



INTERNATIONAL HYDROLOGICAL PROGRAMME

20th IHP Regional Steering Committee meeting for Southeast Asia and the Pacific

Langkawi, Malaysia, 8 and 9 November, 2012

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FINAL REPORT

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UNESCO Jakarta Office, 2012

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**The 20th IHP
Regional Steering Committee Meeting for
Southeast Asia and the Pacific**

**Langkawi, Malaysia,
8 and 9 November 2012**

Chairman: Mr. Trevor Daniell (Australia)
Secretary: Mr. Kaoru Takara (Japan)

UNESCO Representatives: Mr. Giuseppe Arduino (Jakarta Office)
Mr. Shahbaz Khan (Jakarta Office)

Countries Represented: Australia, China, Indonesia, Japan, Korea (Republic of), Lao PDR,
Malaysia, Mongolia, Myanmar, New Zealand, Philippines,
Thailand, Vietnam.
(See Annex 1 for the list of participants)

Observing Countries and Organizations: RCUWM, ICHARM, APCE, HTC, Dr Olivia La
O'Castillo (PHI); Member of the UN Secretary's
General Advisory Board on Water and Sanitation
(UNSGAB)

1 OPENING

The RSC Chair, Mr. Trevor Daniell (Australia), opened the meeting at 8:54am on 8 November 2012, welcomed the participants, and thanked the IHP organizing committee in Malaysia. Mr. Giuseppe Arduino was thanked for his involvement with the RSC over 11 years as he is moving to UNESCO Paris in March 2013. Mr. Shahbaz Khan will take over the Environmental Science role at UNESCO Jakarta in March 2013. M.S. Srinivasan was welcomed to the RSC representing New Zealand as Secretary of the NZ National Committee for IHP.

2 ADOPTION OF AGENDA

The draft agenda was presented by the Chairman. There was discussion about how to divide the 31 agenda items among two days. It was agreed to adopt a flexible approach dependent on progress on the first day. See Annex 2 for the adopted Agenda.

3 ELECTION OF RAPPORTEUR

It was agreed that the task of Rapporteur would be carried out by Mr. Dennis Jamieson (New Zealand) with support from Mr. M.S. Srinivasan (New Zealand).

4 SECRETARIAT REPORTS

4.1 UNESCO JAKARTA OFFICE REPORT

Mr. Arduino presented his report. Some key points follow, with details of other topics being noted elsewhere in these minutes. The complete report is given in Annex 3.

At 10.10 the Chair welcomed the secretary, Mr. Takara, on his arrival. Mr. Takara gave a quick update on the Disaster Reduction Hyperbase (DRH). The sustainability of the RSC was discussed in response to a question from China. Malaysia raised a question about flood forecasting models in Southeast Asia and Mr. Arduino replied that other tools and training would be considered if necessary.

Mr. Arduino welcomed new members, Mr. Shahbaz Khan and Mr. M.S. Srinivasan.

4.2 JAPANESE FUNDS IN TRUST (JFIT)

There was a review meeting held in May 2012. A report was provided on a wide range of activities. Discussion covered how future activities would respond to feedback and the proposed future approach for flood forecasting.

5. REPORT FROM THE 20TH IHP INTERGOVERNMENTAL COUNCIL, JUNE 2012, PAST CHAIR (S. LEE), (MEMBERS AUSTRALIA, JAPAN, MALAYSIA, MONGOLIA, R. OF KOREA), EXCEPT DRAFT IHP-VIII STRATEGY PROGRAM.

A brief outline of important points from the Intergovernmental Council Bureau meetings held in Paris was given by Mr Soontak Lee, who concluded as Chair of the IGC at that meeting but remains as a member representing the Asia Pacific region. The full proceedings of this meeting have been published by UNESCO on their website.

Mr. Khan noted the importance of developing an agenda for the Category 2 centres (e.g. HTC, Malaysia) as they will be reviewed for renewal. Many centres were formulated before the strategy for IHP-VIII was formulated and now need goals to link to strategy. It is expected that centres will be a bigger part of the agenda so centres need to start thinking about goals six months before current contracts expire. A template has been introduced for Centre renewal applications.

6 REPORT ON RSC FUTURE PERSPECTIVES MAPPING (G. ARDUINO)

Mr. Arduino noted that MEXT is revising the project and requesting information on sustainability of the RSC process. See presentation in Annex 4.

The Chair noted the relevance to IHP-VIII. All national committees were requested via an email to provide information for the 19th RSC meeting on:

- What is expected from RSC?
- What have countries learned from RSC?
- Sustainability of future RSC activity?

Ten countries responded to this request.

A further request was made from Japan for information for the 19th RSC meeting and 15 countries responded. An initial concern was that RSC support was of a too long duration, but an observation from NZ was that the effectiveness of long term, low intensity support to make the type of improvements was required. All respondents indicated that IHP information is being shared with local groups, with only 2 exceptions.

A Strengths, Weaknesses, Opportunities, Threats (SWOT) analysis was proposed as a way of analyzing future options for the RSC.

Mr. Khan noted that results of the review of IHP-VI highlighted lack of coordination of IHP and national committees. An internal IHP taskforce has an objective of how to make committees active and make them link with IHP. He also noted that this region is well placed to respond due to activities of RSC.

7 REPORT ON 6TH WORLD WATER FORUM (WWF), MARSEILLE, 12-17 MARCH 2012 (T. DANIELL AND COUNTRY REPORTS)

The Chair gave a report noting that there were large delegations from China and R. of Korea. The next WWF meeting will be held in the ROK. Other SEA countries were well represented. The WWF now focused on solutions. It was a large meeting with many water specialists, which meant it was impossible to meet all attendees. An advantage of such a large and diverse group is that problems identified might not be thought of in a smaller, more traditional format. At WWF policy makers hear directly from those with needs.

Ms. Yan Huang noted that the China Delegation numbered over 200 and was led by a government Minister. The China delegation was split into groups that each focused on particular issues such as river basin management and transboundary aquifers. The meeting dealt with issues at a “political” rather than a technical level. All countries did not welcome some solutions, especially in contentious areas.

Mr. Lee noted that the most important thing is for IHP community involvement. An IHP bureau meeting held at the WWF reinforced this.

8 THE STATUS OF IHP-VIII STRATEGIC PLAN (S. LEE)

It was noted by the Chair that agenda items 8, 9, 10 and 11 go together.

Mr. Lee gave a presentation (Annex 5) summarizing IHP-VIII and noted that theme 6 - Education and capacity building - was added after WWF meeting at Marseille.

9 DISCUSSION: HOW WE GO FORWARD WITH RSC CURRENT PROGRAMS (APFRIEND) & PROJECTS THAT FIT INTO THESE THEMES

Mr. Liongson (Philippines) indicated that it is easy to fill up the six theme. However, when viewed at sub-item level, often the activities are scattered among various small departments. He suggested it will be easier for Member States to commit to main themes and not to specifics.

Mr. Liongson tracked main headings/themes to alignment of national activities. He mentioned a briefing to government to enable it to understand research programs. A question was: how much is national and how much is international, given national priorities.

Mr. Takara noted that the Science commission of Japan has implemented a plan to look at Theme 1. National Disaster Council Research looks at education and research of disasters. However, so far it has all remained domestic (within Japan).. Science Council of Japan now recommends IRDR be more international, for example support of IHP-VIII.

Chair, Mr. Daniell, noted importance of education. He also indicated that RSC is contributing to Theme 6. In addition, he indicated that RSC needs to map against IHP VIII, or else we might become defunct.

10 RSC FUTURE PROJECTS MAPPED AGAINST IHP-VIII

Comments by specific countries:

China: Management, not just infrastructure, and water resources e.g. (North–South transfer complete 2014) are important. Some 4000 site monitoring sites for rainfall are being installed in small catchments to deal with lack of information. This is a part of a 5-year national plan. International works include Mekong River inter-boundary work and river boundary work with North Korea. China would deliver to all themes of IHP-VIII.

Indonesia: Many actors are dealing with water. Focus is on improving information, enhancing groundwater sustainability and quality. Improved governance is a priority.

Japan: Climate change dataset is a priority. Climate change dataset has been developed from Global Climate Models, using numerical methods. These datasets are to be used by hydrologists and ecologists.

Lao P.D.R.: Lao government goal is to develop water resources to achieve social economic goals.

Malaysia: National resources study to 2015 has been completed. National water resources policy is formulated. Issues and strategies paper will be formulated for government. Scarcity and quality are major themes. Ecohydrology is a major theme; also looking for water security.

Mongolia: Water quality degradation – pollution from mining, agriculture and industry – has occurred. There is a need to develop a model of surface water-groundwater interactions in arid & semi arid areas. Implementation of water education and awareness, and contributions to its management are priorities.

Myanmar: Has formed a committee. Collaboration between Republic of the Union of Myanmar and Japanese government is under way. Monitoring water quality, low flows, climate change impact on floods and development of flood forecasting tools are a priority. Assistance from Japan on making meteorological observations has been received.

New Zealand: Transition of Adaptive Integrated Water Resources Management (AIWRM) is under way in one region. This is a “science informed” process rather than “science led”. Science includes both bio-physical and social sciences. Theme 6 is especially appropriate for NZ. HELP project in Motueka indicated a long term engagement with UNESCO programme.

Philippines: Bridging gap between research and construction. IHP-VIII maps across in many areas. Activities in focal areas is scattered among various agencies and universities. On theme 6, Philippines is working at multiple levels, from middle and high schools to institutes of higher learning.

Republic of Korea: Next step is to collect information over this year. No specific projects have been identified yet.

Thailand: Main activities are risk management and adaptation to climate change. People affected by events are important. There are efforts to lesson effects on people and to make sure consequences of events are reduced in the future. Focal areas are water quality, integrated watershed resource management and improvement of human capacity.

Vietnam: Climate change assessment on water resources , risk management and adaptation to climate change has been carried out. Other focal areas include development of water quality management programmes for specific reservoir systems and assessment of upstream and

downstream abstractions. A range of activities and education map to IHP-VIII. A handbook on water resources for schools is being compiled.

Australia: Research covers every focal area – but coordination is difficult. Activities are not internationally based. There are also trans-boundary problems between states which in the past prevented information sharing but under new arrangements this has been improved.

ACTION ITEM 1: All countries to refine mapping against IHP-VIII themes with projects and timelines and submit to UNESCO Jakarta before the next RSC meeting.

11 DISCUSSION TO DETERMINE THE EMPHASIS IN AP REGION FOR THE IMPLEMENTATION OF THE VIII PHASE STRATEGY, WHETHER IT BE ON RIVER BASIN OR WATER RESOURCES MANAGEMENT (Y.HUANG)

Mr. Daniell noted that IHP-VIII starts in a year (2014) so it is timely to start a list of topic areas with a common element.

Republic of Korea is developing a timeline and will have something available for the next meeting.

China – Bottom up approach of interest, but difficult; currently Integrated Water Resources Management is the focus. Emphasise the need for member countries to contribute effectively

Philippines – Education is the most common theme among member countries and integrates people across disciplines.

Mongolia – Support water education.

Chair summary: Have material ready for IHP working group request. A group is forming at the end of 2012/early 2013. Should education be a theme? Risk of affected people? Adaption of processes to climate change? AIWRM (mapped from HELP)? It is recommended to keep links from HELP and FRIEND to demonstrate continuity. He suggested that the member countries may follow the Republic of Korea model of working with the national IHP committee and working groups to generate ideas.

Mr. Khan said we should narrow ourselves down to hydrology. Other inter-governmental programmes need to be included. Mr. Khan indicated the Man And the Biosphere (MAB) programme. There could be an opportunity to bring together IHP and MAB groups together in Southeast Asia next year.

12 COUNTRY REPORTS

All country reports are included as Annex 6.

Australia

IHP activities in Australia are carried out under the guidance of the national UNESCO Science and Technology Network. The IHP Australian Network brings together many of the key hydrological research groups within Australia. As such, Australia is able to contribute towards IHP activities through the research programs currently existing in Australia. The Australian Bureau of Meteorology and CSIRO have also established a Water Information Research and Development Alliance (WIRADA) which has been in existence for nearly 5 years and is presently being reviewed for a further extension of time. WIRADA undertakes research of direct relevance to the activities of the IHP.

HELP basins include the Lower Murrumbidgee catchment in the Murray Darling River Basin (coordinated by Awadesh Prasad, Murray Darling Basin Authority), Tully Basin (coordinated by Jim Williams, CSIRO), Lower Burdekin River Basin (coordinated by Keith Bristow, CSIRO), Fitzroy River basin (coordinated by Chris Carroll, Queensland Department of Environment Resources and Mines) and the Ord River Basin (coordinated by Jeff Camkin and Dick Pasfield). Overall coordination in Australia is through Prof. Jeff Camkin, University of Western Australia.

A continuing program of work is being undertaken in various Pacific Islands.

China

IHP China national committee arranged projects / activities in all themes of IHP-VII through national committee members, focal points and working groups around the country, through research projects, conferences and workshops at national and international level. Attention has been given on flood risk and / drought mitigation, standardization of information acquisition and management, and facilitating integrated water resources management at various perspectives (monitoring on groundwater / surface water, water quality).

IHP China national committee participated in large international meetings / forums such as the 6th World Water Forum, the IHP IGC meeting in Paris, and The United Nations Conference on Sustainable Development in Brazil etc.; IHP China works closely with IAHS and encouraged cooperation among hydrologists from different countries; IHP China took part in and coordinated various international cooperation with countries and organizations such as The Netherlands, EU, Japan and UNESCO-IHE, on IWRM and risk management in particular.

Training courses have been provided at a national level on various topics of IWRM and flood risk management.

For future activities, IHP China developed the 12th 5-year plan regarding hydrological development serving more effective and integrated water resources management, which covers more or less all themes of the IHP-VIII strategy plan.

Indonesia

As a step to improve its performance and efficiency, the Indonesian IHP National Committee has reorganized and revitalized the organization through giving mandate to new experts in the organization structure. These experts represent several research institutes and universities giving significant attention to water resources problems. After several years involved in Phase VII, the Indonesian IHP has managed a significant amount of activities that have national coverage related to the major issues of the IHP Phase VII. Some of the main achievements are:

Coordinating activities related to the management of water resources at national level in a sustainable manner through researches in rivers, lakes, reservoirs etc.

Socializing management of water resources through formal and non-formal education to the society.

Participating in celebration of world water day coordinated by Ministry of Public Work, through seminars, expositions and other presentations.

Attending and participating in various events related to hydrology programs, such as IHP-related meetings (IHP-IGC, RSC), seminars, workshops at national, regional and international level. At national level, the most importance event is a hearing with the House of Representatives considering the management of 15 priority lakes in Indonesia.

Publishing several articles related to the management of national water resources in national and international journals.

Providing research-based considerations to decision-makers through a hearing with the House of Representatives and technical meeting with Ministry of Maritime Affairs and Fisheries on management of national priority.

Japan

Various activities 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. The Japanese National Commission for UNESCO has discussed and made a proposal on “Sustainability Science” which is a scientific concept as the integrated approach to build a truly sustainable society. At the occasion of the 36th General Conference in November 2011, Japan has submitted a proposal on “Sustainability Science” to UNESCO. This concept contributes to the International Hydrological Programme (IHP) of UNESCO from the view of promoting sustainable development and sustainability science within the framework of the UN Decade of Education for Sustainable Development 2005-2014 (DESD). Based on this concept, the Japanese National Committee for IHP of UNESCO is expected to solve complex global challenges through activities such as GEOSS, AWCI, KAKUSHIN, SOSEI, GRAPHIC etc., and flood risk research at ICHARM. For water education for sustainable development, the 20th and 21st IHP Training Courses have been conducted at Nagoya University in 2010 and Kyoto University in 2011 with collaboration of RIHN etc. At ICHARM, various education programs were managed, including a short-course training course, a one-year Masters Degree Program and a three-year doctoral program in cooperation with GRIPS, with the support of JICA.

Korea (Rep Of)

Since the beginning of the seventh phase of IHP, the Korean National Committee for the IHP (IHP-KNC) has been and is being paid for its efforts to achieve the objectives set by UNESCO for this phase of IHP, and the key focal area's projects have been and are being executed in Korean river basins and in the field of hydrology and water resources. Research projects supported by the Government in the framework of the IHP in the period 2010~2012 have been executed according to the implementation plan of IHP-VII phase.

Particularly, during this period, the IHP-KNC proposed to establish 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, and this Centre was unanimously endorsed in the 20th Session of the Intergovernmental Council of the IHP in 2012.

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 will be organised during 2012-2013 as the IHP-VII activities of IHP-KNC.

Lao P.D.R

Activities undertaken in the period November 2011-October 2012 include:

- Meeting of the IHP National committee
- Activities at National Level in the framework of the IHP
- Education and Training Courses
- Publications
- Participation in International Scientific Meetings
- Other activities at Regional Level
- Future Activities

Malaysia

Activities carried out by the MIHPC include:

- Status of IHP-VII activities
- Research projects

- Educational and training courses
- Publications
- Participation in international/regional activities.

Mongolia

During the year 2012, IHP-Mongolia was involved in organizing and coordinating several national and international workshops. A listing of those is available in the country report. Workshop themes included water pricing, reducing climate change impact on water resources, development of integrated water resource management plan for Mongolian river basins and development of government policies on water supply and sanitation. IHP-Mongolia was also involved in preparing a strategic plan for UNESCO-IHP phase VIII, focussing on improving water quality and development of hydrological tools and techniques for arid and semi-arid zones. IHP-Mongolia activities renewed and updated environmental and water related laws in the country. In June 2012, the Parliament of Mongolia enacted laws for establishing river basin councils, increasing water tariffs and preventing pollution of water sources. IHP-Mongolia is currently collaborating with international partners from Europe and Asia in many water related projects. Several water-related educational and training activities were also arranged this year. In the coming year, we propose to work with UNDP on sanitation and UN-ESCAP on wastewater management. We also propose to renew and reorganize the IHP National Committee before the end of the year.

Myanmar

Water resources management activities from earlier years were continued this year. These include monitoring of river water quality, assessing climate change impact on floods, and implementing hydrological disaster risk management. During 2012, a preparatory survey for the establishment of a Disastrous Weather Monitoring System in the Republic of The Union of Myanmar was initiated in collaboration with the Japan International Cooperation Agency and the government of the Republic of the Union of Myanmar. As a part of DMH, a training session was organized from November 2011 to February 2012 at Yangon to train hydrologists. A panel meeting on Tropical Cyclones was held on 5 to 9 March 2012 at Nay Pyi Taw, Myanmar, organized by WMO and DMH. In this meeting, the participants discussed coastal inundation management and the impact of tropical cyclones. Monsoon Forum, organized by FAO and DMH, was held on 17 November 2011 at Yangon, where participants discussed monsoon characteristics of the current year and the climate change impact. We also participated in various international science meetings in 2011-12. A complete listing of them is available in our country report.

New Zealand

Mr Jamieson continues as Chair of the IHP Committee. M. S. Srinivasan (National Institute of Water and Atmospheric Research) is now Secretary of the IHP Committee and member of the UNESCO-New Zealand Science sub-commission.

A range of IHP-VII related projects are funded through the Ministry of Business, Innovation and Employment (MBIE), which replaced the Ministry of Science and Innovation (MSI) in a further restructuring of science administration and funding.

The final version of the IHP-VIII Strategic Plan indicates a close fit with NZ priorities in:

- Theme 1 - Water related disasters and hydrological change
- Theme 2 - Groundwater in a changing environment
- Theme 3 - Addressing water scarcity and quality
- Theme 5 - Ecohydrology

A specific alignment is with the Chapter 6 topic of “Putting science into action” via two major initiatives:

- Canterbury Water Management Strategy (CWMS)
- Land and Water Forum (LAWF)

Activities envisaged in the long term include continuation of the:

- Programme on extreme rainfall and flood design
- NZAID Pacific Hydrological Training Programmes as required;
- NZAID monthly “Island Climate Update” publication
- Monthly New Zealand “Climate Update” and “Climate Outlook” (web) publications.
- Monthly “Freshwater Update” (web) publication
- Canterbury Water Management Strategy (CWMS)
- Land and Water Forum (LAWF)

Philippines

This abstract in outline form summarizes the current activities of major water agencies and related organizations in the Philippines:

National Academy of Science & Technology - dialogues / conferences, policy advice;

Dept. of Public Works & Highways - flood control/drainage/coastal protection projects; national sewerage master plan;

Dept. of S&T - LIDAR survey & mapping, flood forecasting R&D;

University of the Philippines. - DRRM, flood management R&D; R&D water supply & wastewater treatment technology.

Dept. of the Interior and Local Govt. - water supply & sewerage programmes in the provinces;

MWSS - water supply & sewerage programs in Metro Manila;

Dept. of Agriculture - Bureau of Soils & Water Management (BSWM) - water management & RD for agriculture;

National Water Resources Board - water sector reforms; IWRM plan;

Philippine Water Partnership (PWP) - IWRM regional cooperation with GWP-SEA;

Nagoya Training - participation in 2011 and 2012.

Thailand

As a part of IHP-VII, we are continuing programmes on the enhancement of radar network, improvement of storm surge forecasting and flood forecasting and warning systems, and implementation of integrated water resources management. Following the severe flood in 2011, the Thailand government has established a single command centre in accordance with the regulation on National Water and Flood Management, to provide real time data and to serve as a war room during floods. An action plan supporting rehabilitation and conservation of forests and soil, and natural dikes, management of major reservoirs, development of land use maps, improvement of flood forecasting and warning system and improvement of water resources management institutions was initiated with a funding of 40,000 million Baht. A range of training programmes catering to advanced water resources professionals to the general public were organized. Seminars on early warning systems in high risky areas for flash floods and landslides were conducted from August to October 2012. During this year, various water resources management projects were carried out, including flood probability analysis in the lower Yom basin, and IWRM in Songkhla Lake basin. Plans are under way to develop a flood management plan for the Chao Phraya River Basin.

Vietnam

The Vietnam IHP National Committee remained unchanged with the Chairman being Prof. Dr. Tran Thuc, Director of the Vietnam Institute of Meteorology Hydrology and Environment

(IMHEN) - Ministry of Natural Resources and Environment (MONRE), with Asst. Prof. Dr. Hoang Minh Tuyen as secretary.

The national committee arranged activities across themes and focal points of IHP-VII through national committees, focal points and working groups and also prepared for IHP-VIII activities.

Activities planned for 2012-2013 include:

Participation in the guidelines of the Water Resources Law

Assessment of the impact of climate change on water resources and extreme hydrological events;

Research on degradation and impact of water utilisation on water resources;

Study on maintained minimum flow on main rivers;

Development of operational rules for reservoir systems on major rivers;

Continued to improve warning and forecasting flood in central Vietnam.

Activities envisaged in the long term include:

IHP-VIII activities;

Strengthening integrated management of water resources;

Participation in the national action plan on water resources management and building regulations on river basin management organizations;

Participation in the National Program to respond to climate change;

Raising public awareness and education in water resources management;

Contributing practical activities in the modernization program of the Hydro-Met Service.

13 DEVELOPMENT OF CENTRES UNDER THE AUSPICES OF UNESCO (INTERNATIONAL CENTER FOR WATER SECURITY AND SUSTAINABLE MANAGEMENT ICWSSM)

Mr. Soontak Lee made a presentation of this Category II Centre (Annex 7).

14 REPORT FROM THE ASIA-PACIFIC FRIEND

Mr. Daniell presented the Flood Design Hydrograph report published on the recommendation of the 19th RSC meeting. He noted recommendations in the report:

There should be a design guidance document for the region.

There are no consistent standards across the region (100 year ARI) but needs to be.

There needs to be an increased awareness of flood risk.

ACTION ITEM 2: There is a need to promote the use of appropriate procedures to convert rainfall intensities to flood design hydrographs. Mr. Daniell proposed the need to train people on flood hydrograph methodology at a central location or do we send people to individual countries to train people?

A Pilot study was proposed to be conducted across 11 countries, first of all to examine particular country IFDs where there is appropriate data. There is a need to look for changes over time in the generation of IFDs:

Dennis Jamieson

M.S.Srinivasan

Trevor Daniell

Leonardo Liongson

Max. 5 per country

Mr. Khan suggested that the FRIEND report needs to be included in the training programmes for flood work, and the non-stationarity of systems should be communicated.

Mr. Jamieson indicated that instead of providing too much technical information, the wider community should be made aware of risks.

Mr. Liongson questioned why every country uses different methods for flood estimation. He supported providing education to the public on climate change and associated risks. Mr. Leonardo enquired if we can have a programme among RSC members on climate change and its impact on rainfall.

Mr. Daniell highlighted the need to communicate the increased variability in the systems and uncertainty in flood estimate for planners. He indicated that there is variability among member countries in selecting methods.

Mr. Khan indicated that project ICHARM trained people from different levels in Pakistan.

Mr. Jayawardena indicated that ICHARM courses are available on-line.

Mr. Liongson commented that common exercises on looking at data trends would be useful.

Mr. Daniell suggested doing pilot studies on rainfall and climate trends in member countries.

Action item: Mr. Jamieson provided the “Guideline for the application of flood design methods”:

1. APFRIEND flood design methods summary published May 2011
2. Focus work as a component of IWRM (to suit IHP- VIII)
3. Activities to focus on consistency within countries and sharing across boundaries
4. Aim to share and communicate approaches from active countries: Not just methods
 1. Access to data
 2. Process of updating
 3. Methods
 4. Method of application (consistency).

15 FLOOD FORECASTING AND WARNING SYSTEM ASSESSMENT (SEAP)

Mr. Rashid presented on behalf of Mr. Mohd Nor. The 3 stages of the project were described: R. of Korea, China, and Mekong. It was presented as a UNITEN report (on CD).

Discussion on benefits and outcomes. It was noted that verification of methods was not included in reporting. The need for review/vetting was discussed. It was proposed that a measure of success would be whether the resulting report could be published in a peer reviewed journal. The report has not been available to RSC members for inspection. Recommendation was for review by UNESCO and clarifications to be requested if required.

ACTION ITEM 3.

- 1. The Secretariat is to determine if the terms of reference are correct.**
- 2. Is the data analysed correctly and is the analysis defensible? A review of CD content and consideration of issues such as inclusion of comparative analysis is needed. Review by Thailand, Lao P.D.R, Cambodia, R. of Korea (Mr. Kim) and China (Ms Yan Huang). The objective is to ensure the content is correct. Each country + Jaya as an outside person.**

16. PROGRESS OF THE CATALOGUE OF RIVERS

Mr. Chikamori gave a presentation updating progress (Annex 8). Volume VI includes 7 rivers. Three new countries (Korea DPR, Myanmar, Mongolia) have contributed. Issues were identified with the lack of updating of rivers in earlier volumes and the smaller number of new rivers

included. The high value of the catalogue of rivers was noted and the future of the catalogue was discussed, given the need for regular updating, the possibility of publishing on-line and the need to coordinate with other databases.

