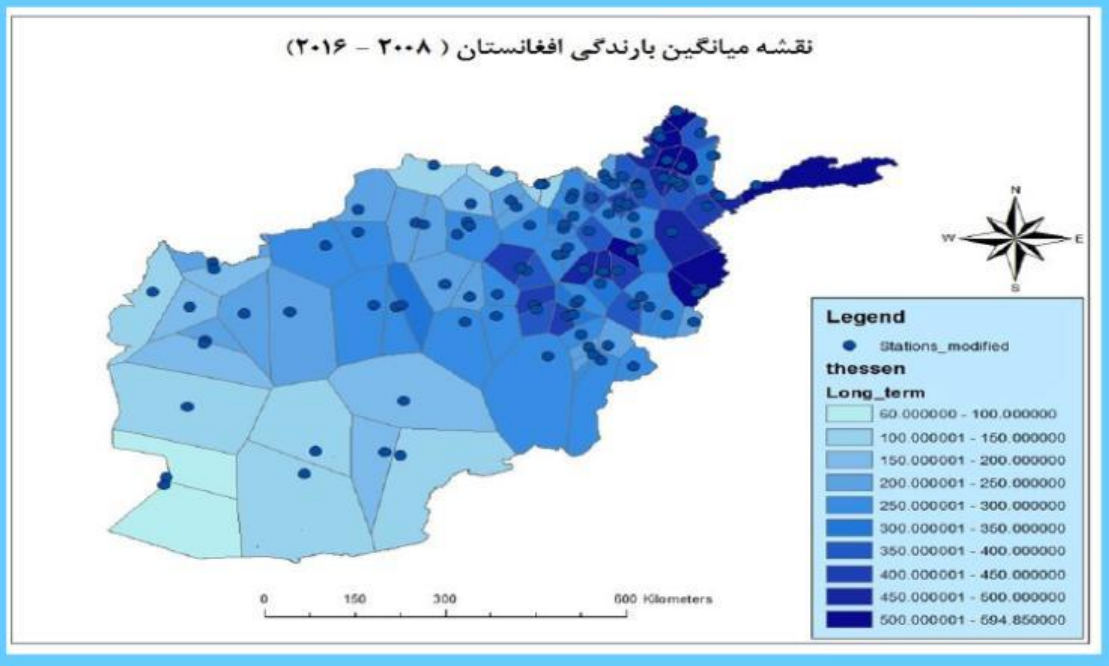


Total average precipitation distribution in Afghanistan

Brief table on calculation of precipitation distribution in the five river basins and country level (2008 - 2016)

No	River basins	Arithmatic mean	Weighted mean	thiessen polygon	# stations	Area (Km2)	(%) Area
1	Helmand	205.43	222.39	165.50	16.00	300882.30	47.00
2	Panj-Amu	370.08	388.92	396.00	48.00	96700.10	15.10
3	Harrirod_Murghab	234.92	244.20	234.07	9.00	99162.50	15.50
4	Kabul	369.51	368.29	360.55	23.00	67408.80	10.50
5	North	238.38	269.88	281.28	22.00	76101.00	11.90
Average Precipitation		283.66	298.73	246.00	118.00	653864	100.00
Total average precipitation distribution in Afgh					**246 mm**		

Precipitation Distribution Map based on the observed data (2008-2016)



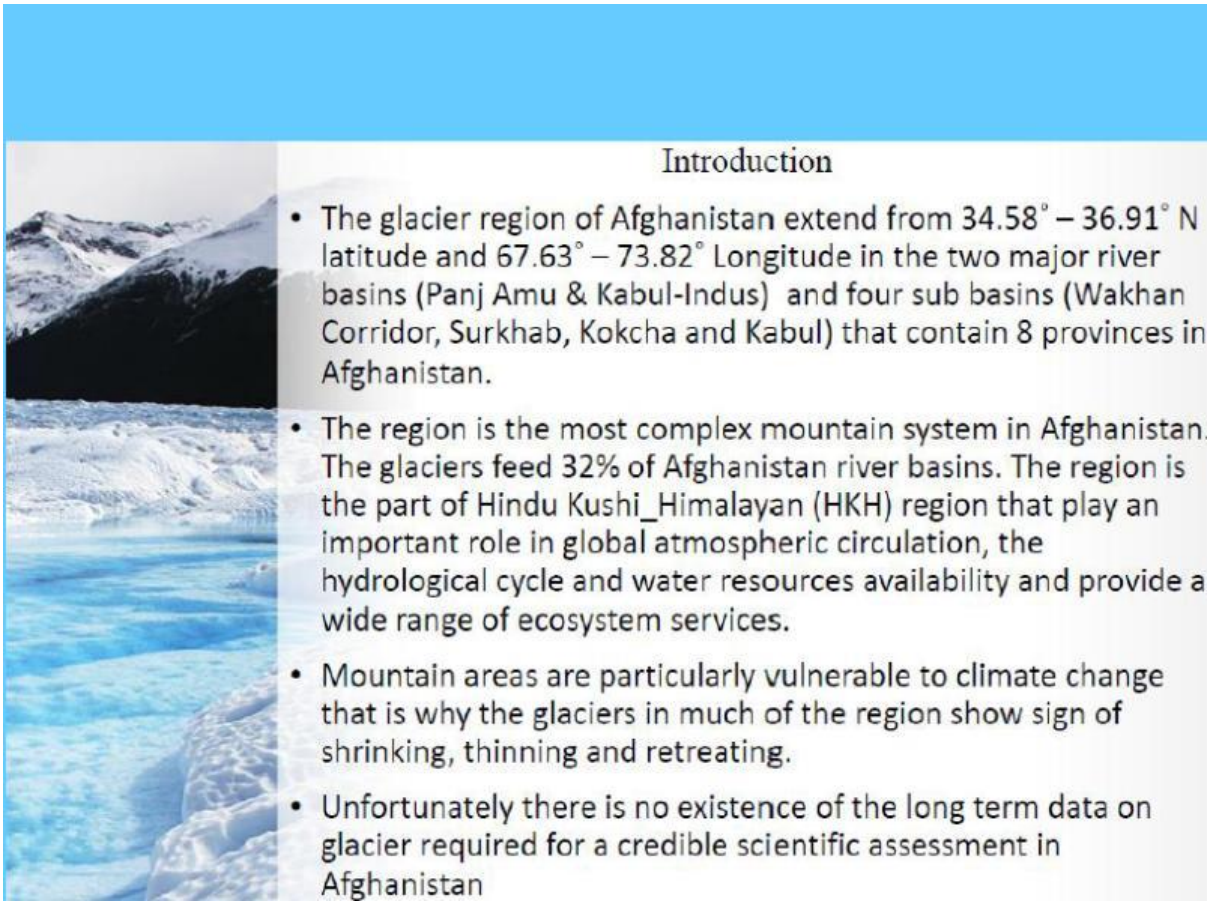
Potential of Runoff of 5 River Basin

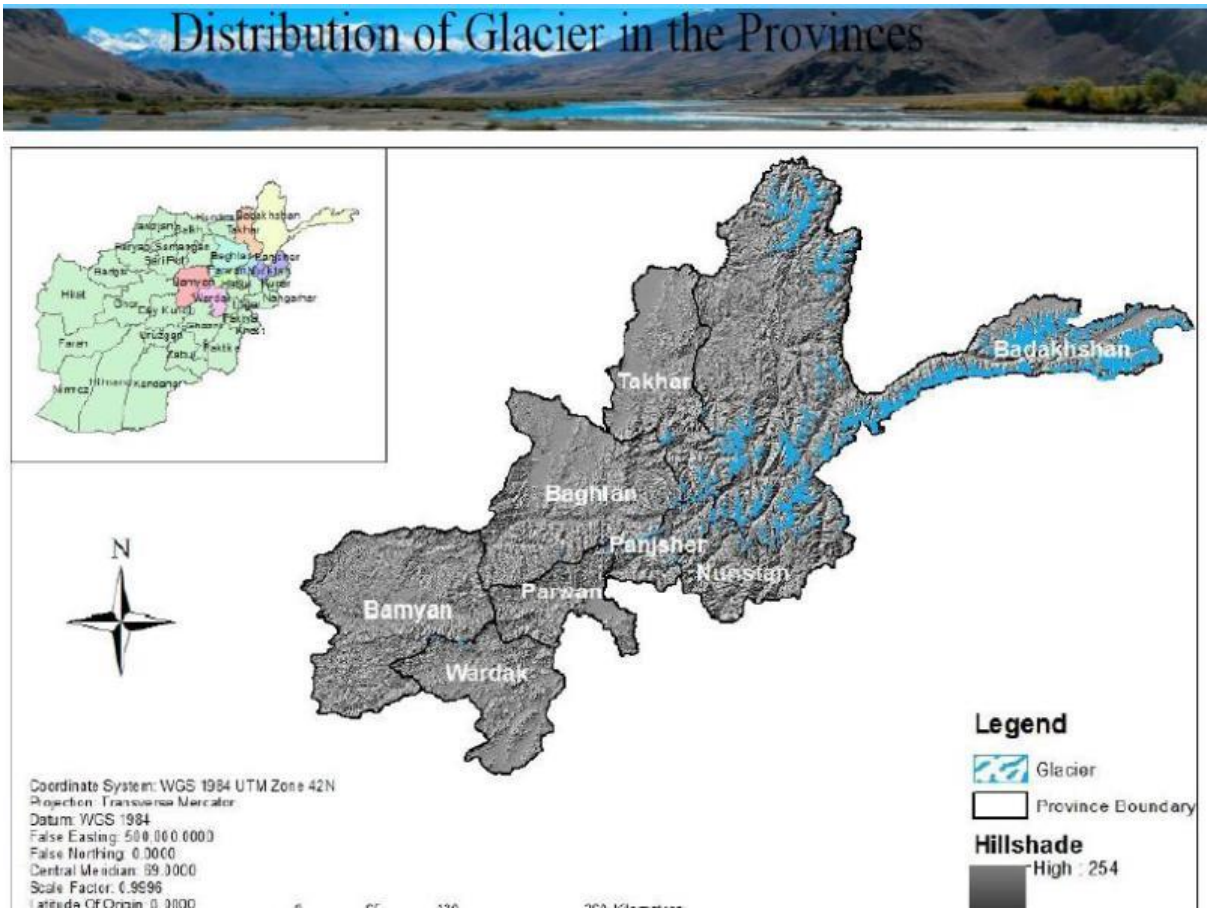
پوتانشیل آبهای سطحی از پنج حوزه دریایی کشور در دو مقطع زمانی (1969-1980) و (2008-2016)

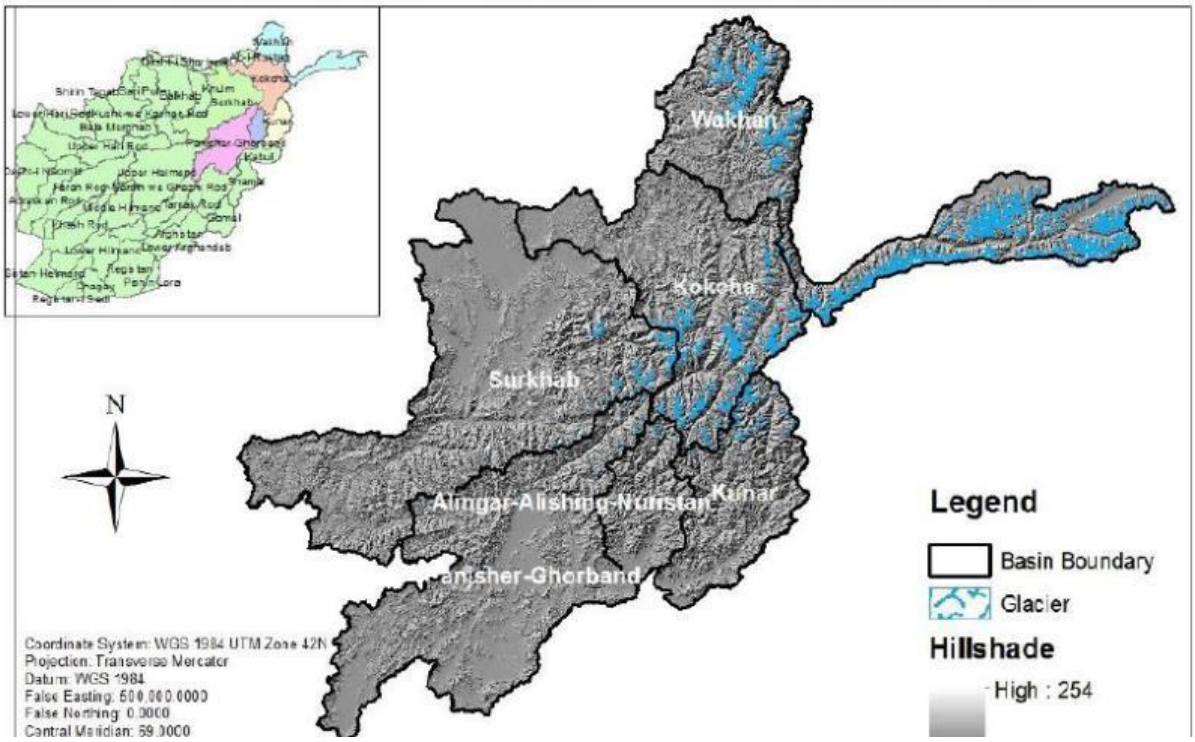
حوزه های دریایی	آب قابل دسترس بین سالهای(1980 -1948) به ملیارد متر مکعب	آب قابل دسترس در زمان فعلی (2008-2016) به ملیارد متر مکعب	کاهش مقدار آب قابل دسترس تا حال ٪
کابل	19.3	17.1	11.3
پنج-آمو	21.5	18.7	13.1
هلمند	10.4	8.4	19.00
هریرود-مرغاب	3.4	2.53	25.00
شمال	2.1	2.2	1.5% INCREAS
مجموعه	56.7	48.93	13.35%

) نوت: مجموع عمومی فعلی پوتانشیل آبهای سطحی پنج حوزه دریایی کشور عبارت است از 49 ≈48.93).

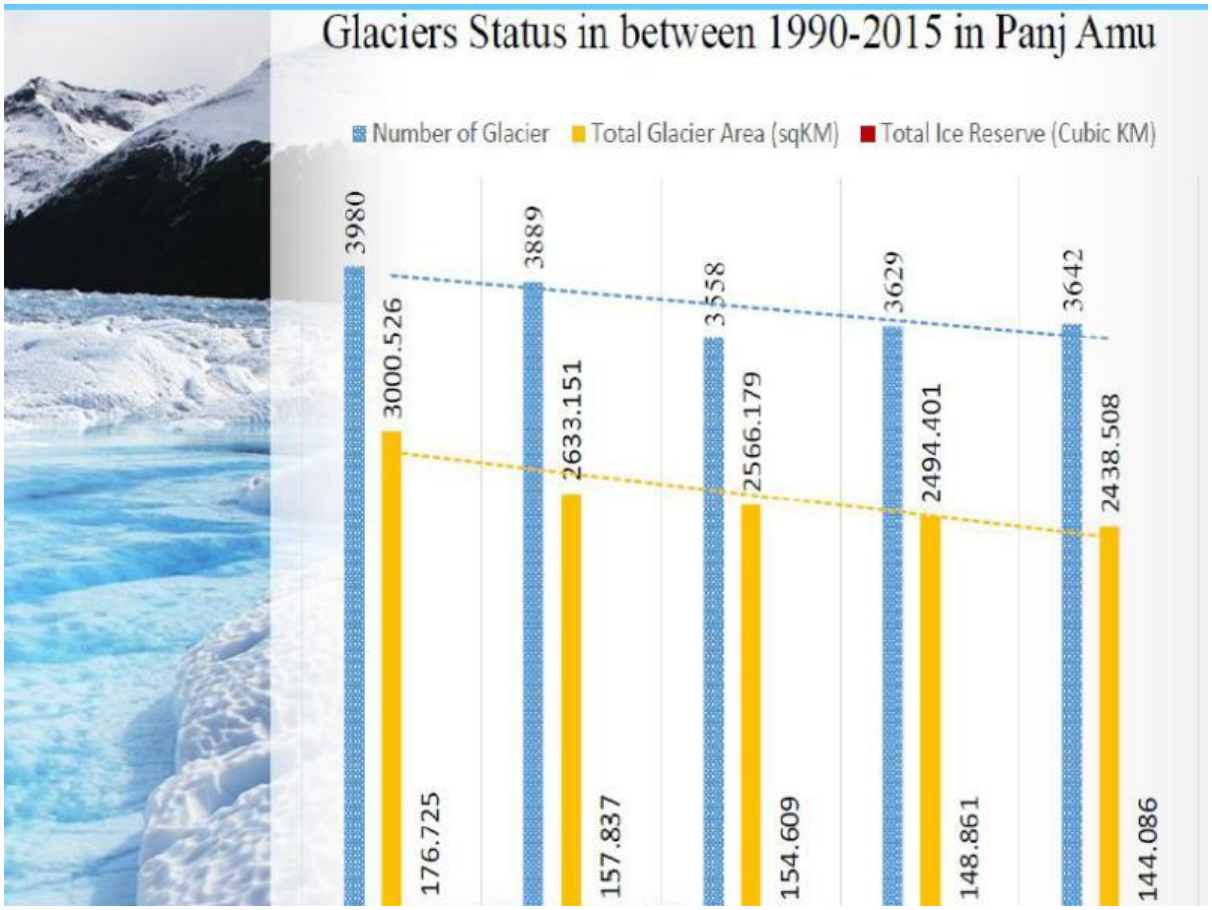
Glacier Mapping and Monitoring using Remote Sensing and GIS Techniques from years 1990-2015

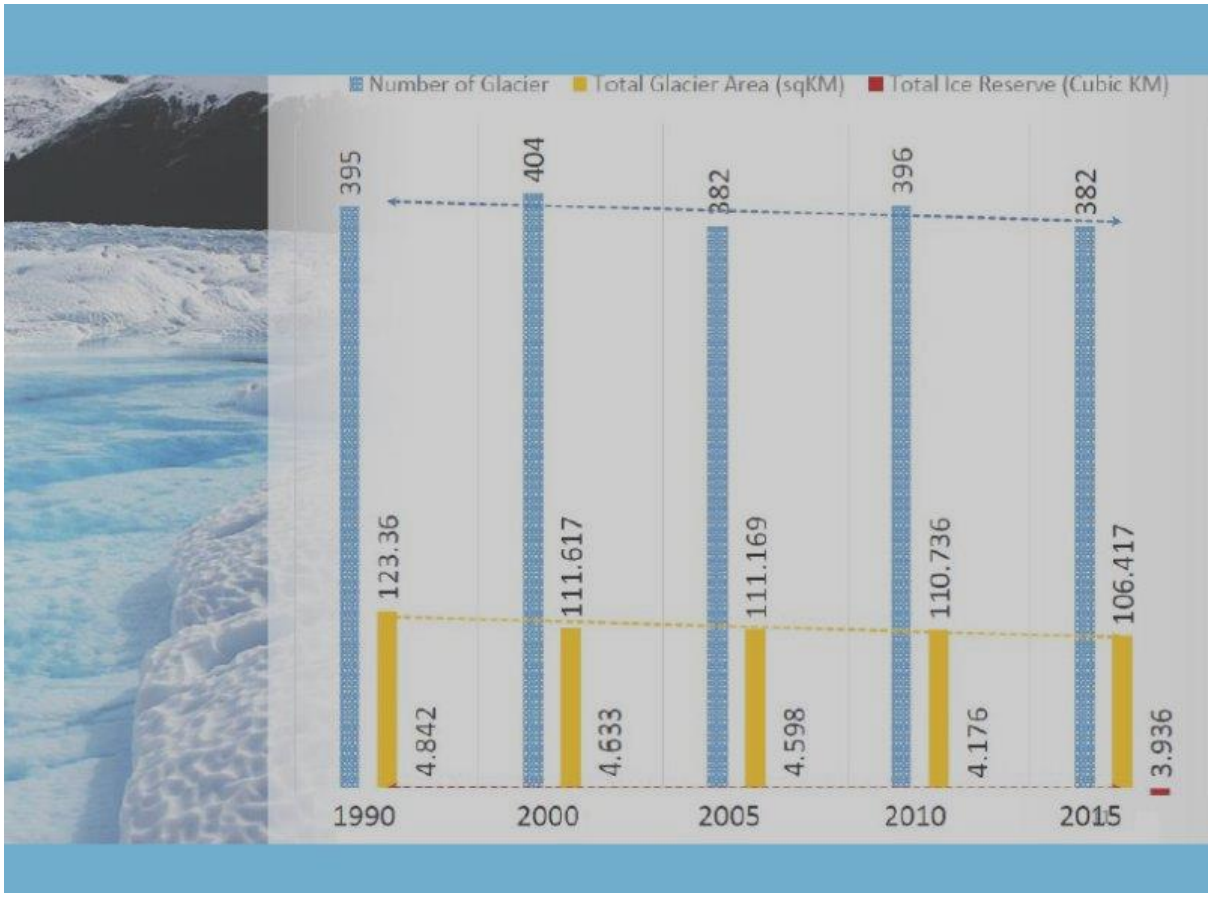

Introduction
• The glacier region of Afghanistan extend from 34.58° – 36.91° N latitude and 67.63° – 73.82° Longitude in the two major river basins (Panj Amu & Kabul-Indus) and four sub basins (Wakhan Corridor, Surkhab, Kokcha and Kabul) that contain 8 provinces in Afghanistan.
• The region is the most complex mountain system in Afghanistan. The glaciers feed 32% of Afghanistan river basins. The region is the part of Hindu Kushi_Himalayan (HKH) region that play an important role in global atmospheric circulation, the hydrological cycle and water resources availability and provide a wide range of ecosystem services.
• Mountain areas are particularly vulnerable to climate change that is why the glaciers in much of the region show sign of shrinking, thinning and retreating.
• Unfortunately there is no existence of the long term data on glacier required for a credible scientific assessment in Afghanistan

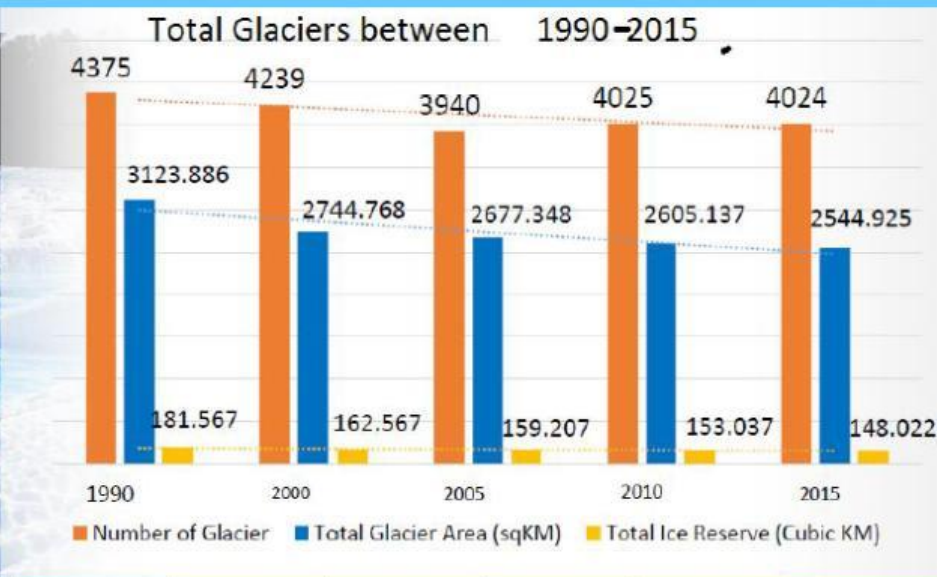

Distribution of Glacier in the Provinces
Badakhshan
Takhar
Baghlan
Panjsher
Nuristan
Parwan
Bamyan
Wardak
N
Legend
Glacier
Province Boundary
Hillshade
High : 254
Coordinate System: WGS 1984 UTM Zone 42N
Projection: Transverse Mercator
Datum: WGS 1984
False Easting: 500,000.0000
False Northing: 0.0000
Central Meridian: 69.0000
Scale Factor: 0.9996



Parameter	Unit	Glacier Area Analysis									
		Panj Amu					Kabul				
		1990	2000	2005	2010	2015	1990	2000	2005	2010	2015
Basin Area	sqKM	86474	86474	86474	86474	86474	61965	61965	61965	61965	61965
Latitude	degree	34.58-38.35	34.58-38.35	34.58-38.35	34.58-38.35	34.58-38.35	35.28-36.91	35.28-36.91	35.28-36.91	35.28-36.91	35.28-36.91
Longitude	degree	67.63-74.88	67.63-74.88	67.63-74.88	67.63-74.88	67.63-74.88	69.36-73.82	69.36-73.82	69.36-73.82	69.36-73.82	69.36-73.82
Number of Glacier	unit	3980	3889	3658	3629	3642	395	404	382	396	382
Cl Glacier Area	sqKM	2831.396	2460.566	2405.587	2318.571	2261.291962	111.26	98.069	97.184	96.322	90.45
DC Glacier Area	sqKM	169.13	172.585	160.592	175.83	177.217	12.1	13.548	13.985	14.414	15.967
Total Glacier Area	sqKM	3000.526	2633.151	2566.179	2494.401	2438.508962	123.36	111.617	111.169	110.736	106.417
Largest Glacier Area	sqKM	37.89	36.535	37.904	37.124	36.601	4.89	4.898	7.99	4.148	7.756
Total Ice Reserve	cubic KM	176.725	157.837	154.609	148.861	144.086	4.842	4.633	4.598	4.176	3.936
highest Elevation	Meter	7213	7074	7213	7243	7256	6150	6150	6150	6134	6134
Lowest Elevation	Meter	3131	3027	3131	3166	3136	3907	3907	3857	3859	3906


Glaciers Status in between 1990-2015 in Panj Amu
Number of Glacier
Total Glacier Area (sqKM)
Total Ice Reserve (Cubic KM)
3980
3000.526
176.725
3889
2633.151
157.837
3658
2566.179
154.609
3629
2494.401
148.861
3642
2438.508
144.086


Number of Glacier
Total Glacier Area (sqKM)
Total Ice Reserve (Cubic KM)
395
123.36
4.842
404
111.617
4.633
382
111.169
4.598
396
110.736
4.176
382
106.417
3.936
1990
2000
2005
2010
2015



Time	1990-2000	2000-2005	2005-2010	2010-2015	1990-2015
Area	379.118	67.42	72.211	60.212	578.961
Percentage	12.13%	2.46%	2.69%	2.31%	18.53%

Challenges &Recommendations

- Extension of hydro meteorological networks in entire basins are essential to generate accurate and reliable database in order to forecast flashflood, drought, Drought analysis planning, research and development.
- Implementation of IWRM approach in order to decentralize the hydro-met activities to the RBL and SRBL
- Capacity building programs in the RBS level and SRB Level
- Existing of hydro-met data gaps (still waiting for result of QCDP datasets)

Australia:

Australian National University

Highlights: Australian Country Report

Ian White
Australian National University

United Nations Educational, Scientific and Cultural Organization · International Hydrological Programme

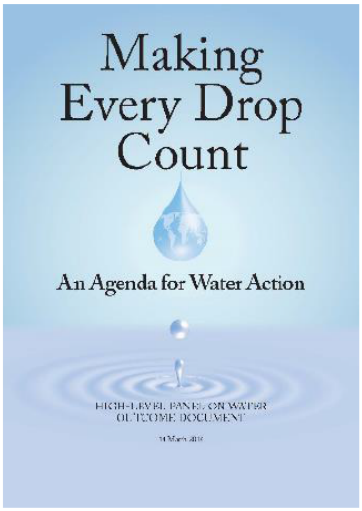
RSC-AP Shanghai 4-5 Nov 2018

UN High Level Panel on Water

https://sustainabledevelopment.un.org/HLPWater

RSC-AP Shanghai 4-5 Nov 2018

UN High Level Panel on Water (HLPW)

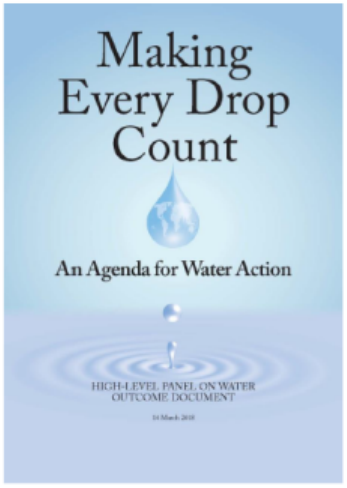


- Convened by UN Sec. Gen & Pres. World Bank
- April 2016 to 14 March 2018
- To ensure availability and sustainable management of water and sanitation for all
- A kick-start for UN SDG 6.

Australia provided leadership to the HLPW on water data, water use efficiency and innovation

https://sustainabledevelopment.un.org/HLPWater RSC-AP Shanghai 4-5 Nov 2018

UN High Level Panel on Water



FOUNDATION FOR ACTION

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

Encourages the launch of new cooperative initiatives in areas of critical importance to the new water agendas:

- A global leadership coalition on valuing water
- A water scarcity initiative, and
- An Africa water investment program.

http://www.unwater.org/high-level-panel-on-water-outcome-document/ RSC-AP Shanghai 4-5 Nov 2018

Two Decades of Water Reforms in Australia

- Cap on surface water abstraction from Murray-Darling 1995
- Australian Bureau of Statics Water Accounts 1996
- National Land & Water Audit 1999 & Salinity Audit 1999
- Basin Salinity Management Strategy 2001-2015
- MDB Council Integrated Catchment Management Policy-2001
- National Water Initiative - 2004
- Commonwealth Water Act 2007 (Amended 2008)
- Bureau of Meteorology – role in water data/ analysis
- Murray-Darling Basin Management Plan 2015, 2016
- Basin Salinity Management Strategy, 2015-2030

http://www.abc.net.au/news/2016-02-18/young-men-burn-copies-of-the-guide-to-the-murray/7180740

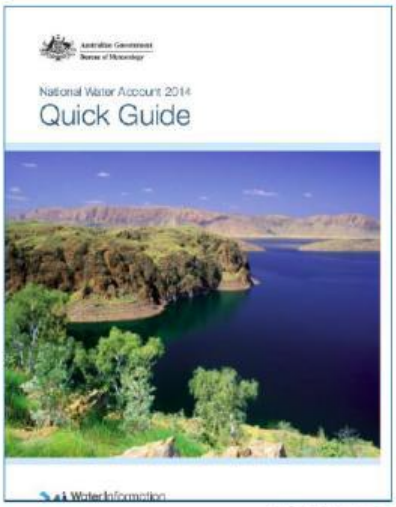
RSC-AP Shanghai 4-5 Nov 2018

National Water Monitoring in Australia - BoM

Commonwealth Water Act 2007:

- Bureau of Meteorology responsible for annual publication of the National Water Account in addition to climate data and analysis, tsunami warnings etc
- 10 National significant water regions
- Water stores, flows, water rights water use, volumes of water traded, extracted & managed for economic, social, cultural and environmental benefit
- Covers surface & groundwater & water quality

www.bom.gov.au/water/nwa



RSC-AP Shanghai 4-5 Nov 2018

National Water Account - BoM

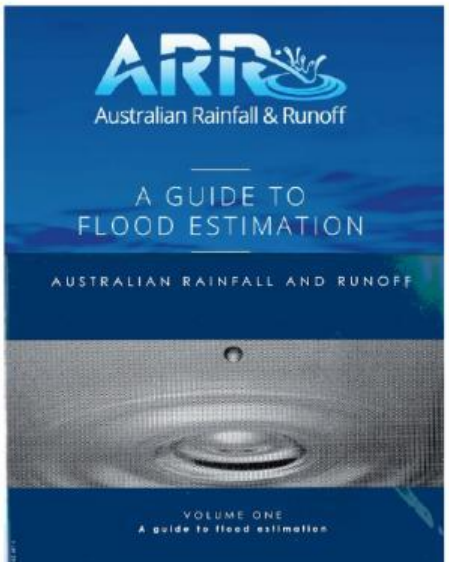
The National Water Account provides:

- information that has previously been difficult to access or unavailable in a standardised form.
- helps identify & understand information gaps & limitations in data collection methods so that they can be addressed better.

http://www.bom.gov.au/water/nwa/2017/mdb/index.shtml

RSC-AP Shanghai 4-5 Nov 2018

FLOODING (ARR- Available on the web)



Australian Rainfall Runoff 2016
- Engineers Australia continuously updated

ARR Project No.	Project Title	Starting Stage
1	Development of intensity-frequency-duration information across Australia	1
2	Spatial patterns of rainfall	2
3	Temporal pattern of rainfall	2
4	Continuous rainfall sequences at a point	1
5	Regional flood methods	1
6	Loss models for catchment simulation	2
7	Baseflow for catchment simulation	1
8	Use of continuous simulation for design flow determination	2
9	Urban drainage system hydraulics	1
10	Appropriate safety criteria for people	1
11	Blockage of hydraulic structures	1
12	Selection of an approach	2
13	Rational Method developments	1
14	Large to extreme floods in urban areas	3
15	Two-dimensional (2D) modelling in urban areas	1
16	Storm patterns for use in design events	2
17	Channel loss models	2
18	Interaction of coastal processes and severe weather events	1
19	Selection of climate change boundary conditions	3
20	Risk assessment and design life	2
21	IT Delivery and Communication Strategies	2

http://arr.ga.gov.au/about

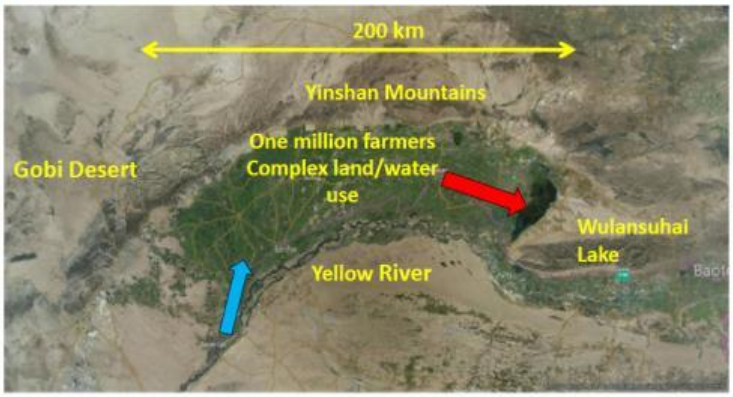
CHA Workshop Shanghai 3 Nov 2018

United Nations Educational, Scientific and Cultural Organization | International Hydrological Programme

Theme of RSC: Water Security: Facing the local, regional and global challenges

RSC-AP Shanghai 4-5 Nov 2018

Hetao Irrigation District: One of 3 Largest in China



Google Earth

Average Farm Size ~ 0.6 ha ≈ 9 mu

Wuhan University
Water Resources Research Institute, Inner Mongolia
China Agricultural University

RSC-AP Shanghai 4-5 Nov 2018

Managed Aquifer Recharge-IAH-UNESCO

Hydrogeology Journal
https://doi.org/10.1007/s10040-018-1841-z

July 2018 Publication

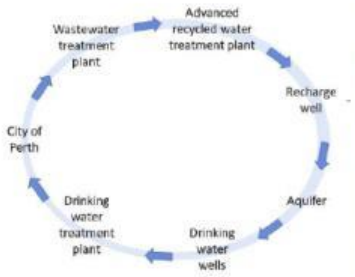
PAPER

Sixty years of global progress in managed aquifer recharge

P. Dillon[1,2] · P. Stuyfzand[3,4] · T. Grischek[5] · M. Lluria[6] · R. D. G. Pyne[7] · R. C. Jain[8] · J. Bear[9] · J. Schwarz[10] · W. Wang[11] · E. Fernandez[12] · C. Stefan[13] · M. Pettenati[14] · J. van der Gun[15] · C. Sprenger[16] · G. Massmann[17] · B. R. Scanlon[18] · J. Xanke[19] · P. Jokela[20] · Y. Zheng[21] · R. Rossetto[22] · M. Shamrukh[23] · P. Pavelic[24] · E. Murray[25] · A. Ross[26] · J. P. Bonilla Valverde[27] · A. Palma Nava[28] · N. Ansems[29] · K. Posavec[30] · K. Ha[31] · R. Martin[32] · M. Sapiano[33]

Received: 12 March 2018 / Accepted: 27 July 2018

Perth Groundwater Replenishment Project, Western Australia



RSC-AP Shanghai 4-5 Nov 2018

United Nations Educational, Scientific and Cultural Organization

UNESCO Natural Sciences Programme Priorities

1. Gender and Science
2. Indigenous Peoples, and
3. Small Island Developing States (SIDS)

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

Australian IHP Committee has been working in LOS (SIDS) since formation in 1995 in collaboration with SPC (SOPAC), UNICEF, AusAID, MFat, EU, PIC Governments
Catalysed by Pilot Projects under UNESCO IHP's Humid Tropics Programme

RSC-AP Shanghai 4-5 Nov 2018

Kiritimati, Line Islands, Kiribati – SPC/EU Water Supply

Google Earth

Photo: Tony Falkland

- Designated national growth centre
- Abundant Fisheries
- Insufficient local fresh groundwater for fishing fleet, processing plant and urban communities
- Highly variable annual precipitation

RSC-AP Shanghai 4-5 Nov 2018

Australian National IHP Committee

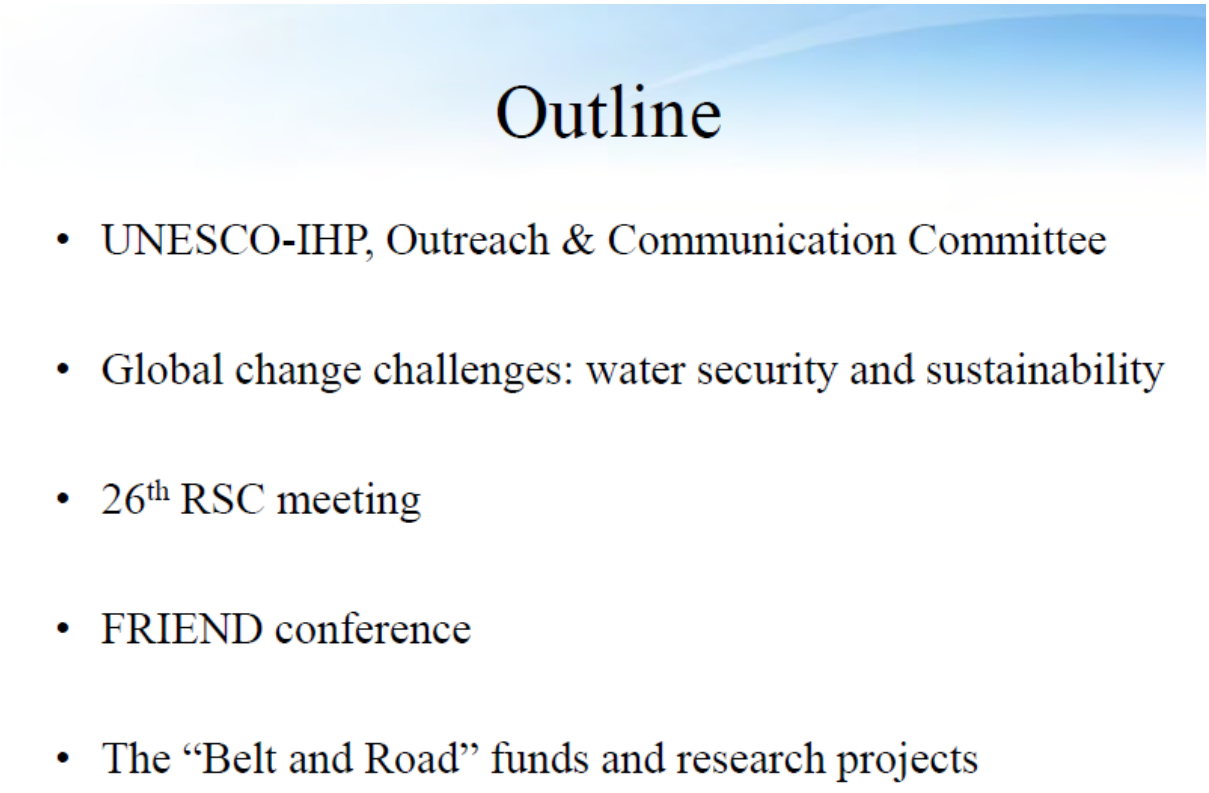
Name	Expertise	Organization
Dasarath Jayasuriya	Flood and Seasonal Forecasting	Bureau of Meteorology
Tony Falkland	Island Hydrology	Island Hydrology Services
Trevor Daniell	Urban, Low and High Flow Hydrology	University of Adelaide
Quentin Grafton	UNESCO Chair in Water Economics and Transboundary Water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

- Is entirely voluntary
- Receives no financial support from Australian Government or Australia's National Commission for UNESCO

RSC-AP Shanghai 4-5 Nov 2018

China:


Hydro-Lab
CHINA
National Report on IHP Related Activities
for
26th UNESCO IHP Regional Steering Committee Meeting
for Asia and the Pacific
Contribution to IHP-VIII (2014-2021)
水文水资源与水利工程科学国家重点实验室
State Key Laboratory of Hydrology-Water Resources and Hydraulic Engineering
中国 · 上海 Shanghai · China


Outline
• UNESCO-IHP, Outreach & Communication Committee
• Global change challenges: water security and sustainability
• 26th RSC meeting
• FRIEND conference
• The "Belt and Road" funds and research projects

Outreach & Communication

Updates for the Bureau of UNESCO-IHP

Outreach & Communication Committee

11 June 2018, Paris

Background

- 1996 – 2010 Council resolutions acknowledging the urgent need for a permanent post for a communications specialist
- UNESCO IOS: raise IHP profile by comms strategy, improving website, allocating resources
- 2014: Outreach and Communication Committee established by IHP Council in the 21st session. Builds on work of the Publication and Communication Committee
- 2014 Resolution XXI-2 (2014) Implementation of a communication and outreach strategy
- 2015-, Implementation and actions of the strategy and plan
- The Council elected a member from each region to the Committee

Why Outreach & Communication?

a **key** enabler for the fulfillment of IHP's mandate, it helps to:

Increase the visibility and transparency of IHP's activities	• helps to understand the potential of IHP and participate in its activities more easily,
Share knowledge & enable cooperation	• Build water cooperation network world-widely
Strengthen connections within the IHP network	• Enhance the leading position of IHP
Increase public recognition	• Increases awareness of water and IHP work
Attract funding	• Improve capacity

Responsibilities of IHP network

- ❑ Undertake communication actions, incl. maintaining a website or webpage and providing relevant information for the IHP website
- ❑ Systematically provide content to the Secretariat for mass diffusion, as appropriate (the Secretariat will provide templates/guidance for this)
- ❑ Actively participate in and take ownership of the platforms for communication and collaboration at their disposal.

Fact: the committee could hardly help due to the loosing formation of the committee & lacking of staffing support from IHP office.

Responsibilities of IHP Secretariat

- Present, on a biennial basis, a communication action plan (together with O&C Committee)
- Facilitate implementation of the strategy and communication actions, in particular through IHP website
- Enhance the division's communication capacity by communication capacity-building actions;
- Systematically collect and diffuse communication content from/to members of the IHP network,
- Establish IHP presence on social media platforms
- Contract a dedicated communication specialist on a full-time basis at the Secretariat

Fact: Insufficient due to lack of Resources in IHP!

Outcomes of last Bureau meeting

- The bureau encouraged the secretariat implement the Communication and Outreach Strategy developed jointly by the committee and secretariat.

- The bureau requested the secretariat to strengthen direct communication with the delegations, updating them on IHP activities, reinforce the communication by and with the IHP national committee in the context of the upcoming 22nd IHP council meeting, and to increase the visibility of the scope of services of the secretariat.

- The bureau recommended to maintain the committee (4-year functioning period).

Increased visibility by improving activities

- IHP's webpages were constantly and substantially updated
- IIWQ (en.unesco.org/waterquality-iiwq)
- IHP-WINS (en.unesco.org/ihp-wins)
- the Global Water Pathogen Project (en.unesco.org/theme/water-security/hydrology/water-human-settlements/gwpp)
- the Urban Water Management Programme (en.unesco.org/uwmp/projects)
- access to the archive of the former water portal's newsletter 2005-20112

Continue ...

- Between June 2016 and January 2018, the general Water Security website received 344187 visits with 642456 page views.
- The IHP website received 57428 visits with 123904 page views.
- As before, page views of the Water Security website reached a peak around World Water Day, on 22 March 2017 with 25189 views in 2017.
- The aforementioned figures reflect the impact of UNESCO water events and the increasing use of online information.

Continue ...

- IHP issued more than 45 announcements of events and 21 news items on activities/projects, events and publications and made them available online.
- IHP has been featured on social media through the UNESCO accounts on Facebook and Twitter, events have also been featured on Flickr through dedicated photo albums as part of the UNESCO Natural Sciences account and the dedicated IHP Water Family account, linking to 414 images in 11 albums which have received 318 cumulated views3.
- Resolution XXII-3 requested that quarterly updates be sent to the UNESCO Water Family. The Secretariat sent informative emails on specific subjects to disseminate a summary of information, past and upcoming events in the Programme's networks and invite contributions to the actions of the Secretariat and/or to contribute on key issues related to IHP and its further development.

Continue ...

- In the reporting period, 39 publications went online as well as 12 videos.
- The dedicated UNESCO water Youtube playlist4 currently counts 25 videos, cumulating over 82800 views.
- The Secretariat shared several videos and informative animations (Brussels office) via social media and produced a series of filmed interviews with participants of the IHP Water Knowledge Forum (November 2017). All communication material, including the constantly updated IHP information kit, is available through the following webpages:
  https://en.unesco.org/themes/water-security/hydrology/resources
  https://en.unesco.org/themes/water-security/resources/videos
- The dedicated Twitter account of the Secretary of IHP issued 1399 tweets and has 1090 followers to date and is supported by the accounts of Programme officers. The account @unescoWATER launched in February 2018, counts, in April 2018, 23 tweets with more than 3000 views and over 110 followers.

Continue ...

- With the support of a volunteering professional designer, the Secretariat undertook first steps towards changing the public image of IHP as a UNESCO Water "brand". This included the identification of specific target groups and the design or re-design of corresponding materials, i.e. for the Member States representatives, the scientific community and the general public.

- Two series of Thematic and Regional brochures benefitted from the re-design. A first revision of IHP's mission statement was presented at the Information meeting for Member States in September 2017. As per the decision of the 56th Bureau, the name change of IHP is being submitted for discussion to the 23rd IHP Council based on document IC-XXIII/Ref.7.

Continue ...

- The recruitment of the communication officer at P2 level in June 2017 has shifted the challenges and lessons learnt encountered in past years.

- Continuous coordination of IHP's communication and related core tasks are now ensured.

- However, certain challenges largely remained and were exacerbated by the contingency plan put in place in July 2017: in the face of an increased need of visibility, experienced temporary staff was available only intermittently, disrupting established and evolving workflows and delaying implementation of the draft Communication and Outreach Strategy, the Resolution XXII-3 (e.g. producing the quarterly e-mail circular to the UNESCO Water Family), and further progress of branding "UNESCO Water" (decision of the 55th Bureau).

- Close collaboration with the Natural Science Sector's communication team continues, helping to enhance IHP's communication and outreach activities, for instance in the case of the COP 23.

Evaluation of the O&C Committee

Recalling	that the Outreach and Communication Committee is an ad hoc committee that will be evaluated during the 23rd session of the IHP Council (IHP/IC-XXI/6 Annex II);
Recalling	That the 22nd Council requested the IHP Secretariat to prepare, jointly with the Committee, reviewed and updated Terms of Reference for the Committee and present them to the 23rd session of IHP Council;
Objective of the Committee	To act on behalf of the IHP in assessing and promoting the implementation of the communication plan. It will also undertake initiatives to raise the impacts of the IHP communication plan and to promote wider reach of IHP, to the widest possible range of stake-holders, water professionals, and the public. The committee emphasises the need to improve both internal and external communication of IHP, leverage existing UNESCO communication tools to enhance communication and outreach, and clearly define the target audience of IHP communication along with actions enhancing the flow and frequency of pertinent information.
Composition of the Committee	The Outreach and Communication Committee shall be composed of six Members States. The composition of the Communication Committee so formed shall reflect an equitable geographical distribution.

Achievements in the past 2 years

- As was presented in the 55th and 56th IHP Bureau, the IHP Secretariat has indeed been able to increase outreach by moving the website and launching a UNESCO Water Family twitter account. That has indeed increased the external Communication.
- The committee has had several meetings this year via Skype to discuss possible improvements of the Outreach and Communication of IHP.
- Region I is now aiming to start using online communication platforms to communicate about separate activities and research topics that might be of interest for their fellow countries or water centres.

