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INTERNATIONAL HYDROLOGICAL PROGRAMME

25Th IHP Regional Steering Committee Meeting for Southeast Asia and the Pacific

Manila, Philippines, 13 November 2017

FINAL REPORT

IHP-VIII │Regional Steering Committee Meeting │ No. 25
Regional Steering Committee for Southeast Asia and the Pacific
UNESCO Jakarta Office, 2017

Contents

The 25th IHP
Regional Steering Committee Meeting for Southeast Asia and the Pacific (RSC – SEAP)

Manila, Philippines
13 November 2017

Chair:	Mr. Guillermo Q. Tabios III (Philippines)
Secretary:	Mr. Yasuto Tachikawa (Japan)
UNESCO Representatives:	Mr. Hans Thulstrup (Jakarta Office) Ms. Maria Karisma Bea Agarao (Manila Liaison Office)
Countries Represented:	Australia, China, Fiji, Indonesia, Japan, Malaysia, Mongolia, Myanmar, Philippines, Republic of Korea, New Zealand, Thailand, Vietnam.
Observing Countries and Organizations:	Germany, India, Pakistan, Asia Pacific Center for Ecohydrology (APCE) and Humid Tropics Center Kuala Lumpur (HTCKL), International Centre for Water Security and Sustainable Management (IWSSM), International Centre for Water Resources and Global Change.

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

1. Welcome and Opening Remarks by Local Host and UNESCO

As the host and Chair of the RSC, Mr. Tabios opened the meeting at 09.00 am on 13 November 2017. He warmly welcomed the participants from member and observing countries, UNESCO, as well as the participating water-related UNESCO Category 2 Centres. Mr. Tabios also thanked everyone for the tremendous support he received during his tenure as the Chair of the RSC.

Mr. Tachikawa and Mr. Thulstrup delivered opening remarks, thanking the host country, the Philippines National Commission for UNESCO, the Philippines Water Partnership, and all of the local contributors and partners who have made the meeting possible. Both also thanked all for their engagement and participation and wished everyone a fruitful meeting. Adding to this note, Mr. Thulstrup specifically thanked the Government of Japan for its generous, consistent and unwavering support towards IHP in Asia and the Pacific, and towards the RSC in particular.

2. Commemorative Addresses on the Occasion of the 25th Anniversary of IHP RSC – SEAP

The 2017 meeting of the RSC event marked the Committee's 25th anniversary. Marking this occasion, special commemorative addresses had been prepared by two founding members of

the RSC, Prof. Kuniyoshi Takeuchi of Japan and Prof. Soontak Lee of the Republic of Korea. The two esteemed professors delivered their remarks in the opening session of the UNESCO-JASTIP (Japan-ASEAN Science, Technology and Innovation Platform) Joint Symposium on Intra-Regional Water Security and Disaster Management, held on 15-16 November 2017 in affiliation with the 25th meeting of the RSC. They spoke to the Committee's early history, its objectives, and the achievements and challenges experienced over the past 25 years.

The complete presentations of two commemorative addresses can be found in **Annex B** of this report**.**

3. Adoption of the Agenda

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

4. Secretariat Reports

4.1 UNESCO Office Jakarta Report

The report of RSC Secretariat was delivered by Mr. Thulstrup. In his presentation, Mr. Thulstrup outlined the action points from the last RSC meeting, activities implemented between November 2016 and November 2017 as well as relevant publications by UNESCO Office Jakarta. The important points from the presentations are highlighted below:

1. UNESCO Office Jakarta has implemented a range of activities towards the six themes and focal areas of IHP VIII strategic plan.
2. The activities - ranging from community-based training programmes, to inter-regional and international workshops, national dialogues, UNESCO conferences, stakeholder meetings and training courses - were implemented widely in Asia and the Pacific, as well as in Africa through interregional cooperative activities.
3. The activities saw active participation from policy makers, water practitioners, professionals and students, communities and IHP network in Asia and the Pacific.
4. UNESCO Office Jakarta took part in a various water-related events in the region, such as the preparations for the Asia-Pacific Water Summit, the Korea International Water Week, and the Asia International Water Week.
5. UNESCO Jakarta leads Asia and the Pacific Regional Ecosystems theme towards the 8th World Water Forum in Brazil.
6. In coordination with the HTC-KL Category 2 Centre, UNESCO office Jakarta oversaw the launching of the three-volume *Water Management Curricula Using Ecohydrology and Integrated Water Resources Management* and *Customizing IWRM at the River Basin Level*.

The Secretariat thanked and acknowledged the generous financial support of the Member States, in particular, the support Indonesian Funds-in-Trust (IFIT), Japanese Funds-in-Trust

(JFIT) and JICA, and Malaysian Funds-in-Trust (MFIT), whose support made these activities possible.

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

4.2 Report of IGC Bureau

Mr. Tachikawa, the IGC Vice-Chair, presented the outcomes of the 55th session of the IHP Bureau. The major points from the event, held on 20-22 June 2017, and subsequent follow-up actions were reported as:

a) Budget for 2018-2021 (39 C/5)

- Mr. Tachikawa took note of the contribution made by member states of the region - including Iran, Japan, Malaysia, Nepal and the Republic of Korea – towards the submission of a draft amendment to the UNESCO Executive Board's 22nd session in October 2017 proposing that a distinct main line of action on Water Security be included in the 39C/5.

b) Update of the IHP statutes and rules of procedure of the IHP Council.

- The Bureau requested the Secretariat to prepare a revised draft of the IHP Statutes and Rules of procedures that includes the comments from surveys and regional consultations.

c) Implementation of the resolutions and decisions adopted at the 22nd session of the IHP IGC

- The Bureau decided to set up a Task Force, composed of one member per region, with the objective of preparing a publication compiling all IHP activities on Water and Climate Change. The publication should also include activities from the UNESCO Water Family and inputs from the World Water Development Reports.

d) IHP-WINS.

- WINS (Water Information Network System) is an open source and open access platform that combines geo-localized data. It was 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. It is designed to assist the Member States in monitoring and implementing the Sustainable Development Goal to "ensure availability and sustainable management of water and sanitation for all" (SDG6). Further information about IHP-WINS is available at https://en.unesco.org/ihp-wins.

Please see **Annex E** for Mr. Tachikawa's complete report of IGC Bureau.

5. Country Reports

RSC member countries briefly presented their activities since the last RSC meeting. A maximum of 4 minutes was allocated for each presentation. Below are brief highlights from the presentations. See **Annex F** for the complete country reports.

5.1 Australia

(Presented by Mr. Ian White)

- Mr. White presented a paper called "Re-engaging UNESCO's International Hydrological Programme in Pacific Island SIDS – Methodology and Workplan".
- The report sets out preliminary work on reviewing the situation and needs in water and sanitation in the very diverse and geographically dispersed Pacific island countries.
- The report examines the Pacific engagement of UNESCO IHP, its relation to the UN's 2030 Agenda and SDG6 on water and sanitation, as well as its past contributions to small island water resources and their management.

5.2 China

(Presented by Mr. Wang Jun)

Mr. Wang presented a summary of activities undertaken in 2017 as well as planned activities by Chinese National Committee for IHP.

Activities were undertaken during the period:

- Meetings of the Chinese National Committee for IHP, discussing: decision regarding the composition of the Chinese National Committee, status of IHP-VIII activities, and decision regarding contribution to/participation in IHP-VIII.
- Activities at national level in the framework of the IHP, including: national/local scientific and technical meetings (National Hydrology Work Conference, held on 6 April 2017, in Beijing, the 5th Water Conservancy Information Technology Forum 2017, held in Nanjing, 30-31 March 2017, and The 2017 Academic Annual Meeting of Chinese Hydraulic Engineering Society, held in Xi'an on 19-21 October 2017), as well as research/applied projects supported or sponsored and collaboration with other national and international organization and/or programs.

Activities planned in 2018:

- The 26th IHP-RSC meeting 2018. China proposed to host the next meeting of the RSC in November 2018 in Shanghai.

5.3 Indonesia

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

Beginning his presentation by introducing the history and purpose of the establishment of the Indonesian National Committee for IHP, Mr. Sutapa provided an update on the newly-designed structure of the body. He furthermore presented water issues and challenges facing in Indonesia, as follows:

a) Lack of access to safe/clean water and sanitation; b) Many areas vulnerable to floods as a result of land-use change and deforestation; c) contamination of water resources from wastewater derived from agricultural, industrial, and domestic sectors; and d) the contrasting water demand and availability between the dry and rainy seasons.

Corresponding to the six themes and focal areas of IHP-VIII, Mr. Sutapa presented in further detail activities implemented by the Indonesian ministries and relevant government bodies convened under six working groups. Finally, Mr. Sutapa summed up future activities as follows:

- Need to ensure more support from the Government of Indonesia
- Strengthen networking with centers under UNESCO, universities, other institutions
- Develop demo-sites for selected and specific purposes, such as small island, karstic, ecohydrology and peatland demo-site.
- Promoting joint activities related to:
  - Sustainable water management for developing resilient 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 with IHP members;
- Attend the next RSC IHP Meeting in China;
- Support the programme and activities of APCE (the Asia-Pacific Centre for Ecohydrology).

5.4 Japan

(Presented by Mr. Yasuto Tachikawa)

Before summarizing IHP-related national activities, Mr. Tachikawa presented the composition of the Japanese IHP National Committee, as well as the status of IHP-VIII activities and funding to promote IHP activities in Japan. Various activities relating to IHP-VIII (2014-2018) themes have been implemented since 2014. As a research and education activity related to all themes in IHP-VIII, the development of a Catalogue of Hydrologic Analysis (CHA) was launched in 2016 with the support of Japan-ASEAN Science and Technology Innovation Platform (JASTIP).

From April 2016 to October 2017, the National Committee for IHP conducted a wide range of initiatives:

- Activities at national level in the framework of the IHP (National/local scientific and technical meetings, Participation in IHP Steering Committees/Working Groups, Research/applied projects supported or sponsored, Collaboration with other national and international organizations and/or programmes)
- Educational and training courses (Contribution to IHP courses, Organization of specific courses)
- Participation in international scientific meetings (Meetings within the country, participation in meetings abroad)

Future activities that have been planned by the Japanese IHP National Committee are listed below:

- Participation in the 3rd Asia-Pacific Water Summit to be held in Yangon on 11-12 December 2017.
- Participation in the 8th World Water Forum to be held in Brasilia on 18-23 March 2018.

Activities envisaged in the long-term include:

- Activities relating to "Sustainability Science", a key priority of the Japanese National Commission for UNESCO.
- Information dissemination through the webpage of the Japanese IHP National Committee (http://hywr.kuciv.kyoto-u.ac.jp/ihp/japan/index.html)
- Information dissemination through the web page of RSC-SEAP (http://hywr.kuciv.kyoto-u.ac.jp/ihp/rsc/index.html).

5.5 Malaysia

(Presented by Mr. Nor Hisham bin Mohd. Ghazali)

Mr. Ghazali summed up the activities implemented by Malaysian IHP in 2017, as listed below:

1. Meetings (Annual General Meetings, National Committee Meeting, Working Committees Meeting)
2. Activities under IHP – VIII: 2014 – 2021 (National World Water Day, Water Watch Programme for Young Leaders, Seminar Building on Effective Framework for Regional Water Corporation, Perak River Expedition, Putrajaya Lake and Wetland Exploration)
3. Activity at regional/national level in the framework of the IHP: National level (UNESCO Malaysia Day 2017)

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

1. Activities planned for December 2018:
   National Water Watch Programme for Young Leaders, IHP Technical Talk, Participation of IHP Malaysia in the next Regional Steering Committee Meeting, Participation in exhibition on Malaysia Water Resources Management (MYWRM) Forum.
2. Activities foreseen for 2018 – 2019 include:
   Participation in IHP-RSC meeting Asian Pacific FRIEND and Catalogue of Rivers, Cooperation between Malaysian universities and non-governmental organizations (NGOs) with IHP Malaysia on several matters for capacity building in hydrology and water resources fields, participation in IHP-Training courses.
3. Activities envisaged in the long-term include:
   Long-term cooperation between The Regional Centre of Expertise on Education for Sustainable Development (RCEs) Penang and IHP Malaysia for Regional Sejahtera ESD Network (RSEN); Participation in IHP-VIII projects and RSC activities; information dissemination through the webpage of the IHP National Committee; participation in IHP-RSC activities and IHP Inter-Governmental Council meetings in Paris; Malaysia IHP commitment to IHP Phase VIII (2014-2021); scientific research by Malaysia IHP Standing

Committee, collaboration with many other agencies for the purpose of scientific research and public outreach programmes.

Publications produced:

1. Monthly updates of IHP activities in DID Bulletin
2. Module for National Water Watch Programme for Young Leaders by the Committee on Education, Training and Public Information, IHP Malaysia
3. Awareness posters and Facebook page of UNESCO-IHP Malaysia.

5.6 Mongolia

(Presented by Ms. Narantuya Sanduijav)

Ms. Narantuya presented IHP-related activities implemented by the Mongolian IHP National Committee during 2016-2017:

1. Celebration of World Water Day (WWD) 2017.
2. Organization of the 24th IHP RSC that took place in Ulaanbaatar, Mongolia, during 21-24 October 2016.
3. Revisions to the national water policy.
4. Updating of the law on water pollution fees.
5. Implementing a project on “Tuul River Improvement”.
6. Implementing a project on “Improving sanitation in area households ”.
7. Workshop on strengthening cooperation with the Tuul River Basin Council.
8. Training on strengthening participation of local communities in water management.
9. Increasing cooperation with the 2030 Water Resource Group and WWF of Mongolia .
10. Integration with Mongolian Women Geologists Association to establish a Geopark in Mongolia.
11. Strengthening groundwater quality monitoring.
12. Translation of the Strategic Plan of the 8th phase of IHP (IHP-VIII, 2014-2021) from English into Mongolian.

Plans for the upcoming years include:

1. Intensify cooperation with IHP RSC members.
2. Develop and carry out joint projects and events .
3. Strengthen the capacity of groundwater quality monitoring.
4. Continue strengthening the cooperation of the Tuul River Basin Authority with the River Basin Council.
5. Further activities to strengthen the participation of the local community in water management.
6. Implement a project with WWF Mongolia for the Tuul River Basin.
7. Organize an event to commemorate the 80th anniversary of the Mongolian water sector.

5.7 Myanmar

(Presented by Mr. Than Zaw)

Mr. Zaw summarized activities undertaken and planned by the National Committee for IHP in Myanmar.

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 monitoring water quality of rivers in Myanmar, and assessment of climate change impacts on flood events.
2. Activities at the national level in the framework of IHP, such as a *Workshop for Development and Implementation of User-Relevant Flood Forecast Generation and Application System for Myanmar* organized by the Myanmar Department of Meteorology and Hydrology (DMH), as well as a *Training on Application of Remote Sensing and Geographic Information Systems for Mapping and Monitoring of Glaciers* organized by DMH and the International Center for Integrated Mountain Development (ICIMOD).
3. Educational and training courses, e.g., IHP training courses.
4. Participation in international scientific meetings and other activities at the regional level.

Planned activities for 2018:

1. The Myanmar IHP National Committee (MNC-IHP) will continue to encourage scientific and technical symposia and workshops
2. Members of MNC-IHP will attend the next Regional Steering Committee for Asia and the Pacific.
3. Members of MNC-IHP will participate in the international and national activities of IHP.
4. The Hydrological Division of DMH will upgrade the flood early warning system and flood monitoring system.
5. The Remote Sensing and GIS Division of DMH will produce flood risk maps and flood assessment maps to reduce the loss of life and properties.

5.8 New Zealand

(Presented by Mr. Dennis Jamieson)

The presentation outlined the followings points:

A. Activities undertaken:

1. Meeting of the IHP National Committee, covering:
   a. Composition of the IHP National Committee
   b. Status of IHP activities (such as the continuation of funding of the projects relating to Information on New Zealand's Freshwaters: 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 Committees Working Groups, research/applied projects supported or sponsored, and collaboration with other national and international organizations and/or programmes.
3. Education and training courses.
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)

B. Future activities:

1. Activities foreseen until December 2017: the annual conference of the New Zealand Hydrological Society is to be held in Napier in November 2017.
2. Activities planned for 2018: 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:
   - NZAID funded Pacific Hydrological Training Programmes as required.
   - NZAID monthly financed "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.

5.9 The Philippines

(Presented by Mr. Roy Soriano)

Mr. Soriano began the report of the Philippine National Committee for IHP by outlining the Committee's composition. Mr. Soriano then summarized activities undertaken at national level in the framework of the IHP. These include:

- National/local scientific and technical meetings, such as the Philippine Water Partnership's (PWP) activities in 2017.
- Participation in IHP Steering Committees/Working Groups, i.e., participation in the 24th Regional Steering Committee Meeting of the UNESCO International Hydrological Programme for Southeast Asia and Pacific (UNESCO-IHP SEAP) and the associated International Conference in Ulaanbaatar, Mongolia, October 2016.
- Research/applied projects supported or sponsored, such as the National Water Resources Board's project on reservoir operation studies, and the Philippine Atmospheric, Geophysical and Astronomical Services Administration's (PAGASA) project on upgrading of flood forecasting operations.

Planned 2017-2018 activities of the IHP National Committee of the Philippines are:

- Mapping of RSC future projects against IHP VIII "Water Security: Responses to Local, Regional and Global Challenges (2014-2021).
- Participation in current RSC-supported programs and activities such as AP-FRIEND, Catalogue of Rivers for SEAP, Flood Forecasting and Warning System FFWS and the IHP training courses conducted by the Kyoto and Nagoya Universities.
- Participation in the review of cross-cutting programs such as FRIEND, HELP, and IWRM.
- Evaluation by the IHP National Committee of IHP-VIII Themes, Focal Areas and Activities.

In terms of long-term programmes, the Philippines will focus efforts and initiatives on 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). In addition, support for and participation in the UNESCO-IHP in general and the RSC in particular will be continued – with particular focus on present and future programmes such as the Catalogue of Rivers for SEAP, Disaster Reduction Hyperbase (DRH), and IHP training courses.

5.10 The Republic of Korea

(Presented by Mr. Soontak Lee)

Mr. Lee presented IHP-related activities implemented in the Republic of Korea. Below follows a summary of undertaken and planned activities.

A. Undertaken activities:

1. National/local scientific and technical meetings:
   Annual scientific and technical meetings held in collaboration with International Hydrologic Environmental Society (IHES), Korea Water Resources Association (KWRA), Korean Society of Civil Engineers (KSCE), ICOLD Korean National Committee (KNCOLD), IWRA Korea Geographic Committee (IWRA-KGC), Korea Federation of Water Science and Engineering Societies (KFWSES), Korea Water Resources Corporation (K-Water), and other water-related organizations in Korea.
2. Participation in IHP Regional Steering Committees / Working Groups:
   - The Republic of Korea is among the most active member countries in the RSC's activities.
   - The Republic of Korea's delegates actively participated in the work of the RSC, workshop and working group meetings held in the period of 2014-2017.
   - The Republic of Korea IHP National Committee contributed to the 7th World Water Forum held in Daegu-Gyeongbuk, Republic of Korea, under the name of the RSC.
3. Research/applied projects supported or sponsored.
4. Collaboration with other national and international organizations or in programmes.
5. Cooperation with the global/regional water centres under auspices of UNESCO, such as the International Centre for Water Security and Sustainable Management (i-WSSM) (a UNESCO Category 2 centre) hosted by the K-water Institute.
6. Collaboration with other national and international organizations or in programmes, e.g., Korea Water Resources Corporation (K-Water); Korea Water Resources Association (KWRA); Korean Society of Civil Engineers (KSCE); Korean Society of Agricultural Engineers (KSAE); Korean Universities Hydrology and Water Resources Programmes, among others.
7. Educational and training courses: contribution to IHP training courses through organization and/or participation.

B. Planned activities:

1. The Republic of Korea IHP National Committee will actively continue to participate in the Asian Pacific FRIEND/HELP projects to produce successful results for Southeast Asia and the Pacific, and will execute a HELP river basin project in collaboration with other HELP projects in the region and UNESCO international cooperative studies.

5.11 Thailand

(Presented by Mr. Mongkol Lukmuang)

Mr. Lukmuang briefly shared the following activities of the Thailand IHP National Committee and related activities:

1. Meeting of IHP National Committee.
   From October 2016 – September 2017, no meeting or discussion was held by the Thailand IHP National Committee. However, the Committee secretariat encouraged the members to continue knowledge and technology sharing and cooperate in various ways to promote hydrological improvement and water resources criteria.
2. Activities at the national level in the framework of the IHP included participation in:
   - The 22nd Session of IHP Intergovernmental Council, 13-17 June 2016, Paris, France.
   - The 24th RSC and associated conference, 24-26 October 2016, Ulaanbaatar, Mongolia
3. Participation in international scientific meetings and projects:
   - The 2nd World Irrigation Forum and 67th International Executive Council (IEC) Meeting (Water Management in a changing World: Role of Irrigation for Sustainable Food Production) on 6-12 November 2016, Chiang Mai, Thailand.
   - WMO 15th Commission for Hydrology (CHY), held during 7-13 December 2016, Italy.
   - THA 2017 International Conference on Water Management and Climate Change towards Asia's Water - Energy - Food Nexus, held during 25-27 January 2017 in Bangkok, Thailand.
   - 49th Session of the ESCAP/WMO Typhoon Committee, 21-24 February 2017, Yokohama, Japan.
   - Regional Consultation Workshop on Basin-wide Assessment of Climate Change Impact on Socio-Economic and Status of Climate Change and Adaptation in the Lower Mekong Basin, held on 12-13 June 2017, Siem Reap, Cambodia.
   - Master Program for Senior Professionals for Lancang-Mekong Water Resources Cooperation, held during 21-29 August 2017, China.
   - ESCAP/WMO Panel on Tropical Cyclones, held on 9-15 September 2017, Bahrain.
   - The 3rd Joint MRC-China Symposium held on 16-17 October 2017, Nanjing, China.
   - The project "A Comparative study of changes of hydrological processes and fluxes in the Jiulong River and Chao Phraya River under changing climate", undertaken during 22-27 October 2017, Tsinghua University, China.
   - ESCAP/WMO Typhoon Committee 11st Integrated Workshop (IWS), held on 24-27 October 2016, Philippines.
4. Future activities
   - Continuation of collaboration with RSC-IHP.
   - Enhancing activities contributed to IHP-VIII.
   - Enhancing activities on flood and drought management.
   - Continuation of promotion of integrated water resources management.

5.12 Vietnam

(Presented by Mr. Hoang Minh Tuyen)

Mr. Tuyen presented the national report on IHP related activities in Vietnam between October 2016 and October 2017.

A. Activities undertaken

1. Activities at the national level in the framework of the IHP:
   - Organized a workshop on "Capacity Building on Climate Change and Sustainable Development for the Ha Noi University of Natural Resources and Environment", on 9 January 2017, in collaboration with Yonsei University, Korea.
   - Organized a workshop on "Transfer Flash Flood Risk Maps to 19 provinces in Central and Central Highland of Vietnam.
   - Continued collaboration with the Hydrology Research Center (USA) to develop Flash Flood Warning System for Vietnam (VNOFFGS and VNAFFGS), funded by the Government of Vietnam.
2. Education and Training Courses. IMHEN (Institute of Meteorology, Hydrology and Environment) organized a training course on applying Arc GIS to Develop flash flood risk Maps.
3. Participation in international scientific meetings, i.e. the participation of the Vietnam National Committee of IHP at the 2017 UNFCCC Climate Change Summit in Bonn (COP23).

B. Future Activities

1. Activities planned for 2017-2018
   - Attending the meeting of 26th IHP Regional Steering Committee for Southeast Asia and the Pacific.
   - Participating in regional and national activities of IHP.
   -
2. 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.

6. Reports from Observing Countries

Brief highlights from presentations made by observing countries are presented below. See **Annex G** for the complete reports.

6.1 India

(Presented by Mr. Vikas Chandra Goyal)

Mr. Goyal delivered a presentation about National Institute of Hydrology (NIH), highlighting the areas of research and development of the institute; outputs and outcomes that have been achieved; as well as significant completed projects and activities implemented under the organization. In addition, some public awareness and outreach activities were presented in detail such as World Water Day celebration, participation in India Water Week, Participation in Indian Science Congress exhibition, participation in India International Trade Fair, awareness

programmes for students, women and farmers, and the printing & distribution of pamphlets on different water-related themes. Future proposed activities and projects of the institution were also briefly presented.

6.2 Pakistan

(Presented by Mr. Muhammad Ashraf)

Mr. Ashraf stated that the Pakistani National Committee for IHP comprises 18 members. The body was formulated to prepare and coordinate a National Hydrological Program (NHP) under the umbrella of the UNESCO-IHP and other international agencies, to identify gaps in the areas of human resource development technologies, instrumentation, and methodology at national and regional levels, to suggest related measures, and to establish international/regional linkages and cooperation.

Below are summarized some recent activities related to IHP conducted in Pakistan:

1. Development of a National Research Agenda on Water and framework for achieving SDG 6.0.
2. Investigation and mapping of groundwater zones in the Upper Indus Basin – 4 Doabs (Thal, Bari, Rechna, and Chaj).
3. Initial investigation and mapping the groundwater of the Lower Indus Basin.
4. Evaluation and introduction of low-cost innovative recharge techniques i.e. leaky structures/dams in Quetta and Qilla Saifullah districts of Balochistan.
5. Determination of soil hydraulic properties in the upper Indus and Kabul rivers watersheds and the Indus Plain (Sutlej, Ravi, Jhelum, and Chenab).
6. Development of a manual for determining the soil physical and hydraulic properties.
7. Introduction of rainwater harvesting and watershed management techniques in the Cholistan, Thar deserts and DI Khan districts.
8. Satellite-based monitoring of surface and groundwater through GRACE (Gravity Recovery and Climate Experiment) in collaboration with the University of Washington.
9. Launched satellite-based Irrigation Advisory Services.
10. Monitoring spatial and temporal water quality trends of the eastern rivers of Pakistan (Sutlej and Ravi).
11. Declaration of the “Karez System Cultural Landscape” in Balochistan as a World Heritage Site

Future activities include the following:

1. Assessment of country-wide wastewater management and development of strategic action plan for sustainable ecosystems.
2. Impact of climate change on water demand/supply for sustainable water resources management in the Indus Basin.
3. Trans-boundary effects on groundwater and surface water along the eastern border of Pakistan.
4. Improved land and water conservation practices to enhance wasteland productivity in the Thal and Thar deserts.
5. Headwater management to the water resources depletion in the downstream of the Indus river system.

6. Strengthening national capacity to reduce drought impacts and improve food security.
7. Rehabilitation of the Karezes in Balochistan through integrated watershed management.
8. Management and policy interventions.

7. Updates from the Centres under the Auspices of UNESCO

Four water-related UNESCO Category 2 Centres were present and updated their activities during the meeting. Brief summaries of the presentations are presented below. Please see **Annex H** for the complete reports.

7.1 Asia Pacific Centre for Ecohydrology (APCE)

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

In his presentation, Mr. Sutapa outlined main issues related to water at regional and global level. He presented the history of APCE's formation and its recognition as a centre under the auspices of UNESCO. In addition, the updates of recent APCE activities were presented and framed as follows:

1. Research and Development
2. Training, Capacity Building, and Collaboration
3. Social, Culture, and Public Awareness
4. Information System and Database

All four programmes are expected to contribute to the implementation of SDGs, mainly SDG No. 6, 13, and 15.

7.2 Humid Tropics Centre Kuala Lumpur (HTCKL)

(Presented by Ms. Rohani Ahmad)

Ms. Ahmad presented a report of HTCKL that highlighted activities from November 2016 to October 2017, as well as future activities of the centre. Various activities implemented by HTCKL during the period are summarized below:

1. Participation in various seminar, workshops, training events, and meetings.
2. Events held at international, regional, and national level.
3. Research activities and water education programme.
4. Publications produced e.g., comparative studies, journal articles, Water Management Curriculum (3 volumes)

Furthermore, Ms. Ahmad outlined the future programmes of the centre, including the following: dissemination of Water Management Curriculum to UNESCO Water Centres and the wider UNESCO Water Family, and the organization of a training course on Urban Stormwater Management (MSMA) for Ethiopia. The centre also set number of targets for its Water Management Curriculum, as follows: organization of a public outreach programme on ecohydrology, Tasik Chini sediment curriculum, river rehabilitation & river restoration, and an ecohydrology curriculum for youth.

7.3 International Centre for Water Hazard and Risk Management (ICHARM)

(Presented by Mr. Tetsuya Ikeda)

Mr. Ikeda outlined three pillars of ICHARM Activities: a) Research and Technology, b) Information and Networking, and c) Training. The centre's innovative research and technology cover the programmes Flood Analysis Systems developed by ICHARM, Programme for Risk Information on Climate Change (SOUSEI Programme), Community-level Flood Contingency Plans, and research on flood and sediment disasters in low upland areas. In terms of information networks, Mr. Ikeda highlighted the activities of the International Flood Initiative (IFI) as well as the establishment of platforms in each country through IFI. Lastly, on the topic of training/capacity development programmes, he noted that ICHARM has been providing various programmes in disaster management, mainly focusing on the governmental engineers in developing countries (accepting more than 1,300 trainees from about 60 countries).

Future events in which ICHARM will take part include:

- IFI technical session at the World BOUSAI Forum in Sendai, Japan, on 28 November 2017, entitled "Platform on Water and Disaster – ICT, Economy, Community, Dynamics".
- Thematic session at the 3rd Asia-Pacific Water Summit (APWS) in Yangon, Myanmar on 11 December 2017, in collaboration with ICIMOD and SPC, entitled "Water and Disasters in the context of Climate Change – From the Mountains to the Islands".
- Submitted Expression of Interest for the 8th World Water Forum (WWF8) in March 2018, in Brasilia, Brazil.

7.4 International Centre for Water Resources and Global Change (ICWRGC)

(Presented by Mr. Ulrich Looser)

Mr. Looser's presentation covered five sectors of ICWRGC's 2016/17 report, wrapping up the session of UNESCO's centre presentations. Mr. Looser briefly presented the following highlights of the centre's activities:

1. Research projects undertaken, including simulation and monitoring of SDG indicators, climate change in the Mediterranean areas, climate change adaptation, water quality from remote sensing, water diplomacy, water scarcity, and seamless prediction.
2. Data: GTN-H, GEMStat, Global Water Information System.
3. Education and capacity building: E-learning, summer schools, flood and drought management, hydro-forum.
4. Events: conferences, workshops, meetings.
5. Networks:
    - National (BMUB, BMVI, AA, BMBF, BMZ, DFG, GPCC, GRDC, Universities)
    - International (IAHS, ERCE, ICWC, SWFP, IAS, ESA, CHR)
    - Supranational (UNEP, FAO, UNESCO, WMO, WWAP, UN Water)

8. Report from UNESCO Conference on Water Security in the Pacific SIDS

The UNESCO Conference *Water Security in the Pacific SIDS: Bringing UNESCO's International Hydrological Programme to the Pacific* was held in conjunction with the International Initiative on Water Quality's regional consultation in the Pacific SIDS in Nadi, Fiji on 23-24 October 2017. The event was organized to review and establish water-related priorities, needs, and implementation gaps in the Pacific with focus on the opportunities offered by IHP. Ms. Susana Pulini of Fiji reported the results of this event.

The following represents a brief listing of the proposed interventions arising from the Nadi meeting, with a focus on cooperation and resources - both technical and financial – that IHP and the UNESCO Water Family may consider supporting in the Pacific SIDS:

- Hydrological data collection, storage, analysis and reporting protocols.
- Water quality monitoring – surface and groundwater resources, drinking water, including household rainwater collection systems.
- Water education and capacity-building at all levels.
- Updating the Pacific Regional Action Plan (RAP).
- Updating of crucial resource materials.
- Understanding groundwater dynamics for water security.
- Engagement with the Pacific Hydrology Services Panel.
- Provision for technical support and science-based information on identifying and monitoring impacts of climate change on water resources in the Pacific.

Please see the **Annex I** for the full message presented, including context and detail concerning the items listed above.

9. Updates on Catalogue of Hydrologic Analysis modules

Mr. Yasuto Tachikawa of Japan presented an update on the Catalogue of Hydrologic Analysis (CHA) modules currently under development and discussed at the 24th meeting of the RSC held in Mongolia in 2016. Referring to the related website (http://hywr.kuciv.kyoto-u.ac.jp/ihp/rsc/cha.html), Mr. Tachikawa explained the content and the status of the modules. He also briefly highlighted the content and activities of a new CHA-related proposal to be developed in 2018 and 2019.

A discussion followed Mr. Tachikawa's presentation, focusing on the new CHA proposal. Committee members expressed support for Japan to take the lead in developing new activities related to the CHA in close dialogue with interested partner countries such as Vietnam, which will contribute to the programme in extension of work undertaken on floods in the Mekong Delta. Other delegates expressed interesting contributing actively to the initiative, namely Australia, China, Indonesia, Malaysia, Philippines and Thailand. UNESCO Office Jakarta took note of a suggestion to facilitate a face-to-face meeting of this group to discuss on the new proposal and assist the RSC in carrying out the related tasks and facilitating the work of the Committee's. The complete presentation on the CHA is available in **Annex J** of this report.

10. Discussion on RSC Statutes and membership

In response to a query from the Secretariat, the RSC unanimously declined to adopt any formal Statutes of Rules of Procedure to govern its work. Rather, the Committee expressed its desire to continue relying its established practice of adopting decisions on the basis of discussion and consensus.

The Secretariat then asked whether – taking into consideration the increasing interest in participating in the Committee's work expressed by countries beyond its original geographical scope – the members of the Committee would wish to formally adopt a more open policy by which all interested national IHP Committees and Focal Points in the region would be invited to participate in the Committee's work. The delegate of the Republic of Korea expressed support for this proposal, suggesting that the RSC be expanded to include the entire Asia and the Pacific.

In response to this proposal, the Committee decided unanimously to welcome as a member any country in Asia and the Pacific with a desire to participate in the Committee. Countries wishing to obtain membership in the RSC are invited to submit an expression of interest in writing to the Secretary, in the understanding that new member countries will be responsible securing the financial means for their participation in the meetings of the Committee.

The Committee took note that this decision was a reflection of the increasing interconnectedness of the Asia and the Pacific as well as the shared water-related challenges faced by countries across the region.

To reflect its new geographical scope, the Committee further agreed to adopt as its new name the ***IHP Regional Steering Committee for Asia and the Pacific***, removing the word "Southeast".

11. Organization of the 26th and Potential Host for the 27th RSC Meeting

Further to the decision of the 24th meeting of the RSC to invite China to host the Committee's 26th meeting, the Chinese delegation presented its plans to host the event in Shanghai, China. The date for the meeting was tentatively set for the week of 19 November 2018.

Myanmar expressed its interest in hosting the 27th meeting of the Committee in 2019, having deferred hosting of the 23rd meeting. All members agreed to the proposal. Vietnam and Malaysia both expressed their interest in hosting the 28th RSC meeting to the general acclaim of the meeting.

12. Election of RSC Chair

Two delegations – China and Indonesia – expressed interest in serving as Chair of the RSC for the period 2017-2019. Following a brief discussion on the most appropriate manner in which to determine the selection of the Chair, the Committee decided to proceed with a secret ballot, overseen by the Philippines as Chair and assisted by Japan as Secretary.

Ballots were distributed to the following members of the committee: Australia, China, Indonesia, Japan, Malaysia, Mongolia, Myanmar, New Zealand, Philippines, Republic of Korea, Thailand, and Vietnam. Based on established practice, ballots were not distributed to observer countries and institutions, nor to Fiji, which participated in the meeting with the specific mandate of delivering a message from the Pacific IHP community (see section 7 above). The ballot resulted in the election of Indonesia as Chair of the RSC. Represented by Ignasius D.A. Sutapa, Indonesia will serve as Chair of the RSC from 2017 through 2019, with a new Chair to be elected at the Committee's 27th meeting.

13. Any Other Issues

Mr. Soontak Lee led the Committee in a brief commemoration on the occasion of the passing of Prof. Leonardo Liongson. Prof. Liongson was a founding contributor to the RSC when the Committee was created of the RSC in 1993. The meeting observed a minute of silence to pay tribute to Prof. Liongson. The Chair, Mr. Tabios, will also pass the condolences of the meeting to the family of Prof. Liongson.

14. Adoption of Resolutions

The 25th meeting of the RSC chose not to adopt any formal resolutions.

15. Closure of the Meeting

Thanking all participants for a fruitful meeting, the RSC Chairperson, Mr. Guillermo Tabios, representing the Philippines as outgoing Chair of the RSC, officially closed the meeting at 17.30.

Action points:

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**

All presentations of the meeting can be downloaded at http://jfit-for-science.asia/25th-rsc-meeting-and-unesco-jastip-symposium/

ANNEX A - List of participants of the 25th IHP RSC SEAP

No	Country	Full name	
1	Australia	Mr.	Prof. Ian White
2	P. R. China	Mr.	ZHAO Xin
3	P. R. China	Mr.	WANG Jun
4	P. R. China	Mr.	YU Dazheng
5	P. R. China	Mr.	YU Zhongbo
6	Fiji	Ms.	Susana Pulini
7	Germany	Mr.	Ulrich Looser
8	India	Mr.	Dr. Vikas Chandra Goyal
9	Indonesia	Mr.	Dr. Fauzan Ali
10	Indonesia	Ms.	Maria Yustiningsih
11	Indonesia	Mr.	Dr. Ignasius D.A. Sutapa
12	Indonesia	Ms.	Eva Mia Siska
13	Indonesia	Ms.	Karlina
14	Japan	Mr.	Dr. Yasuto Tachikawa
15	Japan	Mr.	Prof. Yoshiyuki Imamura
16	Japan	Mr.	Dr. Tetsuya IKEDA
17	Japan	Mr.	Dr. Takahiro Sayama
18	Japan	Mr.	Prof. Kenichiro Kobayashi
19	RO Korea	Mr.	Prof. Soontak Lee
20	RO Korea	Mr.	Dr. Kwang-Suop Lim
21	Malaysia	Mr.	Nor Hisham Mohd Ghazali
22	Malaysia	Ms.	Ir. Rohani Ahmad
23	Malaysia	Ms.	Nor Eliza Binti Alias
24	Malaysia	Mr.	Ali Yuzir
25	Mongolia	Ms.	NARANTUYA Sanduijav
26	Myanmar	Mr.	Than Zaw
27	New Zealand	Mr.	Dennis Jamieson
28	Pakistan	Mr.	Dr. Muhammad Ashraf
29	Pakistan	Ms.	Dr. Saima Riaz
30	Pakistan	Mr.	Mr. Muhammad Sohaib Baig
31	Philippines	Mr.	Prof. Guillermo III Tabios
32	Philippines	Mr.	Richard Martin Rinen
33	Philippines	Mr.	David S. Rojas Jr.
34	Thailand	Mr.	Phoomjit Prodpran
35	Thailand	Mr.	Mongkol Lukmuang
36	Thailand	Ms.	Kanokwan Yoowong
37	Thailand	Ms.	Kanokporn Boochabun
38	Thailand	Mr.	Pathjparn Saklor
39	Thailand	Mr.	Wachira Surin
40	Thailand	Mr.	Ekaphop Thera-oran
41	Vietnam	Mr.	Hoang Minh Tuyen
42	UNESCO Jakarta	Mr.	Dr. Hans Thulstrup
43	UNESCO Jakarta	Ms.	Maria Karisma Bea Agarao

ANNEX B – Commemorative Addresses on the Occasion of the 25th Anniversary of IHP RSC – SEAP

1990

- Prof. **Yutaka Takahasi** was elected as VP of IHP IGC in Mar 1990 from AP region.
- In the *WG of Japan IHP NatCom*, the formation of RSC was proposed to promote IHP activities in AP region.
- An invitation letter was sent to all the IHP member countries in the administrative constituency of the UNESCO Jakarta Office.
- Positive replies from 12 countries incl. Japan.
  - China, R Korea, PDR Korea, Japan, Philippines, Vietnam, Cambodia, Thailand, Malaysia, Indonesia, Australia and New Zealand

1990-1993

- "Caravans" of Y. Takahasi & K. Takeuchi
  - 1992.1.13-21 Malaysia, Indonesia and Philippines,
  - 1992.6.3-11 Vietnam, ID and Thailand
  - (1994.3.29-4.6 TH, ID and Papua New Guinea)
- 1993.1.18-22 IHP ROSTSEA regional meeting in Manila: decided the establishment of RSC
- 1993.7.16 The 1st IHP RSC in Yokohama on the occasion of IAHS 4th Scientific Assembly

1990.6	Conception	
1993.1	Establishment	Manila
1993.7	1st RSC	Yokohama
1994.	2nd RSC	Siem Reap
1995.5	3rd RSC & Symposium	Kofu & Tokyo
1996.11	4th RSC & Symposium	Yogyakarta
1997.12	5th RSC & Symposium	Nong Khai
1998.11	6th RSC & Symposium	Taegu
1999.10	7th RSC & Symposium	Nanjing
2000.11	8th RSC & Symposium	Christ Church
2001.11	9th RSC & Symposium	Hanoi
2002.10	10th RSC & Symposium	Kuala Lumpur

01. 1993.07 Japan (Yokohama) Chair: Yutaka Takahasi (JP), Secretary: Kuniyoshi Takeuchi (JP)
02. 1994.11 Cambodia (Phnom Penh) Chair: Yutaka Takahasi (JP), Sec: Kuniyoshi Takeuchi (JN)
03. 1995.10 Japan (Tokyo and Kofu) Chair: Yutaka Takahasi (JP), Sec: Kuniyoshi Takeuchi (JN)
04. 1996.09 Indonesia (Yogyakarta) Chair: Badruddin Machbub (ID), Secr: Kuniyoshi Takeuchi (JN)
05. 1997.12 Thailand (Nong Khai) Chair: Badruddin Machbub (ID), Sec: Kuniyoshi Takeuchi (JN)
06. 1998.09 Rep. Korea (Taegue) Chair: Soontak Lee (KR), Secretary: Kuniyoshi Takeuchi (JN)
07. 1999.10 China (Nanjing) Chair: Soontak Lee (KR), Secretary: Kuniyoshi Takeuchi (JN)
08. 2000.11 New Zealand (Christchurch) Chair: Richard Ibbitt (NZ), Secretary: Kaoru Takara (JP)
09. 2001.11 Viet Nam (Halon Bay) Chair: Richard Ibbitt (NZ), Secretary: Kaoru Takara (JP)
10. 2002.10 Malaysia (Port Dickson) Chair: Keizrul Abdullah (MY), Secretary: Kaoru Takara (JP)
11. 2003.10 Fiji (Sigatoka) Chair: Keizrul Abdullah (MY), Secretary: Kaoru Takara (JP)
12. 2004.09 Australia (Adelaide) Chair: Tran Thuc (VN), Secretary: Kaoru Takara (JP)
13. 2005.11 Indonesia (Bali) Chair: Tran Thuc (VN), Secretary: Kaoru Takara (JP)
14. 2006.10 Thailand (Bangkok) Chair: Eddy Djajadiredja (ID), Secretary: Kaoru Takara (JP)
15. 2007.11 Philippines (Manila) Chair: Eddy Djajadiredja (ID), Secretary: Kaoru Takara (JP)
16. 2008.10 Mongolia (Ulaanbaatar) Chair: Leonardo Liongson (PH), Secretary: Kaoru Takara (JP)
17. 2009.11 China (Wuhan) Chair: Leonardo Liongson (PH), Secretary: Kaoru Takara (JP)
18. 2010.11 Viet Nam (Hanoi) Chair: Liu Heng (CN), Secretary: Kaoru Takara (JP)
19. 2011.10 Japan (Kyoto) Chair: Liu Heng (CN), Secretary: Kaoru Takara (JP)
20. 2012.11 Malaysia (Langkawi) Chair: Trevor Daniell (AU), Secretary: Kaoru Takara (JP)
21. 2013.10 Rep. Korea (Gyeongju) Chair: Trevor Daniell (AU), Secretary: Yasuto Tachikawa (JP)
22. 2014.11 Indonesia (Medan) C: Kaoru Takara (JP), S: Yasuto Tachikawa (JP)
23. 2015.10 Indonesia (Yokyakarta) C: Kaoru Takara (JP), S: Yasuto Tachikawa (JP)
24. 2016.10 Mongolia (Ulaanbaatar) C: Guillermo Q. Tabios III (PH), S: Yasuto Tachikawa (JP)
25. 2017.11 Philippines (Quezon) C: Guillermo Q. Tabios III (PH), S: Yasuto Tachikawa (JP)
26. 2018. China (Shanghai) C: Ignasius Sutapa (ID), S: Yasuto Tachikawa (JP)

1st RSC in Yokohama

- C&S: Yutaka Takahasi, Kuniyoshi Takeuchi
- NatRep: Liang Ruiju(CH), Soontak Lee(KR), Angel Alejandrino(PH), Le Van Sanh(VN), Somkid Buapend(TH), Feng Meow Chong(MY), Joesron Loebis(ID), Tony Falkland(AU),
- Mike Bonell*(UNESCO), John O. Verboon*(UNESCO-JKT), John S. Gladwell*(formerly UNESCO, CA), Klaus Wilke(GRDC), Ian Douglas(UK), Sampurno Briynzeel(NL), Voluharel Wetzel (BfG), AW Jayawardena(HK), Srisporn Surisparb(TH),
- (JP) Keiji Higuchi*, Takeo Kinoshita, Katsushige Masukura, Fumio Yoshino, Shuichi Ikebuchi, Katumi Musiake, Ryota Nakamura,

The RSC objectives

- The RSC serves as a regional forum for professionals and practitioners of hydrology and water resources in the region to
  - gather periodically,
  - exchange and discuss each other's experiences, problems and possible solutions and
  - promote scientific cooperation for better management of water in the region.