Issues were proposed for discussion around the possible publication of Volume VII. A quick survey of RSC members present at the meeting indicated the majority of countries represented do not have on-line access to river data.

Discussion continued on the updating of river information from previous catalogue of rivers. They are summarised below:

There is a need to update frequently (the Philippines)

Updating is a big task. A catalogue is a good meta data source (New Zealand)

Updating helps to look for climate change impacts.

No need to update frequently but should try to include as many rivers as possible in the catalogue (China)

River catalogue was unique when first published 17 years ago but with newer technology such as the internet, we need to find better ways of compiling this information (Korea, Peoples Republic of).

Google Earth may contain all catchment information but a method is needed to capture all flow recorder information. This may mean linking our databases to Google Earth (Australia).

Update only if there is new information. In our country, this information lies scattered with several agencies and hence any updating is complex (Indonesia).

This catalogue will be a useful educational tool (the Philippines).

Data contained in the catalogue is very important for inter-basins. Also, paper copies are useful where internet access and security are issues (Mongolia).

Mr Takara suggested use of the Wikipedia system for access to river data. It is possible to find data on many USA rivers in Wikipedia, but not for Japan. Transfer catalogue of rivers information to other data sources. Mr. Liongson noted that the catalogue is directly usable by school students and could be further adapted for this purpose. Mr. Basandorj noted that data or website access was restricted in some places.

Action Item: Transfer to Wikipedia and link to the RSC webpage. All countries update data if it is not available on-line.

17 COMMUNICATION STRATEGIES FOR RSC-NEW WEB PAGE (Y. TACHIKAWA)

Mr. Tachikawa projected a IHP RSC webpage and demonstrated key features, including the page on catalogue of rivers.

ACTION ITEM 4: All countries to send RELEVANT links to Mr. Tachikawa for consideration for inclusion.

Nominated country contacts:

New Zealand: **M.S. Srinivasan**

The Philippines

Republic of Korea

Thailand

Vietnam

China: **Yan Wang**

Indonesia

Lao P.D.R

Malaysia: **Hezlandi**

Mongolia: **Gombo Dava**

Myanmar:

Australia: **Trevor Daniell**

18 IHP TRAINING COURSES IN THE REGION

Mr Arduino briefly introduced the 22nd Nagoya training course (Annex 9) on “Precipitation Measurement from Space and its Applications” which is due to be held from 18 November to 1 December in Nagoya, Japan.

19 GROUNDWATER GOVERNANCE REGIONAL CONSULTATION FOR ASIA AND THE PACIFIC

Mr Arduino introduced the meeting to be held in China. The Regional Consultation of the new project on *Groundwater Governance: A Global Framework for Action* will involve the Asia and Pacific Region and will be held in Shijiazhuang from 3 to 5 December 2012. This project is the result of the fruitful cooperation among the UNESCO International Hydrological Programme (IHP), the Global Environment Facility (GEF), the Food and Agriculture Organization (FAO), the International Association of Hydrogeologists (IAH) and the World Bank. The overall project objective is to increase awareness of the importance of a sound management of groundwater resources in preventing and reversing the global water crisis. As a final result, the project will develop a global "Framework of Action" (FA), consisting of a set of effective governance tools: guidelines for policies, legislation, regulations and customary practices. The FA will foster the evaluation of groundwater as a key natural resource, and of the social, economic and ecological opportunities that sustainable groundwater management could provide through an interdisciplinary dialogue.

20 INTERNATIONAL YEAR OF WATER COOPERATION 2013

Mr Arduino referred to an email sent to all IHP members on 19 October 2012 on this topic requesting action and support. UNESCO was appointed as the focal point for this by the UN.

Action Item: All countries to nominate activities and send them to IHP Secretariat.

21 DISCUSSION ON RSC INPUT TO 7TH WORLD WATER FORUM IN KOREA IN 2015

Mr. Lee indicated that the date was not confirmed but is expected to be in April or May in Daegu. He outlined preliminary discussions and meetings to decide the content of the forum.

22 REPORT ON THE IHP-DRH WORKSHOP

Mr. Takara gave a presentation on the development of the DRH, earlier meetings and its place in the APFRIEND systems. Application of the DRH for student led educational material content was outlined (Annex 10).

23 ORGANIZATION OF THE 21ST RSC MEETING IN KOREA IN 2013

Mr. Lee presented a 2 page leaflet outlining details of the 21st RSC which will be coordinated with the 2013 Nakdong River water week. Proposed dates are 9-13 September 2013 at Gyeongju, ROK.

24 REPORTS FROM UNESCO CATEGORY II CENTRES

Regional Centre on Urban Water Management - Tehran.

A presentation was given by the Director of RCUWM, Mr Homayoun Motiee, summarising activities and workplan 2012-13. Mr. Daniell asked about the board composition. The board has 16

members from Central Asia and the Middle East plus some international members. Generally 8 or 9 board members are at each meeting.

Mr. Khan noted the success of the centre and requested information on support from the Government of Iran. The Ministry of Energy is the main supporting agency.

APCE: Asia Pacific Centre for Ecohydrology – Indonesia

A presentation was given by Mr. Sutapa – an update on building construction planned for 2013. He gave an overview of activities, proposed conferences on ecohydrology and treatment of peat water for human consumption (Annex 11).

Day 1 concluded here at 5:55 pm. Day 2 started at 0855 on 9 November 2012. The Chair thanked the Malaysian hosts for their meal arrangements for the previous evening.

No report was available from IRTCES.

ICHARM.

Mr. Jayawardena noted he had left ICHARM on 30 September 2012.

ICHARM agreement was made in 2005 and ICHARM was established in 2006. Current staff: 44.

Activities: Capacity building, research, networking.

Education: Masters and PhD with National Graduate Institute for Postgraduate Study (GRIPS) students from many nations.

Research: Flood forecasting systems for poorly gauged catchments (Indonesia, Pakistan), climate change projection, analysis on the 2011 Thailand flood, generation of climate change risk information (SOSEI programme with Kyoto University).

Training: Wide range of training activities undertaken.

Networking and collaboration: ICHARM acts as the secretariat for the International Flood Initiative which is supported by a range of international organisations. There is participation at many events, including WWF, UNESCO and many other meetings.

Humid Tropics Centre (HTC)

The Director of HTC gave a presentation highlighting the evolution of HTC and the review of HTC commencing 1 November 2012. This included outlines of:

- Collaborations and MoUs;
- Research activities;
- Water education and yearly world water day event;
- Malaysia UNESCO day involvement; and
- Water archive.

The Chair asked about the status of the water archive. This now contains data from 51 rivers, can be accessed from the internet and has been linked to the Catalogue of Rivers project.

Mr. Lee noted that he was a member of the HTC evaluation team and that there were many successes and he made some suggestions for improvement. HTC was heavily involved with RSC at its inception and has expanded into more areas over time. A “training for trainers” course was a suggestion for capacity building. At this stage HTC does not yet have a governing board. This is found with other Category 2 Sectors and it is necessary for HTC to have one. Greater support from senior officials at DID was recommended.

Mr. Khan noted the importance of regular reviews of the Centre. HTC has been in operation from 1999 so this review is more than the 5 year recommended interval. The objective of the review is to ensure the Centre activities align with UNESCO priorities. He noted that HTC was diversifying into new areas (e.g. Ecohydrology) and there is a need to participate with other countries to be a true regional centre. A possible approach is to support higher level governance. He congratulated the Centre and Director about the development of the Centre into new areas. An outline of the contracting process through the UNESCO system was given. His strong concluding message was that it was necessary to start preparing now to ensure a good outcome.

Mr. Husaini (DID Director and IHP Malaysia Natcom Chairperson) noted the positive approach of the review process. He noted that the salaries of the staff were covered by the government and that the staff appointed from DID were at a high level to enable international linkages and activities.

Mr. Arduino noted that he had arrived in Jakarta when the HTC had just opened and was the only regional UNESCO centre in the region for some time. UNESCO Jakarta has made considerable efforts to support the centre to take a regional focus. This includes the flood forecasting project.

25 REPORT ON 2ND INTERNATIONAL CONFERENCE ON WATER RESOURCES (5-6 NOVEMBER 2012 LANGKAWI, MALAYSIA)

A paper was circulated outlining the scale (146 papers) and content of the conference. The proceedings will be published and be available from the UNESCO Jakarta website.

Mr. Daniell noted that a surprising number of authors had not attended to present their papers. Exact numbers are not available.

26 7TH GLOBAL FRIEND 2014, HANOI

Mr. Daniell noted the background to selecting a venue in Asia. The proceedings will be published into the IAHS “red book” series so will be peer reviewed.

Mr. Arduino outlined the expected venue (Hanoi University of Science and Technology) and possible timing.

27 ORGANIZATION OF THE 22ND RSC MEETING IN 2014

Indonesia proposed Yogyakarta and this was accepted.

28 13TH INTERNATIONAL CONFERENCE ON URBAN DRAINAGE, SARAWAK, MALAYSIAN BORNEO, SEPTEMBER 2014

Mr. Rashid presented on behalf of Mr. Mohd Nohr. Information is available from the conference website. Venue will be Borneo Convention Centre in Kuching.

29 ELECTION OF THE RSC SECRETARY

Mr. Daniell thanked Mr. Takara for his hard work and support of RSC over many years and noted that Mr. Tachikawa was proposed as his replacement.

Mr. Takara was asked to speak about his experiences as secretary. His comments confirmed the progress of the RSC over many years, including the involvement of new countries in the process. The support of Japan Funds In Trust (JFIT) has been an important component in supporting this success.

Mr. Tachikawa was proposed by Japan, seconded by NZ and appointed by a unanimous vote.

30 OTHER ISSUES

Mr. Daniell noted that Catalogue of Rivers data has been collected, but that an educational textbook had not yet been prepared. This was discussed as a web-based (rather than a paper) resource. Jaya noted the lack of a textbook on Asia-Pacific countries and the option of transferring copyright to a scientific publisher who might wish to publish free of charge.

Mr. Lee noted that there was a recommendation to find a new project and that this could be decided at the next RSC meeting. A textbook should be part of that discussion. Perhaps academic members can prepare this, as the RSC is not an “academic” committee.

Mr. Daniell outlined how the resource could be made available via the internet, with worked examples.

Mr. Khan noted the difficulty of producing a resource that meets “market” needs. This requires a feasibility analysis. There is also a need to link RSC with the World Water Forum for visibility and integration to meet the inter-governmental mission.

Mr. Jayawardena suggested adding a topic of water supply and sanitation. Reporting of training courses could be made as part of “Continuing Professional Development” (CPD).

Mr. Jayawardena indicated that training courses being offered by various UNESCO Category II centres need to ensure quality and credibility. He gave an example of how the Institute of Civil Engineering offers continuing improvement and up-skilling courses that are accredited. He suggested that UNESCO may want to adopt a similar accreditation approach to keep up the standard of training courses.

31 ACTION ITEMS

The Action Items were discussed and are listed in the Action Item Table below.

32 CLOSURE OF MEETING

Mr Daniell again thanked the Malaysian IHP Committee for organizing the facilities for the RSC meeting and also thanked all the participants for their input to the meeting. The meeting was closed at 11.30am.

ACTION ITEMS	BY WHOM	DATE
1. All countries refine mapping against IHP-VIII themes with projects and timelines and submit to UNESCO Jakarta before the next RSC meeting	All Countries	Before 21 st RSC Meeting
2. There is a need to promote use of appropriate procedures for the conversion of rainfall intensities to flood design hydrographs? It was proposed that there was a need to train people on flood hydrograph methodology at a central location or do we send people to individual countries to train people? A Pilot study was proposed to be conducted across 11 countries, first of all to examine particular country IFDs where there is appropriate data. There is a need to look for changes over time in the generation of IFDs.	Dennis Jamieson A number of people were nominated to progress this item.	ASAP
3. 1. Secretariat to determine if TOR is correct 2. Is the data analysed correct and any analysis defensible? Need for review of CD content and consideration of issues such as inclusion of comparative analysis. Review by Thailand, Lao P.D.R, Cambodia, RO Korea (Mr. Kim) and China (Ms Yan Huang). Objective to ensure content is correct. Each country + Jaya as an outside person.	Thailand, Lao P.D.R, Cambodia, RO Korea, China, Jayawardena	ASAP
4. RSC New web page: all countries to send RELEVANT links to Mr. Tachikawa for consideration for inclusion. Each country to nominate country contact (NZ M.S., China Yan Huang, Indonesia DA Sutapa, Malaysia Hezlandi, Mongolia Gombo Davaa, Australia Trevor Daniell)	All Countries	ASAP

ANNEX 1

**PARTICIPANTS, 20TH MEETING OF THE IHP
REGIONAL STEERING COMMITTEE FOR
SOUTHEAST ASIA AND THE PACIFIC**

ANNEX 1
PARTICIPANTS, 15TH MEETING ON THE IHP
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ANNEX 1

PARTICIPANTS, 20TH MEETING OF THE IHP REGIONAL STEERING COMMITTEE FOR SOUTHEAST ASIA AND THE PACIFIC

ANNEX 1
PARTICIPANTS, 15TH MEETING ON THE IHP
REGIONAL STEERING COMMITTEE FOR
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ANNEX 2

AGENDA, 20TH MEETING OF THE IHP REGIONAL STEERING COMMITTEE FOR SOUTHEAST ASIA AND THE PACIFIC

20TH MEETING OF THE IHP REGIONAL STEERING COMMITTEE FOR SOUTHEAST ASIA AND THE PACIFIC

AGENDA

**Langkawi, Malaysia
8th and 9th November 2012,**

- 1) Opening (9.00 am) (Trevor Daniell, RSC Chairperson)
- 2) Adoption of the Agenda
- 3) Election of Rapporteurs
- 4) Secretariat reports (Jakarta, G. Arduino)
- 5) Report from the 20th IHP Intergovernmental Council, June 2012, Past -Chair (S. Lee) (members Australia, Japan, Malaysia, Mongolia, R of Korea) except Draft IHP –VIII Strategy program.
- 6) Report on RSC future perspectives mapping (G. Arduino)
- 7) Report on 6th World Water Forum, Marseille, 12-17 March 2012 (T. Daniell)
- 8) The status of IHP-VIII Strategic Plan (S. Lee)
- 9) Need detailed discussion how we go forward as RSC current programs (APFRIEND) and projects fit into these themes.
- 10) RSC future projects mapped against IHP-VIII (countries will have 5-10 minutes each).
- 11) Discussion to determine the emphasis in AP region for the implementation of the VIII phase strategy whether it be on river basin or water resources management (Y.Huang)
- 12) Country Reports (4 minutes max), discussion
- 13) Development of Centres under the auspices of UNESCO (International Center for Water Security and Sustainable Management I-CWSSM, Rep.of Korea)
- 14) Report from the Asia-Pacific FRIEND (Trevor Daniell)
- 15) Flood Forecasting and Warning System assessment project (SEAP) (Dr. Rashid/G. Arduino)
- 16) Future of the Catalogue of Rivers, (H. Chikamori)
- 17) Communication strategies for RSC-New Web Page (Y. Tachikawa)
- 18) IHP Training Courses in the Region (G. Arduino)
- 19) Groundwater Governance, Regional Consultation for Asia and Pacific region
- 20) International Year of Water Cooperation 2013 (Countries to Participate) (G. Arduino, T. Daniell)
- 21) Discussion on RSC input to 7th WWF in Korea in 2015
- 22) Report on IHP-DRH Workshop (K. Takara/G. Arduino)
- 23) Organization of the 21st RSC Meeting in Korea November 2013
- 24) Reports from UNESCO Category II Centres (HTC, ICHARM, IRTCES, APCE, I-CWSSM, RCUWM)
- 25) Report on 2nd International Conference on Water Resources (ICWR2012) on “Sharing Knowledge of Issues in Water Resources Management to Face the Future” (Malaysia)
- 26) 7th Global Friend 2014, Hanoi (T. Daniell, G. Arduino)
- 27) Organization of the 22nd RSC Meeting in 2014
- 28) 13th International Conference on Urban Drainage, Sarawak, Malaysian Borneo, September 2014 (Dr. Rashid)
- 29) Election of the RSC Secretary
- 30) Any other issues
- 31) Action Items
- 32) Closing of the Meeting

ANNEX 3

**SECRETARIAT REPORT
BY
UNESCO JAKARTA OFFICE**

**20TH IHP REGIONAL STEERING COMMITTEE MEETING
FOR SOUTHEAST ASIA AND THE PACIFIC**

Langkawi, Malaysia, 8-9 November 2012

UNESCO OFFICE, JAKARTA

Secretariat Report

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33. ACTIVITIES CARRIED OUT SINCE THE LAST REGIONAL STEERING COMMITTEE MEETING

1.1 FOLLOW-UP TO THE 19TH IHP-RSC MEETING

A number of actions to be followed-up were identified during the 19th RSC meeting (UNESCO Office, Jakarta, 2011). Here below is a brief report on the current status:

1. *All National Committees to again submit a recommendation to the IHP Secretariat and Chair of the IGC recommending that both HELP and FRIEND remain as cross cutting programs.*
RSC Secretariat is not aware whether this was done
2. *All member states to respond on IHP VIII Strategic plan by January 10 to Mr Lee with a copy to Mr Arduino.*
N.A.
3. *Thailand delegate on their Small Watershed work with the Thailand delegate to get back to Mr Shrivastava with more information*
N.A.
4. *Publication of Flood Design Report to proceed*
The Flood Design Report has been printed by UNESCO Office Jakarta in May 2012 and is available in UNESCO Jakarta website for downloads.
<http://www.ihpnagoyaforum.org/download/index.php?dir=Jakarta%20website/&file=COMPILATION%20APFRIEND%202011.pdf>
5. *Each country provide a written statement on the Future Perspectives of the RSC*
Written statements on the Future Perspectives of the RSC were provided by 10 countries and presented during the Japan FIT Annual Review Meeting (Annex 1 & 2 of this report).
6. *Member countries were asked to contribute and select a focal point for their individual countries*
This request concerns the Disaster Reduction Hyperbase. So far no country has indicated names of focal points.
7. *All future country reports to have one paragraph of no more than 200 words as an abstract highlighting the country's activities as main points*
This was requested again to countries in a message sent on 19 October 2012.

1.2 WORKSHOPS, TRAINING COURSES, SYMPOSIA

1.2.1 The 21st IHP Training Course on "Introduction to River Basin Environment Assessment under Climate Change" in Kyoto, Japan, from 28 November to 9 December 2011

The 21st IHP Training Course on "Introduction to River Basin Environment Assessment under Climate Change" was organized by the Institute of Hydrospheric-Atmospheric Sciences of Nagoya University in collaboration with the Disaster Prevention Research Institute (Kyoto University), Global Center for Education and Research on Human Security Engineering for Asian Megacities (Kyoto University), and Global Center for Education and Research on Sustainability Science for Resilient Society Adaptable to Extreme Weather Conditions (Kyoto University). The training

course was held in Kyoto, Japan, from 28 November to 9 December and attended by 16 participants (8 of which supported by UNESCO Office, Jakarta, through the Japanese FIT) and 77 online through different broadcasting systems (SOI, NRENT, INHERENT, Point to Point connctions).

The course included 8 lectures in English, field tour, and practice sessions. All lectures were held at Kyoto University, while technical visit and field tour were held in Uji River, Lake Biwa Canal Museum and Kamo River.

The 21st IHP training course focused on three major objectives: (1) to acquire the latest knowledge on hydrological and environmental assessment under climate changes at river basin scale in the Asia-Pacific region, (2) to make practice for selected topics on successful simulations to make use of the river basin environment assessment, and (3) to discuss the possibility to apply the river basin environment assessment into some hydrological and environmental managements.

1.2.2 Integrated Flood Analysis System (IFAS) Training Course in Hanoi, Vietnam, from 20 to 22 June 2012

As a continuation of comprehensive study on Flood Forecasting and Warning System (FFWS), one “in country training courses” on the Integrated Flood Analysis System (IFAS) and FFWS data interpretation was organized in collaboration with ICHARM.

IFAS is a concise flood-runoff analysis system developed by ICHARM as a toolkit for more effective and efficient flood forecasting in developing countries. This system is called "Integrated Flood Analysis System (IFAS)" and provides interfaces to input not only satellite-based but ground-based rainfall data, as well as GIS functions to create river channel network and to estimate parameters of a default runoff analysis engine and interfaces to display output results. ICHARM aims at conducting training seminars for users to utilize IFAS and to do a co-operative study with local governments, organizations, etc. ICHARM and UNESCO hope that IFAS will be widely used as a basic tool for preparing flood forecasting and warning systems in insufficiently gauged basins.

The first training course, sponsored by the Japanese Funds in Trust and UNESCO was organized in collaboration with the Vietnam Institute of Meteorology, Hydrology and Environment (IMHEN) in Hanoi, Vietnam, from 20 to 22 June 2012. The training course gathered up to 36 participants from government institutions, research organizations and universities involved in flood forecasting in Vietnam.

1.2.3 SWITCH-in-Asia Learning Alliance Meetings

The idea of Learning Alliance (LA) has emerged in response to the widespread failure of much conventional research to have significant impact due to the slow pace of its diffusion. The LA concept also emerged with the growing awareness that the activities of researchers are just one of the necessary components to promote innovation in terms of water management.

SWITCH- in-Asia (Sustainable Water Management in the cities of the future) aims to foster such alliances to facilitate integration and the scaling-up of innovation in water management in the Asia and Southeast Asia regions.

These Learning Alliances can be represented by sets of connected stakeholder platforms. Their structure and activities will be designed to optimize relationships, breaking down barriers to both horizontal (i.e. across platforms), and vertical (i.e. between platforms) learning. Alliances members work cooperatively and share a common desire to address underlying problems in the field of water management. They will also share or develop common approaches – visions, strategies and tools – on how this can be achieved.

Two Learning Alliances meeting were organized in Hanoi, Vietnam on 28 March 2012 and in Jakarta, Indonesia on 28 June 2012. In Vietnam, the meeting was held in collaboration with UNESCO Office in Hanoi and the Vietnamese Academy of Science and Technology (SWITCH-in-Asia focal point for Vietnam), and was attended by 14 participants. In Indonesia, the meeting was held in UNESCO Office in Jakarta and was attended by 7 participants.

1.3 TRAVEL GRANTS

UNESCO Office, Jakarta, provided several travel grants to regional scientists in the framework of the IHP Programme, to attend international events. In particular:

- 9 participants from 9 countries were supported to attend the “UNESCO-IHP 19th Regional Steering Committee Meeting for Southeast Asia and the Pacific” in conjunction with the International Symposium on Extreme Events “Meteorological, Hydrological and Tsunami Disasters: Social Adaptation and Future” (EXTREME2011) and IHP- Disaster Reduction Hyperbase Workshop, held from 24 to 28 October 2011, in Kyoto, Japan.
- 8 participants were supported by UNESCO Jakarta through Japanese FIT to attend the 21st IHP Training Course on “Introduction to River Basin Environment Assessment under Climate Change” in Kyoto, Japan, from 28 November to 9 December 2011
- Supported the Chairperson of the IHP Intergovernmental Council to attend the Science Commission of the UNESCO’s General Conference which was held in Paris, France, from 1 to 4 November 2011 to review the progress of IHP-VIII, evaluation of IHP-VI and the preparation for the forthcoming IGC.

1.4 CATALOGUE OF RIVERS FOR SEAP

The sixth volume of the Catalogue of Rivers for Southeast Asia and the Pacific was published in March 2012. This volume contains seven rivers from seven countries with the inclusion of first time contributions from Korea (D.P.R.), Mongolia and Myanmar, and brings the total number of rivers catalogued in the region, including those in volumes I to VI, to 121 from 16 countries. The Catalogue was edited by Mr Hidekata Chikamori, Mr Liu Heng and Mr Trevor Daniell.

1.5 ASIAN PACIFIC FLOW REGIMES FROM INTERNATIONAL AND EXPERIMENTAL NETWORK DATA (AP FRIEND)

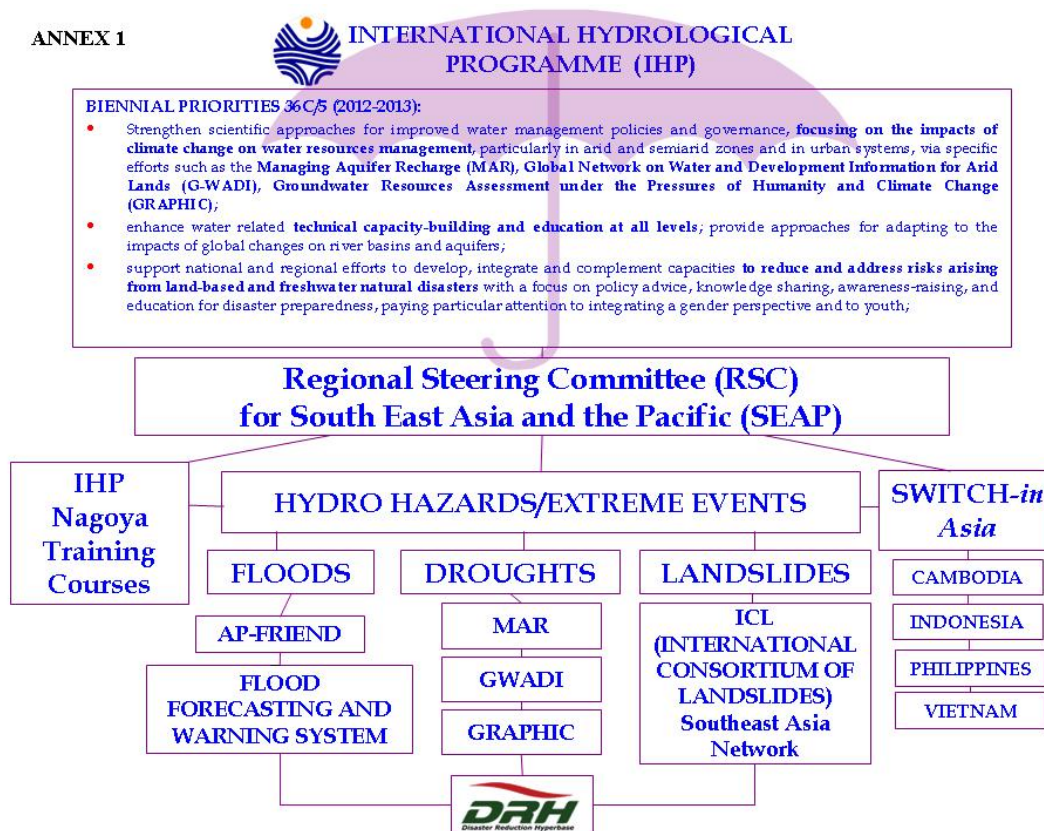
As follow up of the “UNESCO-IHP 19th Regional Steering Committee Meeting for Southeast Asia and the Pacific” 2011, the report **Flood Design Hydrograph information supplied for the Asia Pacific Region** was printed (limited copies) in May 2012 and available in UNESCO Jakarta website.