Necessary improvements for the success

- The Committee members have been chosen thus, that they can represent their Region in the committee, being able to connect more easily with their respective region. However, when only 2 out of 6 committee members are actively joining meetings, this does not function properly. The Committee needs more active members that feel responsible for improving internal communication, and therefore advises to adjust the ToR for the coming period.
- The internal communication therefore has only improved a little, since communication is defined as: a process by which information is exchanged between individuals or organisations through a method of regular communication. There is not a common system in use, and information is not being exchanged (on a regular and systematic basis).
- The potential for an Outreach and Communication Committee is still high. There is still the need to increase the visibility and transparency with regard to IHP's activities so that Member States can understand the potential of IHP and participate in its activities more easily.

Theme & Topics

Theme:

Hydrological Processes and Water Security in a Changing World

Topics:

- Hydrological observations under the changing environment and scarcity.
- River regimes and hydrological extremes under the changing environment.
- Simulation and prediction of surface water and groundwater processes under the impact of human activities.
- Urban hydrology and sponge city.
- Multi-objective water resources allocation and operation.
- Integrated watershed management including eco-hydrology and socio-hydrology.
- Water quality and sediment transport including coastal hydrology: changes under climate change and human activities.
- River health and ecological baseflow under changing environment.

Organizations

1) Hosts

-UNESCO-IHP

-International Association of Hydrological Sciences(IAHS)

-China National Committee of UNESCO-IHP

2) Organizers

-China Institute of Water Resources and Hydropower Research (IWHR)

-Center of Hydrology and Water Resources Monitoring and Forecasting, MWR, P. R. China

3) Co-organizers

-Nanjing Hydraulic Research Institute (NHRI)

-Hohai University

-Bureau of Hydrology, Changjiang Water Resources Commission

-Bureau of Hydrology, Yellow River Conservancy Commission

-State Key Laboratory of Simulation and Regulation of Water Cycle in River Basin

-State Key Laboratory of Hydrology-Water Resources and Hydraulic Engineering

Organizing Committee

Chairman

-Jianyuan CAI	Director, Department of Hydrology, MWR, P.R. China President, China National Committee of UNESCO-IHP

Vice-Chairman

-Ge LI	Deputy Director, Department of International Cooperation, Science and Technology, MWR, P.R. China Vice-President, China National Committee of UNESCO-IHP
-Yanshan YANG	Deputy Director, Department of Hydrology, MWR, P.R. China
-Jing PENG	Vice-President, China Institute of Water Resources and Hydropower Research
-Zhiyu LIU	Vice-President, Center of Hydrology and Water Resources Monitoring and Forecasting, MWR, P. R. China

Secretary-General

-Yanshan YANG	Deputy Director, Department of Hydrology, MWR, P.R. China
-Gil Mahe	Director of Research, IRD, Montpellier, France and President of FIGCC, France

Organizing Committee

Deputy Secretary-General

-Dazheng YU	Director, Division of Hydrological Monitoring, Department of Hydrology, MWR, P.R. China Secretary-General, China National Committee of UNESCO-IHP
-Zhao HAO	Director, Department of International Cooperation, Science and Technology, MWR, P.R. China Deputy Secretary General, China National Committee of UNESCO-IHP
-Jianhua WANG	Director and Professorate Senior Engineer, Department of Water Resources, China Institute of Water Resources and Hydropower Research
-Zongzhi WANG	Professorate Senior Engineer, Nanjing Hydraulic Research Institute
-Chunhui LU	Professor, Hohai University
-Abou Amani	Chief of Section, Water Science Division, UNESCO Paris

Committee

-Jianli ZHANG	Professorate Senior Engineer, Director of Division of International Cooperation, China Institute of Water Resources and Hydropower Research
-Jun WANG	Professorate Senior Engineer, Director of Bureau of Hydrology, Changjiang Water Resources Commission
-Yuanze GU	Professorate Senior Engineer, Director of Bureau of Hydrology, Yellow River Conservancy Commission Hohai University

Organizing Committee

- Secretary

-Shanshan XIONG	Department of Hydrology, MWR, P.R. China
-Dianyi YAN	China Institute of Water Resources and Hydropower Research
-Li ANG	Programme Assistant for Natural Sciences, UNESCO Beijing office, China

Scientific Committee

- Chairman

-Jianyun ZHANG	Professorate Senior Engineer of Nanjing Hydraulic Research Institute Academician of China Engineering Academy
-Gil Mahe	Director of Research, IRD, Montpellier, France and President of FIGCC, France

- Coordinators

-Zhongbo Yu	Chief and Professor of State Key Laboratory of Hydrology-Water Resources and Hydraulic Engineering
-Abou Amani	Chief of Hydrological Systems and Water Scarcity Section, Water Sciences Division, UNESCO Paris, France
-Jianqing YANG	Director, Department of Hydrology, MWR, P.R. China

- Committee

Blanca Jimenez Cisneros	Director Water Sciences Division and IHP Secretary, UNESCO Paris, France
Anil Mishra	Programme Specialist, Hydrological Systems and Water Scarcity Section, Water Sciences Division, UNESCO Paris, France
Jayakumar Ramasamy	Regional Hydrologist for Africa, UNESCO Nairobi Office, Kenya

Scientific Committee

- Committee

Hans Thulstrup	Regional Hydrologist for Asia and Pacific, UNESCO Jakarta Office, Indonesia
Miguel Doria	Regional Hydrologist for Latin America and Caribbean, UNESCO Montevideo Office, Uruguay
Bisher Iman	Regional Hydrologist for Arab region, UNESCO Cairo Office, Egypt
Siegfried Demuth	Director of International Center for Water Resources and Global Change, Koblentz, Germany
Trevor Daniel	Coordinator FRIEND Asia and Pacific, Australia
Henny van Lanen	Coordinator FRIEND Europe, Netherlands
Bamory Kamagate	FRIEND-AOC Coordinator and Professor University of Abidjan, Cote d'Ivoire
Denis Hughes	FRIEND-Southern Africa Coordinator and Professor University of Kuazulu Natal, South Africa
Eduardo Rodriguez	FRIEND Latin America and Caribbean Coordinator, Professor, University Cuba
Oula Amrouni	MEDFRIEND Tunisia
Eric Servat	Director Institute on Water and Environment, Montpellier, France
Pascal Breil	IRSTEA France Ecohydrology
Giuseppe Arduino	UNESCO IHP Ecohydrology France
Abdou Ali	AGRHYMET Niamey Niger
Le Thi Phuong Quynh	Viet Nam Academy of Science and Technology Hanoi Water Quality and Sediment Transport
Bernal Isabel Carolina	National Polytechnic School Quito Equator
Tzoraki Ourania	Ass. Prof. University of Mytilene, Greece, MEDFRIEND
Harouna Karambiri	Head of Doctoral School of 2IE, Ouagadougou Burkina-Faso FRIEND AOC
Andrew Ogilvie	G-Eau Laboratory Montpellier France Socio-Hydrological Dynamics
Duong Thi Thuy	Viet Nam Academy of Science and Technology Hanoi River Health and Ecological Baseflow
Waldo Lavado Casimiro	National Meteorological and Hydrological Service Peru

Scientific Committee

- Committee

Ernest Amoussou	University of Parakou, Benin
Christophe Cudennec	IAHS Secretary General, Agrocampus Rennes France
Mohamed Meddi	Deputy Head of National Superior School of Hydraulics, Blida Algeria, MEDFRIEND
Chantha Oeurng	Deputy Head of Department & Lecturer of Hydraulic, Irrigation and Watershed Management, Department of Rural Engineering, Institute of Technology of Cambodia
Hao WANG	Professorate Senior Engineer of China Institute of Water Resources and Hydropower Research Academician of China Engineering Academy
Jun XIA	Professor of Wuhan University, Academician of the Chinese Academy of Sciences
Jinren NI	Professor of Peking University, Academician of the Chinese Academy of Sciences
Yangwen JIA	Professorate Senior Engineer of China Institute of Water Resources and Hydropower Research
Guangheng NI	Professor of Tsinghua University
Zongxue XU	Professor of Beijing Normal University
Qingping ZHU	Vice President of Orint -Landscape Ltd. Professorate Senior Engineer
Xiuying DONG	Professorate Senior Engineer, Center of Hydrology and Water Resources Monitoring and Forecasting, MWR, P. R. China
Lingli WANG	Professorate Senior Engineer, Center of Hydrology and Water Resources Monitoring and Forecasting, MWR, P. R. China
Guoqing WANG	Professorate Senior Engineer of Nanjing Hydraulic Research Institute

Participants

Approximately 140 participants from 35 countries

Country	Number of Participants	Country	Number of Participants
China	35	Poland	2
France	12	Tajikistan	2
Algeria	7	Tanzania	2
Tunisia	7	Thailand	2
Germany	6	Central African Republic	1
Nigeria	6	Cuba	1
Benin	5	Czech Republic	1
United Kingdom	5	Ecuador	1
Senegal	4	Ethiopia	1
Cameroon	3	Indonesia	1
Cote d'Ivoire	3	Italy	1
DRC	3	Kenya	1
Iran	3	Lebanon	1
Morocco	3	New Zealand	1
Netherlands	3	Russia	1
Philippines	3	Sudan	1
Australia	2	Vietnam	1
Japan	2		

The Belt and Road Funds

主要国际水文计划

GEWEX	Global Energy and Water Cycle Experiment
GCIP	Continental-scale International Project
TOGA	Tropical Ocean-Global Atmosphere
WOCE	World Ocean Circulation Experiment
CLIVAR	Climate and Ocean: Variability, Predictability and Change

- 中国国家主席习近平总书记提出"一带一路"战略，旨在推动中国与沿线国家及地区的合作伙伴关系，互利合作，共同发展
- **President Xi Jinping has announced "the Belt & Road" (B&R) strategy, with the purpose of boosting the mutually beneficial cooperation with countries and regions along B&R**

意 义 Necessity

主要国际水文计划

GEWEX	Global Energy and Water Cycle Experiment
GCIP	Continental-scale International Project
TOGA	Tropical Ocean-Global Atmosphere
WOCE	World Ocean Circulation Experiment
CLIVAR	Climate and Ocean: Variability, Predictability and Change

- 水安全与可持续发展和国家安全、地区及国际和平稳定紧密相连，因此，在“一带一路”战略实施过程中，需要对沿线水问题研究予以高度重视
- **Because the water security and sustainability are closely linked with the security as well as the regional and international peace and stability, research on these issues should be highly regarded in the B&R implementation**

意 义 Necessity

主要国际水文计划

GEWEX	Global Energy and Water Cycle Experiment
GCIP	Continental-scale International Project
TOGA	Tropical Ocean-Global Atmosphere
WOCE	World Ocean Circulation Experiment
CLIVAR	Climate and Ocean: Variability, Predictability and Change

- 目前，针对“一带一路”沿线国家及地区水安全与可持续发展的研究甚少，亟待更多的关注和研究
- **The lack of study on water security and sustainability along B&R urgently calls for more devotion and significant research**

目 标 Mission

One Belt "一带"


河西走廊 Hexi Corridor


哈萨克斯坦 Kazakhstan


乌兹别克斯坦 Uzbekistan


伊朗 Iran


土耳其 Turkey


俄罗斯 Russia

.....

- 沿着以中国西部地区（河西走廊）为起点的丝绸之路经济带，经过中亚，最终到达欧洲
- **The Belt starts from western China (Hexi Corridor), through Centrial Asia, all the way to Europe**

目 标 Mission

One Belt "一带"


河西走廊 Hexi Corridor


哈萨克斯坦 Kazakhstan


乌兹别克斯坦 Uzbekistan


伊朗 Iran


土耳其 Turkey


俄罗斯 Russia

.....

- 沿着以中国西部地区（河西走廊）为起点的丝绸之路经济带，经过中亚，最终到达欧洲
- The Belt starts from western China (Hexi Corridor), through Centrial Asia, all the way to Europe
- 关键点：水资源短缺，气候变化下水生态及水环境的脆弱性
- Issues: water resource shortage, ecological sensitivity and environmental vulnerability to climate change

One Road "一路"


上海 Shanghai


越南 Vietnam


马来西亚 Malaysia


斯里兰卡 Sri Lanka


印度 India


希腊 Greece

.....

- 沿着以中国西南河源、长江经济带为起点的21世纪海上丝绸之路,经过南海，最终到达欧洲
- **The Road starts from southwestern rivers of China, through South China Sea, all the way to Europe**

项目设置 Program

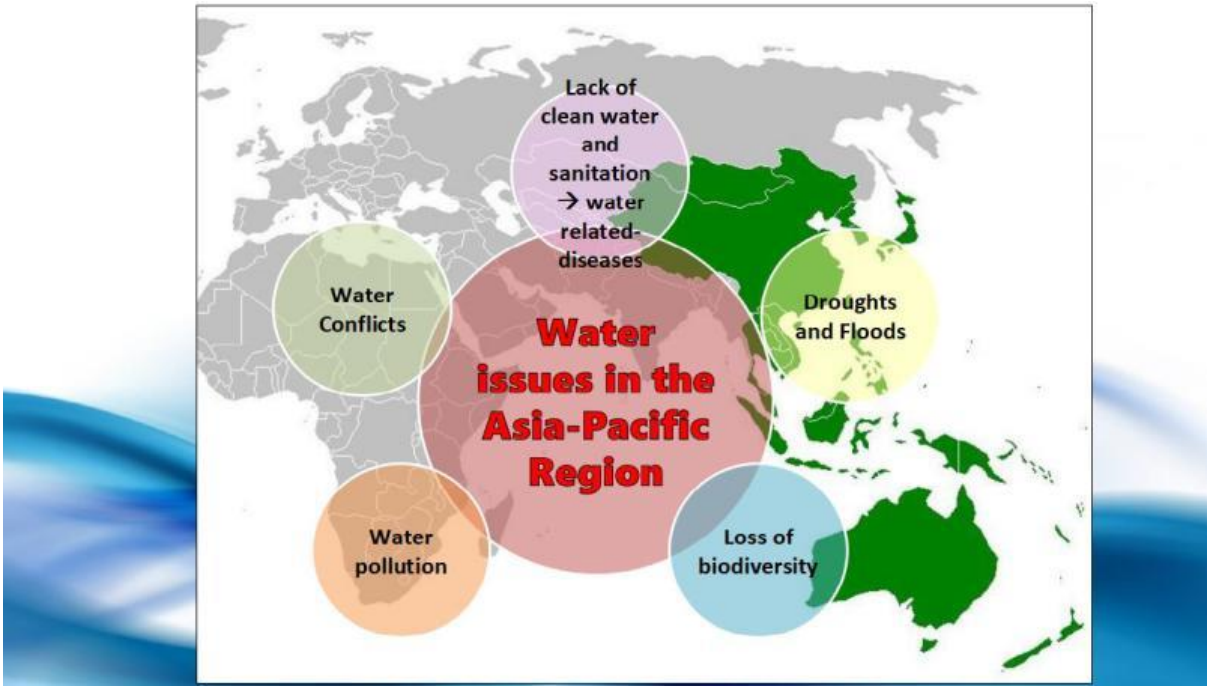
种子基金 1000 万人民币，资助以下项目：

Initial 10 million RMB of B&R Fund is setup for supporting the following:

- 学生奖学金 - Student Scholarship
- 青年科学家研究项目 - Young Scientist Research Project
- 重点研究项目 - Key Research Project

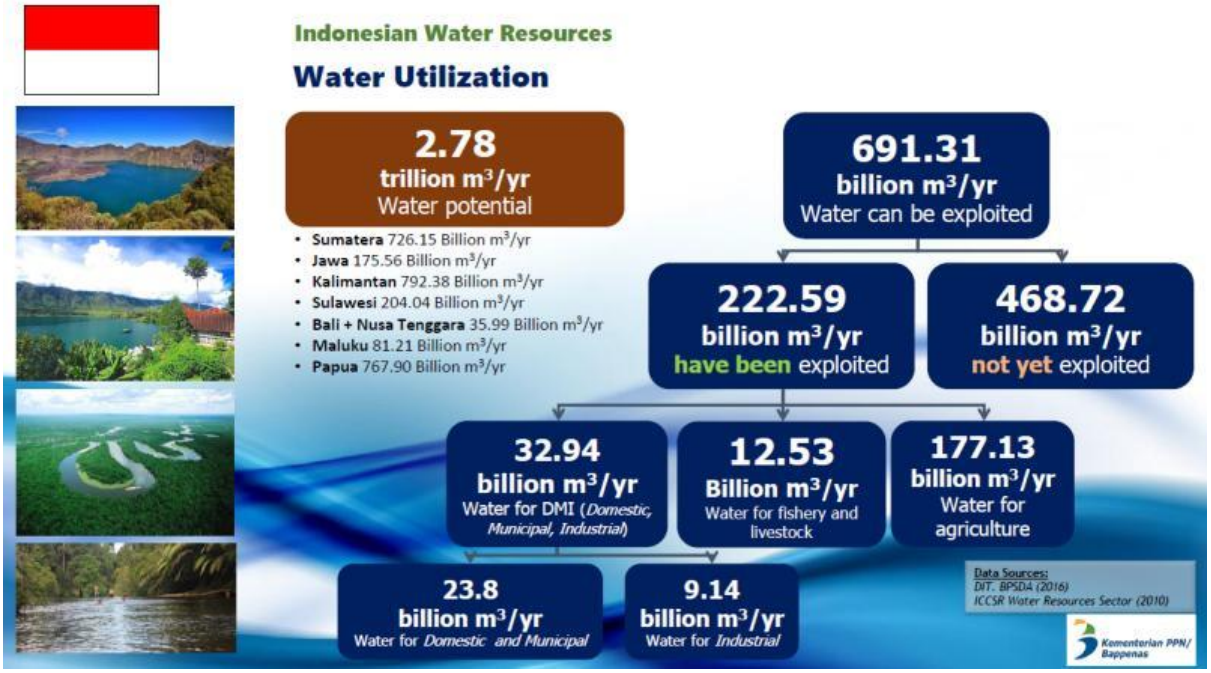
Indonesia:

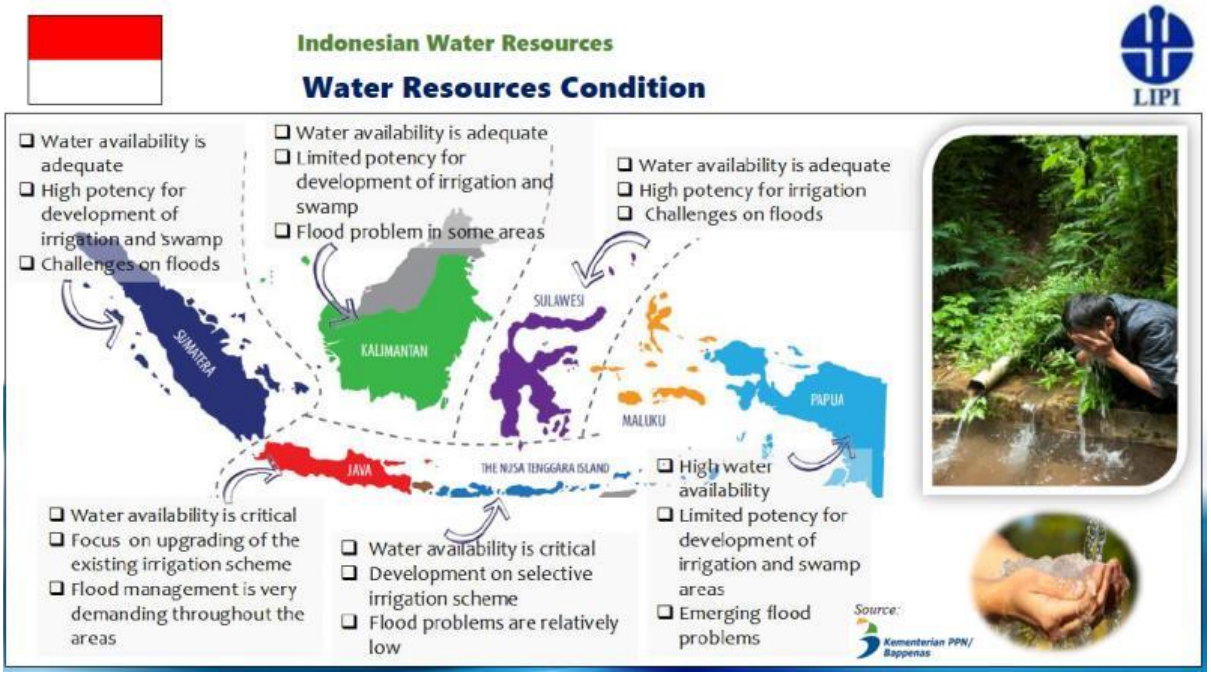

United Nations Educational, Scientific and Cultural Organization
International Hydrological Programme
IHP INDONESIA
LIPI
COUNTRY REPORT OF THE INDONESIAN IHP ACTIVITY 2017-2018
Future Challenges for Water Security
Secretary I of the Indonesian IHP National Committee
Dr. Fauzan Ali, M.Sc.
The 26th UNESCO International Hydrological Programme (IHP) - Regional Steering Committee for Southeast Asia and the Pacific (RSC)
3-5 November, 2018, China


Lack of clean water and sanitation → water related-diseases
Water Conflicts
Droughts and Floods
Water issues in the Asia-Pacific Region
Water pollution
Loss of biodiversity

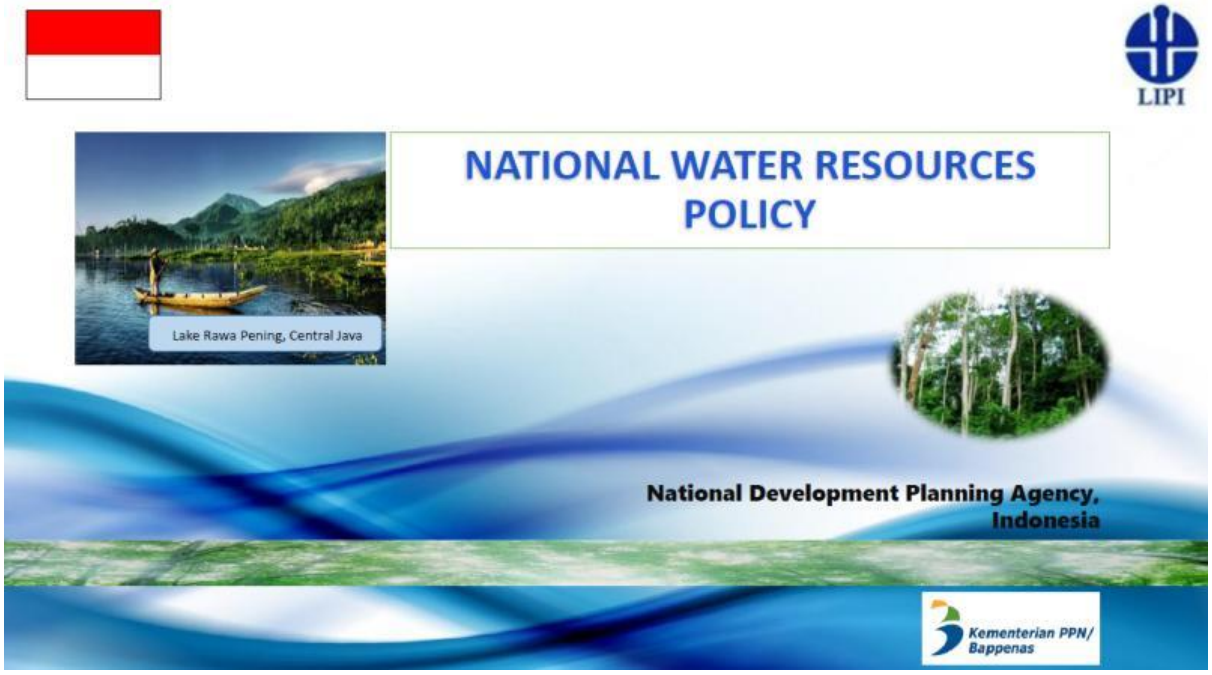

Indonesian Water Resources
LIPI
Inland Water Resources in Indonesia
13.85 millions ha of rivers, lakes and ponds
5,590 major rivers with 65,017 tributaries
12.0 millions ha of rivers and flood plains
1.8 millions ha of natural lakes
0.05 millions ha of dams
Total length of major rivers 94,573 km
1,512,466 km2 watershed areas
©Gadis Sri Haryani, 2014


Indonesian Water Resources
LIPI
IDENTIFIKASI DANAU INDONESIA SERI SUMATERA
Previous Studies:
1. 840 lakes
2. 162 dams
3. 735 ponds
New Data
RC Limnology - LIPI since 2017 have recalculated the number of lake in Indonesia using remote sensing & GIS technique. Report Series on Lake Identification for Java-Bali-Nusa Tenggara and Sumatra have been Published recently
LIPI Findings:
1. 286 (lake, dam, pond) in Sumatera
2. 923 (lake, dam, pond) in Java


Indonesian Water Resources
Water Utilization
2.78
trillion m³/yr
Water potential
Sumatera 726.15 Billion m³/yr
Jawa 175.56 Billion m³/yr
Kalimantan 792.38 Billion m³/yr
Sulawesi 204.04 Billion m³/yr
Bali + Nusa Tenggara 35.99 Billion m³/yr
Maluku 81.21 Billion m³/yr
Papua 767.90 Billion m³/yr
691.31
billion m³/yr
Water can be exploited
222.59
billion m³/yr
have been exploited
468.72
billion m³/yr
not yet exploited
32.94
billion m³/yr
Water for DMI (Domestic, Municipal, Industrial)
12.53
Billion m³/yr
Water for fishery and livestock
177.13
billion m³/yr
Water for agriculture
23.8
billion m³/yr
Water for Domestic and Municipal
9.14
billion m³/yr
Water for Industrial
Data Sources:
DIT. BPSDA (2016)
ICCSR Water Resources Sector (2010)
Kementerian PPN/ Bappenas


Indonesian Water Resources
Water Resources Condition
LIPI
Water availability is adequate
High potency for development of irrigation and swamp
Challenges on floods
Water availability is adequate
Limited potency for development of irrigation and swamp
Flood problem in some areas
Water availability is adequate
High potency for irrigation
Challenges on floods
SUMATERA
KALIMANTAN
SULAWESI
MALUKU
PAPUA
JAVA
THE NUSA TENGGARA ISLAND
Water availability is critical
Focus on upgrading of the existing irrigation scheme
Flood management is very demanding throughout the areas
Water availability is critical
Development on selective irrigation scheme
Flood problems are relatively low
High water availability
Limited potency for development of irrigation and swamp areas
Emerging flood problems
Source:
Kementerian PPN/ Bappenas

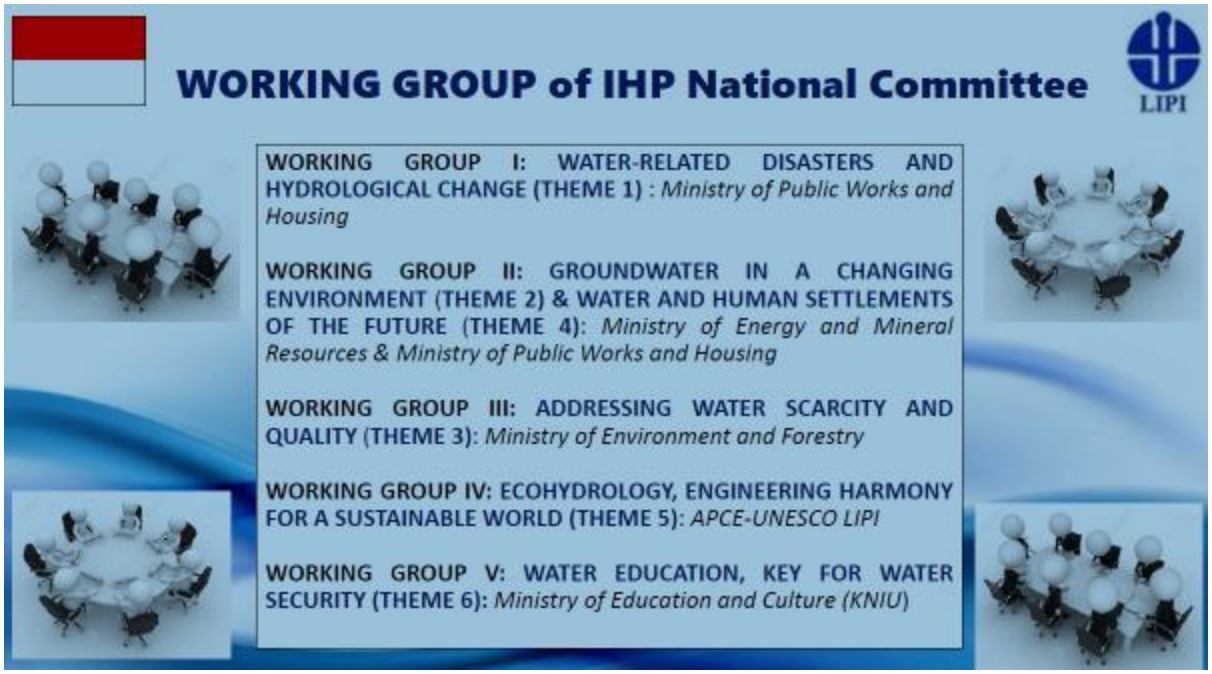

Flood & Sediment Disasters
Eco-disasters
Drought
Water Resources Issues in Indonesia
LIPI
Issues
Degraded Watershed
Unbalanced distribution of people and water
Local scarcity in water allocation for various sector
Lack access to clean water
Pollution on water resources
Un-optimal irrigation and swamp developme nt
Lack manageme nt on waste water disposal
High increased of flood and droughts


LIPI
Lake Rawa Pening, Central Java
NATIONAL WATER RESOURCES POLICY
National Development Planning Agency, Indonesia
Kementerian PPN/ Bappenas

The Indonesian IHP National Committee

- 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 Minitry
  - 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 Minerale 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


The Indonesian IHP National Committee
Advisory Board
Echelon I K/L
Chairman
Deputy IPK LIPI
Secretary I
Secretary II
Secretary III
APCE - LIPI
Vice Chairman I
Vice Chairman II
Vice Chairman III
Vice Chairman IV
Ex Director of APCE
Vice Chairman V
Ministry of Education
Coordinator Working Group I
Coordinator Working Group II
Coordinator Working Group III
Coordinator Working Group IV
Deputy Research APCE
Coordinator Working Group V
Secretary of KNIU
Member of IHP
WG I
Member of IHP
WG II
Member of IHP
WG II
Member of IHP
WG IV
Member of IHP
WG V


WORKING GROUP of IHP National Committee
LIPI
WORKING GROUP I: WATER-RELATED DISASTERS AND HYDROLOGICAL CHANGE (THEME 1) : Ministry of Public Works and Housing
WORKING GROUP II: GROUNDWATER IN A CHANGING ENVIRONMENT (THEME 2) & WATER AND HUMAN SETTLEMENTS OF THE FUTURE (THEME 4): Ministry of Energy and Mineral Resources & Ministry of Public Works and Housing
WORKING GROUP III: ADDRESSING WATER SCARCITY AND QUALITY (THEME 3): Ministry of Environment and Forestry
WORKING GROUP IV: ECOHYDROLOGY, ENGINEERING HARMONY FOR A SUSTAINABLE WORLD (THEME 5): APCE-UNESCO LIPI
WORKING GROUP V: WATER EDUCATION, KEY FOR WATER SECURITY (THEME 6): Ministry of Education and Culture (KNIU)

ACTIVITIES UNDERTAKEN IN THE PERIOD 2017-2018

LIPI

IHP-VIII ACTIVITIES

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** (BNPB) **in collaboration with the Bandung Institute of Technology (ITB) has developing a Prediction System for the Potential of a National Hazard Early Warning System** (MHEWS) that can be accessed through links; http://mhews.bnpb.go.id

ACTIVITIES UNDERTAKEN IN THE PERIOD 2017-2018

LIPI

IHP-VIII ACTIVITIES

Theme 2
Groundwater in a Changing Environment

The Geology and Mineral Resources Agency constructed the artificial wells to provide water suply for the people living in water-poor areas throughout Indonesia. As of October 2018, 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

ACTIVITIES UNDERTAKEN IN THE PERIOD 2017-2018

IHP-VIII ACTIVITIES

Theme 3
Addressing Water Scarcity and Quality

- The Minister of Environment and Forestry (2015 – 2019) has a number of programs to improve water quality in 15 priority watersheds and 15 priority lakes. The program includes installing an online monitoring system on the entire river.
- They are also developing 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.

- The Minister of Environment and Forestry 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 will Provides Water Access for 4.5 Million people (Low Income Communities).

ACTIVITIES UNDERTAKEN IN THE PERIOD 2017-2018

IHP-VIII ACTIVITIES

Theme 3 (cont..)
Addressing Water Scarcity and Quality

- Ministry of Public Works & Housing (PWH)during the last two years (2015-2018) has been built as many as 498 embung for water harvesting in dry land area, Eastern Part of Indonesia.
- In support of water and food security, it was recorded in 2016 that the Ministry of PWH successfully completed the construction of seven 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 (SPAM) in Central Java.

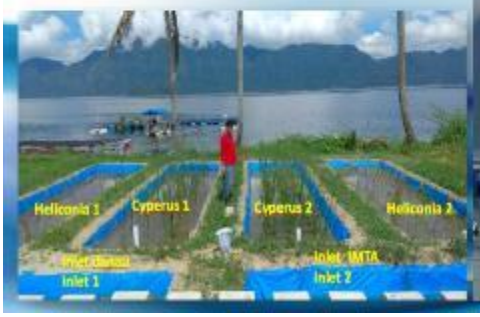
- Revitalization of Muara Sanur Dam in 2017 to restore function of reservoir of water reservoir for water supply in kab. Kuta.
- Development of monitoring system and environmental pollution prevention technology by Indonesia Institute of Science

ACTIVITIES UNDERTAKEN IN THE PERIOD 2017-2018

IHP-VIII ACTIVITIES

Theme 3 (cont..)
Addressing Water Scarcity and Quality

Technology of Constructed Wetland with Aeration at Lake Maninjau, West Sumatera



RC Limnology - LIPI: Application Technology for Restoration at Indonesian Lakes (Maninjau, West Sumatra)

ACTIVITIES UNDERTAKEN IN THE PERIOD 2017-2018

IHP-VIII ACTIVITIES

Theme 3 (cont....)
Addressing Water Scarcity and Quality

Multi trophic fisheries cultivation technology consisting of water treatment ponds using Lemna sp. Water plants, and tilapia fish ponds in Batang River, Lake Maninjau

RC Limnology - LIPI: Application Technology for Restoration at Indonesian Lakes (Maninjau, West Sumatra)

Water quality parameters information board at Lake Maninjau

ACTIVITIES UNDERTAKEN IN THE PERIOD 2017-2018

LIPI

IHP-VIII ACTIVITIES

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 (KOta TAnpa KUmuh) 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.

ACTIVITIES UNDERTAKEN IN THE PERIOD 2017-2018

Theme 5
Ecohydrology : Engineering Harmony for a Sustainable World

APCE program & activities related to theme 5 IHP phase VIII:

Development & Aplication of Ecotechnology for Environmental and Freshwater Ecosystem Improvements:

- Development of ecohydrological demosite in Saguling Reservoir

Capacity Building:

- 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"
- Socialization of ecohydrology approach to Neonbat Junior High School and Takeas High School in NTT.
- consultation workshop and training on water and urban initiative case study in jakarta, indonesia
- Initiation Development of Ecohydrology Demosite for arid zone in TTU Regency, East Nusa Tenggara Province.
- Clean action of Cibinong lake and coloring contest for children of tk and elementary school in the framework of the world water day.

ACTIVITIES UNDERTAKEN IN THE PERIOD 2017-2018

IHP-VIII ACTIVITIES

Theme 6
Water Education Keys for Water Security

ACTIVITIES UNDERTAKEN IN THE PERIOD 2017-2018

LIPI

IHP-VIII ACTIVITIES

UNESCO IGC of IHP in Paris, June 2018

Some interventions conducted by IHP Indonesia include:

- ❑ Appreciate the secretariat for comprehensive reports despite budget cuts, agreeing with the UK's proposal that in the future more detailed reports should be completed with indicators of the impact of the implementation of the IHP program.
- ❑ Indonesia also supports the existence of special accounts from IHP as an effort to improve future performance. The efforts of synergy and cooperation between the State and between regions need to be improved so that the management of water resources in the world will be better in the future.
- ❑ Supporting initiatives related to this "water museums global network", because it is the right time to increase awareness of water problems in the world.
- ❑ Supporting the proposal of the Large River Initiative, because Indonesia has several large rivers, it can share experiences in handling large rivers, in addition Indonesia also supports land subsidence initiatives where Indonesia is a member of the WG.
- ❑ Supporting C2C initiatives proposed by Uruguay, related to water and sanitation, technology transfer, and ready to cooperate through APCE C2C of UNESCO in the future.

ACTIVITIES UNDERTAKEN IN THE PERIOD 2017-2018

NEXT/FUTURE ACTIVITIES

In the new phase of IHP, Indonesia IHP National Committe will actively engage by planing, coordinating and collaborating related to International Hydrologycal Program :

- Getting more support from the Government (Relationship, Institutionally, Financially)
- Strengthening the networking with the center under UNESCO, Universities, other institutions
- Developping demosite in selected and specific purpose: Small Island Demosite, Karstic, Ecohydrolody Demosite, Peatland ecohydrology Demosite....
- Promoting joint activities related to :
  - Sustainable water management for developing resilience cities
  - Ecohydrology for water security in urban and rural areas
  - Development of appropriate technologies for water security in marginal areas
  - Strengthening water management capacity for local communities
- Periodic meeting of IHP members
- Attend to RSC IHP Meeting in Myanmar
- Attend to GC of UNESCO in Paris in June 2019
- World water day celebration in March 2019

AGENDA 2018

No	Agenda	Time	Location
1	APCE General Meeting	3rd Week of January	Cibinong< Indonesia
2	IHP Indonesia Meeting	2nd week of February	Jakarta, Indonesia
3	Ecohydrology Scientific Advisory Committee Meeting	27 February - 2 March	Faro, Portugal
4	Regional Asia Pacific session on Ecosystems- World Water Forum 2018	March 18 – 23	Brasilia, Brazil
5	IHP – UNESCO Water Week (Water initiative actions)	March 26 – 31	Jabodetabek, Indonesia
6	International Workshop on Ecohydrology in Conjuction with Regional Training Course on Coastal Ecohydrology	Second Week of April	Yogyakarta, Indonesia
7	Regional Meeting towards AP-FRIEND Conference and RSC IHP	First Week of May	Jinghai, China
8	Regional Meeting on Promoting Ecohydrology Demonstration site for Arid and Semi Arid Area	3rd Week of May	Bangladesh And TTU, NTT, Indonesia
9	Workshop on IHP Indonesia Activities	Next Week of June	Jakarta, Indonesia
10	Regional Workshop on Peatland Management Based on Ecohydrology Approach	3rd Week of June	Banjarbaru, South Kalimantan, Indonesia
11	IHP and Water Family Centres Meeting	1st Week of July	Teheran, Iran
12	APCE Capacity Building on International Organization Management	3rd Week of July	Bogor, Indonesia
13	National Workshop on Sustainable Water Resources Management	1st Week of August	Padang, Indonesia
14	Water Family Centres Meeting	2nd Week of August	Vietnam
15	APCE Governing Board Member Meeting	4th Week of August	Korea/Japan
16	IHP Indonesia Meeting	1st Week of September	Jakarta, Indonesia
17	Regional Meeting on Promoting Ecohydrology Demonstration site for Traditional Irrigation System	2nd Week of September	Manila, Philippines and Bali, Indonesia
18	IHP FGC and Category 1 Centres Meeting	1st Week of October	Paris, France
19	IHP and Category 1 Centres Workshop on Sustainable Small Islands Management	4th Week of October	Fiji
20	RSC IHP AP Meeting in conjuction with international Conference	November 1 - 3	Jinghai dan Beijing, China
21	Joint conference for ICWR 2018 APCE, IHP with UTM Malaysia	November 27-29	Langkawi, Malaysia
22	IHP Training Course	1st to 2nd Weeks of December	Nagoya, Japan
23	IHP workshop	2nd Week of December	Jakarta, Indonesia
24	Promoting Joint Training With Ministry of Foreign Affairs and Ministry of Maritime and Fisheries	Every 3 months	Locations Should be identified and proposed

THANK YOU

Terima Kasih

Iran:


26th UNESCO-IHP Regional Steering Committee Meeting for Asia and Pacific
Shanghai-China, 4 November, 2018
IHP National Committee Report:
I.R. Iran
Ali Chavoshian
science@irunesco.org
United Nations Educational, Scientific and Cultural Organization
Iranian National Commission for UNESCO
کمیسیون ملی یونسکو- ایران
برنامه بین المللی آب‌شناسی


Organization and Structure
Chair: Minister of Energy of Iran (Dr. Reza Ardakanian)
Vice-chair: Deputy Minister in Water Affairs (Dr. A. Soroosh)
Members: 20 members from Governments, Universities and UNESCO Water related Centres/Chairs and NGOs
Secretariat and Contact
Ali Chavoshian
Science Division of Iran UNESCO NatCom
science@irunesco.org ; chavoshian@gmail.com
Tel/Fax: +98 21 2222 7825

Activities

- Contributions to the implementation of IHP VIII
- Coordinating activities of UNESCO Water Family in Iran (C2C and Chairs and Initiatives)
- Supporting scientific research
- Capacity building and organizing training courses

Contributions to the IHP VIII

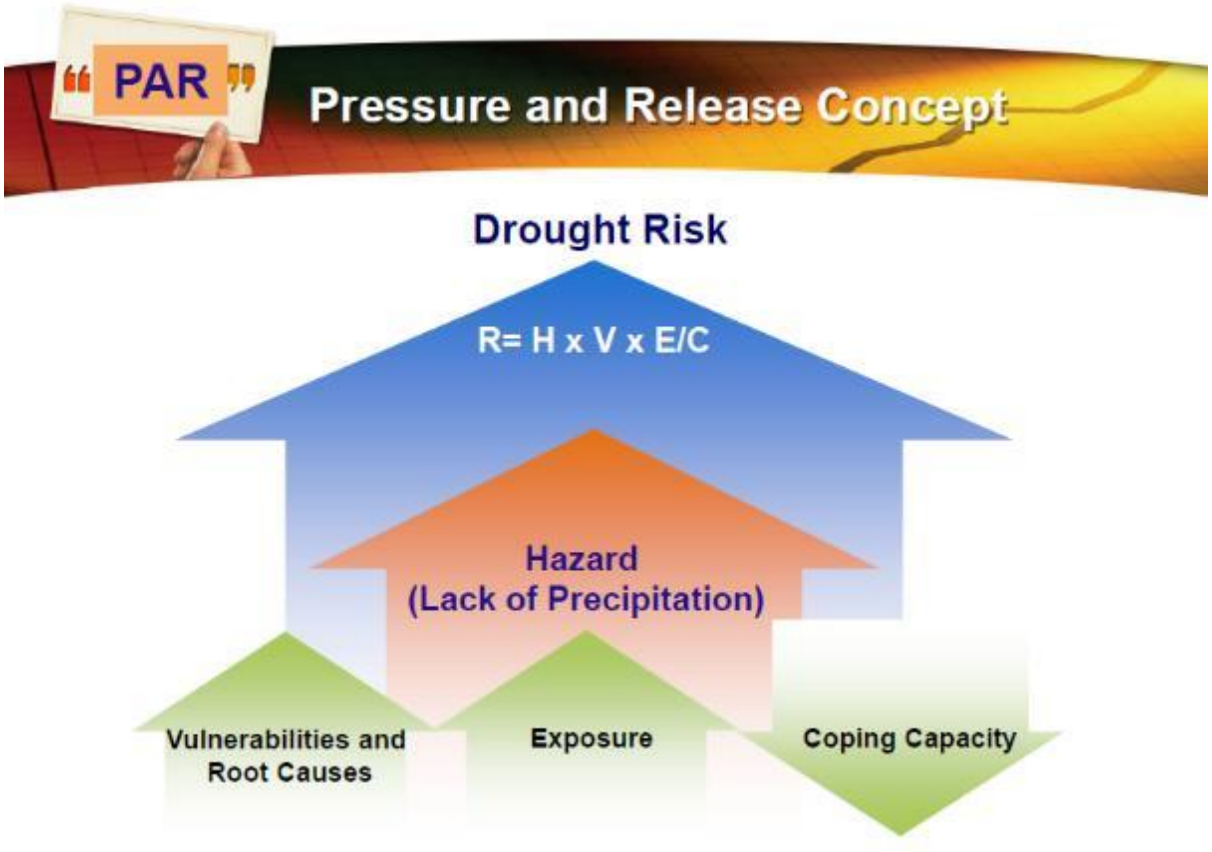
T1: Water-related Disasters and Hydrological Changes

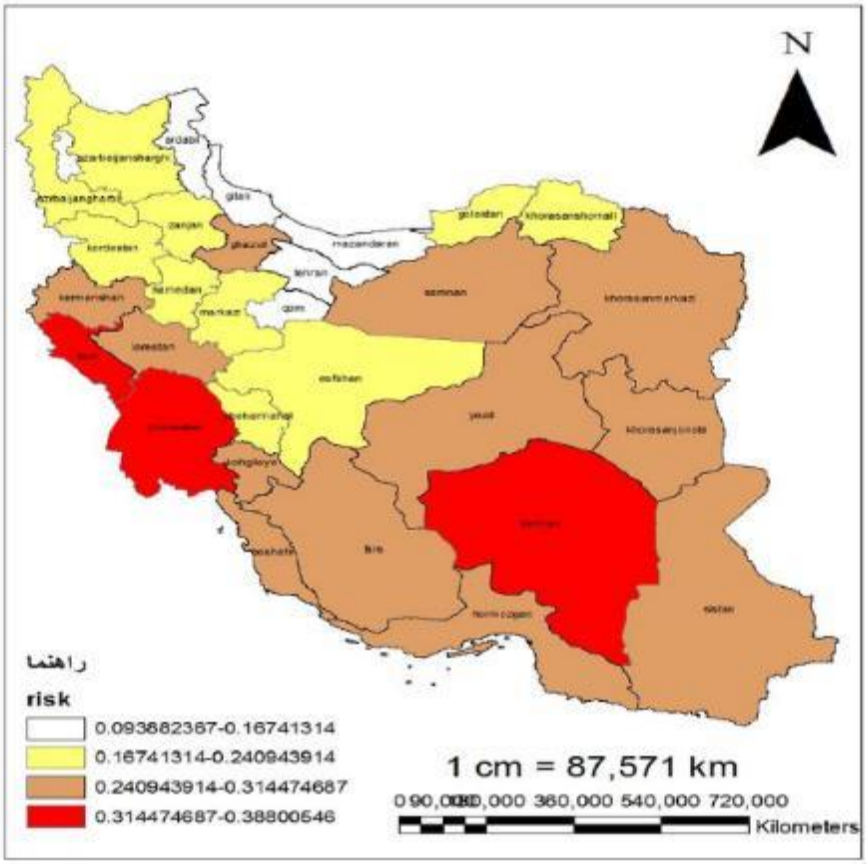
Integrated Drought Monitoring/Prediction System in West and Central Asia

1-Providing drought information based on multiple indicators and data sources including satellite observations and local ground-based data.

2-Providing multi-model multi-index seasonal drought prediction information for the region.

3-Develop a user-friendly system for dissemination of the Drought information.





Integrated Drought Monitoring/Prediction System in West and Central Asia

1-Providing drought information based on multiple indicators and data sources including satellite observations and local ground-based data.

2-Providing multi-model multi-index seasonal drought prediction information for the region.

3-Develop a user-friendly system for dissemination of the Drought information.