What is SEAP region to us?

- Co-existing community sharing common nature, culture, problems, potentials and fate.
  - Climate, geology, society, history, culture, urban problems, disaster, rice, air-pollution, economy,
  - Solve local problems jointly.
- Unique insights from regional peculiarity for global society.
  - Regional responsibility for the globe.

Initial agreements

- The RSC meets every year rotating in countries.
- To publish "Catalogue of Rivers for Southeast Asia and the Pacific" to mutually learn the river basins and management experiences in the neighboring countries.
- To prepare for setting forth the Asian Pacific FRIEND for promoting hydrological and water resources research and database in the region.

Significance of Catalogue of Rivers I-VI

1997-2012: 121 rivers in 16 countries

- We do not know our region and rivers in our neighboring countries.
  - Call river names by their local names.
- Information on rivers are widely scattered in many agencies within a country and difficult to gather all to get an overall picture.
  - Irrigation, public works, sanitation, groundwater, recreation, hydro-met office
- Database for the region, FRIEND, GRDC etc.
- Promoted the global presence of RSC

Names of rivers

- AU: Burdkin River, Pioneer River, Scot Creek
- KH: Prek Thnot, Stung Thinit
- CN: Bei-jiang, Jin-jiang, Jiyun-he
- ID: Citarum, Bengawan Solo, Kali Brantas, Sungai Asahan, Citanduy, Kali-Progo, Cimanuk
- JP: Yoshino-gawa, Ara-kawa, Mogami-gawa
- KR: Pyungchang-gang, Geumho-gang, Miho-chun
- MY: Rajang Batang, Sungai Johor
- NZ: Buller River, Motu River, Hutt River
- PH: Ilog Magat, Ilog Pampanga, Ilog Itaas ng Agno
- TH: Mae Nam Ping, Mae Nam Klong, Mae Nam Nan
- VN: Song Ky Cung, Son Thu Bon, Song Ba, Son Srepok
- LA: Nam Khane, Nam Ngum, Sedone
- PG: Ramu Wara, Purari Wara

KP: Taedong
MN: Tuul
MM: Chindwin

INTERNATIONAL HYDROLOGICAL PROGRAMME

Asian Pacific FRIEND

Flow Regimes from International Experimental and Network Data

Asian Water Archive

F R I E N D - A GLOBAL PROJECT

Established

- N Europe
- AMHY
- Southern Africa
- Asian Pacific
- HKH
- AOC
- Nile
- AMIGO

Emerging

- Central Asia
- N America

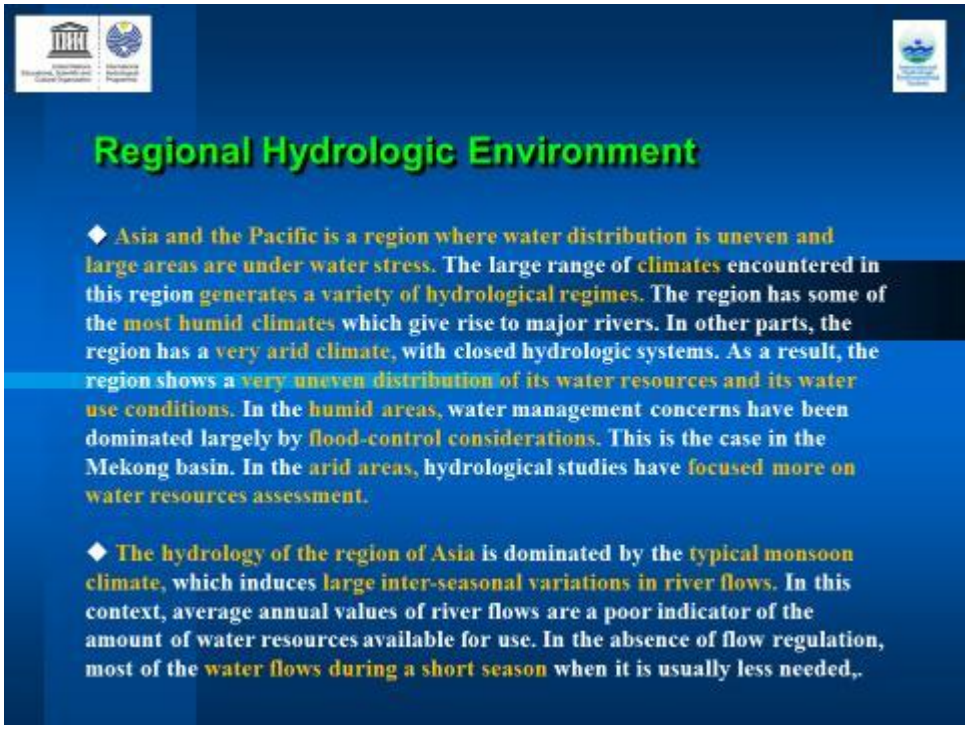

Achievements of RSC
Communication and friendship network among hydrologists and WREs in the region and spirit of working together
Global presence: Catalogue of rivers, Chairs & VCs of IHP IGC, Y Takahasi, Badruddin Machbub, K Takeuchi, Keizrul Abudulla, Liu Hen, K. Takara, Sootak Lee, Ian White, Y Tachikawa
National-awareness and support ➡ Category 2 centres: HTC, ICHARM, APCE,
Regional expansion: IHP IV 5.1➡ IHP, SEA ➡ AP, Pacific Islands, Central and South Asia
Lao, Myanmar, Fiji, Mongolia, Pakistan, Iran, …
IHP-IV (1990-1995) Project 5.1 Hydrologic Research and Water Resources Management: Strategies in the Humid Tropics and Other Warm Humid Region


Finance
Monbusho Research Grants
Japanese Fund-in-Trust
Many nations support by themselves and others

For the next quarter of a century

- AP region is facing unique natural, socio-economic and cultural changes and never experienced challenges of water environment.
- Let us work together and solve the problems for ourselves and for the world!


IHP RSC's Achievements and Challenges in SEAP Region
- In Commemoration of its 25th Anniversary -
Soontak LEE
Distinguished Professor, Yeungnam University, Republic of Korea
President, International Hydrologic Environmental Society(IHES)
Governor, World Water Council(WWC)


Regional Hydrologic Environment
◆ Asia and the Pacific is a region where water distribution is uneven and large areas are under water stress. The large range of climates encountered in this region generates a variety of hydrological regimes. The region has some of the most humid climates which give rise to major rivers. In other parts, the region has a very arid climate, with closed hydrologic systems. As a result, the region shows a very uneven distribution of its water resources and its water use conditions. In the humid areas, water management concerns have been dominated largely by flood-control considerations. This is the case in the Mekong basin. In the arid areas, hydrological studies have focused more on water resources assessment.
◆ The hydrology of the region of Asia is dominated by the typical monsoon climate, which induces large inter-seasonal variations in river flows. In this context, average annual values of river flows are a poor indicator of the amount of water resources available for use. In the absence of flow regulation, most of the water flows during a short season when it is usually less needed,.

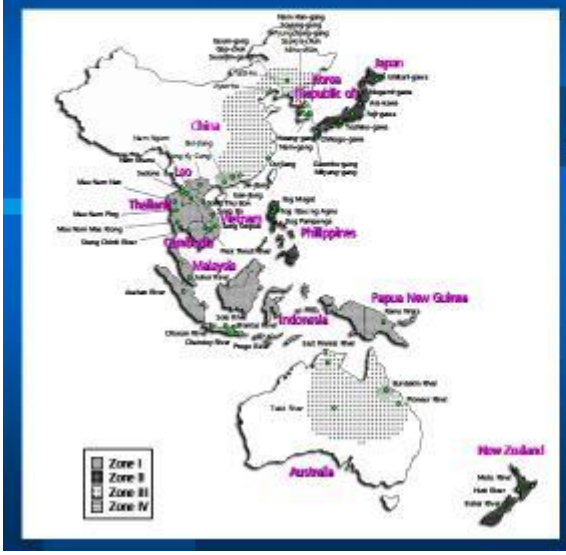
Regional Hydrologic Environment

◆ On the other hand, the largest island of the pacific region such as Australia and New Zealand have different climate(from very dry to humid). Australia is dry, with an uneven geographical and seasonal distribution of rainfall. River flows are highly variable, under the influence of an erratic climate. Diversion of water into irrigation has altered river runoffs significantly, leading in some cases to the reversal of the flow of some rivers.

◆ Overall, in the region of Asia and the Pacific, there are significant differences and varieties of hydrological characteristics through vast range of areas. Therefore, it is obviously needed to have some cooperative activities to understand the hydrology and water resources of the region.

◆ Thus, it was realized to organize an active regional cooperative in IHP through a body such as Regional Steering Committee(RSC)

Hydrologic Regimes in SEAP Region



Hydrological Zones in Southeast Asia and the Pacific River Basins(Lee, et. al, 1996 & 1997)

Zones		Countries
I	Humid Tropical Zone	Cambodia, Indonesia, Lao, Malaysia, Papua New Guinea, Thailand, Vietnam
II	Warm Maritime Zone	Japan, New Zealand, Philippines
III	Continental Monsoon Zone	Australia, China, Korea(Republic of)
IV	Other Outlier Zone	Australia(Burdekin River), China(Bei-jiang, Gan-jiang)

What is IHP?

◆ IHP Programmes

- For the solution of water problems and the protection of mans welfare and the quality of human life, a UNESCO Resolution in 1964 created the International Hydrological Decade (IHD, 國際水文十個年計劃), and embarked in 1975 on a six years International Hydrological Programme (IHP, 國際水文計劃). Since 1975, the Programme has been implemented in phases as the followings;
  - 1975-1980 : IHP-I
  - 1981-1983 : IHP-II (Interim phase)
  - 1984-1989 : IHP-III
  - 1990-1995 : IHP-IV
  - 1996-2001 : IHP-V
  - 2002-2007 : IHP-VI
  - 2008-2013 : IHP-VII
  - 2014-2021 : IHP-VIII (Present phase: Water Security)

The Eighth Phase of IHP (IHP-VIII, 2014-2021)

Water Security : Responses to Local, Regional and Global Challenges

IHP RSC(Regional Steering Committee)

◆ The formation of the IHP Regional Steering Committee for Southeast Asia and the Pacific(RSC) was first initiated in 1990 and was formally established in January 1993 at the Regional Meeting of IHP in Manila, Philippines.

◆ Since then, the RSC has been providing a platform for the IHP member countries in the region to get together periodically to address water issues in the region and exchange their experiences, discuss their problems and possible solutions and promote scientific cooperation.

The RSC is composed of representatives nominated by each national IHP Committee in Southeast Asia and the Pacific and is responsible for the planning and coordination of all IHP activities in the region.

IHP RSC(Regional Steering Committee)

◆ The RSC aims at the exchange of information about national activities for the IHP and the development of regional initiatives such as APFRIEND, APHELP and the Catalogue of Rivers for Southeast Asia and the Pacific, and also the organization of training courses, workshops and seminars in collaboration with all the member states. Under these objectives, the RSC has reached important results and achievements so far, in particular:

- ❖ It has organized its annual RSC meetings with associated International Symposia / Conferences held in rotation of the member states of total 19 countries.
- ❖ It has produced the massive quantity of approximately 800 scientific papers which have been presented in conferences and symposia all along its history.
- ❖ It has organized more than 30 training courses (IHP Nagoya training courses and others).
- ❖ It has produced and published from 1995 to 2004, 5 volumes of the catalogue of rivers for Asia and the Pacific which include 114 basins in 13 different countries. The material for a 6th volume was assembled and is available in the web.
- ❖ It has developed a regional network such as APFRIEND and APHELP, which organized several workshops, symposia and published different reports.
- ❖ It has integrated the participation of other countries in the region, such as the Pacific Island countries, Myanmar and Timor Leste (1st participation in the 19th RSC meeting, October 2011).


IHP RSC(Regional Steering Committee)
◆ Judging from above achievements, it is believed that the RSC is the most unique successful activities in the global IHP community and has been recognized as the best regional example of IHP activities with its international reputation.
◆ Undoubtedly, the member states will be great beneficiaries out of those regional IHP activities through the RSC for their solution of water problems. Regional initiatives such as APFRIEND, APHELP and Asian G-WADI, and knowledge transfers through the RSC meetings and training courses will become the milestone of each member state for their sustainable water management and regional collaboration in the IHP activities.


AP-FRIEND(Asia-Pacific FRIEND)
◆ WHAT IS FRIEND?
UNESCO
FRIEND
LOW
EGIMES FROM
NTERNATIONAL
XPERIMENTAL AND
ETWORK
ATA
An International Collaborative Study in Regional Hydrology
Asia-Pacific FRIEND
Flow Regimes from international Experimental and Network Data
friend

Catalogue of Rivers

◆ As a part of AP-FRIEND, the Catalogue of Rivers was also initiated for river basins from 11 countries – Australia, Cambodia, China, Indonesia, Japan, Korea(Republic of), Malaysia, New Zealand, the Philippines, Thailand, and Vietnam. It was an outcome of the international cooperation of later 12 countries in the region which formed the RSC under the auspices of the UNESCO IHP.

◆ The objectives of publishing the Catalogue of Rivers were as follows;

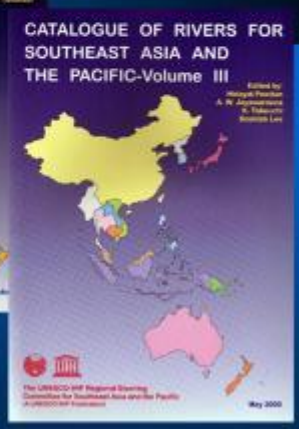
- ❖ To promote mutual understanding of hydrology and water resources of the region and of the neighboring countries. This is essential for better regional co-operation in hydrological sciences as well as for water resources development and management.
- ❖ To promote intra-national information exchange among different organizations in each country. This is essential for the development of hydrological sciences and for better development and management of the water resources within each country.
- ❖ To promote the establishment of an international data exchange and collaborative research network in the region.

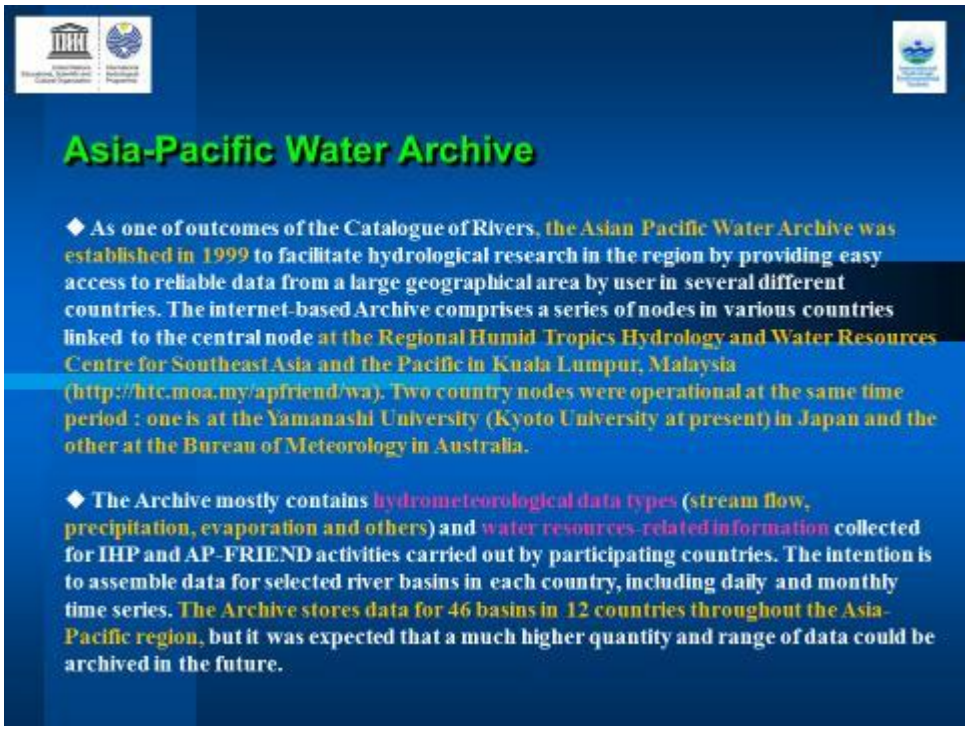
Catalogue of Rivers

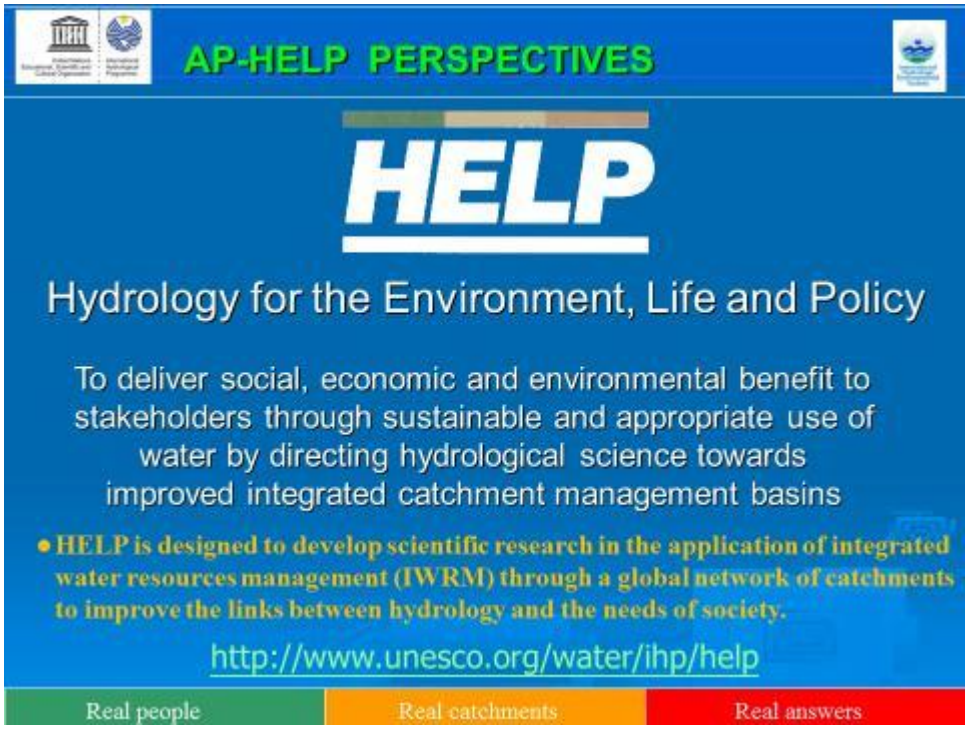
◆ With such an importance of the objectives, the Catalogue of Rivers publishing has been successfully continued to complete until Volume IV and Volume V.

◆ Some of published Catalogue of Rivers are shown in Figures (Takahasi, et. al., 1995 and Lee, et. al., 2000)

Catalogue of Rivers for Southeast Asia and the Pacific




Asia-Pacific Water Archive
◆ As one of outcomes of the Catalogue of Rivers, the Asian Pacific Water Archive was established in 1999 to facilitate hydrological research in the region by providing easy access to reliable data from a large geographical area by user in several different countries. The internet-based Archive comprises a series of nodes in various countries linked to the central node at the Regional Humid Tropics Hydrology and Water Resources Centre for Southeast Asia and the Pacific in Kuala Lumpur, Malaysia (http://htc.moa.my/apfriend/wa). Two country nodes were operational at the same time period : one is at the Yamanashi University (Kyoto University at present) in Japan and the other at the Bureau of Meteorology in Australia.
◆ The Archive mostly contains hydrometeorological data types (stream flow, precipitation, evaporation and others) and water resources related information collected for IHP and AP-FRIEND activities carried out by participating countries. The intention is to assemble data for selected river basins in each country, including daily and monthly time series. The Archive stores data for 46 basins in 12 countries throughout the Asia-Pacific region, but it was expected that a much higher quantity and range of data could be archived in the future.


AP-HELP PERSPECTIVES
HELP
Hydrology for the Environment, Life and Policy
To deliver social, economic and environmental benefit to stakeholders through sustainable and appropriate use of water by directing hydrological science towards improved integrated catchment management basins
• HELP is designed to develop scientific research in the application of integrated water resources management (IWRM) through a global network of catchments to improve the links between hydrology and the needs of society.
http://www.unesco.org/water/ihp/help
Real people
Real catchments
Real answers

Asia-Pacific HELP River Basins (Some Active Examples)

- Asia & Pacific: Tarim River Basin & Heihe River Basin(China), Indus Basin(Pakistan), Murray-Darling Basin, The Burdekin Catchment & Ord River Catchment(Australia), Langat River Basin(Malaysia), Davao Basin(Philippines), Brahmani-Baitarani Basin(India), Motueka(New Zealand), Kumho River Basin(Republic of Korea), Upper Kaligandaki(Mustang) River Basin (Nepal), Syrdarya River Basin(shared by four countries : Kyrgyz Republic, Tajikistan, Uzbekistan, Kazakhstan)

HELP actions through a global network of hydrological catchments for hydrological monitoring and data rescue

AP-HELP Linked with Korean HELP River Basin

- Joint activities proposed to be established in the Asia-Pacific HELP(AP-HELP) linked with Korean HELP River Basin(Kumho River Basin):
  - Action on the ground – e.g application of Ecohydrology Principles for improving water quality using the methods and approaches in the Putrajaya Lake in the Langat River Basin
  - New integrating science development under HELP e.g. development of quantification of water and nutrient balance by linking with the modeling frameworks in the Murray Darling
  - Indicators of HELP success through developing a baseline of hydrological and meteorological data baseline analysis for climate change
  - Implementing HELP in basins with limited resources and capacity e.g. by twining with the Davao River Basin in Philippines
  - Connecting environment, economy, social and cultural impacts through stakeholder mapping techniques
  - Institutional and legal lessons for successful HELP implementation using the examples of Integrated Water Resources Management(IWRM) examples from the basins in Australia

Key Challenges

- How do we develop criteria to better define "vulnerable" basins to global change (sensitivity to climatic variability and hydrological impacts of land use change)?
- How do we address upstream-downstream issues within IWRM from both, a technical management and policy perspective?
- How do we undertake the necessary scientific research where basin scientific infrastructure is lacking?
- Natural disaster and risk management : How to cope with natural disaster and its risk management
- Best practice of sustainable water management with IWRM for water security and goals of SDGs
- How can we use the HELP approach to address national and transboundary basins policy issues connected with intra and inter basin conflicts connected with surface water and groundwater? (surface water-groundwater should not be treated as separate disciplines, they are connected!)
- How do we address scientific gaps within the Water and Food policy issue?

Conclusion

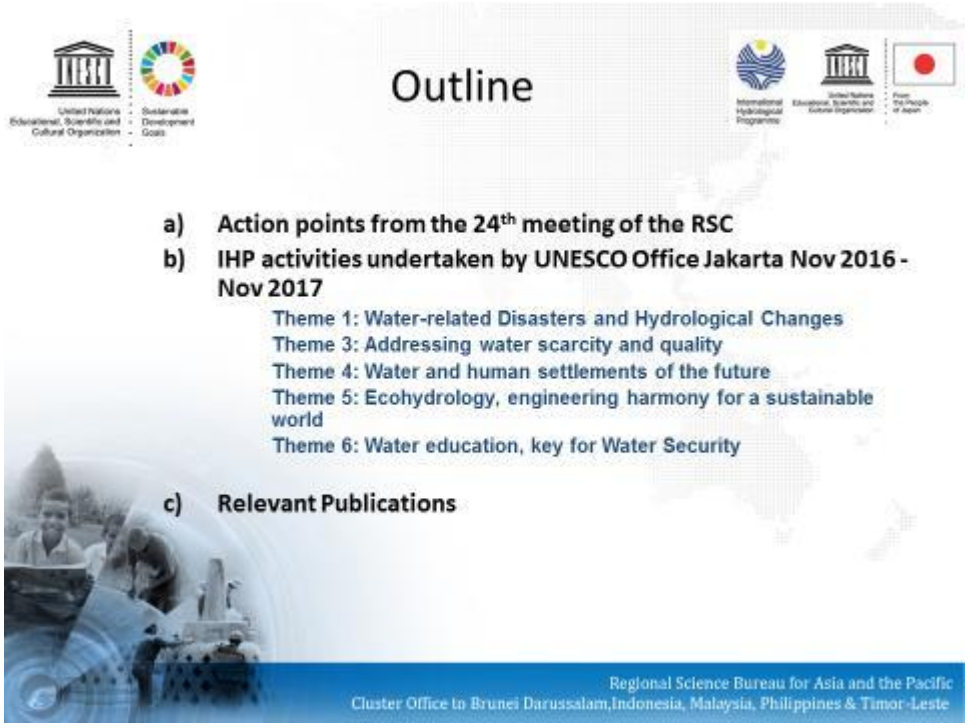
In spite of large range of climates and areas in Southeast Asia and the Pacific region, water-related activities were very active for the last more than two decades through the collaborative and comparative studies of the IHP-RSC. These cooperative activities in this region by the creation of the IHP-RSC could achieve our goals of the IHP for the solution of regional water problems and should be continued more actively for not only the key challenges but also Asia Pacific region and global water community. It is also recommended to create new directions of IHP RSC activities with regard to the SDG6.


International
Hydrologic
Environmental
Society (IHES)
THANK YOU
FOR
YOUR ATTENTION !!

ANNEX C – Agenda of the Meeting

Time	Agenda item	Resource Person/PIC
08.30-09.00	Registration	
09.00-09.10	Welcome Remarks	• Guillermo Tabios, RSC Chairperson & Organizer • Philippines National Commission for UNESCO
09.10-09.25	Opening Remarks	• Yasuto Tachikawa, Secretary IHP-RSC SEAP • Hans Dencker Thulstrup, UNESCO
09.25-09.30	Adoption of the Agenda	Guillermo Tabios, Chairperson
09:30-10:00	Group Photo & Coffee break	
10.00-10.15	Secretariat report	RSC SEAP Secretariat
10.15-10:30	Report of IGC Bureau	Yasuto Tachikawa, IGC Vice-Chair
10.30-12.00	Country Reports (5min/country)	IHP delegates
12.00-13.30	Lunch break	
13.30-13.45	Updates from the centres under the auspices of UNESCO in the Asia Pacific Region	UNESCO Category 2 Water Centres
13.45-14.00	27th IHP Training Course	Yasuto Tachikawa
14.00-14.45	Updates on Catalogue of Hydrologic Analysis modules (followed by discussion)	Kenichiro Kobayashi, Takahiro Sayama, Yasuto Tachikawa
14.45-15.15	Discussion on possible RSC Statutes and membership	RSC Secretariat
15.15-15.30	Coffee break	
15:30-15.35	Presentation by the foreseen host for the 26th RSC meeting and associated conference	China delegate RSC Secretariat
15.35-15.40	Potential host for the 27th RSC meeting and associated conference	IHP delegates, RSC SEAP Secretariat
15.40-16.00	Election of RSC Chair	IHP delegates
16:00-16.15	Any other issues	IHP delegates
16.15-16.30	Adoption of Resolutions	IHP delegates
16.30-16.45	Closing of the Meeting	Guillermo Tabios, RSC Chairperson

ANNEX D – Secretariat Report: UNESCO Office Jakarta Report



Action points from the 24th meeting of the RSC

	Action	Person	Deadline
Action 1	Follow-up on Action 1 and 2 from 23rd IHP-RSC Letter of appreciation to 7th WWF organizers Letter of congratulations to Prof. Takahashi	Chairperson	ASAP
Action 2	Related to CHA • Establish a task force team (initially the current technical sub-committee) • Task force team to conduct literature review to determine other existing similar initiatives • A regional call for contributions will be resent to all RSC members by task force, with encouragement to contribute and commit • Pending comments received, name and purpose of CHA to be redefined.	Prof. Chikamori, Prof. Kobayashi, Prof. Tachikawa	Not defined
Action 3	All adopted resolutions to be sent by Secretariat to IHP Secretariat	Secretariat	ASAP

IHP activities undertaken by UNESCO Office Jakarta Nov 2016 - Nov 2017

Theme 1 : Water-related Disasters and Hydrological Changes

Flood Warning and Management Capacity of Pakistan

1. Community-based training program on *watershed management for floods and droughts* for water managers and users in Sindh Province, Pakistan (**3-5 August 2017, Chakwal, Pakistan**)
2. Capacity-building in *measuring river discharges and assessing river morphology* with Acoustic Doppler Current Profiler for Pakistani institutions (**31 July 2017 for equipment handover and training on 3-7 August 2017, Islamabad, Pakistan**)

Project partners' coordination meeting in Islamabad

Training on Jhelum River

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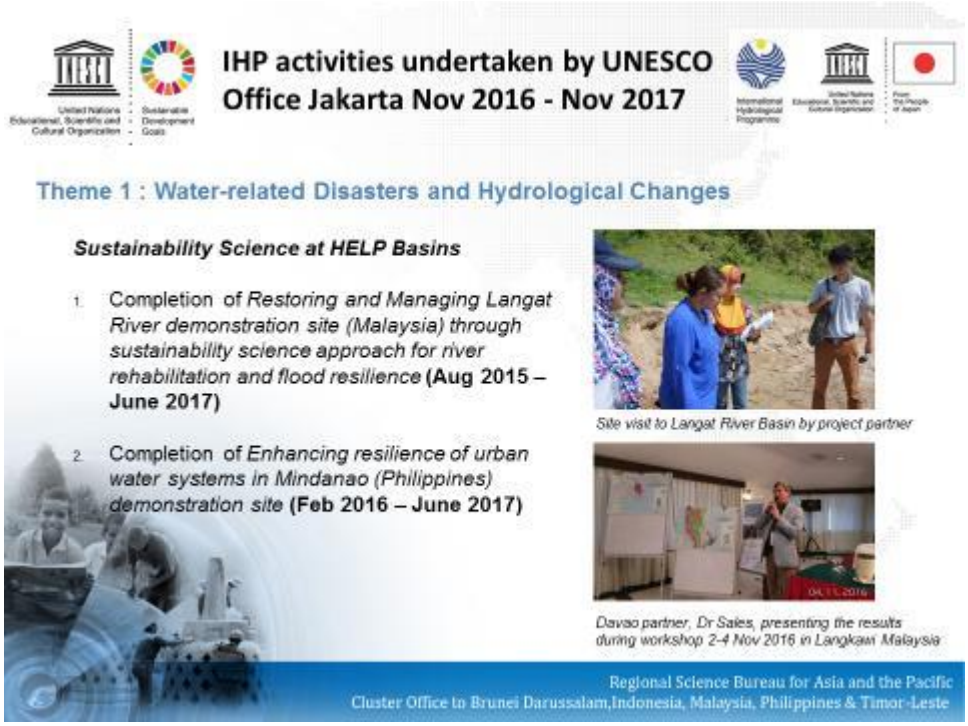
Cluster Office to Brunei Darussalam,Indonesia, Malaysia, Philippines & Timor-Leste


IHP activities undertaken by UNESCO Office Jakarta Nov 2016 - Nov 2017
Theme 1 : Water-related Disasters and Hydrological Changes
Sustainability Science at HELP Basins
1. Completion of Restoring and Managing Langat River demonstration site (Malaysia) through sustainability science approach for river rehabilitation and flood resilience (Aug 2015 – June 2017)
2. Completion of Enhancing resilience of urban water systems in Mindanao (Philippines) demonstration site (Feb 2016 – June 2017)
Site visit to Langat River Basin by project partner
Davao partner, Dr Sales, presenting the results during workshop 2-4 Nov 2016 in Langkawi Malaysia
Regional Science Bureau for Asia and the Pacific
Cluster Office to Brunei Darussalam,Indonesia, Malaysia, Philippines & Timor-Leste


IHP activities undertaken by UNESCO Office Jakarta Nov 2016 - Nov 2017
Theme 3: Addressing water scarcity and quality
Africa-Asia exchange to strengthen cooperation and sharing knowledge for sustainable water resource management in Africa
1. Inter-regional Workshop on South-South Cooperation for Upscaling IWRM and Eco-hydrology as Tools for Achieving Water Security in Africa (24-26 Jan 2017, Abuja, Nigeria)
2. Inter-Regional Workshop Building Resilience to Climate Change Risk and Vulnerability to Meet Water Security Challenges (10-11 Jul 2017, Langkawi, Malaysia)

IHP activities undertaken by UNESCO Office Jakarta Nov 2016 - Nov 2017

Theme 3: Addressing water scarcity and quality

SIDS in Asia and the Pacific

1. The *National Dialogue on Water Security: Implementing Water Goals in Timor-Leste* developed five project concept as a basis for fundraising to **(16 -17 Oct 2017, Dili, Timor Leste)**
2. UNESCO Conference on *Water Security in the Pacific Small Islands Developing States (SIDS): Bringing UNESCO's IHP to the Pacific* **(23-24 Oct 2017, Nadi, Fiji)**

Timor-Leste National Dialogue Identifies Action for Water Sustainability

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IHP activities undertaken by UNESCO Office Jakarta Nov 2016 - Nov 2017

Theme 4: Water and human settlements of the future

1. Stakeholder Workshop: *Enhancing Water Systems in Siem Reap region through Sustainability Science approach* **(13-14 December 2016, Siem Reap, Cambodia)**
2. Short training for hydrological monitoring using OTT Qliner 2 **(21-24 Dec 2016, 18-20 Jan 2017, 22-26 Jan 2017, Siem Reap, Cambodia)**

Stakeholder Workshop with government organizations, international donors, NGOs, academia and community members.

Training Sessions in Siem Reap.