<http://www.ihpnagoyaforum.org/download/index.php?dir=Jakarta%20website/&file=COMPILATION%20APFRIEND%202011.pdf>

1.6 ACTIVITIES WITHIN UNESCO JAKARTA

Within the framework of the International Hydrological Programme - Water Interoperability Networks for Global Change Adaptation “Phase 4 of 555RAS2008”, UNESCO Office Jakarta has proposed four major activities aiming to strengthen, in the ASPAC Region, scientific approaches for improved water resources management policies and governance with reference to hydrological hazards and extreme events and enhanced water related technical capacity-building. The following

scheme addressed the interrelation of activities under the project and its contribution to the biennial priorities (2012-2013) of the International Hydrological programme.



1.6.1 IHP Nagoya Training Courses

See chapter 1.2.1

1.6.2 Hydro Hazards/ Extreme Events

Floods

As a continuation of a comprehensive study on Flood Forecasting and Warning System (FFWS) conducted in ten countries (Australia, Cambodia, China, Indonesia, Lao P.D.R, Malaysia, Philippines, Rep. of Korea, Thailand and Vietnam), the project together with ICHARM, will focus on the organisation of country training courses on the Integrated Flood Analysis System (IFAS) and FFWS data interpretation and implementation in the region, draw the related conclusion and propose to government related agencies, through IHP National Committees, possible management guidelines to deal with FFWS. The activity is intended to focus on sharing knowledge/experience and improve capacity building by enhancing UNESCO-ICARM collaboration through the training courses on Integrated Flood Analysis System.

The first IFAS training course was organized in Hanoi, Vietnam on 20-22 June 2012 (please see chapter 1.2.2 for details) and are planned to be organized in Indonesia in January 2013. Two training courses will be organized in 2013 in two SEAP countries.

Droughts

Managing Aquifer Recharge

As a continuation to “Adapting to climate change: Solutions for monitoring saltwater intrusion and managed aquifer recharge in areas affected by sea level rise in Ninh Thuan province”, UNESCO Jakarta supported 2 monitoring investigation campaigns (during 2012), i.e. to obtain data from installed equipments in the wells and water points in the area, and hydrological campaigns for water sampling.

A seminar on “Presentation of the preliminary water resources management database and general recommendations” will be organized in late November in the Department of Natural Resources of the Ninh Thuan Province.

Global Network for Water and Information in Arid Zones (G-WADI)

In collaboration with the UNESCO Office in Beijing and in Tehran, the UNESCO Office in Jakarta will support activities in two Asian G-WADI Pilot Basins, namely Heihe River Basin in China and Kashafroud River Basin in Iran.

Taking stock of the data and resources already available within these two basins through the Asian G-WADI Network, knowledge and experience of the Asian G-WADI countries as well as the Global G-WADI Network will be shared with relevant authorities of the Heihe and Kashafroud Basins in order to develop the integrated basin-wide model which will ultimately result, in principal, towards an adaptation plan for optimized use of water. Also the International Flood Initiative (IFI) as well as the International Drought Initiative (IDI) established under UNESCO IHP shall be consulted for best expertise and experiences to increase capacity of decision/policy makers for managing water resources in arid regions under climatic variability and increased hydrological extremes. This also contributes to Priority Area III of UNDAF Iran Document (Environmentally Sustainable Development), Outcome 4 which explicitly focuses on UN-wide effort toward formulation and implementation of climate change mitigation and adaptation plans and projects.

International Consortium of Landslides

Another critical disaster in South-east Asia countries is represented by landslides. The larger landslide risks in the SEA countries are due to a number of factors. The most important one is the increased vulnerability of population living in prone areas, in terms livelihood of inhabitants, its buildings and its land use, lack of resources for planning and mitigation actions and lack of knowledge to make correct and timely decisions. Even if such technical information is available, it may be dispersed through different sources without an operational procedure for sharing this information and take appropriate decision at correct time. Landslide professionals have felt the need to have a forum for discussions and development of long term strategy for landslide DRR in South East Asia. In the same way the same forum of professionals can serve as a venue for sharing experiences and challenges as well to present research contributions needed for implementation of cost effective landslide mitigation solutions. The fundamental basis for the establishment of the network is to highlight the need for a gradual change in attitude towards proactive approaches of preventive measures to reduce losses. The members of the network understand the need for continuity for actions as creating trust and changing attitudes cannot happen overnight. Attitude change is the primary challenge in order for behavioural change to occur subsequently. The network partners will take initiatives to share the knowledge and experience in various aspects of landslide DRR such as landslide investigations, instrumentation and monitoring, structural and non-structural mitigation of areas identified to be landslide prone, landslide early warning etc. Especially this is a very important aspect for reducing the socio-economic impacts for human settlements threatened by landslides in terms of reducing the casualties and destructions due to potential events in future.

Since the beginning of 2012 UNESCO Jakarta is working with ICL and SEA countries for the establishment of a Southeast Asian Network for Landslide Risk Management. ICL will convey a meeting late November in Paris and the SEA network proposal will be presented.

Disaster Reduction Hyperbase (DRH)

All activities in the third component i.e. MAR, GWADI, FFWS, and Landslides network are coupled with the Disaster Reduction Hyperbase (DRH) project, carried out in collaboration with the Disaster Prevention Research Institute (DPRI), Kyoto University.

DRH will be used as a web based dissemination platform of the above activities results in order to provide an effective information facility for appropriate disaster reduction technology and knowledge among stakeholders. It may include an inter comparison of all systems studied and a recommendation will be made for a suitable pilot projects for the region that will enhance the present approach (Sustainability Science). The results and further implementations will be included in one of the web based DRH Templates, included in the DRH Web to be easily consulted. A procedure will be put in place in order to make the above web site known and accessible by all different kind of stakeholders.

1.6.3 SWITCH-in-Asia

SWITCH-in-Asia is a visionary programme for the Asia and Pacific region that aims at tackling the challenges brought by global change on the management of water resources in Asian Cities. In order to meet these challenges, SWITCH-in-Asia calls for a paradigm shift in Urban Water Management (UWM).

As explained in chapter 1.2.3, within the framework of this activity, two Learning Alliances were organized in Hanoi and Jakarta in 2012.

Within the framework of SWITCH-in-Asia Vietnamese component, a preliminary hydrological and water quality assessment of the lake Lang Thuong in Ha Noi is been carried out to achieve 2 main objectives, i.e. (1) to understand the lake hydrodynamics in particular the relationship between groundwater, surface water and storm water and (2) to determine the water quality of surface and ground water. Awareness raising on appropriate environmental behavior (waste management and sanitation) will be provided to the communities through meetings and focused training. The results of the preliminary assessment will be discussed at the 2nd Hanoi Learning Alliance meeting which will be organized at the Vietnamese Academy of Sciences and Technology in late November 2012.

Within the framework of Indonesian component of SWITCH-in-Asia, one Learning Alliances meeting will be organized on 13 November 2012 in Bandung, Indonesia.

1.6.4 Rainfall station in UNESCO Jakarta Office

Since February 2007 a simple rainfall station (manual pluviometer) is operational in UNESCO Jakarta Office. The parameters acquired by the station are:

- P in mm
- T in °C
- EC in µS/cm
- TSD in mg/l
- pH

Besides the above parameters obtained on daily events, isotopes analyses for monthly samples are available for from February 2007 to October 2012 and daily samples are available from October 2007 to October 2012.

This station is also operating as a contribution to the HARIMAU Project (Hydrometeorological ARray for ISV-Monsoon AUtomonitoring) by Japan EOS Promotion Program (JEPP) and implemented by JAMSTEC (Japan Agency for Marine-Earth Science and Technology), and Indonesian partners BPPT (Agency for the Assessment and Application of Technology), BMG (Agency for Meteorology and Geophysics) and LAPAN (National Institute of Aeronautics and space).

From September 2007 daily events are collected for JAMSTEC which will perform stable isotopes (18-O and 2-H) analyses on rain water.

In 2012, UNESCO Office, Jakarta continued the activity and collected both single and monthly events from January until now.

Since 2007 590 rainfall events were characterised for all the above parameters.

1.7 REVIEW AND EVALUATION MEETING ON IHP ACTIVITIES SUPPORTED BY THE JAPANESE FUND IN TRUST (FIT)

An evaluation report on the activities implemented within the framework of the IHP Programme and supported by the Japanese FIT during the period 2011-2012, was presented by UNESCO Office, Jakarta, at the meeting held in UNESCO Office, Jakarta, from 21-22 May 2012. The report describes the activities carried out in the Asia Pacific Region within three main areas:

- the Regional Steering Committee (RSC) of IHP for Southeast Asia and the Pacific;
- the IHP Training Courses, annually organised by the Nagoya University in Japan; and
- the Flood Forecasting and Warning System (including the DRH Project)

A proposal was submitted to implement activities summarised in the scheme of paragraph 1.6 above, in the period 2012-2014.

1.8 IHP NAGOYA TRAINING COURSES DATABASES

21 IHP Nagoya Training Courses have been conducted since 1991 and were attended by 234 participants from 28 countries representing various research institutions and governmental organizations.

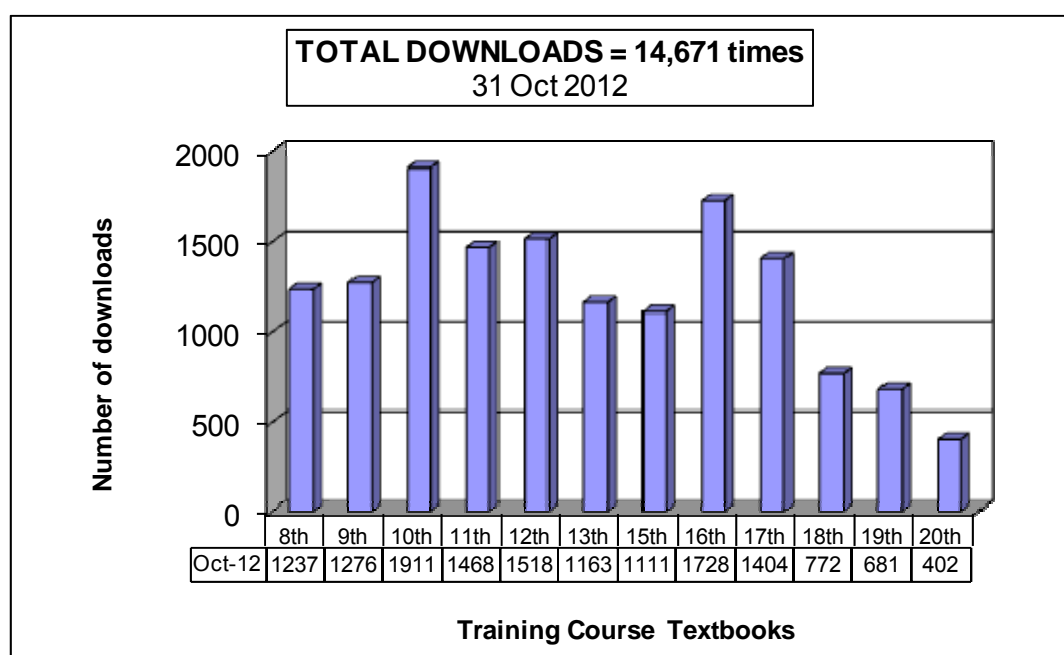
In order to improve the accountability and visibility of the IHP Nagoya Training Courses and to evaluate the potential impact these courses had on participants' research and career the Hydrology Unit of UNESCO Office, Jakarta, has set up a database containing the following information of the training course participants: up-to-date contact details, scientific and professional background, and feedback on the training course attended. This information was obtained by means of an online feedback form to be filled in by training course participants

Evaluation of the feedback form showed that 50 % of the participants are affiliated to a university, 46% to governmental organizations or government related research institutes and around 4 % come from other institutions or organizations such as from the private sector.

IHP Nagoya Forum

In June 2007 in collaboration with the Nagoya University UNESCO Office, Jakarta has started the design of the IHP Nagoya Training courses website (www.ihpnagoyaforum.org), which was launched in July 2008. The website provides:

- information on training courses and up-coming events,
- training course materials for download (textbooks of past training courses),
- a discussion forum in which participants can exchange ideas, expertise, etc. and
- guidelines for preparing the participants' report after having attended the training course,
- photo gallery of past training courses.



Announcement of the training course has been placed on the website of the UNESCO IHP Nagoya Training Courses. UNESCO Office, Jakarta, sent the website address to IHP National Committees approximately 4 months before the course.

Electronic textbooks will be uploaded to the website before the course, and the presentation files of the lecture will be uploaded immediately after the lecture. Those who are interested in the training course can raise questions with contents of the textbook during a certain period (e.g., for a half year) through an interactive forum on the website (IHP Nagoya Forum) after the course without attending the training course. This improves the training course to get wider attention in the world, to be more efficient and interactive for people who cannot attend, and to enhance the capacity building method of the course which in this way enables anybody to learn the course through internet. Participant list, participant report, and question and answer will be uploaded to the website for exchanging mutual understanding (provided participants agreement).

The use of such implementation methods (website, distance e-learning) represents therefore a wider expansion and dissemination of the training courses, enabling wider attendance from many parts of the world.

34. PUBLICATIONS SINCE OCTOBER 2011

Report on “Flood Design Hydrograph information supplied for the Asia Pacific Region”, IHP-VII – Technical documents in Hydrology No. 5, UNESCO Office, Jakarta, 2011

Proceedings of the International Symposium on Extreme Events “Meteorological, Hydrological and Tsunami Disasters: Social Adaptation and Future” (EXTREME2011), IHP-VII – Technical documents in Hydrology No. 6, UNESCO Office, Jakarta, 2011

Final Report of the UNESCO-IHP 19th Regional Steering Committee Meeting for Southeast Asia and the Pacific, 27 to 28 October 2011, UNESCO Office, Jakarta, 2011

Brochure on “Managing Aquifer Recharge in Binh Thuan Province, Vietnam: Implemented Activities in the period 2004 – 2010”, UNESCO Office, Jakarta, 2011

Catalogue of Rivers for Southeast Asia and the Pacific Volume VI, UNESCO Office, Jakarta, 2012

35. CONTACT REFERENCES

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Annex 1:

Country comments on the future perspectives of RSC (2011)

1) AUSTRALIA

Australian comments on Future Perspectives of the RSC

During the meeting a number of points were made which should become part of the future agenda for the Regional Steering Committee:

- From the APFRIEND report on flood design it was highlighted that there was indeed a large disparity between the individual countries in terms of flood design, flood forecasting, data collection and flood management. **It is essential that in country workshops be run on the basics of flood design and modeling.**
- It was mentioned that for the water management perspectives it is essential to have good data collection programmes but equally as important is for that data to be managed and analysed well. From current observations of what countries are doing the basics of hydrological analysis are still lacking in many countries in the region. This again should become a program **to investigate what is lacking in the region and then run in country workshops to improve the basics of the local data collectors and analysts.**
- One of the problems that was highlighted on my return to Australia is that the ordinary bread and butter issues of hydrology (coping with extremes both droughts and floods, adequate monitoring and evaluation, parsimonious modelling, the interactions between ground and surface waters, rationally-based policy and management) have been subverted by the preoccupation with predicting the hydrological impacts of climate change across the region. It is not that climate change variations are not important, but it is even more important to know what you have presently designed for or not designed for. When individuals do not have adequate supplies now for irrigation and water supply surely detailed investigations of the water resources and extremes is warranted and establishment of guidelines for these aspects should be a number one priority.

Australia mentioned to a number of delegates that it was indeed time for the RSC to undertake an analysis of what it had achieved and what it can achieve in the future. This could be done through a SWOT analysis (Strengths, Weaknesses, Opportunities, Threats) of itself and the contributing countries. Perhaps this should be undertaken to clearly align a future agenda for the RSC.

The future of the RSC needs to ensure the present interaction of countries to know what is being undertaken but more importantly to take upon itself to organize initiatives so that the inadequacies of individual countries in basic hydrological methods and data collection ideas are carried out.

2) CHINA

Discussion about how should MEXT continue supporting IHP AP region activities
China

1. Background

the Japanese Ministry of Education, Culture, Sports, Science and Technology, MEXT, since 1993 has been the major IHP sponsor in the Asia Pacific region allowing the organization of the RSC annual meetings (since 1993) and related international conferences / symposia, as well as the organization of the IHP Nagoya training courses. Funds were made available to cover organization logistics, travels for regional country delegates, field trips, proceedings and training course manuals, among other. The RSC overall organization passed from a full sponsorship of all countries to the current situation where approximately 40% of the countries can self-support the participation of their delegates

The coming activities that will be sponsored by MEXT:

- the 19th IHP RSC for ASPAC, in Kyoto on 27 -28 October
- the 21st IHP Nagoya training course, in Kyoto from 28 November to 9 December 2011.

2. Achievements of RSC

RSC is of excellent significance for the development of hydrology of its member countries. During past nearly 2 decades, the IHP Regional Steering Committee (RSC) has achieved the following achievements along the years. The establishment of the IHP Regional Steering Committee (RSC) was a major achievement that contributed to the success of the IHP in the region. The RSC aimed at

- the exchange of information about national activities,
- the development of regional initiatives (APFRIEND, the Catalogue of Rivers for Southeast Asia and the Pacific),
- the organization of training courses, workshops, and seminars in collaboration with all the member states.

The first meeting was held in 1993 in Manila, the Philippines and subsequent RSC meetings with associated International Symposia/conferences have been held in Cambodia (1994), Japan (1995), Indonesia (1996), Thailand (1997), Republic of Korea (1998), China (1999), New Zealand (2000) Vietnam (2001), Malaysia (2002), Fiji (2003), Australia (Adelaide 2004), Indonesia (Bali 2005), Thailand (Bangkok 2006), Philippines (Manila 2007), Mongolia (Ulaanbaatar 2008), China (Wuhan 2009) and Vietnam (Hanoi 2010).

The RSC has reached important results and achievements so far, in particular:

- 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 is currently being assembled and will be available in the web.
- It has developed a regional network such as APFRIEND, which organised several workshops, symposia and published different reports
- It has integrated the participation of other countries in the region, such the Pacific Island countries, Mongolia, Myanmar and Timor Leste (1st participation in the 19th RSC meeting, October 2011).

3. Sustainability of RSC

3.1 Needs from participating countries in respect to the RSC

3.1.1 What is expected from the RSC?

RSC has been playing important role in the hydrological development in the AP region. As the platform of sharing knowledge and experience, RSC is expected to keep providing technical platform for scientists and hydrologists in this region to share their knowledge and experiences/technology. It is also expected to involve professionals from different background, not only from research institutions but also from field so that the sharing can be extend to solve more practical problem. Not only to provide a platform for sharing, RSC, supposed the committee member are highly qualified hydrologists or professionals, should as well provide guidance to future development of hydrology for the member countries.

3.1.2 What a country would learn from the RSC?

To learn and share the state-of-the-art of hydrology development technology in this region and global-wide through symposium / conference / workshop /training courses.

3.2 Future perspectives of RSC

We hope the RSC will continue active so that we can be benefit from the knowledge/experiences sharing.

To sustain such regional platform, it however might be more sustainable to establish a sharing sponsorship, e.g. wealthy member country contribute a share of finance to set up a joint treasure/finance for future activities when it is necessary.

3) INDONESIA

View of Indonesian IHP-UNESCO National Committee

IHP-UNESCO REGIONAL STEERING COMMITTEE FOR ASIA PACIFIC: the past, present and future

The Indonesian IHP-UNESCO National Committee appreciates and acknowledges the achievements, and the key and instrumental roles of IHP-UNESCO RSC for AsPac as being very beneficial, supportive and complementary with respect to member states as well as IHP-UNESCO itself. It has proven to be a prolific forum for:

1. Effectively managing, promoting and fostering the Asia Pacific regional initiatives and cooperation in hydrology and related issues.
2. Leveraging the regional capacity building through trainings, workshops and symposia.
3. Producing and exchanging scientific findings and information from, to and beyond the members.
4. Nurturing a sustainable network of key players by maintaining the personal friendship and collegial relation among RSC members.

What we presently need from the IHP-UNESCO RSC AsPac are the followings:

1. Evaluate the in-country post-mortem information dissemination and benefit of the trainings, workshops and publication of RSC products.
2. Continue and maintain the present state of activities, productivity and frequency in:
 - a. Scientific and practical knowledge sharing
 - b. Regional database
 - c. Trainings, workshops, etc.
3. Right size the future program by modifying, trimming and expanding the scopes and issues when necessary (see below).

Despite the excellent achievement of the IHP-UNESCO RSC for AsPac, the future challenges it has to address and the sustainability issues are:

1. The visibility of RSC/IHP-UNESCO to the UNESCO's sister programmes like IOC, MAB, MOST as well as to other stakeholders. It needs to go "beyond the wall" of RSC/IHP-UNESCO.
2. Program co-ownership, co-sharing of the program
3. Issue driven program: more regionally significant and locally actual programming
4. Sustainable funding

The followings are just some highlights of what the IHP-UNESCO RSC AsPac may consider to be done in the future:

1. Empower, restructure and widen the scope of the secretariat, including the possibility of executing demand assessment and some relevant studies relevant to IHP-UNESCO and RSC in particular
2. Seek complementary and alternative funding sources:
 - a. Membership fees: need to be approved by member states and some critical consideration may apply.
 - b. Explore the link program wise and issues to the available global funds and network for current issues like climate change, environment, REDD, floods and droughts, adaptation funds, disaster and poverty and adaptation.
3. Restructure the RSC Membership from within and outside the region by inviting external advisors and some ad hoc committees
4. Program re-design, ownership and execution and be reflected in:
 - a. The projects.
 - b. Institutions under which RSC has had and will be playing a great role in their existence.
 - c. The regular meetings as well as the related and relevant technical and scientific events.

5. Diversifying and widening the networks and program, by among others considering the:
 - a. More interdisciplinary approach.
 - b. Spatial and regionally critical and commonly shared issues like deltas, megacities, mountains, etc.

Jakarta, October 22, 2011

Indonesian National Committee for IHP-UNESCO Secretariat
Research Center for Limnology LIPI

4) LAO P.D.R

Comment and Request from Lao PDR to IHP-RSC

Since the establishment of the IHP Regional Steering Committee (RSC) from the 1th meeting to now, it has many achievement and success of the IHP in the region such as:

- Exchange the information between member states on national activities.
 - Develop the regional initiatives of APFRIEND, the Catalogue of River for Southeast Asia and the Pacific.
 - Organized many training courses, workshops and seminars in collaboration with all member state.
- I. Refer to the above achievement of IHP Regional Steering Committee (RSC), Lao PDR involved and contributed all activities related to UNESCO-IHP such as:
- Regularly attend the annual IHP Regional Steering Committee for Southeast Asia and the Pacific.
 - Several Lao participant attended training courses, workshops and seminars which organized by UNESCO-IHP.
 - Lao PDR contributed the materials of 12 river basins for Catalogue River in 4 volumes.
 - Lao PDR contributed several scientific papers which are presented in the international symposium.
- II. Future perspective:
- Lao PDR still request to RSC to support fund to the participation of annual meeting, training course in the future to improve the knowledge and experience.

5) MONGOLIA

Mongolian statement

Behalf Mongolian National Committee for the UNESCO-IHP we thank MEXT, UNESCO-Jakarta office for giving opportunity attending RSC meetings and programs. We will actively participate RSC meeting and cross-sectoral programs and training courses.

We fully support feedback and auditing past development of RSC activity. Year by year our IHP activity increasing and every year we reporting implementation IHP phases.

Why we need to participate regional programs and frameworks:

- Mongolia is developing
- Mongolia is part of Northeast Asia
- Mongolia is Semi-arid and landlocked country
- Mongolia is water less country
- Less developed hydrology & water science

We would like more learn and share knowledge as following:

1. New Water education methodology, tools and techniques
2. Water saving technology and water design
3. Urban water management and development economic efficient water infrastructure
4. Climate change and Groundwater issues

RSC input in the development hydrology in arid zones most important. Mongolian IHP Committee would like develop not only regional and subregional cooperation we think closer cooperation in bilateral level is useful learn more developed counties.

Financial support important for Mongolian NC- IHP not only attending RGS meeting and improving capacity in national water sector.

Truly,
Prof. Basandorj
Chairperson national Committee for the UNESCO-IHP, Mongolia

6) NEW ZEALAND

New Zealand perspective: Dennis Jamieson, Chair NZ IHP

At the above meeting there was discussion about the benefits of the long term support (20 years) provided by the Government of Japan through the Ministry of Education, Culture, Sports, Science & Technology (MEXT), through the mechanism of Japan Funds In Trust (JFIT), to the RSC. The following notes have been prepared from a NZ perspective including experiences in working with colleagues in Hydrology around the Asia-Pacific Region and in particular the small Pacific States.

1. The RSC has a unique and highly valued coordinating role across the Asia-Pacific Region.
 - It works across diverse countries ranging in scale from China to small Pacific states
 - It focuses on key unifying issues in hydrology and flood hazards and raising general standards across a wide front.
 - These achievements need to be seen in the context of numerous national and donor programmes in water and water related hazards independent of UNESCO, which total many hundreds of millions of USD per year. Often these programs result in little or no long term benefit. The coordination of objectives and work methods of these programmes is increasing in importance as water issues become more critical with land use intensification and climate change effects.
2. Long term duration (20 years) is one indication of the on-going need for RSC activities.
 - There are examples of variable commitment and policy/practices in many countries.
 - RSC provides a “neutral” forum for countries that share rivers and aquifers
 - Implicitly addresses Millennium Development Goals and other high level UNESCO/UN objectives.
3. Strategy for RSC
 - The following points emerged from discussions at the meeting (This is an NZ perspective to be discussed within the RSC):
 - The role of the RSC in Hydrology: Unifying and improving approaches to critical issues in hydrology across diverse countries
 - Objective to improve practices for hydrology information creation and application across a wide front (Hazards, water management, climate change, land use intensification)
 - Define clear statements around needs for some specific issues that RSC has identified and is actively pursuing:
 - o Data collection (Noted in Pacific Countries)
 - o Database maintenance(Noted in Pacific Countries)
 - o Data access (A critical issue of increasing importance)
 - o Design methods (Flood design, Eco Hydrology)
 - o Specification and application of flood forecasting methods
 - Work method is to guide and influence projects and programmes inside and outside of the UNESCO area. Examples are national and donor projects across water data collection, flood forecasting and hazard reduction.