Copula

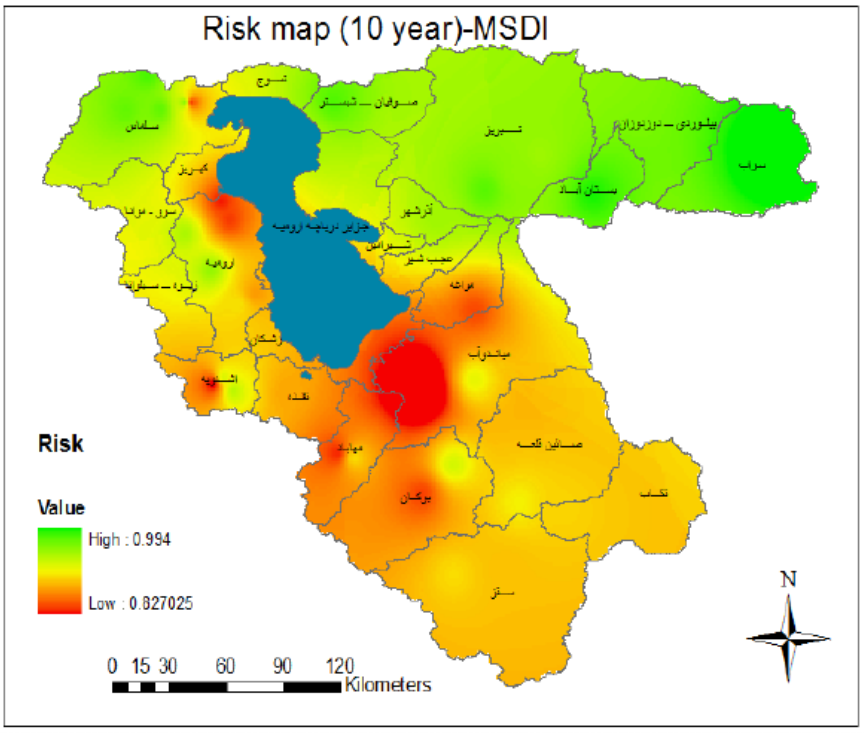
Copula is multivariate distribution function in order to describe the dependence between random variables.

A copula is the joint distribution of random variables $U_1;U_2; \ldots ;U_p$, each of which is marginally uniformly distributednas U(0; 1).

- The term copula is also used for the joint cumulative distribution function of such a distribution,

$C(u_1; u_2; \ldots ; u_p) = P(U_1 \leq u_1; U_2 \leq u_2; \ldots ;U_p \leq u_p)$:

Drought Risk Map with 10 Years Return Period
Urmia lake basin



Integrated Drought Monitoring/Prediction System in West and Central Asia

1-Providing drought information based on multiple indicators and data sources including satellite observations and local ground-based data.

2-Providing multi-model multi-index seasonal drought prediction information for the region.

3-Develop a user-friendly system for dissemination of the Drought information.

http://91.98.142.4:3000/

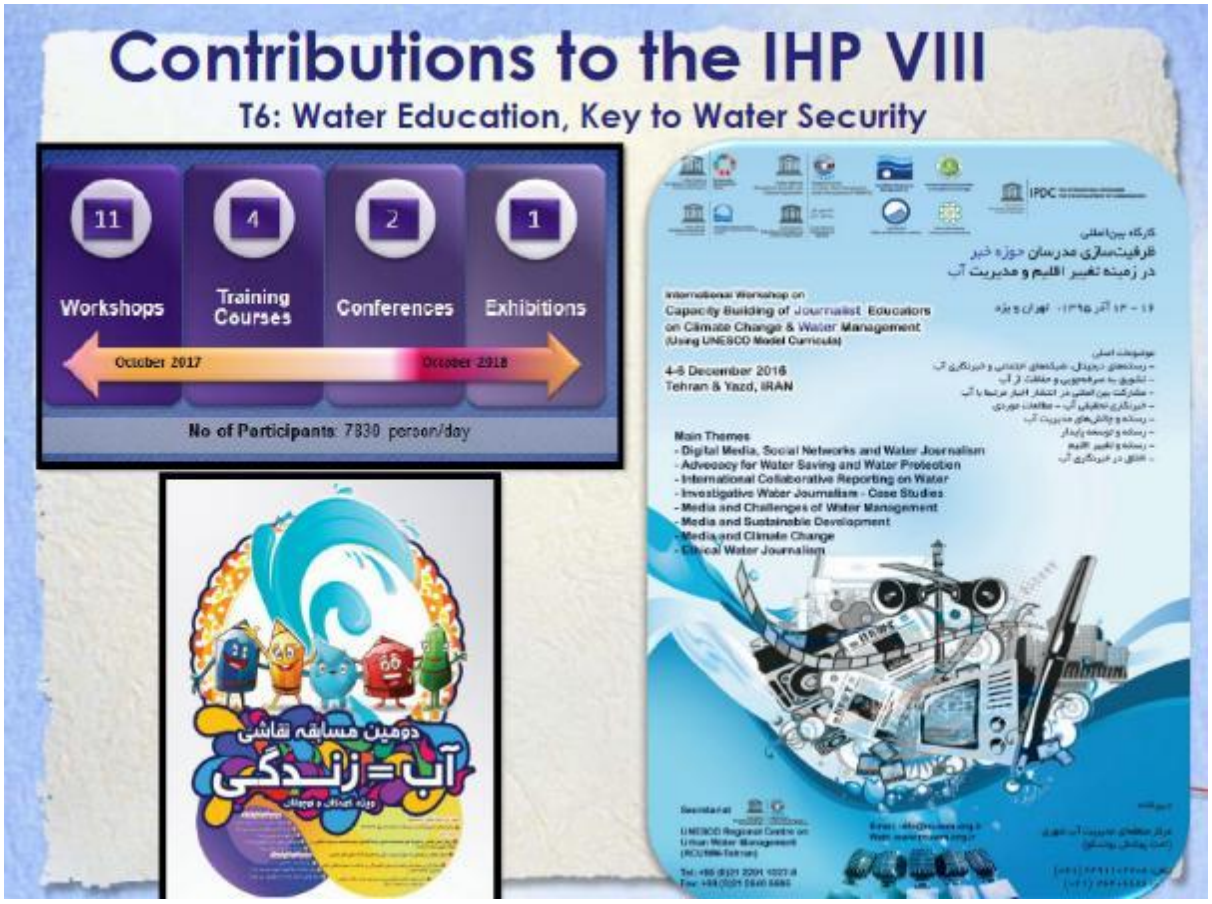
Contributions to the IHP VIII

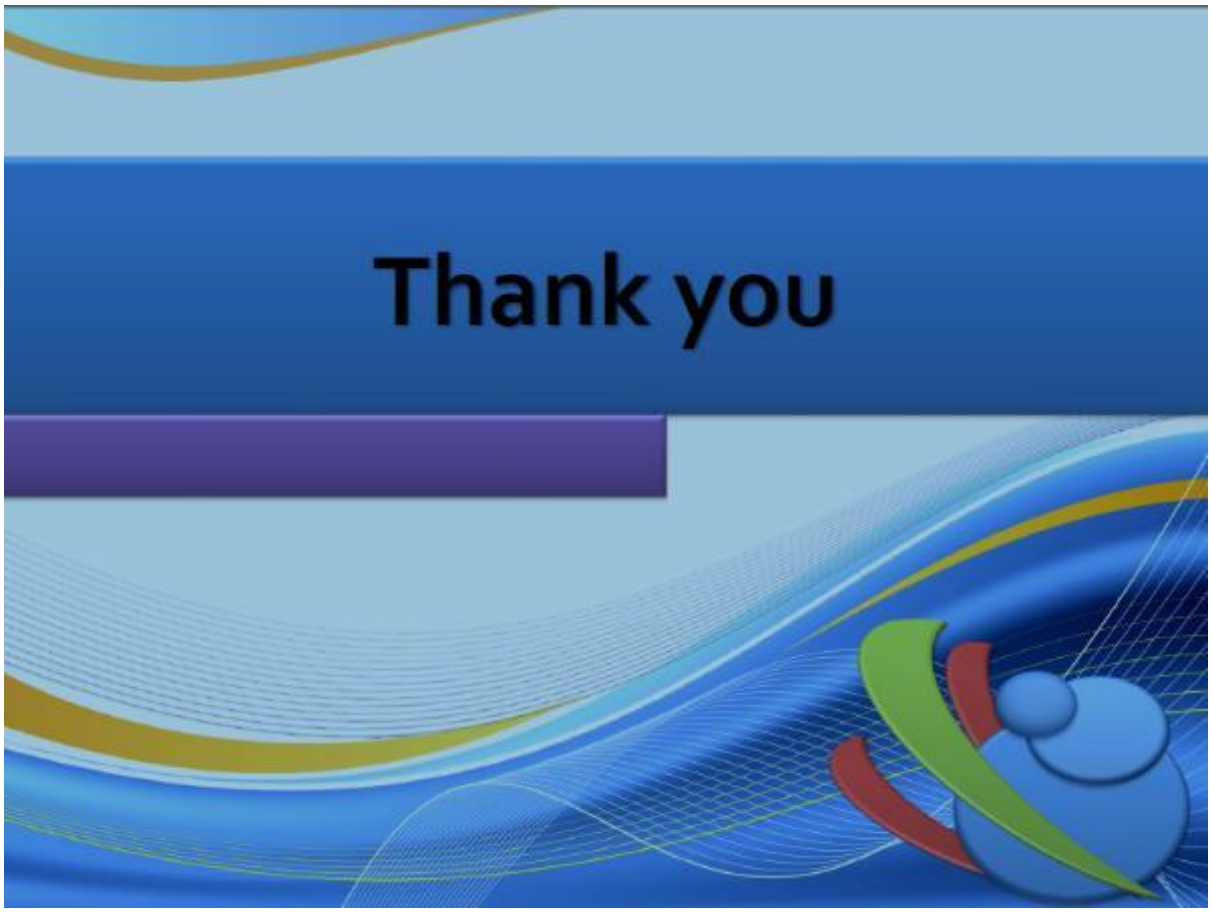
T2: Groundwater in a Changing Environment

- International Centre for Qantas and Hydraulics Structure (ICQHS)
- Pilot project on shared ground water resources and conflict management
- Coordinator of the National Project of GW Restoration and Management


Contributions to the IHP VIII
T3: Addressing Water Scarcity and Quality &
T4: Water and Human Settlements of the Future
IDI
G-WADI
8th Asian G-WADI & 2nd IDI Expert Group Meetings
http://rcuwm.ir/idi-gwadi-workshop/
Call for Papers/Country Reports
International workshop on "Adaptation to Water Scarcity and Basin-connected Cities"
11 December 2018, Mashhad-Iran


Contributions to the IHP VIII
T5: Ecohydrology, Engineering Harmony for a Sustainable World
Tehran River Restoration
ISOCARP Awards for Excellence 2017
International Society of City and Regional Planners
"Master Plan of Tehran River Improvement and Restoration", Apr. 2015- Sep. 2016
The 1st National Conference on Urban River Restoration
صدای پای آب در شهر
ارتباط شهر، شهروندان و رودخانه
ISOCARP
Merit Prize Winner
Awards for Excellence 2017
Tehran River Restoration and Improvement Plan


Contributions to the IHP VIII
T6: Water Education, Key to Water Security
11
Workshops
4
Training Courses
2
Conferences
1
Exhibitions
October 2017
October 2018
No of Participants: 7830 person/day
دومین مسابقه نقاشی
آب = زندگی
International Workshop on
Capacity Building of Journalist Educators on Climate Change & Water Management
(Using UNESCO Model Curricula)
4-6 December 2016
Tehran & Yazd, IRAN
Main Themes
- Digital Media, Social Networks and Water Journalism
- Advocacy for Water Saving and Water Protection
- International Collaborative Reporting on Water
- Investigative Water Journalism - Case Studies
- Media and Challenges of Water Management
- Media and Sustainable Development
- Media and Climate Change
- Ethical Water Journalism


Thank you

Japan:

Summary of National Activities during April 2017 – Oct. 2018

United Nations Educational, Scientific and Cultural Organization

Japanese National Committee for the International Hydrological Programme

IHP-Japan

Members of NatCom as of October 2018

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

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)
E-mail: "Natcom Japan" jpnatcom@mext.go.jp
Web page: http://hywr.kuciv.kyoto-u.ac.jp/ihp/japan/index.html

Status of IHP-VIII activities and funding to promote IHP activities

- FA 1.1: Integrated Research Program for Advancing Climate Models: MEXT TOUGOU Project (2017-2021, PI: Prof. Nakakita at Kyoto Univ.)

- FA 2.1: UNESCO Chair on Water, Energy and Disaster Management for Sustainable Development (KUC-WENDI) at Kyoto University

New Climate Change Research Program
TOUGOU Program, 2017–2021 supported by MEXT

Theme iv(a) Water-related hazard prediction for Southeast Asia and the pacific

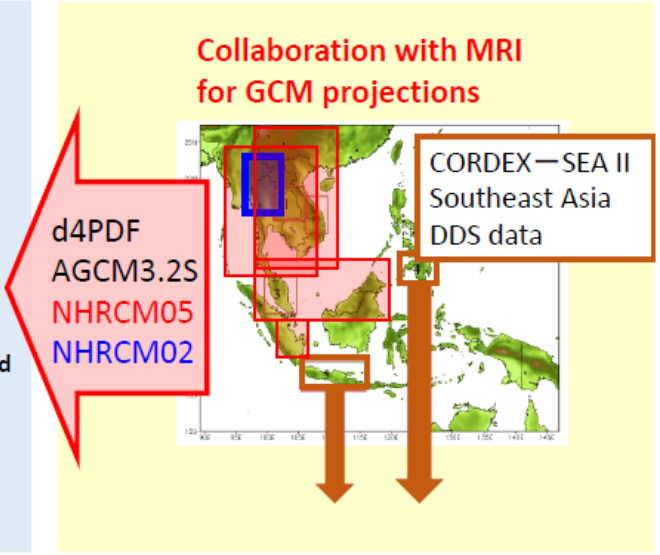
MRI provides multi-ensemble d4PDF 60km data for percent and future climate projections, and will provide new GCM outputs simulated with 60km AGCM, 20km AGCM, and 5km NHRCM05 under RCP8.5 scenario for Southeast Asia and the pacific.

1. Detailed analysis of water-related hazard and water resources under climate change
2. Flood and draught hazard assessment
3. Flood and draught risk assessment

iv. Water-related hazard prediction for Southeast Asia and the pacific

iv(a) Water-related hazard prediction (Kyoto University)

1. Indochinese Peninsula: Hydrologic prediction (low flow and high flow) applying a newly developed bias collection method,
2. Chao Phraya River basin (Thailand): Water resources prediction applying a new land surface model incorporating irrigation scheme,
3. Batanhari River basin (Indonesia): Flood prediction and development of flood hazard mapping,
4. Red River basin (Viet Nam): Flood prediction and development of flood risk mapping.



iv(b) Prototype development for supporting climate change adaptation measures (ICHARM)

Prototype development for supporting climate change adaptation implementation

1. Risk assessment of water-related disasters;
2. Field survey for needs and abilities for climate change adaptation; and
3. Supporting climate change adaptation for local stakeholders.

Kyoto UNESCO Chair on Water, Energy and Disaster Management for Sustainable Development (KUC-WENDI)

United Nations Educational, Scientific and Cultural Organization

UNESCO Chair on Water, Energy and Disaster Management for Sustainable Development, Kyoto University, Japan

WENDI KYOTO UNIVERSITY

KYOTO UNIVERSITY FOUNDED 1897

IHP Training Courses

- 27th IHP Training Course by Kyoto University on

"Integrated Basin Management under Changing Climate" at DPRI Kyoto Univ., 4 December - 15 December 2017.

- 28th IHP Training Course by Kyoto University on

"Integrated Basin Management under Changing Climate" at DPRI Kyoto Univ., 28 November - 7 December 2018.

Korea:

NATIONAL REPORT ON IHP RELATED ACTIVITIES IN REPUBLIC OF KOREA

1. ACTIVITIES UNDERTAKEN

1.1 Meetings of the IHP National Committee

1.1.1 Composition of the IHP National Committee

- In May 2018, the IHP Korean National Committee (KNC) has been reshuffled.
- While keeping the existing membership of water-related ministries (the Ministry of Environment) and institutions (KWRA, K-water, KICT, NDMI), the KNC has decided to invite more diverse stakeholders within and outside of the government together with the new appointment of the Co-Chair (Mr. Ha-Joon Park and Dr. Sung Kim) and the Vice Chair (Professor Joo-Heon Lee).
- New institutional members are the Ministry of Foreign Affairs, the Korea Forestry Service, the Korea Institute of Hydrological Survey, the UNESCO i-WSSM and the Korea Water Forum.

1.1.2 Status of IHP-VIII activities

- The KNC embarked on the core programme's Themes and Focal Areas from the onset of the VIII phase of IHP (2014-2021). The detailed themes and focal areas are as follows:
  (1) Water related disasters and hydrological change
  (2) Significance of groundwater in a changing environment
  (3) Addressing water scarcity and quality
  (4) Water and human settlements in the future
  (5) Harmony between sustainable ecological hydrology and engineering
  (6) Education for water security

1.2 Activities at national level in the framework of the IHP

1.2.1 Participation in IHP Inter-Governmental Council Meeting, Regional Steering Committees/Working Groups

- The IHP Korean National Committee actively participated in the 23rd IHP Inter-Governmental Council during 11-15 June 2018 in Paris, France.
- The delegation of the Republic of Korea has taken an active participate in the IHP Regional Steering Committee, Workshops and Working Group meetings held from June 2016 to May 2018.

1.2.2 National/local scientific and technical meetings

- KIWW 2018 (Korea International Water Week) has been hosted in Daegu city, Korea during September 12-15, 2018 together with Korea Water Forum, Ministry of Environment, Kwater.
- Korea Water Resources Association (KWRA) held its annual conference in May 2018 in cooperation with partner association from Japan, China, Vietnam and New Zealand.

- At the conferences, the IHP KNC organized special sessions in which the research teams involved in the experimental river basins presented and disseminated research outcomes.

1.2.3 Research/applied projects supported or sponsored

- Six IHP research projects have been supported by the Korean government (Ministry of Environment) in the period of 2015-2017 in accordance with the IHP Themes and experimental basin operation.
- In 2018, The Korea Water Resources Association (KWRA) will carry out 5 research projects (2018-2021) on the IHP Phase 8 research topic.
  (1) Sustainable storm-hazard management for climate change adaptation
  (2) Sustainable planning strategy and restoration of water cycle in urban catchments
  (3) Countermeasures against water-related problems due to urbanization and land development in Cambodia
  (4) Development of water scarcity solution and improvement of water resource availability in the future
  (5) Characteristic analysis of representative experimental catchment and establishment of operational strategy

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

- The Ministry of Emvironment (MOE)-UNESCO have decided to conduct joint research on the establishment of a national master plan that should strengthen water security and assess the vulnerability of Asian and African countries to climate change each year. The scale of research fund is aiming at a total of US$3.13 million for 10 years from 2017.
- Many KNC members attended the 8th World Water Forum held in Brasilia, Brazil from 18 to 23 March, 2018 which was co-organized by the government of Brazil and the World Water Council.

1.3 Educational and training courses

- The UNESCO i-WSSM conducted Problem-solving Programme based on On-site Diagnosis in Cambodia Mekong Delta Region and established the Integrated Flood Management Conceptual Plan on 2017. From this year, i-WSSM is undertaking the Problem-solving Programme to improve water quality and monitoring system in the outer islands of Tuvalu with the cooperation of UNESCO Office in Jakarta.
- The UNESCO i-WSSM also undertook Capacity Building Program for the Improvement of Water Security targeting high level officials, government officials, and specialists as follows.
  - Knowledge and Experience Sharing Program of Korea Water Resources for Central and South American Officials & Inter-American Development Bank (2017, 2018)
  - Capacity Building Program for the improvement of water security with 9 Asian countries (2017, 2018)
  - Workshop on Smart Water Management with 5 Central Asian countries (2017, 2018)
  - Joint Technical Workshop on Water management with HEC Software based on the MOU between K-water and USACE with 6 Asia countries (2018)

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

- The IHP KNC has established a close relationship with the UNESCO Category II Center in Korea, the International Center for Water Security and Sustainable

Management (i-WSSM), which is currently located within the premises of the K-water Institute.

- The i-WSSM has become one of the institutional members of the KNC and therefore, there will be more productive cooperative activities between the KNC and the i-WSSM in due course.
- The IHP KNC has been closely collaborating with the other UNESCO Category II Centers such as ICHARM in Japan, the Humid Tropic Center in Malaysia and the Asia Pacific Ecohydrology Center in Indonesia.

2. FUTURE PLANNED ACTIVITIES

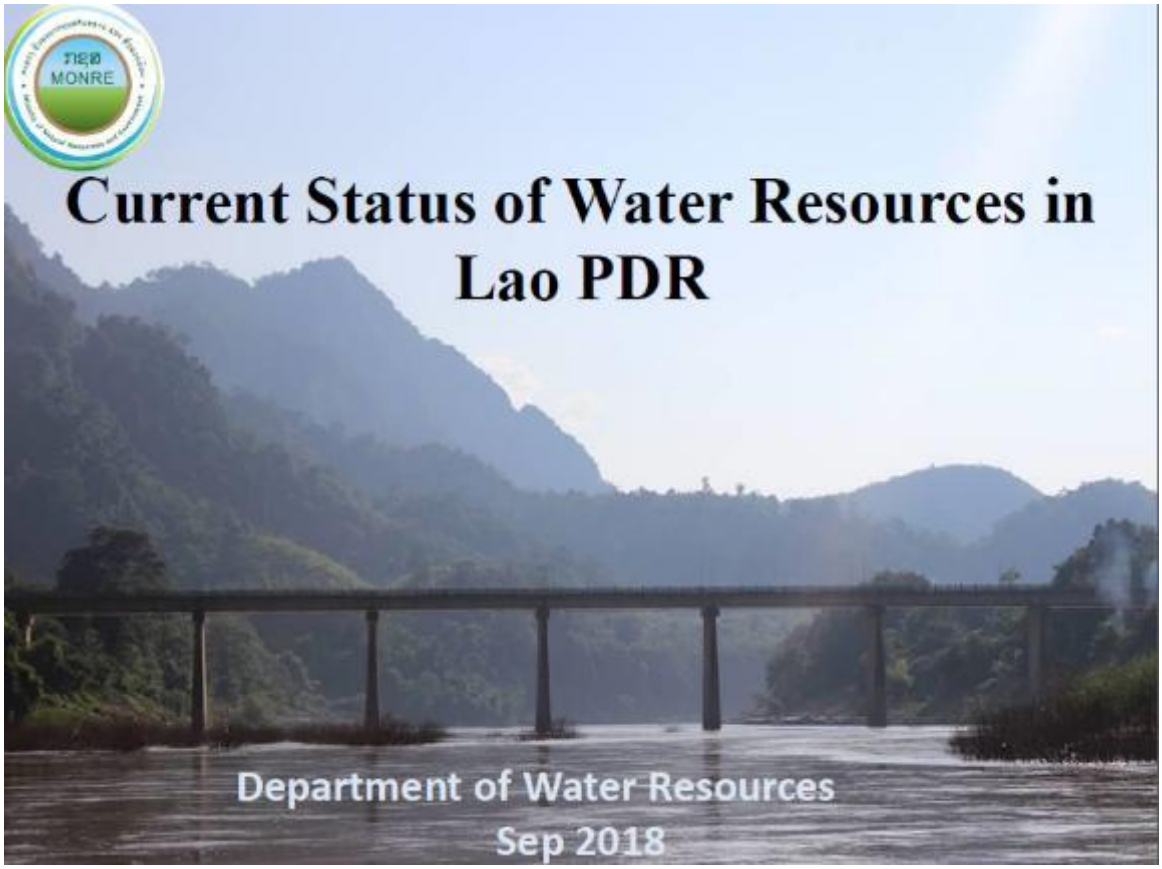
2.1 Activities foreseen for 2019-2020

- The Korea Water Resources Association (KWRA) will carry out the second half of the research projects (2018-2021) on the IHP Phase 8 research topic.
  (1) Management of water-related disasters for climate change adaptation
  (2) Urban water cycle strategy through the establishment of sustainable water ecohydrological system
  (3) Solutions for urban development and water challenges in develping countries
  (4) Future strategies for water shortage challenge and water availability security
  (5) Investigation of the characteristics of the IHP Experimental River Basins (2019-2021)

2.2 Activities envisaged in the long term

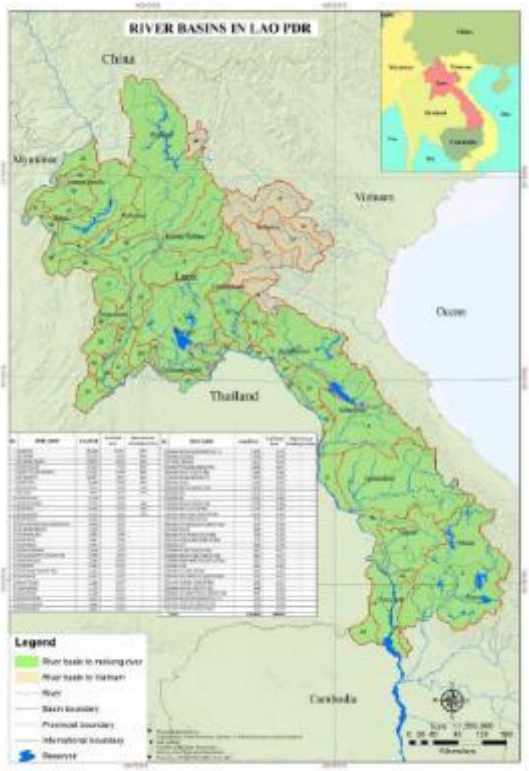
- Regular meetings will be organized and diverse activities will be discussed by the Korean National Committee.

Lao PDR:



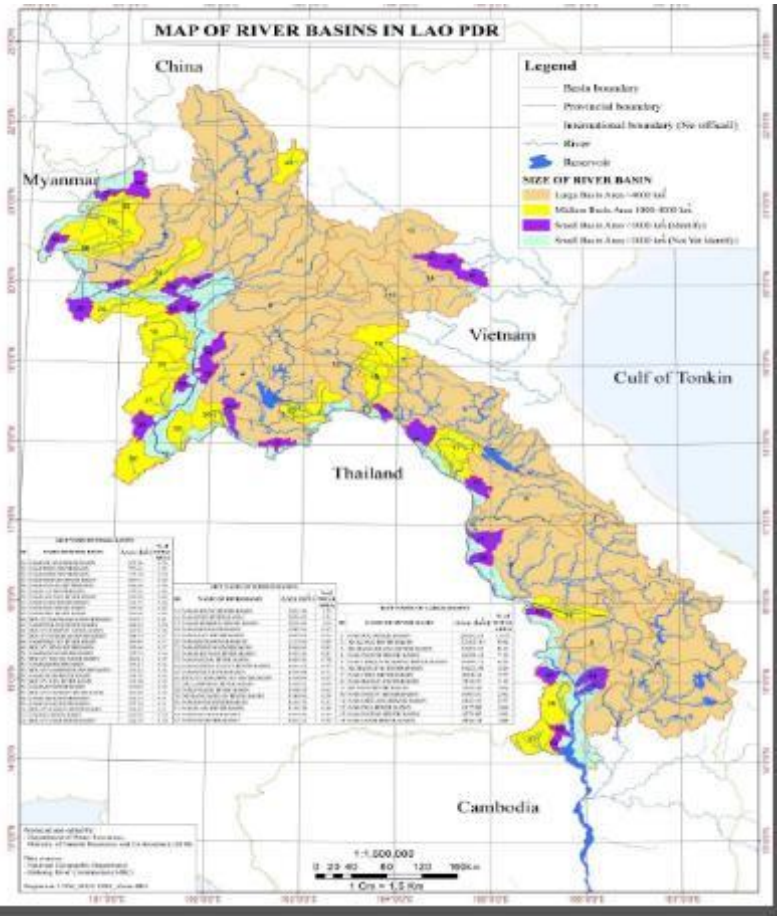
Overview-Water Resources in Lao PDR

- Lao PDR is located in South-East Asia with total land area of 236,800 km2, approx. population 6.49 mill. (2015);
- 90% of the country territory is located in the Mekong Basin
- Water resources per capita is around 55,000 m^3 per year;
- 35% of annual flow (or equal 270,000 mil. m^3) in Mekong flow is from tributaries in Laos;
- The monthly rivers flow by the pattern of rainfall is around 80% (flood season) during the rainy season and 20% (drought season) in the dry season.



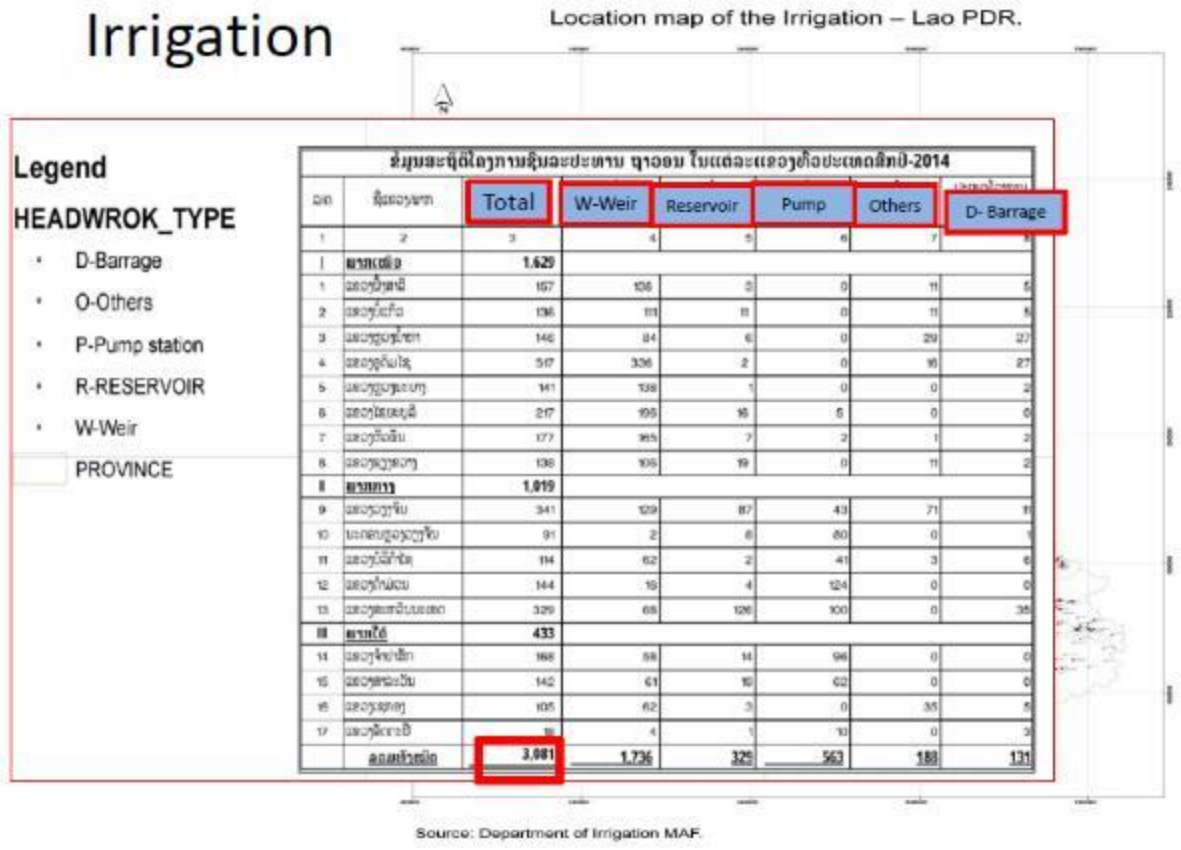
2

- Lao PDR has abundance of water resources which there are total 62 river basins.



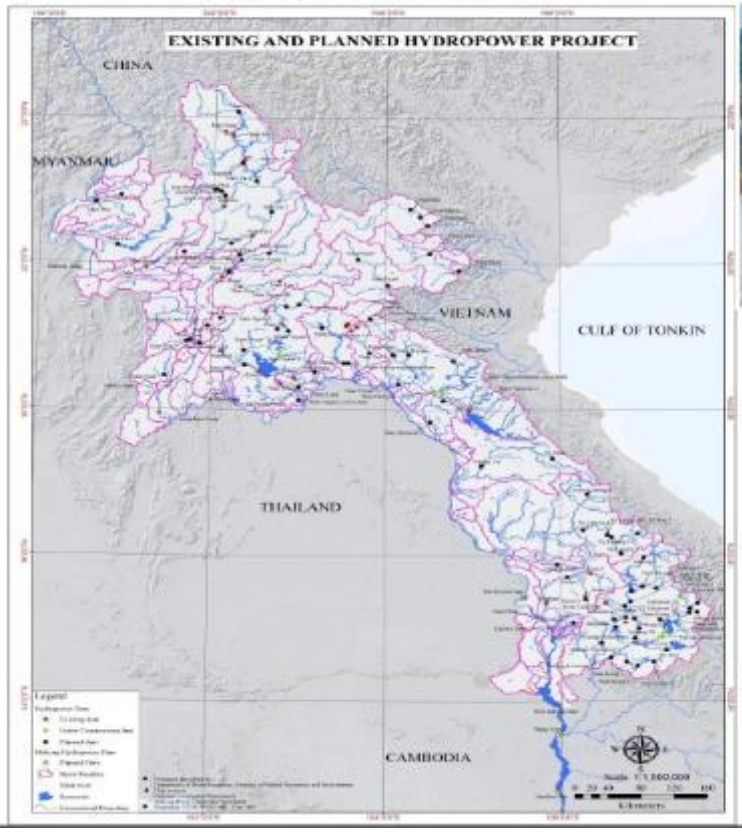
Water Resources Utilization

Lao PDR has rich water resources, mainly good quality fresh water. Water is an essential part of the life and culture of Lao people, and also contributes to the socio-economic development goals of the country. Ultimately the welfare of Lao PDR is bound up with water and all development plans will depend on water resources in some way. The contribution of the water sector has been examined through water sub-sectors: Irrigation, Hydro-power, Navigation, Fisheries, Urban Water Supply, and Rural Water Supply which are major users and the amount of water uses by these sub-sectors are being significantly increased.



Summary of Rice and Vegetable Plantation during dry season 2018				
No	Provinces	Rice	Vegetable and others	Total
		Ha	Ha	Ha
I	Northern part	9,953	16,765	26,718
1	ຜົ້ງສາລີ	50	3,000	3,050
2	ຫຼວງນ້ຳທາ	120	2,900	3,020
3	ອຸດົມໄຊ	880	1,933	2,813
4	ບໍ່ແກ້ວ	2,360	220	2,580
5	ຫຼວງພະບາງ	2,083	1,500	3,583
6	ຫົວພັນ	1,760	1,712	3,472
7	ຊຽງຂວາງ		2,500	2,500
8	ໄຊຍະບູລີ	2,700	3,000	5,700
II	Central part	61,976	24,776	86,752
9	ໄຊສົມບູນ	190	1,300	1,490
10	ວຽງຈັນ	9,000	12,676	21,676
11	ນະຄອນຫຼວງ	15,886	3,000	18,886
12	ບໍລິຄຳໄຊ	1,880	800	2,680
13	ຄຳມ່ວນ	8,760	1,000	9,760
14	ສະຫວັນນະເຂດ	26,260	6,000	32,260
III	Southern part	23,985	22,545	46,530
15	ຈຳປາສັກ	10,335	2,925	13,260
16	ສາລະວັນ	12,000	1,000	13,000
17	ເຊກອງ	1,300	620	1,920
18	ອັດຕາປື	350	18,000	18,350
Grand Total		95,914	64,086	160,000

Hydro power



- Existing Dam 36
- Under Construction Dam 35
- Planned Dam 22

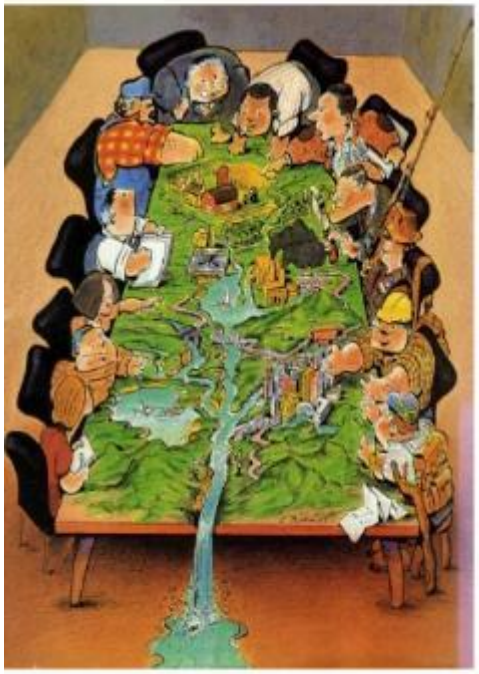
7

Access to Sanitation and Water supply 2015

Lao PDR			
Progress in Access to Sanitation			
in %	Urban	Rural	National
2006	85	38	48
2011/2012	91	48	59
2015	94	60	71
Source: JMP 2008, LSIS 2012, Census 2015			

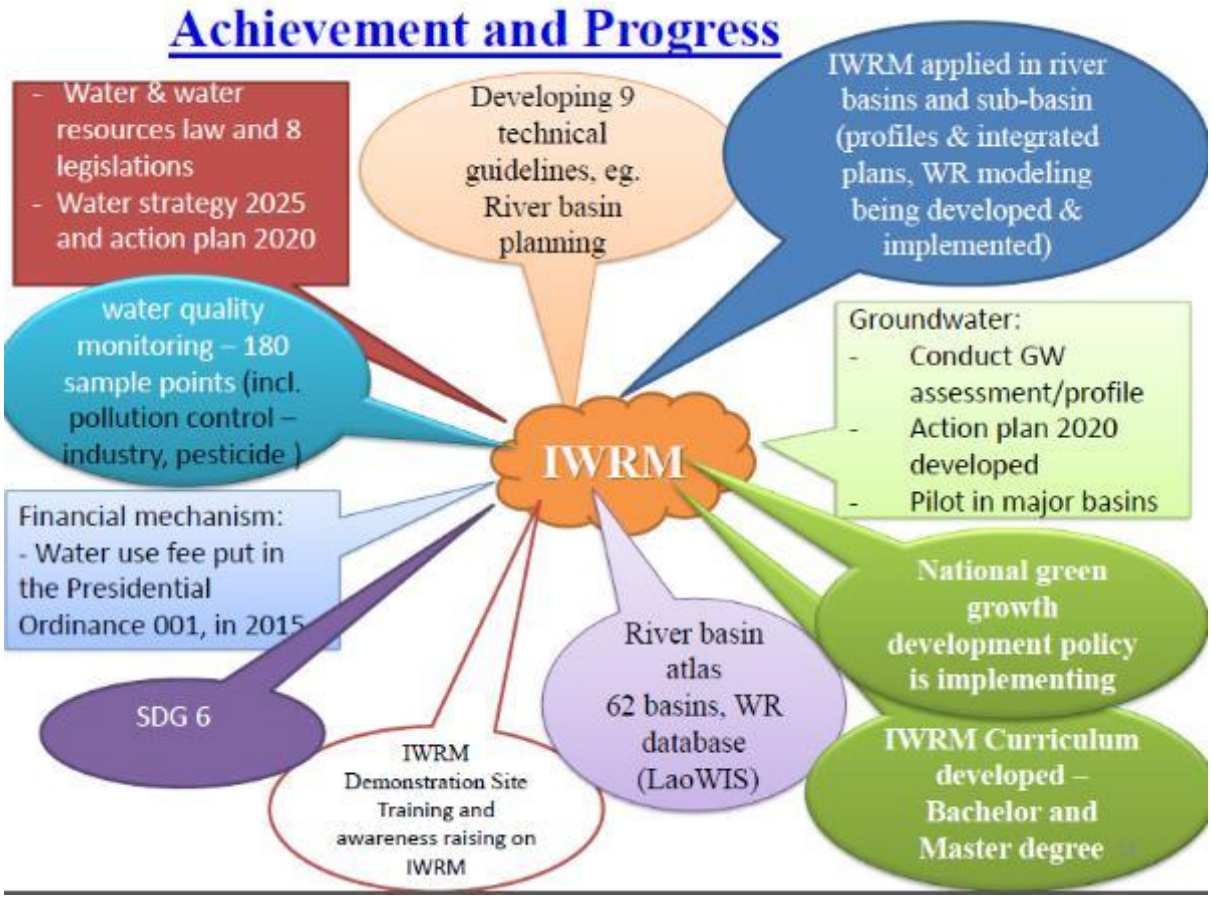
Lao PDR			
Sector Progress in water supply coverage			
in%	Urban	Rural	National
2006	83	53	60
2011/2012	88	64	70
2015	94	79	84
Source: JMP 2008, LSIS 2012, Census 2015			

Why Integrated Water Resources Management?

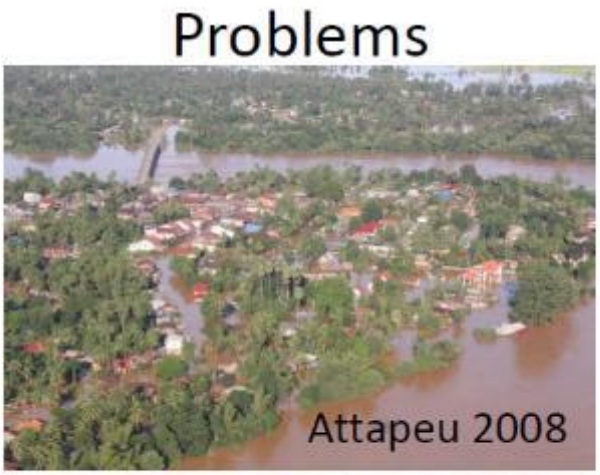


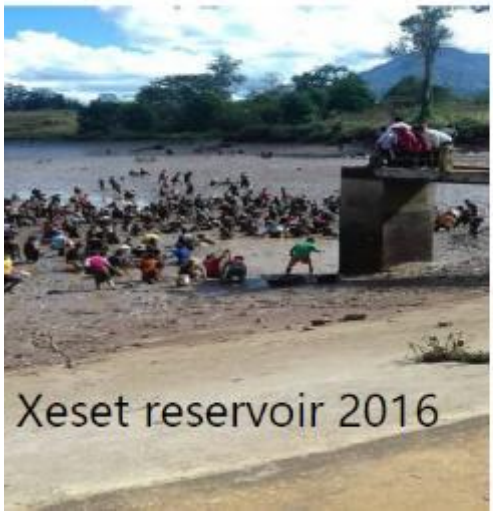
IRBM application in different river basin scale in Lao PDR

Geography	IWRM instruments
Mekong Basin	Mekong IWRM Strategy 2020 Mekong IWRM-based BDP
⇕	
Lao PDR	Draft River Basin Management Strategy 2030
⇕	
Nam Ngum RB	Nam Ngum River Management Plan 2016-2020
⇕	
Nam Ngum sub-basins	Nam Ngum sub-basin plans (as e.g. Nam Xong and Nam Lik)
⇕	
Watersheds/Catchment	Integrated Watershed Management Plans (as e.g. Nam Po)


Achievement and Progress
- Water & water resources law and 8 legislations
- Water strategy 2025 and action plan 2020
Developing 9 technical guidelines, eg. River basin planning
IWRM applied in river basins and sub-basin (profiles & integrated plans, WR modeling being developed & implemented)
water quality monitoring – 180 sample points (incl. pollution control – industry, pesticide)
IWRM
Groundwater:
- Conduct GW assessment/profile
- Action plan 2020 developed
- Pilot in major basins
Financial mechanism:
- Water use fee put in the Presidential Ordinance 001, in 2015
National green growth development policy is implementing
River basin atlas
62 basins, WR database (LaoWIS)
SDG 6
IWRM Curriculum developed – Bachelor and Master degree
IWRM Demonstration Site
Training and awareness raising on IWRM


Attapeu 2018


Problems
Attapeu 2008


Xeset reservoir 2016


Hongkae

12

Challenges

Institutional arrangement & establishment – need to strengthen cross sector collaboration;

Limited financial support & sustainable mechanism – equipments, tools…;

Legislations, guidelines need to enforce and implement

Limited capacity of concerned staff on RB planning & management + public awareness & local participation on IWRM. – thus need to strengthen staff capacity and more on-the-job training, etc.

Lack of efficient & accurate WR data & information

13

To address those challenges….we have to implement Natural Resources and Environment Sector Vision towards 2030

"Keeping Lao PDR Green, Clean and Beautiful based on green economic growth, to achieve sustainable development toward industrialization and modernization and to ensure the resilience to climate change impacts and disaster risks"

Draft River Basin Management Strategy 2030

- Manage, protect and develop water resources for sustainable manner;
- Utilize water resources in the river basin for development and poverty reduction ;
- Ensure fair water use allocation and arrangement for all sectors at national, basin and sub-basin levels.

14

River Basin Management Strategy Programs

1. Improvement of coordinated mechanisms

2. Establish legislation for implementing river basin management

3. Develop River Basin Management Plan

4. Establish sustainable financial mechanism

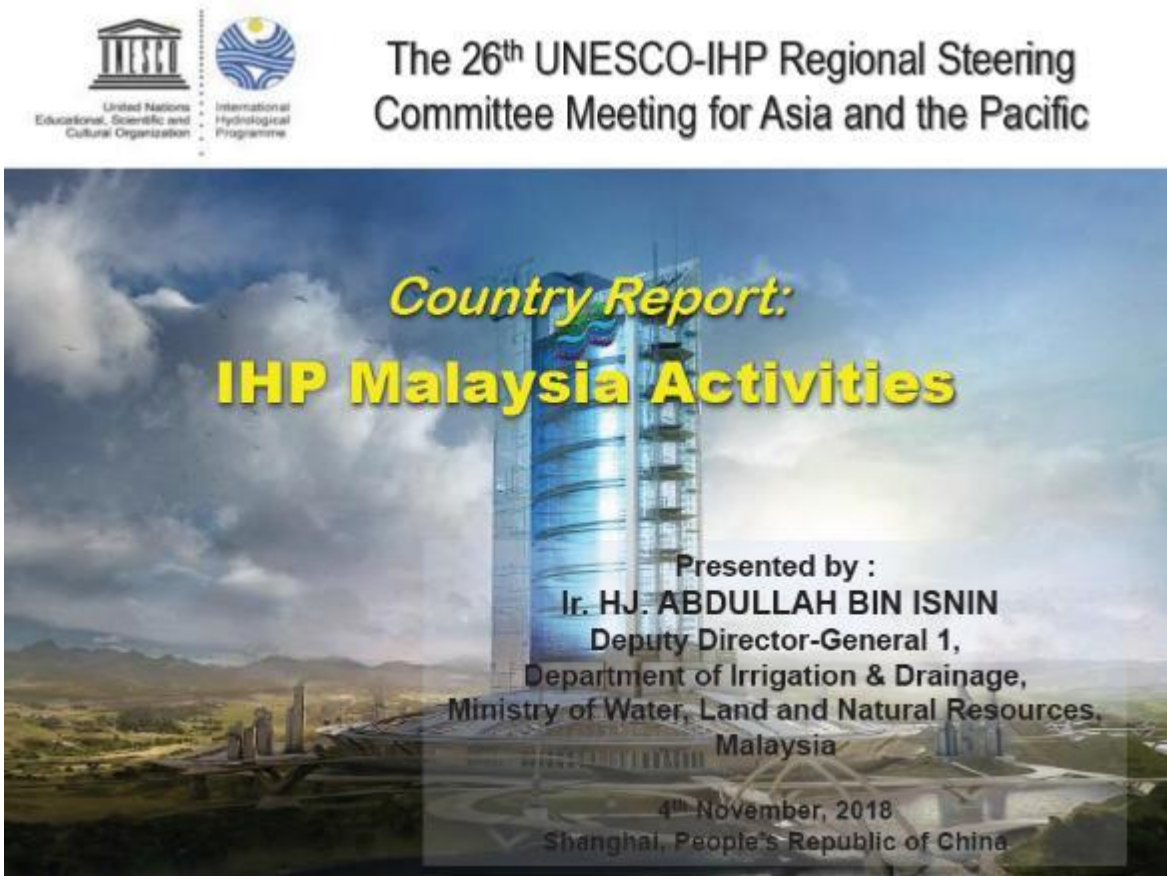
5. Water Resources Data Information System and Management

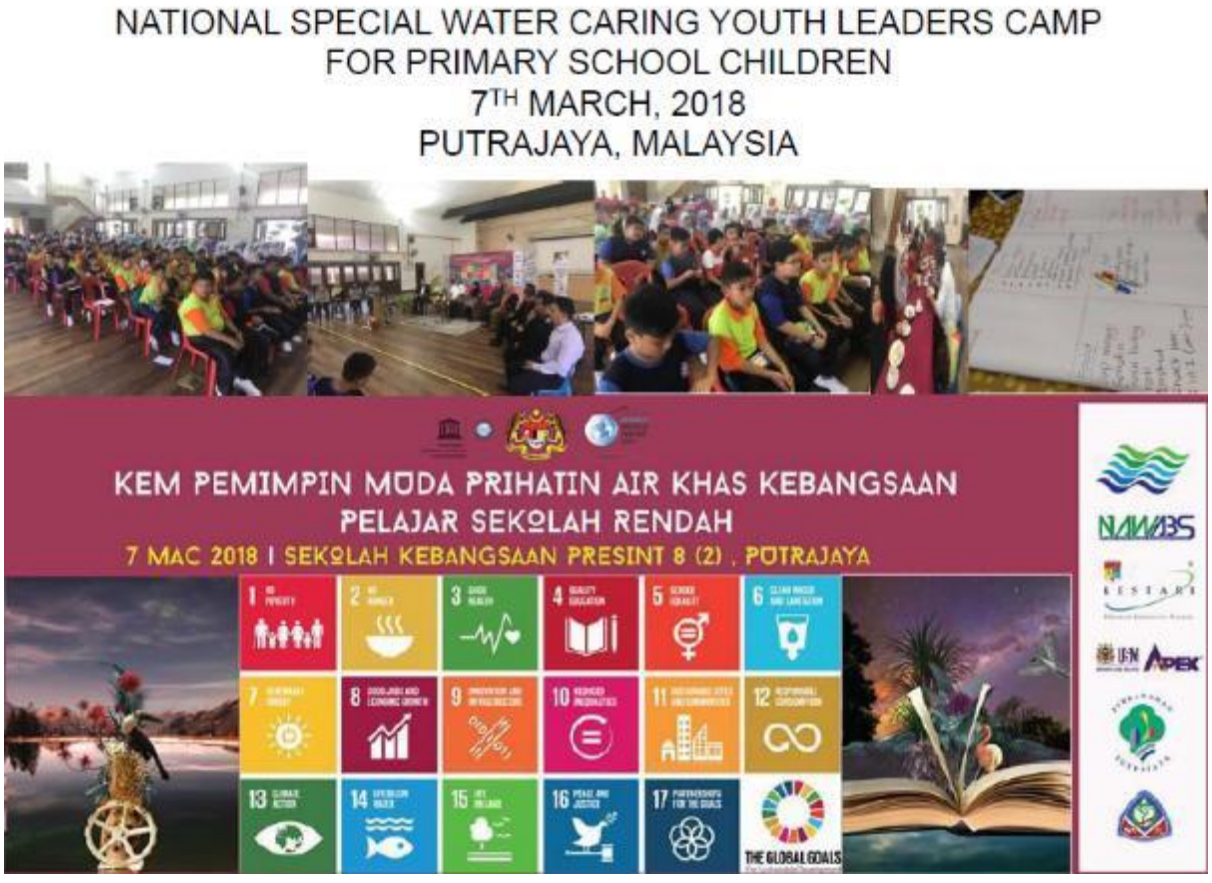
6. Strengthen human resource capacity in water resources sector at all levels.