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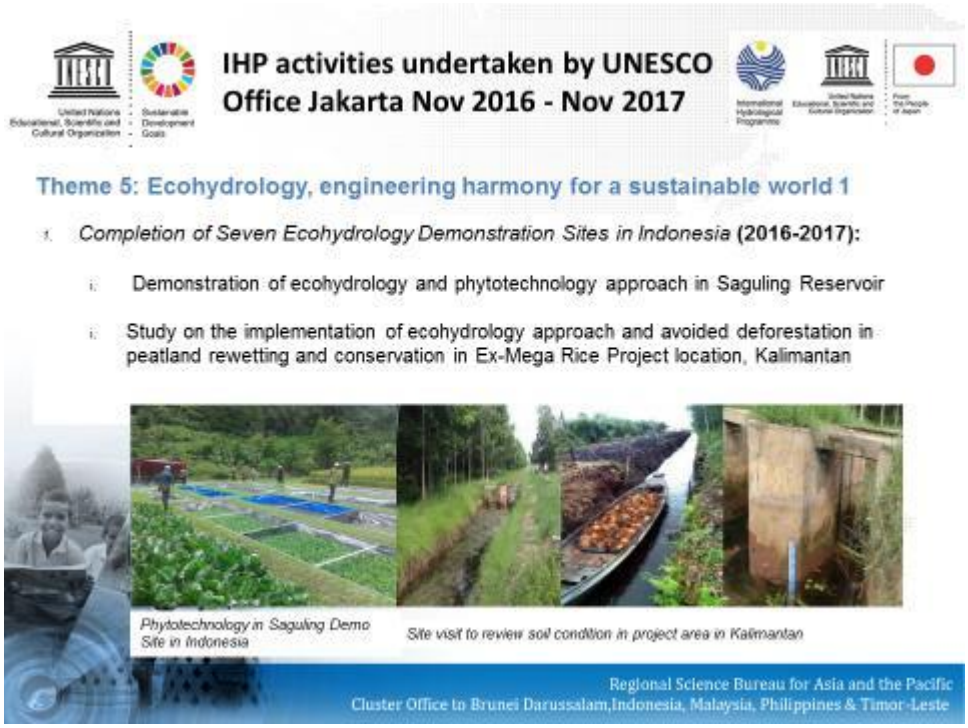
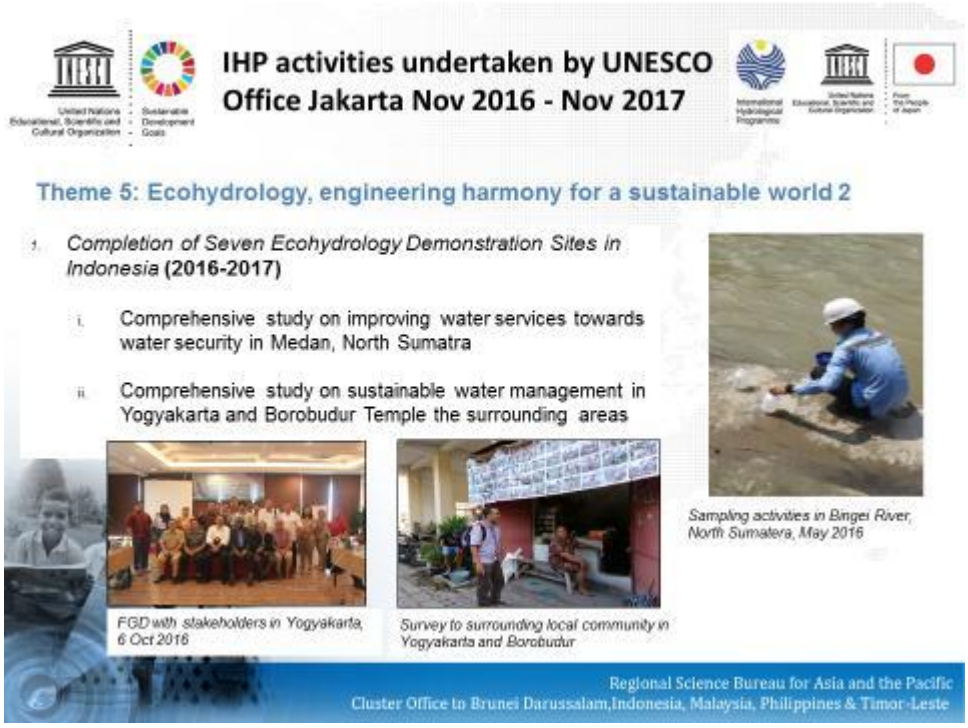

IHP activities undertaken by UNESCO Office Jakarta Nov 2016 - Nov 2017
Theme 5: Ecohydrology, engineering harmony for a sustainable world 1
1. Completion of Seven Ecohydrology Demonstration Sites in Indonesia (2016-2017):
i. Demonstration of ecohydrology and phytotechnology approach in Saguling Reservoir
ii. Study on the implementation of ecohydrology approach and avoided deforestation in peatland rewetting and conservation in Ex-Mega Rice Project location, Kalimantan
Phytotechnology in Saguling Demo Site in Indonesia
Site visit to review soil condition in project area in Kalimantan
Regional Science Bureau for Asia and the Pacific
Cluster Office to Brunei Darussalam,Indonesia, Malaysia, Philippines & Timor-Leste


IHP activities undertaken by UNESCO Office Jakarta Nov 2016 - Nov 2017
Theme 5: Ecohydrology, engineering harmony for a sustainable world 2
1. Completion of Seven Ecohydrology Demonstration Sites in Indonesia (2016-2017)
i. Comprehensive study on improving water services towards water security in Medan, North Sumatra
ii. Comprehensive study on sustainable water management in Yogyakarta and Borobudur Temple the surrounding areas
Sampling activities in Bingei River, North Sumatera, May 2016
FGD with stakeholders in Yogyakarta, 6 Oct 2016
Survey to surrounding local community in Yogyakarta and Borobudur
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IHP activities undertaken by UNESCO Office Jakarta Nov 2016 - Nov 2017

Theme 5: Ecohydrology, engineering harmony for a sustainable world 3

1. *Completion of Seven Ecohydrology Demonstration Sites in Indonesia* **(2016-2017)**
   - i. Training for high school teachers and demonstration site establishment for learning site in East Nusa Tenggara Province
   - ii. Community education to raise awareness of water security and water quality in Pari Island, Jakarta Special Region

Pari Island activity: WASH training for children, 30 Nov 2016

Pari Island activity: Water Resources Management storytelling for children, 16 Dec 2016

Pari Island activity: Waste Management Training for Adult Participant, 30 Nov – 1 Dec 2016

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IHP activities undertaken by UNESCO Office Jakarta Nov 2016 - Nov 2017

Theme 5: Ecohydrology, engineering harmony for a sustainable world 4

1. *Completion of Seven Ecohydrology Demonstration Sites in Indonesia* **(2016-2017)**
   - i. Study on the role of community participation in peri-urban water management in Jember

All seven demonstration site results were presented at the *IFIT Achievements Showcase & Workshop* (22-24 March 2017, Jakarta, Indonesia)

Site visit for data collection in Jember

Dissemination of Jember study results to the local community

IFIT Achievements Showcase, attended by 147 national participants

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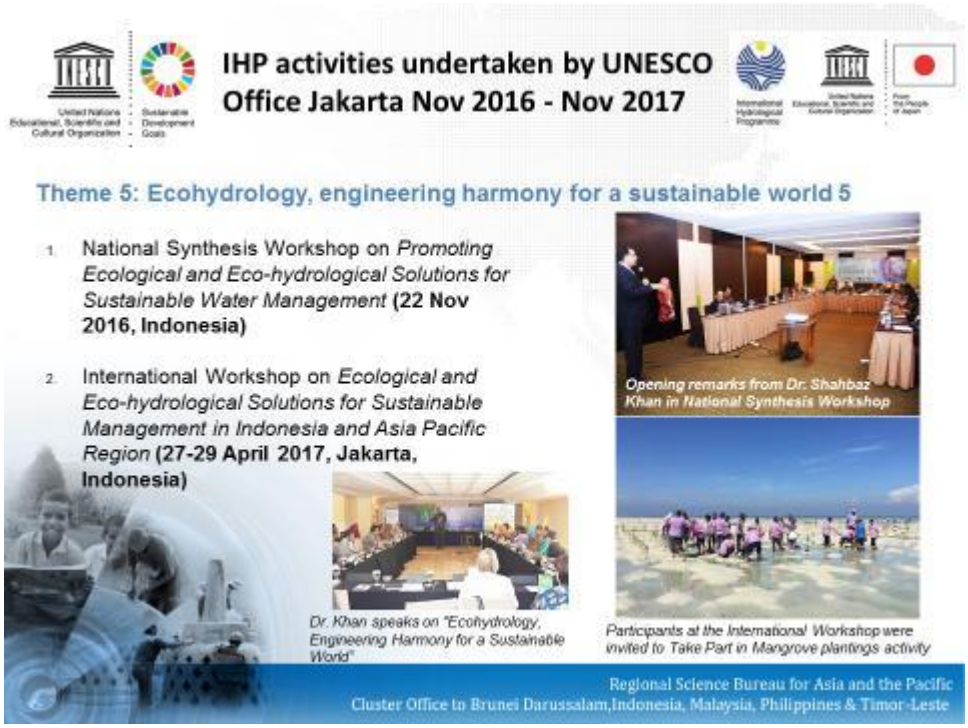
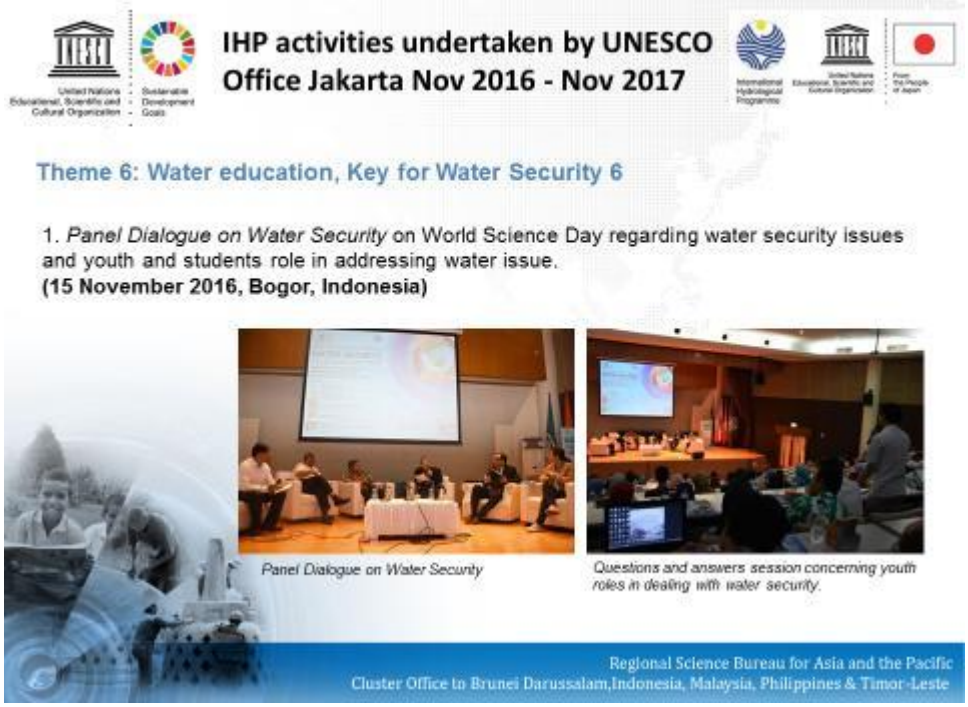
Cluster Office to Brunei Darussalam,Indonesia, Malaysia, Philippines & Timor-Leste


IHP activities undertaken by UNESCO Office Jakarta Nov 2016 - Nov 2017
Theme 5: Ecohydrology, engineering harmony for a sustainable world 5
1. National Synthesis Workshop on Promoting Ecological and Eco-hydrological Solutions for Sustainable Water Management (22 Nov 2016, Indonesia)
2. International Workshop on Ecological and Eco-hydrological Solutions for Sustainable Management in Indonesia and Asia Pacific Region (27-29 April 2017, Jakarta, Indonesia)
Opening remarks from Dr. Shahbaz Khan in National Synthesis Workshop
Dr. Khan speaks on "Ecohydrology, Engineering Harmony for a Sustainable World"
Participants at the International Workshop were invited to Take Part in Mangrove plantings activity
Regional Science Bureau for Asia and the Pacific
Cluster Office to Brunei Darussalam,Indonesia, Malaysia, Philippines & Timor-Leste


IHP activities undertaken by UNESCO Office Jakarta Nov 2016 - Nov 2017
Theme 6: Water education, Key for Water Security 6
1. Panel Dialogue on Water Security on World Science Day regarding water security issues and youth and students role in addressing water issue.
(15 November 2016, Bogor, Indonesia)
Panel Dialogue on Water Security
Questions and answers session concerning youth roles in dealing with water security.
Regional Science Bureau for Asia and the Pacific
Cluster Office to Brunei Darussalam,Indonesia, Malaysia, Philippines & Timor-Leste

IHP activities undertaken by UNESCO Office Jakarta Nov 2016 - Nov 2017

Korea International Water Week – Asia International Water Week

IHP was represented across events, sessions and side meetings, including:

- '***Asia to World Statement***': presentation of new Africa-ASPAC Republic of Korea funds-in-trust project *Sustainable Water Security for Human Settlements in Developing Countries under Climate Change* and the new Republic of Korea Category 2 centre i-WSSM
- ***10th Meeting of High-level Experts and Leaders Panel on Water and Disaster.***

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IHP activities undertaken by UNESCO Office Jakarta Nov 2016 - Nov 2017

8th World Water Forum – 3rd Asia-Pacific Water Summit

8th World Water Forum Brasilia-Brazil 2018
Sharing Water

- UNESCO Jakarta leads Asia and the Pacific Regional *Ecosystems* theme towards 8th WWF
- Regional report under preparation – "Mobilizing science for healthy ecosystems"
- Representation at 3rd Asia-Pacific Water Summit, 11-12 December in Yangon, Myanmar.
- Joint session with NARBO on water governance and IWRM, with expected participation from HELP regional HELP basin

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


Relevant Publications
HTC-KL: Water Management Curricula Using Ecohydrology and Integrated Water Resources Management (IWRM) – 3 volumes
(in finalization)
HTC-KL: Customizing IWRM at the River Basin Level
(in finalization)
Lessons Learnt and Best Practices from UNESCO Sustainability Science Demonstration Sites in Southeast Asia
To be launched at the event "Pathway towards Improved Water Education Curricula, Penang, Malaysia, 28-29 November 2017
Regional Science Bureau for Asia and the Pacific
Cluster Office to Brunei Darussalam,Indonesia, Malaysia, Philippines & Timor-Leste


The activities reported were made possible only through the generous financial support of Member States.
The Secretariat wishes to thanks and acknowledge in particular the support of:
• Indonesian Funds-in-Trust (IFIT)
• Japanese Funds-in-Trust (JFIT) and JICA
• Malaysian Funds-in-Trust (MFIT)
Thank You!
Regional Science Bureau for Asia and the Pacific
Cluster Office to Brunei Darussalam,Indonesia, Malaysia, Philippines & Timor-Leste

ANNEX E - Secretariat Report: Report of IGC Bureau

Report of the 55th session of the IHP Bureau, 20-22 June 2017

1. BUDGET FOR 2018-2021 (39 C/5)
2. Update of the IHP statutes and rules of procedure of the IHP Council
3. Implementation of the resolutions and decisions adopted at the 22nd session of the IHP IGC
4. IHP-WINS

Yasuto Tachikawa

1. BUDGET FOR 2018-2021 (39 C/5)

2014-2017 (37C/5) Major Programme II Natural sciences

MLA 4	**Fostering international science collaboration for earth systems, biodiversity, and disaster risk reduction**	**6 487 300**	**271 000**	**374 700**
ER9	Global cooperation in the ecological and geological sciences expanded	3 878 900	149 700	233 900
ER10	Risk reduction improved, early warning of natural hazards strengthened and disaster preparedness and resilience enhanced	2 608 400	121 300	140 800
MLA 5	**Strengthening the role of ecological sciences and biosphere reserves**	**6 339 400**	**303 800**	**356 000**
ER11	Use of biosphere reserves as learning places for equitable and sustainable development and for climate change mitigation and adaptation strengthened	6 339 400	303 800	356 000
MLA 6	**Strengthening freshwater security**	**13 019 300**	**920 700**	**1 148 400**
ER12	Responses to local, regional and global water security challenges strengthened	9 973 600	627 700	786 200
ER13	Knowledge, innovation, policies and human and institutional capacities for water security strenghtened through improved international cooperation	3 045 700	293 000	362 200

- Water security should be a Main Line of Action (MLA), rather than an Expected Result.

- The resolution below was submitted to Executive Board on 10 Oct 2017.

United Nations Educational, Scientific and Cultural Organization

Executive Board
Two-hundred and second session

202 EX/FA/PX/DR.19.1
PARIS, 10 October 2017
Original: English

FINANCE AND ADMINISTRATIVE COMMISSION (FA)
AND PROGRAMME AND EXTERNAL RELATIONS COMMISSION (PX)

Item 19: **DRAFT PROGRAMME AND BUDGET FOR 2018-2021 (39 C/5)**

DRAFT AMENDMENT

Submitted by: Albania, Bangladesh, Brazil, Cameroon, Chad, Cote d'Ivoire, Dominican Republic, Egypt, France, Ghana, Greece, Haiti, Iran (Islamic Republic of), Italy, Japan, Kenya, Malaysia, Mexico, Morocco, Nepal, Nicaragua, Paraguay, Qatar, Republic of Korea, Saint Kitts and Nevis, Senegal, Spain, Sudan, Trinidad and Tobago, and the United Kingdom of Great Britain and Northern Ireland

7. Recalling that the open-ended working group on 39 C/5 established pursuant to 201 EX/Decision 15.4 took note of the concerns raised by the International Hydrological Programme's (IHP) Bureau at its 55th session about the current structure of document 39 C/5 and its decision to request the assignment of a standalone Main Line of Action for the Division of Water Sciences within Major Programme II, with an equal budget to the one currently envisaged in document 39 C/5 for this Division, prompting the representatives of the Member States to act using the established processes in place,

8. Noting that the present decision has no impact on the budget allocated to the Division of Water Sciences in the 39 C/5 and does not involve the mobilization of any additional resources from UNESCO Member States,

9. Recommends that the General Conference at its 39th session adopt the following amendments to Volume 1 of document 39 C/5:

Major Programme II – Natural Sciences

(1) Create a Main Line of Action 3 as follows: "Improving knowledge and strengthening capacities at all levels to achieve water security";

(2) Under Main Line of Action 3, create an expected result (1) as follows: "Member States have responded to water security challenges and have achieved the water-related 2030 targets, and others from relevant international water agenda";

(3) Under Main Line of Action 3, create an expected result (2) as follows: "Member States have improved policies and increased institutional and human capacities for water security through scientific cooperation";

2. Update of the IHP statutes and rules of procedure of the IHP Council

- The Bureau requested the Secretariat to prepare a revised draft of the IHP Statutes and Rules of procedures that includes the comments from the surveys, regional consultations.
- The deadline for receiving replies on the consultation for the update of the IHP Statutes and of the Rules of Procedure of the IHP Intergovernmental Council is 24 November 2017.

IV. Officers **5. Election of Chairperson and Vice-Chairpersons**	
1. At the beginning of its first session, following a session of the General Conference at which elections to the Council have been held, the Council shall elect a Chairperson and four Vice-Chairpersons. These, with the Chairperson of the previous Bureau, who shall be an ex-officio member, shall constitute the Council's Bureau. The composition of the Bureau so formed shall reflect an equitable geographical distribution. The members of the Bureau who are representatives of Member States of UNESCO shall remain in office until a new Bureau has been elected.	**1.** At the beginning of its first session, following a session of the General Conference at which elections to the Council have been held, the Council shall elect a Chairperson and four Vice-Chairpersons. These, with the Chairperson of the previous Bureau, who shall be an *ex-officio* member **remaining in office as Vice-Chairperson for his/her respective electoral group for one additional term**, shall constitute the Council's Bureau. The composition of the Bureau so formed shall reflect an equitable geographical distribution **and, to the extent possible, gender equality**. The members of the Bureau who are representatives of Member States of UNESCO shall remain in office until a new Bureau has been elected. **If the Chairperson ceases to represent a State Member of the Council or is so incapacitated that he/she can no longer hold office, he/she shall be replaced by a person nominated by the subsequent Council Member of the same region of the departing person, in alphabetical order of the country.**

3. Implementation of the resolutions and decisions adopted at the 22nd session of the IHP IGC

- Regarding Resolution XXII-9 on "Contribution of the IHP to the preparation and follow-up of the 22nd Conference of Parties (COP 22) of the United Nations Framework Convention on Climate Change (UNFCCC) held in Marrakesh, Morocco, in November 2016", the Bureau took note of IHP activities during the Water and Climate Day at COP 22.

The Bureau decided to set up a Task Force, composed of one member per region, to prepare a publication compiling all IHP activities on Water and Climate Change. The publication should also include activities from the UNESCO Water Family and inputs from the World Water Development Reports. The Bureau suggests discussing this issue of climate change and water at the next IHP Council session. The financial support required for this publication should be borne by the Member States.

4. IHP-WINS

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

4. IHP-WINS

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

Dates for the 56th session of the IHP Bureau

20-22 February 2018.

Dates for the 23rd session of the IHP IGC

18-22 June 2018.

ANNEX F - Country Reports

Australia:

Re-engaging UNESCO International Hydrological Programme in Pacific Island SIDS

Methodology and Workplan

Ian White

Terms of reference

Through its International Hydrological Programme, and in partnership with key regional and international partners, UNESCO aims to increase its support to Pacific SIDS to achieve SDG6. UNESCO plans to scope needs and priorities for addressing water challenges in the Pacific region and map on-going activities by a wide range of partners and stakeholders with the aim of identifying targeted areas in which UNESCO's water initiatives and technical expertise could most effectively support Pacific SIDS. The scoping exercise will support the development of a work plan and resource mobilization strategy

The terms of reference for this work are:

- Carry out research, surveys and interviews to identify key water needs and priorities for Pacific SIDS;
- Propose targeted ways in which IHP and other UNESCO water initiatives could address those needs and challenges;
- Develop a concrete and actionable work plan for IHP activities in the Pacific SIDS;
- Develop a funding proposal and identify potential donors

The work would require on-line or remote consultation with:

- Relevant regional and national documents and policies related to freshwater management, governance, security and other areas that fall within IHP's remit
- Officials of relevant government ministries and departments in Pacific Island Countries, technical experts, development partners and stakeholders, including the IHP Regional Steering Committee (RSC) for Southeast Asia and the Pacific and the Pacific Community (SPC)
- Potential donors
- Other UN Bodies and bilateral donors/ cooperation agencies

The following deliverables are required:

1. To be delivered on or before 30 June:
    - A methodology and work plan, including a list of key organisations and individuals to be consulted
2. To be delivered on or before 18 August:

- Initial mapping, survey and consultation results describing the current capacities, expressed needs in water resources management for the Pacific SIDS, and on-going activities (including a folder with all related survey and research documents).
- An initial mapping of the donors' presence and activities being financed (including contact details etc.)
- A draft work plan and
- A draft resource mobilization strategy

3. To be delivered on or before 30 September:
   - Final versions of all documents to be drafted in item 2 above of the deliverables
   - A draft funding proposal based on the above

E. Timeframe:

This assignment is estimated to be for approximately 50 working days, or as required to complete the work. The expected start date of the contract is 1 June 2017 and the end date is 30 September. In consultation with the UNESCO Office for the Pacific States, a workplan will be prepared within the first three weeks.

Summary

This report sets out preliminary work on reviewing the situation and needs in water and sanitation in the very diverse and geographically dispersed Pacific island countries (PICS). It also briefly examines the character of UNESCO IHP, its relation to the UN's 2030 Sustainable Development Goal for water and sanitation and its past contributions to small island water resources and their management. It looks in a preliminary way at the challenges in re-engaging a large multi-national organisation with diverse small island countries. It draws some lessons from the EU's recent Pacific-European Science, Technology and Innovation Project, PACE-NET Plus. It then sets out the planned methodology for achieving the goals of this work. It also notes that the action plan required for this work and the funding proposal are best developed if re-engagement is a key aim, by a participatory process involving the stakeholders This is not possible within the current project. A timetable is also given for this work and lists of organisations that are planned to be researched and contacted.

Introduction

The Barbados Conference on the Sustainable Development of Small Island States in 1994 (UNDESA, 1994) helped raise awareness of their fragility and vulnerability. This vulnerability arises from their remoteness, small land area, rapid population growth, limited capacity and land resources and sensitivity to climate variability (Talu et al., 1979). Low Gross Domestic Product, limited trading opportunities, urbanisation and rapid growth have strained traditional support mechanisms (Ward, 1999) and customary approaches to hazard risk reduction.

The outcome statement of the United Nations (UN) third International Conference on Small Island Developing States (SIDS statement) held in Samoa from 1-4 April 2014 reaffirmed the UN's commitment to the sustainable development of SIDS. Sustainable development the Pacific way, building resilient, self-reliant, and healthy communities, is the key focus of the 2014 Pacific Framework for Regionalisation (PIFS, 2014). The SIDS statement recognised a need for a more integrated approach to sustainable development of island nations. It acknowledged that SIDS remain a special case for sustainable development due to their unique vulnerabilities and because they are constrained in meeting sustainable development goals (UNGA, 2014).

Development in SIDS has been affected adversely by the impacts of the global economic crisis, declining foreign direct investment, trade imbalances, increased indebtedness, lack of adequate transport, energy and information and communications technology infrastructure networks, limited human and institutional capacity and the inability to integrate effectively into the global economy. Growth has also been hindered by the impact of a suite of natural disasters, the high cost of imported energy and the degradation of coastal and marine ecosystems, freshwater resources and the threat of sea-level rise (UNGA, 2014).

Freshwater and sanitation in SIDS

Freshwater and sanitation were singled out by the SIDS statement which detailed numerous challenges in islands for this vital sector including: pollution; the overexploitation of surface, ground and coastal waters; saline intrusion; drought and water scarcity; soil erosion; inadequate water and wastewater treatment; and the lack of access to sanitation and hygiene. In addition, projected changes in rainfall patterns related to climate change may have regionally varying and potentially significant impacts on water supply (UNGA, 2014).

The priority tasks identified in the water and sanitation sector by the SIDS statement are to develop institutional and human capacities for sustainable, integrated management of water resources and related ecosystem; provide and operate appropriate facilities and infrastructure for safe drinking water, sanitation, hygiene and waste management systems; facilitate the expansion of wastewater treatment, recycling and reuse; improve water-use efficiency; work towards eliminating over-extraction, especially of groundwater; and mitigate the effects of saltwater intrusion (UNGA, 2014).

Risks to water security in SIDS

Most international agencies consider climate-change as the greatest risk to water security faced by SIDS. While climate change, and particularly sea-level rise is a major long-term risk, there are more pressing short-term risks. A study in 2011 compared the risks to water security in 15 very diverse SIDS from climate change and non-climate factors out to the year 2030. It found that poor water governance and management, particularly evident during droughts, were among the most significant risks (Falkland, 2011). Amongst the issues identified were failure to legally protect and conserve water sources, reluctance to implement policy and enact water legislation and regulations, over-extraction, excessive unaccounted for water losses, inadequate tariffs, absence of demand

management, lack of capacity, lack of monitoring, poor community engagement, absence of sector priorities, defined responsibilities and goals, as well as general planning failures. While SIDS are incredibly diverse geographically, climatically, culturally and socially there are some common challenges.

Duncan (2011) has also examined the threats to freshwater resources due to environmental change in 7 selected islands out of about 853, assumed representative of 14 Pacific island countries (PICS), using a vulnerability index approach which considered resource stresses, development pressures, ecological insecurities, and management challenges. Duncan also stressed the diversity of contexts in PICS. He found that water resources management provides the greatest challenge regionally, across nearly all islands, with the other significant challenge being the delivery of the fundamental human needs of improved drinking water and sanitation. He concluded that the 7 islands studied fell into three broad groups:

- Low-lying islands which are under severe resource and environmental stress, with significant development pressure and a need for improved water management and governance,
- Larger volcanic islands with adequate water resources, but significant to severe water management and governance challenges in managing available resources provision of drinking water and sanitation,
- Moderate-sized volcanic islands with adequate water resources, significant water management and governance challenges in managing the available resources, but a reasonably high-level of provision of improved drinking water and sanitation.

The study noted, as did Falkland (2011), that the limited availability of data across the region hinders assessment and planning. The report saw that the greatest challenge facing PICs in water resource management is limited technical and governance capacity. There is minimal capacity within countries to respond to the day-to-day vulnerability threats, let alone the frequent natural disasters which sweep the region. It concluded that the broad lack of enabling national policies and legislation, and the lack of capacity to implement existing strategies must be tackled to reduce regional, national and island freshwater vulnerability

Major aid and donor projects throughout the region over four decades have attempted to address vulnerability of water resources and reduce risk to water supplies. Their success has been variable and limited. A key factor has been that most have focussed on single issues, such as infrastructure, have not been integrated, have failed to recognise the unique contexts of PICTs and have not built on the strengths of local communities. In addition, the customs and rights of subsistence living are not matched to the demands of the highly urbanised island environments in population centres in PICTs experienced in many PICTs in their transition to developed economies (Jones, 1997; White et al., 1999).

The Pacific Regional Action Plan on Sustainable Water Management

The 2003 Pacific Regional Action Plan (RAP) on Sustainable Water Management (SOPAC and ADB, 2003). was developed after impressive, wide-ranging, multi-stakeholder, national consultations held throughout the region. The RAP, endorsed by all 17 member countries in 2003, identified priority actions under six themes:

I. Water Resources Management;
II. Island Vulnerability;
III. Awareness;
IV. Technology;
V. Institutional Arrangements; and
VI. Finance.

It outlined the needs of the water and sanitation sector to cope with current and future pressures on often limited water resources caused by increasing populations, development, non-climate hazards, as well as climate variability and climate change.

Actions identified in the RAP focussed on using integrated water resource management to:

- improve the knowledge base;
- identify appropriate water extraction and treatment technologies;
- increase capacity;
- introduce risk assessment and management;
- engage communities in co-management at all levels;
- disseminate information;
- improve water governance;
- promote regional cooperation;
- reduce water demand, wastage and unaccounted losses;
- protect water sources; and
- ensure water supply and sanitation systems are sustainable.

Although developed over 14 years ago many of these actions remain as relevant today within most member states as they were in 2003.

The Pacific Framework for Action on Drinking Water Quality and Health

In parallel with the RAP, Ministers of Health for the Pacific Island Countries called upon Member States, national, regional and international partners to strengthen national drinking water quality standards and monitoring capabilities. The World Health Organisation (WHO) Workshop on Drinking Water Quality Standards and Monitoring in Pacific Island Countries (Nadi, Fiji; 7-10 Feb. 2005) developed the Pacific Framework for Action on Drinking Water Quality and Health (WHO, 2005). The Framework was designed to support the implementation of drinking water quality actions envisioned in the overarching RAP. It provided 21 recommendations under the 6 RAP themes:

1. Protection of water sources such as springs, rivers, groundwater and rainwater catchments from contamination and overuse must be a priority to ensure quality.
2. Technical support should be provided to develop national drinking water quality standards that are dynamic and implemented in stages as necessary.
3. The use of Water Safety Plans should be encouraged in the Region, and countries should be supported with manuals, guidelines and training on the use and implementation of this tool.
4. Effort should be expanded at regional and national level to assess risks posed by toxic chemicals and pathogens in drinking water.
5. Human resources should be developed for drinking water safety, including drinking water quality monitoring, data management and information systems.
6. Research should be promoted and supported, and the scientific knowledge base should be strengthened to support the development of effective, efficient, and equitable policies and plans related to drinking water quality and health.
7. Emergency preparedness plans should adequately address drinking water quality issues, and water safety plans should address risks posed by potential emergencies.
8. The fragile environments of very small islands and their role in managing source water quality and quantity should be respected and protected.
9. Human resources should be developed to strengthen countries capacities for raising community awareness related to water quality and health risks, source water protection, household-level water treatment and safe storage.

10. Community awareness and community-based action programmes on safe water supply and sanitation should be developed and expanded in rural and remote areas and in urban areas alike.
11. Community-based water quality testing and source protection programmes should be supported in rural and remote areas as well as in urban areas.
12. Government awareness should be raised and political commitment should be strengthened to support actions for safe water supply and sanitation.
13. Technical assistance and training should be provided for strengthening drinking water quality management, including monitoring, operation, calibration and maintenance of any related equipment.
14. Adequate equipment for drinking water quality management should be provided.
15. Research should be supported to develop appropriate field-test kits for use in remote and rural areas.
16. Adequate equipment for water and wastewater treatment should be provided.
17. Rainwater harvesting programmes should be supported by improving water quality through approaches such as “first-flush” devices and community-based water quality testing.
18. National and regional partnerships should be built to develop standards and guidelines and legislation in order to ensure provision of safe drinking water, and to establish national water quality committees that could oversee development of water safety plans.
19. Communication and information exchange between agencies involved with water quality data collection should be strengthened. This should include exchange and joint analysis of drinking water quality data and disease surveillance data between water supply agencies and health authorities.
20. Governments should, as a priority, develop and implement appropriate financial mechanisms to support sustained supplies of safe drinking water and sanitation services to both rural and urban communities to fulfil the MDG targets.
21. External agencies should be encouraged to support specific activities in the region where governments are unable to sustain provision of safe drinking water and sanitation services.

These recommendations on drinking water quality reflect both the historic extent of the problems faced in the region and the level of concern over water quality. Many of these concerns remain.

UNESCO IHP1

UNESCO has 195 member countries and 10 associate members. UNESCO’s International Hydrological Programme (IHP) is the only intergovernmental programme of the UN system devoted to water research, water resources management, and education and capacity building. Since its inception in 1975, IHP has evolved from an internationally coordinated hydrological research programme into an encompassing, holistic programme to facilitate education and capacity building, and enhance water resources management and governance.

The planning, definition of priorities, and supervision of IHP are the responsibility of IHP’s by the Intergovernmental Council. The Council is composed of 36 UNESCO Member States elected by the General Conference of UNESCO at its ordinary sessions held every two years. Equitable geographical distribution and appropriate rotation of the representatives of the Member States are aimed for in the composition of the Council. Each of UNESCO’s six electoral regions elects Member States for membership in the Council. Region IV, Asia and Pacific, contains 60% of the world’s population, has 6 of the world’s 10 largest cities, covers more than 40% of the global land area, including the Pacific Ocean which is a diver of much of the world’s climate and ocean circulation, and is incredibly diverse, containing the world’s most populated and least populated countries.

[1] http://en.unesco.org/themes/water-security/hydrology

IHP facilitates an interdisciplinary and integrated approach to watershed and aquifer management, which incorporates the social dimension of water resources, and promotes and develops international research in hydrological and freshwater sciences. Since 1975, IHP has been implemented in six-year programmatic time intervals or phases. It is currently in its eighth phase being implemented during the period 2014-2021.

In framing the UN's 2030 Sustainable Development, Goals, UNESCO IHP was a key actor in ensuring that there was a separate goal devoted to water and sanitation, Goal 6*: Ensure availability and sustainable management of water and sanitation for all.*

IHP and water security

The theme of IHP's eight phase is "Water Security: Responses to Local, Regional, and Global Challenges". To define priorities for IHP-VIII, a series of consultations took place with UNESCO Member States to identify regional needs and priorities for hydrological research, water resource management and education. Many Member States participated in the process and pointed to water related disasters, climate/hydrological variability, water scarcity, water quality and IWRM as being particularly important areas for attaining water security where hydrological research, water resource management and education are critically needed.

Input from most Member States indicated that IWRM is an important cross-cutting area in research, water management and education. The need for considering integrated coastal zone and land hydrological management in a climate change context were also raised by some member states. In relation to global hydrology, IHP was urged to work for the maintenance of long-term hydrological and ecosystem monitor networks, and to advance the use of remote sensing techniques. Several member states considered it important to promote the IWRM approach and to include in this approach socio-economic, legal and environmental aspects to qualify impacts that arise from global changes such as population growth and urbanization. Member States specifically stressed the need for research in social, behavioural, and economic sciences to provide the understanding and tools for participatory governance in facing the different challenges.

Based on the priorities and needs of Member States, the eighth phase of the International Hydrological Programme (IHP-VIII) focuses on six thematic areas to assist Member States in their challenging endeavour to better manage and secure water and to ensure the necessary human and institutional capacities. These are:

Theme 1: Water-related Disasters and Hydrological Changes
Theme 2: Groundwater in a Changing Environment
Theme 3: Addressing Water Scarcity and Quality
Theme 4: Water and Human Settlements of the Future
Theme 5: Ecohydrology, Engineering Harmony for a Sustainable World
Theme 6: Water Education, Key to Water Security

The strategic plan of phase VIII focuses on:

- mobilizing international cooperation to improve knowledge and innovation to address water security challenges,
- strengthening the science-policy interface to reach water security at local, national, regional, and global levels and
- on developing institutional and human capacities for water security and sustainability.

The role of human behaviour, cultural beliefs and attitudes to water, and socio-economic research to better understand and develop tools to adapt to changing water availability will also be addressed.

These themes and their foci are consistent with the eight target areas of SDG 6: by 2030:

6.1 achieve universal and equitable access to safe and affordable drinking water for all

6.2 achieve access to adequate and equitable sanitation and hygiene for all, and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations

6.3 improve water quality by reducing pollution, eliminating dumping and minimising release of hazardous chemicals and materials, halving the proportion of untreated wastewater, and increasing recycling and safe reuse

6.4 substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity, and substantially reduce the number of people suffering from water scarcity

6.5 implement integrated water resources management at all levels, including through transboundary cooperation as appropriate

6.6 protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes

6.7 expand international cooperation and capacity-building support to developing countries in water and sanitation related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies

6.8 support and strengthen the participation of local communities for improving water and sanitation management

Previous work by IHP in SIDS

Members of IHP in the Pacific have had long involvement in water and sanitation in SIDS which culminated in an IHP Publication in 1991 on “Hydrology and water resources of small islands, a practical guide. Studies and reports on hydrology” (UNESCO, 1991). In 1992, as part of the Humid Tropics Programme under Phase V of IHP, a meeting was convened of participants throughout the Pacific and Indian Oceans to identify priority issues in water and sanitation (UNESCO, 1993). Out of that meeting, three very modest pilot research projects were proposed: one on the impact of sanitation on island groundwater in Tonga; one on the impact of forestry practices on near shore environments in Solomon Islands and one on groundwater recharge in atolls. The project on forestry practices was later abandoned but the other two were successfully completed and are presented in UNESCO (2002). These projects have led to a long engagement by Pacific Island water practitioners and Australian and New Zealand hydrologists and water resources people in a wide range of water and sanitation projects including the development of national water policy and plans. Despite the local engagement of IHP committees in this work, at the international level IHP attention moved from SIDS to other pressing problems.

Linking IHP and SIDS

It is apparent that many of the priority tasks and risks to water security that have been identified in SIDS coincide with most of the themes of IHP phase VIII and the SDG 6 targets so a natural linkage would seem almost automatic. The problem that occurs is the problem of scale. IHP is an international organisation composed of 195 incredibly diverse member states some with extremely large populations, enormous resources and very well-trained personnel in the water and sanitation sector. In the very dispersed Pacific SIDS, population numbers are generally small, resources limited and the number of trained personnel in the water and sanitation are few. In addition, the urgency of the problems they face daily mean that strategic issues tend to be of lower priority.

Lessons from PACE-NET

The problem of interfacing large agencies with small Pacific organisations was an issue in the recently completed EU's PACE-NET Plus[2] project which followed on from the earlier PACE-NET project, a 6-year engagement, to develop a Pacific-Europe Network on science, technology and innovation between European and Pacific Island organisations. At first, as one participant observed, it was like trying to refuel a canoe from a super-tanker. As time progressed, progress evolved and significant success were achieved.

PACE-Net Plus aimed to unite 16 partners in the Pacific and the EU to strengthen research cooperation between the two regions. To reach this objective of a better, stronger cooperation in science, technology and innovation, the philosophy was to increase research capacity, management and dialogue, to allow the appropriation of science by the countries of the region. One of the ideas was to make information available to the Pacific states to help them to form opinions, founded on scientific evidence, and for Europe to better know the opportunities in Pacific research.

Some of the key lessons emerging from PACE-NET Plus were:

- The importance of long-term engagement to develop mutual trust and respect;
- The importance of dialogue in reaching shared goals;
- The importance of listening to and recognising Pacific priorities;
- The uniqueness, complexity and diversity in widely dispersed Pacific SIDS;
- The value placed by Pacific island people in capacity building and education;
- The fundamental importance of culture in Pacific SIDS; and
- Recognition of the strengths and resilience of Pacific island peoples.

One of the challenges faced in re-engaging IHP with Pacific SIDS is to ensure that this re-engagement adds value to already existing efforts in the Pacific.

Aims of this Work

The terms of reference for this work identify the aims as (see page 2):

1. Carry out research, surveys and interviews to identify key water needs and priorities for Pacific SIDS;
2. Propose targeted ways in which IHP and other UNESCO water initiatives could address those needs and challenges;
3. Develop a concrete and actionable work plan for IHP activities in the Pacific SIDS;
4. Develop a funding proposal and identify potential donors

The work is envisaged to require on-line or remote consultation with:

[2] http://plus.pacenet.eu.s3-website-eu-west-1.amazonaws.com/

- Relevant regional and national documents and policies related to freshwater management, governance, security and other areas that fall within IHP's remit
- Officials of relevant government ministries and departments in Pacific Island Countries, technical experts, development partners and stakeholders, including the IHP Regional Steering Committee (RSC) for Southeast Asia and the Pacific and the Pacific Community (SPC)
- Potential donors
- Other UN Bodies and bilateral donors/ cooperation agencies.

There may be some difficulties with on-line and remote consultation with key agencies in SIDS. The first is that Pacific peoples greatly value face-to-face discussions and, secondly, the second is that the time pressures on the limited number of individuals and communication difficulties often mean that on-line enquiries are often unanswered.

Methodology

Identify key water needs and priorities for Pacific SIDS

The first step in identifying needs and priorities for Pacific SIDs will be to review the recent literature, reports, plans and policies of SIDS. Some of the earlier identified priorities have already been identified in Section 1 above and the review will build on and update these.

The second step will be to discuss these with the key Council of Regional Organisations in the Pacific (CROP) agencies with responsibility in water, sanitation, climate, natural disasters and the environment:

- the Secretariat of the Pacific Community (SPC)
- the South Pacific Regional Environment Program (SPREP)
- the University of the South Pacific (USP)

In addition, the Pacific Water and Wastewater Association (PWWA) which is a Pacific regional organisation traditionally focused on Pacific water service providers and supplier members, will be contacted. PWWA's coverage extends to the island states covered by the Pacific Islands Forum and their Pacific neighbouring states.

The discussions with these agencies will also seek to identify areas where UNESCO can add value to or supplement existing programmes within the region.

The third step will be to discuss with water agencies in selected individual countries their identified needs and priorities and to seek common themes.

The fourth step will be to find out the priorities and needs identified by the principal donors in the Pacific, Australian DFAT, New Zealand MFAT, EU Pacific, World Bank and Asian Development Bank, ADB as well as the Pacific Regional Infrastructure Fund (PRIF) a multi-agency coordination mechanism aimed at improving the delivery of development assistance from donors and development partners to the infrastructure sector in the Pacific region. PRIF supports infrastructure development and maintenance in Pacific Island Countries through investment coordination, research and technical assistance. The PRIF includes, ADB, Australian Aid, European Union, JICA, New Zealand Aid and the World Bank Group as members,

The inputs from all the above will be reviewed, collated and summarised.

Targeted ways in which IHP and other UNESCO water initiatives could address those needs and challenges

This objective will be addressed by identifying the key strengths and priorities of IHP and other water initiatives which address the needs and challenges in PICS. An already identified priority area is capacity building and community awareness raising where IHP has demonstrated expertise. Also, included in this identification will be agencies with strengths in disaster risk reduction and climate change which will include other UN Water agencies such as WMO, WHO, UNICEF, UNDP and UNEP.

As a first step a rapid computer search of web sites will be carried out to identify key strengths. Follow up interviews with personnel at IHP headquarters and regional offices in Jakarta and Apia as well as Asia-Pacific Regional Category II water Centres will be undertaken.

A critical consideration here is that these UNESCO initiatives not impose external priorities on PICS but address their identified needs and challenges, most preferably working in partnership with

Specific areas in which UNESCO as unique opportunities to address the needs of PICS will be detailed.

Develop a concrete and actionable work plan for IHP activities in the Pacific SIDS

This objective is problematic since concrete and actionable work plans are best developed in an interactive, collaborative process. Robert Ackoff (1999), the founder of operations research identified the separate phases of interactive planning as summarised in **Table 1**.

Table 1 The five phases of interactive planning. Adapted from Ackoff (1999)

Phase	Objective	Components	Principal Outputs
I. Formulation of the Issues	Determine issues, problems and opportunities	Previous actions and plans, recognised issues, problems, opportunities, and their interactions; constraints to effective management	Issues to be addressed by plans
II. Ends Planning	Determine where you want to be and the gaps between that and now	Extract vision, principles, goals, and objectives to achieve the desired ends.	Principles, goals and objectives
III. Means Planning	Choosing mechanisms to achieve goals and objectives	Develop and select actions for achieving goals and objectives and indicators for completion of actions	Implementation Plan Actions
IV. Resource Planning	Determine resources required for planned actions	Define resource needs and identify if resources are available or how they will be generated or acquired	Implementation Plan resources needs
V. Implementation and Control	Determine responsibilities and schedules for implementation	Identify who is responsible for actions, when they are to be implemented and how implementation is to be monitored	Implementation Plan Schedule and Responsibilities for implementation. Operations Plans

In Ackoff's process, plans cannot be handed down from the mountain *ex cathedra*. They must involve the interaction of stakeholders in the development and articulation.

It is envisaged that the actionable concrete plan envisaged in this objective would be best developed in workshops involving UNESCO and the key stakeholders in PICS. Pacific peoples appreciate this sort of inclusive process While a plan can be produced in this work, its ownership may be very limited.

Develop a funding proposal and identify potential donors

Because of the non-inclusive process designed for the Work Plan, basing a funding proposal on it may also be problematic. To be successful, the funding proposal would need support from key agencies and countries within the region and to add value to the many diverse programs, particularly development programs, already underway.

Sustainable development the Pacific way, building resilient, self-reliant, and healthy communities, is the key focus of the 2014 Pacific Framework for Regionalisation (PIFS, 2014) developed by the Pacific Forum and agreed to be all member countries. Almost all PICS have national sustainable development strategies which in many form the basis for the allocation of government resources and for aid funding. The SIDS statement recognised a need for a more integrated approach to sustainable development of island nations. It acknowledged that SIDS remain a special case for sustainable development due to their unique vulnerabilities and because they are constrained in meeting sustainable development goals (UNGA, 2014). It would seem then that a funding proposal based on the contribution that water and sanitation make to sustainable development, to climate resilience, to population health and to disaster risk reduction would add value to the aspirations of PICS and donors within the region.

Because of the unique challenges faced by atoll island countries, one suggestion proposed recently by workers in the Pacific and Indian Ocean, was the establishment of an Atoll Island Water and Sanitation Research Institute, coupled with committed political leadership, could have highly significant benefits for providing practical options for sustainable atoll island communities (White *et al.,* 2015). Perhaps UNESCO could consider a multi-regional Atoll Island Category II water centre?