The points noted above indicate the value of a long term, low intensity, and low cost approach successfully carried out through the UNESCO water science programme with the support of JFIT. The RSC has created recognition of key issues (see list in 3 above) that provides a guide for countries seeking to improve their performance in the water sector and for water related hazards. This has been followed up and supported with practical, tangible and applied activities through the Asia Pacific Flow Regimes in Experimental Network Design (APFRIEND) project such as the Catalogue of Rivers (providing access to data on selected Asia-Pacific Rivers), production of material on rainfall Intensity, Duration Frequency (IDF - a key input to flood design), a just completed compilation of flood design hydrograph methods and a review of flood forecasting methods in selected countries.

It is an example of the benefits of the UNESCO IHP approach combined with long term support from JFIT that complements a wide range of short term projects run by many other agencies that are external to the UNESCO system.

7) PAPUA NEW GUINEA

International Hydrological Program Regional Steering Committee Future

- PNG has been an active member of IHP RSC since 1996.
- The IHP RSC has been the fore front of some of the regional initiatives and activities. The most prominent in my mind is the establishment of the Asia Pacific FRIEND among others. The AP FRIEND river catalogues is this region's outstanding product.
- Through IHP RSC the region has contributed to holding some prominent international positions such as in the IHP inter-government council and IAHS.
- Furthermore, the RSC has successfully administered the hydrology and other water related training courses predominantly held in Nagoya University and perhaps in other areas of the region. Others include establishment of regional training centres.
- Through the RSC, we have received literature and other publications from within and outside the region for our learning purposes and for other useful practical applications. This indeed has been provided without any cost to the government of Papua New Guinea.
- The network established through the RSC meetings, conferences and learning has greatly enabled us to share knowledge and information amongst some of the prominent scientists in the region, and furthermore enabled us to derive from their experiences to our benefit. This kind of learning assisted us, particularly from the developing countries in the region enhanced our personal capacities.
- For me personally, the Regional Steering Committee has created an atmosphere and environment that is conducive for scientists and non-scientists alike for the common good of the Asia Pacific region. And therefore this success should be owed to the outstanding financial support received from MEXT and others not mentioned here.
- And I might add, through the kind support received from the RSC the Papua New Guinea IHP National Committee was established from which we have meaningfully engaged ever since.
- In addition, because of these very positive attributes, it should be argued that continuous support should be given to the RSC to maintain it good work and strengthen areas and sectors that need support, and be with equal par or even better against other regions.
- Some areas that require strengthening include capacity building for the least developed areas in the Pacific and in Asia. This includes specific tailored training, information and knowledge management and provision of hardware support. I think MEXT can support and sustain RSC in strengthening this area given it experience and financial base.
- I also think support should be provided through RSC for small grant aids for specific countries apart from hosting RSC meeting, where there are no direct benefits. The small grants should either be in the form of ground based projects or policy development initiatives in other development sectors.
-
- Finally, withdrawing financial support provided by MEXT and to some extent UNESCO is seen to weakening the structure or the very fabric of RSC in the region, hence is contributing to its demise and eventually will lead to the death of Asia Pacific UNESCO's program on IHP.

Thank you very much.

8) REPUBLIC OF KOREA

A Statement on Future Perspectives of the IHP RSC in SEAP

Since the establishment of the IHP Regional Steering Committee(RSC) for Southeast Asia and the Pacific(SEAP) in 1993, the RSC has been accomplishing successfully its goals for the IHP activities in the region with a great deal of achievements and contributions to the member states.

The RSC aims at the exchange of information about national activities for the IHP and the development of regional initiatives such as APFRIEND 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 including Kyoto meeting in 2011.
- 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 is currently being assembled and will be available in the web.
- It has developed a regional network such as APFRIEND, which organised several workshops, symposia and published different reports.
- It has integrated the participation of other countries in the region, such the Pacific Island countries, Mongolia, Myanmar and Timor Leste (1st participation in the 19th RSC meeting, October 2011).

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 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.

In this sense, the RSC activities should be continued for the solution of regional water problems expecting more serious situation under the climate change with Japanese MEXT full sponsorship of all countries even though approximately 40% of the countries can self-support the participation of their delegates, and the global IHP community will continue their recognition and appreciation for the RSC's continuous regional IHP activities.

Sincerely yours,
Soontak Lee
Chairperson / President
UNESCO IHP Intergovernmental Council

9) THAILAND

Future Perspectives

Thailand appreciated RSC regional Steering Committee which has supported not only tool, new technology, knowledge, capacity building as well as financial support. Thai participants have increased their knowledge and awareness on both principle and practice to understand and improve skills during participating. The trainees who attend RSC training course will get benefit and advantage in application to their work. Also , it will improve our young researcher on hydrology which is very important for water management, Moreover, they will follow up to continue studying and research relation to hydrology as flood forecasting and mitigation management which always occur and will increase every year.

The overview Thailand needs and requests RSC should still support financial, tools, capacity building. For young hydrologist and young researcher in term of implement of joint study both in regional and national such as flood forecasting, flood management climate change, etc.

For the future perspectives of the RSC, member countries need to strengthen their own operation in all parts such as academic coordinate and operate in all parts in order to achieve a future sustainable. As known that the capability and potential of member country are difference, then some country has limitation which may make it difficult to perform.

This year Thailand has faced to severe flood including Bangkok too, due to prolong rainfall, tropical storm. Thailand pleased to be working and collaborate in RSC activities to achieve sustainable.

10) VIETNAM

From Vietnam side, we highly appreciate the IHP RSC activities and its contribution in international support for Hydrology science, Water resources management. It is an important forum for countries to exchange and share information, data, experiences, research results.

Vietnam continues contributing actively in all activities of IHP-RSC and wish expanding and enhancing the co-operation between UNESCO IHP and Vietnam Committee for IHP.

For the future perspectives, Vietnam expects to participate and continue getting support from IHP-RSC in:

- Water for sustainable cities; Water-related disasters management;
- Promoting and applying new technology and approach in Integrated Water Resources management;
- Assessment of impact of climate change on water resources and hydrological extreme events; Adaptation measures to Climate change;
- Monitoring and assessment of water transboundary;
- Developing River Basin Organization (RBO);
- Modernization of Hydro-Met Service;
- Transfer technology and training course in Hydrology and WR;

Annex 2:

Summary of Questionnaire Result from RSC meeting participants (2011)



UNESCO Jakarta:
Evaluation of Japanese Funds-in-Trust for Science Programme

Summary of Questionnaire Result of
RSC meeting participants

During the IHP-RSC meeting on October 27-28, 2011, UNESCO Office Jakarta carried out the questionnaire to assess the awareness of JFIT, the impact of the IHP trainings and the RSC meetings to 16 participants from each member country. The questionnaire consisted of 3 parts; the first part relates to respondents' background information, the second part (Part A) contains a series of statements about the visibility and awareness of the JFIT Science programme among ASPAC countries and the final part (Part B) is about how the JFIT Science programme contributed to the countries' capacity-building and science policy making.

The followings are the main results:

Part 1. Participants' background

1. Number of respondents: 16 (all are valid responses)

Australia (1), China (1), Indonesia (1), Japan (2), Lao P.D.R (1), Malaysia (1), Mongolia (1), Myanmar (1), New Zealand (1), Papua New Guinea (P.N.G) (1), Philippines (1), Rep. of Korea (1), Thailand (1), Timor Leste (1), and Vietnam (1).

2. The number of past participation in the RSC meetings

More than 16 times	7	
9 to 15 times	3	
2 to 8 times	4	
First time	2	Myanmar¹ and Timor Leste

3. Position

Senior country Manager:	3
Professor/ Researcher:	8
Sector Specialist in country:	1
Manager/ Director:	2
Technical Specialist:	2
Other (please specify):	0

4. Organization

UNESCO field office

UN	
NGO	
Government	8
Donor Government	
University/ Research Org.	8
Other	

Part 2. Visibility and Major Results

Part A: Awareness of JFIT for Science programme

Responses to Part A questions indicate that all representatives from 15 member countries recognized that both of IHP trainings and RSC meetings are financially supported by JFIT over 20 years. The majority of respondents said that they learned about JFIT support through the IHP and RSC related documents and UNESCO Jakarta website.

1. Are you aware of the name of Japanese Funds-in-Trust?

All respondents answered to the first question as “Yes”.

2. How do you know about the JFIT for Science programme?

JFIT Logo	3
UNESCO Jakarta website	9
IHP, RSC related documents	13
Representatives from Japanese Government	5

3. For almost 20 years, the IHP training courses and RSC meetings have been financially supported by JFIT. These long-term contributions by JFIT are well known and appreciated by our colleagues. (5-Fully Agree, 4-Partly Agree, 3-Not sure/Don't Know, 2- Don't quite Agree, 1- Don't agree)

All respondents answered “5-Fully Agree”

4. UNESCO Jakarta and the Japanese Government have disseminated enough information about UNESCO-Japanese Government Science programme strategy toward ASPAC countries. (5-Fully Agree, 4-Partly Agree, 3-Not sure/Don't Know, 2- Don't quite Agree, 1- Don't agree)

14 respondents answered “5-Fully Agree” and 2 respondents answered “4-Partly Agree”.

Part B: JFIT's contribution to you and your country's science policy

5. I think the IHP symposiums, trainings and RSC meetings have contributed to improvement of my knowledge and practical skills.

- 5.1 If “yes” to the above question, in what ways?

If “no”, can you elaborate why not?

All respondents answered to the above question as “Yes”.

The responses to 5.1 can be categorized into 3 groups:

- 1) **Access to the regional information on data and techniques in hydrology and water issues;**
- 2) **Application of knowledge in the work place; and**
- 3) **Benefit of networking with other member countries.**

The majority of respondents appreciated that the IHP symposiums, trainings and RSC meetings allowed them to access the latest information on the regional water issues and problem-solving approaches used in the region. Some country representatives responded that the knowledge and techniques acquired during IHP symposiums, trainings and RSC meetings have been used in their working places at all levels, such as for practitioners and professors. Networking opportunity is also mentioned as one of the benefits from several countries.

6. In the past, I have shared the information and knowledge that I gained from IHP symposiums, trainings and RSC meetings with my colleagues after I return to my country.

6.1 If “yes” to the above question, please explain how did you share them (E.g., through presentations, etc.)?

6.2 If “no” to the above question, please explain the reasons?

All the respondents answered “Yes”.

The participants have shared the information and knowledge with their colleagues, their supervisors, as well as their related agencies. Those who work in the university and academic institutions share their knowledge gained from IHP activities with their colleagues and students through lectures. There are various ways to share the knowledge. Majority of the participants organizes knowledge sharing seminars/workshops/meetings through the country’s IHP National Committee. In addition, sharing the mission reports and utilization of the internet website were also mentioned.

7. This year, I plan to share the information and knowledge that I gained from IHP symposiums, trainings and RSC meetings with my colleagues after I return to my country.

7.1 If “yes” to the above question, please explain how will you share them?

7.2 If “no” to the above question, also please explain the reasons?

The same as question 6, all respondents answered “Yes”, through IHP National Committee’s workshops, university’s seminars, sharing the documents.

In particular, Myanmar will make a report to responsible department and share the report with ministers.

Indonesian participant responded that they will share the information with their French colleagues, who are working together as a joint-research group. It showed us their inter-regional initiatives far beyond the colleagues’ level.

Thai participants responded that they will apply a new hydrologic and inundation simulation model acquired during the IHP symposium in solving the current flood disaster.

8. In the past, I have incorporated what I have learned from IHP symposiums, trainings and RSC meetings with our country’s science sector policy/ programme.

8.1 If “yes” to the above question, please provide us more details about the themes that you chose and the name of the policy/programme?

8.2 If “no” to the above question, please specify reason.

(E.g., My professional /position is (was) not influential in science policy/programme-making process, I am (was) not interested in it., etc.)

Except for Myanmar and Timor-Leste,¹ almost all participants incorporated their leanings with their country's science sector policy/ programme though the academic societies and governmental panel/ committee in hydrologic issues.

For example, in New Zealand, IHP activities contributed to the development of Fresh Water Database, the elaboration of flood design programme which are practiced in Japan and other countries.

In China, IHP activities contributed to the technical development in hydrology, especially in Yangtze River and Changjiang River basin management. Also, the monitoring, forecasting, risk mitigation skills and technology which are gained from IHP activities have been incorporated in their 12th Five Year Plan.

In Indonesia, Indonesian Institute of Science (LIPI) carried out the scientific research on the Lake Limboto, Gorontalo Province and their research findings were integrated into Indonesian Water Law No.7, in 2004.

The participant from Philippines mentioned that the IHP Nagoya Training courses are important and correspond to their country's climate change programme and water resource development plan, although the government prioritize the economic development and sometimes that makes them difficult to reflect at a policy level.

9. This year, I plan to incorporate what I have learned from IHP symposiums, trainings and RSC to our country's science sector policy/programme.

9.1 If "yes" to the above question, please explain what you are planning to do.

9.2 If "no" to the above question, please specify reason.

(E.g., My professional /position is not influential in science policy/programme-making process. I am not interested in it., etc.)

All respondents answered "Yes".

The participants from the governments showed their willingness to incorporate the latest findings from hydrological research leaned from IHP activities to their country's policy formulation. The others from academic institutions said that the information will be reflected in further water policy formulation through academic societies and conferences.

Thailand will share the information with the national water resources committee in order to organize the training course for capacity building on water resource management.

Timor Leste will share the water management information with responsible director to organize community sensitization activities on water management.

Papua New Guinea will incorporate the acquired knowledge to the coming review on the waste management policy on mining activities with linking them to climate change and national hazards issues.

Indonesia will integrate their leaning to an academic paper as the scientific bases of Government Regulation of Lake Maninjau management, West Sumatra.

10. If you answered "yes" to the question 8, and provided the details in 8.1, please give provide us further information about outcomes/ best practices realized by the policy/programme related

¹ Due to the political reasons, participants from Myanmar are different each year. For Timor-Leste participant, this was the first RSC meeting.

to the answer in 8.1. (E.g., a successful water management method decreased the number of casualties in recent years.)

The same as the devastated flooding at Thailand, the water-related disasters happened at the Southeast Asian countries causes severe economic and cultural damages in the region, as well as in Japan. Sharing the latest science and technology is without doubt becomes a base to reduce water related disasters. I believe especially an important thing is human resources. For these 20 years, the RSC successfully fosters close relationships in the regions, which is the best outcome for our future. (Thailand)

New Zealand has been contributing to MDG's by developing Fresh Water Database and the flood design programme for better management of water hazards. (New Zealand)

It also results in the culmination of a category 2 regional centre of UNESCO in the country. (Malaysia)

China has developed a complete modelling system on water reallocation in Changjiang River inspired by joint interests from Asia Pacific countries.

Philippines incorporated flood design methodology for safety, knowledge on the water impacts of climate change scenarios, capacity for research cooperation

Vietnam upgraded the Water Resources Law.

Indonesia worked to raise the awareness of the Government of Gorontalo Province, and introduced a water quality and water level instrument (online monitoring) in Lake Limboto.

Additional comments

- **The JFIT has enabled long term interaction between Asia-Pacific country on two maths of critical importance such as water management and risk mitigation. The activities have added to the capacities of all countries involved both directly and indirectly they bi-lateral links that follow from RSC activities.**
- **There is scope for JFIT achieve more than coordination between smaller groupings (e.g. NZ-Japan to co-ordinate RSC relates activities contribute to Pacific.)**
- **This will not only meet RSC/ JFIT objectives but promote wider application of sustainable activities (i.e. On-going, locally supported) by industrial countries.**
- **The type of work proposed would ...on ensuring long term, sustainable activities supported by local governments rather than short term programmes that have little enduring effect.**
- **Close collaboration with specialists in Water qualities, water resources, and disaster management are necessary.**
- **Mongolia would like lean more about "water education and efficient water use" also would like to participate AP-Friend, DRH and other programmes.**
- **AP-FRIEND, IHP Nagoya type training courses, and country hosted international conferences which are in the RSC programme provide opportunities and direct benefits for scientific corporation toward better socio-political cooperation and understandings. The achievements derived from collective strengths of member countries within the RSC. The benefits are realized at both regional and country level.(Philippines)**
- **Gave full knowledge and information for the better water management of the country to professional engineers and management staffs**
- **Lao PDR still requests the support from RSC for the participation of the RSC meetings, training courses, in addition to in order to acquire the high technologies.(Lao)**

- **National water resource policy(Thai), river basin committee**
- **I hope we set up the IHP national committee in my country (East Timor)**

ANNEX 4

REPORT ON RSC FUTURE PERSPECTIVES MAPPING



REPORT ON RSC FUTURE PERSPECTIVES MAPPING

1

RSC Perspectives – requests to countries and questionnaire

After 20 years MEXT is revising the overall project and asking the RSC Secretariat (which is hosted in the UNESCO Jakarta Office) to respond to questions such as the sustainability of the same and mostly what would be the reason to keep supporting the RSC meeting organization.

The RSC overall organization passed from a full sponsorship of all countries to the current situation where approximately 40% of the countries can self support the participation of their delegates.

Before the 19th RSC meeting in Kyoto requests were sent to RSC Members to obtain the country statements on the following issues:

- needs from participating countries in respect to the RSC: what is expected from the RSC; what a country would learn from the RSC
- give a brief statement on the future perspectives of the RSC (future sustainability).
- Statements were received from 10 countries before or during the 19th RSC meeting

During the 19th RSC meeting, Ms Ayako Ito, JFIT coordinator, also distributed a questionnaire *“how JFIT Science Programme contributed to the countries’ capacity building and science policy making”* to respond to questions such as sustainability of the RSC, its visibility as well as major results obtained. 16 countries responded to the questionnaire

2

RSC Perspectives – requests to countries and questionnaire

These requests had a twofold purpose:

1. Firstly to justify and explain to the Japanese Government the reasons to keep the RSC and related activities funded as in the past; thanks to each country contributions through both the requests on perspectives and the questionnaire we were able to have the proposal approved in June 2012 for the current RSC meeting and related events.
2. To discuss among member countries the way forward in respect to the RSC; what has been achieved and what can be achieved in the future

3

RSC Perspectives – replies from countries

1. *Needs from participating countries in respect to the RSC: what is expected from the RSC and what a country would learn;*
 - CHINA: RSC to keep providing technical platform for scientists and hydrologists in this region ; to involve professionals from different background, not only from research institutions but also from field so that the sharing can be extend to solve more practical problem; should as well provide guidance to future development of hydrology for the member countries.
 - INDONESIA: Evaluate the in-country post-mortem information dissemination and benefit of the trainings, workshops and publication of RSC products; continue and maintain the present state of activities, productivity and frequency
 - LAO PDR; request to RSC to support fund to the participation of annual meeting, training course in the future to improve the knowledge and experience
 - MONGOLIA: new Water education methodology, tools and techniques; Water saving technology and water design; Urban water management and development economic efficient water infrastructure; Climate change and Groundwater issues; RSC input in the development hydrology in arid zones most important; continue funding the RSC participation

4

RSC Perspectives – replies from countries

1. *Needs from participating countries in respect to the RSC: what is expected from the RSC;*
 - NEW ZEALAND: Long term duration (20 years) is one indication of the on-going need for RSC activities; There are examples of variable commitment and policy/practices in many countries; RSC provides a “neutral” forum for countries that share rivers and aquifers; Implicitly addresses Millennium Development Goals and other high level UNESCO/UN objectives.
 - PNG: continuous support should be given to the RSC to strengthen areas and sectors that need support such as capacity building for least developed areas
 - THAILAND; financial support, tools, capacity building; young hydrologists and researchers to implement joint studies at national and regional level (flood forecasting and management, CC)
 - VIET NAM: need support in urban water management; disaster management; applying new technology and approach in Integrated Water Resources management; Assessment of impact of climate change on water resources and hydrological extreme events; Adaptation measures to Climate change; Monitoring and assessment of water transboundary; Developing River Basin Organization (RBO); Modernization of Hydro-Met Service; Transfer technology and training course in Hydrology and WR;

5

RSC Perspectives – replies from countries

2. *give a brief statement on the future perspectives of the RSC (future sustainability)*
 - AUSTRALIA: considering the APFRIEND report on flood design and due to the large disparity between the individual countries in terms of flood design, flood forecasting, data collection and flood management it is essential that in country workshops be run on the basics of flood design and modeling; with regards to data collection and hydrological analyses lacking to investigate what is lacking in the region and then run in country workshops to improve the basics of the local data collectors and analysts; it is indeed time for the RSC to undertake an analysis of what it had achieved and what it can achieve in the future. This could be done through a SWOT analysis (Strengths, Weaknesses, Opportunities, Threats) of itself and the contributing countries. Perhaps this should be undertaken to clearly align a future agenda for the RSC.
 - CHINA: benefit from the knowledge/experiences sharing. To sustain such regional platform, it however might be more sustainable to establish a sharing sponsorship, e.g. wealthy member country contribute a share of finance to set up a joint treasure/finance for future activities when it is necessary.

6

RSC Perspectives – replies from countries

2. *give a brief statement on the future perspectives of the RSC (future sustainability)*
 - INDONESIA: Empower, restructure and widen the scope of the secretariat, including the possibility of executing demand assessment and some relevant studies relevant to IHP-UNESCO and RSC in particular
 - Seek complementary and alternative funding sources:
 - » Membership fees: need to be approved by member states and some critical consideration may apply.
 - » Explore the link program wise and issues to the available global funds and network for current issues like climate change, environment, REDD, floods and droughts, adaptation funds, disaster and poverty and adaptation.
 - Restructure the RSC Membership from within and outside the region by inviting external advisors and some ad hoc committees
 - Programre-design, ownership and execution and be reflected in:
 - » The projects.
 - » Institutions under which RSC has had and will be playing a great role in their existence.
 - » The regular meetings as well as the related and relevant technical and scientific events.
 - Diversifying and widening the networks and program, by among others considering the:
 - » More interdisciplinary approach.
 - » Spatial and regionally critical and commonly shared issues like deltas, megacities, mountains, etc. CHINA: benefit from the knowledge/ experiences sharing. To sustain such regional platform, it however might be more sustainable to establish a sharing sponsorship, e.g. wealthy member country contribute a share of finance to set up a joint treasure/finance for future activities when it is necessary.

7

RSC Perspectives – replies from countries

2. *give a brief statement on the future perspectives of the RSC (future sustainability)*
 - NEW ZEALAND: The role of the RSC in Hydrology: Unifying and improving approaches to critical issues in hydrology across diverse countries
 - Objective to improve practices for hydrology information creation and application across a wide front (Hazards, water management, climate change, land use intensification)
 - Define clear statements around needs for some specific issues that RSC has identified and is actively pursuing:
 - » Data collection (Noted in Pacific Countries)
 - » Database maintenance (Noted in Pacific Countries)
 - » Data access (A critical issue of increasing importance)
 - » Design methods (Flood design, Eco Hydrology)
 - » Specification and application of flood forecasting methods
 - Work method is to guide and influence projects and programmes inside and outside of the UNESCO area. Examples are national and donor projects across water data collection, flood forecasting and hazard reduction.

8

RSC Perspectives – replies from countries

2. *give a brief statement on the future perspectives of the RSC (future sustainability)*
 - REP OF KOREA: 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 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.
 - In this sense, the RSC activities should be continued for the solution of regional water problems expecting more serious situation under the climate change with Japanese MEXT full sponsorship of all countries even though approximately 40% of the countries can self-support the participation of their delegates, and the global IHP community will continue their recognition and appreciation for the RSC's continuous regional IHP activities.

9

RSC Perspectives – replies from countries

2. *give a brief statement on the future perspectives of the RSC (future sustainability)*
 - THAILAND: For the future perspectives of the RSC, member countries need to strengthen their own operation in all parts such as academic coordinate and operate in all parts in order to achieve a future sustainable. As known that the capability and potential of member country are difference, then some country has limitation which may make it difficult to perform.
 - This year Thailand has faced to severe flood including Bangkok too, due to prolong rainfall, tropical storm. Thailand pleased to be working and collaborate in RSC activities to achieve sustainable.

10

RSC Perspectives – Questionnaire

During the 19th RSC meeting, Ms Ayako Ito, JFIT coordinator, also distributed a questionnaire “*How JFIT Science Programme contributed to the countries’ capacity building and science policy making*” to respond to questions such as sustainability of the RSC, its visibility as well as major results obtained.

The questionnaire consisted of 3 parts;

- the first part relates to the respondents background information,
- the second part (Part A) contains a series of statements about the visibility and awareness of the JFIT Science programme among ASPAC countries and
- the final part (Part B) is about how the JFIT Science programme contributed to the countries’ capacity-building and science policy making. 15 countries (Australia, China, Indonesia, Japan (2), Lao P.D.R, Malaysia, Mongolia, Myanmar, New Zealand, Papua New Guinea, Philippines, Rep. of Korea, Thailand, Timor Leste, and Vietnam) responded to the questionnaire.

11

RSC Perspectives – Questionnaire

Summary of questions:

- Sharing of information acquired during RSC meetings:
 - *Through different ways (IHP Natcoms, Universities, Agencies/Institutions)*
- **In the past, I have incorporated what I have learned from IHP symposiums, trainings and RSC meetings with our country’s science sector policy/ programme.**
 - Except for Myanmar and Timor-Leste, almost all participants incorporated their leanings with their country’s science sector policy/ programme through the academic societies and governmental panel/ committee in hydrologic issues.
 - For example, in New Zealand, IHP activities contributed to the development of Fresh Water Database, the elaboration of flood design programme which are practiced in Japan and other countries.

12

RSC Perspectives – Questionnaire

Summary of questions:

- **In the past, I have incorporated what I have learned from IHP symposiums, trainings and RSC meetings with our country's science sector policy/ programme.**
 - In China, IHP activities contributed to the technical development in hydrology, especially in Yangtze River and Changjiang River basin management. Also, the monitoring, forecasting, risk mitigation skills and technology which are gained from IHP activities have been incorporated in their 12th Five Year Plan.
 - In Indonesia, through IHP the Indonesian Institute of Science (LIPI) research findings were integrated into Indonesian Water Law No.7, in 2004. IHP Activities also resulted in the establishment of a UNESCO Cat. 2 Water Centre (APCE)
 - VietNam upgraded the Water Resources Law

13

RSC the WAY FORWARD

AUSTRALIA PROPOSAL? (which summarises many of the outputs from Countries)

- It is indeed time for the RSC to undertake an analysis of what it had achieved and what it can achieve in the future. This could be done through a SWOT analysis (Strengths, Weaknesses, Opportunities, Threats) of itself and the contributing countries. Perhaps this should be undertaken to clearly align a future agenda for the RSC.