7. Promote public awareness, genders and stakeholders participation in the river basin management

15

Malaysia:


The 26th UNESCO-IHP Regional Steering Committee Meeting for Asia and the Pacific
United Nations Educational, Scientific and Cultural Organization
International Hydrological Programme
Country Report:
IHP Malaysia Activities
Presented by :
Ir. HJ. ABDULLAH BIN ISNIN
Deputy Director-General 1,
Department of Irrigation & Drainage,
Ministry of Water, Land and Natural Resources,
Malaysia
4th November, 2018
Shanghai, People's Republic of China


NATIONAL SPECIAL WATER CARING YOUTH LEADERS CAMP
FOR PRIMARY SCHOOL CHILDREN
7TH MARCH, 2018
PUTRAJAYA, MALAYSIA
KEM PEMIMPIN MUDA PRIHATIN AIR KHAS KEBANGSAAN
PELAJAR SEKOLAH RENDAH
7 MAC 2018 I SEKOLAH KEBANGSAAN PRESINT 8 (2) , PUTRAJAYA
THE GLOBAL GOALS
NAWABS

National World Water Day Celebration – Kuala Kangsar, Perak
24th March,2018

National Water Resources Expedition – Sungai Sedim, Kedah
4th – 6th August,2018

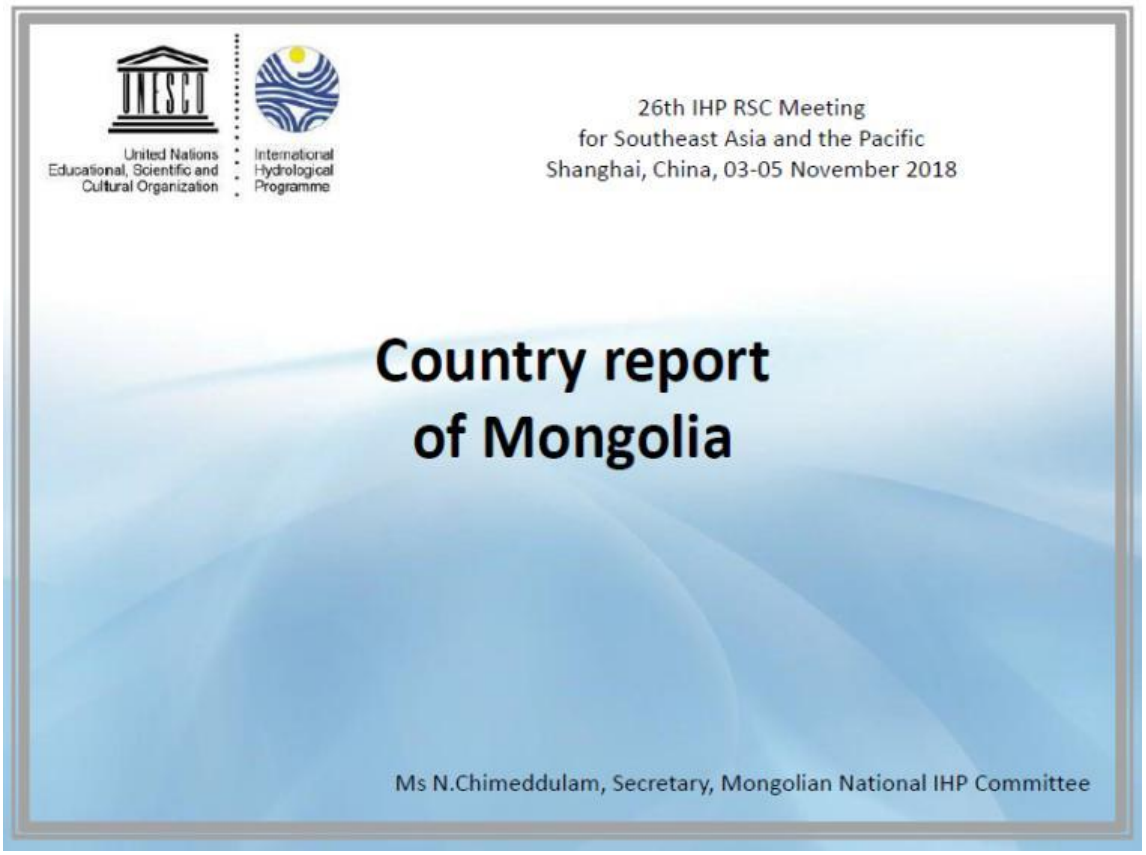
Young Environmentalist Camp – Universiti Malaysia Perlis
3rd – 4th October,2018

UNESCO - IHP Malaysia di bawah Program Kesedaran National Water Balance System (NAWABS) telah bekerjasama dengan Universiti Malaysia Perlis (UniMAP) mengadakan kem untuk pelajar sekolah rendah di Perlis pada 3-4 Oktober 2018.

H2O QUEST 2018 – Taman Wetland
Putrajaya , 13th October, 2018

We proud to annouce that a splashy fun-filled event is coming your way! An exiciting event taht involves solving challenges,thrilling trivia and fun activities. H2O Quest is about understanding why water is our most precious commodity.

Mongolia:


United Nations
Educational, Scientific and
Cultural Organization
International
Hydrological
Programme
26th IHP RSC Meeting
for Southeast Asia and the Pacific
Shanghai, China, 03-05 November 2018
Country report
of Mongolia
Ms N.Chimeddulam, Secretary, Mongolian National IHP Committee


United Nations
Educational, Scientific and
Cultural Organization
International
Hydrological
Programme
ACTIVITIES
2017-2018

Celebration of 80th anniversary of Mongolia's water sector

A jubilee meeting of the water sector took place in Ulaanbaatar

Mr U.Khurelsukh, Prime Minister of Mongolia, made an opening speech and announced to establish an agency responsible for water issues. Since 2012, water issues of Mongolia are ruled by the Ministry of Environment and Tourism. But the current structure is not aligning with the water related challenges, which Mongolia is facing today. So in the coming months a proposal to establish a National Water Agency will be submitted to the Government for discussion.

Celebration of 80th anniversary of Mongolia's water sector

In the scope of the Jubilee meeting, high range of state awards were given to the water scientists, who made significant contibution to the development of water sector of Mongolia. Dr L.Janchivdorj, Chairholder of the UNESCO Chair on Sustainable Groundwater Management, was one of the awardees.

United Nations Educational, Scientific and Cultural Organization | International Hydrological Programme

A photo exhibition "80 years in two centuries" was organized

Showed the achievements of water sector in the past 80 years.

United Nations Educational, Scientific and Cultural Organization | International Hydrological Programme

A non-refundable financial aid agreement between Mongolia and the USA was signed

- The project duration is 5 years between 2019 and 2023
- Total funding amount is USD 350 million
- In the scope of the project:
  - Equipments to increase underground water reserve will be installed and
  - Water recycling facilities will be built with the purpose of using gray water
  - Legal environment regarding the water sector will be improved

United Nations Educational, Scientific and Cultural Organization | International Hydrological Programme

River basin councils have been established

River Basin Councils at the 21 river basins of Mongolia was established with the aim to ensure the participation of different stakeholders and local people in the planning and implementation of Integrated River Basin Management.

United Nations Educational, Scientific and Cultural Organization | International Hydrological Programme

WWD 2018

- We have organized a student's scientific conference and a competition of creative works among university students.
- As every year, the message of the Director-General of UNESCO was translated and delivered to the students during the event. It was also broadcasted through different media.

United Nations Educational, Scientific and Cultural Organization

International Hydrological Programme

Publications

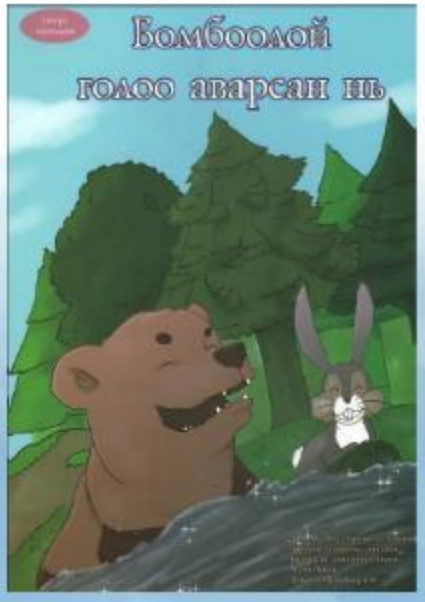
A book with the title "Water is the key to Development" was developed, published and disseminated in the scope of the Jubilee meeting.

United Nations Educational, Scientific and Cultural Organization

International Hydrological Programme

Publications

A children's comic book "Bombooloi saved the river" was developed, 6000 copies were published and disseminated to the schools and kindergartens.



United Nations Educational, Scientific and Cultural Organization | International Hydrological Programme

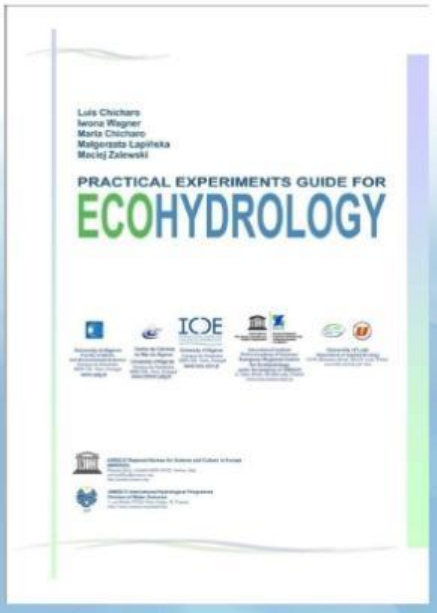
Translations

The statutes of the IHP IGC was translated from English into Mongolian and uploaded online.

United Nations Educational, Scientific and Cultural Organization | International Hydrological Programme

Translations

The translation of a UNESCO publication "Practical Experiments Guide For Ecohydrology" (Chicharo L. et al, 2009) is on going. The Mongolian version will be finalized and published next year.



Myanmar:

NATIONAL REPORT ON IHP RELATED ACTIVITIES

MYANMAR

1. ACTIVITIES UNDERTAKEN IN THE PERIOD November 2017 – October 2018

1.1 Meeting of the IHP National Committee

1.1.1 Decision regarding the composition of the IHP National Committee

The Myanmar National Committee for IHP (MNC-IHP) has been organized on 24 March 2003 comprising a Chairman, a Vice Chairman, a Secretary and (17) members from 8 Ministries and 2 City Development Committees.

Under MNC-IHP, the (5) Working Committees (WC) were organized according to the (5) Themes of IHP-VI. Each working committees consists of (10) members from the members of departments and committees. Activities related to the themes of IHP-VII are implemented by the members of the working committees.

1.1.2 Status of IHP- VIII Activities

- Developing the Operational Flood Forecasting Model (HEC-HMS) for Ayeyarwady River Basin and Sittoung River Basin in Myanmar
- Upgrading the Telemetry Water Level Monitoring System (TWLMS)
- Enhancing the capacity of the river flow monitoring system in Myanmar with River Surveyor M9
- Upgrading the Automatic Weather Observing System at Hydro-met Stations in Myanmar
- Monitoring the river flow at specific hydrological stations in Myanmar
- Monitoring the low flow characteristics
- Assessment of the climate change impact on the flood events
- Developing the flood hazard map in order to reduce loss of lives and properties due to flood disaster
- Implementing the hydrological disaster risk management activities by using GIS and Remote Sensing Technologies

1.2 Activities at National Level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

- Training on HEC RAS Modeling was conducted in Nay Pyi Taw which organized by DMH and Asia Disaster Preparedness Centre (ADPC)

- Training on End User Enhancement to improve the Effectiveness of Sentinel Asia organized by DMH, and ADRC (Asian Disaster Reduction Center) was held on 31-1-2018 to 2-2- 2018 at Nay Pyi Taw.

- Development and Implementation of Myanmar Flash Flood Guidance System (FFGS) organized by DMH, WMO, USAID, HRC and NOAA was held on 26. 2. 2018 to 28. 2. 2018 at Nay Pyi Taw.

- Hazard Modeling Training organized by DMH, ADB and Climate Hazard Project Team was held 30. 8.2018 to 6. 9. 2018 at Nay Pyi Taw.

- DMRS User Training was held at Royal ACE Hotel, Nay Pyi Taw in 29-30 October 2018 , which organized by DMH and Pacific Disaster Center (PDC)

1.2.2 Participation in IHP steering committees/working groups

Participants from DMH attended the UNESCO-IHP 13th, 14th, 15th, 17th, 18th, 19th, 20th, 21st, 22nd, 24th and 25th Regional Steering Committee Meetings for Asia and Pacific during 2005 to 2017.

1.2.3 Research / applied projects supported or sponsored

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

Myanmar is the member country of EANET (Acid Deposition Monitoring Network in East Asia) since 2005. So Myanmar collaborates with EANET's activities.

Myanmar is collaborating with ADPC and RIMES (Regional Integrated Multi-Hazard Warning System for Africa and Asia) in Hydrometeorology, Seismology and Climate Change sectors.

Asia Center for Air Pollution Research (ACAP) and DMH cooperate on Inland Aquatic Monitoring work and Automatic Monitor Installation in Myanmar 26th-29th, March, 2018.

Hydrological Analysis workshop was held at Nay Pyi Taw on 8 – 10, October 2018 organized by Norwegian Water Resources and Energy Directorate(NVE), Department of Hydropower Implementation (DHPI) and DMH.

Open Cannel Hydraulics Workshop at Nay Pyi Taw organized by Norwegian Water Resources and Energy Directorate (NVE), Department of Hydropower Implementation (DHPI) and DMH on 15 – 19, October 2018

DMH is participating in Ayeyarwady Integrated River Basin Management Project organized by World Bank.

1.2.5 Other Initiatives

- DMH has a plan to install 34 Telemetry Water Level Monitoring Sensors at Hydrological stations along the Myanmar Rivers with AIRBM Project, World Bank Loan.

- 58 Automatic Weather Observing System have a plan to install at Hydro-meteorological stations in Myanmar with AIRBM Project, World Bank Loan.

1.3 Educational and Training Courses

1.3.1 Contribution to IHP courses

- Training on Hydrological Grade I is going to be held at Mandalay in November, 2018.
- Training on Hydrological Grade II and III will be held at DMH Office, Yangon during December 2018 to March, 2019.

1.3.2 Organization of specific courses

-

1.3.3 Participation in IHP courses

- In our Department, the IHP courses are needed for capacity building.

1.4 Publication

-

1.5 Participation in International Scientific Meeting

1.5.1 Meeting hosted by the country

- 20th and 21st National Monsoon Forum was held at Nay Pyi Taw organized by DMH and RIMES in May and October, 2018 respectively.

- Development Partners Workshop was held at Royal ACE Hotel in Nay Pyi Taw which organized by World Bank and DMH in 17-19 October 2018.

1.5.2 Participation in meetings abroad

The Secretary of MNC-IHP is a Permanent Representative of WMO and so he has contact and coordinates with WMO's activities.

- Twenty-third Session of UNFCCC Conference of the Parties – COP 23, Germany, 29. 10. 2011 to 17. 11. 2017.
- Signing Ceremony of Memorandum of Cooperation of SIGMET Issuance, Japan, 6. 3. 2018 to 7. 3. 2018.
- Decade Memory of the Wenchuan Earthquake with the 4th International Conference on Continental Earthquakes, People Republic of China, 11. 5. 2018 to 15. 5 2018.
- Expert Group Meeting on Space Applications for Sustainable Development (2018-2030) and the 22nd Session of the Intergovernmental Consultative Committee (ICC) on the Regional Space Application Programme for Sustainable Development (RESAP), Thailand, 28. 8. 2018 to 30. 8.2018.
- China-ASEAN Meteorological Forum, People Republic of China, 12. 9. 2018 to 13. 9. 2018.

1.6 Other activities at regional level

1.6.1 Institutional relation / cooperation

-

1.6.2 Completed and ongoing scientific projects

-

2. FUTURE ACTIVITES

2.1 Activities planned until / December 2018 -

2.2 Activities foreseen for 2018-2019

- Hydrological Division try to develop the impact based flood forecasting at some cities in Myanmar.
- The MNC-IHP will try to implement the water related activities in line with the themes of IHP
- Hydrological division try to monitor the river flow at some hydrological station in order to modify the existing rating table at respective station
- IHP national committee will continue to encourage scientific and technical symposia and workshops
- The members of MNC-IHP will participate in the international and national activities of IHP.
- Remote Sensing and GIS Division will produce the flood hazard maps and flood assessment maps in order to reduce the loss of life and properties.

Nepal:

IHP-Nepal Special Committee Activities

- Workshop on "Climate Change and Water Resources of Kathmandu Valley" has been organized on the date of April 5, 2018 in Kathmandu, Nepal. The participants were from OXFORD, WWF, REDD, Centre PAC , DPD PID, Investment Board, NDRI, DWIDM, WECS, DHM, ICIMOD, DOZ, NCCSP, Climate Change Council, Three experts presented the talks on

1. Impact of Climate Change on Water Resources of Nepal by Dr. Santosh Nepal
2. Climate Change Policy and Recent Initiatives by Dr. Ram Prasad Lamsal
3. Water Supply in Kathmandu Valley by Mahesh Prasad Bhattarai

The aim of the workshop was for the sustainable management of water and energy, its distribution and consumption.

- Workshop conducted on " Water Resource Management in Federal Nepal: Potential Conflict to Potential Cooperation" on February, 2017 in Kathmandu, Nepal.
    1. Potential Conflict under Federal System of Government in Water Resource Management and its Solution : International Experience by Dr. Bishnu Prasad Upreti
    2. Potential Conflict in Water Resource Management in Nepal under Federal System and its Solution by Dr. Dwarika Nath Dhungel.

  The workshop concluded that it will support for the formulation of strategy, program and work plan in context of Federal system of Nepal. The workshop may also support to solve the problems and challenges during the course of development of water resource policy, plan, program and activities.

- National Symposium on Hydrology and Meteorology-2015 was conducted on December 24, 2015

Perspective of Water Resources in context of Federal System in Nepal

With intrusion of Federal system in Nepal under the Constitution of Nepal-2015, the civil service system has undergone to restructuring of whole organization from Central system to Provincial and Local Government level. However, some typical organization has undergone slight changes and still delivering the service through central control system. The hydrological and meteorological service which was mandated to Department of Hydrology and Meteorology fell into the second category with slight changes. The Ministry of Energy, Water Resources and Irrigation become the apex body to look into water related services and activities. However, *the Department of Water Supply and Sewerage was characterized apart and was put under the Ministry of Water Supply*, and it is outbound from the core scientific approach to look into water issues.

The White Paper has been issued on the date of May 8, 2018 by the Ministry of Energy, Water Resources and irrigation for the sustainable development of energy, water resources and irrigation, their conservation and promotion to meet the national goal of prosperous Nepal and happiness of Nepalese people. The objective of the White Paper is to overview current status, diagnose the drawbacks of existing situation and develop the corrective road map for achieving the future national mission of prosperity.

Current Status

A: Water Resources

Water Resource Act- 1992, Water Resource Strategy- 2002 and National Water Plan- 2005 are the prevailing governing law to manage and develop the water resources activities in Nepal. The present status of water resources is estimated to be 225 billion cubic meter annual average. The rechargeable groundwater is estimated in the range of 5.8-11.5 billion cubic meter out of which the water consumed for irrigation is 28.8, for industries 0.5 and for service sector is 0.1 billion cubic meter. Which is account for 0.6 US dollar for unit cubic meter of water consumption.

B: Energy

i) Hydroelectricity

The current status of energy demand of Nepal is 1300 Mw. However, the total capacity is 1073 Mw which includes 562 Mw from Nepal Electricity Authority and 511 Mw from Private Sector. The deficit is substituted by the importing of 450 Mw energy from India. This arrangement has managed the load shading of electricity in the past to optimum level possible in the current moment.

ii) Alternative and Renewable Energy

Alternative Energy Promotion and Development Committee has been formed to extend the development of renewable energy in village level by utilization of technology depending on solar, bio-gas, wind and geothermal energy sources.

C: Irrigation and Water Induced Disaster Management

26410 sq. km of land is the agriculture land out of which irrigation facility is applicable to 17660 sq. km. 14333 sq. km of land has the irrigation infrastructure. The groundwater irrigation is 4433 sq. km. The surface water irrigation is 8131 sq. km and community based farmer irrigation is accounted for 1679 sq. km. Only one third of irrigable land has the whole year availability of the irrigation facility.

The national level irrigation projects such as Bheri-Babai Diversion, Sunkoshi-Marin Diversion, Mahakali Irrigation Projects are under pipeline to overcome the irrigation demand of the agriculture land. The swallow and deep tube well projects are also in existence to irrigate 4156 sq. km of land until 2016

D: Hydrology and Climate

Department of Hydrology and Meteorology is providing data and information of river flows and climate for the development of infrastructure related to hydropower, irrigation and extended its sectoral service to aviation, weather forecast and mountain weather bulletins. The department has also extended its service to extreme weather, flood forecasting and early warning and GLOF mitigation activities in the potentially danger glacial lake in the Himalayas.

The department is updating its infrastructure to automation by installing telemetry system incorporated with automatic weather station and water level sensors in the rivers. The advance technology are procured for establishment of Rader, Radiosonde and software for modelling weather and flow prediction.

Future Road Map

The decadal plan called "Energy and Water Resource, 2018-2027" has been envisaged for achieving national goal of prosperous Nepal through strategic and work plan. Some of the points relevant to hydrological and climate services are bulleted as below.

- Integrated national water resource policy is going to be developed through basin approach to address the transboundary issues of water allocation and consumption, conservation and management.
- Multipurpose water projects plans shall be governed within 3 years considering the social, economic and environmental factors.
- The groundwater conservation, development and regulation shall be incorporated in water resource act.
- Institutional framework shall be formulated for addressing central, provincial and local level water conflict management.
- Strategic and implementation plan shall be envisaged for inter basin transfer and relocation of water resources.
- Transboundary issues of water resources between India and Nepal shall be revisited through mutual agreement and coordination for utmost benefit to Nepal.
- Modality of water allocation of water shall be envisaged to lower region and countries.
- Technologies shall be explored for sustainable irrigation throughout the year for agriculture land.
- Lift irrigation with solar energy technology will be adapted in the difficult mountainous terrain.
- Capacity building measures shall be implemented for water induced disaster prevention in central, provincial and local government level.
- Hydrological and Meteorological network will be expanded and updated through automation and modernization of monitoring stations.
- Research works shall be promoted for incorporating impact of climate change on ground water depletion, flood, agriculture, sediment yield etc.
- The system of 3 to 5 days prediction of weather, prediction of extreme weather events and effective early warning system shall be formulated.

New Zealand:

26th IHP REGIONAL STEERING COMMITTEE MEEETING FOR ASIA AND THE PACIFIC
Shanghai, China
(November 2018)

NATIONAL REPORT OF NEW ZEALAND

Activities undertaken in the period October 2017– October 2018

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. This is fostered by collaborative processes that integrate social science and cultural perspectives into resource management with biophysical sciences. 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.

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.

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 2017 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

Slow progress is being made on this. Next step is to secure central government support. Patience is required in building partnerships with central government agencies that have limited capacity and capability. This initiative is aligned with the APFRIEND activities over many years.

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 2018

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 Christchurch NZ in December 2018.

2.2 Activities planned for 2019

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.

The Philippines:

NATIONAL REPORT ON IHP RELATED ACTIVITIES

PHILIPPINES

26th Regional Steering Committee Meeting
UNESCO International Hydrological Programme
(UNESCO IHP)
for Asia and the Pacific
held at Shanghai, China

4 NOVEMBER 2018

Philippine National Committee
for the
UNESCO International Hydrological Programme
Republic of the Philippines

1. ACTIVITIES UNDERTAKEN IN THE PERIOD OCTOBER 2017- OCTOBER 2018

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

Last November 13-16, the 25th RSC Meeting of the UNESCO-IHP Asia and Pacific (formerly Southeast Asia-Pacific Region) and together with the Joint UNESCO-JASTIP symposium was held in Seda Hotel, I Quezon City of Metro Manila. Details of this event have been reported by

UNESCO Jakarta Office. This is to acknowledge the various persons involved and especially those who headed the following adhoc committees for this event.

a. Local Organizing Committee (Guillermo Tabios UPD)
b. Program Sub-committee (Dora Gamboa of MWSI)
c. Field Trip Sub-committee (Leni Santos-Borja of LLDA)
d. Finance Sub-committee (Leonor Cleofas and Nathaniel Santos of MWSS)
e. Secretariat/Logistics Sub-Committee (Noemi Bautista of PWP)
f. Technical Sub –committee (Roy Soriano of UP-NHRC)

Philippine Water Partnership (PWP),
Water and Climate Development Programme (WACDEP)
Conduct of the Consultation re: the Results on the Gap Assessment of Philippine policies and programs on flood management

2018 World Water Day in the Philippines

The 2018 World Water Day and Water Week 2018 celebration in the Philippines was held from March 15 to 22, 2018 with the theme: "Nature for Water". It was a nationwide event supported by different partner agencies, local government units, NGOs and the private sector.

PWP actively participated in the following events related to the World Water Day celebration:

Kick-off ceremony

PWP participated in the launching of the World Water Day 2018 Kick-off Activity entitled, "Nature Walk" cum "Sining Ipo Sungka Tournament" on March 15, 2018 at La Mesa Nature Reserve, Novaliches, Quezon City. The said activity was led by the DENR-River Basin Control Office (RBCO) in partnership with Manila Water, Maynilad and Metropolitan Waterworks and Sewerage System (MWSS) as part of the week-long celebration.

The sungka tournament by Maynilad, Nature Treasure Hunt, Pinoy Henyo (Kalikasan Version) and Kilos-kilos Game was held simultaneously with the Nature Walk organized by Manila Water. Besides aiming to foster camaraderie among inter-agency participants, the event emphasized the importance of watershed, the protection and care of the country's natural resources.

The educational and fun-filled activities were concluded by the awarding ceremonies, photo-opportunities and Pledges of Commitment to the environment by all those who participated.

Launching of the Wetlands Bioblitz Program

On 16 March 2018, the Society for the Conservation of Philippine Wetlands, Inc. (SCPW), in collaboration with the Philippine Water Partnership (PWP) and Laguna Lake Development Authority (LLDA), launched the Wetlands Bioblitz Program at Panguil River Ecotourism Park. The launching event, which is one of the activities lined-up for the celebration of World Water Day 2018, served as a dry-run for the Wetlands BioBlitz activities that will be implemented in other major rivers in Laguna de Bay region. It underscored the relationship between nature and water, the nature-based solutions for water-related issues which is the theme for this year's World Water Day celebration dubbed as *"Nature for Water: Exploring Nature-Based Solutions to the Water Challenges in the 21st century".* It was attended by scientists, LGUs, community volunteers and interested individuals and organizations, including business participated in the whole-day event.

"NWRB, Nangangalaga ng Water Resources ng Bansa, an Educational Campaign"

This activity is an Information, Education and Communication (IEC) Campaign organized by the National Water Resources Board (NWRB) and the PWP on March 19, 2018 in Nagcarlan, Laguna for non-registered domestic water-users and resort owners.

The objectives are as follows:

- To educate the public on the functions of NWRB, Water Code of the Philippines, and IWRM
- To create a list of households which own and use wells and other sources for domestic purposes; and
- To advocate registration of sources for domestic use and application for permit of sources for other uses

A total of 170 interested stakeholders attended the event.

An open forum followed after the presentations to give the opportunity for participants to raise points and/or clarificatory questions regarding the presentations. The concerned resource persons responded to the points/clarificatory questions raised.

Culminating Activity and Awards

This activity was organized by Maynilad, together with the National Water Resources Board (NWRB). The awards were given to honor eighteen (18) champions for water and the environment — individuals, institutions and programs that made huge strides in achieving water and environmental sustainability in the Philippines. The recognition is the culminating event of the week-long celebration of World Water Day.

Preparation for the 4th International River Summit to be held on 22-24 November 2018 in Cebu

PWP will manage the break-out session on Integrated Water Resources Management and will conduct an IEC for Youth as a side event at the Summit

1.2.2 Participation in IHP Steering Committees/Working Groups

Country Representative, Attended 25th Regional Steering Committee Meeting of the UNESCO International Hydrological Programme for Asia and Pacific (UNESCO-IHP AP) and the Joint UNESCO-JASTIP International Conference at Quezon City, Metro Manila, Novebmer 13-16, 2017.

Regional Shared Vision Planning and Collaborative Modelling Training
23-24 October 2018, Vientiane - Lao PDR

Pre-Steering Committee Meeting
22 October 2018, Vientiane - Lao PDR

2nd WACDEP Regional Workshop
18-19 July 2018, Ho Chi Minh City, VietNam

National Watershed Conference
March 26, 2018

Financial Training in Yogyakarta, Indonesia
27-28 February 2018

WACDEP Regional Workshop
7-8 December 2017, Bangkok, Thailand

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

National Water Resources Board

Assessment and establishment of new streamflow monitoring system in the Upper Agno River and Angat River basin (2018-2019) Phase II: Components of this project include sampling network design based on sampling error variance and capital and maintenance costs, and the establishment of new or revision of location of old stations based on the assessment of sampling network design.

National Economic Development Authority

Drafting the National Water Resources Policy to be issued as an Executive Order by current administration.

Spearheading the creation of a Department of Water Resources as the country's apex body to manage the water resources of the country.

Funded and monitoring of the Philippine Water Supply and Sanitation Master Planning of the country conducted by EDCOP Consulting Firm (January 2018-November 2018).

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

University of the Philippines - Diliman, Institute of Civil Engineering (UP-ICE) and National Hydraulic Research Center (NHRC)

San Juan River Basin, Quezon City Flood Control Project (Dr. Roberto Soriano, principal investigator): Components include hydrologic and flood inundation modeling to assess alternative flood mitigation works in Quezon City along San Juan River.

UNDP/GEF Project on Reducing Pollution and Preserving Environmental Flows in the East Asian Seas through the Implementation of Integrated River Basin Management (IRBM) in the Philippines: Strengthening Integrated Management of the Imus-Ylang Ylang and Pasac-Guagua River Basins and Coastal Areas of Manila Bay. (Dr Guillermo Q. Tabios, national consultant, August 2017-June 2018)

Objective, Fact-finding &Science-based Review of Performance of Existing Mining Operations: Benguet Corp. Nickel Mines, Eramen Minerals, Zambales Diversified Metals Corp., LNL Archipelago Minerals, Inc. and Ore Asia Mining & Development Corp. (Guillermo Q. Tabios III, Team Leader, September 2017-September 2018).

Investigate Additional Potential Surface and Ground Water Source at Carmen, Cebu for Metro Cebu Water Supply (Dr. Guillermo Q. Tabios III, principal investigator) May 2018-November 2018.

Two-Dimensional Modeling and Simulation of Flow-Salinity Interaction of Agno River to Determine Optimal Location for Domestic Water Supply Diversion and Extraction ((Dr. Guillermo Q. Tabios III, principal investigator, September 2018-Febraury 2019)

Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA),

Continuing Priority Programs of the Flood Forecasting Branch
- Upgrading of *Flood Forecasting Operations.*
- Establishment of *Communication Network Thru SMS Link* Between PAGASA Weather and Flood Forecasting Center (WFFC) Bldg. (Quezon City) and Magat Dam in Isabela.
-Establishment/Enhancement of *Community-based Early Warning System(CBEWS)* under the READY Project (UNDP), covering the following Provinces: Laguna, Ilocos Sur, Zambales, Cavite, Bohol
-Conduct of *flood hazard mapping* (READY Project) in the following provinces: Ilocos Sur, Laguna, Cavite, Pampanga, Iloilo.
-Improvement of the *Flood Forecasting and Warning System (FFWS)* of the Pampanga and Agno River Basins, to include the ff. activities:
-Implementation of JICA project in the Pampanga and Agno river basins

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

Water Challenge Forum and Exhibition: *Partnering with Stakeholders in Building a Sustainable Water Future"* , 30 August 2018

WaterLinks Forum 2018: *"Solving Asia' Urban Water Crisis: The Water-Food-Energy-Climate Change",* 25-27 September 2018

1.2.5 Other Initiatives

National Water Resources Board (NWRB)
-Groundwater Resource Vulnerability Studies
- Assessment using Isotope Techniques in Regions 2 and 10 (MGB/NWRB/PNRI- IAEA Funding)
- Inventory of water users in Region 2 -(IAEA)
- Groundwater Management Plan in Metro Iloilo including establishment of monitoring network (Government Funding)
- Preparation of Localized Customer Service Codes in CPC grantees
- Improvement of the water allocation system using Climate Change Impact Model intended for groundwater regulation that considers climate change scenarios
- Data collection and sampling of the groundwater data in Manila Bay Coastal Province (DENR-MBCO)
- Amendment of the Water Code (PD 1067) to be responsive to current issues and challenges and operationalize IWRM.

Metropolitan Waterworks and Sewerage System (MWSS)
Water Supply Projects
- New CentennialWater Supply Project 2013 - 2017 Public-Private Partnership (PPP)
Construction of a new water source in order to meet the increasing water demand. Also intended to provide a redundant dam for Metro Manila's domestic water supply.
- Bulacan BulkWater Supply Project 2014 -2017 PPP
Construction of water distribution system that will provide bulk water supply to the water districts of the Province of Bulacan

Department of Interior and Local Government (DILG)
Current Initiatives & Programs
- MDGF-Enhancing Access to & Provision of Water Services with the Active Participation of the Poor aims to enhance the provision of and access to water services in 36 waterless communities through a combination of improved policy environment and increases local capacities.
- Sagana at Ligtas na Tubig sa Lahat Program- 455 Waterless Municipalities 2011-2016 Bottom-Up Planning & Budgeting Program 609 Focus Areas 2013-2016
- Sagana at Ligtas na Tubig sa Lahat Program (SALINTUBIG)

National Irrigation Administration

- Construction of Balog-balog Single High Dam (650 MCM storage, 1.3 dam crest length with 20 CMS and 60 MW hydropower plant at 95% reliability.

Department of Public Works and Highways (DPWH)

Short-listed Structural Mitigation Measures

Pasig-Marikina River Improvement (RI) + Dam
Meycauayan RI
Malabon-Tullahan RI
South Parañaque – Las Piñas RI
East Mangahan Floodway (Cainta & Taytay RIs)
West Laguna Lakeshore Land Raising
Land Raising for Small Cities around Laguna Lakeshore
Improvement of the Inflow Rivers to Laguna Lake
Manila Core Area Drainage Improvement
West Mangahan Area Drainage Improvement
Valenzuela, Obando and Meycauayan (VOM) Improve.(to be studied further)

Proposed Non-Structural Measures

Strengthening of the Flood Information and Warning System (FIWS)
Effective Flood Control Operation and Warning System (EFCOS) improvement
New telemetric rainfall and water level gauging stations

Capacity Building for Strengthening Community-based FRM

Update and implement Information and Education Campaign (IEC) programs
Rainfall and water level monitoring by Barangay Disaster Risk Reduction and Management Councils (BDRRMCs)
Construction of evacuation routes and temporary evacuation centers

Improvement of Management Information System (MIS) for Disaster Risk Management

Improvement and development of MIS
Capacity building

National Sewerage and Septage Management Program (NSSMP)

Project Description -

Increase number of sewerage and septage management projects (outside Metro Manila) by 2020

Septage Management Targets

All LGUs have septage management programs serving their urban barangays
Capital costs per project range from P4-71 M

Sewerage Targets

17 HUCs outside of MM serving 50% of urban barangays; to be done in 2 phases of 25% each (interceptor type systems)
Capital costs average P410 million/project/phase

National Strategy

Facilitate a bottom-up, demand-driven project development process by providing local implementers with training, tools and financial incentives, including NG cost share for sewerage.
DPWH (in coordination with DOH) – conduct a high-impact nationwide training and promotion campaign
Integral component of the Sanitation Roadmap and National Sustainable Sanitation Plan, broader, over-arching frameworks (needed water and sanitation sector reforms are being developed by other groups)

Flood Control & Sabo Engineering Center (FCSEC), Department of Public Works and Highways (DPWH), *Project for Enhancement of Capabilities in Flood Control and Sabo Engineering of the DPWH*, JICA.

Urban Resilient to Climate Change Projects

- Formulation of river basin flood mitigation master plans to flexibly cope with the potential impacts of future climate changes:

- structural measures resilient to climate change
- measures not to cause any casualties, even in the event exceeding the design flood
- Strengthen non-structural measures for climate change
- Strengthen monitoring system for rainfall intensities, river water level, tidal levels and other hydrological factors related to the climate changes
- Promotion of Rainwater Harvesting
- Retarding basins or ponds for flood control
- Rainwater collector systems in public school buildings for water supply and flood control
- Construction of Evacuation Centers

Bureau of Soils and Water Management (BSWM)
Bureau of Soils and Water Management (BSWM), *Drought Mitigation Measures.*

Bureau of Soils and Water Management (BSWM), *Integrated Watershed Management for Sustainable Soil and Water Resources Management of the Inabanga Watershed, Bohol Island, Philippines*.

Bureau of Soils and Water Management (BSWM), *Rainwater Harvesting.*

Bureau of Soils and Water Management (BSWM), *Rehabilitation/Upgrading of Regional and Provincial Soil and Water Analyses.*

Bureau of Soils and Water Management (BSWM), *Small Water Impounding Projects (SWIP).*

Flood Control & Sabo Engineering Center (FCSEC), Department of Public Works and Highways (DPWH), *Project for Enhancement of Capabilities in Flood Control and Sabo Engineering of the DPWH*, JICA.

Laguna Lake Development Authority (LLDA), *Environmental User Fee Program* (as centerpiece of Environmental Management Program).
Laguna Lake Development Authority (LLDA), *River Rehabilitation Program* .
Laguna Lake Development Authority (LLDA), *Lake Fishery Management Program.*
Laguna Lake Development Authority (LLDA), *Laguna de Bay Shoreland Management*.

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
25th Regional Steering Committee of UNESCO-IHP Southeast and Pacific (SEAP) and Joint UNESCO-JASTIP Symposium on “Intraregional Water Security and Disaster Management”, Quezon City, Metro Manila, November 13-16, 2017.

International Network for Water and Ecosystem in Paddy Fields, 14th INWEPF Symposium and Steering Committee, Theme: “Strengthening Global Partnership for Sustainable and Climate Resileine Irrigation and Drainage Systems in Paddy Fields”, Chaired by National Irrigation Administration, Clark Special Economic Zone Angeles City, Pantabangan, Nueva Ecija & Banaue, Philippines, 21-24 November 2017.

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 2018-2019

Mapping of RSC Future Projects against IHP VIII "Water Security: Responses to Local, Regional and Global Challenges (2014-2021).

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.

Thailand:

NATIONAL REPORT ON IHP RELATED ACTIVITIES THAILAND

for

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

3-5 November 2018 Shanghai, PR China

Contents

ACTIVITIES UNDERTAKEN IN THE PERIOD of November 2017 to October 2018

ACTIVITIES UNDERTAKEN IN THE PERIOD of November 2017 – October 2018

1.1 Meeting of the IHP National Committee

1.1.1 Decision regarding the composition of the IHP National Committee

The present composition of Thailand National Committee – IHP: TNC-IHP consists of 18 members as follows:

Chairman: Director General of Department of Water Resources

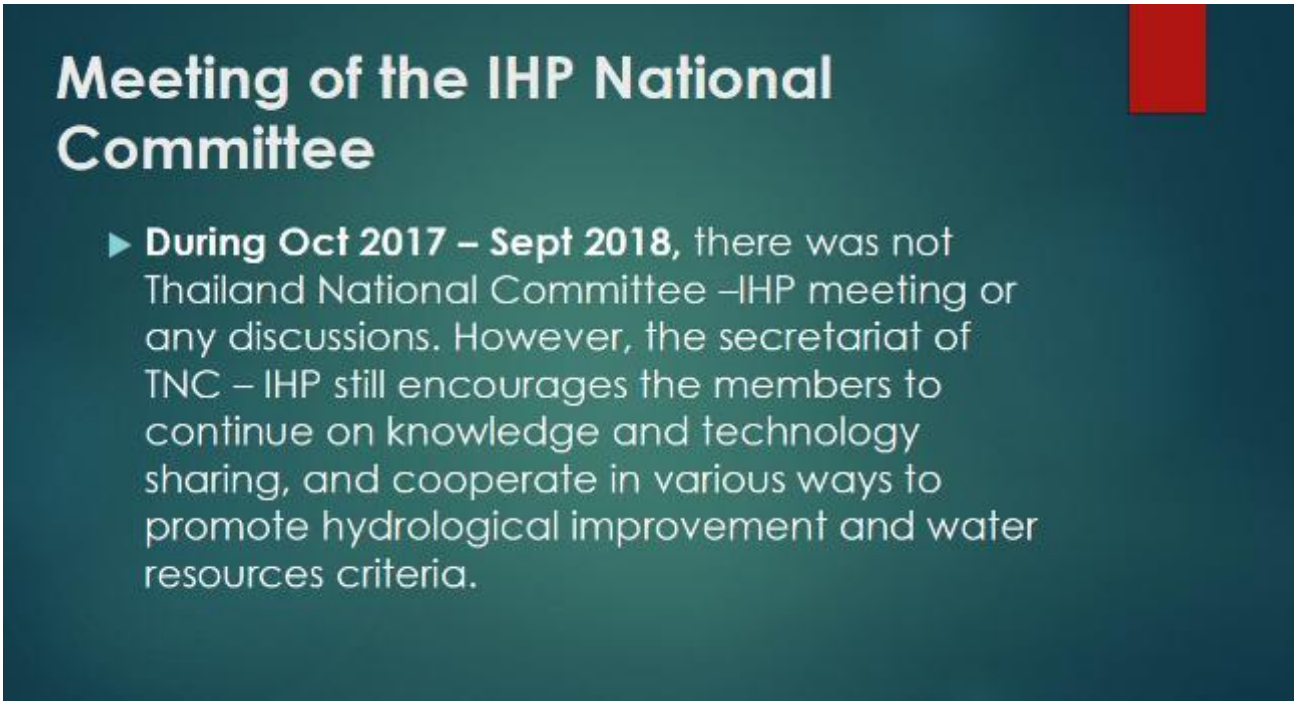
Vice Chairmen: Deputy Director General of Department of Water Resources Deputy Director General of Royal Irrigation Department

Secretary: Director, Bureau of Research, Development and Hydrology Department of Water Resources

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

1. National Park, Wildlife and Plant Conservation Department	8. Department of Royal Rainmaking and Agricultural Aviation
2. Department of Groundwater Resources	9. Secretariat of the Thai National Commission for UNESCO
3. Royal Irrigation Department	10. Electricity Generating Authority of Thailand
4. Thai Meteorological Department	11. The Thailand Research Fund
5. Marine Department	12. Thai Hydrologist Association
6. Hydrographic Department, Royal Thai Navy	13. Mr. Veeraphol Taesombat
7. National Research Council of Thailand	14. Bureau Research Development and Hydrology

Remark: Currently, Office of the National Water Resources has been established to be responsible for national water policy and secretariat of the National Water Resources Committee. Therefore, the composition of Thailand National Committee – IHP: TNC-IHP should be revised.




Activities at national level in the framework of the IHP
Representatives from TNC – IHP and the Department of Water Resources participated in the 25rd Regional Steering Committee Meeting for Southeast Asia and the Pacific, RSC for UNESCO-IHP and the Conference, 13-15 November 2017, Manila, Philippines


Activities at national level in the framework of the IHP
Representatives from TNC – IHP and the Department of Water Resources participated in the 25rd Regional Steering Committee Meeting for Southeast Asia and the Pacific, RSC for UNESCO-IHP and the Conference, 13-15 November 2017, Manila, Philippines

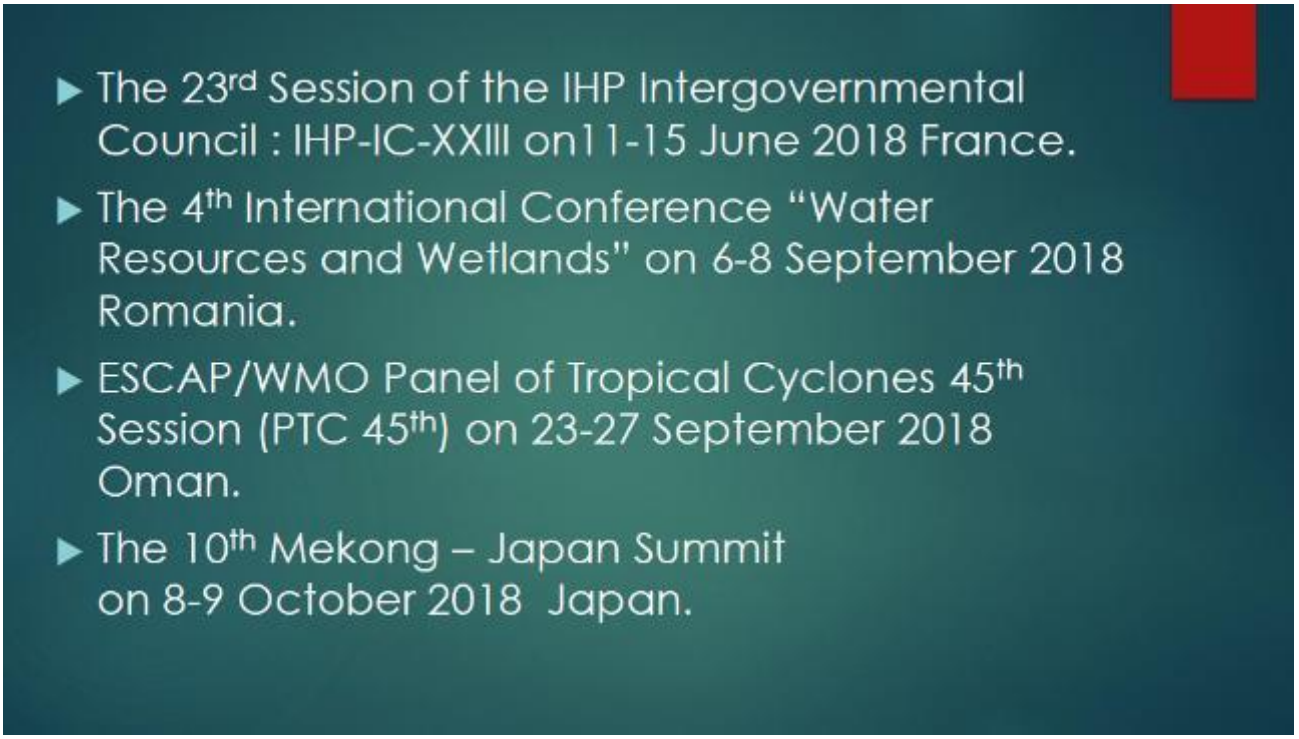
Research/applied projects supported

- Theme 1 Water Related Disasters and Hydrological Changes 10 projects
- Theme 2 Groundwater in a Changing Environment 7 projects
- Theme 3 Addressing Water Scarcity and Quality 7 projects
- Theme 6 Water Education Key, for Water Security 3 projects

Participation in international scientific meeting

- Thailand Country Report "Public Policy" in International Conference on Water Demand Management among Competing Sectors Bangkok, Thailand
- Mekong River Commission Preparatory Meeting of The Joint Committee for The 24th Meeting of The MRC Council 28 November 2017 Thailand.