Work Plan

15 June 2017 – Sign Contract

15 -27 June 2017 – Review literature and reports, web search preliminary contacts to arrange discussions. Prepare Report 1

28 June 2017 - Deliver Report 1

28 June -13 July 2017 -Pre-existing commitment

14 July – 31 July 2017 - Continue web search, Arrange discussions with UNESCO IHP, SPC, UNICEF, DFAT, PRIF, USP, MFAT

1 August -10 August -Continue interviews, discussion and web search

10 August – 18 August -Prepare and deliver Report 2

13 August-18 August -Possible attendance Pacific Meteorology Council in Honiara

20 August -1 September – Develop framework for plan for IHP activities

2 September – 30 September – Finalise plan, discuss with key stakeholders, prepare and deliver funding proposal and Report 3

Agencies to be Contacted

International

UNESCO IHP

UNESCO Regional Offices Jakarta, Apia

UNESCO Category II Centres and UNESCO Water Chairs Region IV

UNESCO Regional Steering Committee South East Asia-Pacific

UNESCO IHP Committees Australia, New Zealand, Japan

UNICEF Pacific

UNDP

UNEP

IHE Delft

WMO
WHO

GADRI

Donors

DFAT

MFAT

EU Pacific

WB

ADB

JICA

PRIF

Regional Organisations

SPC

SPREP

USP
East-West Centre Hawaii

Country Water, Environment, Disaster and Meteorological Agencies

PNG

Solomon Islands

Fiji

Vanuatu

Samoa

Tonga

Cook Islands

Kiribati

FSM

Marshall Islands

Nauru

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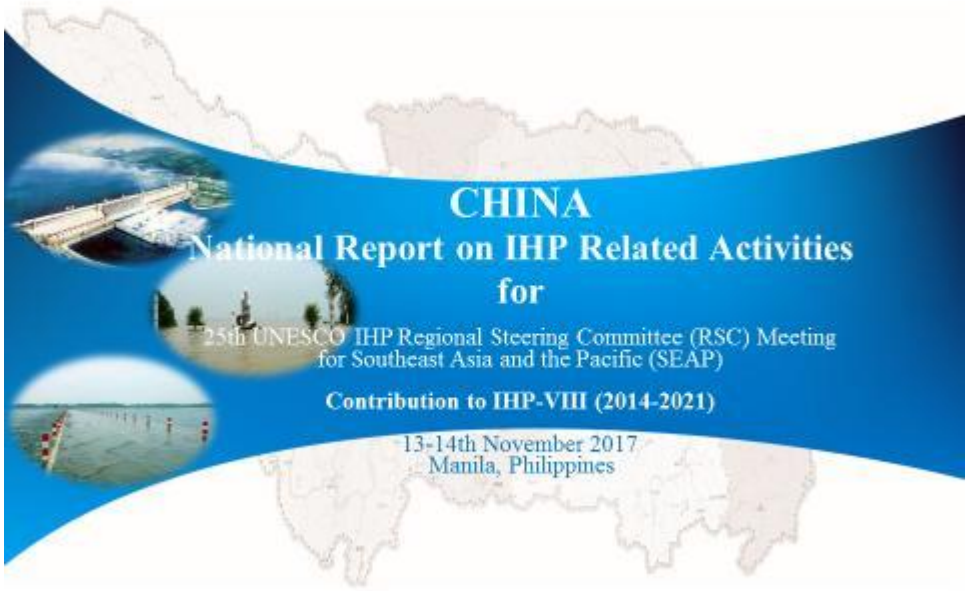
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Contribution to IHP-VIII (2014-2021)
13-14th November 2017
Manila, Philippines


1. ACTIVITIES UNDERTAKEN IN THE PERIOD November 2016 – October 2017
1.1 Meetings of the Chinese National Committee for IHP
1.1.1 Decision regarding the composition of the Chinese National Committee
The organizational structure of the Chinese National Committee for IHP consist of a Chairman, 5 Vice Chairman, a secretary, 3 deputy secretaries and 18 distinguished experts who are active in hydrology and water resources work in China from various research institutes, universities and government departments.
The members of the Chinese National Committee for IHP was renewed in February 2017，the current composition of the National Committee is listed right。

1. ACTIVITIES UNDERTAKEN IN THE PERIOD November 2016 – October 2017

1.1 Meetings of the Chinese National Committee for IHP

1.1.2 Status of IHP-VIII activities

Chinese national committee has arranged projects and activities in all themes and almost all focal points of IHP-VIII through national committee members around the country.

1. ACTIVITIES UNDERTAKEN IN THE PERIOD November 2016 – October 2017

1.1 Meetings of the Chinese National Committee for IHP

1.1.3 Decision regarding contribution to/participation in IHP-VIII

During Nov 2016 to Oct 2017, there were a couple of informal IHP national committee meetings or discussions. Through some focal points for certain projects, members of IHP and working groups desired to complete the on-going projects in their capacities. Meanwhile, the committee encourages IHP members to continue sharing knowledge and technology, and cooperate in various ways to promote hydrological development. Most activities are carried out among organizations of committee members.

1. ACTIVITIES UNDERTAKEN IN THE PERIOD November 2016 – October 2017

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

- National Hydrology work conference was held on 6 April 2017, in Beijing.

This is an annual work meeting particularly in the field of hydrology. The vice minister of WMR - Mr. Liu Ning, Chairman of Chinese IHP national committee also the director general of the bureau of hydrology of WMR, Mr. Cai Jianyuan, and various committee members of the national IHP committee participated the conference.

1. ACTIVITIES UNDERTAKEN IN THE PERIOD November 2016 – October 2017

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

- 5th water conservancy information technology forum 2017 was held in Nanjing, 30~31 March 2017

The opening ceremony of the forum chaired by the director of State Key Laboratory of hydrology water resources and hydraulic engineering, also vice president of Chinese IHP committee, Prof. Yu Zhongbo. This forum aims to promote the construction of water conservancy informatization and water conservancy construction.

1. ACTIVITIES UNDERTAKEN IN THE PERIOD November 2016 – October 2017

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

- The 2017 academic annual meeting of Chinese Hydraulic Engineering Society was held in Xi'an, 19~21 October 2017

The annual meeting lasted for three days, with the theme of "innovation driven water governance system and capacity modernization."

About 600 people from institutes, various branches and provincial institutes attended the annual meeting

1. ACTIVITIES UNDERTAKEN IN THE PERIOD November 2016 – October 2017

1.2 Activities at national level in the framework of the IHP

1.2.2 Participation IHP Steering Committees/Working Groups

- Participation 24th IHP Regional Steering Committee meeting for Southeast Asia and the Pacific Ulaanbaatar, Mongolia 24-26 October 2016

1. ACTIVITIES UNDERTAKEN IN THE PERIOD November 2016 – October 2017

1.2 Activities at national level in the framework of the IHP

1.2.3 Research/applied projects supported or sponsored

- **The website of the Chinese National Committee for IHP has been supported by UNESCO Beijing office and has been updated regularly. It was updated regularly for distributing messages to the public. Official home page is http://www.chinaihp.org. Announcement of web-based training courses and international conferences information are shared with hydrologist at national-wide on this website.**

1. ACTIVITIES UNDERTAKEN IN THE PERIOD November 2016 – October 2017

1.2 Activities at national level in the framework of the IHP

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

- **High-Level Dialogue Conference of China Europe Water Platform was held in Turku, Finland. Minister of Water resources of China Chen Lei attended the conference and addressed its opening ceremony.**

2 FUTURE ACTIVITIES

26th IHP-RSC meeting 2017 China

Prepare meeting was held in 2018,

and the place was provisionally arranged at Shanghai.

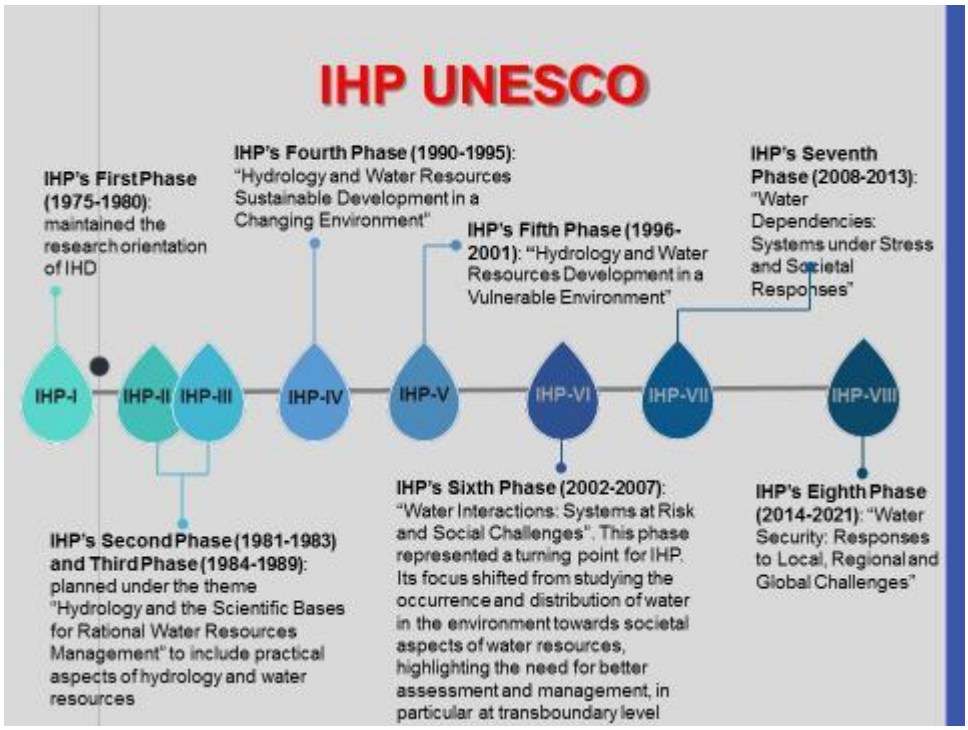
Welcome 欢迎!

Thank you !

谢 谢

Indonesia:


Report 2017
INTERNATIONAL HYDROLOGICAL PROGRAM (IHP) UNESCO
Indonesia IHP Secretariat


IHP UNESCO
IHP's First Phase (1975-1980): maintained the research orientation of IHD
IHP's Second Phase (1981-1983) and Third Phase (1984-1989): planned under the theme "Hydrology and the Scientific Bases for Rational Water Resources Management" to include practical aspects of hydrology and water resources
IHP's Fourth Phase (1990-1995): "Hydrology and Water Resources Sustainable Development in a Changing Environment"
IHP's Fifth Phase (1996-2001): "Hydrology and Water Resources Development in a Vulnerable Environment"
IHP's Sixth Phase (2002-2007): "Water Interactions: Systems at Risk and Social Challenges". This phase represented a turning point for IHP. Its focus shifted from studying the occurrence and distribution of water in the environment towards societal aspects of water resources, highlighting the need for better assessment and management, in particular at transboundary level
IHP's Seventh Phase (2008-2013): "Water Dependencies: Systems under Stress and Societal Responses"
IHP's Eighth Phase (2014-2021): "Water Security: Responses to Local, Regional and Global Challenges"
IHP-I
IHP-II
IHP-III
IHP-IV
IHP-V
IHP-VI
IHP-VII
IHP-VIII

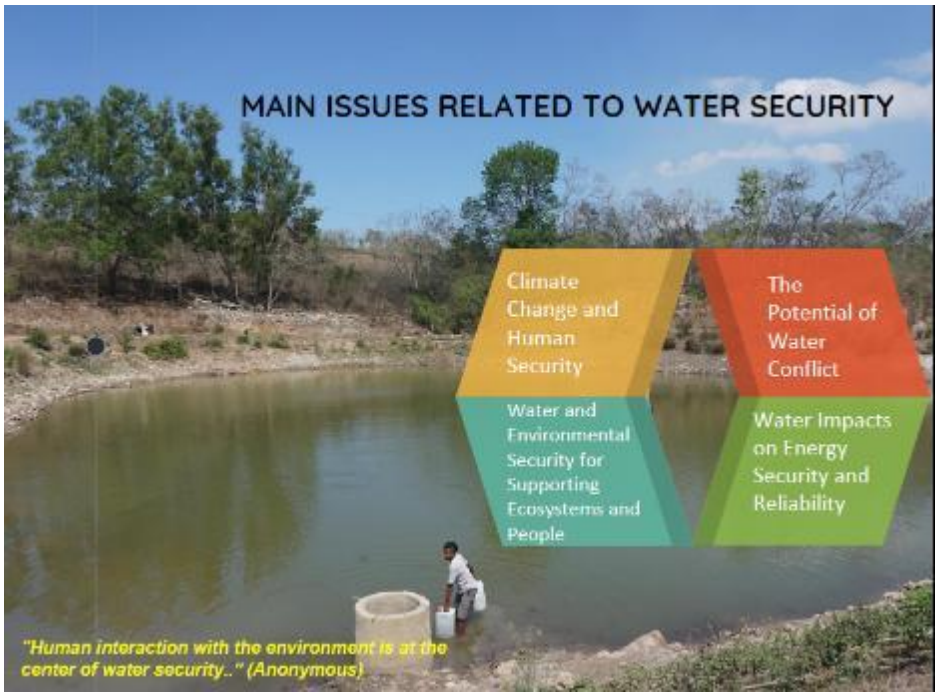
INTRODUCTION

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

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

THE PURPOSE OF THE ESTABLISHMENT

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

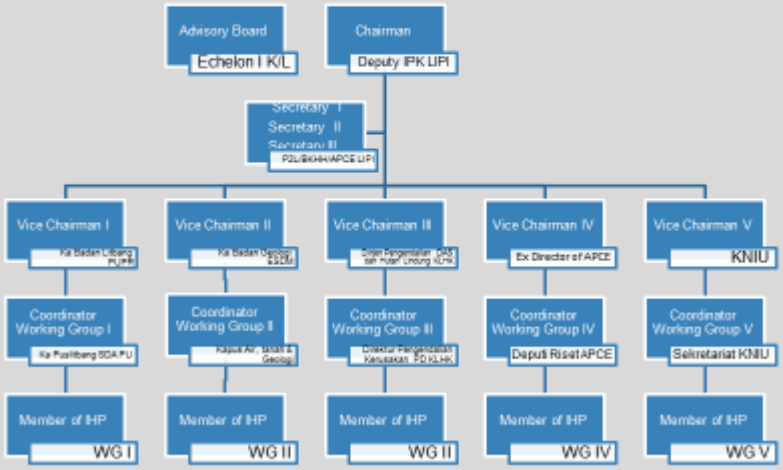

MAIN ISSUES RELATED TO WATER SECURITY
Climate Change and Human Security
The Potential of Water Conflict
Water and Environmental Security for Supporting Ecosystems and People
Water Impacts on Energy Security and Reliability
"Human interaction with the environment is at the center of water security.." (Anonymous)

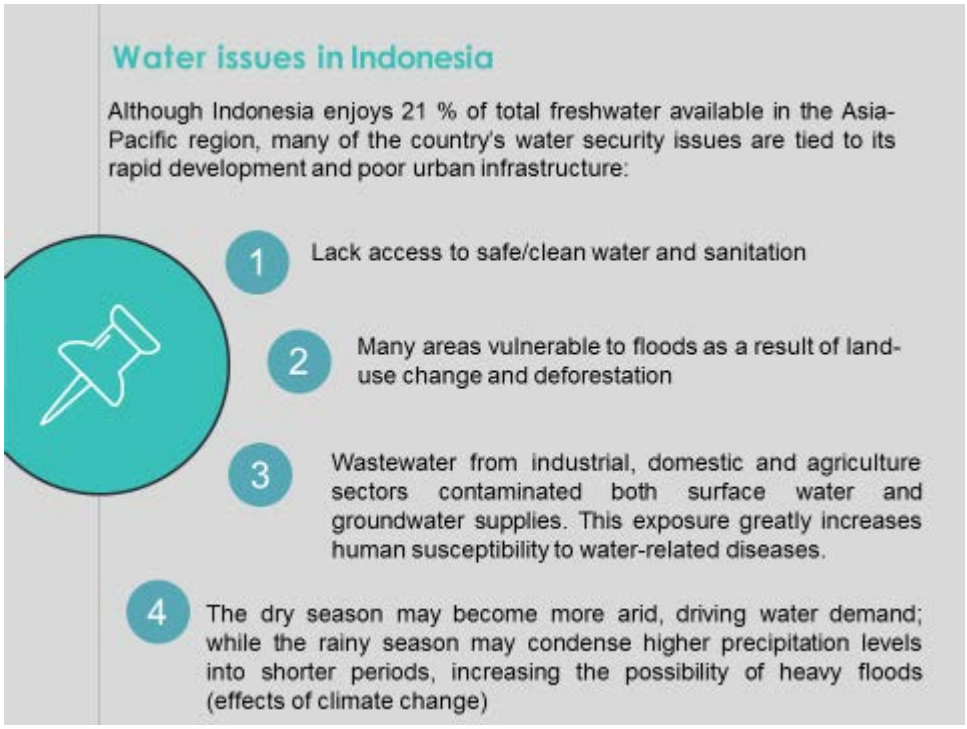

INTERNATIONAL HYDROLOGICAL PROGRAMME (IHP)
EIGHTH PHASE
"WATER SECURITY: RESPONSES TO LOCAL, REGIONAL, AND GLOBAL CHALLENGES"
STRATEGIC PLAN
IHP-VIII (2014-2021)
Water-related Disasters and Hydrological Change
Groundwater in a Changing Environment
Addressing Water Scarcity and Quality
Water and Human Settlements of the Future
Ecohydrology, Engineering Harmony for a Sustainable World
Water Education, Key for Water Security
Water Security: Responses to Local, Regional and Global Challenges

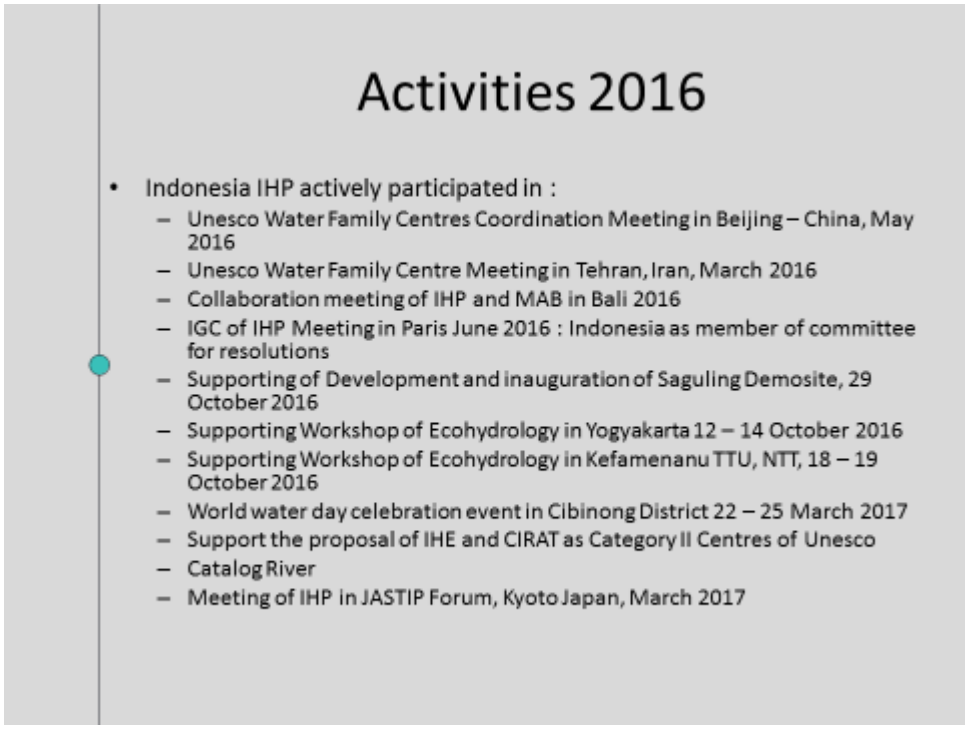
IHP Structure

- Advisory Board :
  - Deputiy of BMKG
  - Deputy of BIG
  - Secretary General of Ministry of Public Works
  - Director General of Multi lateral Collaboration of Foreign Affairs Ministry
  - Deputy of BNPB
  - Vice Rector of IPB
- Chairman : Deputy IPK 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
  - Chairman of KNIU
- Secretary :
  - Director of RC LimnologiyLIPI
  - Director of BKHH LIPI
  - Executive Secretary of APCE - UNESCO
- Working Group Coordinator
  - Director of Pusair – 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
  - Deputi Director or Research and Development Program APCE – UNESCO
  - Deputy for Education Division -KNIU
- Member
  - Member form each Working Group

New Structure of IHP National Committee




Water issues in Indonesia
Although Indonesia enjoys 21 % of total freshwater available in the Asia-Pacific region, many of the country's water security issues are tied to its rapid development and poor urban infrastructure:
1
Lack access to safe/clean water and sanitation
2
Many areas vulnerable to floods as a result of land-use change and deforestation
3
Wastewater from industrial, domestic and agriculture sectors contaminated both surface water and groundwater supplies. This exposure greatly increases human susceptibility to water-related diseases.
4
The dry season may become more arid, driving water demand; while the rainy season may condense higher precipitation levels into shorter periods, increasing the possibility of heavy floods (effects of climate change)


Activities 2016
Indonesia IHP actively participated in :
Unesco Water Family Centres Coordination Meeting in Beijing – China, May 2016
Unesco Water Family Centre Meeting in Tehran, Iran, March 2016
Collaboration meeting of IHP and MAB in Bali 2016
IGC of IHP Meeting in Paris June 2016 : Indonesia as member of committee for resolutions
Supporting of Development and inauguration of Saguling Demosite, 29 October 2016
Supporting Workshop of Ecohydrology in Yogyakarta 12 – 14 October 2016
Supporting Workshop of Ecohydrology in Kefamenanu TTU, NTT, 18 – 19 October 2016
World water day celebration event in Cibinong District 22 – 25 March 2017
Support the proposal of IHE and CIRAT as Category II Centres of Unesco
Catalog River
Meeting of IHP in JASTIP Forum, Kyoto Japan, March 2017

WORKING GROUP of IHP National Committee

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

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

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

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

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

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

Theme 1: Water Related Disasters andHydrological Changes

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

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

Theme 2 : Groundwater in a changing environment

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

Inauguration of groundwater well in Yogyakarta

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

Inauguration of groundwater well in Magelang

Theme 3 : Addressing Water Scarcity and Quality

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

Addressing Water Scarcity and Water Quality

- 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

- During the last two years (2015-2016) has been built as many as 498 embung. The year 2017 has built nine new dams from the target of 65 dam construction (including 16 dams which continued from previous government) in the period 2015-2019.
- In support of water and food security, it was recorded in 2016 that the Ministry of PUPR through the Directorate General (DG) SDA 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.

Theme 4 : Water and Human Settlement of the Future

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

Theme 5 : Ecohydrology : Engineering Harmony for a sustainable World

- APCE program & activities related to theme 5 IHP phase VIII:
- Development of ecohydrological demosite in Saguling Reservoir
- National Workshop "Ecohydrologycal Approach to support Sustainable Management of Peatland in Ex-Mega Rice: Central Kalimantan"
- Workshop "Sustainable Water Resources Management in Yogyakarta"
- Workshop on "Integrated Water and Environmental Management for Water Conservation in East Nusa Tenggara"
- 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.

Theme 8 :Water Education Keys for Water Security

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

Next 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 Philippine
- Attend to General Conference of UNESCO in Paris in November 2017
- Support actively APCE program and activites, and periodic evaluation process by UNESCO Paris

GC of IHP Meeting in Paris November 2017

Unesco Fostering Collaboration Meeting in Bali July

Thanks!

Japan:

NATIONAL REPORT ON IHP RELATED ACTIVITIES

Various activities of UNESCO have been implemented under the support of the Japanese National Commission for UNESCO with financial contribution in the form of Fund-in-Trust (JFIT) for the Promotion of Science for the Sustainable Development. Japanese National Committee for IHP of UNESCO is expected to solve complex global challenges through following activities with a cross-cutting approach in collaboration with all the studies including social and human sciences, in addition to changing value. The following summary includes the activities of Japanese National Committee for IHP of UNESCO undertaken during April 2015 to October 2016.

1. ACTIVITIES UNDERTAKEN IN THE PERIOD JUNE 2016 – OCTOBER 2017

1.1 Composition of the IHP National Committee

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

Members of the IHP National Committee as of October 2017.

	Name	Position	E-mail
Chair*	TACHIKAWA Yasuto	Prof., Kyoto Univ.	tachikawa@hywr.kuciv.kyoto-u.ac.jp
*	UEMATSU Mitsuo	Director and Prof., CICAORI, The Univ. of Tokyo	uematsu@aori.u-tokyo.ac.jp
*	KURODA Reiko	Prof. The Tokyo Univ. of Science	rkuroda@rs.tus.ac.jp
	OKI Taikan	Prof., IIS, The Univ. of Tokyo	taikan@iis.u-tokyo.ac.jp
	KAZAMA Futaba	Prof., Univ. of Yamanashi	futaba@yamanashi.ac.jp
	KAWAMURA Akira	Prof., Tokyo Metropolitan Univ.	kawamura@tmu.ac.jp
	TANIGUCHI Makoto	Prof., RIHN	makoto@chikyu.ac.jp
	CHIKAMORI Hidetaka	Prof.,Okayama Univ	tikamori@cc.okayama-u.ac.jp
	TSUJIMURA Maki	Prof., Univ. of Tsukuba	mktsuji@geoenv.tsukuba.ac.jp
	NAKAYAMA Mikiyasu	Prof., The Univ. of Tokyo	nakayama@k.u-tokyo.ac.jp
	HARUYAMA Shigeko	Prof., Mie Univ.	haruyama@bio.mie-u.ac.jp
	HIYAMA Tetsuya	Prof., ISEE, Nagoya Univ.	hiyama@nagoya-u.jp
	HORI Tomoharu	Prof., WRRC, DPRI, Kyoto Univ.	hori.tomoharu.3w@kyoto-u.ac.jp
	SAWANO Hiyasa	Deputy Director, ICHARM, PWRI	hs-sawano@pwri.go.jp
	MATSUKI Hiroshi	Division of International Division, River Bureau, Ministry of Land, Infrastructure and Transport	
	WATANABE Tsugihiro	Prof., Kyoto Univ.	nabe@kais.kyoto-u.ac.jp

Notes:

* Member of the Japanese National Commission for UNESCO;

CICAORI: Center for International Collaboration, Atmosphere and Ocean Research Institute;

DPRI: Disaster Prevention Research Institute, Kyoto University;

ICHARM: The International Centre for Water Hazard and Risk Management (UNESCO Category II Centre);

IIS: Institute for Industrial Sciences, University of Tokyo;

ISEE: Institute for Space-Earth Environmental Research, Nagoya University (formerly Hydrospheric Atmospheric Research Center (HyARC));

PWRI: Public Works Research Institute;

RIHN: Research Institute for Humanity and Nature; and

WRRC: Water Resources Research Center.

Secretariat of the Japanese National Committee for IHP, UNESCO:

c/o Ms. MOTOOKA Yoshiko

Japanese National Commission for UNESCO,

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

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

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

TEL: +81-(0)3-6734-2585 / FAX: +81-(0)3-6734-3679, http://hywr.kuciv.kyoto-u.ac.jp/ihp/japan/

1.2 Status of IHP-VIII activities

Various activities relating to IHP-VIII (2014-2018) Themes have been implemented since 2014. As a research and education activity related to all themes in IHP-VIII, development of Catalogue of Hydrologic Analysis (CHA) has been launched in 2016 with the support of Japan-ASEAN Science and Technology Innovation Platform (JASTIP).

THEME 1: Water Rerated Disasters and Hydrological Changes

FA 1.1 – Risk management as adaptation to global changes

- Climate change research under the MEXT SOSEI program "Program for Risk Information on Climate Change" was intensively conducted from 2012 to 2016.
- Climate change research under the MEXT TOUGOU program "Integrated Research Program for Advancing Climate Models" is intensively conducted from 2017 to 2021.
- Development of a new flood management method utilizing paddies into river management against global warming [National Institute for Rural Engineering (NIRE), Univ. of Tsukuba, The Univ. of Tokyo]

FA 1.2 – Understanding coupled human and natural processes

- Hydrogeological and sociological survey on development processes of East-Asian cities co-existing with floods [Kyoto Univ.]

FA 1.3 – Benefiting from global and local earth observation System

- UNESCO Pakistan project "Strategic Strengthening of Flood Warning and Management Capacity of Pakistan" [Phase 2: from 2015 to 2018] [ICHARM]

FA 1.4 – Addressing uncertainty and improving its communication

- Climate change research under the MEXT SOSEI program "Program for Risk Information on Climate Change" is intensively conducted from 2012 to 2016

FA 1.5 – Improve scientific basis for hydrology and water sciences for preparation and response to extreme hydrological events

- Inundation analysis and Flood/drought risk assessment [ICHARM, PWRI, IFNet, JMA and universities] under the MEXT TOUGOU Program from 2017 to 2021, changes of water-related disasters and water resources under global warming were investigated.
- Research Project on Disaster Prevention/Mitigation Measures against Floods and Storm Surges in Bangladesh [Prof. Nakagawa, DPRI, Kyoto Univ.] under the Science and Technology Research Partnership for Sustainable Development (SATREPS)from 2013 to 2018.
- Research to develop methodologies to observe, predict and analyze water-related hazards, supporting assessment of water-related risks [ICHARM/PWRI] from 2017 to 2019.
- Research to pioneer new methods and models to assess, analyze and monitor exposure and vulnerability to water-related hazards, supporting risk management at both local and global scales [ICHARM/PWRI] from2017 to 2019.
- Japan-ASEAN Science and Technology Innovation Platform (JASTIP) supported by Japan Science and Technology Agency (JST) from 2015-2019 [Takara, Sayama, Tachikawa, Kyoto Univ.]

THEME 2: Groundwater in a Changing Environment

FA 2.1 – Enhancing sustainable groundwater resource management

- GWES (Groundwater in Emergency Situations).
  Great Eastern Japan Earthquake and Tsunami showed the importance of groundwater use in emergency situation during disasters.

- UNESCO Chair on Sustainable Groundwater Management in Mongolia at the Institute of Geography and Geo-ecology, Mongolian Academy of Sciences and the University of Tsukuba, Japan. UNESCO has decided to launch Phase 3 activity (for next 4 years) of this chair between Mongolian Academy of Sciences and the University of Tsukuba in August 2015. The new phase of the chair will focus on the monitoring of the groundwater and the surface water interaction and the consultant on the sustainable groundwater resources governance in Ulaanbaatar, capital city of Mongolia.
- Research Group on Groundwater Governance in Japanese Association of Groundwater Hydrology launched in October 2017 to summarize domestic and international groundwater governance situation and propose perspectives for future tasks considering SDGs. [Jap. Assoc. Groundwater Hydrol.]

FA 2.2 – Addressing strategies for management of aquifers recharge

- UNESCO Chair on Sustainable Groundwater Management in Mongolia at the Institute of Geo-ecology, Mongolian Academy of Sciences and the University of Tsukuba, Japan. The chair activity has been continued actively focusing on the monitoring of the groundwater and the surface water interaction and the consultant on the sustainable groundwater resources governance in Ulaanbaatar, capital city of Mongolia.
- Research project on Artificial Groundwater Recharge using paddy field [Ono City, Fukui Prefecture, University of Tsukuba]

FA 2.3 – Adapting to the impacts of climate change on aquifer systems

- Groundwater resources assessment under the pressure of humanity and climate change (GRAPHIC) [Research Institute for Humanity and Nature (RIHN)]
  UNESCO-GRAPHIC organized several international activities including symposiums and training courses to evaluate the effects of climate change and human activities on groundwater resources.

FA 2.4 – Promoting groundwater quality protection

THEME 3: Addressing Water Scarcity and Quality

FA 3.1 – Improving governance, planning, management, allocation and efficient use of water resources

- DPRI initiated the Japan Egypt-Hydro Network (JF-HydroNet) with the coordination with three Egyptian Institutions under the umbrella of GCOE-ARS project at Kyoto Univ. for a joint research

and education project on the water resources and environmental problems of the Nile Delta of Egypt [Prof. T. Sumi, WRRC, DPRI, Kyoto Univ.].
- Hydro-microbiological Approach for Water Security in Kathmandu Valley, Nepal [Prof. Kazama, Univ. of Yamanashi] under the Science and Technology Research Partnership for Sustainable Development (SATREPS) from 2013-2018.
- The G-WADI (Global Network on Water and Development Information for Arid Lands) Global Conference "G-WADI more than a decade enhancing water and sustainable development for arid regions" on 25-27 October 2016 in Beijing, China [Prof. Koike, ICHARM]

THEME 4: Water and Human Settlements of the Future

FA 4.2 – System wide changes for integrated management approaches

- Development of a Comprehensive Disaster Resilience System and Collaboration Platform in Myanmar [Prof. Meguro, IIS, The Univ. of Tokyo] under the Science and Technology Research Partnership for Sustainable Development (SATREPS) from 2014 to 2019.
- Research to propose policy tools for integrated and comprehensive water and risk management to enhance human and ecosystem resilience, for instance through preparedness, early warning, and hard-soft integration [ICHARM/PWRI] from 2017 to 2019.

THEME 5: Ecohydrology, Engineering Harmony for a Sustainable World

FA 5.1 – Hydrological dimension of a catchment - identification of potential threats and opportunities for a sustainable development

- Hydrological and ecological impact assessment of long-term global warming on river basins in the world [Kyoto Univ.]

FA 5.2 – Shaping of the catchment ecological structure for ecosystem potential enhancement - biological productivity and biodiversity

- Valorization of Bio-resources in Semi- arid and Arid Land for Regional Development [Univ. Tsukuba]
  Univ. Tsukuba has performed an international collaboration research on the relationship between the bio-resources and surface water/ groundwater resources in semi-arid regions in Tunisia funded by the Science and Technology Research Partnership for Sustainable Development (SATREPS) of the Japan International Cooperation Agency (JICA) and the Japan Science and Technology Agency (JST).

FA 5.3 – Ecohydrology system solution and ecological engineering for the enhancement of water and ecosystem resilience and ecosystem services

THEME 6: Water Education, Key for Water Security

FA 6.2 –Addressing vocational education and training of water technicians

- Promoted UNESCO's "IWRM Guidelines at river basin level (IWRM Guidelines)" by NARBO (Network of Asian River Basin Organizations)
- Preparation for Educational material of IWRM guidelines for UNESCO by Japan Water Agency, secretariat of NARBO.
- International Environment Leaders Training Program funded by Ministry of Education, Culture, Sports, Science and Technology (MEXT) [Univ. Tsukuba, Kyoto Univ., Univ. Tokyo, Kumamoto Univ. et al.]
- ICHARM Training Programmes and a one-year Master Degree Program on water-related risk management in cooperation with the National Graduate Institute for Policy Studies (GRIPS) supported by JICA.

- Japan supports the activities of the Regional Center on Capacity Development and Research in Water Harvesting, UNESCO Category 2 Center, Sudan as a member of the Governing Board [Tsujimura]

FA 6.3 – Water education for children and youth

- Kyoto University is implementing a Leading Graduate Schools Program "Inter-Graduate School Program for Sustainable Development and Survival Societies" (2011-2018) [Takara, Hori, Tachikawa].
- Kyoto University implemented a collaborative education programs with universities in Asia "International Program on Resilient Society Development under Changing Climate" under Re-inventing Japan Project supported by MEXT (2016-2020) [Hori, Tachikawa]
- ICHARM Training Programmes and a one-year Master Degree Program on water-related risk management in cooperation with the National Graduate Institute for Policy Studies (GRIPS) supported by JICA.
- ICHARM Training Programmes and a three-year Doctoral degree program on "Disaster Management Program" cooperation with the National Graduate Institute for Policy Studies (GRIPS)
- Two short-term training courses have been conducted about Capacity Development for Flood Risk Management, June 2014-June 2016 [ICHARM].
- Joint international summer program "Sustainable Water Management in an Era of Big Data" co-organized with the University of Tokyo, July27-August 7, 2016 [ICHARM]
- University of Tsukuba has launched a new graduate level English course "SUSTEP (Sustainability Science, Technology and Policy) Program" to educate global leaders having comprehensive capacity of environment and sustainable development since April 2014.
- University of Tsukuba performs English education program on environmental sciences at the Master's level in the framework of JDS (The Project for Human Resource Development Scholarship) and ABE-Initiative (African Business Education Initiative for Youth) funded by JICA (Japanese International Cooperation Agency), Japanese Government.
- University of Tsukuba launched an International Joint Master's Degree Program of Sustainability and Environmental Sciences with Malaysia-Japan International Institute of Technology (MJIIT), University of Technology, Malaysia (UTM) in September, 2017.

Other regional and cross-cutting themes activities

(1) Post Catalogue of Rivers:

- As an activity for the post Catalogue of Rivers for Southeast Asia and the Pacific, development of Catalogue of Hydrologic Analysis (CHA) has been launched in 2016 with the support of JAPTIP. [Kobe Univ., Okayama Univ., and Kyoto Univ.] The information on CHA locates at http://hywr.kuciv.kyoto-u.ac.jp/ihp/rsc/cha.html

(2) Asian Pacific FRIEND:

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

(3) International Flood Initiative (IFI), International Sediment Initiative (ISI) and International Programme on Landslides (IPL):

- Contribution to IFI as secretariat

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

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

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

(4) UNESCO Chair on Sustainable Groundwater Management in Mongolia (Phase 3):

- Phase 3 has been launched in August 2015 (for next 4 years) between Mongolian Academy of Sciences and the University of Tsukuba. The new phase of the chair will focus on the monitoring of the groundwater and the surface water interaction and the consultant on the sustainable groundwater resources governance in Ulaanbaatar, capital city of Mongolia.
- The business meeting was held on 24th to 26th November, 2016 at Ulaanbaatar, Mongolia [Univ. Tsukuba, Institute of Geography and Geoecology, Mongolian Academy of Sciences]

(5) International Commission on Tracers (ICT), International Association of Hydrological Sciences (IAHS)

- The ICT organized a workshop entitled in "W13: Environmental and artificial tracers as indicators in hydrology" in IAHS 2017 Scientific Assembly on 10th to 14th July 2017 at Port Elizabeth, South Africa [Tsujimura].

1.3 Activities at national level in the framework of the IHP

1.3.1 National/local scientific and technical meetings

- The 30th IHP National Committee meeting was held at MEXT on 30 May 2016 to discuss various issues relating to the 22nd Session of IHP Intergovernmental Council (June 2016) .
- The 31st IHP National Committee meeting was held at MEXT on 4 September 2017 to discuss various issues relating to the 25th IHP RWC and related issues.

1.3.2 Participation in IHP Steering Committees/Working Groups

- The 24th RSC meeting was held in Ulaanbaatar, Mongolia, 24-26 October 2016. [Takara, Tachikawa, Kobayashi, Takeuchi, Sayama, Tsujimura]

1.3.3 Research/applied projects supported or sponsored

- Japan-ASEAN Science and Technology Innovation Platform(JASTIP) supported by Japan Science and Technology Agency (JST) [Prof. K. Takara, T. Sayama, Y. Tachikawa, Kyoto Univ.]
- "Precise Impact Assessments on Climate Change" supported by MEXT TOUGOU Program "Integrated Research Program for Advancing Climate Models" 2017-2021 [ICHARM, PWRI, Kyoto Univ., Univ. Tokyo and others]
- JSPS-Asian Core Program, "Research and Education Center for the Risk Based Asian Oriented Integrated Watershed Management," 2011-2015 [PI: Prof. Yoshihisa Shimizu, Kyoto Univ.]

- Program for Leading Graduate Schools "Inter-Graduate School Program for Sustainable Development and Survivable Societies" (GSS) 2011-2018 sponsored by MEXT-JSPS [Prof. Kaoru Takara, DPRI, Kyoto Univ.]
- Research Project "New frontiers in global hydrology" supported by Grant-in-Aid for Scientific Research of The Japan Society for the Promotion of Science. (2016-2022) [T. Oki, The Univ. of Tokyo]
- Research Project "A tracer simulator of fallout radionuclides for safe and sustainable water use" Core Research for Evolutional Science and Technology (CREST), 2011-2017, the Japan Science and Technology Agency (JST). [T. Oki, University of Tokyo]
- Research Project "Hydro-microbiological Approach for Water Security in Kathmandu Valley, Nepal" supported by the Science and Technology Research Partnership for Sustainable Development (SATREPS), 2013-2018, JST-JICA [F. Kazama, Univ. of Yamanashi]
- Research Project "Disaster Prevention/Mitigation Measures against Floods and Storm Surges in Bangladesh" supported by the Science and Technology Research Partnership for Sustainable Development (SATREPS), 2013-2018, JST-JICA [H. Nakagawa, DPRI, Kyoto Univ.]
- Research Project "Development of a Comprehensive Disaster Resilience System and Collaboration Platform in Myanmar" supported by the Science and Technology Research Partnership for Sustainable Development (SATREPS), 2014-2019, JST-JICA [K. Meguro, IIS, The Univ. of Tokyo]
- Research Project "Advancing of Co-Design of Integrated Strategies with Adaptation to Climate Change (ADAP-T)" supported by the Science and Technology Research Partnership for Sustainable Development (SATREPS), 2015-2020, JST-JICA [T. Oki, IIS, The Univ. of Tokyo]
- UNESCO Pakistan project "Strategic Strengthening of Flood Warning and Management Capacity of Pakistan" [Phase 2: from 2015 to 2018] [ICHARM]
- Asian Development Bank Project "TA-8456: Transformation of Urban Management - Part II Flood Management" in the Republic of the Union of Myanmar, July 2014-November 2016 [ICHARM]
- Asian Development Bank Project "SC 109094 REG: Climate Change and Flood Hazard Simulations Tools for ADB Spatial Application Facility, July 2017-June 2018 [ICHARM]

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

The Japanese IHP National Committee has been closely collaborating with:

- Some committees in the Science Council of Japan (SCJ), including the Sub-Committee on IRDR (Integrated Research on Disaster Reduction) of ICSU (International Science Union), ISSC (International Social Science Council) and UNISDR (United Nations Office for Disaster Risk Reduction).
- The national government and its branches relating to hydrology and water resources administration,
- Nagoya University and Kyoto University for IHP Training Courses and Graduate School and other universities and research institutes,
- The Japan Water Forum (JWF),
- World Meteorological Organization (WMO), and
- International NGOs/NPOs such as the International Association of Hydrological Sciences (IAHS), the International Water Resources Association (IWRA), the International Association for Hydro-Environment Engineering and Research (IAHR), the World Water Council (WWC) especially for World Water Forum (WWF), the Asia Pacific Association of Hydrology and Water Resources (APHW), Asia Oceania Geosciences Society (AOGS) and the International Consortium on Landslides (ICL).

1.3.5 Other initiatives

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

On 23 July 2013, the Ambassador of Japan to UNESCO, H.E. Mr Isao Kiso and the Director-General of UNESCO, Irina Bokova, signed an agreement for the renewal of ICHARM at the UNESCO Headquarters in Paris. The agreement, which entered into force upon its signature, grants ICHARM the status of an international centre under the auspices of UNESCO (Category 2) for a second six-year term.

It is important to cooperate with existing UNESCO water Centers such as IHE in the Netherlands, HidroEX in Brazil, IRTCES in China, HTC in Malaysia and RCUWM in Iran, Federal Institute of Hydrology (BfG) of Germany etc. The outline of ICHARM is as follows:

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

2) Functions:

(i) to promote scientific research and to undertake effective capacity-building activities at the institutional and professional levels;

(ii) to create and reinforce networks for the exchange of scientific, technical and policy information among institutions and individuals;

(iii) to develop and coordinate cooperative research activities, taking advantage particularly of the installed scientific and professional capacity of the IHP networks, WWAP, the IFI/P and relevant programmes of non-governmental organizations, international institutions and networks;

(iv) to conduct international training courses for practitioners and researchers on the global level; and

(v) to organize knowledge and information transfer activities including international symposia or workshops, and to engage in appropriate awareness-raising activities;

3) Structure: The center is established as a part of the Public Works Research Institute (PWRI) and operated under the responsibility of its Chief Executive.