Please give contributions for further proposals.

14

ANNEX 5

THE STATUS OF IHP-VIII STRATEGIC PLAN

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

International Hydrologic Environmental Society

Status of IHP-VIII Strategic Plan

Soontak LEE

1

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

International Hydrologic Environmental Society

IHP Programmes

IHP-VIII (2014-2021)

Water Security: Responses to Local, Regional, and Global Challenges

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

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IHP Programmes
IHP-VIII (2014-2021)
Water Security: Responses to Local, Regional, and Global Challenges

Theme 1	Water-related Disasters and Hydrological Change
Focal Area 1.1	Risk management as adaptation to global changes
Focal Area 1.2	Understanding coupled human and natural processes
Focal Area 1.3	Benefiting from global and local Earth observation systems
Focal Area 1.4	Addressing uncertainty and improving its communication
Focal Area 1.5	Improve scientific basis for hydrology and water sciences for preparation and response to extreme hydrological events
Theme 2	Groundwater in a changing environment
Focal Area 2.1	Enhancing sustainable groundwater resources management
Focal Area 2.2	Addressing strategies for management of aquifers recharge
Focal Area 2.3	Adapting to the impacts of climate change on aquifer systems
Focal Area 2.4	Promoting groundwater quality protection
Focal Area 2.5	Promoting management of transboundary aquifers
Theme 3	Addressing Water Scarcity and Quality
Focal Area 3.1	Improving governance, planning, management, allocation, and efficient use of water resources
Focal Area 3.2	Dealing with present water scarcity and developing foresight to prevent undesirable trends
Focal Area 3.3	Promoting tools for stakeholders involvement and awareness and conflict resolution
Focal Area 3.4	Addressing water quality and pollution issues within an IWRM framework - improving legal, policy, institutional, and human capacity
Focal Area 3.5	Promoting innovative tools for safety of water supplies and controlling pollution








**International Hydrologic
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IHP Programmes

IHP-VIII (2014-2021)

Water Security: Responses to Local, Regional, and Global Challenges

Theme 4	Water and human settlements of the future
Focal Area 4.1	Game changing approaches and technologies
Focal Area 4.2	System wide changes for integrated management approaches
Focal Area 4.3	Institution and leadership for beneficiation and integration
Focal Area 4.4	Opportunities in emerging cities in developing countries
Focal Area 4.5	Integrated development in rural human settlement
Theme 5	Ecohydrology, engineering harmony for a sustainable world
Focal Area 5.1	Hydrological dimension of a catchment– identification of potential threats and opportunities for a sustainable development
Focal Area 5.2	Shaping of the catchment ecological structure for ecosystem potential enhancement – biological productivity and biodiversity
Focal Area 5.3	Ecohydrology system solution and ecological engineering for the enhancement of water and ecosystem resilience and ecosystem services
Focal Area 5.4	Urban Ecohydrology – storm water purification and retention in the city landscape, potential for improvement of health and quality of life
Focal Area 5.5	Ecohydrological regulation for sustaining and restoring continental to coastal connectivity and ecosystem functioning
Theme 6	Water Education, key for Water Security
Focal Area 6.1	Enhancing tertiary water education and professional capabilities in the water sector
Focal Area 6.2	Addressing vocational education and training of water technicians
Focal Area 6.3	Water education for children and youth
Focal Area 6.4	Promoting awareness of water issues through informal water education
Focal Area 6.5	Education for transboundary water cooperation and governance



**International Hydrologic
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Working Group on Supporting the Implementation of the Strategic Plan of IHP-VIII

During its 20th session, the Intergovernmental Council of IHP has established a working group (WG) for developing implementation strategies and supporting the implementation of IHP VIII. The following short description gives explanation on reasons, aims, roles and procedures.

- The WG is meant to catalyze and ease member state input to the implementation of IHP VIII (see TOR below).
- The WG initially consists of the IHP Bureau and 2 experts from each region as well as experts from Cat I and II Centers. These members are responsible for analyzing member states needs and proposing approaches for cooperating in the implementation of the programme.
- The Secretariat will start the consultation process with member states on priorities and member states input to IHP VIII soon.
- Based on the results of the consultation process and regional discussions of Bureau members, WG + Secretariat will organise implementation groups of member states that are willing to cooperate on specific focal areas and objectives of IHP VIII.
- Member states join the implementation group according to their interest. Members can either help in coordinating a certain focal area, they can also contribute specifically and targeted on focal areas or on the level of objectives.

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**International Hydrologic
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Working Group on Supporting the Implementation of the Strategic Plan of IHP-VIII

- **WG + Secretariat facilitate member states discussion and cooperation on how to address the challenges and will support and consult with regard to specific projects or programmes.**
- **Member states agree on approaches, targets and activities jointly (or they can of course also contribute without partners).**
- **The implementation groups jointly develop and deliver results that are tailored to their own needs.**
- **Member states that do not have the possibility to actively contribute will be able to comment and to bring their needs to the attention of the implementation groups.**
- **The structure and members of the WG as well as members of implementation groups will be communicated transparently and constantly through web sites.**
- **Any member state is welcome to freely contact implementation groups on their behalf.**
- **Implementation groups are communicating with all member states through the Secretariat and through the WWW.**
- **Reporting will be jointly organized by Secretariat and implementation groups.**

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**International Hydrologic
Environmental Society**

Terms of Reference

ESTABLISHMENT

The 20th session of the Intergovernmental Council of the International Hydrological Programme (IHP) established a Working Group (WG) to develop a strategy for supporting the Implementation of IHP-VIII in accordance with the HP Statutes, article V, paragraphs 3 and 4.

TERMS OF REFERENCE

The overall objective of the working group is to develop, together with the secretariat, a strategy for implementing IHP VIII; with the aim to enhance contribution and cooperation of Member States for implementing IHP-VIII. The asks of the WG are to:

- **Co-ordinate with the secretariat the development of an implementation plan for IHP-VIII and to support the IHP Secretariat, Bureau and Council in implementing IHP-VIII by:**
- **Develop an overall strategy to ensure Member States active participation as lead partners in the implementation of activities relevant to themes and focal areas of IHP VIII,**
- **Propose, to the IHP Council, viable approaches for evaluating progress in meeting the expectation of Member States and determining the format they should be reported to the Governing Bodies of UNESCO;**

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- Propose to the IHP Council, mechanisms for Member States to recommend adjustment of the implementation on the basis of the reports if necessary;
- Define clear criteria for introducing new activities and maintaining existing activities;
- Oversee the establishment of transparent information and communication means (internet) to allow easy access to IHP VIII, its implementing bodies and lead partners, in co-operation with the IHP publication and communications committee, and ensuring that such is done at no additional cost to the secretariat's regular programmes' budget.



MEMBERSHIP

The WG will be composed initially of members of the IHP Bureau, and members of the task force that prepared the Strategic Plan for the Eighth Phase of the IHP. Membership will be open to all relevant competent representatives of Member States in accordance with article V.4 of the Statutes of the Intergovernmental Council of IHP in terms of appropriate geographic distribution and adequate regional representations. Membership is also open to designated representatives of category 1 and 2 centres considering again the appropriate geographic distribution and adequate regional balance.

CHAIR

The working group shall elect its chair and rapporteur on its first meeting after or during each session of the Intergovernmental Council. The chair of the IHP-Bureau will serve as interim chair of the working group until its first meeting.

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DURATION

The WG has been established by the IHP Council on its 20th session in June 2012, and will be subject to review during regular sessions of the IHP Council.


FUNCTIONING

The Secretary of IHP will designate staff members of the secretariat to provide contact and necessary support for the WG and its functioning without burdening the regular programme resources. The WG will interact constantly, by e-mail, video conference and telephone. If needed, the working group may also meet at a location to be agreed upon. No regular budget funds can be used to support secretariat and/or WG members' attendance of these meetings.


FINANCIAL IMPLICATION

WG meetings shall not be supported financially by UNESCO's regular budget and shall have no financial implication to the Organization. Costs will be borne by Member States participating in the WG and by any extra budgetary funds that Member States decide to provide for this initiative.


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United Nations
Educational, Scientific and
Cultural Organization



International
Hydrological
Programme



**International Hydrologic
Environmental Society**

Terms of Reference [an]
for the
Working Group on Supporting the Implementation of the Strategic Plan of IHP-VIII

ESTABLISHMENT


The 20th session of the Intergovernmental Council of the International Hydrological Programme (IHP) established, in accordance with the IHP Statutes, article V, paragraphs 3 and 4 [an], a Working Group (WG) to develop a strategy for supporting the implementation of IHP-VIII based on Member States' input [an], in accordance with the IHP Statutes, article V, paragraphs 2 and 4.

TERMS OF REFERENCE OBJECTIVES AND TASKS


The overall objective of the working group is to develop, together with the Secretary of IHP, a strategy for implementing IHP VIII; with the aim to enhance contribution and cooperation of Member States for in implementing IHP-VIII. The tasks of the WG are to:

- Co-ordinate with the Secretary, Bureau and the Council the development of an implementation plan for IHP-VIII and to support the IHP Secretariat, Member States, their IHP National Committees and Focal Points, and other partners [an] Bureau and Council in implementing IHP-VIII by:
- Developing an overall strategy to ensure Member States active participation, as lead partners in the implementation of activities relevant to themes and focal areas of IHP VIII, taking into account the relevant decisions related to the strengthening of IHP National Committees and focal points [an]
- Proposeing, to the IHP Council, viable approaches for evaluating progress in meeting the expectation of Member States and recommending [an] suggesting the format they should be reported to the Governing Bodies of UNESCO;
- Proposeing to the IHP Council, mechanisms for Member States to recommend adjustment of the implementation of IHP-VIII on the basis of the secretariat reports, if necessary;
- Defining clear criteria for introducing new activities and maintaining existing activities:


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United Nations
Educational, Scientific and
Cultural Organization



International
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Programme



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← Overseeing the establishment of working group owned transparent information and communication means (internet) to allow easy access to IHP VIII. Its implementing bodies and lead partners, in co-operation with the IHP publication and communications committee, and ensuring that such is done at no additional cost to the secretariat's regular programmes' budget.

MEMBERSHIP [an]

The WG will be composed initially of members of the IHP Bureau, and members of the task force that prepared the Strategic Plan for the Eighth Phase of the IHP.

The Secretariat will seek nomination from Member States to expand the membership will be open to all relevant experts competent representatives nominated by of Member States, in accordance with article V.4 of the Statutes of the Intergovernmental Council of IHP in terms of appropriate geographic distribution and adequate regional representations. Membership is also open to designated nominated experts representatives from of category 1 and 2 institutes and centres, as well as water related Chairs, ~~ensuring also~~ ensuring also the appropriate geographic distribution and adequate regional balance. [an]

CHAIR




The working group shall elect its chair and rapporteur on its first meeting after or during each session of the Intergovernmental Council. The chair of the IHP-Bureau will serve as interim chair of the working group until its first meeting.

DURATION

The WG has been established by the IHP Council on its 20th session in June 2012, and will be subject to review during regular sessions of the IHP Council for the duration of IHP-VIII [an]

FUNCTIONING

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International Hydrologic
Environmental Society

The Secretary of IHP will designate staff members of the secretariat to ~~provide contact and necessary support for the Working Group/WG in carrying out its and its function~~ing without burdening the regular programme resources.

The WG will interact constantly, by e-mail, video conference and telephone ~~conferences~~. If needed, the working group may also meet at a location to be agreed upon. No regular budget funds can be used to support ~~secretariat and for WG members attendance of~~ these meetings.

FINANCIAL IMPLICATION

~~The Working Group, including its meetings & meetings shall not be supported financially by UNESCO's regular budget and shall have no financial implication to the Organization. Costs will be borne by directly by the Member States of working group Members and/or by Member States participating wishing to in the support the functioning of the WG and by through any extra budgetary funds, that Member States decide to provide for this initiative [B.10]~~

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ANNEX 6
COUNTRY REPORTS

NATIONAL REPORT ON IHP RELATED ACTIVITIES AUSTRALIA

1. ACTIVITIES UNDERTAKEN IN THE PERIOD June 2010 to Sep 2012

At the 36th session of UNESCO General Conference in November 2011 Australia was nominated and won election to the IHP Intergovernmental Council.

1.1 Meetings of the IHP National Committee

IHP activities in Australia are carried out under the guidance of the national UNESCO Science and Technology Network. In order to facilitate the implementation of UNESCO activities in Australia and the region, a national IHP Australian Network was established in 1995 and this network acts as the IHP National Committee for Australia. There are no formal meetings of the IHP Australian Network. Activities are conducted largely between the members by telecommunications (e-mail). The Australian National Commission (NATCOM) for UNESCO (www.dfat.gov.au/intorgs/unesco) has 12 members, two parliamentary representatives and four honorary members. Prof Ian White, Mr Tony Falkland and Mr Bruce Stewart have represented the IHP National Network at these meetings.

1.1.1 Decisions regarding the composition of the IHP National Committee

The IHP Australian Network includes the following members. Summary details of all current members are listed below. Dr Dasarath Jayasuriya is the principal focus point for the National committee following the resignation of Mr Bruce Stewart who has taken up an appointment in the WMO.

Name	Expertise	Organization
Dasarath Jayasuriya	Flood and Seasonal Forecasting	Bureau of Meteorology
Tony Falkland	Island Hydrology	
Trevor Daniell	Urban, Low and High Flow	
	Hydrology	University of Adelaide
Peter Martin	Public Relations	
Ian White	Hydrology/Water Quality	CRC for Weed Management
Jeff Camkin	Ecohydrology	Australian National University
	HELP Coordination	University of Western Australia
Ian Cordery	Flood/Drought Hydrology	Centre for Excellence for Ecohydrology
Peter Dillon	Groundwater	University of New South Wales
Anne Jensen	Ecotones	CSIRO Land and Water
Ray Volker	Groundwater	Wetlands Care Australia
		University of Queensland

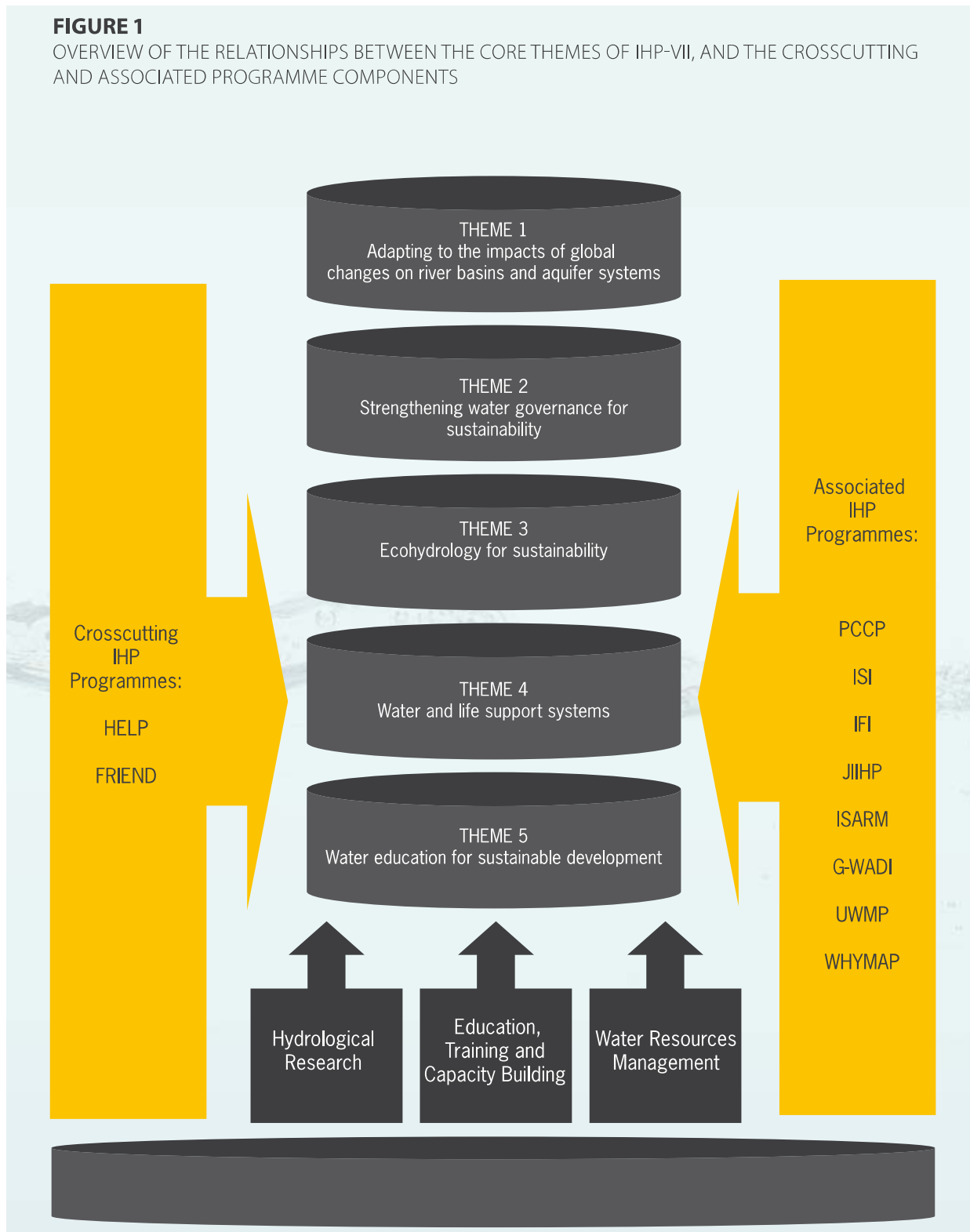
1.1.2 Status of IHP-VII activities

The IHP Australian Network brings together many of the key hydrological research groups within Australia. As such, Australia is able to contribute towards IHP activities through the research programs currently existing in Australia. For example, the eWater Cooperative Research Centre (CRC) and other centres for research undertake activities which are closely aligned to the themes of IHP-VII. Figure 1 from the strategic plan for IHPVII shows the interaction of the various groups within the region as well as the elements of the plan. A description is provided below of some activities pertinent to IHP-VII. The Australian Bureau of Meteorology and CSIRO have also established a Water Information Research and Development Alliance (WIRADA) which undertakes research of direct relevance to the activities of the IHP.

Australia faces major challenges in ensuring sustainable water supply in the face of drying climate and rising demand for water. In response, the Australian Government's initiative, Water for the Future (<http://www.environment.gov.au/water/australia/index.html>) is built on four key priorities of taking action on climate change; using water wisely, securing water supplies and supporting healthy rivers.

FIGURE 1

OVERVIEW OF THE RELATIONSHIPS BETWEEN THE CORE THEMES OF IHP-VII, AND THE CROSSCUTTING AND ASSOCIATED PROGRAMME COMPONENTS



THEME 1 Adapting to the impacts of global changes on river basins and aquifer systems

Focal Area I-1: Large-scale groundwater dependencies related to global change.

- The Great Australian Artesian basin and associated research activities.
- Frameworks for determining sustainable yield of aquifers

Focal Area I-2: Hydrological extremes in sensitive and stressed biomass and hydroclimatic zones e.g. small island developing states.

- Research activities involving the Pacific Island Countries

Focal Area I-3: Global change and feedback mechanisms of hydrological processes in stressed environments.

- The Murray Darling River Basin and GEWEX related research activities

Focal Area I-4: Changing global dynamics in aquatic environments: degrading ecosystems, especially those susceptible to sea level change, coastal sediment balance and pollutant accumulation.

- *Crosscutting Program Components – FRIEND and HELP*

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

A subset of the hydrological data collected by the State and Territory water agencies and the Bureau of Meteorology is contributed to international data centres for use in global and regional studies. The eWater Cooperative Research Centre (<http://www.ewatercrc.com.au/>) has continued its research program that includes modelling hydroclimatic variability and impact on water resources and aquatic ecosystems and rare events and resilience in hydrological and ecological risk assessment and now offers a range of next generation products for Integrated catchment management, Complete River System management, Stormwater quality modelling, Urban water management and Ecological response management. This rapidly expanding product portfolio is the result of a partnership between the knowledge of leading scientists in the Australian water sector with the practical experience of frontline water managers from Government and Industry

The Indian Ocean Climate Initiative (IOCI) (<http://www.ioci.org.au>), a partnership of research organisations, is researching the impact of climate variability and climate change on the water resources of the southwest region of Australia. CSIRO (<http://www.csiro.au/>), Australia's national research organisation, has research programs addressing global and regional climate change, climate change impacts on natural resources including water and climate change adaptation strategies.

Australian National University (ANU) together with Ecwise Environmental have been researching vulnerability and adaptation to global change in small island countries and have contributed to AusAID's Pacific vulnerability and adaptation project. The ANU, Ecwise Environmental and the University of Adelaide have been investigating the vulnerability of water supply catchments in the Australian Capital Territory to global change.

The National Centre for Groundwater Research and Training (<http://www.groundwater.com.au>) has an extensive research program including research on groundwater/surface water interaction and is investigating how better to manage groundwater resources. CSIRO is researching use of aquifer storage and recovery with urban stormwater and recycled water to sustain depleted groundwater resources (www.clw.csiro.au/research/urban/reuse). The ANU is researching artesian groundwater processes and modelling of groundwater changes in the lower Great Artesian Basin and in south eastern Australia. ANU, with Ecwise Environmental, are investigating shallow groundwater recharge, socio-cultural aspects of groundwater management and impacts of climate variability in low coral islands as a follow up to a UNESCO-IHP initiated project. The Water Information Research and Development Alliance (WIRADA) brings together CSIRO's research and development expertise in water and information sciences and the Bureau of Meteorology's operational role in hydrological analysis and prediction. The Alliance has covered fields of data interoperability, hydrologic modelling, water accounting and water resource assessment. The [Water data transfer standards](#) project is defining and developing transfer standards and procedures for supply of specified data from water information providers and has contributed significantly to the development of an international data exchange standard named WaterML. Among the other significant contributions has been in improving the seasonal streamflow forecasting area using the Bayesian Joint Probability method which has been operationalised using the Bureau operational systems and now well accepted in the industry, One further development is the Australian Hydrological Geospatial Fabric which is a specialised Geographic Information System (GIS). This identifies the spatial relationships of important hydrological features such as rivers, lakes, reservoirs, dams, canals and catchments and makes working with geodata in a hydrological context much easier.

THEME 2 Strengthening water governance for sustainability

Focal Area II-1: Culture, ethics and legislation for wise stewardship of water.

- Indigenous water knowledge and understanding
- Pacific Island countries culture and water issues
- A framework for integrating water policy for managed aquifer recharge into water resources management was developed and is being taken up by those states where the need is most pressing (<http://www.nwc.gov.au/publications/waterlines/robust-policy-design-for-managed-aquifer-recharge>)

Focal Area II-2: Good Governance, capacity development and stakeholder participation. Empowerment of human resources.

- CSIRO with NCGRT and IceWARM are providing training on MAR (management of aquifer recharge) including technical aspects, management policies and guidelines for health and environment protection
- Frameworks for determining sustainable yield of aquifers
- CSIRO and SKM are each developing a thematic paper on groundwater governance for GEF-FAO (on groundwater recharge/discharge and aquifer equilibrium and on surface water-groundwater interaction, respectively)

Focal Area II-3: Affordability, poverty alleviation and assured financing, for effective IWRM. Include 'water' in national PRSP'

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

Focal Area II-4: Shared Water resources and conflict

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

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

The WIRADA [water resources assessment and water use accounting](#) project is developing methods and technologies, to enable the Bureau to provide integrated surface and groundwater resource assessments, water accounts and water resource outlooks. The first 5 year agreement finishes in 2012 and will be reviewed for extension for a period of 3 more years

THEME 3 Ecohydrology for sustainability

Focal Area III-1: Water as a landscape agent: erosive capacity, mobile solvent, habitat for aquatic biota - interdependencies and regulation in biogeochemical cycling.

- Developing policy and programs to support ecosystem enhancement through ecosystem service production
 - Australia has three UNESCO Ecohydrology Program Demonstration sites (Ord River, Western Sydney and water planning in Australia, with all three featured in the 2012 UNESCO document "Ecohydrology for Sustainability".

Focal Area III-2: Complementing engineering solutions with ecological measures resulting in sustainable carrying capacity of ecosystems

- Developing policy and programs to support ecosystem enhancement through ecosystem service production
- National Approach to Biodiversity Decline
- Groundwater dependent ecosystems

Focal Area III-3: Urbanization pressures, sustainable cities, towns and villages; water and sanitation for mega cities

- Free exchange of information between the Australian Water Conservation Reuse Research Program and UNESCO

Focal Area III-4: Risk based environmental management (under uncertainty), especially climate change threats to ecosystem functions

- Biodiversity and climate change

The ANU and Ecowise Environmental have ongoing projects in conjunction with UNESCO-IHP investigating shallow groundwater recharge, water quality, impacts of land-use and extraction and socio-cultural aspects of groundwater management and impacts of drought in low coral islands. The ANU together with NSW Department of Primary Industry has been investigating estuary policy and management strategies to improve the health of estuaries. Research into hydrological process in and the sustainable management of wetlands is being undertaken in a number of universities and eWater Cooperative Research Centre and the ANU in conjunction with UNSW and the NSW Sugar Industry has been investigating the use of constructed wetlands to treat drainage from farm lands. The urban environment and water sensitive urban design are also areas of current research. The Bureau has been given a new responsibility under the *National Plan for Environmental Information*, which is the first step on a long-term commitment to reform Australia's environmental information base and build this critical infrastructure for the future. It is initially a four-year program, and the first phase is a joint initiative between Commonwealth Department of Sustainability, Environment, Water, Population and Communities and the Bureau. The needs driving this initiative include looking at prioritising of investments in Natural Resource Management, identifying and predicting the impact of climate change, understanding environmental management decision impacts on the economy and society, activation of markets for environmental goods and services, improvement of the quality and transparency of environmental assessments for major projects and driving more sustainable resource management.

THEME 4 Water and life support systems

Focal Area IV-1: Methodologies for safeguards against water borne biotic and abiotic pollutants

Focal Area IV-2: Access to safe water, human health and integrated water resource management.

-
- An AusAID project has been approved to facilitate development of water quality guidance for managed aquifer in India. UNESCO Delhi office is assisting in project establishment.
- An IAH Commission on MAR project has commenced to produce a monograph on clogging in MAR and the international publication is being led by an Australian editorial team from AGT and CSIRO. This addresses an important constraint on the effectiveness of recharge enhancement.

Focal Area IV-3: Non-conventional water resources: brackish water use and waste water re-use.