The 3rd Asia-Pacific Water Summit (3rd APWS) on 11-12 December 2017 Myanmar.
The 5th Green Mekong Forum (Water Resources Management and Disaster Risk Reduction) 12 February 2018 Thailand.
Typhoon Committee 50th Session (TC 50th) on 25 February - 4 March 2018 Vietnam.
The 8th World Water Forum on18-23 March 2018 Brazil.
The 3th Mekong River Commission Summit and International Conference on 2-5 April 2018 Cambodia.


The 23rd Session of the IHP Intergovernmental Council : IHP-IC-XXIII on11-15 June 2018 France.
The 4th International Conference "Water Resources and Wetlands" on 6-8 September 2018 Romania.
ESCAP/WMO Panel of Tropical Cyclones 45th Session (PTC 45th) on 23-27 September 2018 Oman.
The 10th Mekong – Japan Summit on 8-9 October 2018 Japan.


Future activities
Continuation of Collaboration with RSC-IHP 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
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


Thank you for your attention

Timor Leste:

The 26nd UNESCO- IHP Regional steering Committee for Asia and Pacific Meeting, Venue Ocean Hotel in Shanghai from 3rd – 5 November 2018

Water Resource of Timor Leste

By

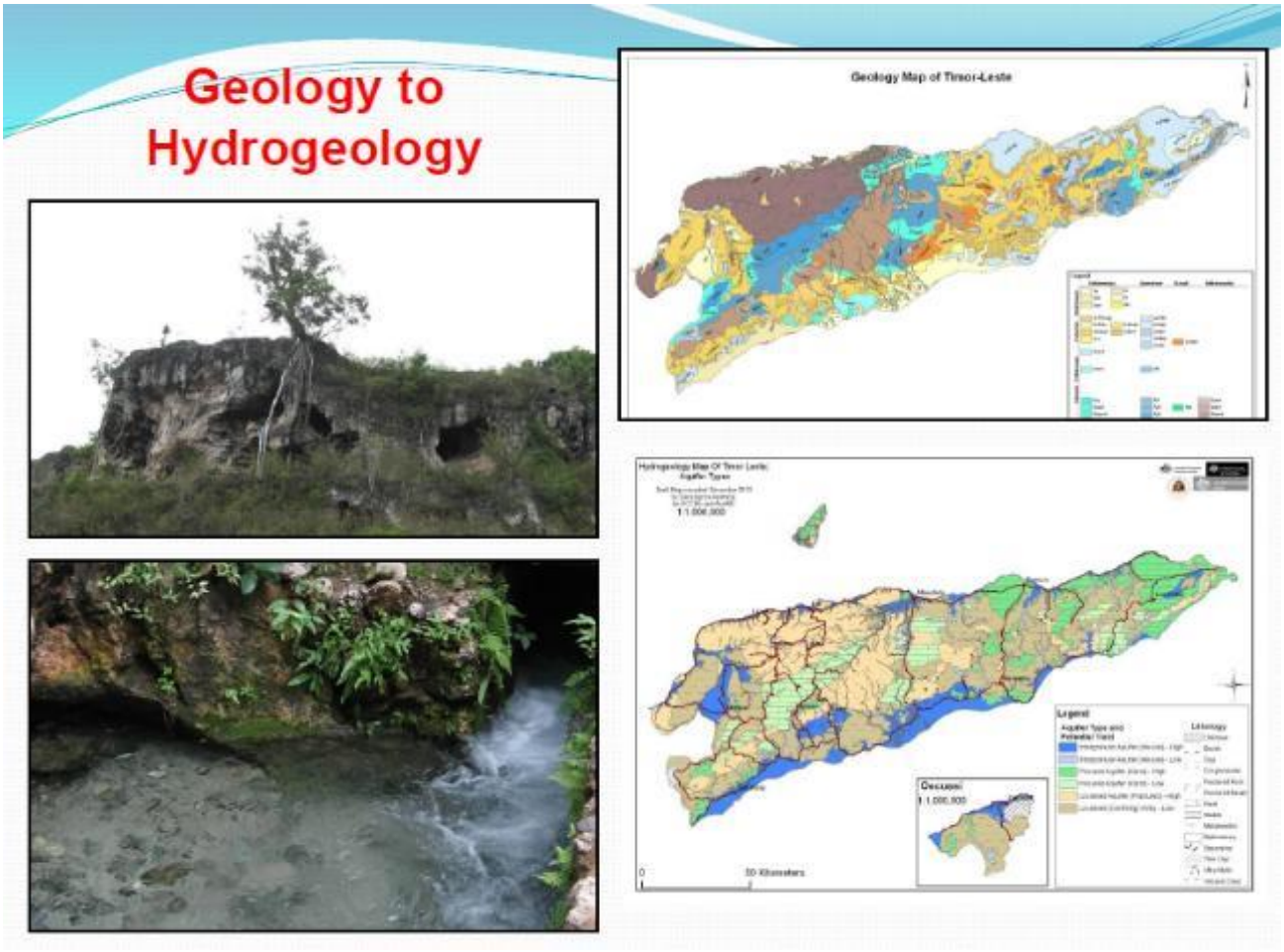
Osorio Belo da Piedade
Department of Water Resource Management
Ministry of Public Work Timor Leste

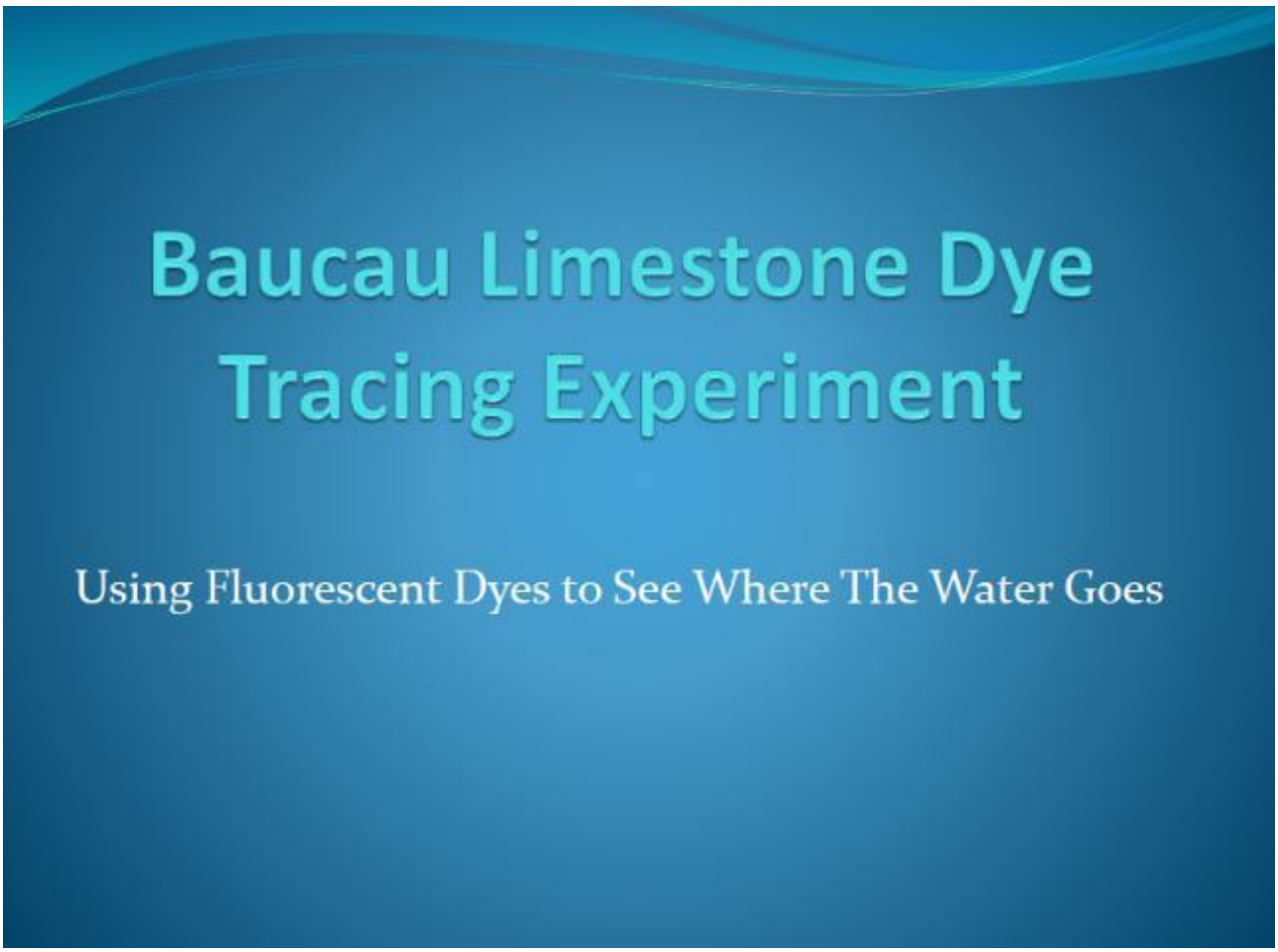
Content

- Characteristics of TL
- Climate
- Dye Tracing study

CHARACTERISTIC OF TIMOR LESTE

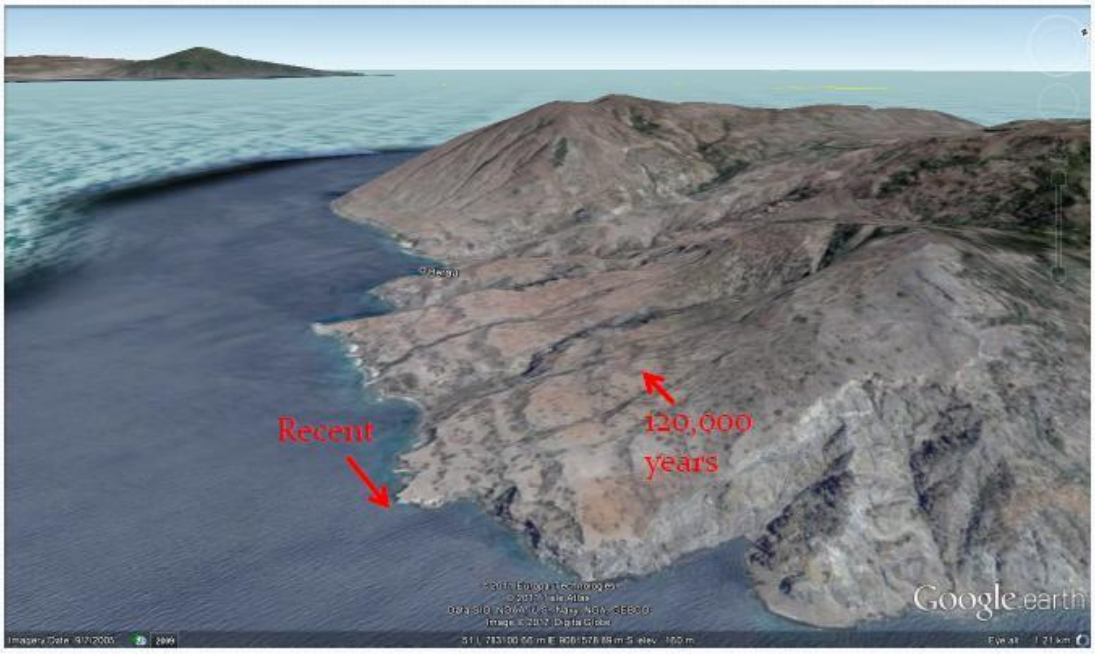
- Eastern half of Timor island located in south Pacific 400 km north Of Australian Continent .
- About 1.3 million people with 3.2% annual growth rate
- 14,610 km2 , Latitude 8° and 9° 30' South, Longitude 124° and 126° 30' East.
- Generally mountainous characterised by rugged terrain & small narrow valleys.
- Highest mountain (Ramelau Mountain) extending from west to east has a altitude of 3,000 metres


Geology to Hydrogeology
Geology Map of Timor-Leste


Baucau Limestone Dye Tracing Experiment
Using Fluorescent Dyes to See Where The Water Goes

Baucau Karst Limestone Location

Limestone terraces on Atauro Island



Baucau Limestone Springs

Uaisarake & UaiLilia Springs

Uaimatahun Sinkhole

Uaileabere Cave

Flow Net

Dye Tracing Method

- Three basic questions commonly encountered in groundwater hydrology are:

- • Where does the water go?
- • How long does it take to get there?
- • What happens along the way?

Dye Introduction Points

Dye Mixing and Introduction

Mixing dye powder

Pour into cave stream

Uaileamata Cave

Entry with rope ladder

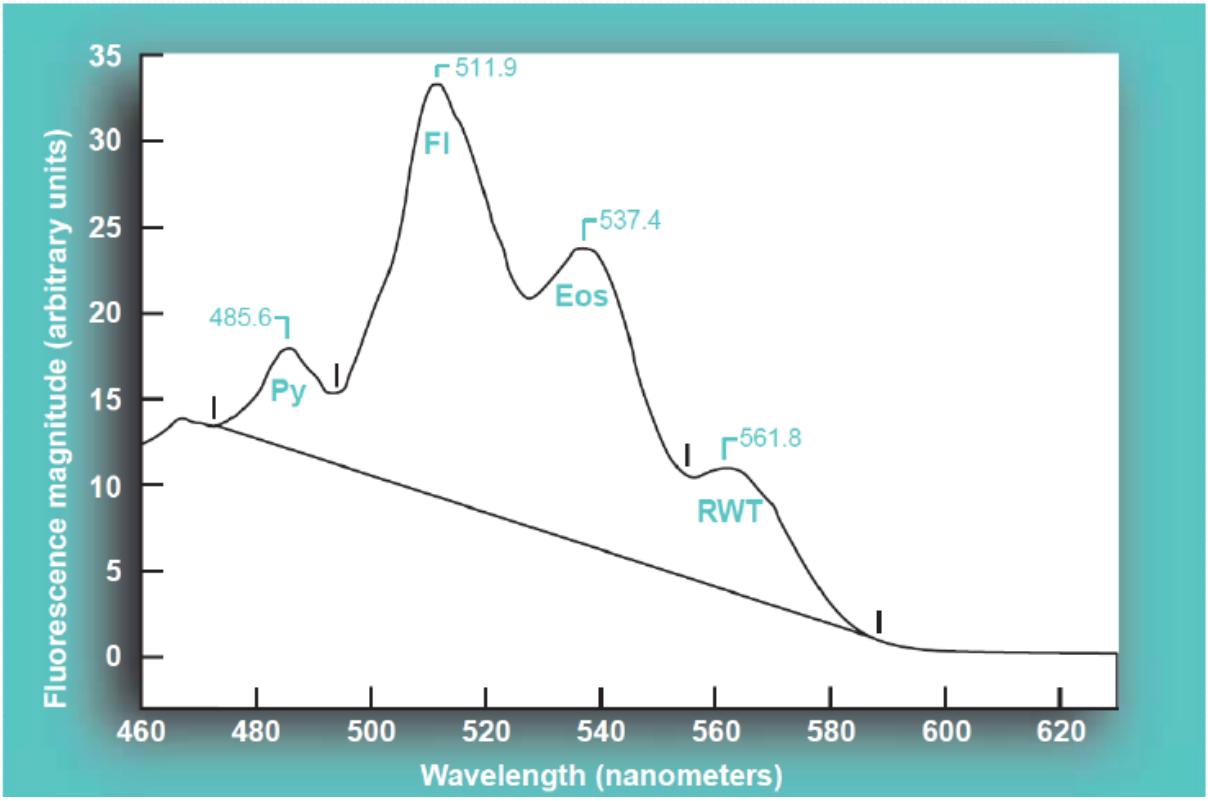
Liquid dye direct in stream

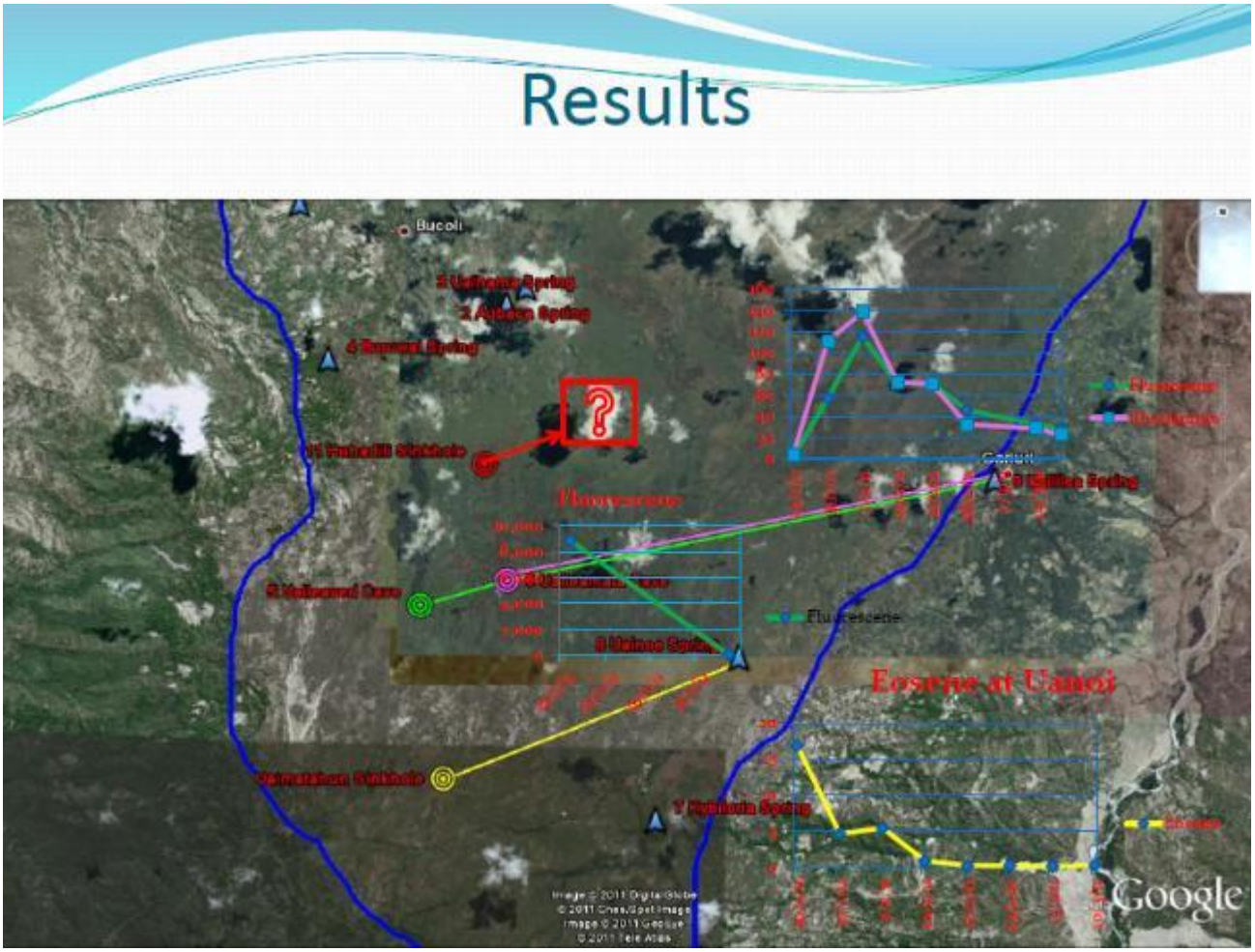
Sampling for dye

Anchor used to hold sampler

Aubaca Spring sample site

Laboratory Analysis of Sampler




Results
Bucoli
Fluorescene
Eosene at Uanoi
Google

Thank you

Vietnam:

VIET NAM NATIONAL COMMITTEE FOR THE IHP

62 Nguyen Chi Thanh, Dong Da, Ha Noi, Viet Nam

Tel: (84-4) 8359540, Fax: (84-4) 8355993, Email: tranthuc.vkttv@gmail.com

NATIONAL REPORT ON IHP RELATED ACTIVITIES

3. ACTIVITIES UNDERTAKEN IN THE PERIOD OCT 2017 – OTC 2018

3.1 Meetings of the IHP National Committee

3.1.1 Decisions regarding the composition of the IHP National Committee

- The Committee has remained unchanged during the period under review, with the Chairman being Prof. Tran Thuc, Vietnam Institute of Meteorology, Hydrology and Climate Change - Ministry of Natural Resources and Environment.
- Assoc. Prof. Huynh Thi Lan Huong, Deputy Director General of Vietnam Institute of Meteorology, Hydrology and Climate Change - Ministry of Natural Resources and Environment will be the Vice Chair.

3.1.2 Status of IHP-VIII activities

- Prepare for the implementation, participation and contribution to IHP-VIII activities.

3.2 Activities at national level in the framework of the IHP

3.2.1 National/local scientific and technical meetings

- Scientific and technical meetings are generally held within the context of the Ministry of Natural Resources and Environment and professional societies (particularly, the Viet Nam Panel on Climate Change, Viet Nam Fluid Mechanics, and Viet Nam Geography Societies). There have been no meetings specifically under the aegis of the IHP. The Chairman and the Members of the IHP National Committee meet regularly to discuss IHP matters.
- Organized a training course on applying and using the Flash Flood Warning Systems to develop flash flood risk maps.

3.2.2 Participation in IHP Steering Committees/Working Groups

- Viet Nam participated in the establishment of the Regional Steering Committee for Asia-Pacific. The members of the Viet Nam National Committee for the IHP have attended and participated actively in all of the annual meetings of the Regional Steering Committee.
- Participate in Asian Pacific FRIEND.

3.2.3 Research/applied projects supported or sponsored

- Finalyzed the Project on “Developing of Flash Flood Risk Maps to 19 provinces in Central and Central Highland of Vietnam”. Transfer the result to Vietnam Hydro-Meteorological Administration for apply in the practice.
- Updating Climate Change Scenarios for Viet Nam.
- Developing The National Climate Assessment.
- Developing Project of Climate Adaptation and Sustainable Development for the Central Viet Nam. In which, we mention about developing the early warning system and Intergrated water resouces management.
- Implimenting the Study of multi-disaster management and scientific solutions, development of tools for decision support for multi-disaster response, pilot application for the Central Coast.

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

- None

3.2.5 Other initiatives

- The Viet Nam Institute of Meteorology, Hydrology, and Climate Change (IMHEN) submitted to the Viet Nam Ministry of Science and Technology the National project title: "Combining top-down and bottom-up approaches in assessing water resources risks due to changes in hydrological systems to respond to regional and global changes - case study for a river basin". The main objective of the research is provide a contribution from Viet Nam to the UNESCO/IHP Strategic Plan in the VIII phase (2014-2021). At current, the project proposal has been and received positive feedback.

3.3 Educational and training courses

3.3.1 Contribution to IHP courses

- None.

3.3.2 Organization of specific courses

- None.

3.3.3 Participation in IHP courses

- Several Vietnamese have participated in IHP courses and workshops during the reporting period.

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

- The Viet Nam Institute of Meteorology, Hydrology, and Climate Change (IMHEN) has worked closely with the International Center for Water Hazard and Risk Management (ICHARM) from Japan and the Institute of Technology Bandung from Indonesia to submit a joint project proposal within the e-Asia "Disaster Risk Reduction and Management" platform. As for the IMHEN side, a project proposal of "Combining community knowledge and modern technology in natural disaster management" has been submitted to the Viet Nam Ministry of Science and Technology. The Japanese and Indonesian partners will have to submit their proposals to focal points in Japan and Indonesia and receive approval respectively. At current, the project proposal from IMHEN has received positive feedback from MOST and the application is pending approval for waiting approval from Japan and Indonesia.

3.5 Publications

- Published a special issue on the IHP-VIII and researches under the IHP-VIII themes. In which, there are 13 paper have been publicated. The title of the issue is: Special Issues on UNESCO's IHP, Journal of Climate Change Science, No.3-2017, Ha Noi, Viet Nam.

1) Tran Thuc (2017), UNESCO's International Hydrological Programme and Contribution of Viet Nam to the Programme.
2) Nguyen Van Thang (2017), Hydrology and Water Resources PhD Program at Viet Nam Institute of Meteorology, Hydrology and Climate Change.
3) Pham Quy Nhan, Tae Yoon Park (2017), Groundwater Resources in Viet Nam: Potential and Challenges.
4) Ta Dinh Thi, Ta Van Trung, Bui Duc Hieu (2017), Water resource security in the context of climate change in Viet Nam.
5) Nguyen Van Thang, Mai Van Khiem, Truong Thi Thanh Thuy, Ha Truong Minh, Nguyen Dang Mau (2017), Assessment of Drought Conditions in the Red River Delta.

6) Huynh Thi Lan Huong, Tran Thanh Thuy (2017), Multi Risk: A New Approach for Disaster Risk Management.
7) Mai Van Khiem, Ha Truong Minh, Luu Nhat Linh (2017), Impact of Climate Change on Intensity-Duration-Frequency Curves in Ho Chi Minh City.
8) Tran Van Tra, Nguyen Xuan Thinh (2017), The Use of Combined Top-Down And Bottom-Up Climate Change Impact Assessment in Hydrological Systems.
9) Hoang Minh Tuyen, Luong Huu Dung, Le Tuan Nghia (2017), Flash Flood Events in Mu Cang Chai and Muong La on August 3, 2017 – Causes and Prevention Measures.
10) Vu Van Thang, Tran Dinh Trong, Phung Duc Chinh (2017), Jerome Faucet, Calculating and Building Inundation Maps Corresponding to Flood Frequencies in Gianh River Basin.
11) Nguyen Xuan Hien, Pham Tien Đat, Doan Thi Thu Ha, Nguyen Thi Phuong, Dang Linh Chi (2017), Vulnerability to Climate Change Assessment for the Agriculture Sector at Tuyen Quang Province.
12) Le Ngoc Cau (2017), Policies To Promote Sustainable Water Resources Management In Viet Nam – An In-Depth Analysis.
13) Anh Tien Do, Huynh Thi Lan Huong, Hai Bang Pham (2017), Application of Airlift Membrane Bioreactor for Slaughterhouse Wastewater Treatment: 20 m^3/day Pilot Study in Ha Noi, Viet Nam.

3.6 Participation in international scientific meetings

3.6.1 Meetings hosted by the country

- None

3.6.2 Participation in meetings abroad

- Attending meeting of the 26th IHP Regional Steering Committee for Southeast Asia and the Pacific.

3.7 Other activities at regional level

3.7.1 Institutional relations/cooperation

- None

3.7.2 Completed and ongoing scientific projects

None under the aegis of IHP-VI

4. FUTURE ACTIVITIES

4.1 Activities planned until December 2018

- Attending meeting of 27th IHP Regional Steering Committee for Southeast Asia and the Pacific.

4.2 Activities foreseen for 2019-2020

- In the coming years, the activities are oriented towards the goal of IHP-VIII period 2014-2021, IHP Viet Nam focuses on the following issues:
    - (i) Water resources security; Water for sustainable cities; Disaster preparedness for schools and communities; Sustainable water resources management; Effectively managing rivers, national aquifers and transboundary aquifers; Raise awareness of all levels on climate change;
    - (ii) Water, Energy and Food Nexus to improve the capacity of integrated water resources management;
    - (iii) 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.

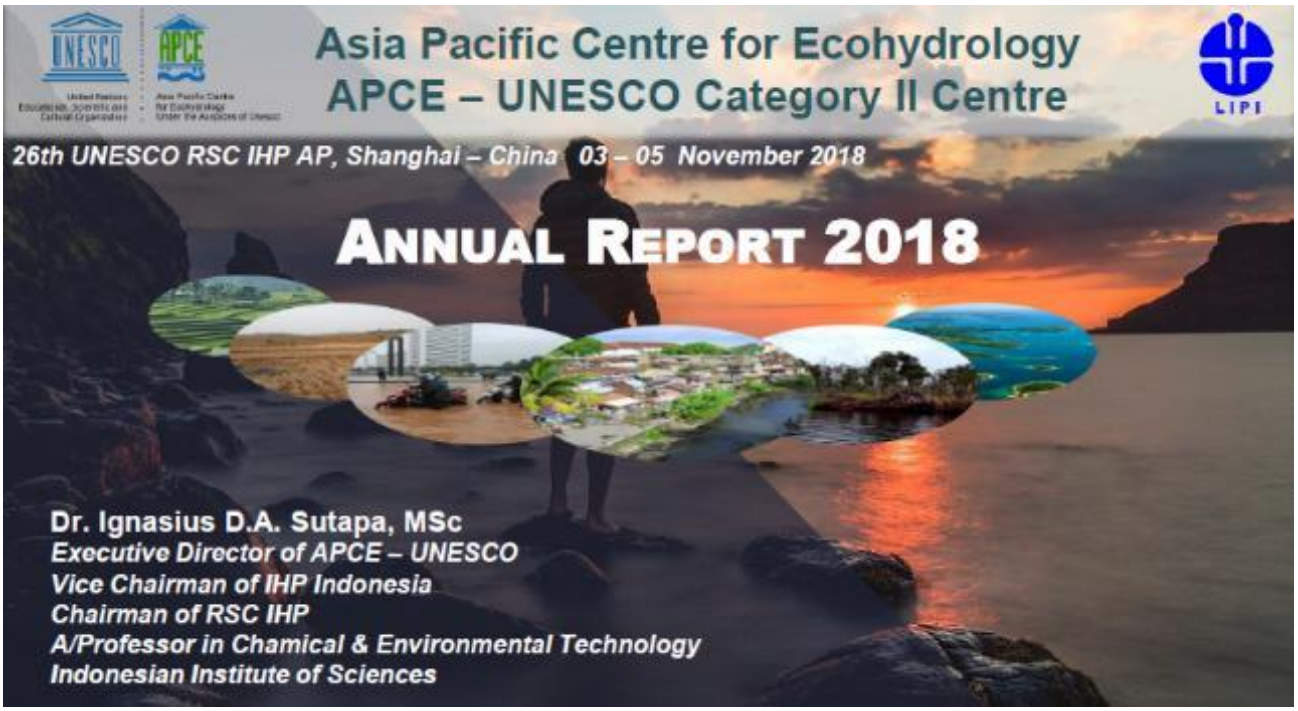
- Registered and successfully organized of the 28th IHP-RSC meeting in Viet Nam.

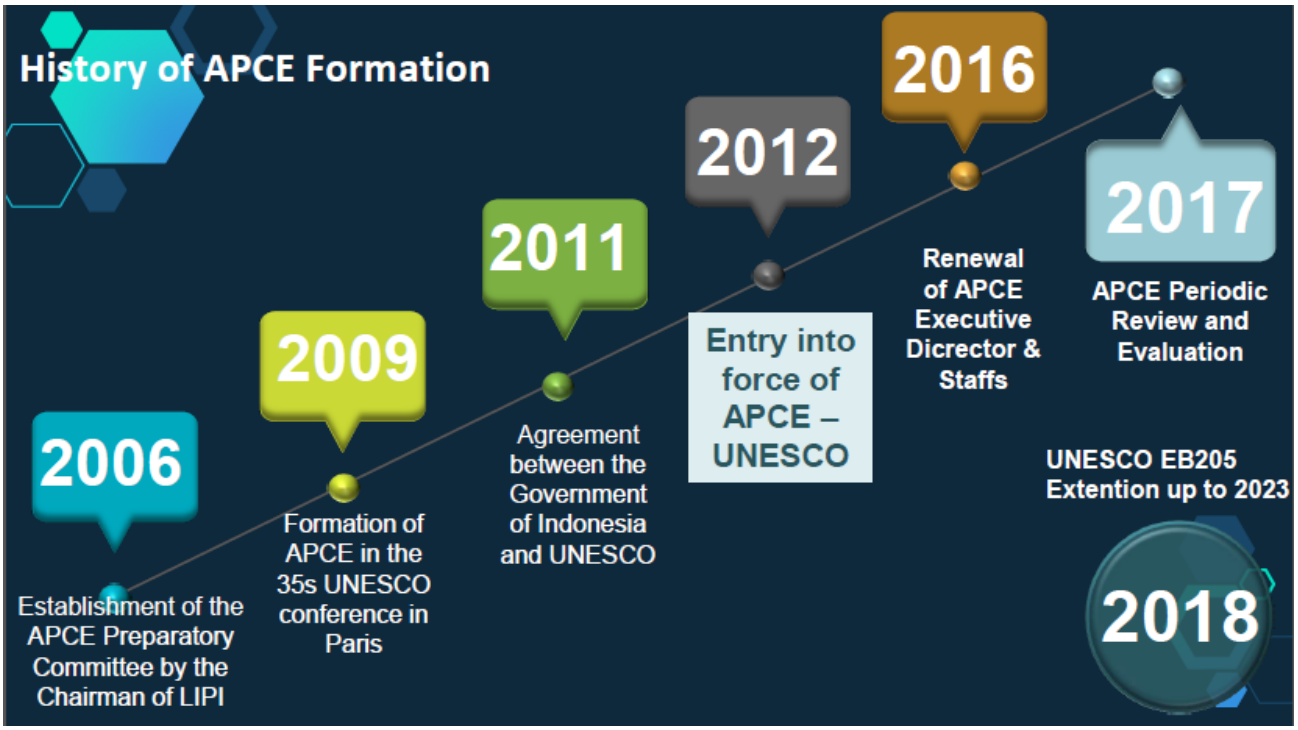
Activities envisaged in the long term

- Enhance activities that contribute to IHP-VIII. - Focus on water security and scarcity in Vietnam.
- Upgrade flash flood warning systems and develop detail flood forecasting maps for Vietnam.
- Transfer technology and training course in Hydrology and water resources

ANNEX F – Updates from the Centres and Chairs under the Auspices of UNESCO

Asia Pacific Centre for Ecohydrology (APCE)

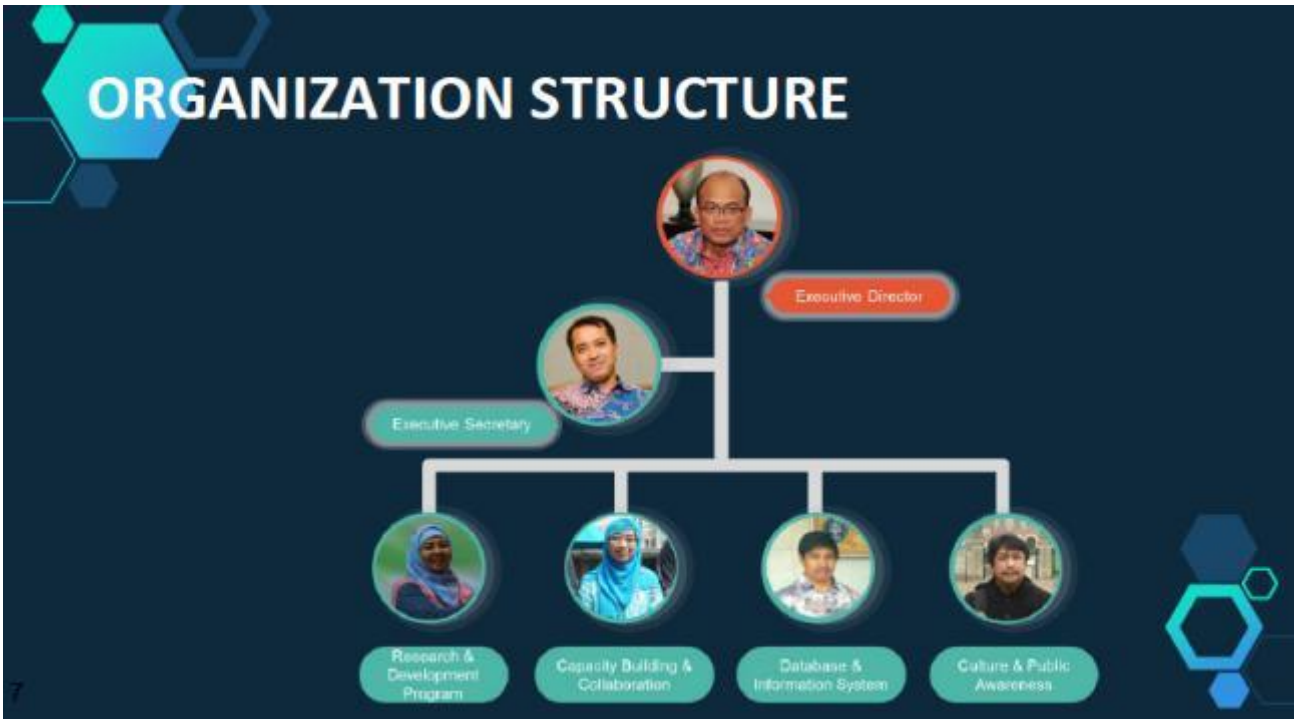



History of APCE Formation
2006
Establishment of the APCE Preparatory Committee by the Chairman of LIPI
2009
Formation of APCE in the 35s UNESCO conference in Paris
2011
Agreement between the Government of Indonesia and UNESCO
2012
Entry into force of APCE – UNESCO
2016
Renewal of APCE Executive Dicrector & Staffs
2017
APCE Periodic Review and Evaluation
UNESCO EB205 Extention up to 2023
2018


APCE DIRECTIVE
VISSION
To be an Internationally Reputed Asia Pacific Center 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
4


STRATEGIC GOALS
1. To promote local resources base ecohydrological research
2. To strengthen local capacity to adopt ecohydrological concept and approach
3. To provide easy access to local resources based ecohydrological information and knowledge
4. 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



BOARD

Advisory Board :

1. Chairman of LIPI (IIS)
2. Vice Chairman of LIPI
3. Director of UNESCO Office Jakarta
4. Executive Chairman of the Indonesian National Commission for UNESCO
5. Principal secretary LIPI
6. Deputy for Earth Sciences LIPI
7. Deputy for Life Sciences LIPI
8. Deputy of Social Sciences and Humanities LIPI
9. Director General Of Water Resources, Ministry Of Public Works.
10. Director General for Research and Development, Ministry of Research, Technology & Higher Education
11. Director General for Multilateral Affairs, Ministry of Foreign Affairs
12. Deputy Minister for Human Development, Society, and Cultural Affairs, Ministry of National Development Planning

Board of Director:

1. Deputy for Earth Sciences LIPI
2. Deputy for Life Sciences LIPI
3. Deputy of Social Sciences and Humanities LIPI
4. Deputy for Engineering Sciences
5. Principle Secretary LIPI


APCE GOVERNING BOARD MEMBERS
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)


Partnership
ICHARM, Japan
HTC Kuala Lumpur, Malaysia
UCWR, Iran
ICUWRM, Tehran – Iran
ANU & University of Canberra, Australia
University of Queensland Australia
Kyoto University
ILEC, Japan
UNESCO Jakarta Office
ERCE, Poland
Centre for Coastal Ecohydrology, Portugal
University of Western Sydney, Australia
K-Water, Korea
MAB – UNESCO
MOST (Management of Social Transformation)
MOW (Memory of The World)
Universiti Sains Malaysia (USM)
University Teknologi Malaysia (UTM)
Institute for Environment and Development (LESTARI) - UKM
National Hydraulic Research Institute of Malaysia (NAHRIM)
Perbadanan Putrajaya, Malaysia
DPRI Kyoto, Japan
IAEA, Austria
RC-IRBM, Nigeria
IUE-CAS, China
Hohai University, China
CEA, Paris
L'Oreal, Paris
Lawrence University, USA
i-WSSM, Korea
KUC-WENDI, Japan
IRRI, Philippines
CSEAS, Indonesia
Indonesia Peatland Restoration Agency
Gov. Of Special Region of Yogyakarta
UGM, Yogyakarta – Indonesia
IPB, Bogor – Indonesia
UNLAM, Banjarmasin, Indonesia
University of Palangkaraya, Indonesia
University of Timor, Indonesia
Ministry of Environment and Forestry
Ministry of Public Works and Housings
Indonesia Power
Islamic Boarding School

APCE WORK PLAN:

- IHP phase VIII
- Implementation of SDGs 2030, Goal 6, 13 & 15.
- In line with the 9 priority programs of the NAWA CITA

11

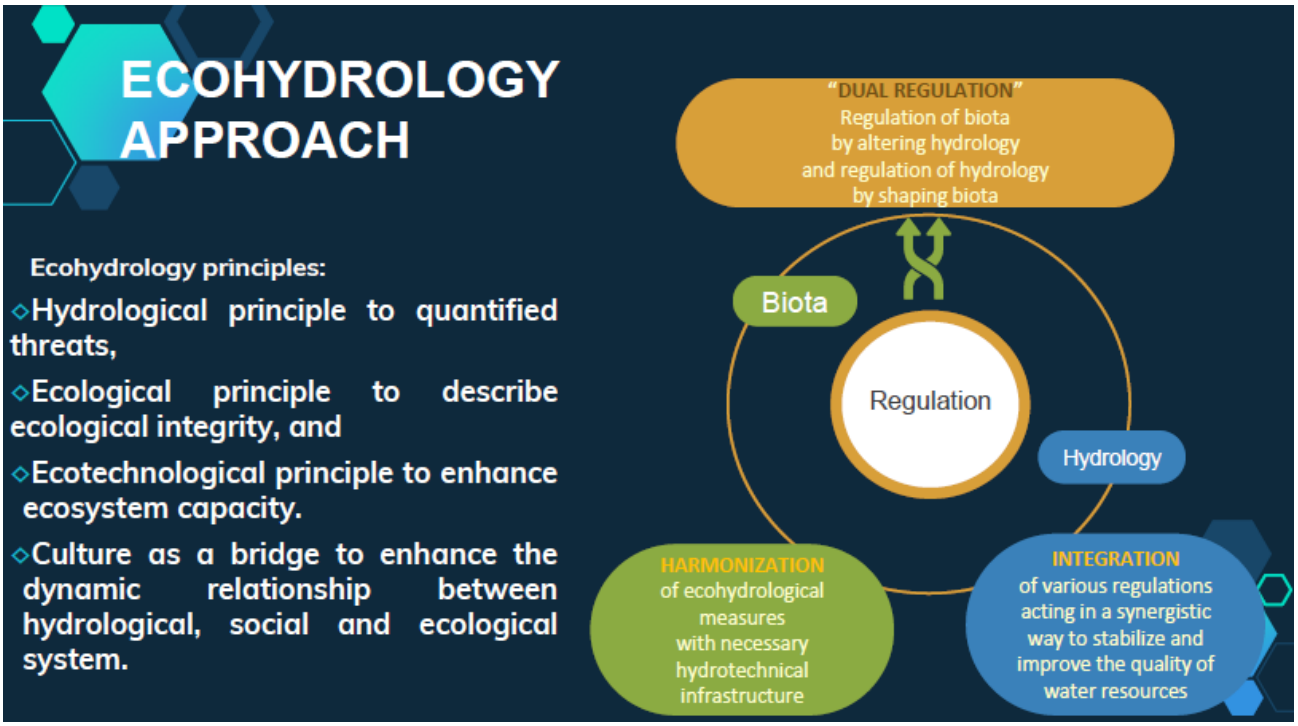
INTERNATIONAL HYDROLOGICAL PROGRAMME (IHP)

EIGHTH PHASE

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

STRATEGIC PLAN

IHP-VIII (2014-2021)


ECOHYDROLOGY APPROACH
Ecohydrology principles:
◇Hydrological principle to quantified threats,
◇Ecological principle to describe ecological integrity, and
◇Ecotechnological principle to enhance ecosystem capacity.
◇Culture as a bridge to enhance the dynamic relationship between hydrological, social and ecological system.
"DUAL REGULATION"
Regulation of biota by altering hydrology and regulation of hydrology by shaping biota
Biota
Regulation
Hydrology
HARMONIZATION
of ecohydrological measures with necessary hydrotechnical infrastructure
INTEGRATION
of various regulations acting in a synergistic way to stabilize and improve the quality of water resources


FOCUS AREAS
WATERSHED
PEATLAND
URBAN
TRADITIONAL IRRIGATION SYSTEM
ARID & SEMI ARID ZONE
SMALL ISLANDS


ECOHYDROLOGY DEMOSITE FOR EACH FOCUS AREAS
Watershed
-sustainable water resources management to improve water quality
-restore water related ecosystem
Peatland
- restoring and maintaining water resources in peatlands
- management of water resources in peatlands for efficient agricultural needs.
Urban
-reduce the loss of urban flooding
-wastewater treatment management to reduce water pollution
Traditional Irrigation system
-preserving traditional irrigation
-increase the quantity of water resources for agriculture
Arid & Semi Arid Zone
- increase water storage capacity in the dry season
- Improve clean water and sanitation
Small Island
- provides clean water access
- Improve ecosystem services


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 11: Sustainably cities and Communities
Goal 15: Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss


GOAL 6
CLEAN WATER AND SANITATION
Ensure availability and sustainable management of water and sanitation for all.
SUSTAINABLE DEVELOPMENT GOALS
SDGs FACTSHEET
INDONESIA
91%
76%
In 2015, 91% of the global population was using an improved drinking water source compared to 76% in 1990.
2.5 billion people
worldwide still lacked access
to basic sanitation services
Approximately 50 million people, 20% of the Indonesian population, still practice open defecation.
In 2015, 93% of Indonesians used improved sources of drinking water.
Each day an average of 5,000 children die worldwide
Indonesia has huge potential to increase its use of water resources for renewable energy, agricultural and food production.


GOAL 11
SUSTAINABLE CITIES AND COMMUNITIES
Make cities and human settlements inclusive, safe, resilient and sustainable.
SUSTAINABLE DEVELOPMENT GOALS
SDGs FACTSHEET
INDONESIA
In Indonesia, 134 million people lived in cities in 2014. This represents 53% of Indonesia's population. Indonesia is one of the most urbanised countries in Asia.
However, 828 million people still live in slums today and the number keeps rising.
In Indonesia, the number of people living in slums declined by 1.2% between 2009 and 2014.
The world's cities occupy just 2% of the Earth's land, but account for 60 – 80% of energy consumption and 75% of carbon emissions.