Based on the 2013 renewed agreement between the UNESCO and the Government of Japan on ICHARM, the Governing Board was established. Following the first Governing Board meeting on February 25, 2014, the second meeting was held on 3 March 2016 and examined and adopted, "ICHARM Long-term (around 10 years) and Mid-term (around 5 years) Programmes" and the "ICHARM Work Plan (From April 2016 to March 2018)" that describes the detail of activity plan. Also reviewed is the "ICHARM Activity Report" dated from April 2014 to March 2016 (including the plan for March 2016). The third Governing Board meeting will be held on 14 February 2018. Following members will be designated as the Governing Board Members from January 1, 2018 for two years;

Akihiko Tanaka, President, National Graduate Institute for Policy Studies (GRIPS)

Andras Szollosi-Nagy, Chairperson, International Hydrological Programme Intergovernmental Council;

Robert Glasser, Special Representative of the Secretary-General for Disaster Risk Reduction, United Nations Office for Disaster Risk Reduction (UNISDR)

Shinichi Kitaoka, President, Japan International Cooperation Agency (JICA)

Masafumi Mori, Vice Minister for Engineering Affairs, Ministry of Land, Infrastructure, Transport and Tourism (MLIT)

Kazuhiro Nishikawa (Chairperson), President, Public Works Research Institute (PWRI)

Irina Bokova, Director-General, United Nations Educational, Scientific and Cultural Organization (UNESCO)

See other information at: http://www.icharm.pwri.go.jp/html/about/governingboard.html

The events related to the ICHARM since June 2016 are summarized as below:

(1) JAXA-SAFE mini workshop and provide technical support to SFAE-MRC and SAFE-Sri Lanka Projects on 2 June 2016 in Jakarta, Indonesia
(2) The 7th International Conference on Water Resources and Environment Research (ICWRER) on 5-9 June 2016 in Kyoto, Japan
(3) The 22nd session of the Intergovernmental Council of the International Hydrological Programme (IHP) of UNESCO and IFI side event, 12th Kovacs Colloquium on 13-17 June 2016 in France, Paris
(4) International Training on IWRM under Climate Change on 14-16 June 2016 in Bangkok, Thailand
(5) The Kick-off Meeting of the 8th World Water Forum on 26-28 June 2016 in Brasília, Brasil
(6) The 7th International Conference on Water Resources and Environment Research (ICWRER2016) on 7 July 2016 in Kyoto, Japan
(7) River Flow 2016, Eighth International Conference on Fluvial Hydraulics on 12-14 July 2016 in St. Louis, USA
(8) Fostering Collaboration between UNESCO in the Field and Networks towards the Agenda 2030 on 21-24 July 2016 in Bali, Indonesia
(9) Meeting of the Drafting Group of the Budapest Water Summit 2016 on 22-24 July 2016 in Tihany, Hungary
(10) The 13th Annual Meeting, Asia Oceania Geosciences Society (AOGS2016) on 1-5 August 2016 in Beijing, China
(11) Capacity Building/Training Workshop on Operational Flood Forecasting and Early Warning System Development and real time Satellite rainfall application in the Kalu Ganga Basin on 22-24 August 2016 in Kotmale, Sri Lanka
(12) Drainage Systems Asia Summit 2016 on 24-25 August 2016 in Singapore
(13) The 5th Working Group of Hydrology of the UNESCAP/WMO Typhoon Committee on 6-7 September 2016 in Seoul, Korea
(14) The Advisory and Management Committee meetings of the WMO/GWP Associated Programme on Flood Management (APFM) on 12-14 September 2016 in Geneva, Switzerland
(15) Japan Society of Hydrology and Water Resources 2016 science meeting on 17 September 2016 in Fukushima, Japan
(16) 2016 International Training Workshop on Natural Disaster Reduction hosted by NCDR on 26 September 2016 in Taipei, Taiwan
(17) Regional Training for Flood Forecasting in Transboundary River Basins on 3-6 October 2016 in Bangkok, Thailand
(18) The 11th Integrated Workshop of the UNESCAP/WMO Typhoon Committee session on 24-28 October 2016 in Cebu, Philippines
(19) The G-WADI Global Conference "G-WADI more than a decade enhancing water and sustainable development for arid regions" on 25-27 October 2016 in Beijing, China
(20) Training Workshop on Numerical Modelling of Extreme Flash Floods in Arid Regions on 24 October 2016 in El Gouna, Egypt

(21) The Second International Symposium on Flash Floods in Wadi Systems Disaster Risk Reduction and Water Harvesting in the Arab Region on 25-27 October 2016 in El Gouna, Egypt
(22) Conference of the Meteorological Society of Japan, 2016 Fall meeting on 28 October 2016 in Nagoya, Japan
(23) The Eighth Meeting of High-Level Experts and Leaders Panel on Water and Disasters (HELP) and IFI side event on 31 October - 1 November 2016 in Jakarta, Indonesia
(24) Workshop on Experience sharing of Sediment Disaster Management in Nepal and Japan on 8 November 2016 in Kathmandu, Nepal
(25) COP22 and side events on 8-11 November 2016 in Marrakech, Morocco
(26) 1st Regional Training Course (RTC) of the International Atomic Energy Agency (IAEA)/Regional Cooperative Agreement (RCA) RAS/7/30 Project on the use of isotope techniques for water characterization on 14-25 November 2016 in Xian, China
(27) The 23rd Session of the Asia-Pacific Regional Space Agency Forum (APRSAF-23) on 14-16 November 2016 in Manila, Philippine
(28) The International Conference "Asia Pacific Policy Dialogue on Water, Energy and Food Security for Poverty Alleviation in Dryland Regions", co-hosted by UNESCO and PMAS-AAUR on 23-25 November 2016 in Islamabad, Pakistan
(29) The Budapest Water Summit 2016 on 28-30 November 2016 in Budapest, Hungary
(30) World Meteorological Organization, Commission for Hydrology Fifteenth Session on 6-15 December 2016 in Roma, Italy
(31) Snow Model Intercomparison Project (ESM-SnowMIP) workshop, the 6th annual meeting of the Permafrost Carbon Network, 2016 American Geophysical Union (AGU) on 10-16 December 2016 in San Francisco, USA
(32) 20th Governing Board of the Asia-Pacific Water Forum (APWF) on 18-19 January 2017 in Singapore
(33) GPM Asia Workshop on 18-19 January 2017 in Bangkok, Thailand
(34) International Symposium on the Cryosphere in a Changing Climate on 12-17 February 2017 in Wellington, New Zealand
(35) The 49th Session of the UNESCAP/WMO Typhoon Committee session on 21-24 February 2017 in Tokyo
(36) 6th NARBO General Meeting on 23 February 2017 in Jakarta, Indonesia
(37) 4th Joint Project Team Meeting for Sentinel Asia STEP3 (JPTM2017) on 7-9 March 2017 in Hanoi, Vietnam
(38) IFI Coordinating Meeting in Philippines on 13 March 2017 in Davao, Philippines
(39) Conference on Hydraulic Engineering on 17 March 2017 in Fukuoka, Japan
(40) Workshop regarding the joint study for Bolivian Glacier catchment on 19 March 2017 in La Paz, Bolivia
(41) Joint Workshop on Climate Change Impact Assessment in the Solo River Basin on 21 March 2017 in Jakarta, Indonesia
(42) Capacity Building/Training Workshop on RRI Model and GSMaP satellite data on 21-24 March 2017 in Colombo, Sri Lanka
(43) Workshop "Strategic Data for Reliable Models and Flood Forecasts" funded the UNESCO Pakistan project, flood modelling training funded by the UNESCO Pakistan project on 6-12 April 2017 in Lahore and Islamabad, Pakistan
(44) The "Risk-Based Hydrologic Engineering Standards" workshop at the International Centre for Water Resources and Global Change (ICWRGC), Federal Institute of Hydrology (BfG) on 24-25 April 2017 in Koblenz , Germany
(45) The High Level Consultation Meeting on IFI Coordination in Myanmar on 9 May 2017 in Naypyidaw, Myanmar
(46) UNESCO i-WSSM Seminar on 11–13 May 2017 in Seoul, Korea
(47) International Symposium on Integrated Governance of Large-scale Disaster and Economic risks on 13-14 May 2017 in Shenzhen, China
(48) APRSAF/SAFE-ESCAP Meeting on 15 May 2017 in Bangkok, Thailand
(49) Building Resilience to Water-related Disaster Risks in the 73rd session of ESCAP on 18 May 2017 in Bangkok, Thailand

(50) Ninth Meeting of the High-level Experts and Leaders Panel on Water and Disasters (HELP) and its Technical Session/ Side Event on 18-19 May 2017 in Chengdu, China
(51) The 2017 Japan Geosciences Union (JpGU)-American Geoscience Union (AGU) Joint Meeting on 20-24 May 2017 in Chiba, Japan
(52) 2017 Global Platform for Disaster Risk Reduction organized by UNISDR on 22-26 May 2017 in Cancun, Mexico
(53) Conference of the Meteorological Society of Japan, 2017 Spring meeting on 26 May 2017 in Yoyogi, Japan
(54) The 12th Working Group of Disaster Risk Reduction Meeting of the UNESCAP/WMO Typhoon Committee on 31 May - 1 June 2017 in Ulsan, Korea
(55) Tools for Managing Hydrological Maximums in a Changing World on 12-19 June in Montevideo, Uruguay
(56) 17th Conference of the Science Council of Asia, meeting for SATREPS Proposal and meeting for the Platform on Water-related Disasters on 14-15 June 2017 in Manila, Philippines
(57) The Third Pole Science Summit (TPSS) - TPE-CSTP-HKT Joint Conference on 9-11 July 2017 in Beijing and Kunming, China
(58) UNESCO Regional Workshop "Building Resilience to Climate Change Risk and Vulnerability to Meet Water Security Challenges" on 10-11 July 2017 in Langkawi, Malaysia
(59) Third UN Special Thematic Session on Water and Disasters on 20 July 2017 in New York, USA
(60) Closure meeting of the SAFE Project (Mekong River Commission) on 20-21 July 2017 in Vientiane, Laos
(61) The 21st Governing Council Meeting of the Asia-Pacific Water Forum (APWF) on 31 July 2017 in Singapore
(62) UNESCO Pakistan Project Partners progress report workshop, ADCP training, 31 July - 7 August 2017 on Islamabad, Pakistan
(63) 14th Annual Meeting Asia Oceania Geosciences Society (AOGS) on 8-11 August 2017 in Singapore
(64) 2nd RTC of the IAEA/RCA RAS/7/30 Project on 14-18 August 2017 in Sydney, Australia
(65) Plenary Session for the Platform on Water and Disasters in Sri Lanka on 24 August 2017 in Colombo, Sri Lanka
(66) Training as part of the JAXA-SAFE Sri Lanka project on 28-30 August 2017 in Colombo, Sri Lanka
(67) 44th Asia-Pacific Advanced Network Meeting (APAN 44) on 29-31 August 2017 in Dalian, China
(68) Advisory Committee (AC) and Management Committee (MC) meetings of the Associate Programme on Flood Management (APFM) on 4-5 September 2017 in Geneva, Switzerland
(69) 7th International Conference on Flood Management (ICFM7) on 6-7 September 2017 in Leeds, UK
(70) The 10th GEOSS Asia-Pacific Symposium and Asian Water Cycle Initiative (AWCI) group session on 18-20 September 2017 in Hanoi, Vietnam
(71) 2nd Implementation Roadmap Review Meeting on the results of the 7th World Water Forum during Korea International Water Week 2017 (KIWW2017) on 20-23 September 2017 in Gyeongju, Republic of Korea
(72) The 10th Meeting of the High-Level Experts and Leaders Panel on Water and Disasters (HELP) on 21 September 2017 in Gyeongju, Korea
(73) The 6th Working Group of Hydrology of the UNESCAP/WMO Typhoon Committee on 26-27 September 2017 in Seoul, Korea
(74) Fifth session of the Committee on Disaster Risk Reduction of the ESCAP on 10-12 October 2017 in Bangkok, Thailand
(75) The Knowledge Forum on Water Security and Climate Change on 18-20 October 2017 in Paris, France
(76) GEO Week 2017 on 23-27 October 2017 in Washington DC, USA
(77) 1st China-Japan-South Korea Water Science Research Forum - Sustainable Development of Regional Water Resources Under Changing Environment on 28-29 October 2017 in Dalian, China
(78) The 12th Integrated Workshop of the UNESCAP/WMO Typhoon Committee session on 30 October - 3 November 2017 in Jeju, Korea

(79) Conference of the Meteorological Society of Japan, 2017 Fall meeting on 31 October - 1 November 2017 in Sapporo, Japan

1.4 Educational and training courses

1.4.1 Contribution to IHP courses

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

An important development of TC is information dissemination on website. The broadcasting of the lectures to universities in Asia via the Internet was successfully performed with help of Keio University and collaboration with EST (Engineering, Science, and Technology) programme. When the visiting participants and some graduate school students join the TC's, the number is limited as only 10-20. The lectures are now available via the Internet, and many participants at remote sites can join the TC. The lectures are also open to graduate school students staying at universities in Japan. Since the TC is a good opportunity for graduate school students to learn various kinds of hydrology, water resources and disaster-related issues with trainees from abroad, the conveners of TC encourage graduate students to join the TC.

1.4.2 Organization of specific courses

ICHARM has been conducting a one-year master's program, "Water-related Disaster Management Course of Disaster Management Policy Program," since 2007 in collaboration with JICA and the National Graduate Research Institute for Policy Studies (GRIPS). The doctoral program in disaster management started in October 2010 in collaboration with GRIPS.

ICHARM has been providing a short-term training course with JICA as Capacity Development for Flood Risk Management. This training program was launched in FY2012 and designed to provide opportunity for meteorologists, river administrators and disaster management officers in flood-vulnerable developing countries to learn the use of the Integrated Flood Analysis System (IFAS), developed and upgraded by ICHARM. The other important purposes are to learn about disaster management and evacuation plans and flood response cases in Japan, and to develop an action plan for local flood management of flood-vulnerable areas in the participants' countries. These training activities aim to enhance individual flood-coping capacities and eventually to contribute to flood damage mitigation in the countries.

1.5 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

- The 3rd Global Summit of Research Institute for Disaster Risk Reduction was held at DPRI, Kyoto University on March 2017.
- The 7th International Conference on Water Resources and Environment Research (7th ICWRER), Kyoto, Japan, 5-9 June 2016.

1.6.2 Participation in meetings abroad

- The 24th Session of the IHP Regional Steering Committee (RSC) for Southeast Asia and the Pacific held at Ulaanbaatar , Mongolia on 24-26 October 2016 [Takara, Tachikawa, Tsujimura, Sayama, Kobayashi, Takeuchi]
- The 22nd session of the Intergovernmental Council, Paris, 13-14 and 16-17 June 2016 [Takara, Koike, Tachikawa, Yamashiki, Sayama]
- Expert Meeting on "Water Harvesting and Groundwater Recharge" organized by the Regional Center on Capacity Development and Research in Water Harvesting, UNESCO Category 2 Center, 10th – 11th December 2016, Khartoum, Sudan [Tsujimura]
- The Governing Board Meeting of the Regional Center on Capacity Development and Research in Water Harvesting, UNESCO Category 2 Center, Khartoum, Sudan, 12th December 2016 [Tsujimura]
- IAHS (International Association of Hydrological Sciences) 2017 Scientific Assembly, Port Elizabeth, South Africa, 10th - 14th July 2017 [Tsujimura]
- 9th Jeju Water World Forum "Sustainable Development and Value Creation of Water Resources in the Asia-Pacific Region", Jeju City, Korea, 20th – 22nd September 2017 [Taniguchi, Tsujimura]

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2017

- The 26th IHP Training Course with the theme "Coastal Vulnerability and Freshwater Discharge" will be held at HyARC, Nagoya Univ., 27 November to 10 December, 2016.
- The 24th Session of the IHP Regional Steering Committee (RSC) for Southeast Asia and the Pacific will be held at Mongolia on 24-26 October 2016.

The 3rd Asia -Pacific Water Summit will be held at Yangon on 11-12 December 2017.

2.2 Activities foreseen for 2018-2019

- The 3rd Global Summit of Research Institutes for Disaster Risk Reduction will be held in Kyoto University, March 2017.
- A faculty development workshop for "International Program on Resilient Society Development under Changing Climate" under Re-inventing Japan Project supported by MEXT will be held at Kyoto, March 2017.
- The 8th World Water Forum will be held in Brasilia on 18-23 March 2018.

2.3 Activities envisaged in the long term

- The 26th IHP Training Course with the theme "Coastal Vulnerability and Freshwater Discharge" will be held at HyARC, Nagoya Univ., 27 November to 10 December, 2016.
- Participation in IHP-VIII projects and RSC activities.
- Activities relating to "Sustainability Science" that is a key promotion by the Japanese Commission for UNESCO.
- Information dissemination through a web page of the National Committee.
  http://hywr.kuciv.kyoto-u.ac.jp/ihp/japan/index.html

- Information dissemination through a web page of the IHP RSC for Southeast Asia and the Pacific.
  http://hywr.kuciv.kyoto-u.ac.jp/ihp/rsc/index.html

Malaysia:


UNESCO - IHP MALAYSIA
[ACTIVITIES 2017]
13 November 2017
by
Dato' Ir Hj Nor Hisham bin Mohd. Ghazali
Secretary UNESCO – IHP Malaysia


MIHP ACTIVITIES 2017
2

THEME 6 : WATER EDUCATION, KEY FOR WATER SECURITY

i) WORLD WATER DAY 2017 held on 25th March 2017 at Port Dickson Negeri Sembilan, Malaysia

- Participation: 650 people (Students, Teachers, Publics)
- Launching Ceremony by Deputy Prime Minister of Malaysia

ii) NATIONAL WATER WATCH PROGRAMME FOR YOUNG LEADERS

- 24 Programmes (2009 – 2017)
  - Purpose: To create awareness amongst students regarding water conservation and protection of water resources to ensure the responsible utilization of water for a sustainable future
  - Participation: 2485 Students & 470 Teachers

National Water Watch Programme for Young Leaders (South Zone)
at Institute of Biodiversity Conservation Krau, Pahang, Malaysia

ii) NATIONAL WATER WATCH PROGRAMME FOR YOUNG LEADERS

- 24 Programmes (2009 – 2017)
  - Purpose: To create awareness amongst students regarding water conservation and protection of water resources to ensure the responsible utilization of water for a sustainable future
  - Participation: 2485 Students & 470 Teachers

National Water Watch Programme for Young Leaders (Borneo Zone)
at Kibunut River Penampang, Sabah, Malaysia

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iii) SEMINAR ON BUILDING AN EFFECTIVE FRAMEWORK FOR REGIONAL WATER COORPERATION held on 19th April 2017 at Department of Irrigation and Drainage Headquarters

- Purpose: To provide paricipants with a practical approach to the principles and rules for the effective governance of water resources.
- Participation: 18 people (From all 10 Asean Countries)

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iv) PERAK RIVER EXPEDITION, 14-16 July 2017

- Purpose: Collaboration with media & researcher to promote awareness to public on water conservation and current water related issues
- Participation: 120 people (Media, University Researcher and Government Servant)




v) PUTRAJAYA LAKE AND WETLAND EXPLORACE, 4-5 November 2017

- Purpose: To create awareness amongs university students to protect and preserve water resources
- Participation: 314 Students from various Local Universities




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

(i) National Level

- **UNESCO Malaysia Day 2017**

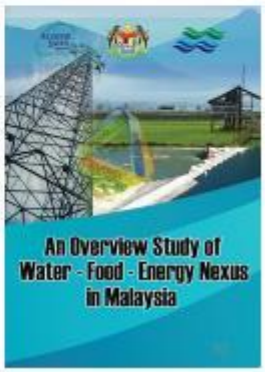
UNESCO Malaysia Day 2017 was held on 9th September 2017 at Kundasang Sabah, Malaysia and was attended by the Minister of Higher Education Malaysia



9

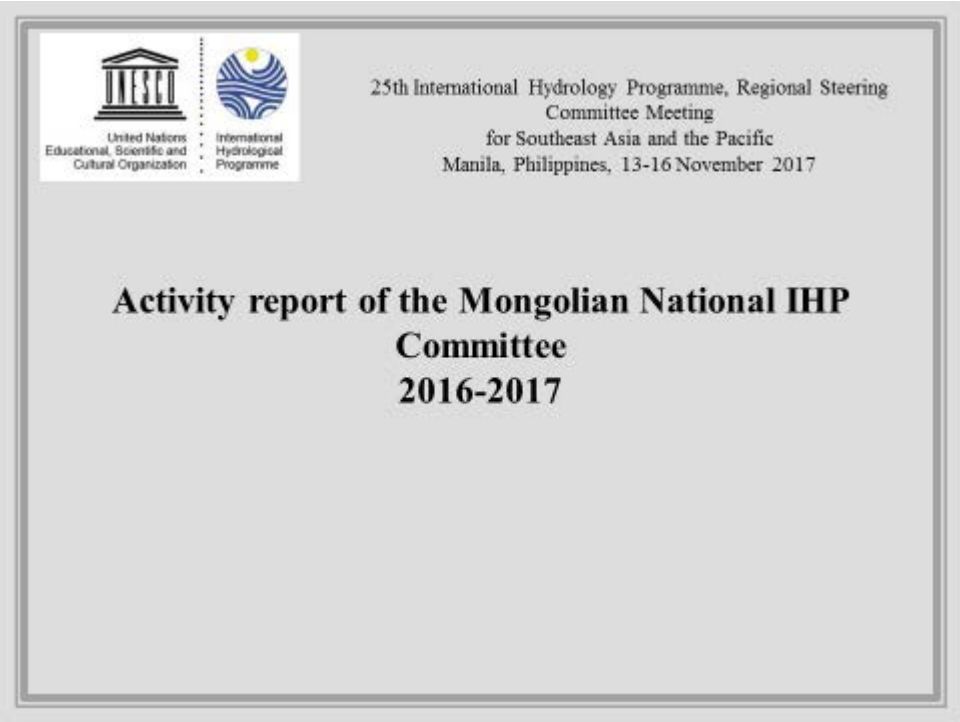
4.0 PUBLICATIONS





THANK YOU

Mongolia:


United Nations Educational, Scientific and Cultural Organization
International Hydrological Programme
25th International Hydrology Programme, Regional Steering Committee Meeting
for Southeast Asia and the Pacific
Manila, Philippines, 13-16 November 2017
Activity report of the Mongolian National IHP Committee
2016-2017


ACTIVITIES
2016-2017

Celebration of WWD 2017

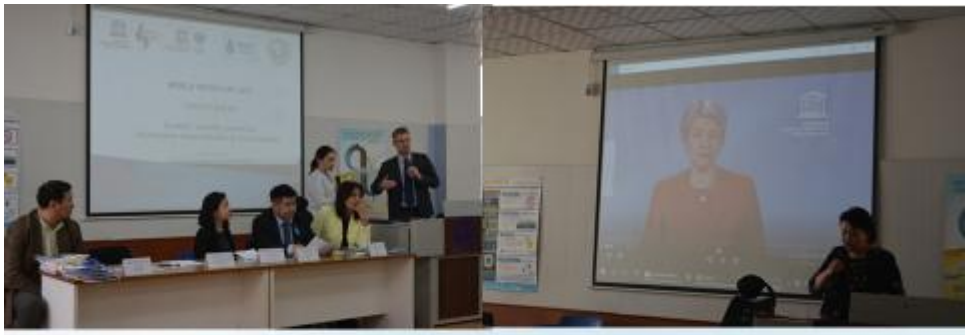
- The message of Ms. Irina Bokova, Director-General of UNESCO, was translated and broadcasted
- The World water development report of 2017 was handed over to the representatives of the Ministry of Environment and Tourism and other related organizations

WWD 2017: A student's scientific conference and a performance-based event for secondary schools was organized

- The event drew the attention of more than 250 participating students – representing 10 universities and 13 secondary schools - to (waste) water problems, strengthened their awareness of water related issues, and allowed them to share and distribute ideas, experiences and best practices related to wastewater management.
- Secondary school students competed in essay writing, design and construction of scale models, visual arts and theatrical performances on the theme of wastewater

Activities

World Water Day 2017:
Selected presentations of the student's conference have been compiled and uploaded online on websites of the related organizations and universities.

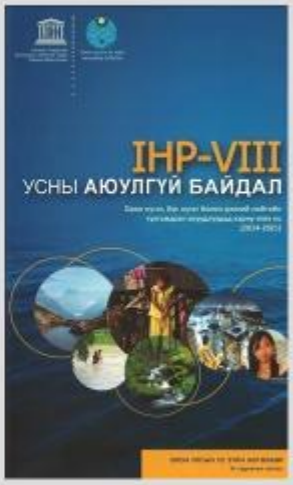


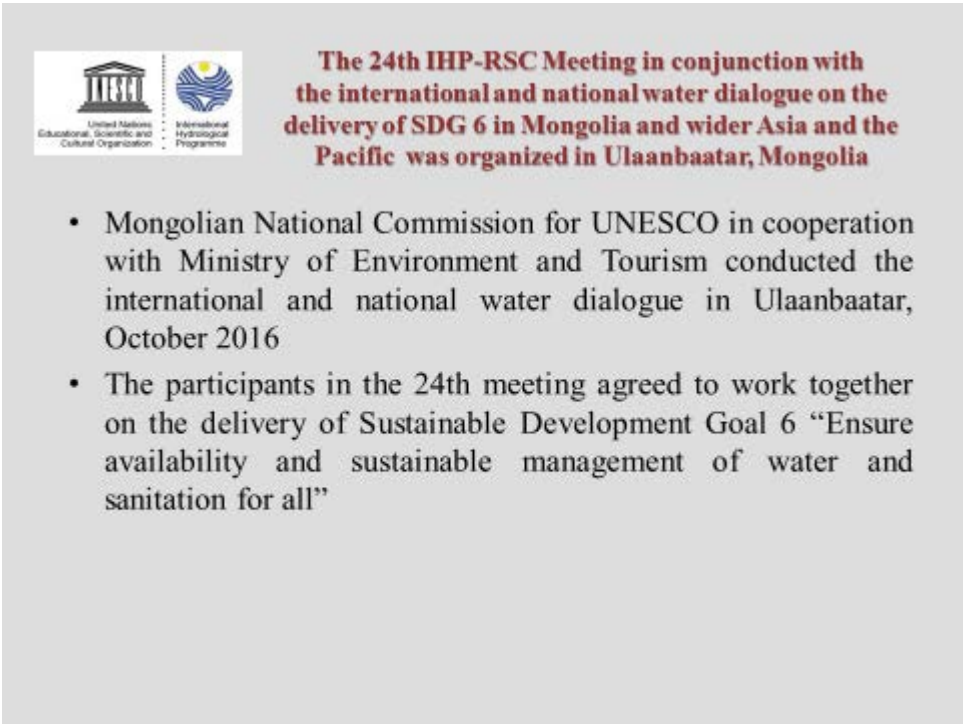
Pictures of the Student's Conference on the World Water Day 2017

Pictures of the Student's Conference on the World Water Day 2017

Activities
2016-2017

- 24th IHP RSC took place in Ulaanbaatar, Mongolia on 21-24 October, 2016.
- The Strategic Plan of the 8th phase of IHP (IHP-VIII, 2014-2021) was translated from English into Mongolian and published.




The 24th IHP-RSC Meeting in conjunction with the international and national water dialogue on the delivery of SDG 6 in Mongolia and wider Asia and the Pacific was organized in Ulaanbaatar, Mongolia
• Mongolian National Commission for UNESCO in cooperation with Ministry of Environment and Tourism conducted the international and national water dialogue in Ulaanbaatar, October 2016
• The participants in the 24th meeting agreed to work together on the delivery of Sustainable Development Goal 6 "Ensure availability and sustainable management of water and sanitation for all"


The 24th IHP-RSC Meeting in conjunction with The international and national water dialogue on the delivery of SDG 6 in Mongolia and wider Asia and the Pacific was organized in Ulaanbaatar, Mongolia
The recommendations resulted from the 24th IHP RSC:
• To increase collaboration with international networks
• To strengthen information sharing
• To strengthen IWRM and groundwater sustainable management
• To collaborate with the Global Geoparks Network and World Network of Biosphere reserves
• To improve water governance with multiple participatory
• To strengthen water policy based on science and innovation
• To support projects on drinking water safety, economic security and restore underground water
• To expand the collaboration with the UNESCO organizations
• To reuse waste water and support eco sanitation
• To increase education and training activities on water
• To expand the cooperation with UNESCO

Since the 24th meeting, Mongolian National IHP Committee has been working on:

- Revisions on the water policy
- Updating the law on water pollution fee
- Implementing a project on "Tuul River Improvement "
- Implementing a project on "Improving sanitation in ger area households"
- Tuul River Basin Authority organized a workshop on strengthening the cooperation with the Tuul River Basin Council
- Ministry of Environment and Tourism and Tuul River Basin Authority organized training on strengthening the participation of local community in the water management
- Increasing cooperation with 2030 Water Resource Group and WWF of Mongolia
- Integration with Women Geology Association to establish Geopark in Mongolia
- Strengthening ground water quality monitoring

Plan for the next year

- To intensify the cooperation with IHP RSC members
- To develop and carry out joint projects and events
- To strengthen the capacity of ground water monitoring on water quality
- To continue strengthening the cooperation of Tuul River Basin Authority with the River Basin Council and strengthening the participation of the local community in the water management
- To implement a project with the WWF of Mongolia for Tuul River Basin
- To organize an event on the occasion of the 80 years anniversary of the Mongolian Water Sector


United Nations Educational, Scientific and Cultural Organization
International Hydrological Programme
Thank you for your attention

Myanmar:

NATIONAL REPORT ON IHP RELATED ACTIVITIES

MYANMAR

1. ACTIVITIES UNDERTAKEN IN THE PERIOD November 2016 – October 2017

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

- Monitoring Water Quality of Rivers in Myanmar
- Monitoring the changes of Water resources 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

- Workshop for Development and Implementation of User-Relevant Flood Forecast Generation and Application System for Myanmar organized by DMH, and RIMES was held on 2017 at NayPyiTaw.

- Training on Application of Remote Sensing and Geographic Information Systems for Mapping and Monitoring of Glaciers organized by DMH and International Center for Integrated Mountain Development (ICIMOD)

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 and 24th Regional Steering Committee Meetings for Southeast Asia and Pacific during 2005 to 2016.

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 start Site selection in Myanmar in 2017.

Data Compilation workshop was held at Nay Pyi Taw on 6 – 10, November 2017 organized by Norwegian Water Resources and Energy Directorate(NVE), Department of Hydropower Implementation (DHPI) and DMH.

Hydrology Analyses Session 5 is being held at Nay Pyi Taw on 14 – 24, November 2017 organized by Norwegian Water Resources and Energy Directorate(NVE), Department of Hydropower Implementation (DHPI) and DMH on 6th – 10th, November, 2017.

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

1.2.5 Other Initiatives

- 100 years Return Period Flood Hazard Maps for Yangon, Mandalay and

  Mawlamying Towns Developing works are completed with ADB Project in 2017.

- 13 Radar Sensors are installed for Flood forecasting along Ayeyarwady, Chindwin and Sittaung Rivers with Indian Government Financial Support and RIMES's Technical Support in 2017.

- Three Meteorological RADAR systems are setup and operate with the support of JICA from 2014 to up to now.

1.3 Educational and Training Courses

1.3.1 Contribution to IHP courses

- Training on Meteorological Grade I was being held at Mandalay in November, 2017.
- Training on Meteorological Grade II will be held at NayPyiTaw in December, 2017.

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

- Monsoon Forum was held in May 2017 at Nay Pyi Taw, Myanmar. This meeting was organized by RIMES and DMH. Regional level Monsoon Forums were held in Ayeyarwady, Yangon Region, Mandalay Region, Shan State, Mon State and Kayin State.
- Union Level Monsoon Forum was held at Nay Pyi Taw organized by DMH and RIMES in October, 2017.

1.5.2 Participation in meetings abroad

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

- Seventh Regional Conference on Management of Meteorological and Hydrological Services (RECO-7) and Sixteenth Session of Regional Association II (RA II-16), UAE, 10th – 16th , February, 2017.
- Forty-Sixth Session of the Subsidiary Body for Scientific and Technology Advice (SBSTA 46), Forty-Sixth Session of the Subsidiary Body Implementation (SBI 46) and Third part of the first Session of the Ad Hoc Working Group on the Paris Agreement (APA1.3), Germany, 8th – 18th , May, 2017.
- 3rd RIMES MINISTERIAL Conference, Papua New Guinea, 22nd – 25th, August, 2017.
- Twenty-third Session of UNFCCC Conference of the Parties- COP 23, Germany. 29th – 17th , November, 2017.

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 2017 -

2.2 Activities foreseen for 2017-2018

- The MNC-IHP will try to implement the water related activities in line with the themes of IHP

- IHP national committee will continue to encourage scientific and technical symposia and workshops
- The members of MNC-IHP will attend the 25th Regional Steering Committee for Southeast Asia and the Pacific.
- The members of MNC-IHP will participate in the international and national activities of IHP.
- Hydrological Division will upgrade the flood early warning system and flood monitoring system.
- Remote Sensing and GIS Division will produce the flood risk maps and flood assessment maps in order to reduce the loss of life and properties.

New Zealand:

25th IHP REGIONAL STEERING COMMITTEE MEEETING FOR SOUTH EAST ASIA AND THE PACIFIC
Manila, Philippines
(13 November 2017)

NATIONAL REPORT OF NEW ZEALAND

Activities undertaken in the period October 2016– October 2017

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.

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 is late 2017 is expected to result in increased engagement with 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 2016 RSC meeting enabled by sponsorship through 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

Application of Ecohydrology principles is evident as water infrastructure options are advanced in New Zealand. Two examples are on the Opihi and Hurunui Rivers (Canterbury) where and existing and possible infrastructure concepts are being refined through field studies.

The approach of increasing rivers flows in rivers used for water sources is resulting in additional interest in infrastructure which will be required to achieve downstream flow regimes. The cost of such providing additional water has resulted in increased interest in improving water use efficiency and downsizing required infrastructure such as storage dams. This is a positive outcome for the environment. Alongside this approach research has commenced to understand the risks around climate change reducing flow availability and increasing water demand and how additional infrastructure development might be staged over time to meet these demands.

Update of New Zealand Flood design methods

The Central Government has just included the need for this in a report (October 2016) updating its National Infrastructure Plan. Activities and workshops continue to refine the business case for this work between central and local government that meets the needs of practitioners and policy makers. This initiative is aligned with the APFRIEND activities over many years.

Application of IHP-VIII approaches to urban water

There is increasing government interest in improving practices for "3 waters" (stormwater, wastewater and water supply). These interests align with concern from the NZ public, given the country is highly urbanized and there have been a series of high profile incidents. These include a major mass illness outbreak due to a contaminated urban water supply and the failure of a flood protection wall inundating a township

This change is significant as it indicates SDG topics are relevant and that the previous largely sole focus on "rural" water quality issues is changing. Investments in urban water infrastructure is far larger than in rural water infrastructure and public interest is more pronounced in urban water quality issues so this is a significant change. An important response to public concern has been increased coordination between the multiple infrastructure, policy, health etc. agencies involved and a realization that things need to change.

FE^{2}W Workshop 8 November 2017

A significant workshop was held to trial the Real Options Analysis for Decision makers (ROAD) from the FE^{2}W Network (http://www.fe2wnetwork.org/) approach on water problems in New Zealand on 8 November 2017. The potential for this method to explore the IWRM approach being used in the Canterbury Water Management Strategy was developed. It was noted that this workshop was in the same week as two other significant events looking at related water issues (the rehabilitation of a 900km^2

shallow lake and the decline of Chinook Salmon populations in Canterbury Rivers) indicating the importance of ensuring wider frameworks for guide action are well founded and reviewed.

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.

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 2016 was held in Queenstown NZ. This was a joint conference for NZ Hydrological Society, Australian Hydrology and Water Resources Symposium and IPENZ Rivers Group with an infrastructure theme.

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

There is considerable contact 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 2017

The annual conference of the NZ Hydrological Society is to be held at Napier NZ in November 2017. A workshop on current significant issues is being held as part of this on Open and Transparent Access to data, updating NZ Rainfall and Runoff design methods and the customization of an existing nationwide rainfall-runoff model or wider use.

2.2 Activities planned for 2018

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:

- 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

25th Regional Steering Committee Meeting

UNESCO International Hydrological Programme

(UNESCO IHP)

for Southeast Asia and the Pacific

held at Quezon City, Metro Manila, Philippines

13 November 2017

NOVEMBER 2017

Philippine National Committee

for the UNESCO International Hydrological Programme

Republic of the Philippines

1. ACTIVITIES UNDERTAKEN IN THE PERIOD OCTOBER 2016- OCTOBER 2017

1.1 Meetings of the IHP National Committee

1.1.1 Decisions regarding 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)

LPA & Associates (private sector)

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 Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD), 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 at Los Baños (UPLB), College of Engineering and Agro-Industrial Technology (UPLB-CEAT), Los Baños, Laguna

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

University of San Carlos (USC), Department of Civil Engineering & Water Resources Research Center (USC), Cebu City

Officers of the Philippine National Committee for UNESCO-IHP:

Chairman: Guillermo Q. Tabios III (UP Diliman)

Secretariat: NHRC and PWP staff (on secondment)

For Purpose of the RSC Meeting and Joint UNESCO-JASTIP symposium being organized by the Philippines this November 13-16, 2016, the following adhoc committees have been formed as representative by the listed agencies.

a. ADVISORY COMMITTEE

- National Water Resources Board (NWRB)
- Manila Waterworks and Sewerage System (MWSS)
- National Mapping and Resource Information Authority (NAMRIA)
- Department of Public Works and Highways (DPWH)
- Local Water Utilities Administration (LWUA)
- National Economic Development Authority (NEDA)
- Department of Science and Technology (DOST)
- Philippine Atmospheric Geophysical and Astronomical Services Administration (PAGASA)
- National Academy of Science and Technology
- Laguna Lake Development Authority
- National Irrigation Administration
- Maynilad Water Services Inc (MWSI)
- Manila Water Company Inc (MWCI)
- UNESCO Jakarta

b. Local Organizing Committee (Head: Dr. Tabios)

- Philippine Water Partnership (PWP)
- National Hydraulic Research Center (NHRC)
- National Water Resources Board (NWRB)- Dr. Tabios
- Laguna Lake Development Authority (LLDA)- c/o L. Santos-Borja
- UNESCO Philippine National Commission
- Philippine Atmospheric Geophysical and Astronomical Services Administration (PAGASA)
- Department of Environment and Natural Resources (DENR)

- UNESCO Jakarta

c. Program Sub-committee (Head: Dora Gamboa)

- University of the Philippines- Institute of Civil Engineering (UP-ICE)
- National Hydraulic Research Center (NHRC)
- National Water Resources Board (NWRB)
- Maynilad Water Services Inc (MWSI)
- National Mapping and Resource Information Authority (NAMRIA)

d. Field Trip Sub-committee (Head: Leni Santos-Borja)

- Laguna Lake Development Authority (LLDA)
- Department of Environment and Natural Resources Region 4A (DENR-4A)
- Maynilad Water Services Inc (MWSI)
- Manila Water Company Inc (MWCI)

e. Finance Sub-committee (Head: Leonor Cleofas/N. Santos)

- Philippine Water Partnership (PWP)
- Metropolitan Waterworks and Sewerage System (MWSS)
- Maynilad Water Services Inc (MWSI)
- Manila Water Company Inc (MWCI)
- Local Water Utilities Administration (LWUA)

f. Secretariat/Logistics Sub-Committee

- Noemi, Philippine Water Partnership (PWP)
- Abner, National Hydraulic Research Center (NHRC)

g. Technical Sub –committee (Roy Soriano)

- National Hydraulic Research Center (NHRC)
- Maynilad Water Services Inc (MWSI)
- JASTIP
- Department of Environment and Natural Resources-Ecosystems Research and Development Bureau (DENR-ERDB)
- Department of Environment and Natural Resources- River Basin Control Office (DENR-RBCO)
- Department of Environment and Natural Resources-Biodiversity Management Bureau (DENR-BMB)

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 Water Partnership (PWP),

- *Activities for 2017:*
    - Strategic Goal 1 - Catalyze change in policy and practice
        - Outcome Challenge: CWP Incorporate water security in their IWRM and climate change-related policies and plans
        - Activity: Understanding Water and Food Nexus to Improve Water Security: The Philippine Context
    - Strategic Goal 2 - Generate and Communicate knowledge
        - Outcome Challenge: Stakeholders gain improved political awareness and commitment to deliver water security with demonstrable follow-up commitments and actions
        - Activity: Information, Education and Communication (IEC) campaign on water security

1.2.2 Participation in IHP Steering Committees/Working Groups

Country Representative, Attended 24th Regional Regional Steering Committee Meeting of the UNESCO International Hydrological Programme for Southeast Asia and Pacific (UNESCO-IHP SEAP) and the International Conference at Ullanbatar, Mongolia, October 2016.

1.2.3 Research/applied projects supported or sponsored

National Water Resources Board

Reservoir operations studies of Ambuklao, Binga and San Roque of the Upper Agno River Basin (January 2016-July 2017): Involves optimization-simulation model development, optimization-simulation studies with 50 years historical data and with rescaled historical data under 2050 climate change scenario, and, finally development of reservoir operation rule curves based on these optimization-simulation studies.

Assessment and establishment of new streamflow monitoring system in the Upper Agno River and Angat River basin (2016-2017): 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.

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.

Laguna Water Supply Masterplan from Surface and Groundwater Sources (Dr. Guillermo Q. Tabios III, principal investigator) November 2016-October 2017.

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.

- Calibration of the following hydrologic models, to be applied operationally to the various flood forecasting points of the Pampanga, Agno, Bicol and Cagayan River Basins: MLRegression, Storage Function and Sacramento Model.

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

Strengthening of the *FFWS for Dam Operation*, including Magat Dam through the improvement of dam facilities and conduct of training.

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

No additional information is available.