- A major new research project on storing wetland treated stormwater in a brackish aquifer for recovering potable water. This will be an icon project with much on HACCP that will be transferable to developing countries. This now has partners in China, India and Singapore.
- Free exchange of information from Australian Water Conservation Reuse Research Program and UNESCO (<http://www.clw.csiro.au/publications/awcrrp/>)

Focal Area IV-4: Access to water for food security in environmentally stressed zones.

- Climate variability and change and water resources for agriculture

The National Land and Water Resources Audit (<http://www.nlwra.gov.au/>) and http://audit.ea.gov.au/ANRA/atlas_home.cfm) and the Water and the Economy study have produced a considerable body of data and information about the value, use, distribution and quality of water within Australia.

Research on property rights of water and the structure, operations and social and economic impacts of water trading markets continues to receive a lot of attention in Australia and is a potential resource for similar projects in other countries. The ANU, the French agency CIRAD and Ecowise Environmental has undertaken research on the use of multi agent systems and companion modelling to support negotiations and reduce conflict over groundwater use in low atolls.

THEME 5 Water education for sustainable development

Each of the Cooperative Research Centres (CRC) is required to undertake an active program of training to ensure their research and technology are transferred into practise as soon as possible. The water related CRCs are:

eWater CRC (<http://www.ewatercrc.com.au/>)

CRC for Irrigation Futures (www.irrigationfutures.org.au/)

These CRCs are a partnership between universities and other research centres that also have educational and training programs. Some of the research centres are listed separately below.

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

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

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

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

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

The International Centre of Excellence in Water Resource Management (ICE WaRM) (<http://www.icewarm.com.au/>) is made up of a consortium of universities and has a strong focus on education and training. It promotes itself to international water resource management students to further their education in Australia and is also developing online courses for delivery in Australia and overseas.

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

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

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

- *Crosscutting Program Components – FRIEND and HELP*

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

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

1.2.1 National/local scientific and technical meetings

- The biennial convention of the Australian Water Association (AWA) (www.awa.asn.au) was Ozwater 11 Convention & Exhibition, which was held in Adelaide, May 2011.
- **Workshop on Managed Aquifer Recharge for Safe Drinking Water Supplies, Adelaide, 9 May 2011.** Run by AWA, IAH and IWA at OzWater.
- **Stormwater Harvesting Risk Assessment Workshop, 12-13 May 2011, Adelaide. Run by CSIRO for stormwater harvesting for a range of uses, via aquifers and via surface water storage.**
- **XXV IUGG General Assembly Earth on the Edge: Science for a Sustainable Planet** 28 June - 7 July 2011, Melbourne Convention & Exhibition Centre, Melbourne, Australia. This incorporated a large number of IAHS streams and **18 IAHS Lead Workshops** pertaining to many facets of Hydrology and water resources.
- PACE-Net Second Platform: Key Stakeholder Conference: Strengthening Pacific-European Collaboration in Research, Development and Innovation, Brussels, 20-23rd March 2012.
- Practical Responses to Climate Change 2012, Water and Climate: Policy Implementation Challenges, National Convention Centre Canberra, 1-3 May 2012, Engineers Australia
- 34th IAHR World Congress together with the 33rd National Hydrology and Water Resources Symposium and the 10th National Conference on Hydraulics in Water Engineering was held at the Brisbane Convention and Exhibition Centre, in Brisbane from 26 June - 1 July 2011
- 'Irrigation 2011 - New Horizons, Fresh Ideas Conference', held in Launceston from the 22 – 25 August.
- EcoForum Conference & Exhibition incl 4th ALGA Annual Conference, 9-11 March 2011, Sydney
- *2011 Melbourne Water Kids Teaching Kids Conference* – June 23rd and 24th. *2011*
- International Conference on Integrated Water Management, 2 - 5 February, 2011, Western Australia, Australia
- Water Australia Summit 2011, 29–21 July 2011, Sydney
- Experts Meeting on Extended Hydrological Prediction (EHP) with WMO from 7 to 9 July 2011, Hosted by the Bureau of Meteorology, Australia.
- RiverSymposium 2011, 26–29 September 2011, Brisbane
- WASH Conference 2011 took place in Brisbane, Australia from 16-20th May 2011. It was coordinated by the Water and Sanitation (WASH) Reference Group in conjunction with AusAID
- NCGRT Managed Aquifer Recharge Course, Melbourne, 17-19 October 2011.
- Australia - Watermarks, the Heritage of Water 27/10/2011 - 30/10/2011 Annual conference of Australia ICOMOS in partnership with the National Trusts of Australia in Melbourne.
- Water Governance Research Initiative Workshop, 21-22 November 2011, Canberra
- The Water Information Research and Development Alliance (WIRADA) Science Symposium held between 1 and 5 August 2011 in Melbourne, Australia
- WSUD2012 - Water Sensitive Urban Design, Building the Water Sensitive Community, 21 - 23 February 2012, Melbourne Cricket Ground
- Practical Responses to Climate Change 2012, Water and Climate: Policy Implementation Challenges, 1 - 3 May 2012, National Convention Centre, Canberra, Website: www.climatechange2012.org
- The Irrigation Australia 2012 Conference & Trade Show took place in Adelaide, 24 – 29 June. This meeting incorporates the ICID: 63rd IEC Meeting & 7th Asian Regional Conference
- 9th IWA Leading-Edge **Conference on Water** and Wastewater Technologies. 3 - 7 June 2012. Brisbane, **Australia**
- OZWATER'12 was held in Sydney 8-10 May, 2012 at the Sydney Convention and Exhibition Centre Darling Harbour.
- 14th Water Distribution Systems Analysis Conference to be held on 24-27 September 2012 in Adelaide, South Australia. WDSA 2012 is produced as part of the annual conference series sponsored by the [American Society of Civil Engineers \(ASCE\)](http://www.asce.org)
- A number of meetings of the National Committee on Water Engineering, Institution of Engineer's have been held during this period. Some of the key purposes of these meetings are to coordinate and organise hydrology and water resources symposia and conferences, to coordinate the ongoing revision to the national hydrological design guidelines Australian Rainfall and Runoff, prepare Position Papers on key

hydrological issues and to manage the publication of Australian Journal of Water Resources. Position Papers are now all available on the Institution of Engineers, Australia web site:

(<http://www.eng.newcastle.edu.au/~ncwe/ncwePosPaper/ppHome.htm>).

1.2.2 Participation in IHP Steering Committees/Working Groups

Australian experts were nominated for a number of IHP-VI Theme Advisory Boards with Prof. Ian White being appointed as a Regional Representative to the Advisory Board for Theme 4 – Water and Society.

CSIRO is the Australian research organisation linked to the Water and Development Information for Arid Lands – A Global Network (G-WADI) project set up by the IHP (www.gwadi.org/).

Prof Ian White was elected to the Governing Board of UNESCO IHE, Institute for Water Education, Delft, the Netherlands in 2006 and is a Member Editorial Board UNESCO- Cambridge University. Press International Hydrology Series.

Prof Ian White attended the UNESCO IHE Board Meeting in Delft, the Netherlands, as representative of the South East Asia-Pacific Region of UNESCO IHP.

Mr Trevor Daniell was elected Chairman of the SE Asia and Pacific Regional Steering Committee in Kyoto in October 2011. He attended the RSCs in Hanoi in 2010 and Kyoto in 2011 as well as regional APFriend meetings. He was also the Chairman of the IHP FIGCC from 2006-2010 and relinquished this role at the Sixth World FRIEND Conference, Fez, Morocco, October 2010.

Prof. Jeff Camkin, University of Western Australia, was invited to the Steering Committee for the 2nd International HELP Symposium Building Knowledge Bridges for a Sustainable Water Future, Panama, November 2011.

1.2.3 Research/applied projects supported or sponsored

As a follow-up to the UNESCO/SOPAC research projects in Kiribati and Tonga, Professor Ian White, ANU is Project Manger of an ACIAR (Australian Centre for International Agricultural Research) sponsored project titled: Equitable Groundwater Management for the Development of Atolls and Small Islands. Its overall aim was to provide the basis for the sustainable use and equitable sharing of groundwater resources and their associated catchments between competing sectors, particularly agriculture, combining research on climate, groundwater, cropping and irrigation practices, economics, cultural traditions and social customs, and the aspirations and needs of stakeholders. The first phase of the project in Kiribati focussing on equitable groundwater use in North and South Tarawa was carried out in conjunction with the French agency CIRAD, the South Pacific Applied Geoscience Commission and government agencies in Kiribati and Tonga. This work used Multi Agent Systems and a companion modelling approach to develop Negotiation Support Systems to minimise conflicts over water resource development and use.

1. Kiribati Adaptation Programme Phase II

Development of National Water Resources Policy and National Implementation Plans

The Pacific small island nation of the Republic of Kiribati has water resource problems amongst the most challenging in the world: rapidly growing population; urbanisation; high infant death rates due to water borne-diseases; limited freshwater supplies; restricted resources and capacity; vulnerability to climate change and variability; seawater intrusion; unclear management and regulatory roles; and limited information on the quantity and quality of water resources. This project focussed on the development of the country's first National Water Resources Policy and 10-year Implementation Plan. Simple translocations of developed-world policy frameworks and "toolkits" to small island nations are unlikely to succeed because they ignore the local biophysical, socio-cultural, governance and resource context. Instead, analysis of past ministerial declarations, government decisions and community consultations as well as publicly-developed water resource priorities were used as a basis for developing policy. Many of the pressing national problems can be addressed through seven key policy objectives: improved understanding and monitoring of water

resources and their use; increased access to safe and reliable water supplies and appropriate sanitation; achieving financially, socially and environmentally sustainable water resource management; increased community participation in water management and conservation; improved governance in water and sanitation sectors; providing training opportunities for and mentoring of staff in the sector; and decreasing unaccounted for water losses and improved cost recovery. These objectives were used as the framework for developing a 10-year National Water Resources Implementation Plan, The Cabinet of the Government of Kiribati endorsed both the National Policy and its Implementation Plan in January 2009.

Project support: The Kiribati Groundwater Hydrology Programme was initiated under UNESCO IHP V Theme 6, Humid Tropics Programme. It has been supported by UNESCO IHP, the Australian Centre for International Agricultural Research grant LW1/2001/050, by the European Union-SOPAC Pacific Water Governance Project, by AusAID, NZAid and the World Bank through the Kiribati Adaptation Programme Phase II and by Agence Francaise de Developpement (AFD), France.

2. Kiribati Adaptation Programme Phase II

Development of a 10-20 Year Water Master Plan for Tarawa.

The Water Master Plan for Tarawa is a direct response to the Government of Kiribati's National Water Resources Policy and its accompanying Implementation Plan. It focuses on the ability of groundwater sources, the traditional source of the majority of water used in Tarawa, the most populated atoll in the Republic and the location of the capital, to meet expected future demands. This focus is necessary because there are a number of knowledge gaps and difficult issues which need to be addressed by the government, its Ministries and agencies as well as the community. Demand for water in Tarawa is estimated over the next 10 to 20 years. Tarawa is an island in transition from largely subsistence, rural lifestyles, still largely followed in North Tarawa, to high-density, urban living in South Tarawa. Over the last 50 years, demographic and socio-economic factors have changed dramatically. This means that the traditional adaptation strategies developed over 4,000 years of subsistence in small islands are largely ineffective in coping with the demands of a modern urban society. The issues faced in groundwater management in Tarawa are already critical and future population growth will severely challenge the Government's ability to provide adequate supplies of safe, good quality water. Work in the Tarawa Water Master Plan has identified significant shortfalls in the ability of treated reticulated groundwater to meet the water needs of future populations in Tarawa. The potential for meeting some of the future water needs of Tarawa for the next 20 years through rainwater harvesting was examined. The large variability of rainfall in Tarawa, mostly driven by ENSO events plays a critical role. Major droughts occur on average about every 7 years and can last for two years. The predictions from climate change studies Global Circulation Models (GCMs) of changes in future rainfall and drought frequency due to climate change are problematic since the GCMs do not simulate ENSO events. It is assumed here that the future variability of rainfall in Tarawa over the next 20 years will be similar to that in Betio over the period 1947 to the end of 2008.

It was found that there is currently insufficient capacity in South Tarawa to meet the current water needs using piped, treated fresh groundwater from Bonriki and Buota water reserves and from domestic rainwater tanks. Future demand will be even greater than current demand and there is an urgent need, and one mandated by GoK in its National Water Resources Policy, to supply adequate quantities of safe freshwater to meet that demand.

The suggestions of previous studies in Tarawa have been reviewed. Desalination, bulk importation by ship, large constructed rainwater harvesting systems, recycling and a reclaimed island in the lagoon built to act as a source of fresh groundwater for the water supply system have all been critically examined. It is emphasised here that development of any other water source should only be considered once the existing leaks in the reticulation systems are dramatically reduced. There is no point in investing in extra water sources when losses from the reticulation system are 50%.

Project support: The Kiribati Groundwater Hydrology Programme was initiated under UNESCO IHP V Theme 6, Humid Tropics Programme. It has been supported by UNESCO IHP, the Australian Centre for International Agricultural Research grant LW1/2001/050, by the European Union-SOPAC Pacific Water Governance Project, by AusAID, NZAid and the World Bank through the Kiribati Adaptation Programme Phase II and by Agence Francaise de Developpement (AFD), France.

2. Groundwater Vulnerability, Tongatapu Kingdom of Tonga. This SOPAC/EU EDF8 project on the monitoring and assessment of the vulnerability of groundwater resources in Tonga's main island Tongatapu was conducted by a team from the Ministry of Lands, Survey, Natural Resources and Environment, the Tonga Water Board and the Australian National University. Tongatapu is blessed with reliable rainfall and fertile soils but has groundwater of variable quality for drinking. There are increasing demands on, growing threats to, and public concerns about its groundwater, which require wise management and use to ensure adequate supplies of safe freshwater for current and future generations, in accord with UN Millennium Goals and the Pacific Regional Action Plan on Sustainable Water Management. The team found that natural, human and institutional factors all add to the natural vulnerability of groundwater in Tongatapu. Strategies to decrease this vulnerability and protect Tongatapu's vital groundwater resource were presented. The main being the introduction of a Water Resources Bill to provide legal protection of groundwater sources and assign clear roles and responsibilities to government agencies and corporations.

3. Development of a National Water and Sanitation Policy Framework and Implementation Plan for the Republic of Nauru. This project is being conducted by ANU with support from the EU Pacific Integrated Water Resources Management National Planning Programme being run by the Secretariat of the Pacific Community's Applied Geoscience Division (SOPAC). Water supply and sanitation issues in Nauru are amongst the most complex and challenging in the world. This is due to frequent, severe droughts, which are closely related to sea surface temperature, increasing demand for freshwater, the impact of settlements and sewage on the safety of Nauru's very limited fresh groundwater, reliance on expensive, energy-intensive and aging desalination, limited water storages which are exhausted during droughts, less than ideal water distribution systems, absence of demand management, low rates of community participation limited resources and capacity to address the priority issues and future impacts of climate change. The Policy and its Implementation Plan addresses these challenges and are being developed through a whole-of-government and community-based-organisation Steering Committee under the Department of Commerce, Industry and Environment. The Policy whose theme is *Ebōk eiy itsimor, Ebōk eiy itsimor, Ebōk eiy gaganado, Rañga kō wam ebōk bwain tsimorum ñage me iyamwan* (Water is life, Water is precious, Care for water for your life for today and for the future) was endorsed by Cabinet of the Government of Nauru on 7 February 2012. The Implementation Plan is now being finalised.

1.2.4 Hydrology for Environment, Life and Policy (HELP)

Australia continues to contribute to the projects established under the HELP banner: the Lower Murrumbidgee catchment in the Murray Darling River Basin (coordinated by Awadesh Prasad, Murray Darling Basin Authority), Tully Basin (coordinated by Jim Williams, CSIRO), Lower Burdekin River Basin (coordinated by Keith Bristow, CSIRO), Fitzroy River basin (coordinated by Chris Carroll, Queensland Department of Environment Resources and Mines) and the Ord River Basin (coordinated by Jeff Camkin University of Western Australia and Dick Pasfield). Overall coordination in Australia is through Prof. Jeff Camkin, University of Western Australia.

A meeting of HELP Australia and New Zealand Coordinators took place at RiverSymposium held in Perth in October 2010 in conjunction with a public seminar on HELP in Australia and the Pacific..

Prof. Jeff Camkin was an invited keynote presenter at the IHES/UNESCO Symposium Restoring Rivers for Future, South Korea (April 2011) and invited member of the Steering Committee for the UNESCO-IHP HELP 2nd International Symposium Building Knowledge Bridges for a Sustainable Water Future in Panama, November 2011.

The HELP Program, and HELP network participants from Australia and other countries, has featured in new modules developed for the Erasmus Mundus MSc in Ecohydrology delivered at the University of Algarve through a collaboration between the International Centre for Coastal Ecohydrology (under the auspices of UNESCO), the UWA and Technical University of Lisbon.

Ord River Help Basin activities include: successful nomination of the Ord River as a UNESCO Ecohydrology Program Demonstration Site in May 2010; a HELP workshop with Ord stakeholders in July

2010 to develop a HELP workplan; and joint papers and presentation with a comparable basin in Portugal (Guadiana) at conferences in Australia and Portugal (2010) and Korea (2011).

Fitzroy HELP Basin activities include: a visit from Dr Mike Bonnell from the UNESCO HELP Centre for Water Law, Policy and Science, University of Dundee in 2010; a series of “Catchment Champion” workshops held by the River Basin Association and the Department of Environment and Resource Management to identify environmental values and water quality objectives for the basin and using catchment modelling an economic assessment was conducted to assess priority of on ground investment in grazing to reduce sediment and nutrient loads to the reef lagoon. The Paddock to Reef Integrated Monitoring, Modelling & Reporting Program focuses on diffuse water quality entering the Reef to track progress towards the Reef Plan targets.

Lower Burdekin HELP Basin activities included: A UNESCO HELP water forum with a keynote address by Professor Shabaz Khan, Global HELP Coordinator, and the establishment of the Burdekin Water Futures Group (BWF) to guide HELP and other whole of catchment activities, creation of a groundwater science plan and a modelling proposal for the Burdekin. The BWF is in the process of appointing an independent Chair and is reviewing its progress to date and confirming and updating future activities and directions.

Activity in the Murray Darling HELP Basin has focussed on the development of a Basin plan, the largest ever water reform in the Murray Darling Basin. The key elements of the Plan currently include:

- Sustainable diversion limits (SDL) on surface and groundwater that will come into effect from 1 July 2019 (i.e. a 7 year transition period):
 - o A basin-wide surface water SDL of 10873 GL (a 2750 GL reduction from the baseline diversion limit (BDL) of June 2009);
 - o A groundwater SDL of 3184 GL (a reduction of 1244 GL from BDL)
- A review of SDLs in 2015 to consider water savings infrastructure, system operations improvements and new information
- A basin-wide environmental watering plan
- A water quality and salinity management plan; and
- Water trading rules.

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

As President of the WMO Commission for Hydrology Network, Mr Bruce Stewart provided a link between the UNESCO IHP and WMO’s Operational Hydrology Programme. Mr Tony Falkland and Prof Ian White are members of the Water Working Group of the Science, Technology and Resources Network of the South Pacific Applied Geoscience Commission. Prof Ian White is a member of the Asian Pacific Association of Hydrology and Water Resources. Mr Trevor Daniell is the past Chairman of the FIGCC. Dr Peter Dillon chairs the IAH Commission on Managed Aquifer Recharge. University of Western Australia has entered into a Memorandum of Understanding with the International Centre for Coastal Ecohydrology (under the auspices of UNESCO). Prof. Jeff Camkin, who coordinates HELP in Australia, has designed and delivered new components of the Erasmus Mundus MSc in Ecohydrology course in 2010, 2011, 2012 and further work is being developed under the MoU.

1.2.6 National Plan for water security

As a result of 10 years of drought across a large portion of the country, in recognition that past management of water resources has not been effective, and that the recent National Water Initiative was not achieving sufficiently rapid progress in improving water management, the Australian government has embarked upon a National Water Security Plan. The plan has funding of A\$10B, will run for 10 years and includes the following components.

- a nationwide investment in Australia's irrigation infrastructure to line and pipe major delivery channels;
- a nationwide programme to improve on-farm irrigation technology and metering;
- the sharing of water savings on a 50:50 basis between irrigators and the Commonwealth Government leading to greater water security and increased environmental flows;

- addressing once and for all water over-allocation in the Murray-Darling Basin;
- a new set of governance arrangements for the Murray-Darling Basin;
- a sustainable cap on surface and groundwater use in the Murray-Darling Basin;
- major engineering works at key sites in the Murray-Darling Basin such as the Barmah Choke and Menindee Lakes;
- expanding the role of the Bureau of Meteorology to provide the water information necessary for good decision making by governments and industry;
- a Taskforce to explore future land and water development in northern Australia; and
- completion of the restoration of the Great Artesian Basin.

The release of the National Plan for Water Security has resulted in the passing of the first Water Act. Previously water management was covered by legislation of the eight State and Territory governments.

1.3 Educational and training courses

The National Centre for Groundwater Research and Training (a joint venture between 9 research/educational institutions, government water management organizations and private consultants) organises a wide range of groundwater related training courses. Details of courses can be found at the web site <http://www.groundwater.com.au/conf/content.asp>. The centre has established strong links with institutions in the region, particularly in Indonesia, Malaysia, Thailand and China.

1.4 Publications

There are numerous Publications from various conferences and Journals.

Some of Particular interest are :

Australian Bureau of Meteorology and CSIRO, 2011. Climate Change in the Pacific: Scientific Assessment and New Research. Volume 1: Regional Overview. Volume 2: Country Reports. <http://www.cawcr.gov.au/projects/PCCSP/publications.html>

Neto, S., Chicharo, L. and Camkin, J. 2011. Building synergies from the UNESCO-IHP HELP and Ecohydrology Programmes in the Guadiana river basin. UNESCO-IHP HELP International Symposium Building Knowledge Bridges for a Sustainable Water Future, Republic of Panama, 21-24 November 2011

Camkin, J. and Neto, S. 2011. New learning foundations for building water knowledge bridges. UNESCO-IHP HELP International Symposium Building Knowledge Bridges for a Sustainable Water Future, Republic of Panama, 21-24 November 2011

Camkin, J. 2011. Addressing changing hydrology, ecological condition and community attitudes to water at the Ord River, Western Australia. IHES - HELP Symposium Restoring and managing rivers for the future, Daegu City, Republic of Korea, April 2011

1.5 Participation in international scientific meetings

There have been numerous individuals participating in many meetings for IHP, APFRIEND, WMO, SOPAC.

Participation in the FRIEND Symposium 2010, Fes, Morocco, 25-29th October by Trevor Daniell as the Chairman of the FIGCC.

Participation in the HELP International Symposium in Panama, November 2011 by Jeff Camkin

2.6 Other activities at a regional level

A project titled: Enhanced Application of Climate Predictions in Pacific Island Countries is currently in progress to meet the general goals of improving weather and climate services and products. The AusAID funded project is developing a climate prediction capacity in participating countries, and in particular, is providing a framework for incorporating climate prediction information into planning across a broad range of agencies and industries. The climate prediction system being provided under the project is based upon the

seasonal climate prediction system of the Australian Bureau of Meteorology, which has successfully issued climate predictions for some years. (www.bom.gov.au/climate/pi-cpp/)

The Pacific HYCOS Project proposal developed by WMO in 2001 has received funding through the European Union. The Pacific HYCOS Project was originally launched at a workshop in Brisbane, Australia 16-19 April 2007 organized by Bureau of Meteorology (BOM) Australia, World Meteorological Organisation (WMO), National Institute for Water and Atmosphere Research (NIWA), and Pacific Islands Applied Geoscience Commission (SOPAC). The meeting and workshop was funded by WMO, BOM and SOPAC.

Dr Peter Dillon of the CSIRO, Water Recycling and Diversified Supplies, Urban Water Theme, Water for a Healthy Country Flagship Program, CSIRO Land and Water, has been active in Managed Aquifer Recharge across the region and beyond.

www.clw.csiro.au/research/urban/reuse

2.6.1 Institutional relations/co-operation

No information available at this time.

2.6.2 Completed and ongoing scientific projects

Refer section 1.2.3 re ongoing Pacific Island projects.

3. Future Activities

2.1 Conference Activities in 2012-13

- 34th Hydrology and Water Resources Symposium (HWRS) in Sydney, Australia on 19 – 22 November 2012.
- OZWATER'13 will be held in Perth 7-9 May, 2013 in Perth, Western Australia
- The 40th International Congress of the IAH will be hosted in Perth between 15 and 20 September, 2013. Themed ‘Solving the Groundwater Challenges of the 21st Century
- 8th Intl Symp on Managed Aquifer Recharge (ISMAR8) will be held in Beijing, 15-19 Oct 2013,
- MODSIM2013 congress will be held in Adelaide, South Australia, from Sunday 1st to Friday 6th December 2013. The theme for this MODSIM2013 event will be *Adapting to Change: the multiple roles of modelling*.

2.2 Activities Planned for 2012-13

- Transference of the outcomes of update of ARR to the International Community.
- Continuation of assistance to Pacific Island Projects.
- Continuation of involvement in Asian Pacific FRIEND.
- Continuation of involvement in HELP
- Participation in the IHP Intergovernmental Council of 2012-14

2.3 Activities envisaged in the long term

No information available at this time.

CHINA

National Report on IHP Related Activities

for

The 20th UNESCO-IHP Regional Steering Committee (RSC)
Meeting for Southeast Asia and the Pacific (SEAP)

Contribution to IHP-VII (2008-2013)

Langkawi, Malaysia, 5-9 November 2012

Chinese National Committee for the IHP

This report is submitted to the 20th RSC meeting for the IHP at Langkawi, Malaysia, 5-9 November 2012

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1. ACTIVITIES UNDERTAKEN IN THE PERIOD DECEMBER 2011 – OCTOBER 2012

1.1 MEETINGS OF THE CHINESE NATIONAL COMMITTEE FOR IHP

1.1.1 Decision regarding the composition of the Chinese National Committee

The current IHP national committee consists of **29** distinguished water experts who are active in hydrology and water resources work in China. There was no particularly decision has been made during the past one year.

1.1.2 Status of IHP-VII activities

China national committee has arranged projects and activities in all themes and almost all focal points of IHP-VII through national committee members, focal points and working groups around the country. Some activities are provided in the following paragraphs.

(1) In April 2012, Chinese expert from IHP, prof. Shujun, participated and provided important contribution to the revision of the Strategic Plan of IHP-VIII.