GOAL 13
CLIMATE ACTION
Take urgent action to combat climate change and its impacts
SUSTAINABLE DEVELOPMENT GOALS
SDGs FACTSHEET
INDONESIA
Indonesia is vulnerable to climate-induced disasters, risks and multiple natural hazards such as floods, landslides, droughts and forest fires.
Indonesia is among the top 35 countries with the highest disaster risk in the world. 40% of the Indonesian population is at risk.
In 2013, 511 out of 514 districts in Indonesia face a high disaster risk.
The Indonesia Government has committed to reducing emissions by 29% compared to the business as usual scenario by 2030, and up to 41% with international support.
In 2005, 63% of emissions were the result of land use change and peat fires.
Forests are essential for the livelihood of Indonesians: 48.8 million people in Indonesia directly depend on forest for their livelihood.
The average annual net loss of forest between 2010 and 2015 was 684,000 hectares. Forests are lost through deforestation, endangering globally important biodiversity and affecting the livelihoods of forest-dependent communities.
Indonesia's National Medium Term Development Plan for 2015-2019 specifies that a green economy will be the foundation of inclusive and sustainable growth, driven by increasing the quality of the environment, tackling climate change, and improving disaster risk reduction.
FIVE PRIORITY SECTORS FOR REDUCING GHG EMISSIONS IN INDONESIA

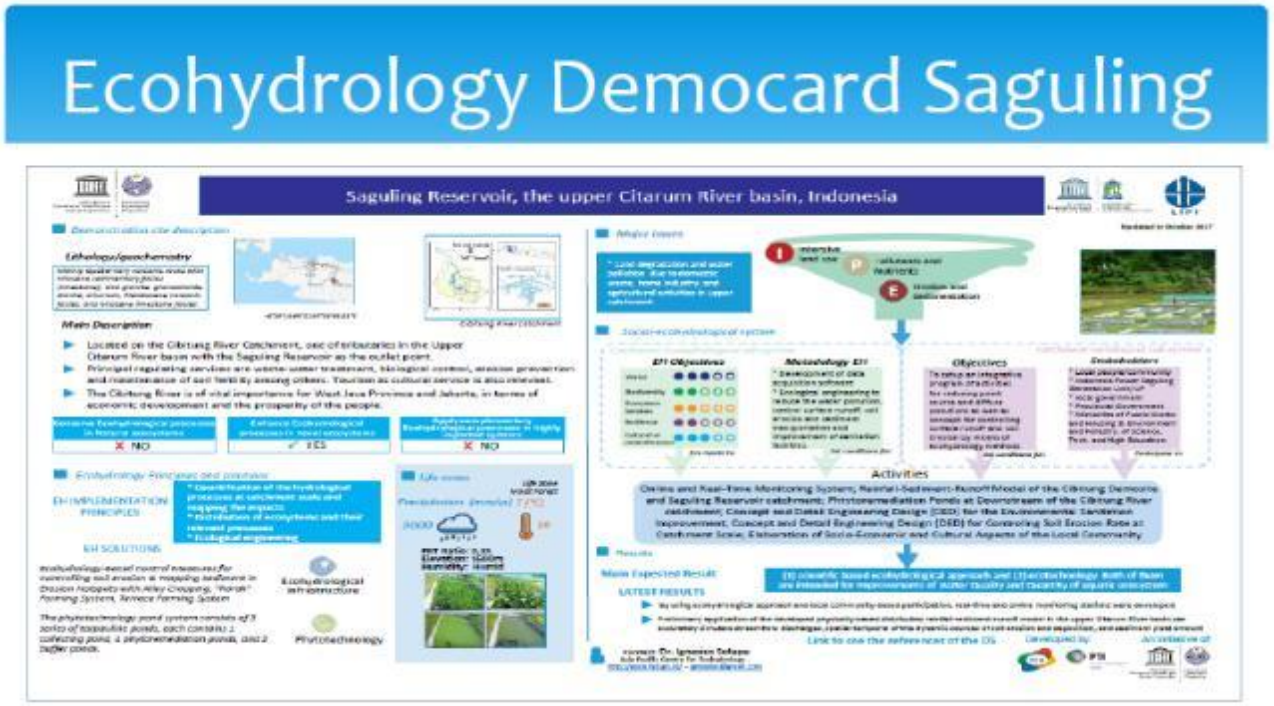

GOAL 15
LIFE ON LAND
Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation and halt biodiversity loss
SUSTAINABLE DEVELOPMENT GOALS
SDGs FACTSHEET
INDONESIA
There are 91 million hectares of forests in Indonesia, covering just over half of the country's total land area.
Indonesia is home to more than 20% (2.2 million hectares) of the world's mangrove forests.
Mangrove forest ecosystems nurture fishery and forest resources, mitigate coastal disasters and climate change, provide multiple ecosystem services and eco-tourism opportunities and accommodate biodiversity.
As the largest archipelagic and 15th biggest state by area in the world, Indonesia has a big impact on the world's climate conditions.
Peatlands cover an estimated 14.9 million hectares, or nearly 8%, of Indonesia's total land area. Tropical peatlands are home to important biodiversity and they are a highly effective natural terrestrial carbon storage system.
In 2005, 63% of emissions were the result of land use change and peat fires.
By 2030, Indonesia aims to restore 2 million hectares of degraded peatland ecosystems.
Indonesia is home to the third largest tropical forest worldwide and forests are essential for the livelihood of Indonesians: 48.8 million people in Indonesia directly depend on forest (or forest ecosystem services) for their livelihood.
The average annual net loss of forest between 2010 and 2015 was 684,000 hectares. Forests are lost through deforestation, endangering globally important biodiversity and affecting the livelihoods of forest-dependent communities.

APCE ACTIVITIES (2017 – 2018) IN LINE WITH THE SDGs

Goal 6: Ensure access to water and sanitation for all

- 6.3
- By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated waste water and substantially increasing recycling and safe reuse globally
- 6.6
- By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes

Advanced development of Ecohydrology Demosite in Saguling Reservoir


Ecohydrology Democard Saguling
Saguling Reservoir, the upper Citarum River basin, Indonesia
Main Description
Activities


ETATS MEMBRES
UNESCO IGC IHP, Paris 10 – 16 June 2018
Symposium and Scientific Advisory Committee of Ecohydrology, 27 February – 1 March 2018, Faro Portugal


Goal 6: Ensure access to water and sanitation for all
6.a
By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programs, including water harvesting, desalination, water efficiency, waste water treatment, recycling and reuse technologies
Universiti Teknologi Malaysia
Universiti Sains Malaysia
International Cooperation with other water-related institutions
Japan International Cooperation Agency (JICA)
APCE succeeded in establishing cooperation with Norway


Visit to State Key Laboratory of Hohai University, Nanjing August 29 2018
International Symposium and Inaugural of Kyoto University Chair of WENDI, 29 July – 1 August 2018


Goal 6: Ensure access to water and sanitation for all
Water related activities to help others implementing integrated water resources management
APCE has published a book entitled "APCE Best Learning Pengelolaan Sumber 'Daya Air"
APCE give a recommendation for a better water resources management in small island
Capacity Building for APCE Staff in International Organization Management


Goal 6: Ensure access to water and sanitation for all
6.b
Support and strengthen the participation of local communities in improving water and sanitation management
PERINGATAN HARI AIR DUNIA 2017
AKSI BERSIH SUNGAI DAN DANAU UNTUK LINGKUNGAN YANG LESTARI
JUMAT, 24 MARET 2017
LOMBA MEWARNAI DAN MENGGAMBAR SEMARAK HARI AIR DUNIA 2017
ASIA PACIFIC CENTRE FOR ECOHYDROLOGY (APCE)- UNESCO
TEMA LOMBA : AIR DAN LINGKUNGAN YANG LESTARI


Berita Satu TV Show :"How to Avoid Stunting Generation"
Metro TV Show : "River Water Quality In Jakarta City


Goal 11: Sustainably cities and Communities
Consultation Workshop And Training On Water And Urban Initiative Case Study In Jakarta, Indonesia (Water Quality, Wastewater management, flood risk management)


Goal 13: Take urgent action to combat climate change and its impacts
Preliminary study to construct ecohydrology demosite in arid zone
Workshop "Initiation of the Ecohydrology demosite development in arid zone in Timor Tengah Utara, East Nusa Tenggara


International Training Course on Coastal Ecohydrology
Yogyakarta – Indonesia , 6 – 10 August 2018

Goal 15: Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss

FGD "Implementation of the ecohydrological concept for sustainable management of peatland, arid zones and subak irrigation system"

Joint collaboration research program focused on ecohydrology in peatland with BRG

UNESCO AP Symposium in World Water Forum Brasilia 2018

UNESCO World Water Day Workshop In Jakarta April 2018

APCE Periodic Review & Evaluation 2017

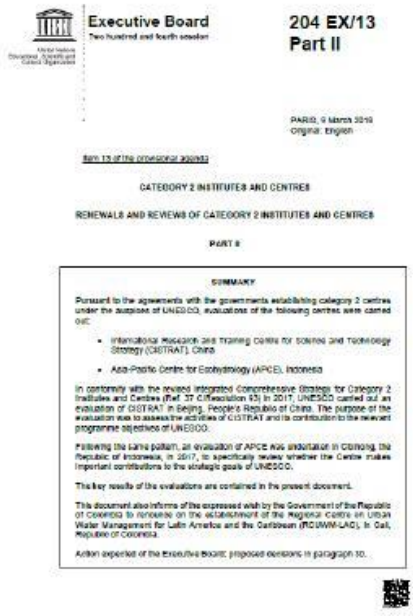
Evaluator s:

1. Dr. Tariq Rana, Australia
2. Dr. Arguino Giuseppe, UNESCO HQ

Results Summary:

1. Evaluators were satisfied that APCE has met the expectations of the IHP Intergovernmental Council
2. Evaluators recommended that UNESCO's agreement for APCE is renewed for a period of six years

UNESCO Executive Board 204



Executive Board
Two hundred and fourth session

204 EX/13
Part II

PARIS, 9 March 2018
Original: English

Item 13 of the provisional agenda

CATEGORY 2 INSTITUTES AND CENTRES

RENEWALS AND REVIEWS OF CATEGORY 2 INSTITUTES AND CENTRES

PART II

SUMMARY

Pursuant to the agreements with the governments establishing category 2 centres under the auspices of UNESCO, evaluations of the following centres were carried out:

- International Research and Training Centre for Science and Technology Strategy (CISTRAT), China
- Asia-Pacific Centre for Ecohydrology (APCE), Indonesia

In conformity with the revised Integrated Comprehensive Strategy for Category 2 Institutes and Centres (Ref: 37 C/Resolution 93) in 2017, UNESCO carried out an evaluation of CISTRAT in Beijing, People's Republic of China. The purpose of the evaluation was to assess the activities of CISTRAT and its contribution to the relevant programme objectives of UNESCO.

Following the same pattern, an evaluation of APCE was undertaken in Cibinong, the Republic of Indonesia, in 2017, to specifically review whether the Centre makes important contributions to the strategic goals of UNESCO.

The key results of the evaluations are contained in the present document.

This document also informs of the expressed wish by the Government of the Republic of Colombia to renounce on the establishment of the Regional Centre on Urban Water Management for Latin America and the Caribbean (RCUWM-LAC), in Cali, Republic of Colombia.

Action expected of the Executive Board: proposed decision in paragraph 30.

Proposed decision

30. In light of the above, the Executive Board may wish to adopt the following decision:

The Executive Board,

1. Recalling 36 C/Resolution 20 and 37 C/Resolution 93, document 179 EX/7 and 33 C/Resolution 33,
2. Taking into account document 37 C/18 Part I, its Annex and the attachments thereto, and 171 EX/Decision 23 of the Executive Board,
3. Having examined document 204 EX/13, Part II,
4. Notes the Director-General's recommendation to renew under the auspices of UNESCO (category 2), the designation of the:
   - International Research and Training Centre for Science and Technology Strategy (CISTRAT), China;
   - Asia-Pacific Centre for Ecohydrology (APCE), Indonesia;
5. Confirms that CISTRAT and APCE have performed satisfactorily as category 2 centres under the auspices of UNESCO;
6. Decides to renew the designation of CISTRAT and APCE as category 2 centres under the auspices of UNESCO;
7. Authorizes the Director-General to sign the corresponding Agreements;
8. Takes note that, in August 2017, the Government of the Republic of Colombia expressly renounced on the establishment of the Regional Centre on Urban Water Management for Latin America and the Caribbean (RCUWM-LAC) as a category 2 centre under the auspices if UNESCO, considering that the Centre has not been established.

UNESCO EB 204, 12 April 2018, Apce was approved As UNESCO C2C for the next 6 years up to 2024

Future Activities

Training and workshop in traditional irrigation system

- Clean activity inside Cibinong Science Centre and surrounding residential areas by involving the community

- Training and workshop in Emerging Water Pollutants
- Erotion and sedimentation research program

Ensure access to water and sanitation for all

GOAL 6

Sustainably cities and Communities.

GOAL 11

- Erotion and sedimentation in urban area

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

- Training and Workshop of Ecohydrology in Peatland area
- Developing Ecohydrology demosite in Peatland
- Compiling a reference book for water resources management in peatlands

Conclusions

- ❑ APCE has done various activities and program for the achievement of strategic plan
- ❑ To increase the contribution of IHP, APCE needs support from various institutions, ministries and researchers

Humid Tropics Centre Kuala Lumpur (HTCKL)

INTRODUCTION

- This report covers HTC KL activities from November 2017 to 31st October 2018 and future activities

- Its highlights events and activities that had taken place since the 25th Regional Steering Committee Meeting for Southeast Asia and The Pacific UNESCO IHP held in Manila, Philippines (13th – 15th November 2017)

INTERNATIONAL WORKSHOP/SEMINAR

Disaster Management Course in Taiwan, 29th October – 11th November 2017


International Symposium for Official Launch of UNESCO Chair WENDI, Kyoto Japan on 27th July – 1st October 2018

Korea International Water Week 2018 (KIWW) in Daegu, Korea on 12th – 15th September 2018


International Training Course on Coastal Ecohydrology in Yogyakarta, Indonesia on 6th – 10th August 2018

No	Organisation	Date	No. of Visitors	Gender
1	UNDP Bangladesh	6 Dec 2016	9	(1W, 8M)
2	APCE Indonesia	8 Dec 2016	4	(1W, 3M)
3	REDHA	17 March 2017	5	(2W, 3M)
4	UNESCO Dhaka	5 May 2017	1	1W
5	UNESCO Jakarta	8 May 2017	1	1M
6	RCUWM Tehran	16 – 20 Oct 2017	9	(1W, 8M)
7	UTHM	19 Feb 2018	2	(1W, 1M)
8	MJIIT-UTM	18 April 2018	18	(5W, 13M)
	Total		49	(12W, 37M)


ACTIVITIES AT NATIONAL LEVEL
Malaysia World Water Day 2018 (WWD 2018) in Kuala Kangsar, Perak on 24th March 2018
Malaysia UNESCO Day in Ipoh, Perak on 30th September 2018


WORKSHOP/SEMINAR/TRAINING
The Potential of Groundwater in Malaysia's Resilient Urban Future at Heriot-Watt University on 9th – 12th July 2018
Regional Workshop: Pathway Towards Improved Water Education Curricula, 27th – 28th November 2017 in Penang, Malaysia
Ekspedisi Sumber Air Negara 2018 programme in Kedah, Malaysia on 5th – 6th August 2018
Soft Launching Mobile Flood Wall Barrier (MFWB) NAHRIM-DID at SK Kajang, Selangor on 13th October 2018

WORKSHOP/SEMINAR/TRAINING

Future Malaysia Flood Protection, Response, Recovery and Drawing up of Flood Risk Management Plans Conference 2018, Berjaya Times Square Hotel on 24th – 25th April 2018

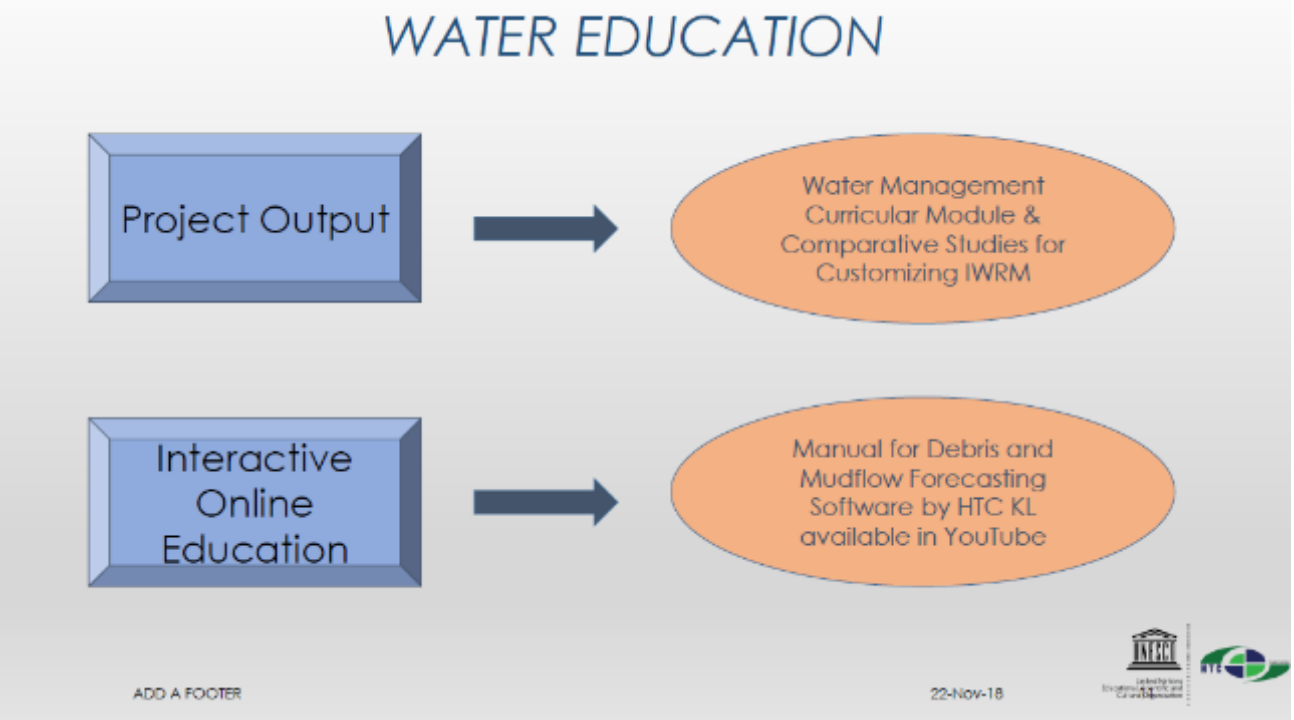
ISTIC 10th Anniversary International Conference On Climate Change Education, 7th – 8th May 2018 at Corus Hotel Kuala Lumpur

Hyper-Concentrated Flow Training Part I, 19th – 20th April 2018

Workshop on Flood Forecasting and Hazard Mapping, 18th April 2018 at HTC KL

RESEARCH ACTIVITIES

No	Title	Objective Remarks		
		Phase VII-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	Middle Flood Wall Barrier (MFWB)	THEME 1 : Water Related Disasters and Hydrological Change	6.6 Protect and restore water-related ecosystems	In progress
3	Biodiversity Flow at Jenderam River, tributary of Sg Langat (subject to budgetary)	THEME 5 : Ecohydrology, Engineering Harmony for a Sustainable World	6.3 Improve water quality	In progress (to improve rejuvenation)
4	Biodiversity Flow at Tasik Chini (Lake)	THEME 5 : Ecohydrology, Engineering Harmony for a Sustainable World	6.3 Improve water quality	Project completed with reconnaissance report published in 2017
5	Development of Soil Water Index (SWI) for Highland Area	THEME 1 : Water related Disasters and hydrological change	Development of Soil Water Index for Highland Area	In progress

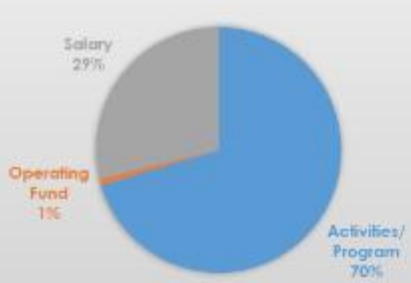

WATER EDUCATION
Project Output
Water Management Curricular Module & Comparative Studies for Customizing IWRM
Interactive Online Education
Manual for Debris and Mudflow Forecasting Software by HTC KL available in YouTube
ADD A FOOTER
22-Nov-18


FUTURE PROGRAMME
HTC Kuala Lumpur is proposed the following activities for future endeavor
No
Program /Activities
1. Memorandum of Agreement between Government of Malaysia and UNESCO
2. Dissemination of Modula Curricula to UNESCO Water Centres and Water Families
3. Training on Urban Stormwater Management (MSMA) for Ethiopia
4. Re-Engineering Program for Malaysia Water Security Project
5. Workshop on Water Security – 27-28 Feb 2019 ; invitation to UNESCO Institutes & Water Centres, Higher Learning Institutions & Stakeholders


FUTURE PROGRAMME
WATER MANAGEMENT CURRICULA TARGET FOR 2018
Public Outreach Programme (PoP) Curricula
Sediment Management for Lake Curricular
Sustainable Sediment Removal Curricula for Practitioner
Ecohydrology Curricular for water-related stakeholder
13


PUBLICATIONS
JOURNAL
OF WATER RESOURCES
MANAGEMENT
Journal
TECHNICAL REPORT
STUDY ON
RIVER WATER QUALITY TREATMENT
USING PHYTOREMEDIATION
TECHNIQUE
TECHNICAL REPORT
ARTIFICIAL BIO-MACROPORE
FOR ECHANCING SOIL INFILTRABILITY
FOR URBAN CATCHMENT
Technical Report
WATER
MANAGEMENT
CURRICULA
Water Management Curricula & Customising IWRM
14

OPERATION & MAINTENANCE AND DEVELOPMENT COST



18

FORTHCOMING ISSUE

The renewal of Memorandum of Agreement (MoA)

The above draft MoA has recommended and approved by the UNESCO during the 205th Session Executive Board (UNESCO).

16


THANK YOU
UNESCO
United Nations Educational, Scientific and Cultural Organization
RTC
The Regional Humid Tropics Hydrology and Water Resources Centre for Southeast 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 : rohani@water.gov.my

International Centre for Water Hazard and Risk Management (ICHARM)

3-5/11/2018, SHANGHAI, CHINA

THE 26TH IHP RSC MEETING FOR ASIA AND THE PACIFIC

ICHARM ACTIVITIES

Mamoru Miyamoto

Researcher,
Executive Manager of IFI Secretariat,
International Centre for Water Hazard and Risk Management
(ICHARM) under the auspices of UNESCO

THREE PILLARS OF ICHARM ACTIVITIES

- International Flood Initiative (IFI)
- UNESCO-IHP
- WMO CHy
- Typhoon Committee

- Doctorate Course
- Master Course
- Short-term training
- Follow-up Seminar

CAPACITY BUILDING

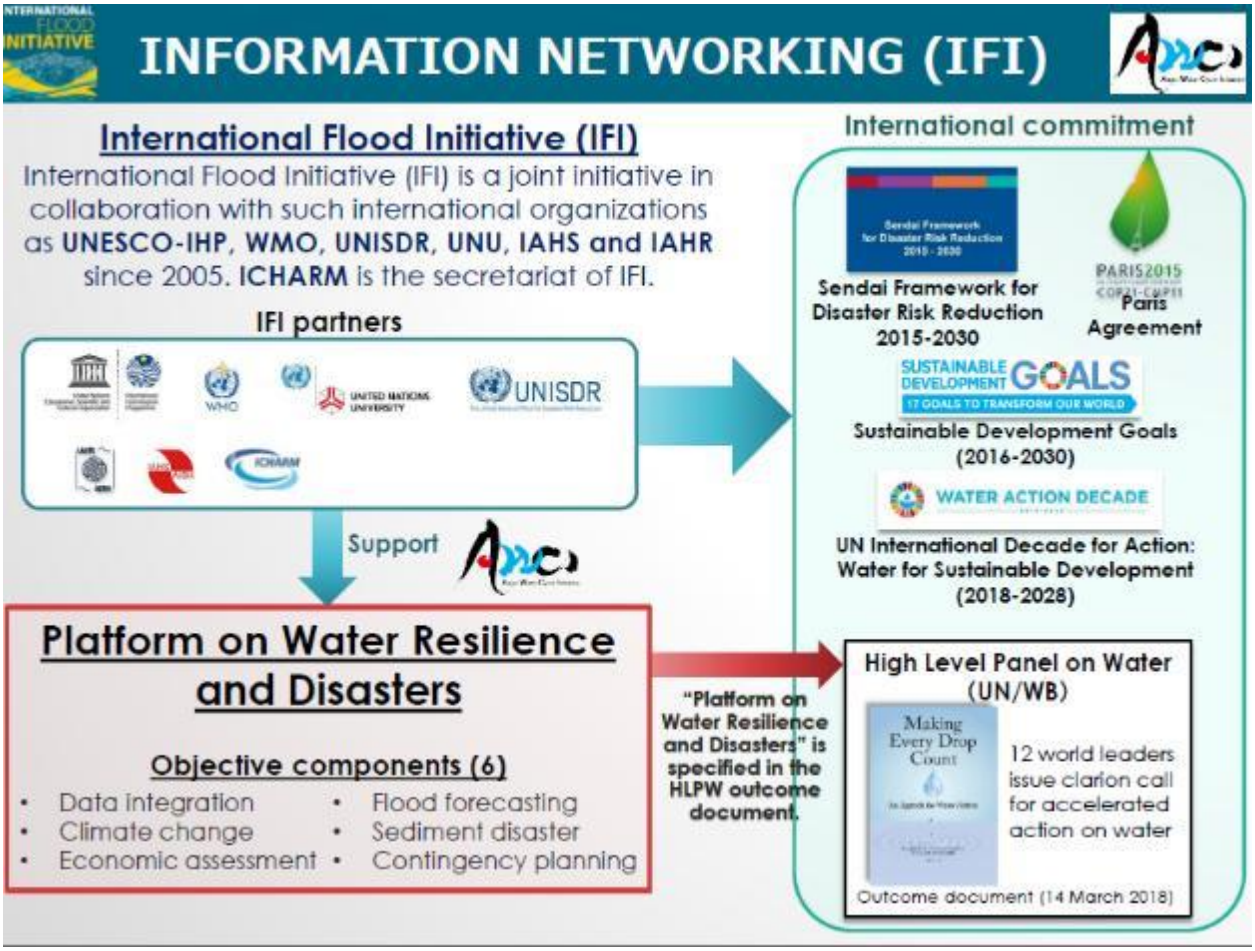
More than 1,500 individuals from 57 countries

1. Master's degree course (1 year):
   - In cooperate with the National Graduate Institute for Policy Studies (GRIPS)
   - and Japan International Cooperation Agency (JICA)
   - Since October 2007
2. Doctor's degree course (3 years):
   - In cooperate with the Graduate Research Institute for Policy Studies (GRIPS)
   - ICHARM has offered a program," Disaster Management Ph.D. Program"
   - Since October 2010

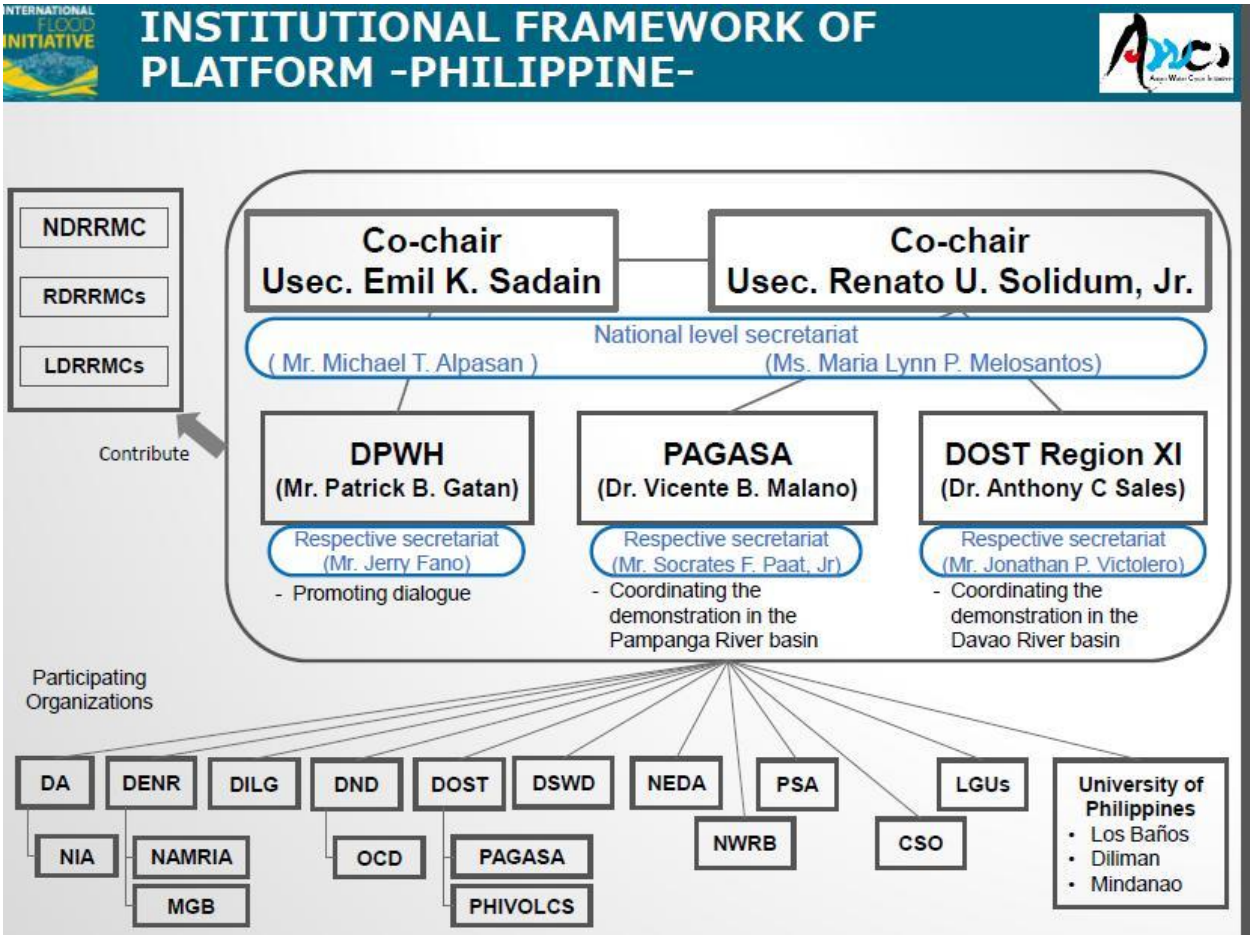
	Master's	Ph.D.
2007	10	
2008	7	
2009	12	
2010	12	1
2011	19	1
2012	12	2
2013	12	3
2014	13	-
2015	13	2
2016	8	(2)
2017	14	(1)
total	**118**	**7**

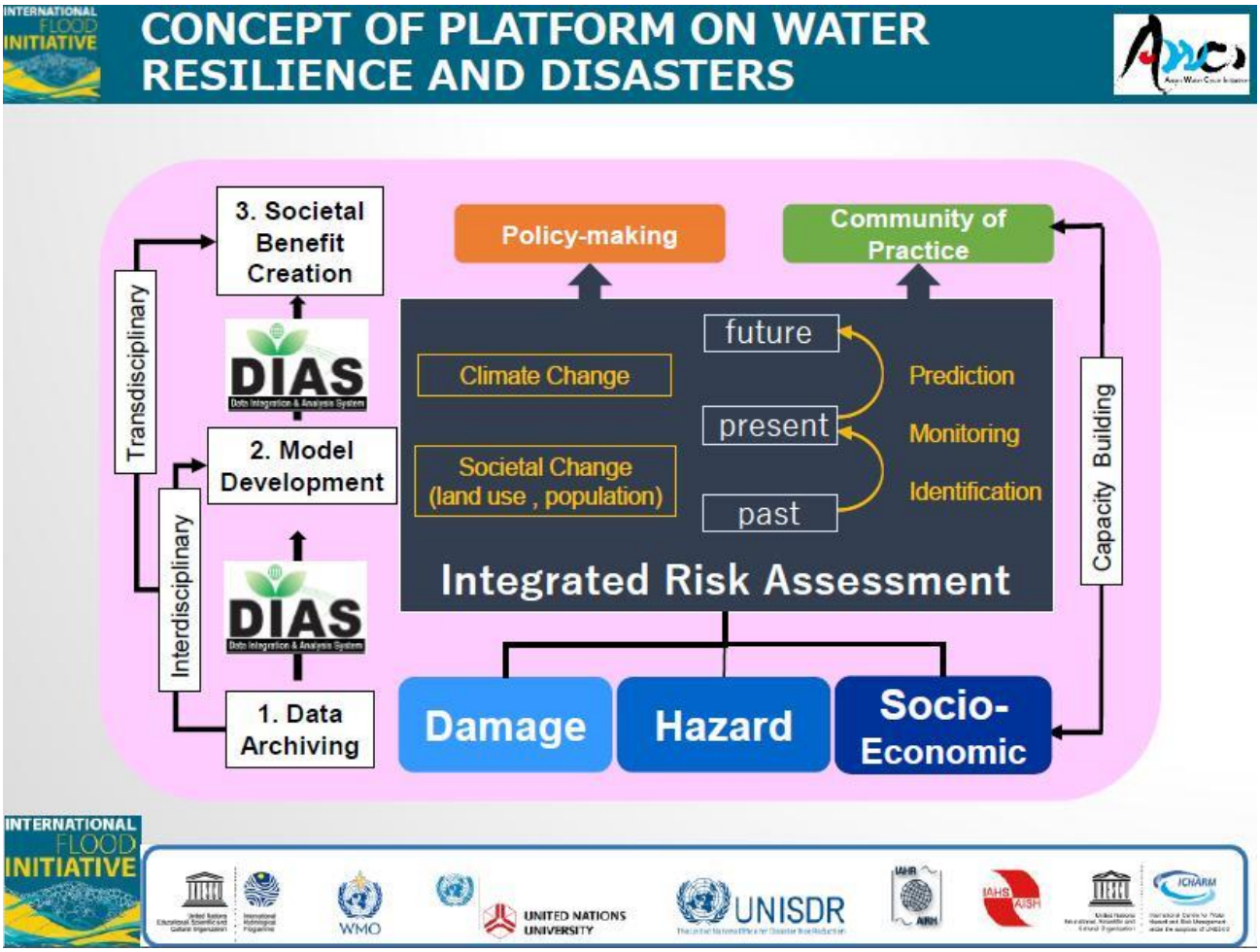
CAPACITY BUILDING

3. Follow-up activities:
   - ICHARM hold seminars for former participants in its training courses to follow up their subsequent activities and understand issues the face in their home counties
   - Kuala Lumpur 2007, Guangzhow 2008, Manila 2009, Hanoi 2010, Bangkok 2012, Dhaka 2013, Kuala Lumpur 2014, Jakarta 2015, Tokyo 2016, Manila 2017, Yangon 2017
4. Short-term training Programs and Workshops (a few days to a month):
   - In cooperation with JICA, UN/ISDR, UNESCO and the University of Tokyo
   - ex. Hazard maps, IFAS and local preparedness (2004-2017, JICA), Tsunami (2008, ISDR), CC adaptation (2010, JICA), Pakistan Flood WSs (2011-12, 2015-17, UNESCO), Summer Program (2015-16, UoT)
5. Workshops on IFAS and RRI model (a few days to a month):
   - ICHARM holds workshops and lectures on the principal hydrological models, the Integrated Flood Analysis System (IFAS) and the Rainfall-Runoff-Inundation (RRI) model in Japan and overseas
6. Internship for researchers and students from Japan and abroad
   - Number: 2 (`09), 3(`11), 3(`12), 3(`13), 5(`14), 2(`15), 10(`16), 7(`17)

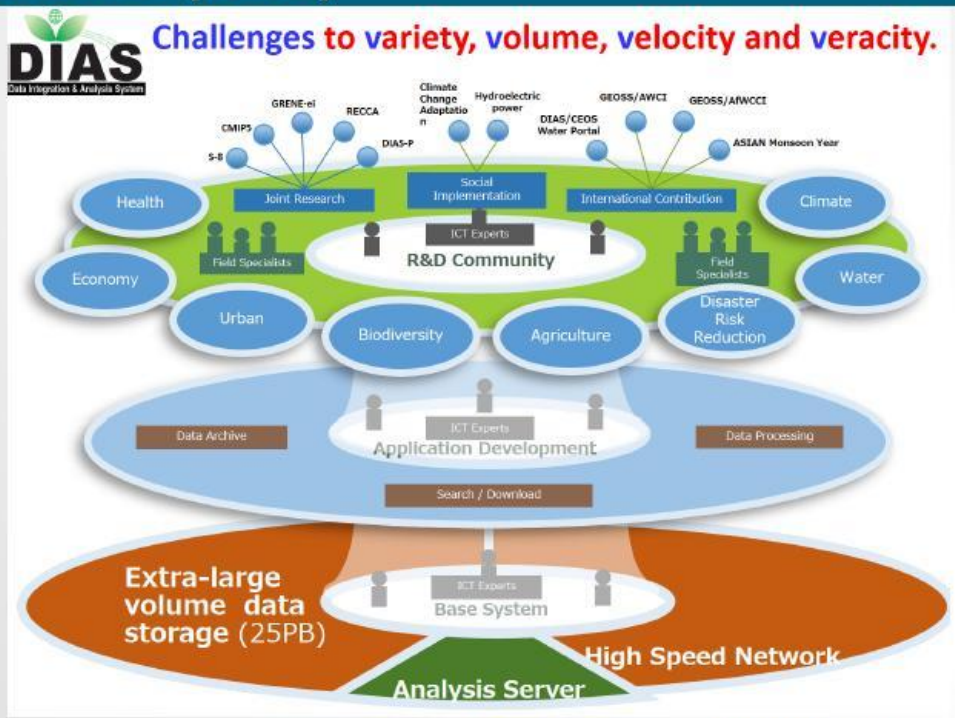

INFORMATION NETWORKING (IFI)
International Flood Initiative (IFI)
International Flood Initiative (IFI) is a joint initiative in collaboration with such international organizations as UNESCO-IHP, WMO, UNISDR, UNU, IAHS and IAHR since 2005. ICHARM is the secretariat of IFI.
IFI partners
Support
Platform on Water Resilience and Disasters
Objective components (6)
• Data integration
• Climate change
• Economic assessment
• Flood forecasting
• Sediment disaster
• Contingency planning
"Platform on Water Resilience and Disasters" is specified in the HLPW outcome document.
International commitment
Sendai Framework for Disaster Risk Reduction 2015-2030
Paris Agreement
Sustainable Development Goals (2016-2030)
UN International Decade for Action: Water for Sustainable Development (2018-2028)
High Level Panel on Water (UN/WB)
Making Every Drop Count
12 world leaders issue clarion call for accelerated action on water
Outcome document (14 March 2018)


PLATFORM ACTIVITIES IN ASIA-PACIFIC REGION
Pakistan
- Indus River Basin
Philippine
- Pampanga River Bas
- Davao River Basin
Myanmar
- Bago River Basin
- Sittaung River Basin
Sri Lanka
- Kalu River Basin
- Kelani River Basin
- Malvathu River Basin
Indonesia
- Bengawan Solo River Basin
Google Earth


INSTITUTIONAL FRAMEWORK OF PLATFORM -PHILIPPINE-
NDRRMC
RDRRMCs
LDRRMCs
Contribute
Co-chair
Usec. Emil K. Sadain
Co-chair
Usec. Renato U. Solidum, Jr.
National level secretariat
(Mr. Michael T. Alpasan)
(Ms. Maria Lynn P. Melosantos)
DPWH
(Mr. Patrick B. Gatan)
Respective secretariat
(Mr. Jerry Fano)
- Promoting dialogue
PAGASA
(Dr. Vicente B. Malano)
Respective secretariat
(Mr. Socrates F. Paat, Jr)
- Coordinating the demonstration in the Pampanga River basin
DOST Region XI
(Dr. Anthony C Sales)
Respective secretariat
(Mr. Jonathan P. Victolero)
- Coordinating the demonstration in the Davao River basin
Participating Organizations
DA
DENR
DILG
DND
DOST
DSWD
NEDA
PSA
LGUs
University of Philippines
• Los Baños
• Diliman
• Mindanao
NIA
NAMRIA
MGB
OCD
PAGASA
PHIVOLCS
NWRB
CSO


CONCEPT OF PLATFORM ON WATER RESILIENCE AND DISASTERS
3. Societal Benefit Creation
Policy-making
Community of Practice
Transdisciplinary
DIAS
Data Integration & Analysis System
future
Climate Change
Prediction
present
Monitoring
2. Model Development
Societal Change (land use , population)
Identification
past
Capacity Building
Integrated Risk Assessment
Interdisciplinary
DIAS
Data Integration & Analysis System
1. Data Archiving
Damage
Hazard
Socio-Economic

DATA INTEGRATION AND ANALYSIS SYSTEM (DIAS)



Data Integration
(hazard, damage, socio-economic)

Early Warning;
(Flood, Land Slide, Drought)
Climate Change Impact Assessment;
(Dynamical-Statistical Down-scaling)

DATA INTEGRATION ACTIVITY (PHILIPPINE CASE)

Data List

Damage

Data	Source of information
Casualties & missing person	OCD
Num. of affected people	OCD
Agricultural damage	DA
Housing damage	OCD
Damage to critical infrastructure	DPWH, LGU
Direct economic loss other than agricultural loss	LGU NEDA

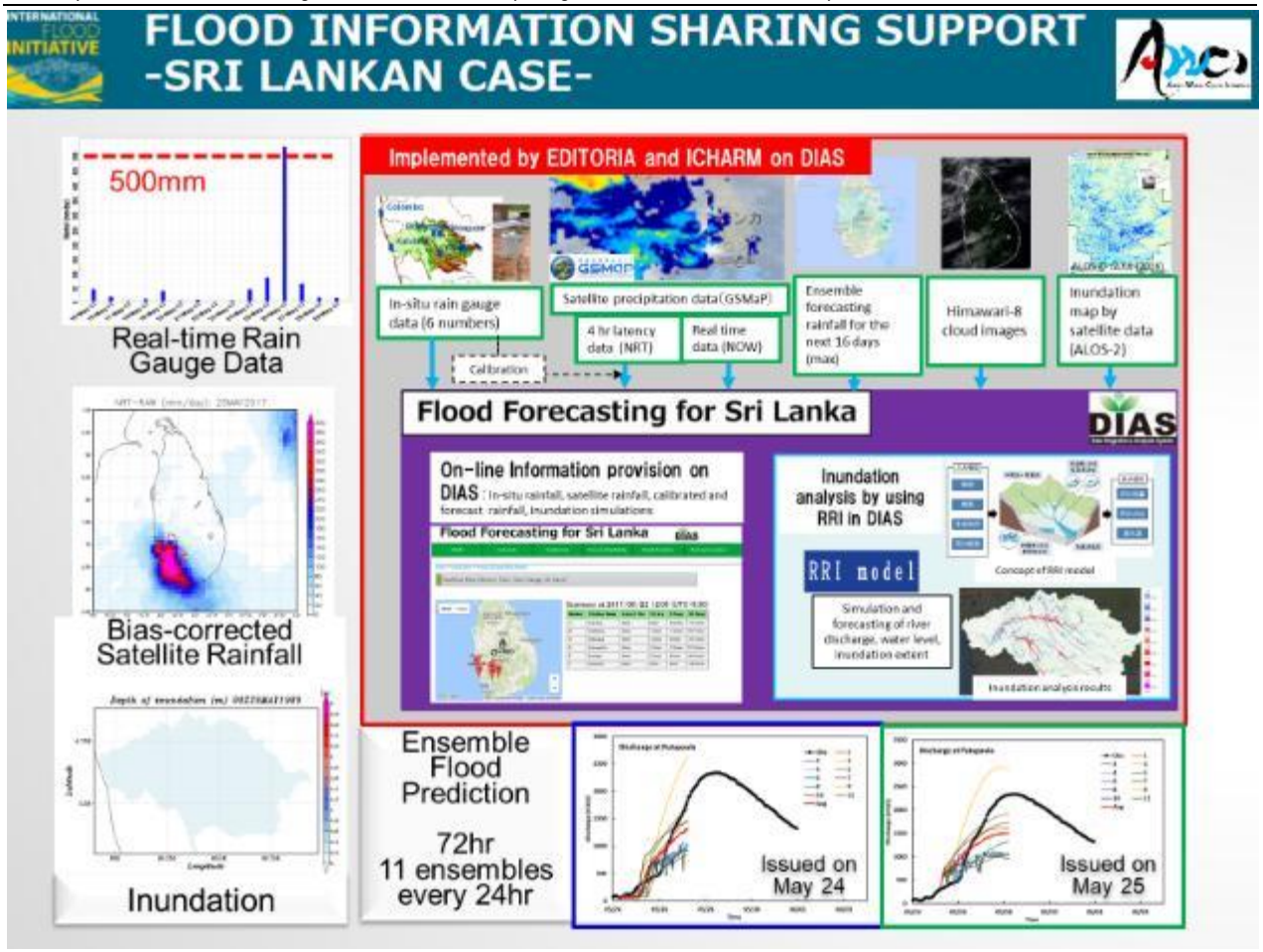
Hazard

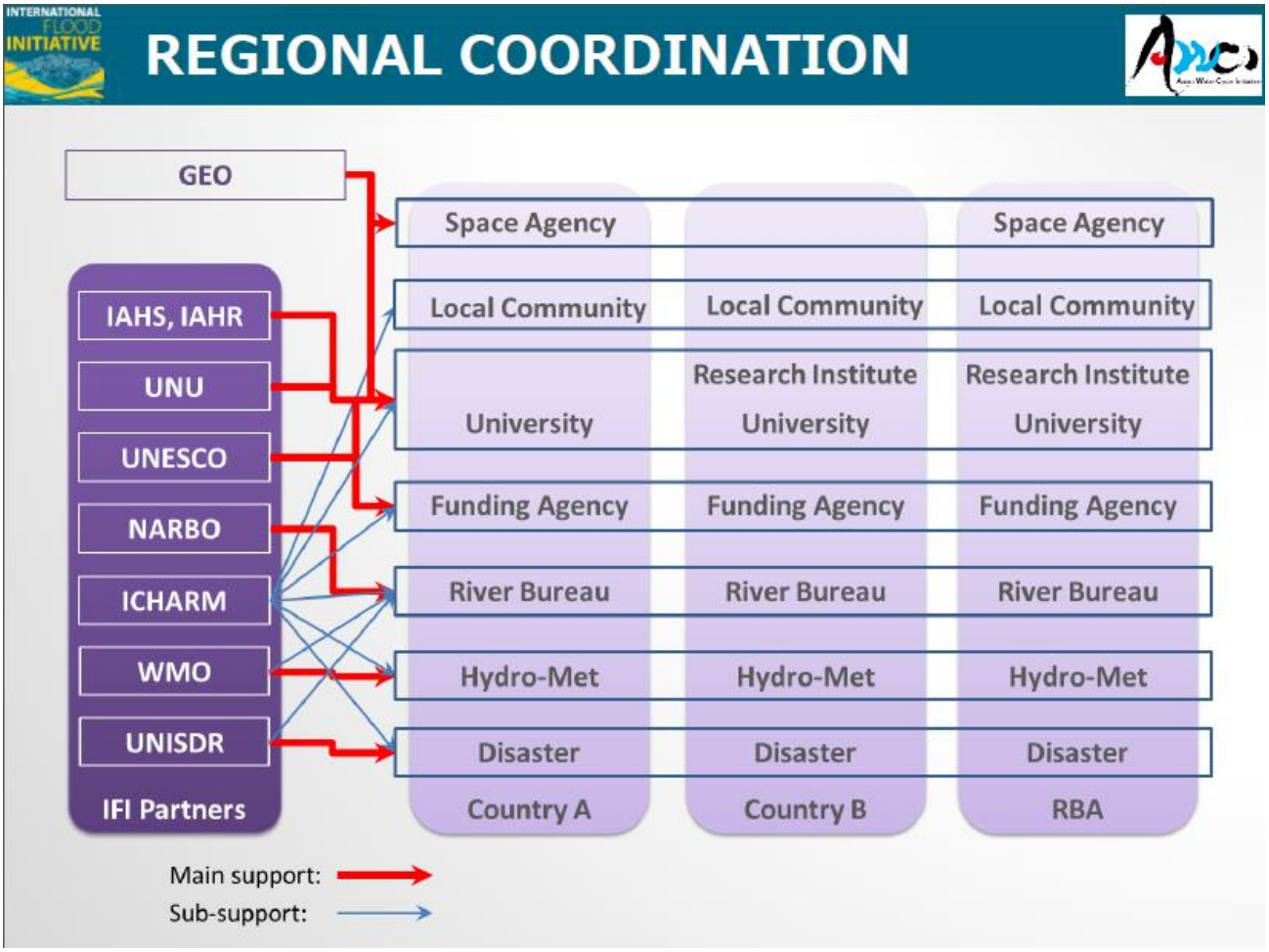
Data	Source of information
DEM (LiDAR)	UP Mindanao
DEM (ifSAR)	NAMRIA
Hydromet data	PAGASA, ASTI, DREAM
Inundation depth (LiDAR)	UP Diliman, UP Mindanao
Inundation depth (interview)	PAGASA
Rainfall	PAGASA
River flow	DPWH, UP Mindanao
River cross section	DPWH, UP Mindanao
Tidal level	NAMRIA

Socio-economic

Data	Source of information
Land use	LGU, DOST
Agriculture	PSA, DA
Population	PSA
Infrastructure	DPWH/LGU
Industry	DTI
Commerce	DTI
Drainage facility	DPWH/LGU
Information	PSA, NEDA
Regional GDP	PSA
Tax revenue	BIR
Land price	City Assessors Office

Commitments by responsible agencies


FLOOD INFORMATION SHARING SUPPORT
-SRI LANKAN CASE-
500mm
Real-time Rain Gauge Data
Bias-corrected Satellite Rainfall
Inundation
Implemented by EDITORIA and ICHARM on DIAS
In-situ rain gauge data (6 numbers)
Satellite precipitation data (GSMaP)
4 hr latency data (NRT)
Real time data (NOW)
Ensemble forecasting rainfall for the next 16 days (max)
Himawari-8 cloud images
Inundation map by satellite data (ALOS-2)
Calibration
Flood Forecasting for Sri Lanka
DIAS
On-line Information provision on DIAS : In-situ rainfall, satellite rainfall, calibrated and forecast rainfall, inundation simulations
Flood Forecasting for Sri Lanka
Inundation analysis by using RRI in DIAS
RRI model
Simulation and forecasting of river discharge, water level, inundation extent
Ensemble Flood Prediction
72hr
11 ensembles
every 24hr
Issued on May 24
Issued on May 25


REGIONAL COORDINATION
GEO
IAHS, IAHR
UNU
UNESCO
NARBO
ICHARM
WMO
UNISDR
IFI Partners
Space Agency
Local Community
University
Research Institute
University
Funding Agency
River Bureau
Hydro-Met
Disaster
Country A
Country B
RBA
Main support:
Sub-support:

KYOTO STATEMENT, 2018 OCTOBER 11TH GEOSS ASIA-PACIFIC SYSMPOSIUM

SDGs

AWCI Launches full-scale effort to active **Platform on Water Resilience and Disasters** by promoting dialogues, reinforcing partnership, sharing data, information, models, tools, experiences and ideas, and expanding sustainable practices.