1.2.5 Other Initiatives

National Water Resources Board (NWRB)

On-going Programs:

- Groundwater Resource Vulnerability

- 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.
  (a Joint Program of the Government and the United Nations, with funding from the Spanish government under the MDG Achievement Fund Strategies works with local governments and communities empowers the vulnerable and disadvantaged inspires commitment, support and partnerships)
- Sound Practices and Knowledge Products
  Human rights-based approach to WATSAN development planning.
  Godparent schne for knowledge and skills transfer
  Localized customer service code for Level II systems
  Fact sheets, Publications, Brochures
  Local Water Governance Toolbox - Physical and Web-based Knowledge Products
- 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)
  A pro-poor initiative designed to provide water supply systems for waterless municipalities and intend to enhance/improve local capacities of
  LGUs and Water Service Providers in planning, implementation and operation and management of water supply facilities in a sustainable manner;
  Target Beneficiaries - 455 waterless municipalities, waterless barangays, resettlement / relocation sites, lying-in clinics, RHUs and BEMONCs
- Program Components
  Capacity Development
  Training and Workshops
  Studies
  OJT
  Mentoring and Coaching
  Infrastructure Investment
  Construction
  Rehabilitation
  Expansion
  Upgrading

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

Reforestation and Watershed Management

Fort Bonifacio Retarding Tank - a model urban rainwater catchment system.

Estero de Paco Development - dredging, riprap, slope protection and phytoremediation, facelifting of residential homes, walkway/linear park

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)

Local Strategy

LGUs, water districts, and small water service providers use the NSSMP Guide for Local Implementers to develop projects

Projects will include operational guidelines, ordinances, enforcement, user fees, promotion campaigns

LGUs encouraged to share capital costs with WDs and/or bid out contracts to the private sector for septage collection and treatment

DENR regional offices continue to lead the creation of WQMAs and Funds

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*.

Educational and training courses

1.2.6 Contribution to IHP Courses

No information available.

1.2.7 Organization of specific courses

No information available.

1.2.8 Participation in IHP courses

No information available.

1.3.4 Papers and Publications

No information available.

1.3 Participation in international scientific meeting

No information available.

1.4.1 Major Meetings hosted by the country

2nd International Conference on Climate Change Research and Development and 6th National Climate Research Conference, School of Environmental Science and Management of the University of the Philippines, Los Banos and National Academy of Science and Technology, Los Banos, September 27-28, 2017.

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 2017-2018

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 APFRIEND, Catalogue of Rivers for SEAP, FFWS and the IHP training courses conducted by the Kyoto University.

Participation in the review of cross-cutting programs such as FRIEND, HELP and IWRM.
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: APFRIEND (rainfall IDF and flood frequency studies), Catalogue of Rivers for SEAP, DRH, IHP training courses conducted by host countries, and joint hydrologic training courses and researches among member countries.

The Republic of Korea:

NATIONAL REPORT ON IHP RELATED ACTIVITIES IN REPUBLIC OF KOREA In the period of OCTOBER 2015 – NOVEMBER 2017

Korean National Committee

for

The International Hydrological Programme

Republic of Korea

Abstract

Since the beginning of the eighth phase of IHP, the Korean National Committee for the IHP(IHP-KNC) has been and being paid its efforts to achieve the objectives set by UNESCO for this phase of IHP and the key focal area's projects have been and being executed in Korean river basins and in the field of hydrology and water resources in Korea. Research projects supported by the Government in the framework of the IHP in the period of June 2014 – May 2016 have been executed according to the implementation plan of IHP-VIII phase.

Particularly, in this year, the IHP-KNC finally established a UNESCO Category II Water Centre, the International Centre for Water Security and Sustainable Management(i-WSSM) at the K-water Institute, Republic of Korea which was unanimously endorsed in the 20th Session of the Intergovernmental Council of the IHP and approved by the General Conference in 2013.

The IHP-KNC will actively continue and participate in the Asian Pacific FRIEND/HELP projects to complete with successful results and also will execute a HELP river basin project in collaboration with other Asia Pacific HELP projects and UNESCO international cooperative studies. Furthermore, a series of international symposiums and workshops have been and will be organized during this period as the VIII activities of IHP-KNC and contributed to the 7th World Water Forum held in Daegu-Gyeongbuk, Republic of Korea in 2015.

1. ACTIVITIES UNDERTAKEN IN THE PERIOD OCTOBER 2015 – NOVEMBER 2017

1.1 Meetings of the IHP National Committee

1.1.1 Decisions Regarding the Composition of the IHP National Committee

Korea as a participant in the program, then appointed within its Ministry of Construction a IHD National Committee(later, IHP National committee), which undertook pioneer hydrologic surveys of selected representative basins in three major river systems during the program period, and embarked in 1975 on a 6-year International Hydrological Programme (IHP) project as the first step toward an extension of surveys of domestic river basins in order to fulfill its responsibilities in the world's consolidated efforts to cope with the water problem.

After the completion of the first phase of IHP in 1980, the second phase of IHP project(1981~1983), the third phase of IHP project(1984~1989), the fourth phase of IHP project(1990~1995), the fifth phase of IHP project(1996~2001), the sixth phase of IHP project(2002~2007), the seventh phase of IHP project(2008-2013) and eighth phase of IHP project(2014-2021) followed for the continuation of representative basin studies, the adoption of new techniques of water resources development and water quality control, the hydrological evaluation of urbanization and variations of watershed including sustainable development in a changing environment, hydrology and water resources development in a vulnerable environment, water interactions of systems at risk and social challenges and water dependencies of systems under stress and societal responses, and education and water security with responses to local, regional and global challenges.

From the beginning of the New Millennium through the year of 2010, the Korean National Committee for the IHP was reorganized and strengthened to fulfill the IHP activities more effectively and actively. Particularly, the Korean National Committee for the IHP has been reorganized to include more members from various water organizations in Korea under the supplement of the legal background in the beginning of 2011.

All members of the Committee were from every part of water related organizations in the country and executive functions are carried out within the Water Resources Bureau, Ministry of Land, Infrastructure and Transport.

Decisions regarding most of IHP related activities are made by this committee which is held regularly and on request in special occasion.

1.1.2 Status of IHP-VIII activities

As the completion of the seventh phase of IHP(2008-2013) the Korean National Committee for the IHP has executed most of the implementation plan of IHP-VII during the period(2008-2013), and initiated and undertook the core programme's Themes and Focal Areas from the beginning of the eighth phase of IHP(2014-2021) according to its implementation plan and projects.

During this period of the eighth phase of IHP, the Korean National Committee for the IHP has been paid its efforts to achieve the objectives set by UNESCO for this phase of IHP and the following projects have been and being executed in Korean river basins and in the field of hydrology and water resources in Korea:

(1) Water related disasters and hydrological change

(2) Groundwater in a changing environment

(3) Addressing water scarcity and quality

(4) Water and human settlements of the future

(5) Ecohydrology, engineering harmony for a sustainable world

(6) Water education, key for water security

(7) FRIEND and HELP basin studies

1.2 Activities at national level in the framework of the IHP

1.2.1 National / local scientific and technical meetings

Annual regular or many special scientific and technical meetings in the framework of the IHP were held in collaboration with International Hydrologic Environmental Society(IHES), Korea Water Resources Association(KWRA), Korean Society of Civil Engineers(KSCE), ICOLD Korean National Committee (KNCOLD), IWRA Korea Geographic Committee(IWRA-KGC), Korea Federation of Water Science and Engineering Societies(KFWSES), Korea Water Resources Corporation(K-Water), and other water-related organizations in Korea. In those meetings, national/local hydrologic issues and water resources problems were dealt with special solution

measures and their results were published in the form of scientific or technical reports and papers.

1.2.2 Participation in IHP Regional Steering Committees / Working Groups

- Republic of Korea was one of most active member countries in IHP Regional Stee ring Committee's activities for Southeast Asia and the Pacific.
- Republic of Korea's delegates actively participated in the IHP Regional Steering C ommittee, Workshop and Working Group meetings held in the period of 2014-2017 .
- Republic of Korea IHP National Committee contributed to the 7th World Water For um held in Daegu-Gyeongbuk, Republic of Korea under the name of IHP RSC acti vities.

1.2.3 Research / applied projects supported or sponsored

- Research projects supported by the Government in the framework of the IHP in th e period of 2015~2017 have been executed according to the IHP Themes and Foc al Areas.
- Some other research or applied projects were also supported or sponsored by the Government and other water-related organizations such as Korea Water Resource s Corporation(The K-water) during this period.
- The following projects have been and are being implemented for the Asia Pacific F RIEND in the representative river basins chosen as the Korean Asia Pacific FRIEN D, and a Korean HELP basin(Kumho river) which is one of the International HELP basins;
    - Basic hydrologic analyses and data collection
    - Comparative regional flow regimes analyses
    - Rainfall models and design storm
    - Flood models and design flood
    - FRIEND river basins studies
    - Asia Pacific HELP(AP-HELP) river basin studies with UNESCO internationa l joint cooperative studies

1.2.4 Collaboration with other national and international organizations / or programmes

The Korean National Committee for the IHP is functioning in the execution of IHP activities in collaboration with the following national and international organizations/or programmes; Korea Water Resources Corporation(K-Water); Korea Water Resources Association(KWRA); Korean Society of Civil Engineers(KSCE); Korean Society of Agricultural Engineers(KSAE); Korean Meteorological Society(KMS); ICOLD Korean National Committee(KNCOLD); IWRA Korean Geographic Committee; International Hydrologic Environmental Society(IHES); Korea Federation of Water Science and Engineering Societies(KFWSES); Korea Institute of Construction Technology(KICT); Korean Universities Hydrology and Water Resources Programmes.

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

The Korean National Committee for the IHP is contributing to the Korean Universities hydrology and water resources courses in the framework of the IHP in which graduate students and engineers are mostly involved with IHP projects and also educated or trained through the formal courses.

1.3.2 Organization of specific courses

Special workshops and seminars in the field of hydrology and water resources are annually organized by the Korean National Committee for the IHP in collaboration with above mentioned organizations in 1.2.4. In these specific courses, special topics are dealt with practical application in river basins.

1.3.3 Participation in IHP courses

The Korean National Committee for the IHP has actively been participating in IHP courses which were held in Asia-Pacific regions such as Japan, China and Malaysia by sending highly qualified hydrologists or proper candidates.

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

- The Korean National Committee for the IHP contributed to the establishment of a U NESCO Category II Water Centre, the International Centre for Water Security and Sustainable Management(*i*-WSSM) at the K-water Institute, Republic of Korea whi ch was unanimously endorsed by all member states in the 20th Session of the Inte rgovernmental Council of the IHP and approved by the General Conference in 201 3.
- The Korean National Committee for the IHP has been collaborating very actively w ith other UNESCO Category II Centres such as ICHARM in Japan, Humid Tropic C entre in Malaysia and Asia Pacific Ecohydrology Centre in Indonesia.

1.5 Publications

- The Korean National Committee for the IHP is publishing IHP Annual Research Re port in the form of Government Publication since 1975.
- These reports are distributed to all water-related organizations and IHP-KNC mem bers and research results are published on the journals of academic societies or o rganizations.
- Some other technical reports, proceedings of scientific meetings and specific cour se's materials are also published by the IHP-KNC.

1.6 Participation in international scientific meetings

- Meetings hosted by the country
  The following IHP meetings were hosted and organized by the IHP-KNC and IHES

- In the 7th World Water Forum, the IHP-KNC arranged and contributed to m ore involvement of the IHP communities in processes and activities of the 7t h World Water Forum which was held in Daegu-Gyeongbuk, Republic of Ko rea on 12-17 April, 2015.

- UNESCO-IHES International Water Planning Experts Workshop was held in Daegu, Republic of Korea on 25-26 April, 2017.

- Participation in meetings abroad
  The Korean National Committee for the IHP actively participated in the IHP Inter-Governmental Council meeting as well as the regional IHP meetings such as Meetings of IHP Regional Steering Committee for Southeast Asia and the Pacific, Asia Pacific FRIEND Project and its workshops, Asia Pacific HELP project and its workshops, working Group meetings and etc.

2. FUTURE ACTIVITIES

- IHP-KNC will actively continue and participate in the Asian Pacific FRIEND/HELP projects to complete with successful results for the Southeast Asia and the Pacific and also will execute a HELP river basin project in collaboration with other Asia Pacific HELP projects and UNESCO international cooperative studies.

- The following international symposiums and workshops have been and will be organized during 2015-2017 as the IHP -VIII activities of IHP-KNC.

  - Korean Workshops of AP-HELP during 2015-2017.
  - 2016 IHES International Workshop on AP HELP and Sustainable Water Ma nagement and Planning, Daegu, Republic of Korea.
  - UNESCO-IHES International Water Planning Experts Workshop was held in Daegu, Republic of Korea.

Thailand:

Thailand National Report on IHP Related Activities for 25th IHP Regional Steering Committee Meeting for Southeast Asia and the Pacific

13—16 NOVEMBER 2017, MANILA, PHILIPPINES

Meeting of the IHP National Committee

- **During Oct 2016 – Sept 2017,** there was not Thai-land National Committee –IHP meeting or any dis-cussions. However, the secretariat of TNC – IHP still encourages the members to continue on knowledge and technology sharing, and cooperate in various ways to promote hydrological improve-ment and water resources criteria.

Activities at national level in the framework of the IHP

- Representatives from TNC – IHP and the Department of Water Resources participated in

- the 24rd Regional Steering Committee Meeting for Southeast Asia and the Pacific, RSC for UNESCO-IHP and the Conference, 24-26 October 2016, Ulaan bator, Mongolia

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 8 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
- The 23th International Commission on Irrigation and Drainage (ICID) Congress and 66th IEC Meeting on 10-19 October 2016, France
- ESCAP/WMO Typhoon Committee 11st Integrated Workshop (IWS) on 24-27 October 2016, Philippine
- 2nd World Irrigation Forum and 67th International Executive Council (IEC) Meeting (Water Management in a changing World: Role of Irrigation for Sustainable Food Production on 6-12 November 2016, Chiang Mai, Thailand
- WMO 15th Commission for Hydrology (CHY) on 7-13 December 2016, Italia
- THA 2017 International Conference on Water Management and Climate Changetowards Asia's Water Energy - Food Nexus on 25-27 January 2017 in Bangkok, Thailand.

- 49th Session of the ESCAP/WMO Typhoon Committee, 21-24 February 2017, Yokohama, Japan

- Regional Consultation Workshop on Basin-wide Assessment of Climate Change Impact on Socio-Economic and Status of Climate Change and Adaptation in the Lower Mekong Basin, 12-13 June 2017, Siem Reap, Cambodia

- the 3rd Joint MRC-China Symposium 16-17 October 2017, Nanjing, China

- Master Program on Senior Professionals for Lancang-Mekong Water Resources Cooperation, 21-29 August 2017, China

- ESCAP/WMO Panel on Tropical Cyclones 43rd Panel on 9-15 September 2017 , Bahrain

- Project "A Comparative study on changes of hydrological processes and fluxes in the Jiulong River and Chao Phraya River under changing climate, 22-27 October 2017, Tsinghua University

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

Thank you for your attention

Vietnam:

VIET NAM NATIONAL COMMITTEE FOR THE IHP

No 23 Lane 62 Nguyen Chi Thanh, Ha Noi, Viet Nam

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NATIONAL REPORT ON IHP RELATED ACTIVITIES

I. ACTIVITIES UNDERTAKEN IN THE PERIOD OCTOBER 2016 - OCTOBER 2017

1.1 Meetings in the IHP National Committee

1.1.1 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 (IMHEN) - Ministry of Natural Resources and Environment.

Vive Chairman of VN IHP: Assoc. Prof. Dr. Huynh Lan Hương, Vice Director of IMHEN.

Assoc. Prof. Dr. Hoang Minh Tuyen, secretary of VN IHP

The current Vietnam National Committee for IHP consists of water experts working in hydrology and water resources in Viet Nam. Experts from Institutes, Departments and Committees concerned are as follows:

1. Vietnam Institute of Meteorology Hydrology and Environment
2. Department of Water Resources Management.
3. National Hydro-Meteorological Service
4. Ha Noi University for Natural Resources and Environment
5. Ha Noi Water Resources University
6. Center for Water Resources Planning and Investigation

1.1.2 Status of IHP-VIII activities

Prepare for the participation/contribution to IHP-VIII activities.

1.1.3 Decisions regarding contribution to/participation in IHP-VIII

1.2 Activities at a national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

Scientific and technical meetings are generally held within the context of the Ministry of Natural Resources and Environment, Ministry of Science and Technology, and Professional Societies.

The IHP National Committee has a meeting with the Vietnam National UNECO Commission on the activities of the IHP National Committee. The Chairman and the Secretary of the IHP National Committee meet regularly.

1.2.2 Participation in IHP Steering Committees/Working groups

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.

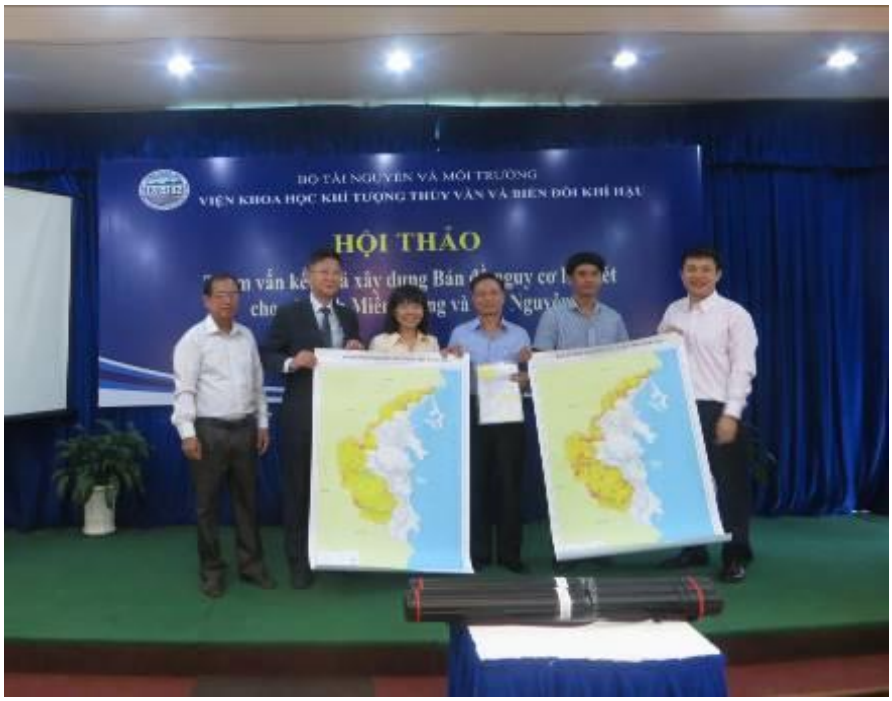
1.2.3 Research/applied projects supported or sponsored

- Continue working with Hydrology Research Center of USA to develop Flash Flood Warning System for Vietnam (VNOFFGS and VNAFFGS), funded by VN Government

1.2.4 Collaboration with other national and international organizations

- On January 9, 2017, IMHEN collaborated with Yonsei University, Korea to hold a workshop on "Capacity Building on Climate Change and Sustainable Development for the Ha Noi University of Natural Resources and Environment".

- On 31/12/2017, IMHEN organized the Workshop to transfer Flash flood risk maps to 19 provinces in Central and central high land of Viet Nam



1.2.5 Other initiatives

1.3 Education and training courses

1.3.1 Contribution to IHP courses

None

1.3.2 Organization of specific courses-

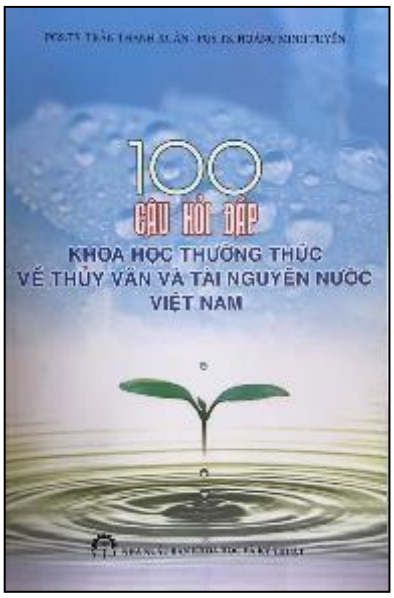
In October 2017, IMHEN organized the training course on applying Arc Gis to Develop flash flood risk maps.

1.3.3 Participation in IHP courses

- None

1.4 Publications

- Hoang Minh Tuyen, Tran Thanh Xuan, (2016): 100 Questions & Answers about Hydrology and Water Resources. Publishing House for Natural science and Technology.



- Release the Special issue of Journal of Climate Change Science on WATER SECURITY: Responses to Regional and Global Challenges under the UNESCO-IHP VIII vision (in English).

1.5 Participation in international scientific meetings

Prof. Dr Trần Thuc, chairman of VietNam National Committee and for IHP and

Assoc. Prof. Dr. Huynh Lan Huong have participated in COP23 from 6-17 November 2017.

1.6 Other activities at a regional level

1.6.1 Institutional relations/co-operation

None

1.6.2 Completed and ongoing scientific projects

None under the aegis of IHP-VIII

II. FUTURE ACTIVITIES

2.1 Activities planned for 2017-2018

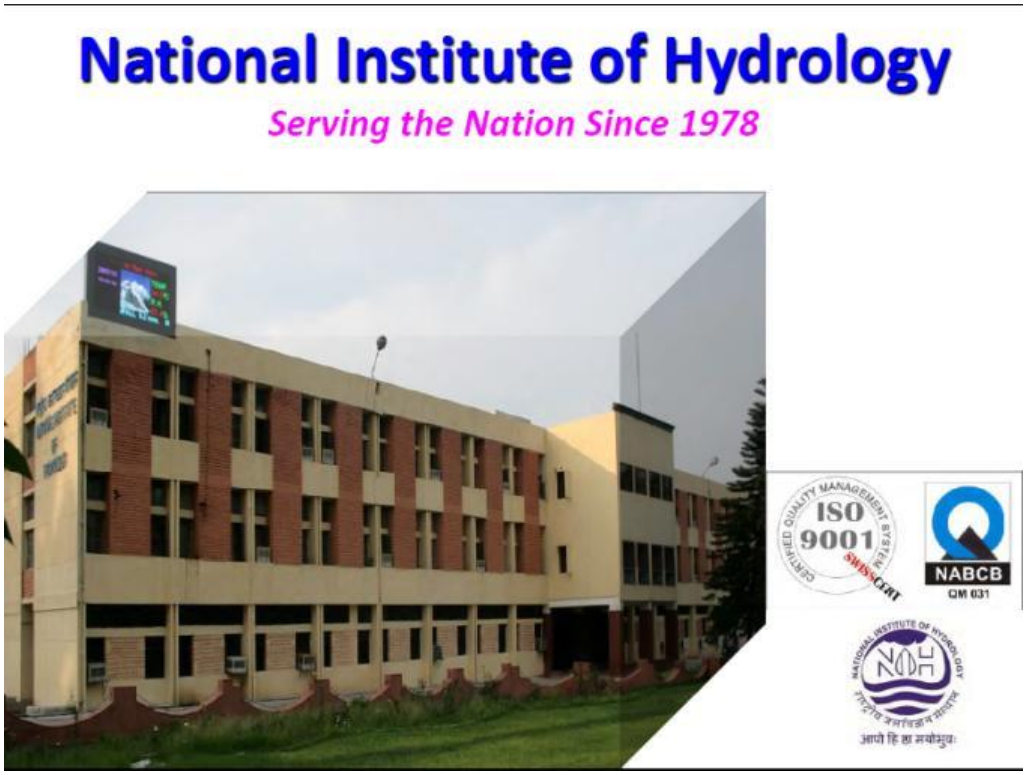
- Attending meeting of 26th IHP Regional Steering Committee for Southeast Asia and the Pacific.
- Participating in regional and national activities of IHP.

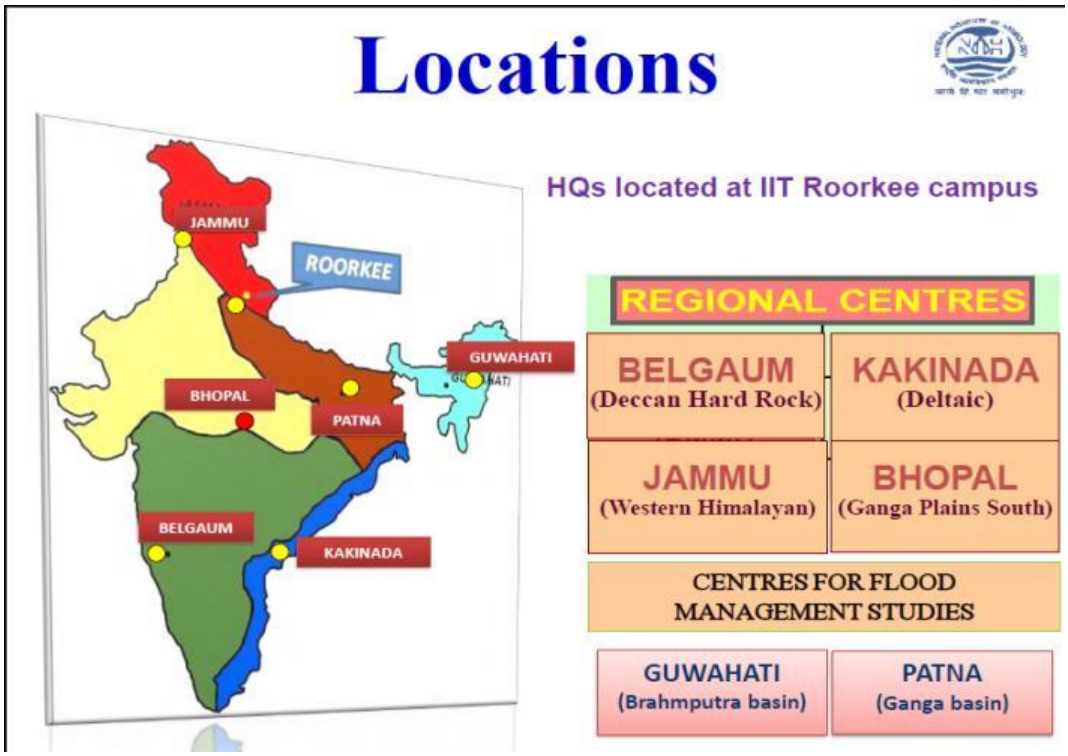
2.2 Activities envisaged in the long term

- Enhance activities contributed to IHP-VIII;
- Focus on Water security and Scaring for Viet Nam ;
- Upgrade Flash flood warning system and develop detail FFPI maps for Vietnam;
- Transfer technology and training course in Hydrology and WR

ANNEX G - Updates from Observing Countries

India:





THRUST AREAS OF RESEARCH

- **Hydrology of Extremes**
- **Environmental Hydrology**
- **Regional Hydrology**
- **Integrated Water Resources Management (IWRM)**
- **Hydrological Studies for North-East Region**
- **Hydrological Studies for Himalayan Region**
- **Hydrology for Watershed Management**
- **R&D Under National Water Mission**
- **Capacity building**
- **Technology Transfer and Outreach Activities**

OUTPUTS AND OUTCOMES

- Solution of specific water-related problems (sponsored, consultancy & strategic projects)
- Improved techniques for field engineers, researchers
- Mass awareness and outreach activities
- Research publications
- Training courses
- Inputs in development of Indian Standards, Guidelines, etc.
- Inputs to NGT, Tribunals, other Regulatory Authorities on hydrology
- Secretariat Services for:
- (1) INC-Climate Change, and
- (2) INC- International Hydrological Program (IHP) of UNESCO
- (3) State Action Plan (SAP) for Water Sector (NWM)

R&D CAPABILITIES

- Flood and drought studies
- Water resources systems analysis
- Water availability assessment
- Water quality assessment & modelling
- Environmental flow in rivers
- Ground water modelling & management
- Regional hydrology
- Urban hydrology
- Impact of climate change on water resources
- Integrated Water Resources Management (IWRM)
- Snow and glacier investigations
- Watershed hydrology
- Hydrology of lakes and ponds

MAJOR COMPLETED PROJECTS

- **Establishment of NIH (UNDP)**
- **Transfer of SHE Model to NIH (CEC)**
- **Indo-Dutch Training Program on Water Management (WAMATRA)**
- **Developing Capabilities for Hydrological Studies (UNDP)**
- **Development of Hydrological Model using Geomorphological Parameters (USAID)**
- **Influence of Forest Cover on Watershed Functions *(UNESCO)***
- **Paleo-flood Hydrology (USAID)**
- **Hydrology Project-I & II (World Bank)**
- **Saph-Pani (EU)**

MAJOR PROJECTS AND ACTIVITIES OF NATIONAL IMPORTANCE

- Integrated Hydrological Studies for Upper Ganga Basin up to Rishikesh (NMSHE)
- National Hydrology Project (NHP)
- Neeranchal National Watershed Project (NNWP)
- Strategic Planning for Ganga River Basin
- Research Collaboration with Centre for Ecology and Hydrology (CEH)
- WaterRain-Him: Changes in Water Resources and Adaptation options in the Indian-Himalayan basins
- State Specific Action Plan (SSAP) for Water Sector
- Water accounting exercise by MoWR, RD & GR
- INC-CC
- INC-IHP

SOME PROPOSED PROJECTS/ACTIVITIES

- UNESCO Category-2 Regional Centre on "Water and Environment" for South Asia
- Water Learning Centre of UNU in India
- Innovation Centre for Eco-Prudent Wastewater Solutions
- Development of application modules (e.g. DSS, software products) for field users, line departments, etc.
- Aligning with flagship schemes of Government of India (e.g. PMKSY, NMCG, NWM, SAGY, Swachch Bharat, AMRUT, Rurban Mission)

R&D ALIGNED WITH MOWR, RD & GR

1	PMKSY 1. Har Khet ko Pani 2. Per drop more crop 3. Watershed development	MAR (Ground water development) Neeranchal National Watershed Project
2	National Water Mission (NWM)	1. State Specific Action Plan for Water Sector 2. Capacity building programs
3	National Mission on Clean Ganga (NMCG)	
4	Inter-linking of rivers	Hydrological study of Ken-Betwa link
5	Basin planning studies	1. Strategic planning for Ganga river basin 2. Water accounting
6	Sediment management	
7	Groundwater management	Arsenic , RBF
8	Flood management	
9	Drought management	Drought studies in Bundelkhand
10	R&D scheme	Renovation of village ponds in western UP; Grey water to blue water; Peyjal Suraksha
11	Water security	IWRM plan for identified watersheds in 4 districts of Bundelkhand

MASS AWARENESS & OUTREACH ACTIVITIES

- World Water Day Celebration
- Participation in India Water Week
- Participation in Indian Science Congress exhibition
- Participation in India International Trade Fair
- Awareness programs for students, women & farmers
- Printing & distribution of pamphlets on different themes of water

Water security in 4 districts of Bundelkhand

Sponsored by	MoWR, RD & GR
Date of start	April 2016
Duration	Upto Mar 2018
Budget	Rs 299 lakh

Study area: Four watersheds in:

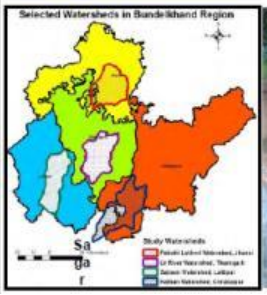
1. Jhansi (U.P.)
2. Lalitpur (U.P.)
3. Tikamgarh (M.P.)
4. Chhatarpur (M.P.)

Deliverables:

- IWRM Plans
- Web-based DSS
- Capacity building of stakeholders

Progress:

- IWRM Plan for Ur river watershed (Tikamgarh, MP) ready
- Draft IWRM Plans for Kathan river watershed (Chhatarpur dist., MP), (Jhansi dist., UP) and (Lalitpur dist., UP) prepared
- IWRM Plan deals with Water, Agriculture and Livelihood Management
- Vulnerability assessments in 4 watersheds completed
- Web-based DSS (Jal-Jan-Jeevan) hosted on NIH server
- Livelihood demonstration trainings completed in 14 villages of Tikamgarh and 16 villages of Chhatarpur
- Installation of Rainwater Harvesting systems at 6 school sites in Tikamgarh and Chhatarpur



Neeranchal National Watershed Project

(under PMKSY component of DoLR, GoI)

Sponsored by	World Bank (DoLR, GoI)
Date of start	Dec 2016
Duration	5 years
Budget	~Rs 600 lakh/Yr

Objectives:

1. Develop and pilot a DSS-H to implement the Watershed Component of PMKSY at 18 demonstration watersheds in 9 States
2. Develop tools and systems to help stakeholders for impact assessment
3. Conduct capacity building programs for the stakeholders (SLNAs)

Deliverables:

- Web-based DSS (Hydrology) and a mobile App
- Handholding and capacity building of SLNAs

Planning	Sites and Structures	Impact Assessment	DPR Inputs
• Database generation • WH structures location • Water Demand • Pre-project Water balance	• Suitable site for WH structures • Appropriate design of structures • Number of structures feasible	• Runoff • Water quality • NDVI, NDWI • GW Level • Soil Erosion • Soil Moisture • Water availability • Crop production • Vulnerability	• Tables for DPR • Thematic maps

Constructed Wetland
as a Natural Treatment System for Wastewater Management

THE TECHNOLOGY

Constructed Wetland (CW) is a Natural Wastewater Treatment system. It exploits the nature's potential for treatment of wastewater using pebbles, plants, enzymes and nutrients. CW-based facilities are being implemented at thousands of locations around the world, including India, because of its several benefits. As an eco-sustainable product, it offers vast potential application in residential complexes, shopping complexes and malls, village ponds and other community places.

SALIENT FEATURES

- **Robust** — Stable under load variations; consistent treatment results.
- **Site** — Requires minimum space; looks like an ornamental garden.
- **Zero Energy** — Does not require electricity for operation.
- **Zero Discharge** — Treated wastewater is usable for gardening, toilets, etc.
- **Zero Waste** — No generation of solid waste; no foul smell.
- **Foot-print** — No negative environmental impact.
- **Cost** — Requires <40% capital cost of a conventional STP and negligible O&M costs. A 40KLD plant serving 100 households will cost Rs 20-25 lakh approx.
- **Maintenance** — Minimal O&M; easily handled by unskilled staff.

A boon for villages and community places in cities and towns.

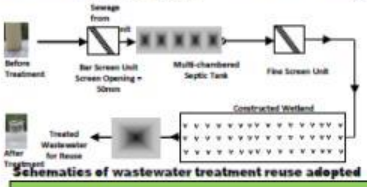
Some of the Constructed Wetland based STPs Work

7.8 MLD STP Jaipur

50 KLD STP Jaipur

50 KLD STP Agra

30 KLD STP IIT Bombay



Schematics of wastewater treatment reuse adopted

Typical Performance

S.N.	Parameter	Untreated Water	Treated Water	Limits as Per CPCB
1.	TSS (mg/l)	410	8	100
2.	BOD (mg/l)	346	7	30
3.	COD (mg/l)	726	65	250
4.	PH	6.9	7.78	5.5 - 9.00
5.	TKN (mg/l)	47	9.24	100
6.	TP (mg/l)	16	2.85	5
7.	Feacal Coliform (MPN)	1.6x10^6	2824	NA

CONTACT:

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Research Management and Outreach Division
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Tel: (+91) 01332-249226, 276417
Fax: (+91) 01332-276417
E-mail: vcgoyal@nih.ernet.in

Steps for Implementation and Commissioning

Pakistan:

Water Science Activities under Pakistan National Committee on IHP

Dr. Muhammad Ashraf

Pakistan Council of Research in Water Resources (PCRWR)

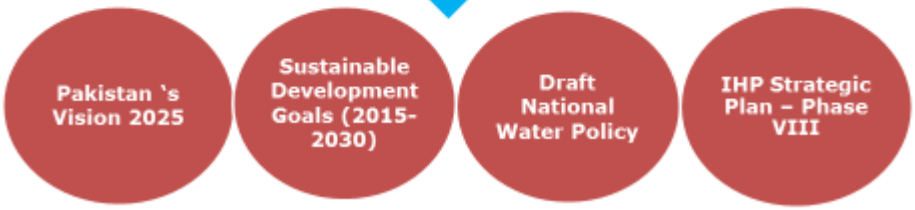
November 13, 2017

Pakistan National Committee on IHP

- It is a 18-members Committee
- To prepare and coordinate National Hydrological Program (NHP) under the umbrella of the UNESCO-IHP and other International Agencies
- To identify gaps in the areas of human resource development technologies, instrumentation and methodology at national and regional levels and suggest measures
- To establish international/regional linkages and cooperation
- To formulate recommendations for implementation of the Government of Pakistan

PCRWR: Secretariat of PNC-IHP

To conduct, organize, coordinate and promote research on all aspects of water resources including irrigation, surface and groundwater hydrology, drainage, soil reclamation, drinking water, wastewater management etc.

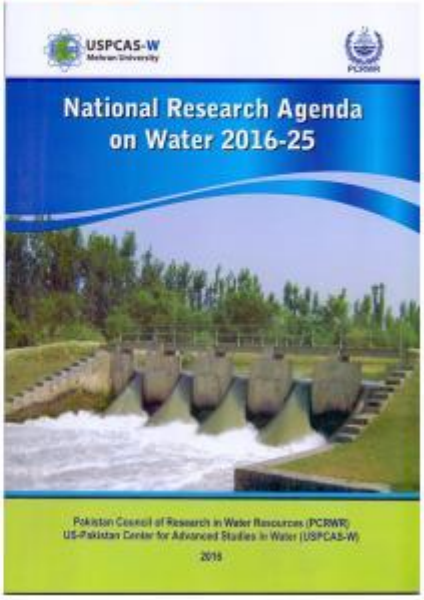


Some Recent Activities Related to IHP

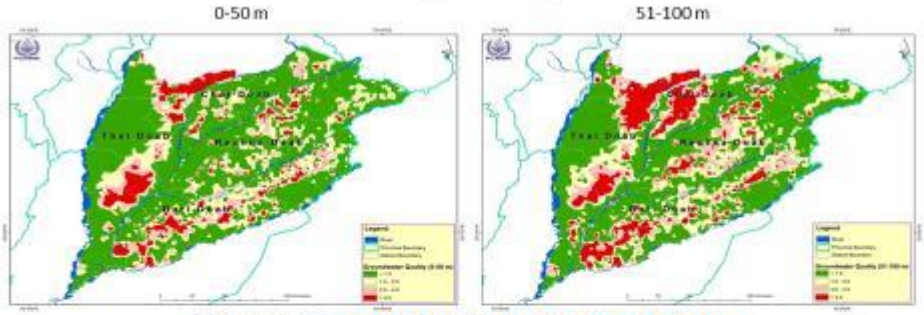
- Developed a National Research Agenda on Water and framework for achieving SDG 6.0
- Investigated and mapped groundwater zones in the Upper Indus Basin – 4 Doabs (Thal, Bari, Rechna and Chaj).
- Started investigating and mapping the groundwater of the Lower Indus Basin
- Evaluated and introduced low cost innovative recharge techniques *i.e.* leaky structures/dams in Quetta and Qilla Saifullah districts of Balochistan
- Determined soil hydraulic properties in the upper Indus and Kabul rivers watersheds and the Indus Plain (Sutlej, Ravi, Jhelum and Chenab). This data has been used as input in IFAS model developed by ICHARM
- Developed a manual for determining the soil physical and hydraulic properties
- Introduced rainwater harvesting and watershed management techniques in the Cholistan, Thar deserts and DI Khan districts
- Satellite based monitoring of surface and groundwater through GRACE (Gravity Recovery and Climate Experiment) in collaboration with the University of Washington
- Launched satellite based Irrigation Advisory Services
- Monitoring spatial and temporal water quality trends of the eastern rivers of Pakistan (Sutlej and Ravi)
- Declaration of "Karezes in Balochistan" as World Heritage Site

National Research Agenda on Water and Framework for Action for Achieving SDG 6.0

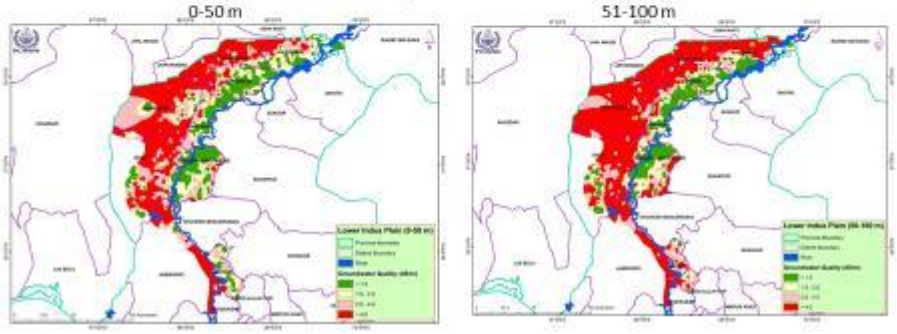
- Developed a National Research Agenda on Water in consultation with all the stakeholders
- How to achieve the Sustainable Goals? (SDG: 6)
  - Preparing a Pakistan Water Development Report in collaboration with the University of Utah and US-Pakistan Centre of Excellence in Water:
  - Introducing SDG Policy Support System – UNU
  - Regional dialogue on implementation of SDG 6.0 – Tajikistan Embassy



Groundwater Quality in the Upper Indus Basin

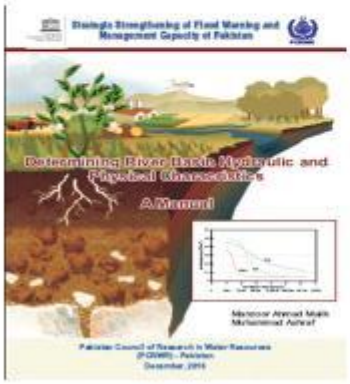


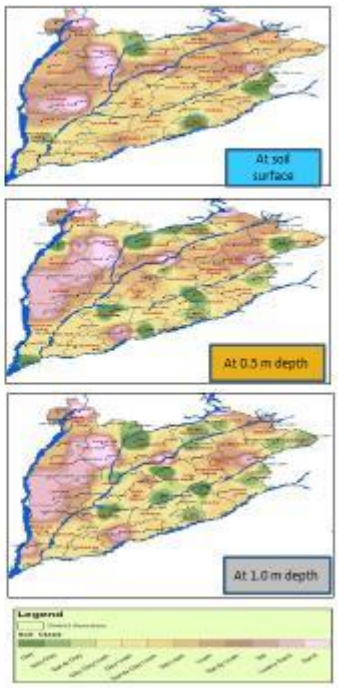
Groundwater Quality in the Lower Indus Basin



Determined Soil Physical and Hydraulic Properties of Soils: Input for IFAS Model

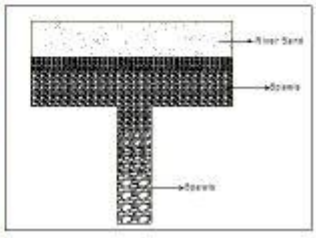
- Soil texture
- Moisture retention curves
- Infiltration rate
- Soil chemical properties
- Development of a manual





Introduced Innovative Low Cost Groundwater Recharge Technique

- Water is released to the downstream at the rate it is infiltrated into the soil
- Sediment is retained at the upstream
- Recharge occurs at the downstream of the dam
- Provides more surface area for groundwater recharge
- No ponding of water for longer time – minimum evaporation
- Easy availability of sites and material
- Easy to construct, cascade approach, low cost

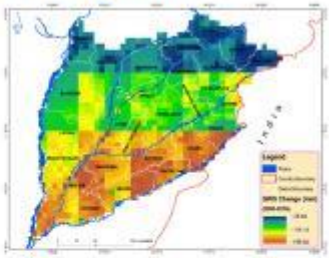


Introduced Rainwater Harvesting in Drylands

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

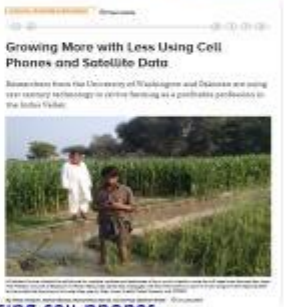
Satellite Based Water Resource Management

- Monitoring of Groundwater Storage with gravity satellite "GRACE" for effective surface and groundwater resource management at doab levels
- Monitoring of trans-boundary river and reservoir discharges falling in Indian territory for surface water resource management and flood mitigation using satellite altimeters – presently doing for Mangla reservoir
- Future Plan: Capacity building of national organizations (IRSA, Irrigation Dept., WAPDA, PMD, NDMA, etc.)