As the member of Work Group on Land Subsidence, Prof. Shujun, has participated in the discussion and contribution to the revision of Strategic Plan of the Eighth Phase of the IHP (IHP–VIII) with regard the draft 3 on explicit inclusion of the topic of “land subsidence or ‘land-level lowering’” into the Strategic Plan. The WG (China, Italy, Japan, Mexico, The Netherlands, USA) has drafted the comments and required the WG member to approach their national committee of IHP and to submit the comment through national IHP committee. As the member of the WG, Prof. Shujun has approached Chinese IHP national committee and the Chinese IHP national committee has submitted their suggestions before the IGC meeting. The suggestion and comments have been accepted in the Strategic Plan discussed during the IGC meeting in June 2012 in Paris.

(2) 4-7 June 2012, Chinese delegation attended the 20th session of the Intergovernmental Council (IGC) of the International Hydrological Programme (IHP) at UNESCO Headquarters in Paris.



During 4-7 June 2012, the delegation of IHP national committee of China attended the 20th IGC meeting of IHP in Paris. The delegates are Mr. Deng Jian (Chairman of IHP China national committee), Mr. Wang Jun (Committee member), Ms. Zhu XiaoYuan (Secretary of IHP China) and Dr. Yan Huang (Deputy Secretary of IHP China national committee). The delegation participated the IGC meeting as observer and has provided active participation and comments to various topics during the discussion and reviewing of the Strategic Plan of

IHP-VIII. The Chinese delegation presents the meeting with international cooperation progress on hydrology and water in general as the contribution to the IHP-VII plan, and expressed their willingness on continuing supporting to IHP work at national level.

(3) 8-12 June 2012, delegation of IHP China national committee, visited and exchange ideas on water management and hydrological works with various water-related departments of Turkey.

During 8-12 June 2012, delegation of IHP China national committee, visited Istanbul Technical University, State Hydraulic Works (DSI), General Directorate of Water Management (SYGM) and the State Meteorological Services (DMI). The Turkish water excerpts presented the Chinese delegation with water works practices, policies, management framework and technologies regarding hydraulic engineering, hydro-

meteorology and flood forecasting system of Turkey, in return, Chinese delegation explained the hosts about the hydrological work in China. Both sides also recollected cooperation in various sections of water between two countries, and also express wiliness for future cooperation.

(4) 4-7 June 2012, Chinese delegation representing IRTCES attended the 20th session of the Intergovernmental Council (IGC) of the International Hydrological Programme (IHP) at UNESCO Headquarters in Paris.

On behalf of director general of IRTCES, the vice director general Mr. Hu ChunHong, vice department head Mr. Liu Cheng, attended the 20th IGC meeting in Paris as part of the Chinese delegation. In the meeting, the excellent achievements of IRTCES in the past years were highly recognized. During the discussion of the IHP-VIII Strategic Plan, Chinese delegation required that higher attention shall be given on sediment issues during the next phase work.



Delegates from IRTCES attend the meeting (left) and meet with UNESO and ISI officers (right)

During the IGC meeting, a meeting on II Category centers was held. Delegates from about 20 centers attended the meeting and shared views and ideas on future work and cooperation. Chinese delegation from IRTCES also met the UNESCO IHP officers and the chairman of ISI Mr. Manfred Spreafico and discussed about the ISI work and activities for the next steps.

(5) 17 - 20 June 2012, Chinese delegation attended RIO+20- 'The United Nations Conference on Sustainable Development' in Brazil.

Prof. Liu Heng, DG of ICSHP and Vice-Chairman of China-IHP attended the Rio+20 Conference. World leaders, along with thousands of participants from governments, the private sector, NGOs and other groups, came together to shape how we can reduce poverty, advance social equity and ensure environmental protection on an ever more crowded planet to get the future we want.



During the conference, Prof. Liu joined several academic exchange activities, including "Sustainable Development: Do we need a green industrial policy?", "Dublin Rio Principles, where do we stand, what lessons learned", and the activities of "UN-Energy Day" and "UN-Water Day". In addition, invited by Switzerland, he also gave a keynote speech on the workshop of "Resilience for communities-what do we really need by 2015".

Besides above side events, Prof. Liu actively communicated with UN and relevant institutions, in order to expand the exchange, inquire into cooperation opportunities and reach many agreements on SHP cooperation.

1.1.3 Decision regarding contribution to/participation in IHP-VII

During Nov 2011-Oct 2012, 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.

1.2 ACTIVITIES AT NATIONAL LEVEL IN THE FRAMEWORK OF THE IHP

1.2.1 National/local scientific and technical meetings

(1) National Flood Control and Drought Mitigation Meeting was held on 3 Feb 2012 in Chongqing city.



This is an annual meeting organized by the National Headquarter for Flood Control and Drought Mitigation. A flood control and drought mitigation are usually based on coordination of organizations and agencies at different levels, senior officials from the Ministry of Water Resources, Ministry of Land Resources, headquarters of flood control and drought mitigation of each river basins, China Meteorology Agency and provincial flood control and drought mitigation organizations and agencies took part in the meeting.

The minister Mr. Chen Lei and the vice minister Mr. Jiao Yong, of MWR, attended the meeting and gave important strategic talks to guide the work for the year of 2012.

The meeting reviewed the past year work on flood control and drought mitigation and set up new objectives for future work under the situation of increasing pressure on flood management and water scarcity issues for all sectors of the society. Special attention has been given to the implementation of the so-called No. 1 Article of the State Government in which water work was high lightened as the top priority among all other works and developments in the coming years of national work.

(2) National Hydrology work meeting was held during 26-27 March 2011, in Xian, Shanxi province.

This is an annual work meeting particularly in the field of hydrology. The vice minister of WMR - Mr. Hu Siyi, Chairman of China IHP national committee also the director general of the bureau of hydrology of WMR, Mr. Deng Jian, and various committee members of the national IHP committee participated the work meeting. Officers of provincial water authorities, provincial bureau of hydrology and bureau of hydrology from each river basin commission, as well as professional from scientific institutions took part in the work meeting.



The meeting reviewed work achievements, problems and experiences learnt from the past, and discussed about the current situation and demands to hydrological work, and set up objectives for the hydrological work for the year of 2012.

(3) Meeting on Standardization of Hydrological Information was held in 17-18 August, 2012, in Jiayuguan, Gansu Province.

The meeting aims to promote and improve and further develop standardization of hydrological information at national scale. Vice director general of the bureau of hydrology, MWR attended the meeting and listed out clear requirements to future work, officers from international affair office of MWR also attended the meeting. Nearly 50 representatives from officers and experts from related departments of MWR, research institutes, some river basin commission and provincial water authorities, attended the meeting.



Standardization of hydrological information has been started in 2009, and has obtained quite significant progress so far. Requirements were given by the meeting for the future work on information compiling and the modification of the “table of hydrology technical standard system”. Promotion of the standardization to public has also been set as the next work focus.

(4) Workshop on the compiling of “Guideline on monitoring and assessment of urban hydrology” was held during 14-16 September, in Zhangjiajie, Hunan province.



About 20 participants from bureau of hydrology of MWR, Nanjing Hydraulic Institute, Yellow River Commission, Changjiang Water Resources Commission, and various provincial hydrology offices took part in the workshop.

The meeting discussed 216 comments to the “guideline” and received suggestions on the modification of the “guideline” accordingly.

(5) Training courses on the operation of soil moisture monitoring equipment was given during 17-20 Sept, in Changsha, Hunan province.



The training course was organized and co-organized by the bureau of hydrology of MWR and Nanjing Hydraulic Institute. Nearly 70 engineers from hydrology offices of provinces and river basin commissions etc. participated in the training course. Professors from Nanjing Hydraulic Institute, Bureau of Hydrology of MWR provided technical lectures for the course. The main topics include: methodology and technology on soil moisture monitoring, main contents of the information system of the national flood control and drought mitigation, introduction to technology and equipment of soil moisture monitoring etc.

During the training course, officers from the bureau of hydrology of MWR have also collected suggestions and comments on future work of soil moisture monitoring at national scale. Suggestions have been given to the future work.

(6) Reviewing workshop on the editing and compelling “Planning of national water resources monitoring network” was held on 22 May, 2012, in Beijing.

Officers and experts from departments of water resources, finance, hydrology, project office of state water resources monitoring capacity building, center of hydrological information participated in the workshop. According to Mr. Deng Jian, Chairman of IHP national committee, also the director general of the bureau of hydrology of MWR, the “planning” is the most important guideline for the implementation of the so-called “most strict” water resources management policy.



Experts and professionals reviewed and consulted the “planning” report. The “planning” report has categorized 4 types of monitoring network including provincial boundary, boundary of city/towns, groundwater and intake water monitoring network. Such monitoring planning has improved the hydrological and water resources monitoring network capacity, and shall be able to provide support for water resource management with comprehensive information. The report has passed the review and received approval from the workshop.

(7) Workshop of reviewing “technical regulation of automatic hydrological monitoring and reporting” (revision) during 22-23 May, 2012, in Beijing.

20 experts and officers from the bureau of hydrology of MWR, international affair office of MWR, information center of MWR, Beijing University, Bureau of Hydrology of Yellow River Commission and Huai River Commission, hydrological offices of provinces of Jiangxi, Sichuan, Anhui, Shanghai, Zhejiang etc., participated the workshop. The experts reviewed the report and considered that the modified regulation has made improvement to the current situation with innovative techniques and methodology and approved the regulation from technical point of view.

(8) “The 12th 5-year planning of informatics development of hydrology” was issued on 3 May 2012, by the Ministry of Water Resources (MWR) of China.

The 12th 5-year planning of informatics development of hydrology is a guideline for the short-term development and implementation of innovative technology in water works. It has provided directors, principles, targets and programme, as well as supporting guarantees to the implementation of the planning.

(9) Training course on “Implementation of technology on data inquiry and transferring of Groundwater” was given during 26-30 March, 2012, in Hangzhou.



The objective of the training course was to improve technical capacity on monitoring and information transferring technology of groundwater. More than 90 engineers from provinces and river basin commissions participated in the course. The course was organized by Nanjing hydraulic institute. The training course has provided broad knowledge on theory and practices regarding how to measure groundwater with a systematic lectures.

1.2.2 Participation IHP Steering Committees/Working Groups

NIL.

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.

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

(1) The 5th International Yellow River Forum was hold during 24-28 Sept, 2012, in Zhengzhou city, China.

The 5th International Yellow River Forum (IYRF) on ensuring water right of the river's demand and healthy river basin maintenance was jointly organized by Yellow River Commission and various international institutions / organizations such as the Global Water Partnership, International Commission on Large Dams, World Wide Fund for Nature etc. With the main theme of "ensuring water right of the river's demand and healthy river basin maintenance", four sub-forums of "climate change", "severe water resource crisis", "water shortage and efficiency management" were organized. The forum focuses on hot spots of water issues about the integrated water resources and river basin management, facing the deteriorating ecological and living environment, taking into account demands of both rivers and human beings, the objectives are to ensure right of the river's, protect the ecosystem and sustainable development of rivers, and provide positive support for living and development of human beings. During the forum, a large-scale exhibition of product and results of water-related works were presented. During the 5-day forum, over 1000 participants took part in the forum, in which about 300 professionals are from 60 different countries.



The opening of the 5th Yellow River Forum (left) and Minister Chen Lei gives speech (Right)

The particular contribution of the forum shall be given to the participation and talks given by the minister of Mr. Chen Lei. During the first two days of the conference the Chinese water minister Chen Lei held high level talks with delegations from Australia, Zimbabwe, USA, France, European Commission and the Netherlands.

With the EU-delegation the minister discussed the progress of the newly formed China-European water platform (CEWP). Represented by the Danish environmental minister Ida Auken, the EU-delegation and the Chinese ministry of water resources agreed on a first working programme 2012-2015 for the platform that was initiated six months ago during the World Water Forum in Marseille, France. The aim of the platform is

to hold dialogues and strengthen joint research on improvement of water resource management. Three pillars of the cooperation are policy dialogue, research and business development. Denmark, Portugal and Hungary are already full participants in the new platform, whereas other European countries are in the stage of talks.



Mr. Chen Lei hold meeting with delegation from EU (left hand) and the Netherlands.

Regarding the cooperation with the Netherlands, on Sept 24, Minister Chen Lei met the Dutch delegation led by deputy director Ingwer de Boer of the ministry of infrastructure and environment, and exchanged views on cooperation related to water resource and flood risk management, the progress of the Memorandum of Understanding signed in Nov 2011.

During the Forum, scientists, water professionals and stakeholders presented and shared their views and knowledge regarding integrated water resources and river basin management.

(2) Workshop on Science Initiative of International Association of Hydrological Science (IAHS) was held during 11-13 May, 2012, in Nanjing, China.

Chinese academia Mr. Zhang JiangYun, also the chairman of IAHS of China national committee, and Chancellor of Hohai University Mr. Wang Cheng attended the meeting. Bureau member of commissions of IAHS also attended the meeting. The meeting was jointly organized by IAHS, and Hohai university, and IAHS China national committee. Professional from Canada, France, the Netherlands, Italy, Sweden, Australia, Russia, South Africa and IWHR china, Qinghua University, Beijing Normal University, Hohai University and the state key laboratory of water resources and hydraulics took part in the workshop.



The workshop discussed about Scientific Initiative for the next decade of IAHS, including themes, objectives, programme etc. This is another new initiative since IAHS has started the PUB program. The initiative was planned to be published during the next Assemble in July 2013 in Gothenburg, Sweden.

(3) Signing of Agreement on “Sino-Dutch cooperation on early warning and forecasting of engineering measures for flood management” between Yellow River Commission and AGT the Netherlands on 17 Nov, 2011, in Beijing.

The agreement aims to take comprehensive and real-time monitoring to the engineering measure of flood management, i.e. the dike of the Yellow River, which is very important to the sustainable development of the mid-downstream of yellow river.

(4) Workshop Sino-EU project on of the “post-assessment of river basin management project” on 24 Nov, 2011, in Beijing.

More than 50 professionals from the various departments of MWR including the department of Planning, department of International cooperation and the center station of construction and management, as well as experts from UNDP, project office of Sino-EU project of “integrated river basin management”, Germany, The Netherlands and Australia, took part in the workshop. As part of the Sino-EU project of “integrated river basin management”, this project aims to assess the effectiveness of some water project using EU methodology on project management. The assess area include river regulation projects, water saving projects, construction of reservoirs, development of informatics etc. The ultimate objective of this project is to improve the technology and methodology on post-assessment of water project of China, and provide valuable reference to decision making regarding investment and management of water-related project.

(5) Wrap-up meeting of Sino-EU project of “integrated river basin management” was held on 21 June, 2012, in Beijing.

Vice minister of MWR china, Mr. Liu Ning, Ambassador of EU attended the meeting and delivered opening speech. Nearly 100 people from EU, EU embassies, World Bank, Ministry of Commerce of China, Ministry of Environmental Protection, Ministry of Water Resources, Changjiang Water Resources Commission, Yellow River Commission, Peal River Commission and Experts from project office participated the meeting.



commissions on various areas.

The project was initiated in September 2005. It aims to assist China with EU knowledge experiences particularly the Water Directive Framework of EU, on the sustainable development and exploration of water resources, as well as adaptation to climate change and global change. The project was implemented by the MWR, and has been cooperated with several river basin

(6) May 22, 2012, Sino-Japanese Symposium on Dam Management and Workshop of Dam Safety Monitoring and Maintenance were held in Nanjing, China.

The symposium was sponsored by the Human Resources Development Center and Dam Safety Management Center of MWR. More than 100 delegates from MWR Department of Construction and Management, Human Resources Development Center, Dam Safety Management Center, Changjiang Water Resources Commission, Huai River Water Resources Commission, Hai River Water Resources Commission, Zhejiang Provincial Department of Water Resources, Ningbo Municipal Water Conservancy Bureau, and other reservoir management departments attended the symposium. More than 70 of them attended the workshop. Sessions were held on dam damage after the Tohoku earthquake of 2011, dam safety assessment, deformation measurement studies of earth-rockfill dams, legislation and framework of dam safety management, etc., in which experts had in-depth discussions. Representatives of dam managerial bodies also introduced their practices and experiences of dam management at the symposium.

At the symposium was also released Guidelines for Reservoir Management, a book written by more than 100 experts of both China and Japan.

After the symposium, more than 70 attended the workshop at which they were trained for dam safety monitoring, risk management, repair and maintenance, etc. They also learned Japanese practices and experiences of dam management and had discussions over existing problems of the field, popularization of the Guidelines, and training of dam managers as well.

(7) Opening Ceremony of "Ministerial Seminar on Water Resources and Small Hydropower for Developing Countries", on 1st November, 2011, in Hangzhou, Zhejiang Province.

Jointly sponsored by Ministry of Commerce and Ministry of Water Resources and undertaken by National Research Institute for Rural Electrification (NRIRE), was held in Hangzhou. In total there were 25 high level government officials including ministers, deputy ministers and department heads from 12 countries in Asia and Africa, attended the Seminar. This is the first ministerial seminar in the field of water resources and small hydropower that was held by the Chinese government, with the purpose of strengthening the communication and cooperation between China and other developing countries in the field of water resources and small hydropower, sharing success experiences, advanced technologies and the best practice, promoting the effective utilization of water resources and sustainable development of small hydropower in the whole world.

(8) The 10th "Water Forum of China" was held on 25 August, 2012, in Wuhan, China.



The forum set the main theme on "water issues and solutions under changing environment". This is the 10th forum aiming to discuss water issues and finding solutions after the 1st forum was held in 2003. The forum reviewed the experiences and lessons during the past years, and discussed new solutions and technology to deal with the increasing water disasters. The

forum consisted of 5 sub-forums of "hydrological changes under changing environment", "water resources allocation and sustainability under changing environment", "hydropower exploration and optimization of multiple reservoirs operation", and "evolution of floods and drought and its mitigation solutions".

More than 400 professionals from universities, research institutions, governmental offices, and enterprises of Norway, Hong Kong, and Mainland China, participated in the forum.

(9) Working with UNESCO-IHE and WWAP for contribution to the World Water Development Report 5, to be published in 2015.

During the 5th IYRF, Prof. Andras Szollosi-Nagi, rector of IHE, and Prof LIU Heng, Vice-Chairman of China-IHP discussed participation of International Center on Small Hydropower for contribution to the report, which topic is water and energy. This will be the first report after new mechanism for certain topic and compact report annually.



1.2.5 Other initiatives

NIL.

1.3 EDUCATION AND TRAINING COURSE

1.3.1 Contribution to IHP courses

NIL.

1.3.2 Organization of specific courses

(1) Training course on Urban Flood Risk Management was held in 23-27 Sept, 2012, in Guangzhou.

Jointly Organized by ESCAP, Typhoon Commission of WMO, and the bureau of hydrology of MWR of China, Bureau of Hydrology of Guangdong Province, the workshop of urban flood risk management (UFRM) training course. Participants are hydrologists and meteorologist from Typhoon commission, China, Malaysia, Philippine, Thailand, Vietnam; lectures were given by professors and experts from Hehai University, Zhongshan University, and China Institute of Water Resources and Hydropower Research (IWHR).



The major topics of the training course include application of Xinanjiang model in Rivers of China, Application and technology of the combination of hydrological and meteorological products (QPE/QPF), urban inundation risk mapping and early warning and forecasting model of urban flood.

(2) Training course on “Integrated water resources and river basin management” between China and France was held during 29 Feb ~ 2 March, 2012, in Tianjing.

Organized by Haihe river commission, representatives from organization of Senna river of France, Hai river commission, Water Authority of Tianjing city, Water Authority of Hebei province etc., took part in the training programme. This is the 3rd training course given in China during the 1st stage of binaural cooperation between France and China. It aims to provide mutual understanding to water resources management and provide better cooperation basis for the 6th world water forum held in France in March, 2012.



During the training course, Mr. Régis THEPOT, the chairperson of Senna river organization introduced the policies regarding environment protection and water management in France, special attention has been given to the restoration of environment and ecology. Field trip to the water resources management of Zhou river has been also made.

1.3.3 Participation in IHP courses

No participation to IHP Courses during Nov 2011 to Oct 2012 basically due to lack of financial support.

No observation of how many have actually participated in (or have received) the distance learning via web-courses. But the web-based distance learning notices received from UNESCO Jakarta office have been widely distributed through IHP China website and emails from IHP China secretariat.

1.4 PUBLICATION

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1.5 PARTICIPATION IN MEETINGS ABROAD

No observations.

1.6 OTHER ACTIVITIES AT A REGIONAL OR INTERNATIONAL LEVEL

No observations.

1.6.1 Institutional relations / co-operation / exchanges

No observations.

1.6.2 Completed and ongoing scientific projects

Contributed to project of “River catalogue” Volume VI, 2012. After the meeting in Hanoi Vietnam, IHP China has contributed to the “river catalogue” project with Tanghe River basin information. Tanghe River is a tributary of Changjiang River of China, with the catchment area of 8010 km². The information has been submitted to the editor in Feb 2011. Further modification has been made under the requirement of UNESCO Jakarta office in 2012.

2. FUTURE ACTIVITIES

2.1 ACTIVITIES PLANNED TO UNTIL DECEMBER 2012

For IHP China, the National Committee will:

- Continue paying high attention for regional (and international) cooperation under IHP framework and encourage cross-cutting cooperation with other international programme.
- Contribute to the implementation of IHP VIII strategic plan particularly on the integrated river basin management via case studies, however such activity require strong convener-ship from UNESCO-IHP at either global level or regional level.

2.2 ACTIVITIES FORESEEN FOR 2012-2013

Projects related to IHP-VII themes will be continuously supported by the Ministry of Water Resources through IHP national Committee. IHP national committee will continue to encourage scientific and technical symposia and workshops. Meanwhile, initiatives for IHP-VIII themes will be encouraged by the National Committee. Cooperation among the Southeast Asia and the Pacific will be top priority. In summary, the activities will include (but not only) as below:

- Annual IHP national committee meeting to be held in April - May 2013. The objective is to strengthen participation from members and cooperation between them. Progress will be presented to the members; initiative of participation & supporting IHP activities shall be proposed and discussed.
- Continue to implement collaborative researches project with IRTCES on erosion and sedimentation.
- Continue researching and collaboration on climate change impact on the hydrological cycle and water resources following the theme of IHP Phase VII.
- Encourage and initiate project following the new themes of IHP phase VIII, which will focus on water scarcity and environmental issues as well as integrated river basin management.
- Further continue colorations with international counterparties (e.g. Switzerland, the Netherlands, USA etc.) to promote and develop integrated water management concepts from different perspective such as risk management (Swiss), reservoir operation (USA) and environmental concerns.
- Continue collaboration with USA and UK on hydrometric technical development particularly on uncertainty quantification.
- Cooperate with regional IHP national committees to develop a development strategy on Small Hydropower.
- Participate in national planning on water resources management, hydrological professional development, promote basin-wide integrated water resources management at national scale.
- To facilitate national planning on water resources management, a planning of rainfall monitoring network for small rivers is developed. According to the plan, from 2012 onwards, jointly with the bureau of Meteorology, for 5202 rivers, 48537 rain gauges are planned for 31 provinces and cities of China. Amongst it, 17920 will be built by the Bureau of Meteorology, and 30617 rain gauges to be built by the

Ministry of Water Resources which include 26217 new gauges and 4400 restored gauges.

- Participate in national rural drinking water planning and national drinking water sources area protection planning.
- Participate in national rural drinking water safety evaluation and planning, continue developing water quality protection technology.
- Providing training course for participates from developing countries on hydrological monitoring and flood forecasting technology
- Develop and promote integrated water resources management particularly on multiple reservoir operation and optimization.
- Other activities that will be organized at national/local (or basin-wide) levels by the committee members

2.3 ACTIVITIES ENVISAGED FOR THE LONG TERM

China IHP National Committee will continue contributions to IHP actives, especially, may host RSC meeting/workshops/conferences, or join co-team for regional and international cooperation. In the phase of IHP-VIII, working groups will be established for more cooperation activities. The committee will also promote and encourage young scientists to be actively involved in IHP work at national and international level.

Furthermore, it has to be noted that as UNESCO IHP China is a committee without **firm** management and organizational mechanism, it is difficult to gain driving forces to facilitate or promote HIP work. Thus, the secretariat will propose to the committee to promote IHP to gain more public attention and attract more participation from scientists and professionals from research institutions, in addition to the governmental organizations.

REPORT OF THE INDONESIA NATIONAL COMMITTEE OF IHP

1. ACTIVITIES UNDERTAKEN IN THE PERIOD OCTOBER 2011 – OCTOBER 2012

1.1 Meetings of the IHP National Committee

The organizational structure of the Indonesian National Committee for IHP consist of a Chairman, a Vice Chairman, two Secretaries, and 23 members from various research institutes, universities and sectoral-Ministries.

The new composition of the National Committee is:

Chairman	: Dr. Iskandar Zulkarnain
Vice Chairman	: Ir. Bambang Hargono, M. Eng
Secretary I	: Dr. Tri Widiyanto
Secretary II	: Dr. Bogie Sudjatmiko
Members:	
1. Prof.Dr. H. Arief Rachman	: Executive Chair of National Commission for Unesco – Ministry of Education and Culture
2. Prof. Drs. Agus Subekti MSc, PhD	: Ministry of Education and Culture
3. Prof.Dr. Hery Harjono	: Indonesian Institute of Sciences (LIPI)
4. Prof. Dr. Hidayat Pawitan	: Bogor Agriculture Institute (IPB)
5. Ir. Dodid Murdohardono, MSc	: Ministry of Energy and Mineral Resources
6. Dr. Ir. William M. Putuhena M.Eng	: Ministry of Public Works
7. Prof. Dr. Sudarto Notosiswoyo	: Technology Institute of Bandung (ITB)
8. Drs. Endro Santoso, MSi	: BMKG
9. Drs. Arko Hananto Budiadi	: Ministry of Foreign Affairs
10. Dr. Titi Anggono	: Indonesian Institute of Sciences (LIPI)
11. Dr. Ir. M. Rahman Djuwansah	: Indonesian Institute of Sciences (LIPI)
12. Ir. Sudaryati Cahyaningsih	: Indonesian Institute of Sciences (LIPI)
13. Dr. Indreswari Guritno	: University of Indonesia (UI)
14. Dr. Istiqlal Amien	: Ministry of Agriculture
15. Dr. Budi Kartiwa	: Ministry of Agriculture
16. Ir. Imam Anshori, MT	: National Water Resources Council
17. Dr. Arie Setiadi Moerwanto, MSc	: Ministry of Public Works
18. Dr. Sutopo Purwo Nugroho	: National Bureau of Disaster Management (BNPB)
19. Dr. Gadis Sri Haryani	: Indonesian Institute of Sciences (LIPI)
20. Drs. Budi Suhardi, DEA	: BMKG
21. Dr. Armi Susandi	: National Climate Change Council (DNPI)
22. Dr. Saiful Anwar	: Ministry of Forestry
23. Dr. Ignasius D.A. Sutapa	: Indonesian Institute of Sciences (LIPI)

The committee hold bimonthly coordination meetings and in additional several technical meetings as needed for the planning and implementation of seminars and workshops organized under coordination of the committee. The committee routine meetings is attended by the Chairman of the Indonesian Committee for UNESCO and by Program Specialist of the UNESCO Jakarta Office. Members of the national committee through regular meetings distribute informations gathered during the meeting as well as report to the meeting hydrological and related activities in their organizations.