AWCI promotes initiative that will address targets in **Goal 6 on Water use efficiency and Integrated Water Resources Management** as well as SDGs related to Poverty(1), Food security(2) and Life on Land(15).

Mapping AOGEOSS Initiative TG Activities with GEO Priorities

	GEO Priorities	Cross-Cutting Areas	TG1	TG2	TG3	TG4	TG5	TG6	TG7	TG10	TG11	TG12
SDGs	1.NO POVERTY		3	3	0	0	3	1	0	1	1	1
SDGs	2.ZERO HUNGER		3	3	0	0	3	1	0	1	1	2
SDGs	3.GOOD HEALTH AND WELL-BEING		1	3	1	1	2	1	0	1	1	1
SDGs	4.QUALITY EDUCATION		1	2	2	2	0	1	0	0	0	1
SDGs	5.GENDER EQUALITY		2	1	0	0	0	1	0	1	1	2
SDGs	6.CLEAN WATER AND SANITATION		3	3	2	1	2	1	1	2	2	3
SDGs	7.AFFORDABLE AND CLEAN ENERGY		2	3	2	0	1	1	1	1	1	1
SDGs	8.DECENT WORK AND ECONOMIC GROUTH		1	2	1	1	3	1	0	1	1	1
SDGs	9.INDUSTRY, INNOVATION AND INFRASTRUCTURE		2	1	1	0	2	1	0	1	1	1
SDGs	10.REDUCED INEQUALITIES		1	2	0	0	2	1	0	1	1	1
SDGs	11.SUSTAINABLE CITIES AND COMMUNITIES		3	3	2	1	0	1	1	1	1	3
SDGs	12.RESPONSIBLE CONSUMPTION AND PRODUCTION		1	3	0	1	0	1	0	1	1	1
SDGs	13.CLIMATE ACTION		3	3	3	3	3	1	2	1	1	3
SDGs	14.LIFE BELOW WATER		2	3	2	3	0	1	0	1	1	1
SDGs	15.LIFE ON LAND		3	3	2	1	3	1	3	1	1	2
SDGs	16.PEACE, JUSTICE AND STRONG INSTITUTIONS		1	1	0	0	0	1	0	0	0	1
SDGs	17.PARTNERSHIP FOR THE GOALS		3	3	2	2	3	1	2	1	1	3
Paris Agreement	Adaptation		3	3	2	1	3	1	0	1	1	2
Paris Agreement	Loss & Damage		2	3	1	1	0	1	0	1	1	2
Paris Agreement	Capacity Development/Technology Transfer		3	3	2	2	0	2	2	2	2	3
Paris Agreement	National Reporting/Global Stocktake		0	2	3	2	0	1	1	2	2	1
Paris Agreement	Mitigation		2	3	3	1	0	1	0	1	1	1
Sendai Framework	Understanding disaster risk		3	3	3	1	0	2	0	2	2	2
Sendai Framework	Strengthening disaster risk governance to manage disaster risk		3	3	0	1	0	2	0	1	1	2
Sendai Framework	Investing in disaster risk reduction for resilience		3	3	0	1	0	1	0	2	2	2
Sendai Framework	Enhancing disaster preparedness for effective response, and to "build back better" in recovery, rehabilitation and reconstruction		3	3	0	0	0	1	0	2	2	2
		Data Sharing Infrastructure	3	3	3	3	3	2	2	3	3	3
		User Engagement and Communication	3	3	2	3	3	2	2	3	3	3
		Total:	64	74	39	32	36	33	17	36	36	51

*Scoring: 0=Do nothing, 1=less active, 2=active, 3=very active

THANK YOU FOR YOUR KIND ATTENTION

mmiyamoto@pwri.go.jp

AWCI session (TG1)
11th GEOSS Asia-Pacific Symposium
24-26 October 2018, Kyoto

International Centre for Water Resources and Global Change (ICWRGC)

United Nations Educational, Scientific and Cultural Organization | International Hydrological Programme

World Meteorological Organization
Weather • Climate • Water

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 operational environment

Operates under the auspices of the
World Meteorological Organisation (WMO)

on the advice of an
International Steering Committee

with the financial support of the
Federal Republic of Germany

within the
Federal Institute of Hydrology

bfg

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 9500 stations in 161 countries to science and research ("One-stop shop")

Note:

GRDC does not have its own monitoring infrastructure and thus is not substituting the functions of the National Hydrological Services

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

GRDC Data Users

The GRDC supports the climate-related programmes and projects of the United Nations and their special organisations such as the:

- *UNESCO International Hydrological Programme (IHP) (FRIEND-Water, WHYMAP)*
- *Global Terrestrial Network for Hydrology (GTN-H)*
- *GCOS (Global Climate Observing System)*
- *GEO (Group on Earth Observations)*
- *GEWEX (Global Energy and Water Exchanges Project)*
- *Cross-sectoral issues on Intra-Regional Water Security and Disaster Management*

and the international scientific community on:

- *Global change*
- *Climate and hydrological modelling*
- *Climate services*
- *Research and assessment*

GRDC Data Policy (excerpt)

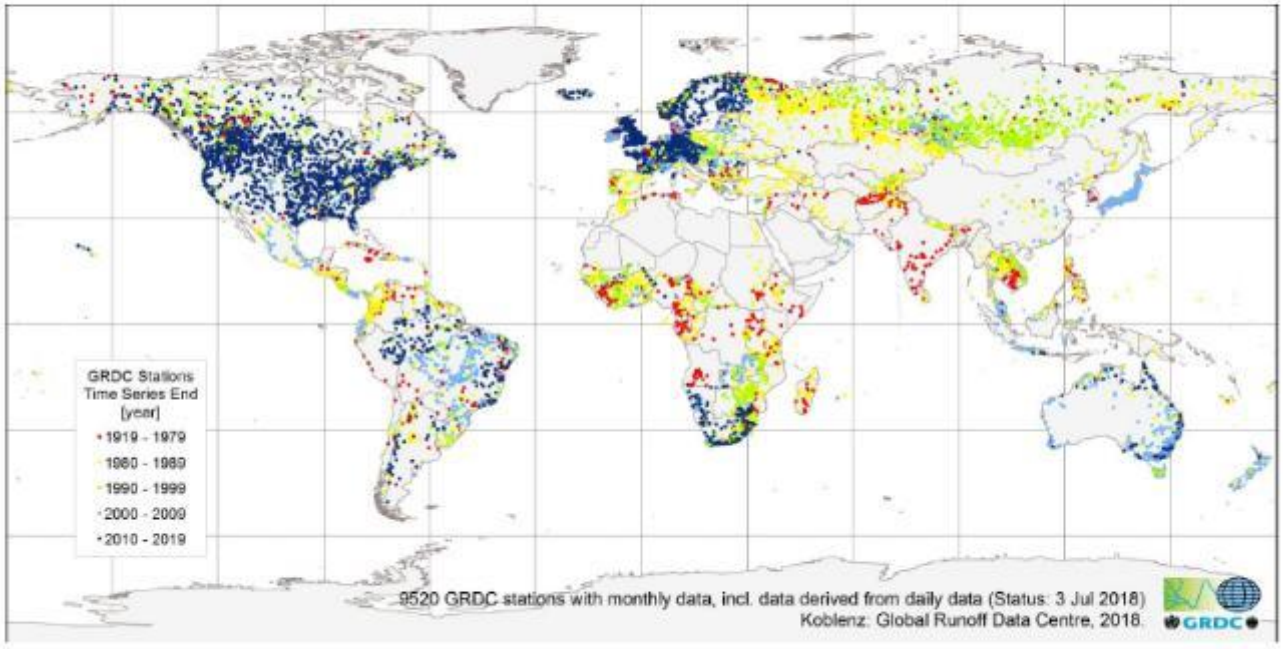
GRDC data are available to users free and unrestricted under specific conditions

Data requests must be in writing: e.g. E-mail, letter or facsimile
Data users must sign a user declaration stating that:

- *Data may not be used for commercial purposes*
- *Data may not be transferred to third parties*
- *Data users agree that the GRDC may inform data providers about the use of their data*
- *Source of the data must be acknowledged in all publications*

Status of the Global Runoff Database

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



Global Runoff Database – Status October 2018

Database Summary Statistics

Global Runoff Data Centre, Station Summary Statistics — 19 October 2018

	# of stations	station years	individual values	average length	shortest timeseries	longest timeseries	earliest timeseries	latest timeseries
AFRICA								
all stations	1559	43458	12702587	27.90	1	116	1869	2017
original daily	1170	34267	12507455	29.29	1	112	1903	2017
original monthly	855	16261	195132	19.02	1	116	1869	2012
ASIA								
all stations	1922	57072	4280083	29.69	1	125	1865	2015
original daily	648	9995	3648175	15.42	1	82	1918	2015
original monthly	1703	52659	631908	30.92	1	125	1865	2015
AUSTRALIA AND PACIFIC								
all stations	550	22063	7872196	40.11	2	123	1886	2018
original daily	2338	142140	51881100	60.80	1	157	1860	2018
original monthly	1078	32320	387840	29.98	1	137	1860	2002
SOUTH AMERICA								
all stations	740	25224	8103347	34.09	2	113	1901	2015
original daily	638	21739	7934735	34.07	1	113	1901	2015
original monthly	577	14051	168612	24.35	1	113	1901	2015
WORLD								
all stations	9540	415512	124709804	43.55	1	211	1806	2018
original daily	7316	336340	122764100	45.97	1	211	1806	2018
original monthly	5574	162142	1945704	29.09	1	192	1807	2015

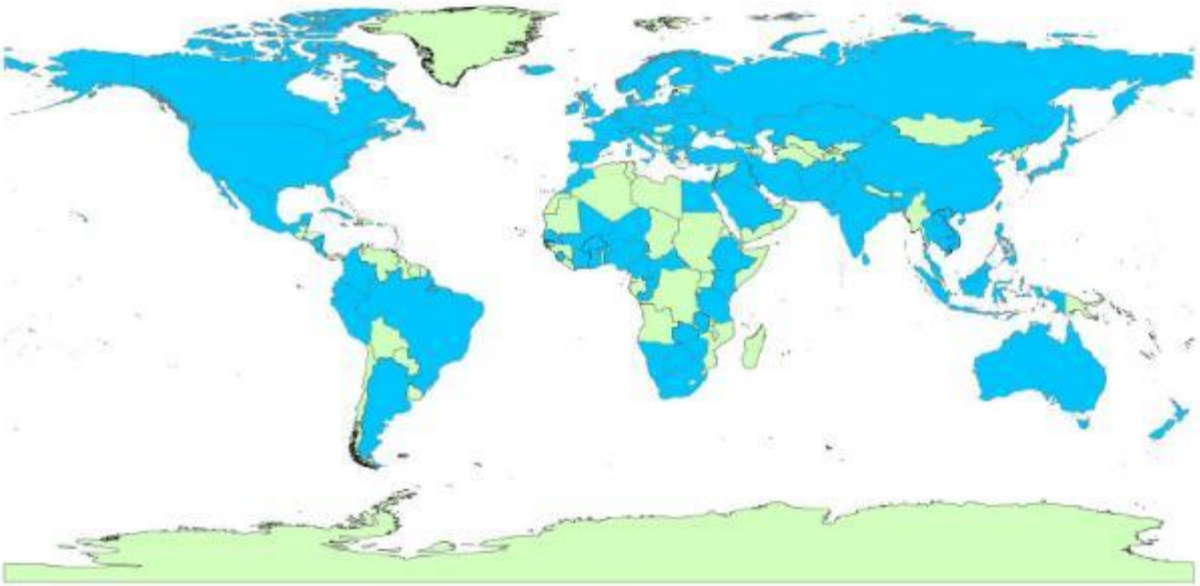
19 October 2018 — Seite 1 von 1

Updates 2018: **KR**, GL, FI, NL, CA, IS, DE, CH, BE, SL, CF, BO, **MM**, BY, US, JM, LV, SI, DK, BW, PL, EE, PE…(not all in database yet)

Hopefully further Asian countries will make data available to GRDC

GRDC Data Requests

Data delivered to 96 countries (blue)



This year already more than 500,000 time series provided to data users

...30 years GRDC

Global Runoff Data Centre (GRDC)
Ulrich Looser (Head)
Thomas de Couet
Irina Dornblut

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

Thank you for your attention!

United Nations Educational, Scientific and Cultural Organization

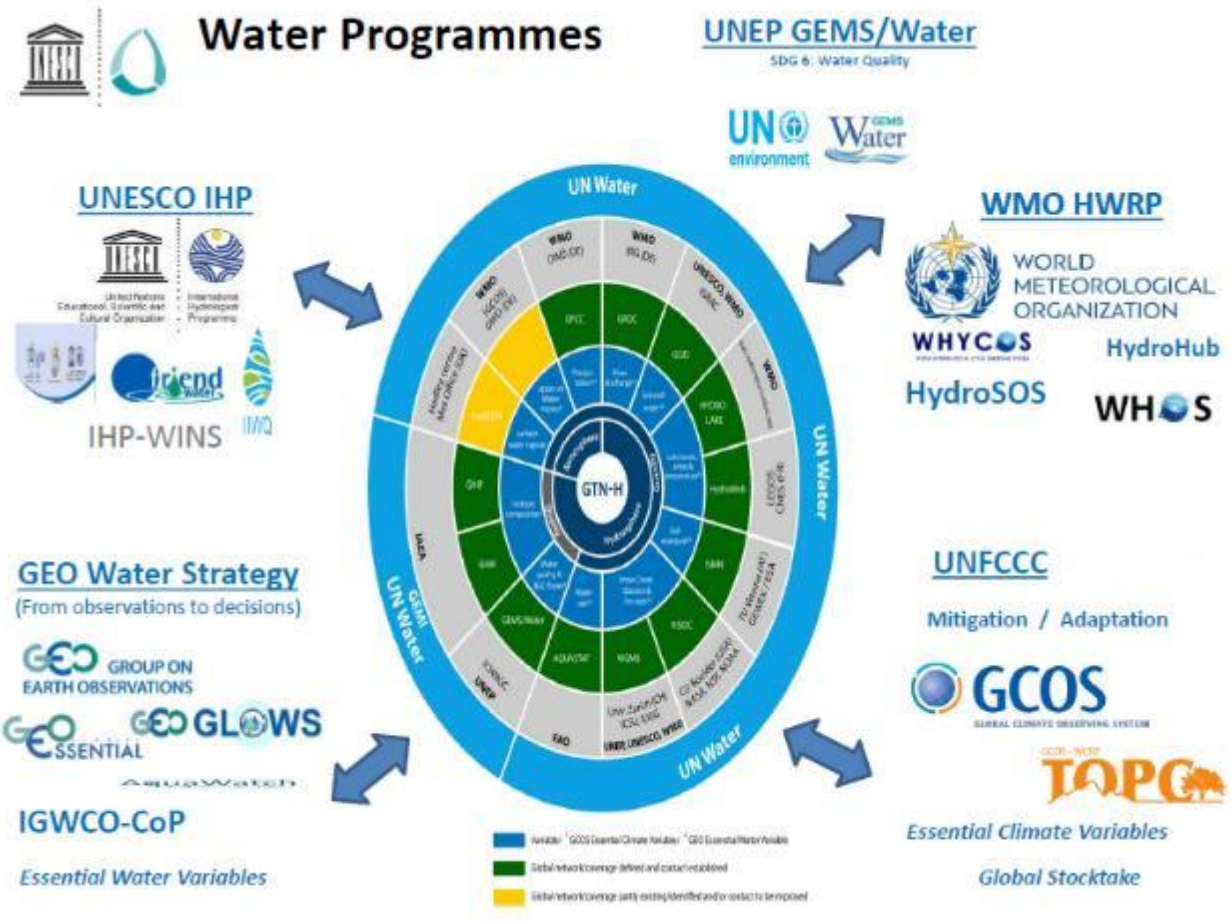
International Centre for Water Resources and Global Change under the auspices of UNESCO

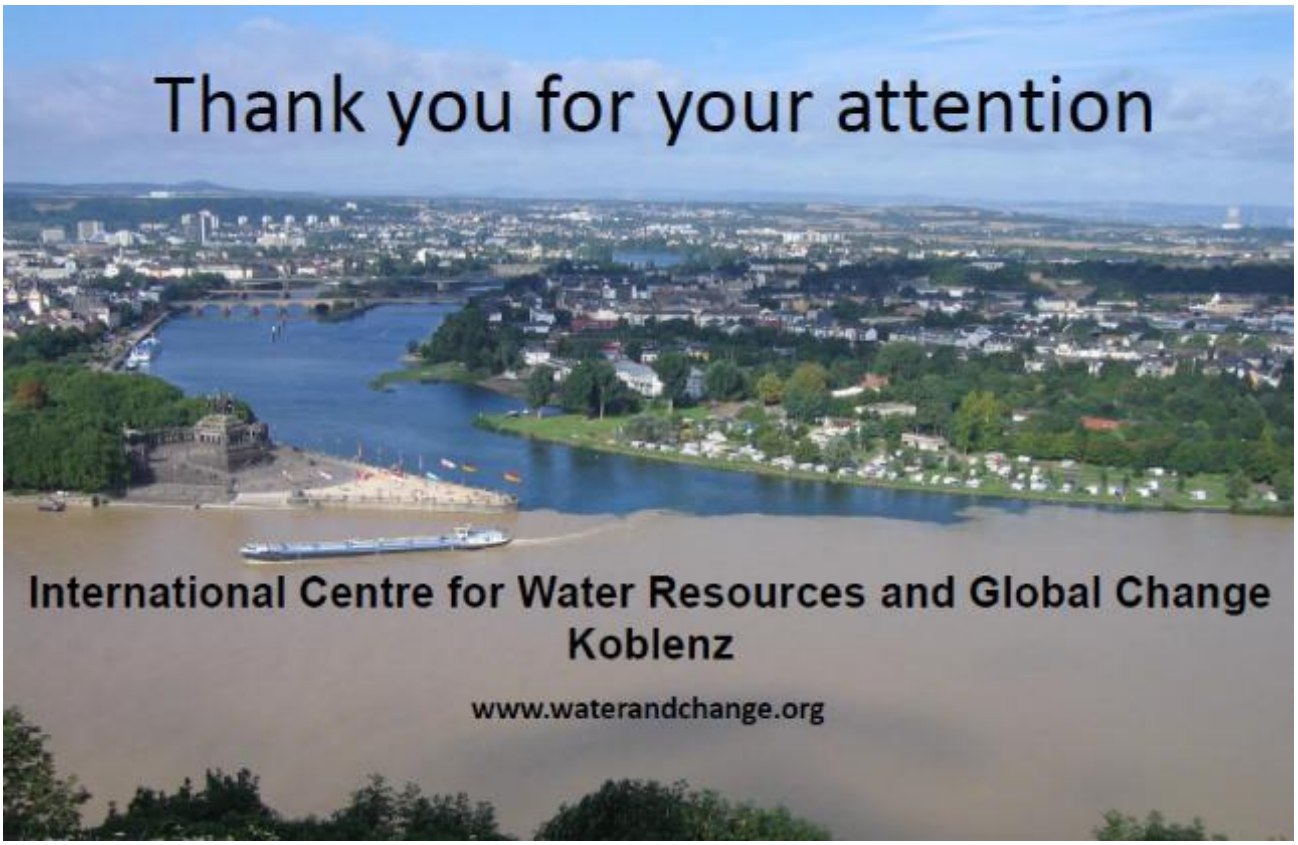
ICWRGC-brief introduction and update

Ulrich Looser on behalf of Harald Köthe

1. Introduction of ICWRGC

- Since 1975 German secretariat IHP/UNESCO and HWRP/WMO located at the German Federal Institute of Hydrology (BfG) in Koblenz
- Head is hydrologic adviser for the permanent Group of German Ministries for foreign water affairs
- Head ICWRGC is hydrologic adviser to the Permanent German representative to the WMO
- Head ICWRGC is German representative in the International Commission for Hydrology of the river Rhine (CHR)
- Since 2014 UNESCO Category 2 water centre and renamed as ICWRGC
- Since 2014 host and developer of the World Water Quality data centre GEMStat under auspices of UN Environment
- Since 2017 Coordination of the Global Terrestrial Network Hydrology (GTN-H) / WMO




Thank you for your attention
International Centre for Water Resources and Global Change
Koblenz
www.waterandchange.org

International Centre for Water Security and Sustainable Management (IWSSM)

UNESCO i-WSSM

International Centre for
Water Security and Sustainable Management

26th IHP Regional Steering Committee Meeting for Asia and the Pacific
Nov 3 – 5, 2018. Shanghai, China

UNESCO i-WSSM
International Centre for Water Security and Sustainable Management

RESEARCH EDUCATION/TRAINING GLOBAL PLATFORM THE WAY FORWARD

CONTENTS

1. Water Security
2. Research
3. Education & Training
4. Globally Networked Cooperation Platform
5. The Way Forward

i-WSSM

UNESCO i-WSSM
International Centre for Water Security and Sustainable Management

RESEARCH EDUCATION/TRAINING GLOBAL PLATFORM THE WAY FORWARD

UNESCO i-WSSM

Centre Opening
May 2, 2017

Location
In K-Water Institute, Daejeon, Korea

Related IHP Theme
Theme 6: Water Security

Legal Status
UNESCO Category 2 Centre

UNESCO i-WSSM
International Centre for Water Security and Sustainable Management

RESEARCH EDUCATION/TRAINING GLOBAL PLATFORM THE WAY FORWARD

Water Security

"The capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability."

UN WATER 2013

- Providing water security is a common goal in the 21st century
  World Water Forum 2000, Ministerial Declaration
- If stable supply and predictability of water resources are not secured, the current water crisis hinders economic growth and implementation of SDGs.
  UN World Water Development Report, 2015

UNESCO i-WSSM
International Centre for Water Security and Sustainable Management

RESEARCH EDUCATION/TRAINING GLOBAL PLATFORM THE WAY FORWARD

UNESCO i-WSSM

OBJECTIVES

RESEARCH

Integrated Problem Solving Research System

EDUCATION & TRAINING

Case & Field-Oriented Education & Training Program

INFORMATION

Globally Networked Hub for Sharing Water Information

UNESCO i-WSSM
International Centre for Water Security and Sustainable Management

RESEARCH EDUCATION/TRAINING GLOBAL PLATFORM THE WAY FORWARD

ACTIVITIES

Research Activity

- ✓ 8th World Water Forum side event: "Green Transition for Enhancing Water Security for All" (with WWC, P4G, and Nautilus)
- ✓ Publishing Global Water Security Issues(GWSI)
- ✓ Implementing International Collaborative Study on Water Security & Sustainable Growth
- ✓ Establishment of Integrated Global Water Network Database

Education and Training

- ✓ Knowledge & Experience Sharing Programme of Korea Water Resources for Central and South American Officials & IDB
- ✓ Global Technical Exchange in Floodplain Modeling and Shared Vision Planning (44 participants from Asia, Middle East and Africa)
- ✓ Workshop for Specialist on Smart Water Management in Central Asia
- ✓ On-site Diagnosis Programme for Cambodia

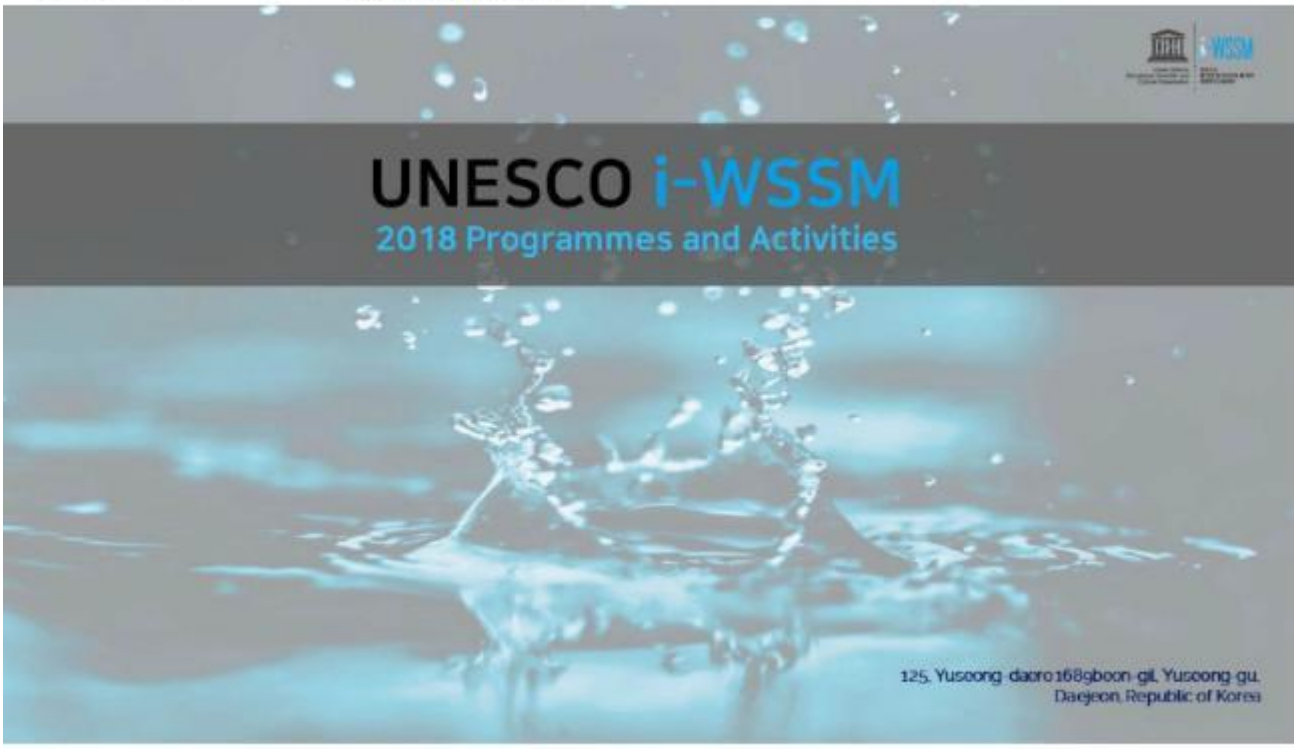
Information Platform

- ✓ 23rd IHP Council Meeting
- ✓ Jeju Forum for Peace & Prosperity: Reengineering peace for Asia
- ✓ 12th International Symposium on Climate Change and UAV Application on Floods and Droughts in Asia Region
- ✓ Korea International Water Week 2018
  - Promotional Booth and Water education booth for students

UNESCO i-WSSM
International Centre for Water Security and Sustainable Management

RESEARCH EDUCATION/TRAINING GLOBAL PLATFORM THE WAY FORWARD

ACTIVITIES



UNESCO i-WSSM
International Centre for Water Security and Sustainable Management

RESEARCH EDUCATION/TRAINING GLOBAL PLATFORM THE WAY FORWARD

Global Collaborative Research for Water Security

- **Global Water Security Issues (GWSI) Series**
  - A journal for exchange of scientific, social, economic, and environmental knowledge to achieve water security
  - Water security & Environment, Society, Economy, Governance
  - Open themes relevant to water security & SDG6
- **International Collaborative Study on Water Security & Sustainable Growth**
  - Water security in terms of socioeconomic
  - Framework development
  - Case analysis
  - Making an impact on policy decision

- **Integrated Global Water Network Database**
  - An Integrated Global Water Experts directory
  - Collecting separated data and information from various water-related organizations, conferences, and events

UNESCO i-WSSM
International Centre for Water Security and Sustainable Management

RESEARCH | EDUCATION/TRAINING | GLOBAL PLATFORM | THE WAY FORWARD

Organizing Sessions and Seminars

- AIWW Special session on Asian water challenge
- 8th International Conference on Water & Appropriate technology (10 orgs., 150 participants)
- 8th World Water Forum side event: "Green Transition for Enhancing Water Security for All" (with WWC, P4G, and Nautilus)
- KIWW 2018 Nature-based solutions for SDGs Forum & Gender Talk Concert

UNESCO i-WSSM
International Centre for Water Security and Sustainable Management

RESEARCH | EDUCATION/TRAINING | GLOBAL PLATFORM | THE WAY FORWARD

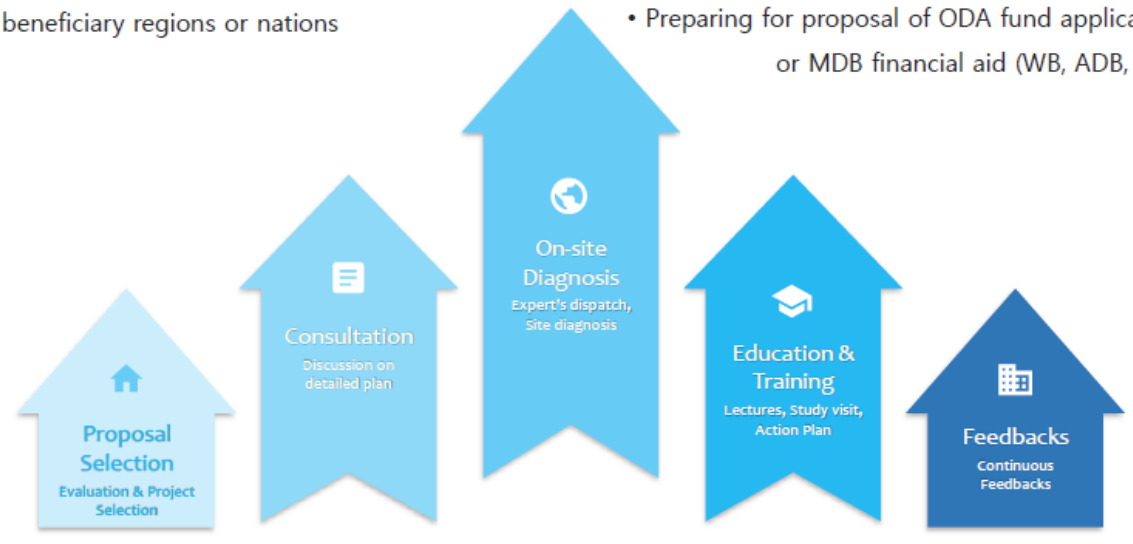
Problem Solving Program based on On-site Diagnosis

Objectives

- To Provide customized problem solutions & Capacity building programs based on the challenges that are faced by the beneficiary regions or nations

Diagnostic Outcomes

- Providing customized problem solutions
- Personnel or institutional capacity building program
- Preparing for proposal of ODA fund application or MDB financial aid (WB, ADB, etc.)



UNESCO i-WSSM
International Centre for Water Security and Sustainable Management

RESEARCH | EDUCATION/TRAINING | GLOBAL PLATFORM | THE WAY FORWARD

Problem Solving Program based on On-site Diagnosis

On-site Diagnosis(Cambodia)

Integrated Flood Management Conceptual Plan for Cambodia Mekong Delta Region

- Location – Transboundary between Cambodia & Vietnam
  - Major rice producing area
- Challenges
  - Low level area & frequent flood damage
- On-site diagnosis
  - Experts dispatch & survey
  - Identifying issues and problem solving
- Outcomes
  - Flood Management conceptual plan to reduce flood damage and increase rice productivity

On-site Diagnosis(Tuvalu, On-going)

Improving water quality and monitoring system in the outer islands of Tuvalu

- Location – Outer island of Tuvalu
- Challenges
  - Water supply problem due to draught and storm
  - Geographic location (remote from the continents)
- Expected outcomes
  - Developing water quality & supply monitoring systems for the outer islands
  - Suggesting a development of alternative water resources

UNESCO i-WSSM
International Centre for Water Security and Sustainable Management

RESEARCH | EDUCATION/TRAINING | GLOBAL PLATFORM | THE WAY FORWARD

Capacity Building Program for the Improvement of Water Security (1/2)

aims to High Level Officials

- Knowledge and Experience Sharing Program of Korea Water Resources for **Central and South American Officials** & **IDB** (8 countries, 15 participants)
  - 1st year: Smart water management
  - 2nd year: Sustainable Development (NEXUS, Sanitation and PPP)
  - 3rd year: Integrated water management

UNESCO i-WSSM
International Centre for Water Security and Sustainable Management

RESEARCH | EDUCATION/TRAINING | GLOBAL PLATFORM | THE WAY FORWARD

Capacity Building Program for the Improvement of Water Security (2/2)

aims to Government Officials and Specialists

- Program for the Improvement of Water Security in Asia (9 countries, 10 participants)
- Workshop on Smart Water Management in Central Asia (5 countries, 10 participants)
- Global Technical Exchange in Floodplain Modeling and Shared Vision Planning (44 participants from Asia, Middle East and Africa, Sep, 2018)

UNESCO i-WSSM
International Centre for Water Security and Sustainable Management

RESEARCH | EDUCATION/TRAINING | GLOBAL PLATFORM | THE WAY FORWARD

Globally Networked Cooperation Platform

- Domestic UNESCO CAT 2 Centre Cooperation Meeting (2017, 2018)
  - APCEIU, ICHCAP, ICM, ICDH at Jeju
- **IHP Regional Steering Committee Meeting for Southeast Asia and the Pacific**
- Cooperation with the US Army Corps of Engineers, ICIWaRM, and the World Bank
- Cooperation with the Int'l Water Resource Research Institute of Chungnam Nat'l University

UNESCO i-WSSM
International Centre for Water Security and Sustainable Management

RESEARCH | EDUCATION/TRAINING | GLOBAL PLATFORM | THE WAY FORWARD

Future work

MISSION

- Support Water Security Strategies for Sustainable Development against Climate Change

VISION

- Equal and Safe Water Use and Better Quality of Human Life

MISSION & VISION

STRATEGY

- Cooperation with the global/regional water centres under auspices of UNESCO to achieve UN's SDG 6: Clean Water and Sanitation
- Stimulating international cooperation to improve knowledge, education, and global network to address water security challenges in line with IHP-VIII

Thank You

United Nations Educational, Scientific and Cultural Organization | International Centre for Water Security and Sustainable Management

unesco-iwssm.org

Regional Centre on Urban Water Management (RCUWM)

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

Shanghai-China, 4 November, 2018

Regional Centre on Urban Water Management (RCUWM)

Ali Chavoshian

chavoshian@gmail.com

United Nations Educational, Scientific and Cultural Organization

RCUWM TEHRAN

IDI International Drought Initiative

RCUWM-Tehran is one of the most active Category II Centre's of UNESCO and Secretariat to International Drought Initiative

United Nations Educational, Scientific and Cultural Organization

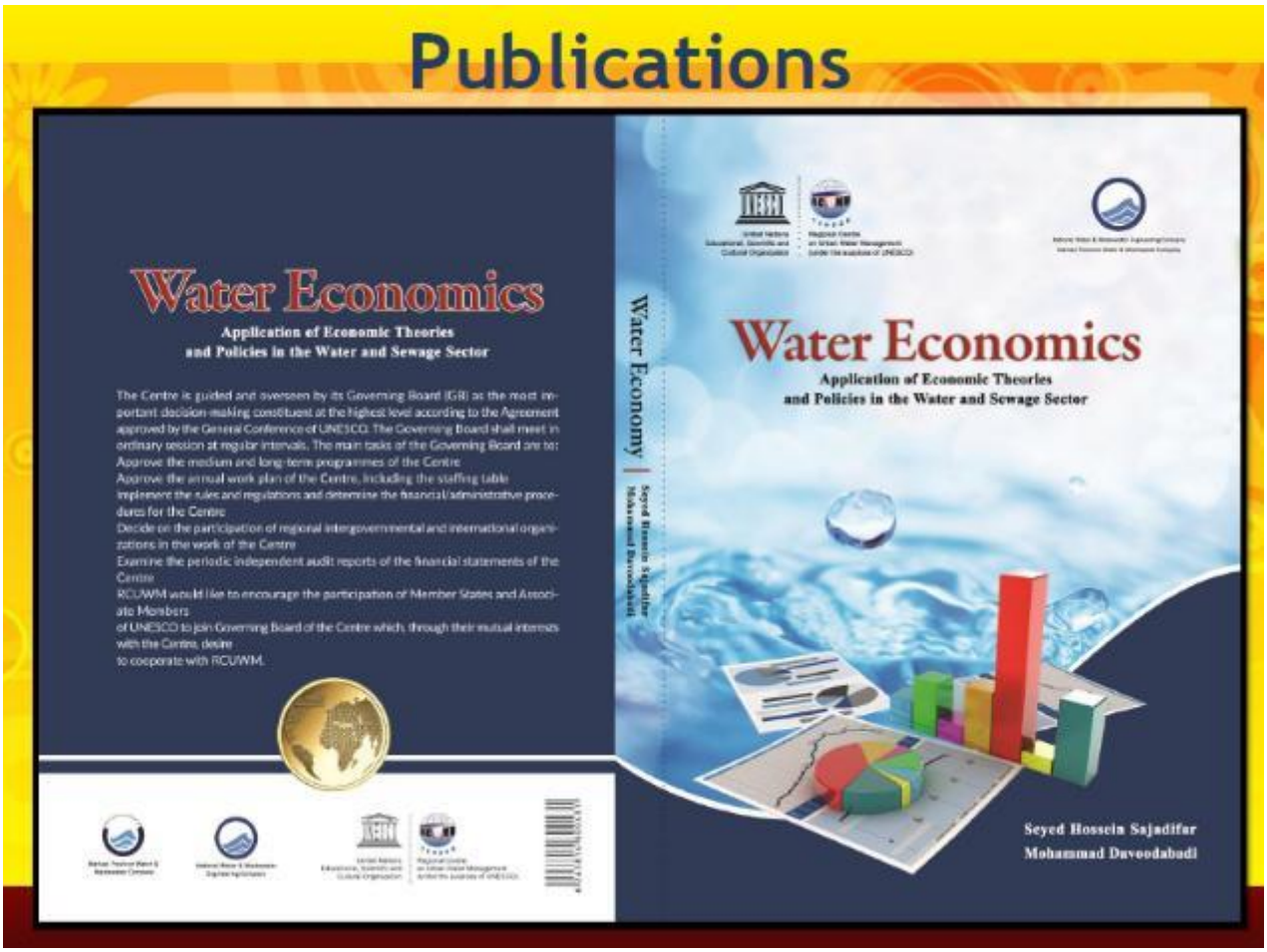
Regional Centre on Urban Water Management (under the auspices of UNESCO)

Regional Centre on Urban Water Management - Tehran (under the auspices of UNESCO) established February 2002

Objectives:

- Promoting IHP programs and initiatives
- Supporting applicable scientific research
- Networking international and local institutions
- Organising training courses


RCUWM Activities
6 CLEAN WATER AND SANITATION
11 SUSTAINABLE CITIES AND COMMUNITIES
● Urban river restoration
● Non-revenue water reduction
● Unconventional water resources development
● Drought predication and monitoring
● Groundwater Management
● Water reuse and wastewater treatment
● Water-related public awareness in cities
● Water and media and hydro-journalism


Publications
Water Economics
Application of Economic Theories
and Policies in the Water and Sewage Sector
The Centre is guided and overseen by its Governing Board (GB) as the most important decision-making constituent at the highest level according to the Agreement approved by the General Conference of UNESCO. The Governing Board shall meet in ordinary session at regular intervals. The main tasks of the Governing Board are to:
Approve the medium and long-term programmes of the Centre
Approve the annual work plan of the Centre, including the staffing table
Implement the rules and regulations and determine the financial/administrative procedures for the Centre
Decide on the participation of regional intergovernmental and international organizations in the work of the Centre
Examine the periodic independent audit reports of the financial statements of the Centre
RCUWM would like to encourage the participation of Member States and Associate Members
of UNESCO to join Governing Board of the Centre which, through their mutual interests with the Centre, desire
to cooperate with RCUWM.
Water Economy
Water Economics
Application of Economic Theories
and Policies in the Water and Sewage Sector
Seyed Hossein Sajadifar
Mohammad Davoodabadi

Regional Centre on Urban Water Management

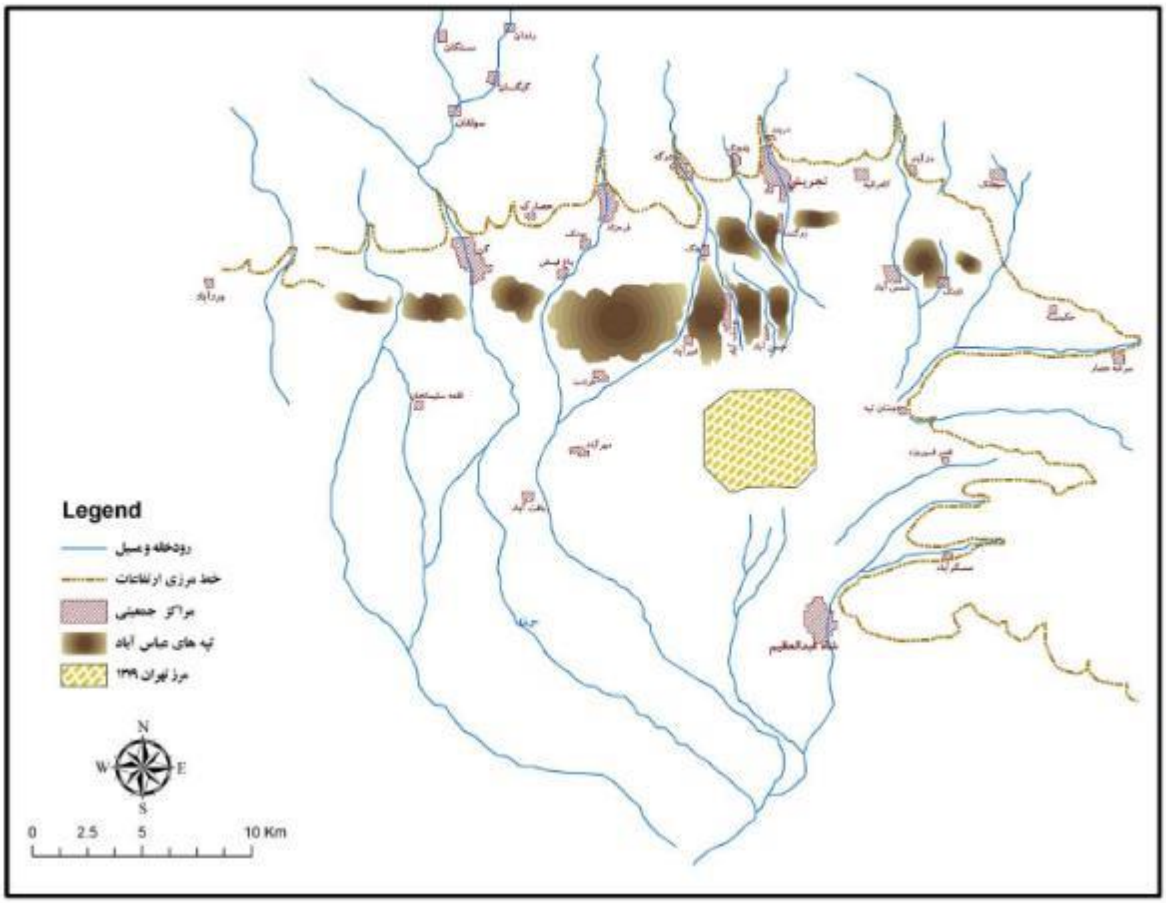
AGENCE D'URBANISME & DE DÉVELOPPEMENT Pays de Saint-Omer - Flandre Intérieure

United Nations Educational, Scientific and Cultural Organization

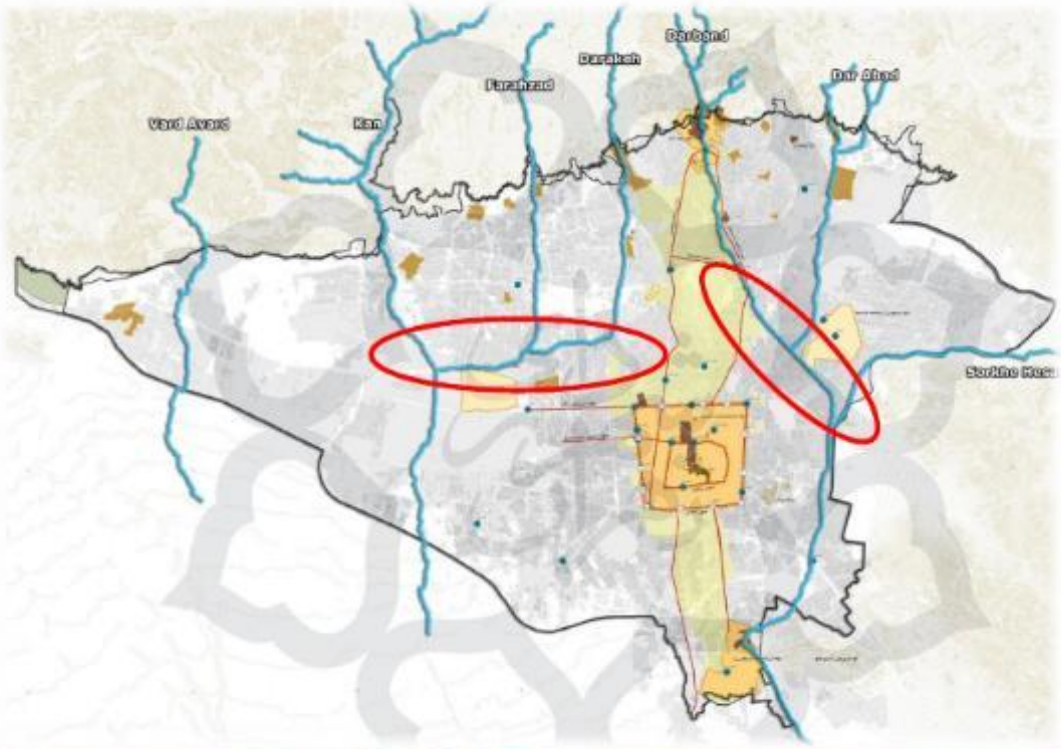
Regional Centre on Urban Water Management (under the auspices of UNESCO)

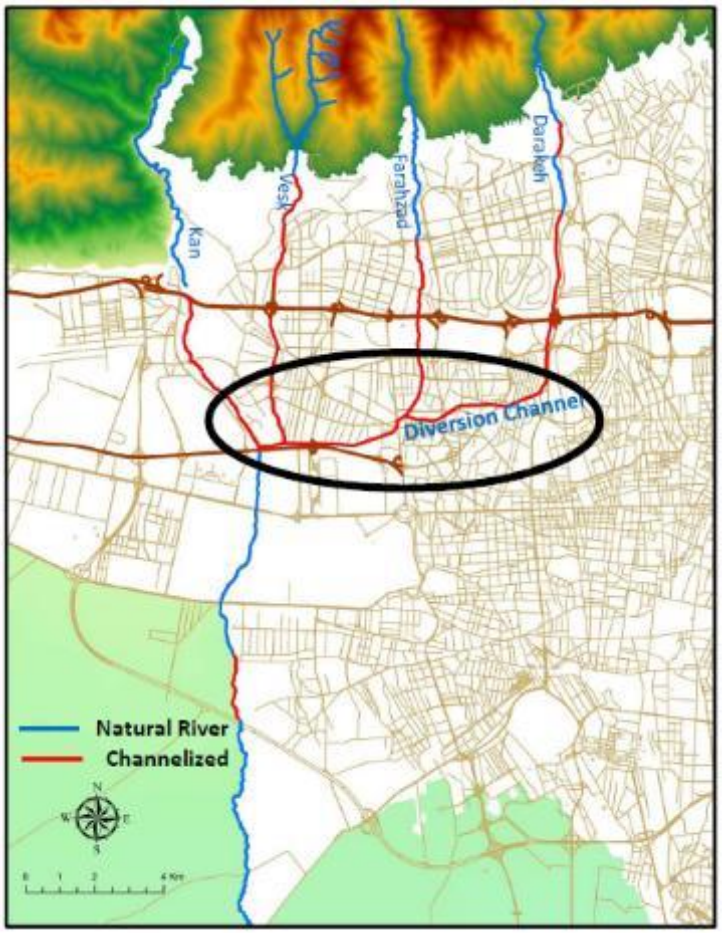
Imperial College London

Tehran-1880



Seven Major Rivers of Tehran





ACTION PLAN

Classification of damages to Tehran Rivers at each segments using Multi-Criteria Decision Making (MCDM)
Severe Damage (e.g. buried river)
Highly damaged (e.g. covered river)
Moderated damage (concrete walls)
Low impact (e.g. unauthorized residence)
Natural condition and need to be conserved as it is

Contributions to the IHP VIII

T3: Addressing Water Scarcity and Quality &
T4: Water and Human Settlements of the Future

UNESCO Tehran Cluster Office
UNESCO Jakarta Office
UNESCO New Delhi Cluster Office

G-WADI

I.R. Iran
Ministry of Energy

8th Asian G-WADI & 2nd IDI Expert Group Meetings

http://rcuwm.ir/idi-gwadi-workshop/

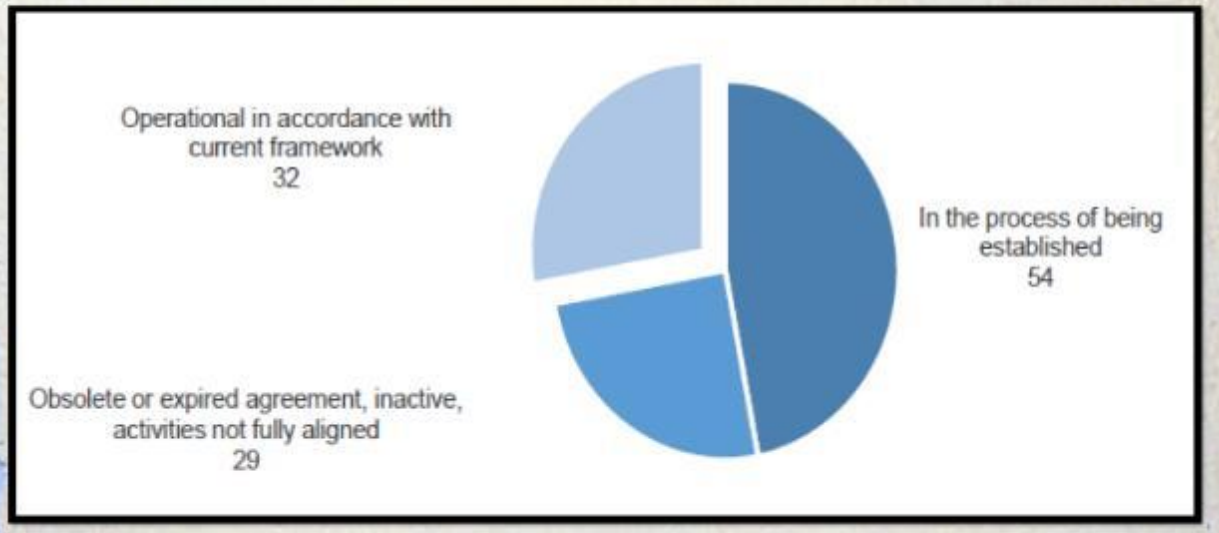
Call for Papers/Country Reports

International workshop on "Adaptation to Water Scarcity and Basin-connected Cities"

11 December 2018, Mashhad-Iran

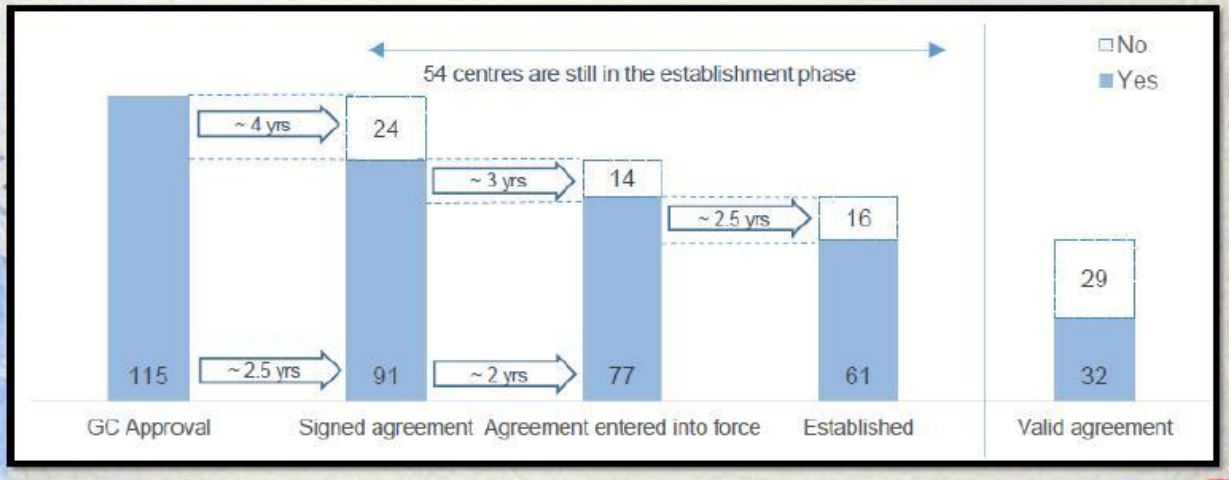
General Overview of C2C

Two-thirds of 115 Centres are not operational in conformity with the current framework. Most of these non-operational institutes/centres are not yet established as category 2 institutes/centres..