Real-time ETo and Irrigation Advisory Service (IAS)

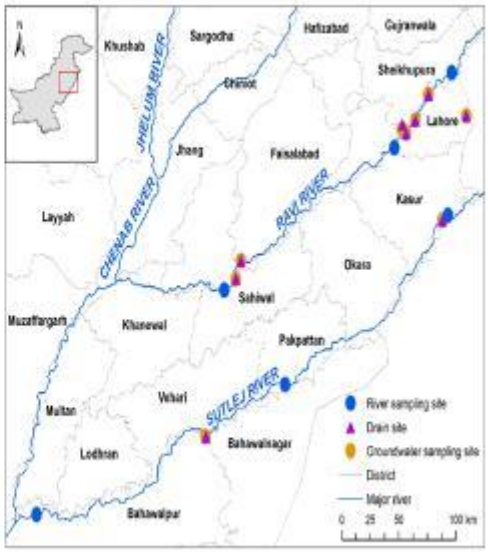
- Getting popular worldwide due to massive irrigation water saving
- Successful in USA, Spain, Southern Italy, Austria and southern Australia
- IAS is based on monitoring soil, crop (K_c) and climatic information (ET_o/Rainfall)
- Remotely sensed real-time climatic data and lysimeteric-measured soil and crop data is used to determine weekly irrigation requirements and shared with farmers
- Rainfall forecast is included to further rationalize irrigation application



(https://eos.org/project-updates/growing-more-with-less-using-cell-phones-and-satellite-data)
https://www.voanews.com/a/pakistan-farmers-get-tips-via-text/3917603.html

Spatial and Temporal Trends in River Water Quality of Pakistan (Sutlej and Ravi)

- Water quality of the Ravi river was found more degraded as compared to Sutlej river
- As the river moves downstream and also from high flow season (July-September) to low flow season (October-June) worsen the water quality
- In the month of October the COD & BOD level increases even above the water quality standards of effluent and DO level dropped down to zero
- The level of other water quality parameters TDS, heavy metals and organic pollutants also increases



Future Plans

- Assessment of Country-wide Wastewater Management and Development of Strategic Action Plan for Sustainable Ecosystem
- Impact of Climate Change on water demand/supply for sustainable water resources management in the Indus Basin
- Trans-boundary affects on groundwater and surface water along the Eastern border of Pakistan
- Improved Land and Water Conservation Practices to Enhance Wasteland Productivity in Thal and Thar Deserts
- Headwater management to reduce the water resources depletion in the downstream of the Indus river system
- Strengthening National Capacity to Reduce Drought Impacts and Improve Food Security
- Rehabilitation of Karezes in Balochistan through integrated watershed management and policy interventions

Thank You

Visit Us @ : http://www.pcrwr.gov.pk ,
E-mail: pcrwr@isb.comsats.net.pk

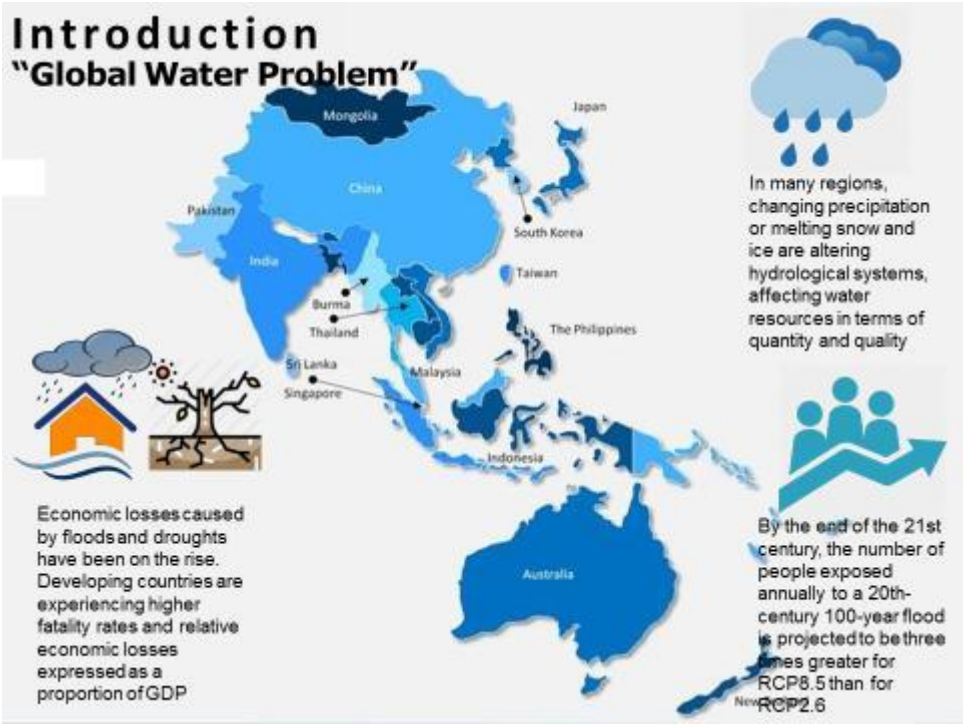
ANNEX H - Updates from the Centres under the Auspices of UNESCO

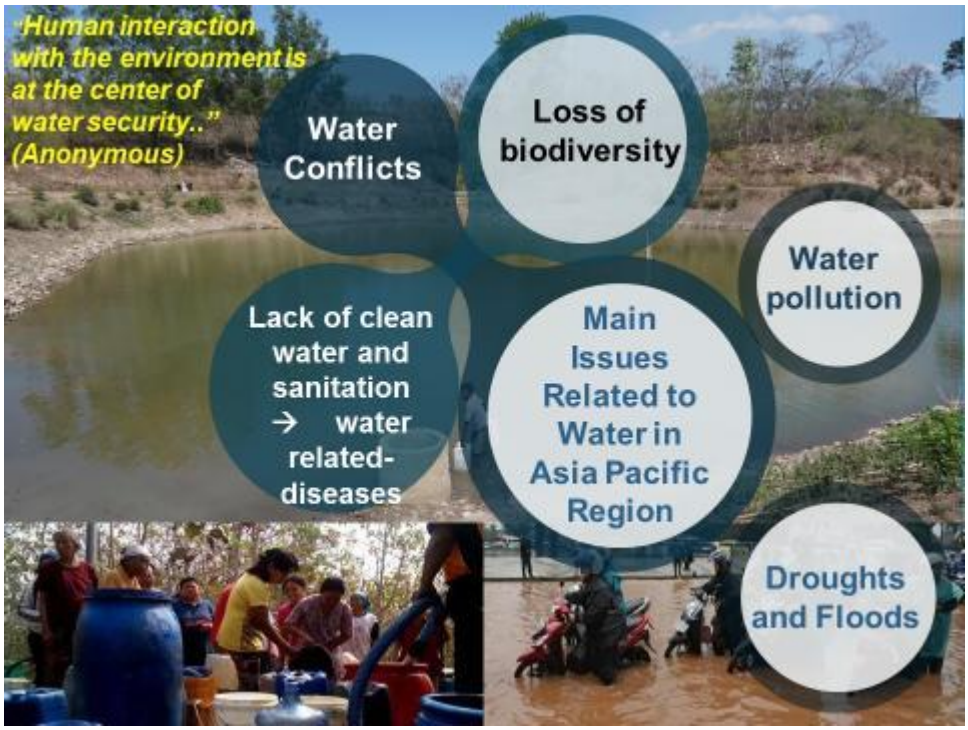
APCE:

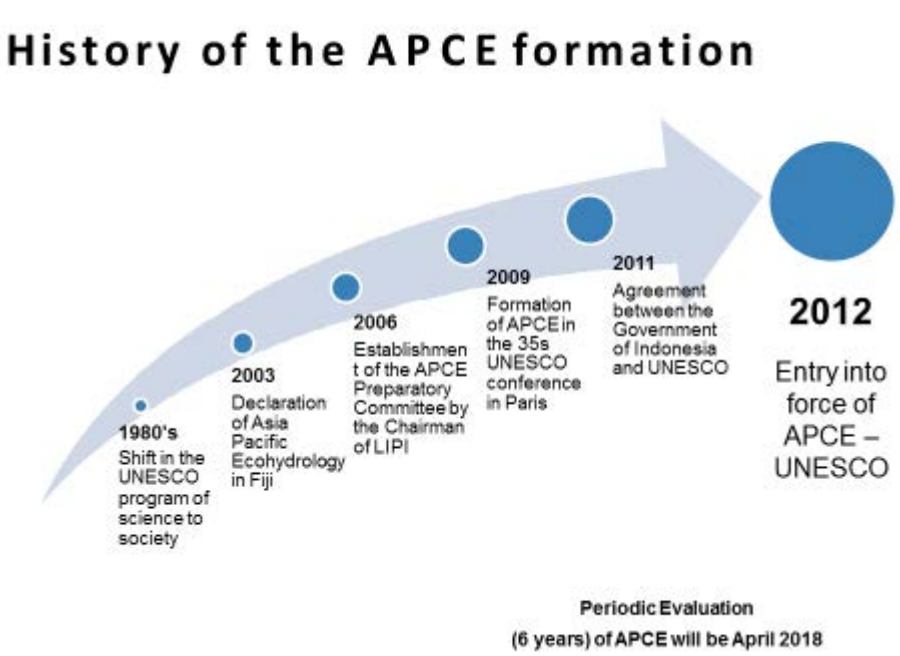
Asia Pacific Centre for Ecohydrology
APCE – UNESCO Category II Centre

APCE – UNESCO POTENTIAL SUPPORT FOR SDG ACHIEVEMENTS RELATED TO WATER RESOURCES MANAGEMENT IN ASIA AND THE PACIFIC REGION

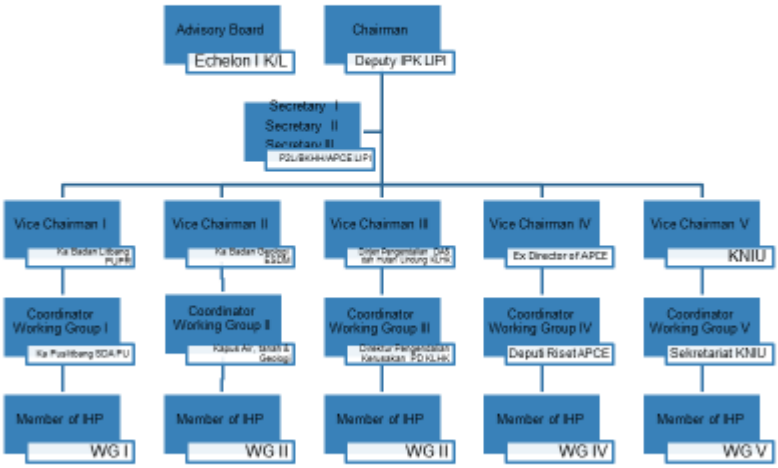
Dr. Ignasius D.A. Sutapa, MSc
Vice Chair of IHP Indonesia
Executive Director of APCE – UNESCO
Associate Professor in Chemical & Env. Technology




"Human interaction with the environment is at the center of water security.." (Anonymous)
Water Conflicts
Loss of biodiversity
Water pollution
Lack of clean water and sanitation → water related-diseases
Main Issues Related to Water in Asia Pacific Region
Droughts and Floods


History of the APCE formation
1980's
Shift in the UNESCO program of science to society
2003
Declaration of Asia Pacific Ecohydrology in Fiji
2006
Establishmen t 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
Periodic Evaluation
(6 years) of APCE will be April 2018

New Structure of IHP National Committee



APCE DIRECTIVE

VISION

- 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.

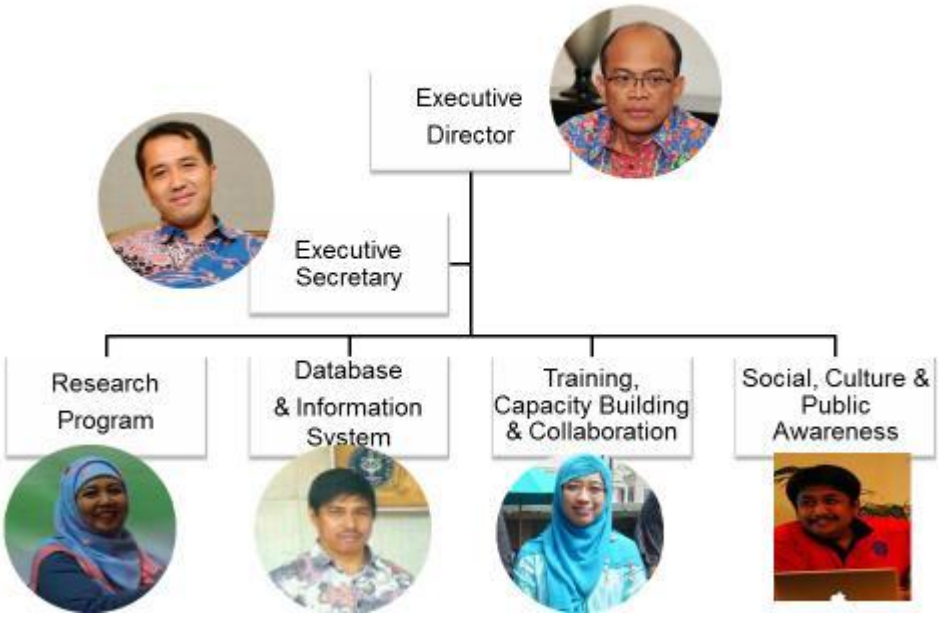
VALUES

- Wisdom
- Integrity
- Harmony

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

Organization Structure of APCE



APCE Governing Board Members

Dr. Zainal Arifin
(Indonesia, Deputy for Earth Science - LIPI

Prof. Dr. Soontak Lee (Korea, Member)
Distinguished Professor of Hydrology and Water Resources Engineering of Yeungnam University

Prof. Dr. Hidayat Pawitan (Indonesia, Observer)
Professor of Hydrology and Water Resources, Geophysic and Meteorology Department, Bogor Agricultural University

Prof. Dr. Shahbaz Khan
(UNESCO, Member)
Director of UNESCO Office Jakarta

Prof. Dr. Kaoru Takara (Japan, Member)
Professor of Disaster Prevention Research Institute, Kyoto University

Prof. Dr. Quentin Grafton (Australia, Member)
Chairholder, UNESCO Chair in Water Economics and Transboundary Water Governance

APCE Contribution to the implementationf of SDG's

APCE involved in Goal 6, Goal 13 and Goal 15

Advanced Development of Ecohydrology Site in Saguling Reservoir

- Monitoring the development of water quality for the subsequent demosite ecohydrology development plan.

Development Of Ecohydrology Demosite in Arid Zone

- A preliminary survey was conducted before establishing ecosystem demosite in dry areas (TTU-NTT).
- Several water sources in the visited TTU villages are: Embung Santoi, South Waeninu Village, Embung Oenemu, Saunoni Embung, Noimeto River, and Noineh
- This research is a collaboration between APCE with the Environment Department of TTU and Faculty of Biology - University of Timor

Development Of Ecohydrology Demosite in Arid Zone

- The objective is to implement the ecohydrology concepts in arid zone.
- Expected to improve water resources for local communities.
- Directed to a location demo site representing the concept of sustainable water resources management in several different groups, namely an ecohydrology demo site for the community-based management of water resources.

Research collaboration between APCE and Enviomental Agency – TTU and Faculty of Biology - UNIMOR

Capacity Building for APCE Staff in International Organization Management

Focus Group Discussion on Ecohydrology

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

Initiation Development of Ecohydrology Demosite for arid zone in TTU Regency, East Nusa Tenggara Province

Consultation Workshop And Training On Water And Urban Initiative Case Study In Jakarta, Indonesia

APCE in collaboration with UNU-IAS (United Nation University - Institute for the Advance Study of Sustainability) has organized a Workshop and Training on "Water and Urban Initative Case Study in Jakarta, Indonesia" on August 21-24th, 2017.

Attending International Meeting & Symposium

UNESCO Water Family Meeting

Training material arangements related to radiotracer - APCE and other member from France, Colombia, Australia, and India facilitated by IAEA (International Atomic Energy Agency)

Actively contribute in the regional workshop on "Building Resilience to Climate Change Risk and Vulnerability to Meet Water Security Challenges"

APCE, also took a part in GADRI and JASTIP conference and symposium in Uji Campus, Kyoto University Japan

Attending International Meeting

Meeting with the University of Queensland, Australia

Attending International Meeting

Meeting with the University of Queensland, Australia

On February, APCE was visited by UTM for collaborative research that is part of the JASTIP program.

APCE was visited by Institute of Urban Environment, Institute of Urban Environment - Chinese Academics of Science (IUE-CAS) and The Indonesian Research and Development International (IRDI), at September 28th, 2017.

Water initiative for world water day

- As a celebration of world water day on March 2017, APCE cooperated with LIPI for organizing clean river and lake action in Cibinong and colorin contest in APCE building with a theme of waste water recovered.

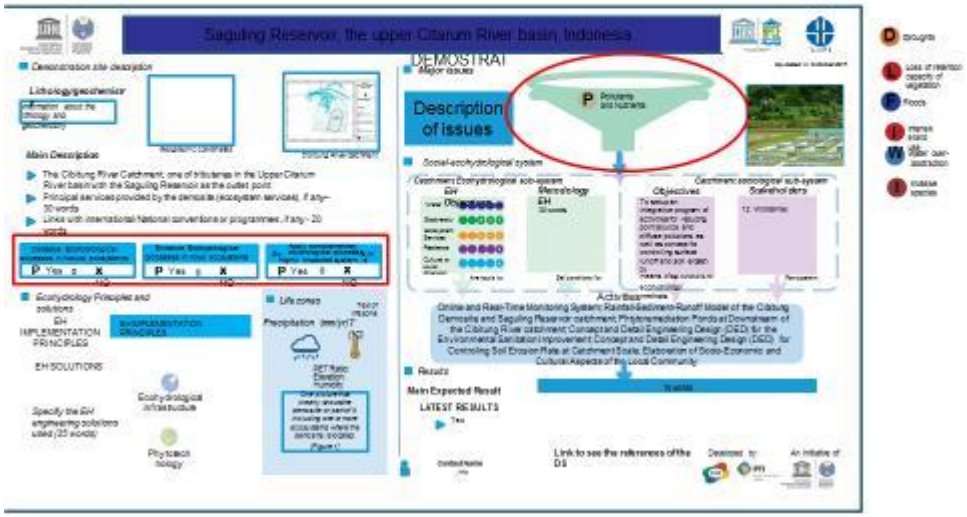
Lake condition after being clean by communities

Coloring competition as an interactive event to introduce children that wastewater can be reused and recovered and persuade them to preserve and care about the water and environment around.

INFORMATION SYSTEM & DATABASE

During 2016, the division information system developed the APCE website and was eventually established in 2017. The official website can be accessed through It contains the latest information and activities such as workshops, training and collaboration.

Demosite card (Draft)



Next Activities

1. Monitoring and Advanced Development of Saguling Ecohydrology Demosite
2. International symposium (The 3rd Symposium on JASTIP Disaster Prevention International Cooperation Research, Philipines.

Conclusion

- APCE – UNESCO as Category II Centre of UNESCO contributed to cope the main issues related to water in Asia Pacific Region with ecohydrological approach.
- APCE – **UNESCO also want to realize SDG's Goals** 6,13, 15 related water isues.
- It is important to take into account the cultural aspect and community participation on ecohydrological approach.

THANK YOU

HTCKL:

25th REGIONAL STEERING COMMITTEE

FOR SOUTHEAST ASIA & PACIFIC UNESCO IHP

DIRECTOR'S REPORT

2017

PREPARED BY

THE REGIONAL HUMID TROPICS HYDROLOGY AND

WATER RESOURCES CENTRE FOR SOUTHEAST ASIA AND THE PACIFIC

NO. 2, JALAN LEDANG, OFF JALAN DUTA, 50480 KUALA LUMPUR, MALAYSIA

Foreword by the Director

The Regional Humid Tropics Hydrology and Water Resources Centre for Southeast Asia and the Pacific Kuala Lumpur is one of the UNESCO Category 2 Water Centre. Better known as Humid Tropics Centre Kuala Lumpur (HTC KL), HTC KL has been established upon the approval of the Malaysia Cabinet Paper on the 17th April 1996. Hence, on the 28th October 1999, Memorandum of Agreement has been signed between Government of Malaysia and United Nations of Educational, Scientific and Cultural Organization (UNESCO).

Inspired by the Knowledge Enhancement and Awareness towards Water Security, HTC KL was founded as a catalyst in carrying out its UNESCO Water Centre Category 2 (WC2) functions in hydrology and water resources towards achieving the 2030 Agenda of the Sustainable Development Goals. As per today HTC KL has conducted more than 20 conferences, seminars, trainings and workshops; altogether more than 2000 attendees and participants from various countries and water backgrounds. As for Research and Development (R&D), HTC KL has collaborated various R&D projects with its partners and associates. HTCKL has also produced more than 50 technical reports, journals, and proceedings with hundredth of publications that streamline with all IHP Strategic Plans (currently is IHP-VIII Strategic Plan 2014-2021).

HTC KL will continue to carry out the responsibilities and trust given to us focusing on IHP-VIII Strategic Plan 2014-2021; filling the gaps for Theme II while playing a bigger role to cope with the country and regional challenges particularly on water security agenda for Humid Tropics areas around globe.

HTC KL will continue to collaborate and network at the national, regional or international level. HTC KL also offer our services as a regional water centre under the auspices of UNESCO.

With Best Wishes

Ir. Rohani Binti Ahmad

DIRECTOR'S REPORT

1.0 INTRODUCTION

This report is to highlights events and activities that had taken place since the 24th Regional Steering Committee Meeting for Southeast Asia and the Pacific UNESCO IHP held on 24-26 October 2016 in Ulaanbaatar, Mongolia. This report covers HTC KL activities from November 2016 to 31st October 2017 and future activities planned by the HTC KL.

2.0 ACTIVITIES AT INTERNATIONAL AND REGIONAL LEVEL

2.1 Seminar/Workshop/Training

IKCEST International Training Workshop 2016 on Big Data Technology Application and Knowledge Service in Hangzhou, China on 2nd – 9th November 2016.

This training workshop aims at helping developing countries cultivate talent and build capacity in the field of information technology and it was attended by Mrs. Sharina Sulaiman, HTC KL and Mrs. Ruzanna Ahmad Zahir, Department of Irrigation and Drainage (DID) Malaysia.

Training of Technology of Transfer (ToT) Workshop on Capacity building of Journalist Educators on Climate Change & Water Management Using UNESCO Model Curricula in Tehran, Iran on 4th to 6th December 2016.

This training was attended by Mrs. Norhafizah Binti Mohd Suhadis from DID Malaysia. The workshop was fully sponsored by the Regional Centre for Urban Stormwater Management, Tehran (RCUWM-Tehran).

Final Dissemination Workshop on Promoting Ecological and Eco-Hydrological Solutions for Sustainable Water Management in Indonesia & Asia Pacific Region on the 27th to 29th April 2017 in Jakarta, Indonesia.

The aims of this workshop are to present the achievements and results in implementing eco-hydrology as tool for attaining better and more sustainable water management.

This workshop was attended by Dr. Norlida Mohd Dom, Deputy Director of HTC KL and Mrs. Sandra Ligong, Assistant Director of HTC KL.

Seminar for Water Security under the auspices of UNESCO in Korea on 12th May 2017.

This seminar was attended by Dr. Norlida Binti Mohd Dom, Deputy Director of HTC KL and she has also presented a paper on the main output of the HTC KL as Category 2 Water Centres successfully. It was fully sponsored by the organizer.

Disaster Management Course in Taiwan organized by National Cheng Kung University (NCKU) in collaboration with Disaster Prevention Research Centre (DPRC), Disaster Preparedness & Prevention Centre (DPPC) and Malaysia-Japan international institute of Technology (MJIIT) on 29th October to 11th November 2017.

The course was sponsored by National Cheng Kung University (NCKU) and were attended by Deputy Director of HTC KL, Dr. Norlida Mohd Dom together with Ms. Azura Daud from DID Malaysia.

2.2 Meeting

HTC KL participated in Science Cooperation Meeting and Inter-Regional Workshop on South-South Cooperation for Upscaling Integrated Water Resources Management (IWRM) and Eco-hydrology. The workshop was held on 24th to 26th January 2017 in Abuja, Nigeria. The paper was presented by Dr. Norlida Mohd Dom, Deputy Director of HTC KL.

2.3 Conference

International Conference Asia Pacific Policy Dialogue on Water, Energy and Food Security for Poverty Alleviation at Rawalpindi, Pakistan.

The conference was held on 23rd to 25th November 2016 and Dr. Asnor Muizan Ishak, from DID Malaysia was attended the conference.

2.4 Technical Visit

Visit by UNDP Bangladesh and APCE Indonesia

HTC KL has received a technical visit from the UNDP Bangladesh on the 6th December 2016 and from APCE Indonesia on the 8th December 2016.

The objectives of the technical visit are to understand how South-South and Triangular Cooperation can be used as an effective tool to attain the national and international development goals, to acquaint with the process of international cooperation by the Government and to exchange experiences with Ministry officials. The programme comprised of briefings, sharing the experiences, demonstrations sessions and visits to the relevant institutions to give exposure on the operational aspects of South-South cooperation as well as to some relevant site visits. There are 9 participants from United Nation Development Programme (UNDP) Bangladesh and 4 participants from Asia Pacific Centre for Eco-Hydrology (APCE) Indonesia. They were taken to visit around HTC KL area and HTC KL Small Demonstration Project (MSMA –ISME).

HTC KL has also received a brief visit from UNESCO Dhaka which attended by Mrs. Beatrice Khaldun. The visit was held on the 5th May 2017 and the purpose of the visit is to have a new collaboration between UNESCO Dhaka Office and HTC KL through UNESCO Jakarta office. It also provides a platform for knowledge sharing and learning process.

Prof. Dr Shahbaz Khan from UNESCO Jakarta also visited HTCKL on the 8th May 2017. The purpose of the visit is to discuss about collaboration between UNESCO Jakarta and HTC KL.

Nine delegates from Regional Centre on Urban Water Management, Tehran (RCUWM-Tehran), Iran visited HTCKL on the 16th October 2017 to 20th October 2017. The activities involved are Ice-Breaking session, visiting Putrajaya Wetland and Lake, River of Life (RoL) Blue Pond, Storm Water Management and Road Transport (SMART) Tunnel and River of Life (RoL) Open Classroom, River Bio-Indicator and visiting around HTC KL on MSMA-ISME component.

3.0 ACTIVITIES IMPLEMENTED AND PARTICIPATED AT NATIONAL LEVEL

3.1 Malaysia World Water Day 2017 (WWD 2017)

As an annual activity, HTC KL has once again organised the Best Thesis Award (PhD; Masters; Undergraduate) in Hydrology and Water Resources for Malaysia's Universities and Higher Learning Institutions in conjunction with Malaysia World Water Day (WWD) 2017 on the 25th March 2017 at Dataran Teluk Kemang Port Dickson, Negeri Sembilan. The theme of the WWD2017 is Wastewater.

3.2 Knowledge Enhancement and Awareness (KEA) Programme

On the 20th February 2017 and 15th March 2017 respectively, the KEA Program was held in collaboration with HTC KL partners such as Flood Management Division, Hydrology and Water Resources Division, and Corporate Division of Department of Irrigation and Drainage (DID), Malaysia. The KEA Program consists of lectures and exhibition for Subject Matter: Mobile Flood Wall Barrier and Soil Water Index.

3.3 Malaysia UNESCO Day

HTC KL participated in an exhibition during the Malaysia UNESCO Day on the 9th to 10th September 2017 at Kundasang, Sabah. The theme for this year was "Harmony with Nature" and organized by Malaysian National Commission for UNESCO (NatCom).

Among the dignitaries' presence in the event are the Honourable Minister of Education, Y.B. Dato' Seri Mahdzir Khalid, the Director of UNESCO office in Jakarta, Prof. Dr. Shahbaz Khan, the Honourable Deputy Minister of Education, Y.B. Datuk Dr. Mary Yap Kain Ching and the Honourable Minister of Environment and Tourism of Sabah, Y.B. Datuk Seri Panglima Masidi Manjun.

3.4 Seminar /Workshop/Training (National Level)

Urban Storm Water Management and Ecohydrology at the GreenRE Manager's Course 11, 12 & 13 Intakes held in Johor Bahru, Petaling Jaya and Penang.

The lecture was presented by Deputy Director of HTC KL, Dr. Norlida Mohd Dom on 23rd May 2017 in Johor Bahru, 15th August 2017 in Petaling Jaya and 10th October 2017 in Penang.

37th International Association for Hydro-Environment Engineering and Research (IAHR) on 14th – 18th August 2017 at Putra World Trade Centre (PWTC).

This congress was attended by Ir. Rohani Ahmad, HTC KL's Director, Mrs Zaliffah Binti Ayop, Principal Assistant Director and Mrs Sandra Ligong, Assistant Director to enhance their knowledge in the relevant topics. In order to share knowledge in River and Sediment Management, Dr. Norlida Mohd Dom, the Deputy Director of HTC KL presented her technical paper on Debris and Mudflow Computer Model.

National Conference on Stormwater Management and Erosion & Sediment Control on 18th – 20th September 2017 organized by Malaysian Stormwater Organisation (MSO).

Dr. Norlida Mohd Dom the Deputy Director of HTC KL was presented a paper on Emerging Ecohydrology on Urban Storm Water Management. The conference was held at TH Hotel & Convention Centre, Terengganu.

3.5 Research Activities

The ongoing Research & Development (R&D) collaboration activities carried out by HTC KL for this year till 2020 are in line with the 11th Five Years Malaysia Plan (2016 – 2020). The R&D projects output will be either or combinations of technical reports, manual, technical papers, posters and innovation products. The projects are as shown in Table 1.

Table 2: R&D Activities from 2016 – 2020

No	Title	Objective Remarks		
		Phase IHP-VIII	SDGs (No.6)	Status
1	Debris Mud Flow Warning System (Phase II)	THEME 1: Water related Disasters and hydrological Change	6.6 Protect and restore water-related ecosystems	In progress
2	Mobile Flood Wall Barrier (MFWB)	THEME 1: Water Related Disasters and Hydrological Change	6.6 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	Project completed but to be improved
4	Biodiversity Flow at Tasik Chini (Lake)	THEME 5: Ecohydrology, Engineering Harmony for a Sustainable World	6.3 Improve water quality	Project completed
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

4.0 WATER EDUCATION

Project Output

HTC KL is currently publishing the Water Management Curricula Module & Comparative Studies for Customizing IWRM. It will be disseminated tentatively on the end of November 2017 by the

UNESCO Jakarta office through the workshop of Pathway towards Improved Water Education Curricula.

Technical Visit to HTC KL

HTC KL has received visitors from various organisations and higher learning institutions from both local and international including UNESCO to see and gain knowledge through Stormwater Management Eco-hydrology (SME) and Research and Development (R&D) activities. The list of the technical visit from organisations and higher learning institutions to HTC KL are listed in Table 2.

Table 3: List of Technical Visitors Visited to HTC Kuala Lumpur

No	Organization	Date	No. of Visitors
1	UNDP Bangladesh	6 Dec 2016	9
2	APCE Indonesia	8 Dec 2016	4
3	REDHA	17 March.2017	5
4	UNESCO Dhaka	5 May.2017	1
5	UNESCO Jakarta	8 May.2017	1
6	RCUWM Tehran	16 – 20 Oct 2017	9
Total			**29**

Interactive Online Education

Manual for Debris and Mudflow Forecasting Software by HTC KL, Version 2 is available in YouTube at Debris and Mudflow Forecasting Software Malaysia or **https://www.youtube.com/watch?v=LKCzFScC21E**. Some documentation and Technical Reports can be downloaded from HTC KL Website (http://htckl.water.gov.my) or email to htckl@water.gov.my (Page ID: 123 953 267 743 223).

Social Media

HTC KL use Facebook as one of the platform to disseminate the output of its R&D projects as well as to share its activity. The Facebook of HTC KL is Humid Tropics Centre Kuala Lumpur.

5.0 FUTURE PROGRAMME

5.1 The Future Activities

The future activities will cover some of the 2017 pending activities due to financial problems and government procedures. They are as shown in Table 3 and Table 4.

Table 4: Future Activities in 2018

No	Program /Activities
1	The HTC KL Centre evaluation
2	Memorandum of Agreement between Government of Malaysia and UNESCO
3	Dissemination of Modula Curricula to UNESCO Water Centres and Water Families
4	Training on Urban Stormwater Management (MSMA) for Ethiopia
5	Re-Engineering Program for Malaysia Water Security Project

Table 4: Future Activities for Water Management Curricular Target in 2018

No	Water Management Curricular Target
1	Public Outreach Programme (PoP) on Eco-hydrology
2	Tasik Chini Sediment Curricular
3	River Rehabilitation & River Restoration
4	Eco-hydrology Curricular for Youngsters

5.3 Operational

HTC KL will continue to perform and carry out its obligation under Article 2 of the Agreement related to;

- Coordinating the implementation of cooperative hydrological and water resources research projects and activities;
- Networking with IHP National Committees and other similar centre for exchange of scientific and technical information on research results;
- Organizing training courses, seminars, workshops and meetings for knowledge and technology transfer;
- Producing related hydrological and water resources publications and media for distributions.

5.4 Strategic Plan linked with IHP-VIII (Water Security: Responses to Local, Regional and Global Challenges)

HTC KL focus areas on Research and Development (R&D) and water education based on UNESCO IHP Phase VIII Themes (2014 – 2021) related to Sustainable Development and Science,

and UN Post-2015 Water Agenda. HTC KL will continue to contribute in stormwater management, eco-hydrology, river basin management, waste water management through its R&D collaboration programmes and through the cross-cutting programmes i.e. UNESCO SWITCH (Sustainable Water Management Improves Tomorrow's Cities Health)-in-Asia: Urban Water Management; and UNESCO-HELP (Hydrology for the Environment, Life and Policy) the Langat River Basin. The scope of activities will continue to include applied research, advising/ consulting, continuing education and software development.

6.0 FINANCE

Operation and Maintenance & Development Cost

The annual operating budget for the year 2016 and 2017 is as shown in the Table 5.

Table 5: Operation and Maintenance & Development Cost

No.	Component	Amount 2016		Amount 2017		Contribution Agency
		RM	USD	RM	USD	
1	**OPERATION AND MAINTENANCE**					
	a) Operating Fund	197,440.00	51,957.89	181,033.00	45,258.25	Government of Malaysia
	b) Salary	1,168,233.50	307,429.87	1,007,568.00	251,892.00	Government of Malaysia
2	**DEVELOPMENT**					
	a) Applied research	400,000.00	105,263.16	918,074.00	229,518.50	Government of Malaysia
	TOTAL	**1,765,673.50**	**464,650.92**	**2,106,675.00**	**526,668.75**	
	14 STAFFS					
	AVERAGE/STAFF	**126,119.54**	**33,189.35**	**150,476.79**	**37,619.20**	

7.0 STAFF ORGANISATION

7.1 Outgoing Staffs

1) Mrs. Azliza Aziz, Assistant Senior Engineer of HTC KL has been transferred to DID Kelantan, Malaysia in March 2016.

2) Mrs. Taharah Mohamed, Secretary of HTC KL has been transferred to Headquarters in May 2017.
3) Mrs. Farah Hafiza, Assistant Senior Engineer of HTC KL has been transferred to Infrastructure and Building Division of DID in May 2017.
4) Mrs. Sharina Sulaiman, Assistant Director has further her study at postgraduate level in August 2017.
5) Mrs. Nor Azlinda Saad, Assistant Senior Engineer has been transferred to DID of Kedah in August 2017.

7.2 **Incoming Staffs**

1) Ms. Nursyarein Abd Samad, Assistant Engineer had reported her first duty in HTC KL on 21st November 2016.
2) Mrs. Zaliffah Ayop, Principal Assistant Director had reported her duty in HTC KL on 1st January 2017.
3) Ms. Siti Najwa Ramli, Assistant Engineer had reported her first duty in HTC KL on 6th April 2017.
4) Ms. Belinda Adzmi, Assistant Senior Engineer had reported her duty in HTC KL on 17th April 2017.
5) Mrs. Naizati Sintar, Secretary had reported her duty in HTC KL on 2nd May 2017.
6) Ir. Rohani Ahmad, Director of HTC KL had reported her duty in HTC KL on 15th May 2017.
7) Mrs. Satiavathi, Assistant Senior Engineer had reported her duty in HTC KL on 4th September 2017.

HTC Kuala Lumpur Organization Chart is as shown in Figure 1.

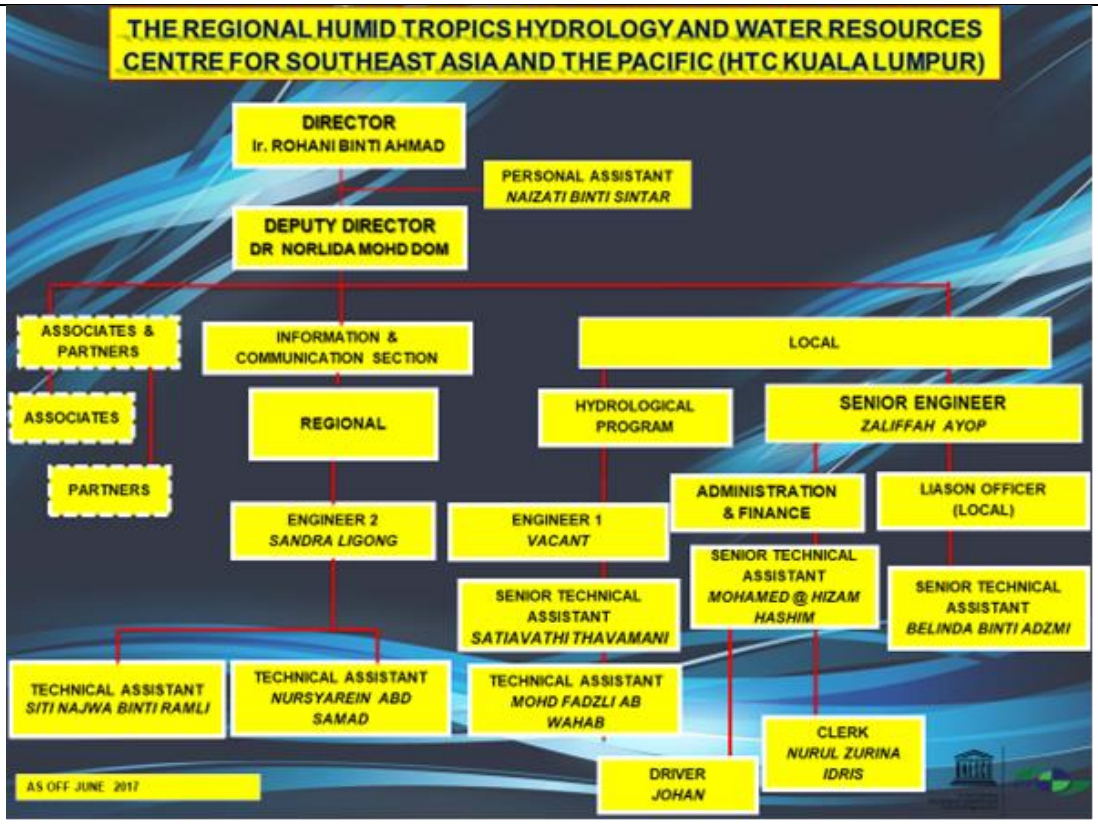


Figure 1: HTC KL Organization Chart

8.0 PUBLICATION

Publications by HTC KL in 2016/2017 are as shown in Figure 2.

- Journal of Water Resource Management, Vol. 1, No. 5, December 2016
- Curricula Module & Comparative Studies for Customizing Integrated Water Resources Management (IWRM)

Figure 2: HTC KL Publications

9.0 FORTHCOMING ISSUE

The forthcoming activities and challenges are as below.

- The HTC KL Centre evaluation
- The assessment and renewal of Memorandum of Agreement (MoA).

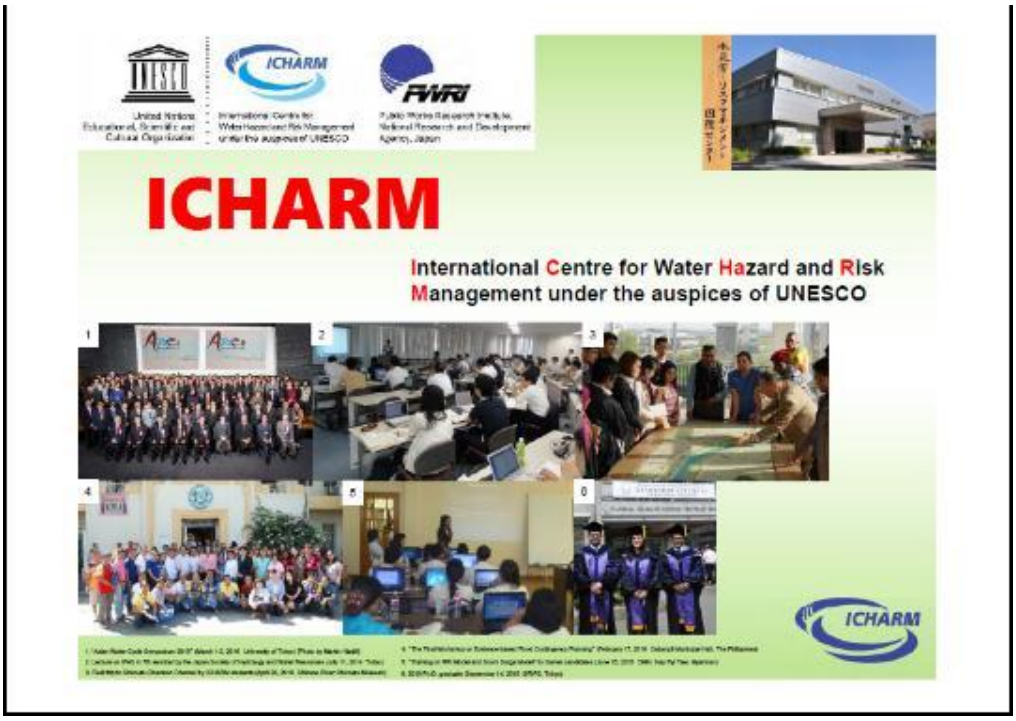
The above MoA has recommended by the UNESCO to proceed with the renewal with a further evaluation. This would allow to meet the expectations of the Government and Centre, align the agreement with the ruling strategy (model agreement), and align the cooperation with HTC with UNESCO's new programmatic frame.