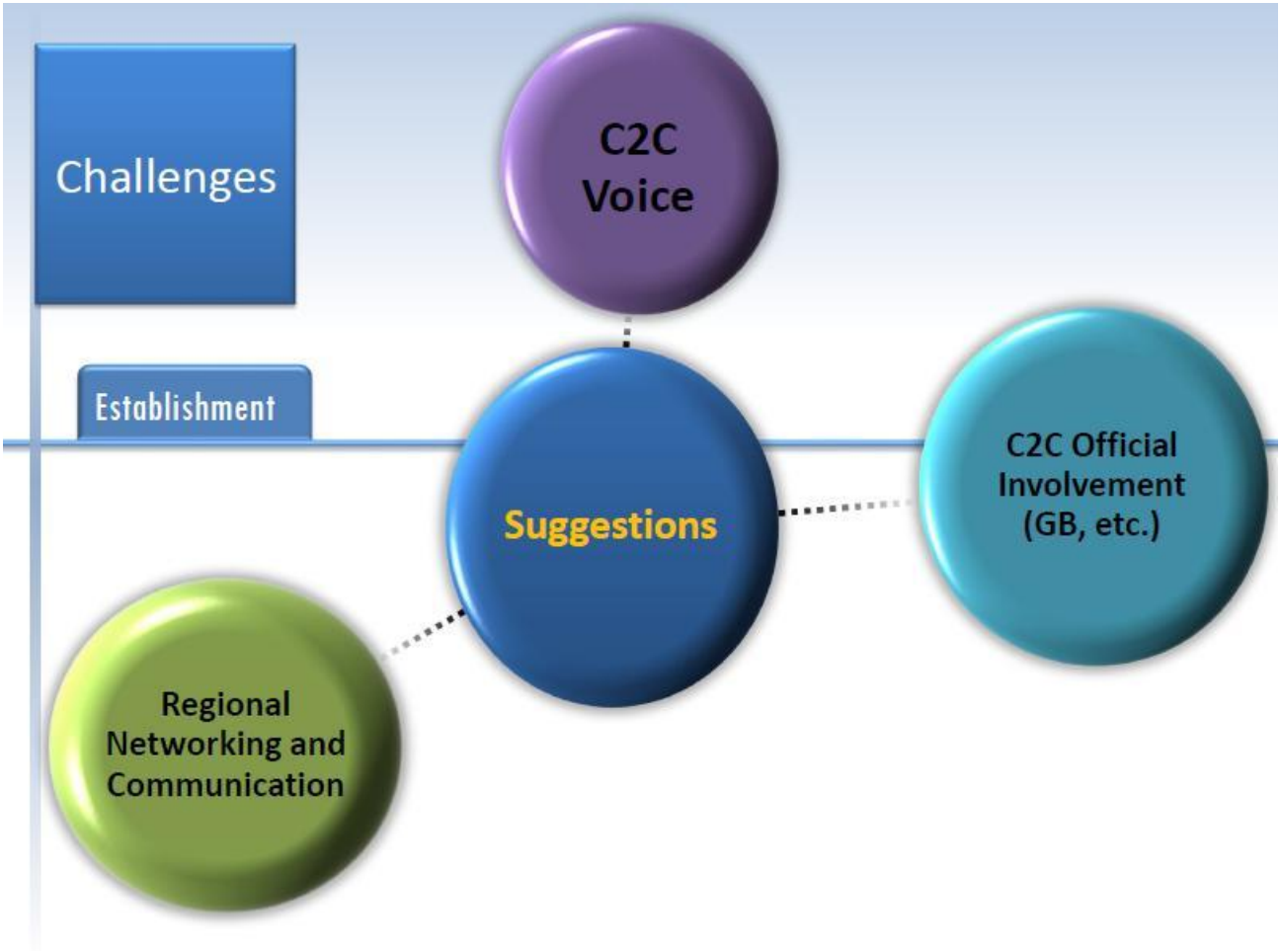
The Lengthy Establishment Process

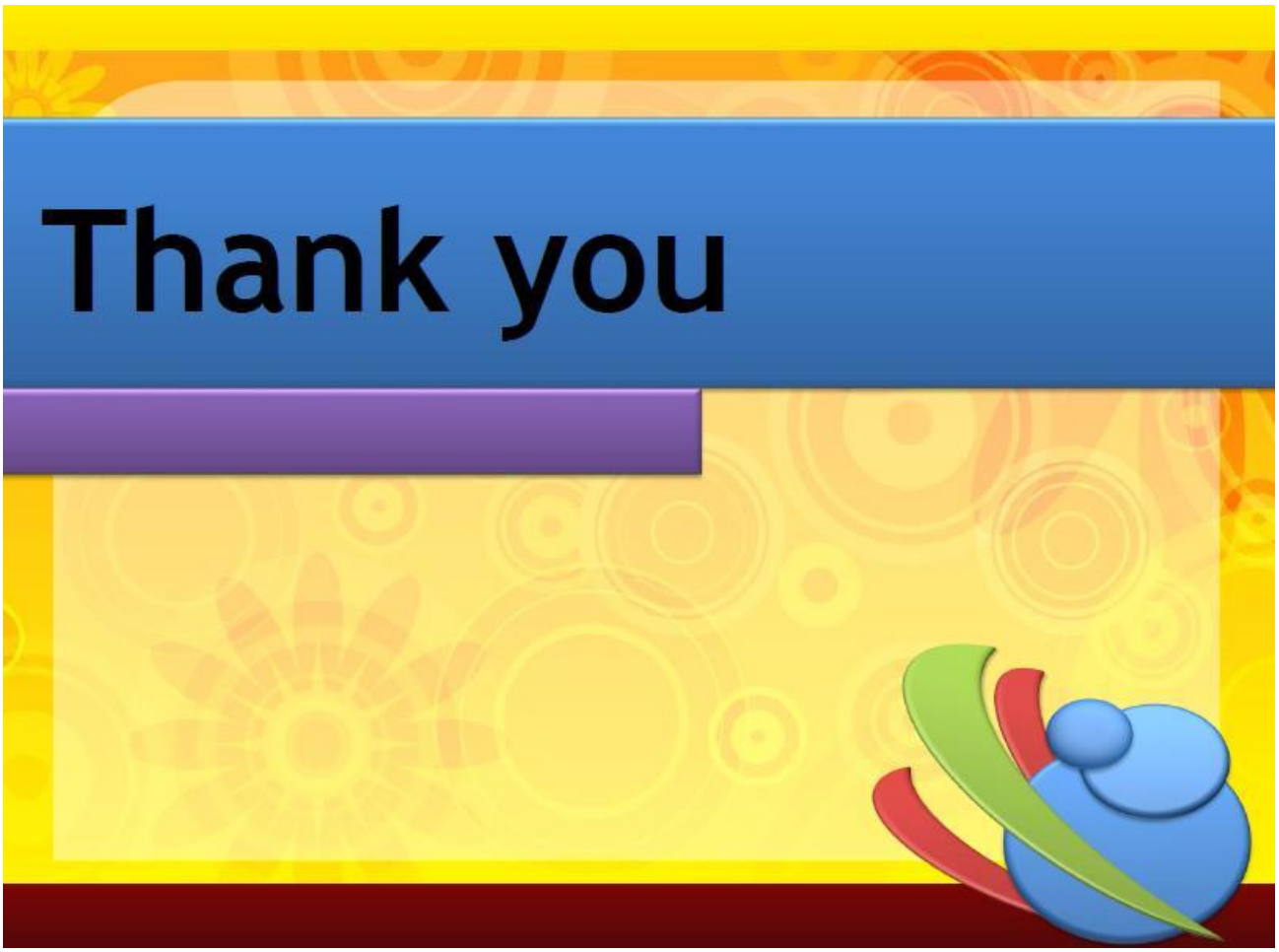
The establishment process proves to be lengthy, requiring considerable investment in staff time from the Secretariat before benefits materialize.



Recommendations

- Efforts should be directed towards a limited number of institutes/centres, preferably with proven records of excellence and that can effectively collaborate with UNESCO to achieve its 2018-2021 programme objectives.
- UNESCO also should (i) examine the non-operational institutes/centres and recommend revision or termination of the agreement, (ii) develop overarching criteria to limit the number of, and (iii) improve the screening process for proposals and renewals.


Challenges
C2C Voice
Establishment
Suggestions
C2C Official Involvement (GB, etc.)
Regional Networking and Communication


Thank you

Water, Energy and Disaster Management for Sustainable (WENDI)

United Nations Educational, Scientific and Cultural Organization

UNESCO Chair on Water, Energy and Disaster Management for Sustainable Development, Kyoto University, Japan

Kyoto UNESCO Chair on Water, Energy and Disaster Management for Sustainable Development (KUC-WENDI)

2018/11/4@IHP-RSC

Activities of WENDI

- Proposal of WENDI to UNESCO HQ in April 2017
- Approval notification in August 2017
- International Symposium on Utilization of Field Sites in Research and Education (FREE2017) on 8-9 December 2017
- Signing Agreement between UNESCO and KU and Kyoto University UNESCO Chair Special Seminar on 13 February 2018
- Official logo approved in March 2018
- Creating another logo of WENDI
- Inaugural Symposium on 30 July 2018

Signing Agreement between UNESCO and KU and Kyoto University UNESCO Chair Special Seminar on 13 February 2018

International Inaugural Symposium for UNESCO Chair on Water, Energy and Disaster Management for Sustainable Development

30 July 2018, Symposium Hall, International Science Innovation Building, Kyoto University, Japan

Action plans by 8 Co-chairs of WENDI

10:30-10:33	Session introduction	
10:33-10:40	Prof. Yasuto Tachikawa Graduate School of Engineering Co-Chair (Water-related Disaster Management)	Higher education and research for water-related disaster management in WENDI
10:41-10:48	Prof. Shigenobu Tanaka Disaster Prevention Research Institute Co-Chair (Water Resources)	UNESCO IHP Training Course
10:49-10:56	Prof. Yosuke Yamashiki GSAIS Co-Chair (Water Quality)	Global lakes & reservoir repository to be linked with satellite remote sensing
10:57-11:04	Prof. Kenichi Ishihara Graduate School of Energy Science Co-Chair (Energy Science)	Energy security and Easterlin paradox
11:05-11:12	Prof. Hideaki Ohgaki Institute of Advanced Energy Co-Chair (Energy)	Energy education activities for sustainable development in Asia
11:13-11:20	Prof. Eiji Nawata Graduate School of Agriculture Co-Chair (Food Security)	Activities of the Graduate School of Agriculture in WENDI agricultural systems and food security
11:21-11:28	Prof. Mamoru Kanzaki Graduate School of Agriculture Co-Chair (Forestry and Biodiversity)	Forest ecosystem studies in the Graduate School of Agriculture and WENDI Program
11:29-11:36	Prof. Shigeo Yoden Graduate School of Science Co-Chair (Climate Change)	An emerging activity of WCRP/SPARC program for understanding climate variations and change in the stratosphere-troposphere coupled system
11:37- 11:44	Prof. Michinori Hatayama Disaster Prevention Research Institute Co-Chair (Data Sciences)	Data science for disaster risk management and disaster response
11:45-11:59	Discussion and feedback	

UNESCO Chair Proposal:

Kyoto UNESCO Chair on Water, Energy and Disaster Management for Sustainable Development (KUC-WENDI)

Overall objectives To promote multi-disciplinary and holistic approach for research implementation, knowledge transfer and capacity building in the fields of water, energy, and disaster management and linkages to other sectors (food, forestry, biodiversity, climate change and data science) by establishing a comprehensive and trans-disciplinary programmes on the Education for Sustainable Development (ESD) in graduate school-level and implementing international collaborative researches utilizing existing UNESCO-Sites such as Geoparks, Biosphere Reserves and Cultural, Natural and Mixed World Heritage Sites.

Goal / Rationale / Impact

- Establishment of "KU-Model of ESD", through implementing Graduate-school-level ESD as the first in Japan
- Expanding international collaborative researches utilizing UNESCO-Sites as the application field.

UNESCO Chair
- KU-Model of ESD-

Autonomous and **Systematic** study in graduate school level

Acknowledging the challenges
Sharing of the implementations around the world
Seeking for measures towards solutions

Supporting the human resource development with a view of tackling various issues in the current society.

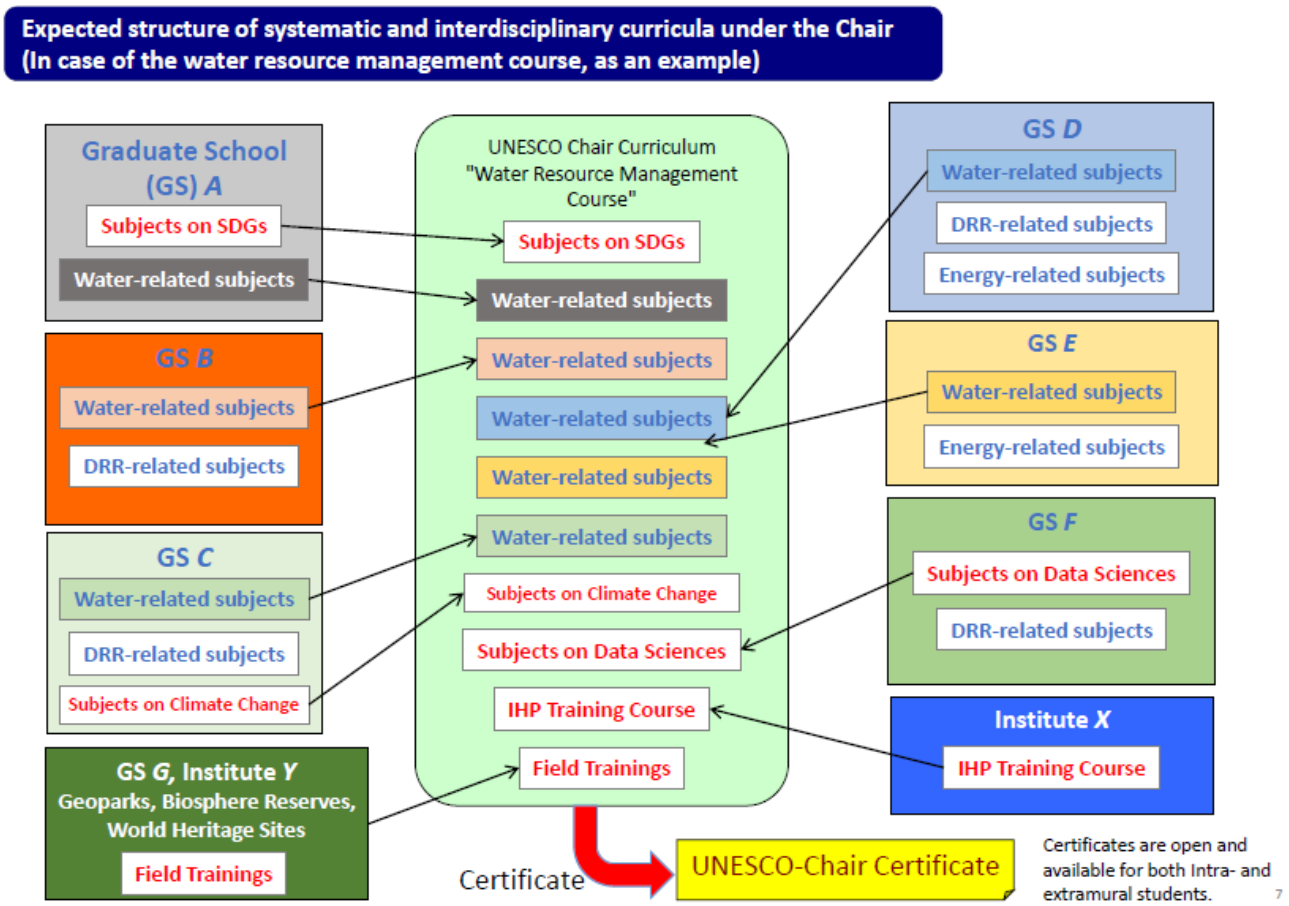
Field trainings / Internships

Common Global Issues
Tackling
global risks and challenges
by focusing on
Water
Energy
Disaster
and linkages to other sectors (food, forestry, biodiversity, climate change and data science)

UNESCO Sites
Geoparks (Global:119 / Japanese:43)
Biosphere Reserves (669 sites)
World Heritage Sites (Cultural:814, Natural:203, Mixed:35)

KU's Network
in and out of Japan
European Center at Heidelberg
North American Center at Washington D.C.
ASEAN Center at Bangkok

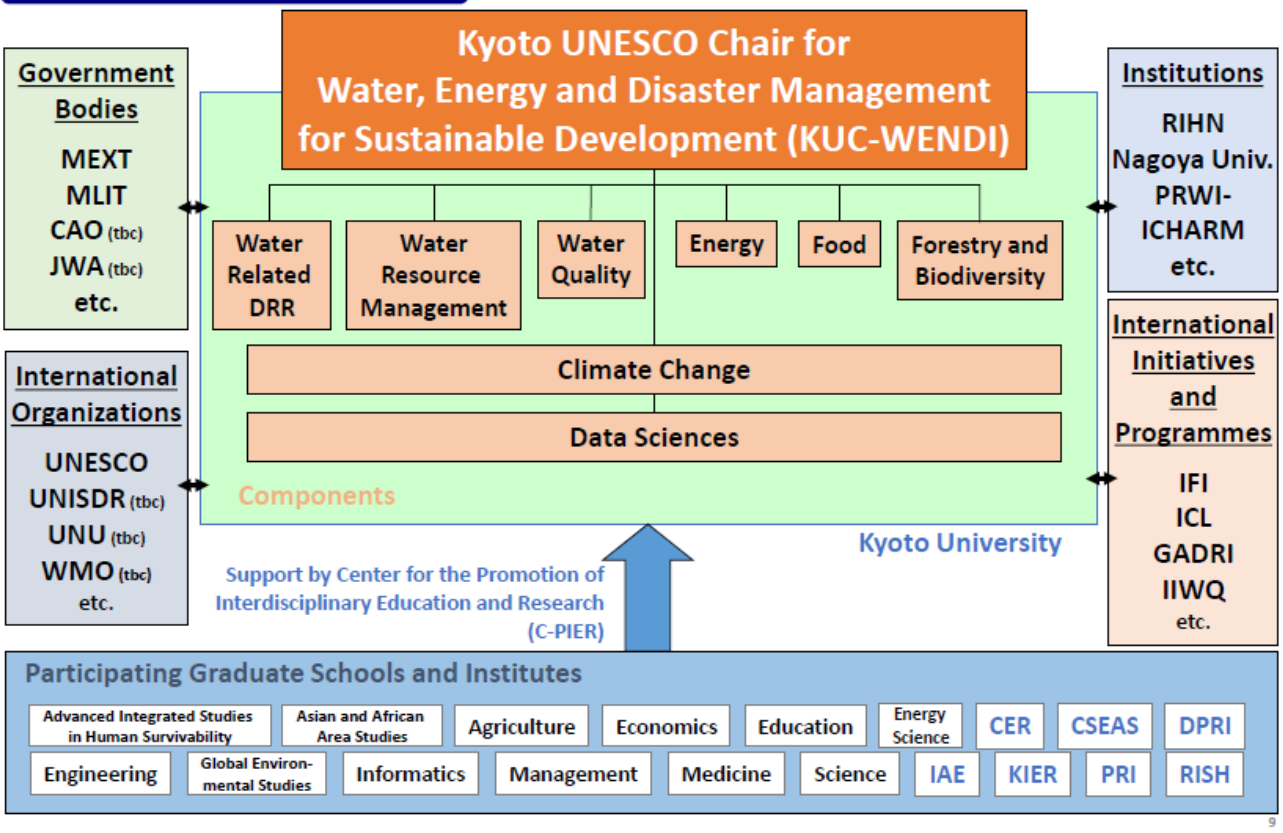
6



Planned Chair Curriculum Courses
(as of Nov. 2918)

- Water Resources Management Course
- Water Environment Course
- Energy Science Course
- Sustainable Bioresource Utilization and Ecosystem Management Course
- Resilient Society Management Course

Implementation Structure and Partners

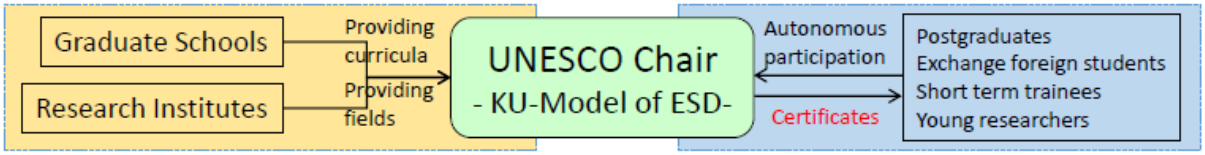


Implementation Strategy

Take full advantage of KU
- Water: Numerous university-wide water-related professors
- Energy: Energy-related graduate school and institute
- Disaster: Department and institute focusing on DRR

Overall strategy

Providing systematic and interdisciplinary educational field to the younger generations including postgraduates and foreign students by getting researchers and educators together under the UNESCO-Chair



* "Water Environment Course", "DRR Course" and "Energy Course" will be opened respectively and research and education programmes will be established in systematic and interdisciplinary manner.
* Certificates are open and available for both Intra- and extramural students.

Expected Outcomes

1) Establishment of a standard model of intersectional and trans-disciplinary education at the graduate school level based on the collaboration of university-wide researchers in the fields of water, energy and disaster management and its related fields.
2) International and nationwide acknowledgement as a core of graduate school level ESD, which enhances the capacity for leadership of KU as the leading institution.
3) Enhancement of new academic excellence regarding UNESCO-related sites including Geoparks, Biosphere Reserves and World Heritage Sites towards further clarification of scientific and cultural significance, developability and sustainability of those sites through international collaborative researches or field workshops all over the world.

ANNEX G – Report from the representative of the Pacific SIDS

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

In association with

Catalogue of Hydrological Analysis Workshop

3-5 November 2018

Shanghai, China

Summary report on Pacific-SIDs Recent Progresses and Challenges in in Water-related Disasters

Amini Loco

Geoscience Energy and Maritime Division

SPC

INTRODUCTION - THE PACIFIC SIDS UPDATE ON WATER-RELATED HAZARDS

The Pacific Islands – Small Islands Developing states (SIDs), are in need of support to establish appropriate technologies, compatible and accessible observation systems and to build adequate human and infrastructural capacity to help prepare and develop resilience in the disaster-prone region. Linked to the Sendai framework for Disaster Risk Reduction 2015 – 2030 and the Framework for Resilience Development in the Pacific 2017 – 2030, widespread institutional progress has been made to minimise the frequent and severe impacts of water-related hazards, namely flooding, droughts and tidal inundation related to tropical cyclones. The role of national hydrology (NH) and meteorology services (MS) is central for the prediction, early warning, and responses associated with these disasters, and thus require huge support. Key progresses and achievements in NHMS sector, to date is the formation of the Pacific Meteorological Council (PMC), which has a number of panel or key areas, including the recently endorsed Hydrological Services Panel. These progress is a mark of commitment from Pacific Island Government and the support from regional organisations such as SPREP, SPC, USP and WMO.

This report will summarise the progresses, challenges and suggested improvements surrounding hydrology and meteorological services around Pacific-SIDs. This will also extend in to a brief look at the Pacific context and governance and institutional arrangement around the regional NHMS.

PACIFIC SIDs – CONTEXT

The Pacific region (Figure 1 below) is characterised by an extensive ocean that accommodates relatively small-sized islands, having low population in communities or extremely highly-population urban centres and are run by self-governing bodies, be it community, island or local, and national levels. The physical conditions of these islands range from low lying carbonate islands or atolls such as Kiribati and Marshall Islands, raised limestone islands such as Niue and high volcanic islands such as Vanuatu, Solomon and Fiji.

Surrounded by vast ocean, the Pacific climatic and weather conditions are strongly influenced by the ENSO conditions and hence is vulnerable to frequent and severe climatic extremes, such as prolong dry periods, and torrential rainfall and strong winds. These recurring water-related conditions created havoc, in small islands conditions through droughts and intense flooding which usually are huge setback to the economic and infrastructural development in the region. This is very well recorded by the severe TC Pam in 2015, TC Winston in 2016, TC Gita in 2018 couples with the severe drought that had devastating effects the region between 1997 and 1998, and the many other recorded dry events that followed. Not limited to these, the Pacific is also vulnerable to tidal inundation and landslides and salinization of freshwater resources, induced by climate extremes.

Further, ability of the Pacific governments to withstand or reduce the impacts of these water-related conditions is often worsened by the lack of capacity in NHMS to properly monitor water resources and rainfall to provide reliable prediction and adequate warning. These are coupled with poor monitoring infrastructure and lack of policies and/or enablers to allow coordination between NH and MS and to foster data sharing and collaboration.

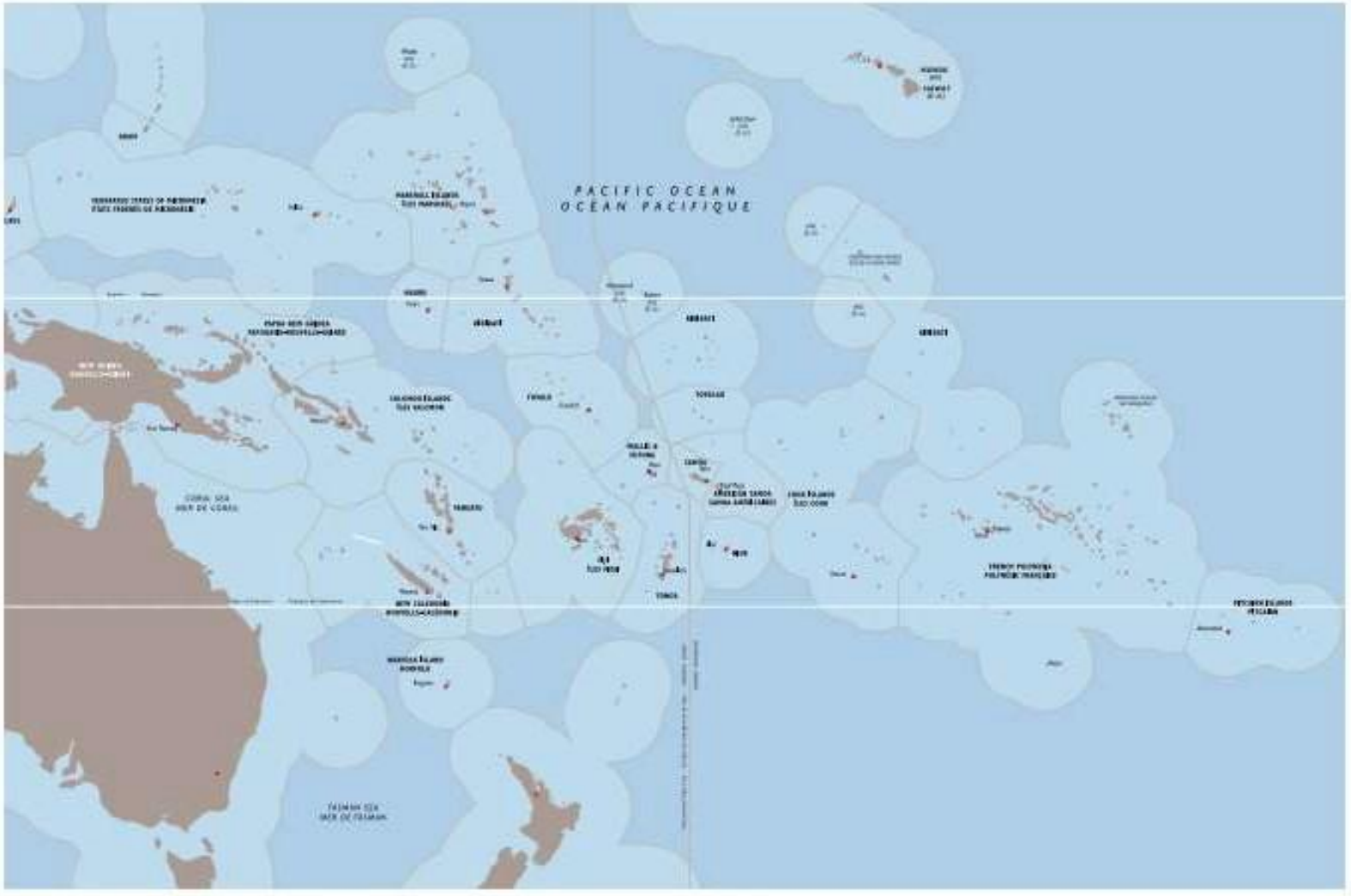
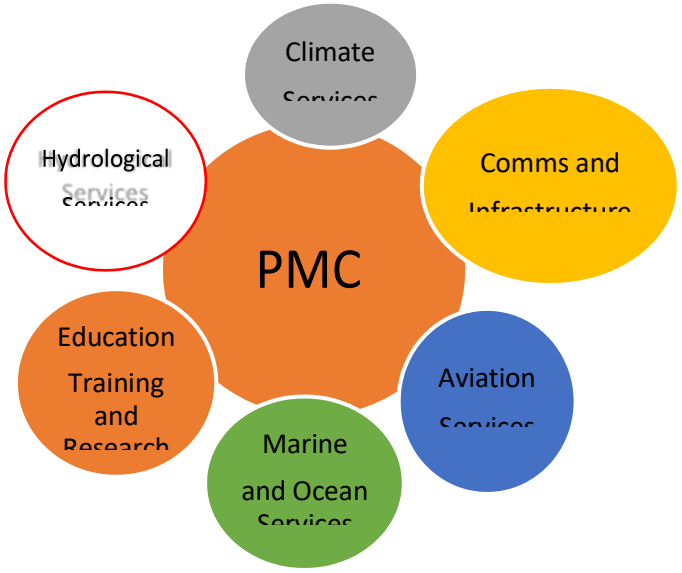


Figure 1. the extensive nature of the Pacific-SIDs, their remoteness and small sizes make them vulnerable to extreme water-related weather conditions and disasters (Source. Framework for Resilience Development in the Pacific, 2016)

GOVERNANCE & INSTITUTIONAL ARRANGEMENTS

Under the auspices of the PICT's ministerial declaration in 2015 and 2017, the support by SPREP, SPC, USP and WMO is critical to improve NH and MS was paramount for water resources management, sound early warning systems and disaster reduction. This resulted in the formation of the Pacific Meteorological Council (PMC) in Marshall Islands in 2011. The PMC, now a specialised body of SPREP and strongly supported by SPC, WMO and USP, was established to provide scientific and technical support and coordination in NHMS space.

Currently the PMC has 6 technical areas, namely climate services, communication and infrastructure, ocean and marine services, aviation services, educations, training and research and hydrological services.



Critical to the governance mechanisms and worthy to emphasise is that the Pacific Hydrological Services Panel (HSP) was recently incorporated and endorsed in December, 2017 to support delivery and coordination of meteorological and hydrological priorities stipulated in the Pacific Island Meteorological Strategy 2017-2026. Following this endorsement, a TOR for the HSP was developed focusing on the following area:

- To establish links and improve coordination between the PMC and international and regional organizations with an interest in hydrological services. [This would include, but not be limited to: WMO, UNESCO-IHP, International Association of Hydrological Sciences (IAHS), International Association of Hydrogeologists (IAH), International Groundwater Resources Assessment Centre (IGRAC), PIFS, SPREP, USP, SPC, CSIRO, Geosciences Australia, NIWA, NOAA, USGS]
- To provide guidance on the design and scope of current and future programmes that support hydrological services at the community, national and regional levels;
- To work with partners, including the WMO RA V Working Group for Hydrology, to progress the development and implementation of new programmes and initiatives to address identified gaps in PICTs capacity to provide quality hydrological services relevant to Pacific island environments and circumstances.

MAJOR CHALLENGES

Although the recent progress and commitment from Pacific island leaders and the establishment of key technical groups and support from regional partners, is it critical to understand the number of fundermantle challenges prevalent in the region and required immediate attention. These include, but not limited to:

1. Lack of coordination between NH and MS to undertake periodical monitoring and data sharing;
2. Lack of capacity to confidently design monitoring programs and lack of long-term data to undertake modelling ;
3. Lack of resources within government to be mobilised for NHMS data collection during disaster periods;
4. Lack of joint initiatives and opportunities for capacity building within the NHMS;
5. Lack of infrastructural and telecommunication; and
6. Inadequate forecasting system to predict and warn potentially vulnerable communities of looming disasters for appropriate response and/or actions.

ACTIVITIES AND PROGRESSES IN WATER-RELATED DISASTER SPACE.

1. A UNESCO IHP work plan meeting was undertaken in Nadi, in November 2017
2. JICA supported DRM work in the Solomon Islands where one of its major rivers is currently equipped with monitoring and telemetered stations – this is possible pilot for Catalogue of Hydrology Analysis publication.
3. Partnership between Fiji NHMS with SPC to undertake peak flood flow estimation after TC Josie early in the year – the approach used was the slope area methods where R10 Survey grade GPS was used to capture elevation of high flood mark.
4. The partnership between India, UNDP and SPC that enabled the training of 17 participants from 9 countries at the Roorkee National Hydrological Institute, in July 2018.
5. A Pacific Hydrology Panel meeting was undertaken in August, 2018 in partnership with the New Zealand funded Water Security project – the meeting resulted in the panel members workshopping the Pacific IHP work plan with key country needs and actions established.
6. Numerous early warning and early action initiatives, including the training on TB3 rain-gauges installation and data collection and analysys around the region
7. Groundwater investigation in a number of countries in response to drought and cyclone disasters where new and/or alternative groundwater sources were identified through the use of electrical resistivity geophysics.

SUGGESTED WAY FORWARD

The Pacific Hydrological Panel, during its regional meeting in Nadi, Fiji Islands in August, 2018 has agreed on a work plan towards achieving the goals of the Pacific Key Outcome 7 which is "Strengthen collaboration between meteorological and hydrological services in order to better manage water resources and reduce the impact of water related hazards". High level actions identified going forward include:

1. Identifying and quantifying impacts of climate variability and climate change to water resources

2. Identify and pursue joint opportunities NH and MS for the improved collection, management and use of hydrometric and meteorological data to support priority data needs.
3. Identify and implement opportunities to strengthen the capacity of hydrological and meteorological services.
4. Improved hydrological infrastructure, communications and forecasting systems to support hydrological services

Key to these actions are following needs:

- Having Pacific cantered approach that considers downscaling climate and rainfall models to meet PICT's needs and diversity
- Understanding the existing capacity in terms of skill sets, training and technological needs to properly and sustainably support NH and MS
- Establishing enabling environment between NH and MS to review and determine what the technological and instrumentation needs are, improve monitoring networks, ensure data compatibility and data dissemination
- Linking with WMO RAV training networks and establishing links with international institutions that provide appropriate trainings to meet in-country and Pacific needs and to build and sustain in-country or regional capacities for sound hydrological services
- Adequate investment and research efforts on flood management and drought management around improved catchment characterisations, establishing of appropriate early warning systems and trigger levels for response and understanding community alert levels and response.
- Effective and targeted communication and early warnings to the public is required.

These improvements are very well reflected in the concept of a Hydrological Observation System Phase 2, which the following goals:

- Develop regional hydrological skills and capacity - focus on leadership, and skills in data analysis, interpretation and data presentation – GIS
- Improve database management and data confidence
- Support development of flash flood warning and groundwater management products and technologies

It is critical that a multi-hazard approach, including a catalogue of methods, can be considered to capture, accommodate, and address the range the water-related hazards prevalent in the region.

ANNEX H – Catalogue of Hydrologic Analysis (CHA): Report from workshop and next steps

Catalogues of Hydrologic Analysis, CHA Workshop

United Nations Educational, Scientific and Cultural Organization | International Hydrological Programme

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

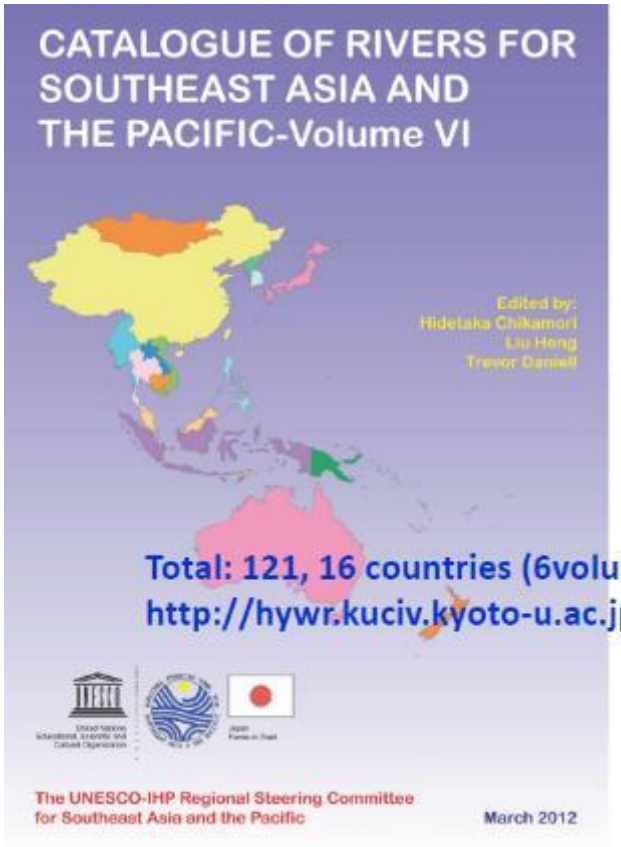
3-5 November 2018, Shanghai, China

Purpose of the workshop

- The purpose of the Catalogue of Hydrologic Analysis (CHA) is to share the information on water-related issues such as disaster preparedness, water environment conservation, and water resources management in Asia and Pacific region.
- In this workshop, hazard mapping developed at each country in the region is focused in terms of technologies, theories, experiences, good practice, and lesson learned.
- After presentations on hazard mapping for several countries, we will discuss detailed publication plan to develop CHA.

Program of the workshop

- 15.00-15. 15 Introduction
- 15:15-17:00 Hazard mapping developed in each country
- 17.00-17.30 Break
- 17.30-19.00 Discussion on publication plan to develop CHA
  - ✓ Table of Contents
  - ✓ Publication schedule
  - ✓ Editorial team
  - ✓ Next topic and schedule
  - ✓ Others



Significance of Catalogue of Rivers I-VI

1997-2012: 121 rivers in 16 countries

- When the RSC-SEAP began, information on our region and rivers in our neighboring countries was quite limited.
- Information on rivers are widely scattered in many agencies within a country and difficult to gather all to get an overall picture.
- The activity promoted the global presence of RSC-SEAP.

We have discussed new collaborative activities in Asia and the Pacific.

Catalogue of Rivers

- River information and basic hydrologic data

↓

- Hydrologic analysis tool sharing such as a rainfall-runoff model, inundation simulation tool, hydrologic frequency analysis tool, and so on

↓

Catalogue of Hydrologic Analysis

- Hydrologic analysis tool sharing, and
- Our experience of water resources management

Catalogues of Hydrologic Analysis (CHA)

Compile our experiences of water resources management (hazard map, flood forecasting, groundwater, water quality, eco-hydrology etc.) to work together and solve the problems for ourselves and for the world.

Program of the workshop

- 15.00-15. 15 Introduction
- 15:15-17:00 Hazard mapping developed in each country
- 17.00-17.30 Break
- 17.30-19.00 Discussion on publication plan to develop CHA
  - ✓ Table of Contents
  - ✓ Publication schedule
  - ✓ Editorial team
  - ✓ Next topic and schedule
  - ✓ Others

CHA Workshop Report

- November 3 15:00-19:00
- Participants: 32
- Number of countries: 12
- Number of presentations: 11

Table of Contents

Publication Schedule

Date	
November 4, 2018 RSC	Publication schedule and contents are determined. A focal point of each country is reported to Tachikawa.
April 30, 2019	Deadline for manuscript submission
	Editing works
November 2019 RSC	PDF Publication, hopefully 50 printed version, Upload to IHP WINS

Editorial Team

- Editor in chief — Ken Kobayashi
- ...
- ...
- RSC chair — Ignasius Sutapa
- RSC secretary — Yasuto Tachikawa
- RSC secretariat — Hans Thulstrup

- Please inform a focal point of each country to Prof. Kobayashi on Nov. 4th, 2018.

Next topic and long-term schedule

Date	Theme 1 Hazard mapping	Theme 2 Draught	Theme 3 ?
Nov. 2018 RSC	Workshop		
April 2019 RSC	Deadline for submission		
Nov 2019 RSC	Editorial and publication	Workshop	
		Deadline for submission	
Nov 2021 RSC		Editorial and publication	Groundwater
Nov 2022 RSC			Deadline for submission

Next topic: Draught?

CHA Development Plan

- New activity in AP-RSC followed by Catalogue of Rivers.
- Contents: Compiling methods, technologies, experiences, good practices, lesson learned in each country on water-related disaster preparedness (hazard mapping, flood warning), eco-hydrology (water quality control in lake, water environment conservation), water resources (groundwater, draught) etc., which are related to IHP8 and SDGs.
- Schedule: 2018 to 2027.
- Editorial team: RSC chairperson, secretary, two CHA task force members for each theme.
- Pdf documents are updated on RSC web page and IHP-WINS.
- RSC member countries are encouraged to submit documents.

- A different theme will be selected every year at RSC meeting and papers will be collected at RSC meeting.
- Schedule planed:

Date	Theme 1	Theme 2	Theme 3
Nov. 2018 RSC	Hazard mapping		
Nov 2019 RSC	Deadline for submission	water quality control in lake	
Nov 2020 RSC	Editorial and publication	Deadline for submission	Groundwater
Nov 2021 RSC		Editorial and publication	Deadline for submission

Table of Contents（原案）

Title: Flood hazard mapping in the ABC river

1. Catchment introduction
   Overview of the ABC river. It is desirable to refer Catalogue of Rivers.
2. Method to make flood hazard map
   - 2.1 Theory to make flood inundation map
     Theory, equations, experiences to make flood hazard mapping
   - 2.2 Development of flood hazard map
   - 2.3 Tools to make flood hazard map
3. Usage of flood hazard map
   Flood waring, dissemination of flood prone are, land use regulations
4. Administrative and legal framework
5. Good practice, Lesson learned.
6. References