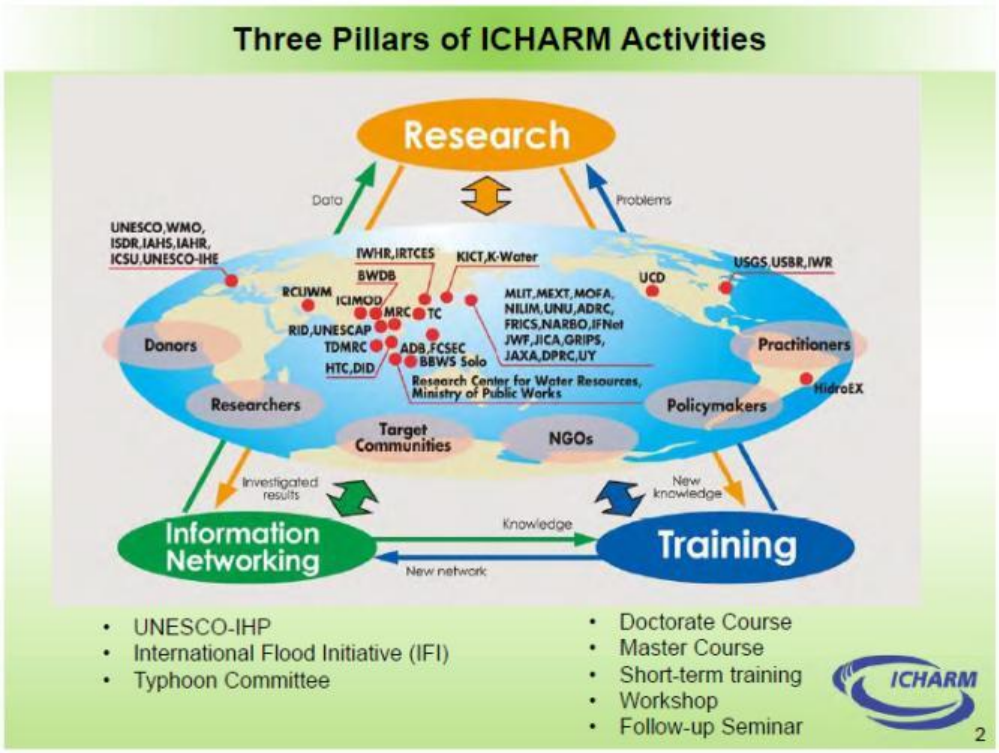
10.0 CONCLUDING REMARKS

This report is to summaries the activities that carried out by the Centre during the reporting period. HTC KL has been in operational for the past 18 years since October 1999 under the agreement between the Government of Malaysia and the United Nations Education, Scientific and Cultural Organization (UNESCO) and is expected to continue to be the UNESCO Category 2 Water Centre i.e. The Regional Humid Tropics Hydrology and Water Resources for Southeast Asia and The Pacific.

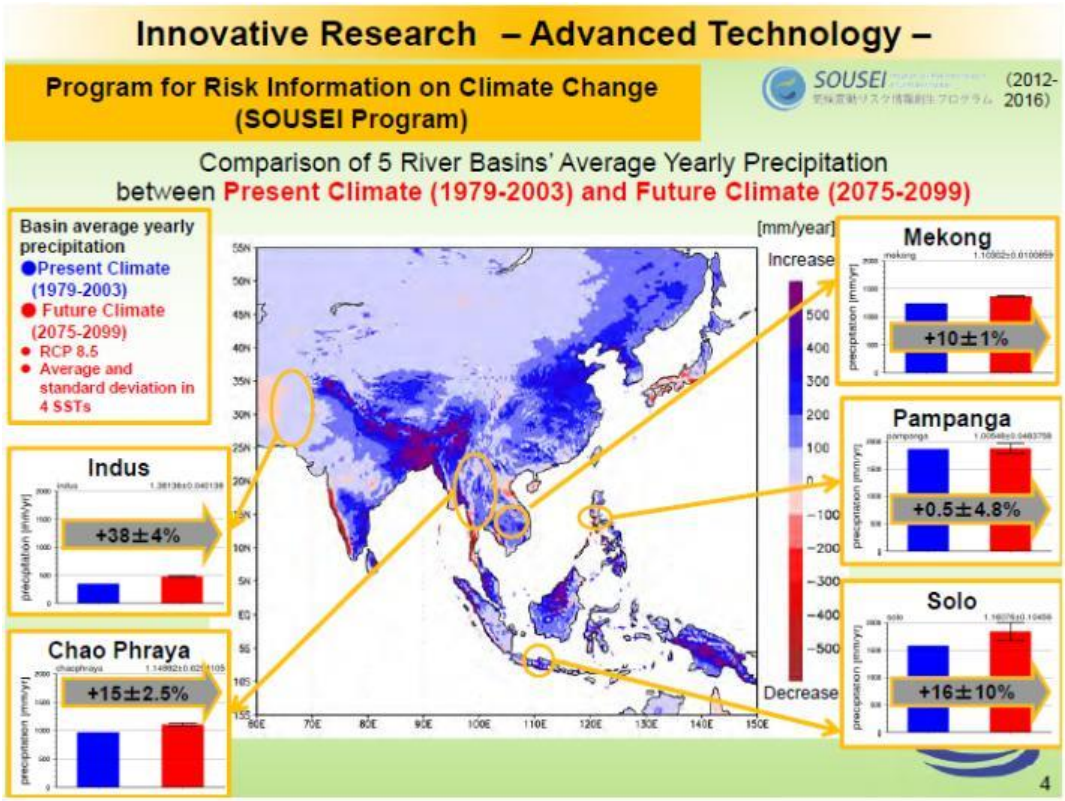
HTC KL would continue to participate in relevant activities in order to achieve the vision to be World Water Centre of Excellence by year 2020 with the full support and cooperation from members countries.

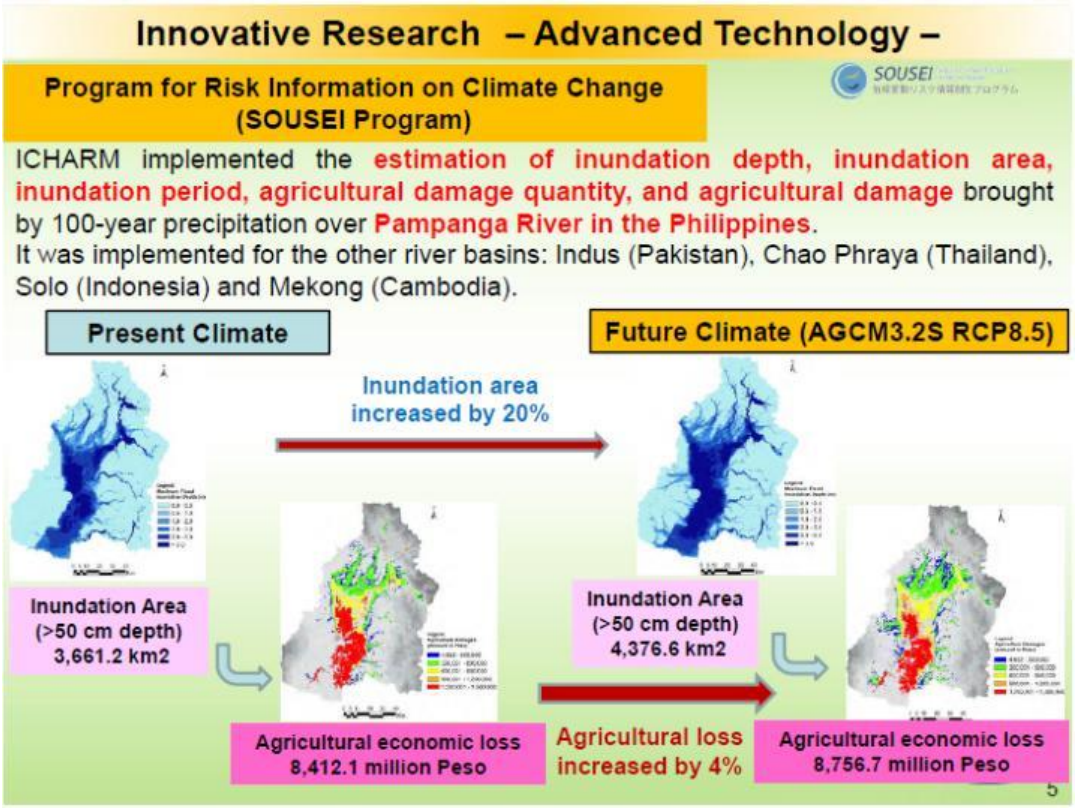
ICHARM:

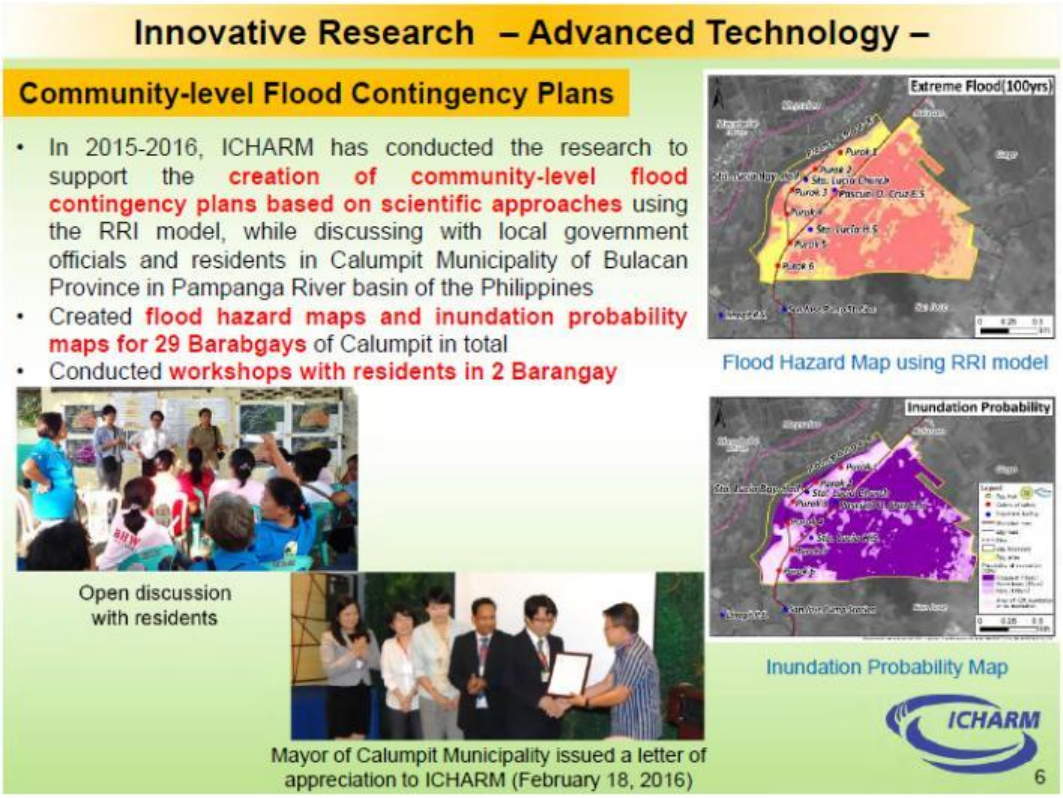

ICHARM
International Centre for Water Hazard and Risk Management under the auspices of UNESCO
ICHARM


Three Pillars of ICHARM Activities
Research
Data
Problems
UNESCO,WMO, ISDR,IAHS,IAHR, ICSU,UNESCO-IHE
IWHR,IRTCES
KICT,K-Water
BWDB
RCUWM
ICIMOD
MRC
TC
RID,UNESCAP
TDMRC
HTC,DID
ADB,FCSEC
BBWS Solo
MLIT,MEXT,MOFA, NILIM,UNU,ADRC, FRICS,NARBO,IFNet JWF,JICA,GRIPS, JAXA,DPRC,UY
Research Center for Water Resources, Ministry of Public Works
UCD
USGS,USBR,IWR
Donors
Practitioners
HidroEX
Researchers
Policymakers
Target Communities
NGOs
Investigated results
New knowledge
Knowledge
New network
Information Networking
Training
UNESCO-IHP
International Flood Initiative (IFI)
Typhoon Committee
Doctorate Course
Master Course
Short-term training
Workshop
Follow-up Seminar
ICHARM
2


Innovative Research – Advanced Technology –
Flood Analysis Systems developed by ICHARM
Development and dissemination of Integrated Flood Analysis System (IFAS)
Development and dissemination of Rainfall-Runoff-Inundation (RRI) model
Global data: topography, land use, etc.
Ground-gauged and satellite rainfall
Courtesy of JAXA
input
Model creation
Run-off analysis
River discharge, Water level, Rainfall distribution
IFAS
Input
Rainfall
DEM
Land Cover
Cross Sec.
Subsurface + Surface
1D Diffusion in River
2D Diffusion in Catchment
Vertical Infiltration
Output
Discharge
W. Level
Inundation
Ver.1 released in 2007, and Ver.2 released in 2012
Now used in Indonesia, Philippines, Vietnam, Malaysia, Pakistan
Infrastructure Technology Development Award 2017
Used for Chao Phraya River basin in 2011 for the first time
Now used in Thailand, Philippines, Pakistan, Myanmar and several river basins in Japan
Infrastructure Technology Development Award 2013
Training on IFAS and RRI domestically and globally at various opportunities (About 1,000 trainees)
ICHARM
3


Innovative Research – Advanced Technology –
Program for Risk Information on Climate Change (SOUSEI Program)
SOUSEI
(2012-2016)
Comparison of 5 River Basins' Average Yearly Precipitation between Present Climate (1979-2003) and Future Climate (2075-2099)
Basin average yearly precipitation
Present Climate (1979-2003)
Future Climate (2075-2099)
RCP 8.5
Average and standard deviation in 4 SSTs
[mm/year]
Increase
Decrease
Mekong
+10±1%
Pampanga
+0.5±4.8%
Solo
+16±10%
Indus
+38±4%
Chao Phraya
+15±2.5%
precipitation [mm/yr]
4


Innovative Research – Advanced Technology –
Program for Risk Information on Climate Change (SOUSEI Program)
SOUSEI
ICHARM implemented the estimation of inundation depth, inundation area, inundation period, agricultural damage quantity, and agricultural damage brought by 100-year precipitation over Pampanga River in the Philippines.
It was implemented for the other river basins: Indus (Pakistan), Chao Phraya (Thailand), Solo (Indonesia) and Mekong (Cambodia).
Present Climate
Future Climate (AGCM3.2S RCP8.5)
Inundation area increased by 20%
Inundation Area (>50 cm depth) 3,661.2 km2
Inundation Area (>50 cm depth) 4,376.6 km2
Agricultural economic loss 8,412.1 million Peso
Agricultural loss increased by 4%
Agricultural economic loss 8,756.7 million Peso
5


Innovative Research – Advanced Technology –
Community-level Flood Contingency Plans
In 2015-2016, ICHARM has conducted the research to support the creation of community-level flood contingency plans based on scientific approaches using the RRI model, while discussing with local government officials and residents in Calumpit Municipality of Bulacan Province in Pampanga River basin of the Philippines
Created flood hazard maps and inundation probability maps for 29 Barabgays of Calumpit in total
Conducted workshops with residents in 2 Barangay
Extreme Flood(100yrs)
Flood Hazard Map using RRI model
Inundation Probability
Inundation Probability Map
Open discussion with residents
Mayor of Calumpit Municipality issued a letter of appreciation to ICHARM (February 18, 2016)
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6

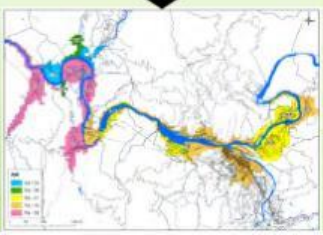
Innovative Research – Advanced Technology –

Research on flood and sediment disasters in the low upland areas

Development of easy and effective risk identification methods for flood and sediment disasters in the low upland areas by using hydrological models where the information for resident's evacuation is insufficient.

Agano River in Niigata Prefecture

Estimating flood risk from 8 indicators for various flood events by using the result of RRI model at 20 areas along the river basin (**Flood Karte**)



Categorizing by flood risk and identifying flood vulnerable areas (**Flood Hot Spots**)

Omoto River in Iwate Prefecture

Implementing the research on flood and sediment disasters and analyzing on rainfall runoff and discharge of floodwater and sediment in the Omoto river where severe damages occurred due to the Typhoon No. 10 in 2016.

Accumulation of sediments rushed out over the stream bank

Formation of cliff due to erosion on the stream bank

ICHARM

7

Information Network – IFI Activities –

International Flood Initiative (IFI)

May: XIVth **WMO Congress** welcomed the initiative and suggested to establish a joint UNESCO/WMO Committee on Floods. The proposed ICHARM will constitute a global facility for this programme.

18-22 Jan 2005
Inauguration of IFI at WCDR in Kobe
WMO/UNESCO/ UNISDR/UNU

2003

2004

> 12-14 Jul : **Preparatory meeting in Tsukuba**. A joint UNESCO/WMO task team (6 members) produced a **concept paper** "The Joint UNESCO/WMO Flood Initiative (JUWFI)"

> 20-24 Sep : **16th IHP-IGC** approved the concept paper and renamed as "The International Flood Initiative (IFI)".

> 20-29 Oct : **12th WMO CHy** discussed the Concept Paper

2002

17-22 Jun : **15th UNESO-IHP IGC Resolution** XV-14 on Joint UNESCO/WMO Programme on Floods

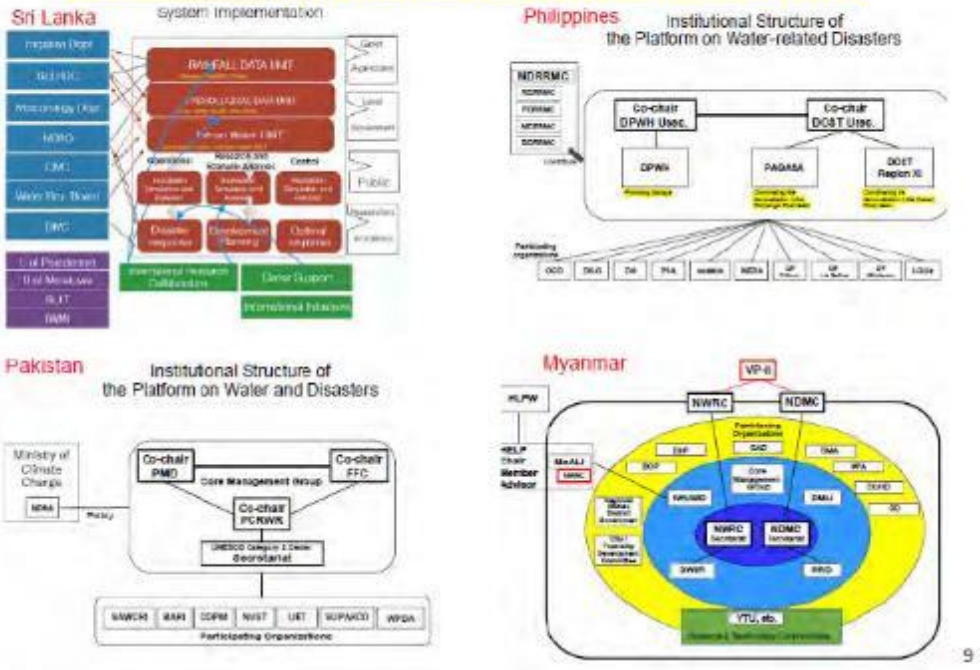
In Close Collaboration with:

UNITED NATIONS UNIVERSITY ICHARM IAHS AISH IAHR AIRH

8

Information Network – IFI Activities –

Establishment of Platforms in each country through IFI



Training/Capacity Development Programs

ICHARM has been providing various **training/ capacity development programs** in disaster management, mainly focusing on the governmental engineers in the developing countries. (Accepting **more than 1,300 trainees from about 60 countries**)

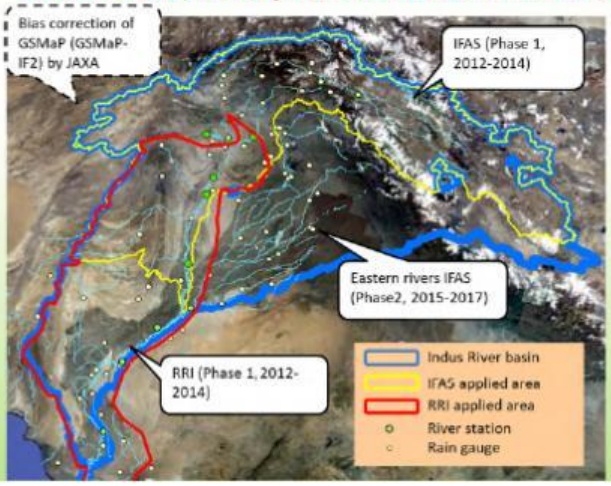
- **Short-term training courses** on lectures, exercises, and field trips from several day to months
  - Hazard maps, IFAS & local preparedness (2004-, JICA)
  - Tsunami (2008, ISDR), CC adaptation (2010, JICA)
  - Pakistan Flood Workshops (2011-12 & 2016-17 UNESCO) etc.
- **Follow-up seminars** for the ex-trainees to support their activities in the countries/ regions (Already 9 times, during 2007 – 2016)
- **Master Course** **on Water-related Disaster Management** with GRIPS supported by JICA since 2007: 110 graduates in these 10 years
- **Ph.D. Course** **on Disaster Management** with GRIPS since 2011
  - 1 ('13), 1('14), 2('15), 3 ('16), 4 ('17)

10

Local Practices

INDUS-IFAS in Pakistan (UNESCO Project) (2012-2014) & (2015-2017)

- After the unprecedented floods in Pakistan in 2010, ICHARM conducted a cooperation through UNESCO to provide technical assistance for development of **a flood forecasting system in the Indus basin (Indus-IFAS), flood plain hazard mapping & capacity building** (Phase 1).
- As a result and successful achievement, Pakistan Meteorological Department (PMD) is providing flood forecast information based on Indus-IFAS on website.
- Since 2015, Phase 2 has started on **improvement of Indus-IFAS through integration of the eastern rivers, development of calculation module for melting snow** in upstream regions.



Phase 1 (2012-2014) :

- Model in main river (Indus-IFAS)
- Capacity building

Phase 2 (2015-2017) :

- Eastern rivers model
- Snowmelt module
- ADCP observation
- Capacity building

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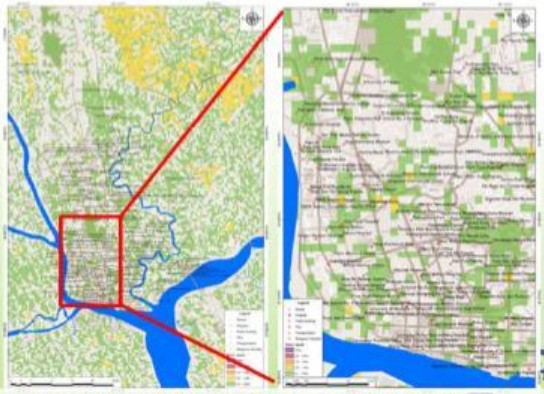
Local Practices

ADB TA-8456 Republic of the Union of Myanmar: Transformation of Urban Management (2014.07-2016.11)

- Asian Development Bank (ADB) implemented a project,"TA-8456: Transformation of Urban Management," to promote **sustainable urban development for three large cities (Yangon, Mandalay and Mawlamyine)** in Myanmar.
- ICHARM participated as the project leader in Part II (Flood Management) of this project, mainly responsible for **technical transfer in flood management**. ICHARM led the **enhancement of the organizational capacity of the Myanmar government** in flood risk reduction by providing them with the knowledge and skill in flood risk assessment and other relevant areas.



Flood Hazard Map in Yangon for 100-year flood (Green(0.1-0.5m), Yellow(0.5-1.0m))

12

Future Events

- IFI technical session at the **World BOUSAI Forum** in Sendai, Japan
  - **9:00-10:30 on November 28, 2017**
  - Title: "Platform on Water and Disaster – ICT, Economy, Community, Dynamics – "
- Thematic session at the **3rd Asia-Pacific Water Summit (APWS)** in Yangon, Myanmar
  - In collaboration with ICIMOD and SPC
  - **13:00-17:00 on December 11** (Day One), 2017
  - Title: "Water and Disasters in the context of Climate Change – From the Mountains to the Islands – "
- Submitted Expression Of Interest for the **8th World Water Forum (WWF8)** in March 2018
  - Theme Climate: Session 1.a.1 and Session 1.d.1
  - Theme Capacity: Session 8.d.1

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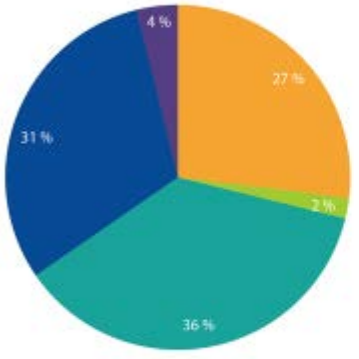
ICWRGC:

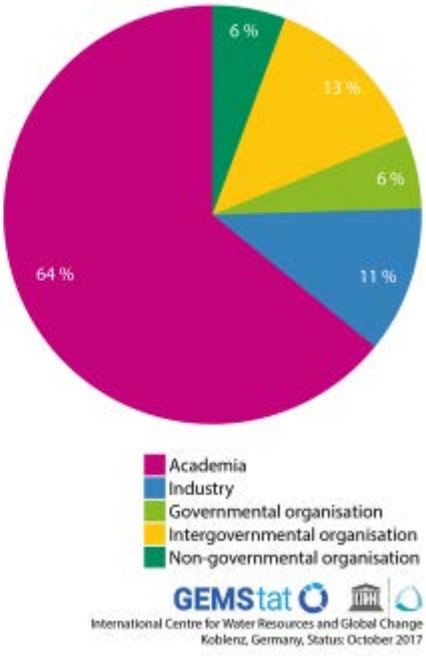

Activities of the ICWRGC 2016/17
Ulrich Looser for
Prof. Dr. Siegfried Demuth
www.waterandchange.org


International Centre for Water Resources and Global Change (ICWRGC, UNESCO Cat 2 Centre)
Research projects
Simulation and monitoring of SDG indicators
Climate change in the Medit. area
Climate change adaptation
Water quality from remote sensing
Water diplomacy
Water scarcity
Seamless Prediction
Data
GTN-H
Coordination of this "network of networks".
GEMStat
Hosting and operation of this Water Quality Database.
Global Water Information System
Future vision of a centralized access to water data from different sources.
Education, Capacity Dev.
E-Learning: module on IWRM.
Summer Schools, e.g.:
• Climate skeptics (Koppelsberg, 2017)
• Groundwater and Energy (Bochum, 2017)
• Plastics in the Environment (Koblenz, 2017)
Flood and Drought Management: Training and guidelines (Jakarta, 2016)
Hydroforum: Database on water courses in universities.
Events
Conferences, workshops, meetings, e.g.:
• Workshop "Indirect Potable Reuse", 2018, Koblenz
• Int. Symposium „Ecohydrology for the Circular Economy and Nature-Based Solutions towards Mitigation of Climate Change" (2017, Lodz)
• Podium: Wastewater – The Untapped Resource 2017, Bonn
• Int. Symposium on Water Diplomacy (2016, Stockholm)
Networks
National:
BMUB, BMVI, AA, BMBF, BMZ, DFG, GPCC, GRDC, Universities.
International:
IAHS, ERCE, ICWC, SWFP, IAS, ESA, CHR.
Supranational:
UNEP, FAO, UNESCO, WMO, WWAP, UN Water.
IHP/HWRP Secretariat
www.waterandchange.org
2

Visit the new GEMStat Portal at www.gemstat.org

GEMStat data requests






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

ANNEX I - Report from UNESCO Conference on Water Security in the Pacific SIDS

Message to the 25th meeting of the International Hydrological Programme Regional Steering Committee for Southeast Asia and the Pacific

Manila, the Philippines, 13 November 2017

We, the participants at the **UNESCO Conference on Water Security in the Pacific SIDS: Bringing UNESCO's International Hydrological Programme to the Pacific**, including the **International Initiative on Water Quality's regional consultation in the Pacific SIDS**, met in Nadi, Fiji on 23-24 October 2017 in order to review and establish water-related priorities, needs and implementation gaps in the Pacific with focus on the opportunities offered by the International Hydrological Programme (IHP).

As an outcome of two days of presentations, discussion and informal exchange, we hereby reaffirm our interest in actively engaging with IHP and the UNESCO Water Family. We take particular note of the International Hydrological Programme Regional Steering Committee for Southeast Asia and the Pacific (RSC-SEAP), which over the past 25 years has served as a mechanism for exchange for the region's IHP community.

We express our interest in actively engaging with the RSC-SEAP, and thereby call upon the Committee and its Secretariat to actively pursue mechanisms through which to ensure broader Pacific representation at future meetings on a rotational basis among the Pacific States. In this regard, we take note that representatives of Papua New Guinea, as one of the founding members of RSC-SEAP, have regularly participated in RSC-SEAP's meetings, and that additional representation of the Pacific has during periods in the past been ensured on the basis of rotational representation.

With this statement, we bring to the attention of the RSC-SEAP the outcomes and results of our discussions in Nadi, in the anticipation that these may serve as entry points for engaging with IHP and for further cooperation and exchange with the Committee and its members. In this regard, we note that:

- The Pacific sub-region is home to a wide range of different contexts – from high islands to low-lying atolls, from large, centrally located island hubs to remote, outer-lying islands and with vast cultural and linguistic diversity.
- However, there is a general demographic shift to urban and peri-urban areas, creating stress on existing infrastructure and water sources.

- Pacific needs in terms of hydrological sciences and water-related services are as different as the islands that make up the sub-region. For successful planning and implementation of any intervention, this diversity must be acknowledged taken into account.

- The Pacific actively pursues cooperation and exchange in the area of water through the network of CROP agencies, the United Nations system, as well as a range of bilateral and multilateral agreements and frameworks.

- The Pacific island countries are most vulnerable to climate change, extreme events and natural hazard impacting on their water resources which are often coupled with challenges due to their geographic sizes, small water lenses and remoteness.

As an outcome of our deliberations and recognizing that UNESCO assists in mobilization of partnerships that can bring resources, both technical and financial, we propose the following as priority areas for intervention by IHP and the UNESCO Water Family in the Pacific SIDS, and invite the RSC-SEAP and its members to consider potential cooperation in these areas.

- **Hydrological data collection, storage, analysis and reporting protocols**. Recognising work that has already been done (for instance, the Pacific WMO HYCOS project) and existing regional and national platforms for collecting and storing hydrological data from remote island locations (for instance, Tonga Smart Groundwater Management and Kiri-WATSAN), we discussed the need to strengthen existing baseline hydrological data, develop replicable and simple data collection and management protocols, in parallel with the retrieval and securing of existing data records.

- **Water quality monitoring – surface and ground water resources, drinking water, including household rainwater collection systems**. With particular reference to UNESCO-IHP's International Initiative on Water Quality (IIWQ), we discussed the need to strengthen existing knowledge, regulatory frameworks and practices, develop or, in the case of already existing programmes, extend water quality monitoring and knowledge at a manageable cost based on Pacific experience and innovation. IIWQ was invited to contribute to regional efforts on water quality and wastewater together with partners such as Pacific Water and Wastewater Association (PWWA).

- **Water education and capacity-building at all levels**. We discussed the need to strengthen water education in both formal and non-formal contexts, including practical and theoretical learning from early childhood. In this regard, it was proposed to integrate water into Education for Sustainable Development

programmes. We also discussed the need for capacity development for water sector professionals, as well as for outreach and engagement with communities.

- **Updating the Pacific Regional Action Plan (RAP)**. We request UNESCO to provide technical support in the updating of the RAP for Sustainable Water Management in the Pacific.
- **Updating of key resource materials.** We discussed the potential benefits of updating and publishing key IHP materials of particular relevance to the Pacific, such as Tony Falkland's "Hydrology and water resources of small islands: a practical guide" (Studies and reports in hydrology Vol. 49, 1991)
- **Understanding groundwater dynamics for water security.** We discussed the need to strengthen knowledge of our groundwater resources as a basis for sustainable management of these resources.
- **Engagement with the Pacific Hydrology Services Panel.** We discussed the recent endorsement by Pacific Ministers for Meteorological Services of a Hydrology Services Panel to provide advice to the Pacific Meteorological Council, and the opportunities for UNESCO to work with this panel to progress the development and implementation of new programmes and initiatives to support the capacity needs of hydrological services in Pacific Island countries and territories.
- **Provision for technical support and science-based information on identifying and monitoring impacts of climate change on water resources in the Pacific.** We discussed the need for countries to better manage their water resources based on sound science and seek support to identify adaptation measures to increase country resilience.

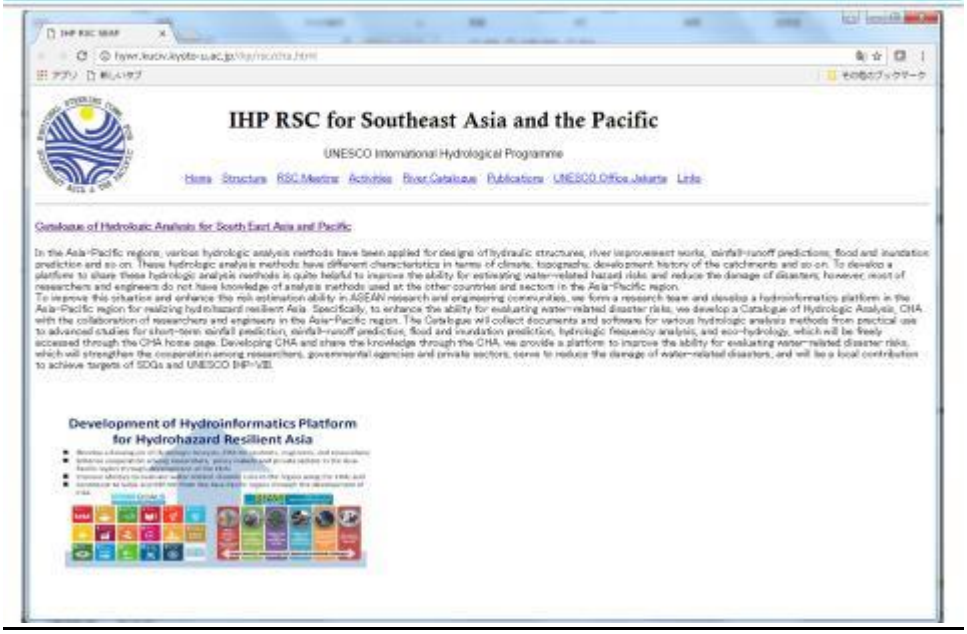
Nadi, 24 October 2017

ANNEX J - Updates on Catalogue of Hydrologic Analysis modules

Catalogues of Hydrologic Analysis (CHA)

Tachikawa, Y., Kobayahi, K. and Sayama, T. (IHP Japan)

A Homepage was made by Prof. Tachikawa
http://hywr.kuciv.kyoto-u.ac.jp/ihp/rsc/cha.html



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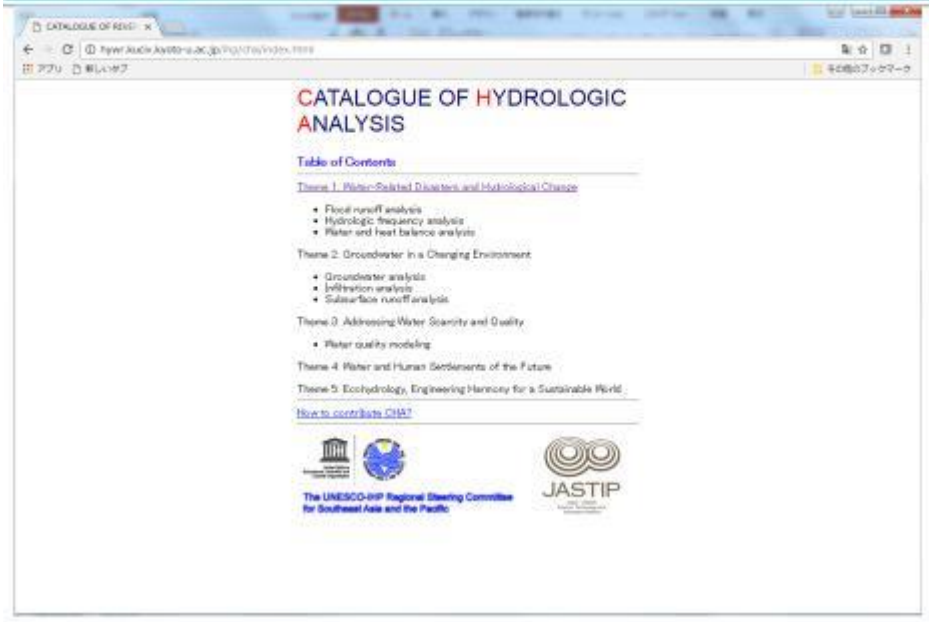

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http://hywr.kuciv.kyoto-u.ac.jp/ihp/rsc/cha.html

CATALOGUE OF HYDROLOGIC ANALYSIS

Table of Contents

Theme 1: Water-Related Disasters and Hydrological Change

- Flood runoff analysis
- Hydrologic frequency analysis
- Water and heat balance analysis

Theme 2: Groundwater in a Changing Environment

- Groundwater analysis
- Infiltration analysis
- Subsurface runoff analysis

Theme 3: Addressing Water Scarcity and Quality

- Water quality modeling

Theme 4: Water and Human Settlements of the Future

Theme 5: Ecohydrology, Engineering Harmony for a Sustainable World

How to contribute CHA?

The UNESCO-IHP Regional Steering Committee for Southeast Asia and the Pacific

JASTIP

CATALOGUE OF HYDROLOGIC ANALYSIS

October 22, 2016

Theme 1: Water-Related Disasters and Hydrological Change

Flood runoff analysis

- Flood prediction using a distributed flow routing model, 1K-FRM (Y. Tachikawa and T. Tanaka, Japan)
  - document
  - related information
- Rainfall-runoff and flood inundation predictions using RRI model (T. Sayama and Y. Iwami, Japan)
  - document
  - related information

Water and heat balance analysis

- Estimation of monthly potential evapotranspiration using Thornthwaite method (K. Kobayashi, Japan)
  - document
  - Excell sheet for calculation

Hydrologic frequency analysis

New proposal (by Tachikawa, Kobayashi and Sayama) this year!

- Title: CHA
- Contents: Water related disaster (forecasting, hazard map), Water resources management (drought, groundwater use), eco-hydrology (water quality, water environment preservation) etc. which are related with IPH 8th Phase.
- Editorial board: RSC chairperson, secretary and appointed persons (according to the theme) × 3 = approx. 5 persons) which will be requested to all the countries.
- Schedule: Publication at every 2 years
- 2017: Proposal of the revised plan
- 2018: Decision of the proposal (e.g. hazard map). The due date is 2019
- 2019: Start editorial process after the collection of the hazard map manuscripts. To be completed by 2020.
- 2020: Discussion of the 2nd phase plan, decision and request of the 2nd phase

Contents examples

Water related hazard（flood forecasting）

Title：Flood forecasting in the Yodo River basin

(1)（Yodo river basin overview）：The citation from River Catalogue is expected.

(2)（System）：flood warning system including meteorological warning system; System and legal framework; and information dissemination to the public (e.g. evacuation information) will be described.

(3)（Technology）：Introduction of meteorological forecast and flood forecast.
(Theory) Theory of the analysis, basic equation
(Tool) e.g. RRI.

(4) (Example) Good practice. When the warning was made and how the reaction was etc.

(5) (References) if possible

Contents examples

Water related hazard（hazard map）

Title： Flood hazard mapping in the Yodo River basin

(1)（Yodo river basin overview）：The citation from River Catalogue is expected.

(2)（System）：How to use hazard map; System and legal framework; and information dissemination to the public (e.g. the relation with the evacuation information) will be described.

(3)（Technology）：How to make hazard map.
(Theory) Theory of the analysis, basic equation
(Tool) e.g. RRI.

(4) (Example) Good practice. How it is actually used.

(5) (References) if possible

Contents examples

Water resources management (Draught management)

Title: Draught management in the Yodo River basin

(1) (Yodo river basin overview) : The citation from River Catalogue is expected.

(2) (System) : How to manage drought in the catchment; System and legal framework; and information dissemination to the public will be described.

(3) (Technology): Draught forecasting, draught monitoring.
(Theory) Theory of the analysis, basic equation
(Tool) e.g. RRI.

(4) (Example) Good practice. Past examples.

(5) (References) if possible

Contents examples

Water resources management (Groundwater use)

Title: Groundwater management in the Yodo River basin

(1) (Yodo river basin overview) : The citation from River Catalogue is expected.

(2) (System) : System and legal framework for the groundwater use

(3) (Technology): Groundwater monitoring, forecasting
(Theory) Theory of the analysis, basic equation
(Tool) e.g. MODFLOW

(4) (Example) Good practice. Past examples.

(5) (References) if possible

Contents examples

Ecohydrology (Water quality, eco-system preservation)

Title: Environmental management in the Yodo River basin

(1) (Yodo river basin overview) : The citation from River Catalogue is expected.

(2) (System) : How to manage water quality and eco-system preservation; System and legal framework for the eco-system preservation; and information dissemination to the public will be described.

(3) (Technology): Water quality, eco-system monitoring and forecasting
(Theory) Theory of the analysis, basic equation
(Tool) e.g. RRI

(4) (Example) Good practice. Past examples.

(5) (References) if possible

Thank you very much