1.1.1 Status of IHP-VII activities

Theme 1. Adapting to impacts of global changes on river basins and aquifer systems

1. Global change and feedback mechanism of hydrological processes in stressed systems
2. Climate change impacts on hydrological cycle and consequence impact on water resources
 - Impacts of landuse and climate change on hydrologic regime on a watershed
 - Studies on water resources carrying capacity (WRCC)
3. Hydro hazards, hydrological extremes and water related disasters
4. Managing groundwater systems' response to global changes
5. Global change and climate variability in arid and semi arid region

Theme 2. Strengthening water governance for sustainability

1. Cultural, societal and scientific responses to the crisis in water governance
2. Capacity dev., for improved governance; enhanced legislation for wise stewardship of water resources
3. Governance strategies that enhance affordability and assure financing
4. Managing water as shared responsibility across geographical and social boundaries
5. Addressing the water energy nexus in basin wide water resources

Theme 3. Ecohydrology for sustainability

1. Ecological measures to protect and remediate catchment processes
2. Improving ecosystem quality and services by combining structural solutions with ecological biotech. : Research Center for Limnology-Indonesian Institute of Sciences (LIPI) conduct research on Ecohydrology application in Lake Limboto, Gorontalo Province
3. Risk based environmental management and accounting
4. Groundwater-dependent identification, inventory and assessment ecosystems : Research Center for Physic - Indonesian Institute of Sciences (LIPI) conduct research on Groundwater identification for community and economy in Serang, Province of Banten
5. Global change and climate variability in arid and semi arid region

Theme 4. Water and life support system

1. Protecting water quality for sustainable livelihoods and poverty alleviation
2. Augmenting scarce water resources, especially in small island developing states
3. Achieving sustainable urban water management
4. Achieving sustainable rural water management

Theme 5. Water education for sustainable development

1. Tertiary water education and professional development
 - Basic hydrological training for the water resources managers of the river area
 - DUWRMT formation in the Ministry of Public Works as a unit of knowledge dissemination and knowledge management on water resources including hydrology
 - Centre River Basin Organization Management (CRBOM) establishment as a center that will facilitate the implementation of experience in water resources management based on river basin carried out by the RBO (River Basin Organization)
2. Vocational education and training of water technicians
3. Water education in school
4. Water education for communities, stakeholders and mass-media professional

1.1.2 Decisions regarding contribution to/participation in IHP-VII

1.2 Activities at national level in the framework of the IHP

- National Seminar of Limnology : Management of 15 Priority Lakes in Indonesia
- Research of hydroclimate characterization in Semayang – Melintang Lakes National Congress of Sciences with sub theme “Water and its problems” in Jakarta 2011

- Faculty of engineering students, Indonesia University, in March 28 2012 organized World Water Day Festival, sponsored by the Directorate General of Water Resources, Ministry of Public Works, consisting of
 - kindergarten children : coloring contest;
 - primary school children : reading poetry and singing
 - secondary school children : poster drawing contest and writing
 - high school children : research and draw a poster

Total attendees 250 children, with World Water Day Theme: Water and Food Security. The Festival goal is to raise awareness and wisdom of children facing problems of water and food that threatens the world. In the future we will include the informal education sector.

1.2.1 National/local scientific and technical meetings

- Hearings with the House of Representatives Commission VII, on the research of 15 priority Lakes in Indonesia
- Technical Meeting to construct Government Regulation of water resources management in Indonesia
- Technical Meeting to construct Government Regulation of mangrove and wetland areas zonation
- Technical Meeting with the Ministry of Marine Affairs and Fisheries to identify the potential resources of 15 priority lakes in Indonesia (Tri Widiyanto)
- Attend to the meeting of Rawa Pening Lake management in Semarang Indonesia
- Hidayat Pawitan, as Resource person at the meeting of the National Congress of Sciences
- Ignasius D.A. Sutapa, as Resource person at the meeting of the National Congress of Sciences
- Committee member of the National Seminar of Limnology LIPI
- Meeting with the Ministry of Education and Culture, and Indonesia National Committee for Unesco

1.2.2 Participation in IHP Steering Committees/Working Groups

Annual meetings of the Regional Steering Committee for IHP in the Asia Pacific region are held in rotational base locations. Indonesia has always participated in these yearly meetings.

1.2.3 Research/applied projects supported or sponsored

RC for Limnology – Indonesian Institute of Sciences :

- Development of Saguling Reservoir Demo-site

RDC for Water Resources – Ministry of Public Works

- Flood forecasting and warning system
- Area reduction factor in West Jawa
- Rainfall runoff relationship for flood analysis
- Hydrological characteristics and the erosion rate as a function of land use change
- Balance and utilization of water resources strategy
- Balance and allocation of water in Indonesia
- Forecasts and drought control in the River watershed of Pemali Comal
- Development of flood and drought risk map of the Java island
- Raw water supply technology development in East Java

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

- Biovillage development in Giam Siak Kecil – Bukit Batu Biosphere Reserve in collaborate with MAB – Unesco : Promoting Alternative Technology To Provide Clean Water In Peat land Area
- Development of Peat Water Treatment Technology To Provide Clean Water In Peat land Area in coloboration with Katingan Prefecture – in Central Kalimantan
- Committee member of the National Congress of Sciences especially in water field

1.2.5 Other initiatives

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

1.3.2 Organization of specific courses

1.3.3 Participation in IHP courses

- International Training Program on Technology for Water Management, Belgium, December, 2011
Focuses on understanding the water system and applying technology to enhance integrated water management. The program aim to improve the understanding of concepts and systems and enhance knowledge regarding tolls and technologies for water management.
- 21st IHP Nagoya Training Course in Asia and Pacific Region on Introduction to River Basin Environment Assessment under Climate Change. @8 November – 9 December 2011, Kyoto University, Japan.
This course focuses on three main objectives: (1) to acquire the latest knowledge on hydrology and environmental assessment under the influence of climate change on the scale of the catchment area in the Asia-Pacific, (2) use of simulation exercises catchment environmental assessment, (3) to discuss the possibility of implementing the environmental assessment of the catchment into several hydrologic and environmental management.

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

1.5 Publications

- Proceedings of National Symposium on Ecohydrology “Integrating Ecohydrological Principles for Good Water Governance” on 24 March 2011 in Jakarta, Indonesia
- Ignasius Sutapa, Water Quality Assesment In Giam Siak Kecil – Bukit Batu Biosphere Reserve, Riau Province. Proceeding of International Workshop on “Sustainable Management of Bio-resources in Tropical Peat-swamp Forest” LIPI, Bogor/Cibinong, July 19th, 2011
- Ignasius Sutapa, Alternative Technology To Provide Clean Water In Peatland Area Of Gsk – Bb Biosphere Reserve - Riau Province. Proceeding of The 2nd International Workshop on South-South Cooperation for “Sustainable Development in the Three Major Tropical Humid Regions in the World”, Pekanbaru, Indonesia, 4-8 October 2011
- Ignasius Sutapa, Bio-Village Development Concept In Giam Siak Kecil Bukit Batu Biosphere Reserve, Riau Province: Development Of Peat Water Treatment Technology To Provide Clean Water Basic Needs. Proceeding of Korea International Symposium on “Addressing Water Quality Challenges in Asia”, jointly organized by UNESCO’s International Hydrological Programme and K-Water Institute. Daejeon, Republic of Korea, 07-09 December 2011.
- Reliana Lumban Toruan, 2012, Zooplankton emerging from fresh and saline wetlands, Journal of Ecohydrology and hydrobiology, Vol.12 no 1. 2012
- Tjandra Chrismada, Gadis Sr Haryani, M Fakhruddin, Lukman, I Ridwansyah, and P E Hehanussa. Ecohydrology approach for rehabilitation of lake Limboto in Gorontalo, Indonesia, Journal of Ecohydrology. 2011.
- Sudarto Notosiswoyo, "Early Step to prevent Environmental Impact in Mining Project. Case studiess: Mine Water Management in Messel Gold Mine, Minahasa, North Sulawesi and Sorowako Lateritic Nickel Mine, Luwu, South Sulawesi". Journal of Novel Carbon Resource Sciences Vol. 5, Februari 2012; ISSN 18884-6300

1.6 Participation in international scientific meetings

- Gadis Sri Haryani presented a paper entitled “Concept & Application Of Ecohydrology In Indonesian Inland Waters”, International Workshop on New Ecohydrology Demonstration Site Projects “Ecohydrology for Managing Sustainable Water Futures”, in Jakarta, Indonesia, 21 – 23 March 2011

- Peter Hehanussa presented a paper entitled “APCE in Indonesia” on National Symposium on Ecohydrology “Integrating Ecohydrological Principles for Good Water Governance” on 24 March 2011 in Jakarta, Indonesia
- Ignasius D.A. Sutapa presented a paper to the Korea International Symposium : ”Addressing water quality challenges in Asia/Pacific”, in Daejon, Korea, 7 – 9 December 2011
- Sudarto Notosiswoyo, presented a paper entitled “Prevention of water / groundwater pollution due to mining activities” to the Symposium Global Center of Excellence – 8th Novel Carbon Resource Sciences in Nagpur – India, 14-16 December 2011
- MHI seminar sponsored by the Ministry of Public Works, the Application of Technology Assessment Agencies, Ministries of Agriculture, Agency for Geospatial Information and Agency for Meteorological and Geophysical.
- National seminar on dam safety sponsored by the Ministry of Public Works, the State Electricity Company, Indonesia national committee for large dams
- Ignasius D.A. Sutapa gives presentation to the International Workshop “The Asia Pacific Water Museum : Concept and Development” NWM, Pathum Thani 24 – 25 June 2012.
- Gadis Sri Haryani gives presentation to the International Seminar on Ecohydrology and Global Water Issues, University Algarve, Faro, Portugal, 4 – 5 September 2012

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1.7 Meetings hosted by the country

- Asia Pacific Centre for Ecohydrology, Indonesian National Committee for IHP-UNESCO, Indonesian Institute of Sciences, Indonesian National Committee of Indonesia conducted International Workshop on New Ecohydrology Demonstration Site Projects “Ecohydrology for Managing Sustainable Water Futures”, in Jakarta, Indonesia, 21 – 23 March 2011
- Asia Pacific Centre for Ecohydrology, Indonesian National Committee for IHP-UNESCO, Indonesian Institute of Sciences, Indonesian National Committee of Indonesia, organized National Symposium on Ecohydrology “Integrating Ecohydrological Principles for Good Water Governance” on 24 March 2011 in Jakarta, Indonesia

1.7.1 Participation in meetings abroad

- Dr. Gadis Sri Haryani, Dr. Ignasius D Sutapa, Dr. Tri Widiyanto, participated UNESCO IHP 19th RSC Meeting in Kyoto – Japan December 2011
- Prof. Peter Hehanussa and Dr. Gadis Sri Haryani, participated UNESCO IHP 18th RSC Meeting for Southeast Asia & The Pacific (SEAP) in Hanoi, Vietnam. in conjunction with a the Fifth APHW conference on Hydrological Regime and Water Resources Management in the Context of Climate Change (HWCC 2010) took place in Hanoi, Vietnam 8 – 12 November 2010.
- Dr. Gadis Sri Haryani, Dr. Ignasius D Sutapa, Dr. Tri Widiyanto attend to EXTREM Symposium in Kyoto Japan, December 2011
- Dr. Ignasius D.A. Sutapa attend to Korea International Symposium : ”Addressing water quality challenges in Asia/Pacific”, in Daejon, Korea, 7 – 9 December 2011
- Dr. Ignasius D.A. Sutapa attend to the International Workshop “The Asia Pacific Water Museum : Concept and Development” NWM, Pathum Thani 24 – 25 June 2012
- Dr. Gadis Sri Haryani attend to the International Seminar on Ecohydrology and Global Water Issues, University Algarve, Faro, Portugal, 4 – 5 September 2012.

1.8 Other activities at regional level

1.8.1 Institutional relations/cooperation

1.8.2 Completed and ongoing scientific projects

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2012

- Participation in IHP-Training course
- Development of Saguling Demo-site

2.2 Activities foreseen for 2012-2013

- Asia Pacific Centre for Ecohydrology, Indonesian National Committee for IHP-UNESCO, Indonesian Institute of Sciences, Indonesian National Committee of Indonesia, will continue to conduct on going research on Ecohydrology Demosite “Sediment Deposition System on Saguling Reservoir”
- Participation in IHP-RSC meeting Asian Pacific FRIEND
- Participation in IHP-Training course
- Conducting International seminar on Ecohydrology, in cooperation with the Ministry of Education and Culture of Indonesia
- Conducting regional training on ecohydrology, in cooperation with UNESCO Jakarta Office and KNIU
- Constructing the building of APCE Secretariat in Cibinong Sciences Centre Area

2.3 Activities envisaged in the long term

- Participation in IHP-RSC activities and IHP Intergovernmental Council meetings.

NATIONAL REPORT ON IHP-RELATED ACTIVITIES

Japan

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 Commission for UNESCO has discussed and made proposal on “Sustainability Science” which is a scientific concept as the integrated approach to build a truly sustainable society. At the occasion of 36th General Conference in November 2011, Japan has submitted a proposal on “Sustainability Science” to UNESCO. This concept contributes to the International Hydrological Programme (IHP) of UNESCO from the view of promoting sustainable development and sustainability science within the framework of UN Decade of Education for Sustainable Development 2005-2014 (DESD). Based on this concept, 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 October 2011 to November 2012.

3. ACTIVITIES UNDERTAKEN IN THE PERIOD JULY 2010 – MAY 2012

3.1 Meetings of the IHP National Committee

3.1.1 Decisions regarding the composition of the IHP National Committee

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

Members of the IHP National Committee as of May 2012.

	Name	Position	E-mail
Chair *	TAKARA Kaoru	Prof., DPRI, Kyoto Univ.	takara.kaoru.7v@kyoto-u.ac.jp
*	UEMATSU Mitsuo	Director and Prof., CICAORI, Univ. of Tokyo.	uematsu@aori.u-tokyo.ac.jp
*	SUZUKI Kunio	President, Yokohama National Univ.	k-suzuki@ynu.ac.jp
	OKI Taikan	Prof., IIS, Univ. of Tokyo	taikan@iis.u-tokyo.ac.jp
	KAWAMURA Akira	Prof., Tokyo Metropolitan Univ.	kawamura@c.metro-u.ac.jp
	KOIKE Toshio	Prof., Univ. of Tokyo	tkoike@hydra.t.u-tokyo.ac.jp
	SHIMIZU Yoshihisa	Prof., Kyoto Univ.	shimizu@biwa.eqc.kyoto-u.ac.jp
	TACHIKAWA Yasuto	Assoc. Prof., Kyoto Univ.	tachikawa@hywr.kuciv.kyoto-u.ac.jp
	TANAKA Shigenobu	Deputy Director, ICHARM	s_tanaka@pwri.go.jp
	TANIGUCHI Makoto	Prof., RIHN	makoto@chikyu.ac.jp
	TSUJIMURA Maki	Prof., Univ. of Tsukuba	mktsuji@geoenv.tsukuba.ac.jp
	NAKAMURA Kenji	Prof., HyARC, Nagoya Univ.	nakamura@hyarc.nagoya-u.ac.jp
	NAKAYAMA Mikiyasu	Prof., Univ. of Tokyo	nakayama@k.u-tokyo.ac.jp
	HORI Tomoharu	Prof., WRRC, DPRI, Kyoto Univ.	hori.tomoharu.3w@kyoto-u.ac.jp
	WATANABE Tsugihiko	Prof., RIHN	nabe@chikyu.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;
HyARC: Hydrospheric Atmospheric Research Center, Nagoya University;
ICHARM: The International Centre for Water Hazard and Risk Management (UNESCO Category II Centre);
IIS: Institute for Industrial Sciences, University of Tokyo;
RIHN: Research Institute for Humanity and Nature; and
WRRRC: Water Resources Research Center.

Secretariat of the Japanese National Committee for IHP, UNESCO:

c/o Ms. HORIO Taka

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/>

3.1.2 Status of IHP-VII activities

Various activities relating to IHP-VII (2008-2013) Themes have been implemented since 2008 as follows.

THEME 1: Adapting to the Impacts of Global Changes on River Basins and Aquifer Systems

FA 1.1 – Global changes and feedback mechanisms in hydrological processes in stressed systems

- Global water cycle assessment: IHP contribution to GEOSS [Univ. of Tokyo]

There are number of activities led by Prof. Koike (Univ. of Tokyo) and others as:

in Asia

- International Coordination Group (ICG) Meetings on the Global Earth Observation System of Systems (GEOSS) and Asian Water Cycle Initiative (AWCI) (GEOSS/AWCI/ICG)
 - 2nd GEOSS/AWCI/ICG Meeting, Tokyo, Japan, 16-17, April 2008
 - 3rd GEOSS/AWCI/ICG Meeting, Beijing, China, 6 November 2008
 - 4th GEOSS/AWCI/ICG Meeting, Kyoto, Japan, 6-7, February 2009
 - 5th GEOSS/AWCI/ICG Meeting, Tokyo, Japan, 15-18, December 2009
 - 6th GEOSS/AWCI/ICG Meeting, Bali, Indonesia, 13 March 2010
 - 7th GEOSS/AWCI/ICG Meeting, Tokyo, Japan, 5-6, October 2010
 - 8th GEOSS/AWCI/ICG Meeting, Seoul, South Korea, 6-8 October 2011

in Africa

- 1st African Water Cycle Symposium, Tunis, Tunisia, 6-8 January, 2009.
 - 1st Task Team meeting in preparation of the Second GEOSS African Water Cycle Symposium, Geneva, Switzerland, 23-24 September 2009
 - 2nd African Water Cycle Symposium, Addis Ababa, Ethiopia, 6-8 January, 2011.
 - GEO-UNESCO Joint Workshop on Earth Observation and Capacity Development for IWRM at River Basins in Africa, Nairobi, Kenya, 12 - 14 January 2012.
 - 3rd African Water Cycle Symposium, Libreville, Gabon, 27-29 February, 2012.
- Interaction between hydrological cycle and physical/biochemical oceanography by cooperation between IHP and IOC [JAMSTEC, Univ. of Tokyo, Kyoto Univ.]
- IHP-IOC sessions are organized at the meetings of Japan Geoscience Union (JpGU) at Makuhari Messe in May 2011 and in May 2012.

FA 1.2 – Climate change impacts on the hydrological cycle and consequent impact on water resources

- Climate change research focusing on impacts on water-related disaster risk using “Earth Simulator”: MEXT KAKUSHIN Project (2007-2012).
- The follow-on research project MEXT SOSEI Project (2012-2016).

- Global Earth Observation System of Systems (GEOSS) and Asian Water Cycle Initiative (AWCI) [Koike]
 - GEOSS/AWCI training course for the Climate Change Assessment and Adaptation Study, Tokyo, Japan, 11-12 March 2011
 - 1st AWCI Climate Change Assessment and Adaptation (CCAA) study Workshop, Seoul, South Korea, 6 - 8 October, 2011

- GWSP-Asia: HydroChange 2008 Conference, Kyoto, Japan, 1-3 October 2008:
HydroChange 2008 conference was held in Kyoto on October 1-3, 2008, and more than 180 papers were presented. The conference was organized by RIHN, GWSP, IAHS with co-sponsored by EOMF and IAHC. The conference results was published as a book “From headwaters to the ocean” from Taylor and Francis.
http://www.chikyu.ac.jp/HC_2008/

- Groundwater research such as GRAPHIC.
International symposium on “Groundwater as key for adaptation to changing climate and society” was held in Kyoto on November 14, 2010. The symposium was organized by RIHN, UNESCO-IHP-GRAPHIC, DPRI (Kyoto University), HyARC (Nagoya University), and MEXT, and more than one hundred people attended the symposium.
http://www.chikyu.ac.jp/archive/topics/2010/e-topics_101114.html

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

- Collaboration with Mongolian UNESCO Chair on Groundwater.
The monitoring system of the groundwater has been launched in Ulaanbaatar, capital city of Mongolia as one of the major activities of 2nd Phase activities of UNESCO Chair on Sustainable Management of Groundwater Resources in Mongolia.

- Second Phase of PUB project in cooperation with IAHS [Kyoto Univ., ICHARM].
Climate change research under the MEXT KAKUSHIN program was intensively conducted from 2008 to 2012.

- Climate change research on dam safety and dam functions at JCOLD.

FA 1.3 – Hydro-hazards, hydrological extremes and water-related disasters

- A Global Center of Excellence (GCOE) Program at Kyoto University “Sustainability/Survivability Science for a Resilient Society Adaptable to Extreme Weather Conditions” adopted for 2009-2014.
Interdisciplinary research and education at Ph.D. level is implemented at Kyoto University for extreme weather and water conditions [Takara, Tachikawa and others].

- A new task force on frequency analysis for non-stationary hydrological time series in ICHARM initiated since 2009
Flood damage investigation of Thai flooding in 2011 was conducted in Thailand in cooperation with various Thai authorities.
Intensive observation of radioactive materials and numerical modeling of the movement was intensively conducted at the river basins in Fukushima.

- Improving the predictability of hydrological extremes in ungaged or poorly gaged basins using new measurement technology and promoting the local use of satellite information for improved river basin management in partnership with GEOSS.

The predictability of the largest recorded flood at the Kumano River basin in 2011 was examined to verify the performance of a hydrologic model for predictions of extreme events [Tachikawa].

Space Application for Environment (SAFE), Asia-Pacific Regional Space Agency Forum (APRSA) [Koike]

Demonstration projects:

- Hong River, Viet Nam, 2008-2010
- Sangker River, Cambodia, 2009-2012
- Indus River, Pakistan, 2010-2012

- Case studies on human security and water-related disasters.
- Japan has experienced very severe water-related disasters in 2010-2012. Especially, the Great East Japan Earthquake and Tsunami (GEJET) damaged Japan very much, causing the tsunami disasters in wider coastal zones and its aftermath including radioactive contamination issues from nuclear power plants in Fukushima.
- Best practices on water risk management
 - * ICHARM, as an ICFM5 Secretariat organized the 5th International Conference on Flood Management (ICFM5) in Tokyo from 27 to 29 September 2011.
 - * ICHARM has started a UNESCO funded project “Strategic Strengthening of Flood Warning and Management Capacity of Pakistan” in response to the unprecedented Indus river flood disaster (2012-2013).
 - * ICHARM had announced a flood inundation forecast of Chao-Phraya river basin to help local people in emergent operation(2011-).
 - * Flood forecasting and management [ICHARM, PWRI, IFNet, JMA and universities] under the MEXT KAKUSHIN Program from 2007 to 2012, changes of water-related disasters and water resources under global warming were investigated.

FA 1.4 – Managing groundwater systems’ response to global changes

- 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. Many case studies are synthesized by books including “Groundwater System Responses to Changing Climate (eds.: Taniguchi and Holman)” and “Climate Change Effects on Groundwater Resources: A Global Synthesis of Findings and Recommendations (eds.: Treidel et al.)”, from Taylor and Francis.

FA 1.5 – Global change and climate variability in arid and semi-arid regions

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

THEME 2: Strengthening Water Governance for Sustainability

FA 2.1 – Cultural, Societal, and scientific responses to the crises in water governance

- Community-based integrated river basin management as a HELP follow-up [Univ. of Tokyo, Kyoto Univ.]
To share the knowledge of hydrologic modeling techniques and enhance the understanding of hydrologic predictions, CommonMP (Common Modeling Platform for water-material circulation analysis) was developed at the National Institute for Land and Infrastructure

Management (NILIM). The hydrologic modeling software is a tool for construction of hydrologic models that anyone can download from the NILIM home page [Tachikawa et al.].

FA 2.2 – Capacity development for improved governance; enhanced legislation for wise stewardship of water resources*

- Research on “virtual water”
Developed inventories of the virtual water/water footprint of industrial commodities [The University of Tokyo]
Dispatched an expert for the ISO/TC207/SC5/WG8 Waterfootprint and supported developing the community draft [The University of Tokyo]
- Collaboration with IHP-LAC for Rio de La Plata Basin Workshops
Preparatory Meeting for 6th International Workshop of Regional Approach of Development and Management of Reservoirs in La Plata River Basin [Dr. Yosuke Yamashiki, Kyoto Univ.]
- Relative impact evaluation in water resources dynamics and social systems with large development in river basins [Kyoto Univ.]

THEME 3: Ecohydrology for Sustainability

FA 3.1 – Ecological measures to protect and remediate catchments process

- Participation in ecohydrology research development
- Effect of forest devastation on water resources and environmental issues [Univ. of Tsukuba, Kyoto Univ., Kyushu Univ., Univ. of Tokyo, Tokyo Univ. of Agriculture and Technology]
- Ecohydrology symposia and sessions at AOGS meetings
Ecohydrology session (JHW02: Interaction between fresh water and ecosystem in the coastal zone) was organized at IUGG2011 meeting on July 2, 2011 at Melbourne, Australia.

FA 3.4 – Groundwater-dependent ecosystems identification, inventory and assessment*

- Frontier of sustainable groundwater management systems based on groundwater flow process in arid/semi-arid region in cooperation with China and Mongolia [Univ. of Tsukuba, Hiroshima Univ., Kumamoto Univ.]
- A new CREST Project on the impact of the forest thinning on the groundwater recharge has been launched since 2010 [Univ. Tsukuba, Kyoto Univ., Univ. Tokyo, Kyushu Univ., ...]

THEME 4: Water and Life Support Systems

FA 4.3 – Achieving sustainable urban water management

- Hydrogeological and sociological survey on development processes of East-Asian cities co-existing with floods [Kyoto Univ.]
- Human impacts on Urban subsurface environments were evaluated in seven Asian cities including Tokyo, Osaka, Seoul, Taipei, Bangkok, Jakarta and Manila by RIHN project (<http://www.chikyu.ac.jp/USE/index-e.html>) . The results were shown in a book edited by M. Taniguchi “Groundwater and Subsurface Environment – Human Impacts in Asian Coastal Cities – “ from Springer, Mar. 2011.
- New CREST (Core Research for Evolutional Science and Technology) research projects supported by the JST (Japanese Science and Technology Agency) since 2009 for Innovative Technology and System for Sustainable Water Use
The JST adopted 17 projects: 7 in 2009, 6 in 2010 and 4 in 2011.

FA 4.4 – Achieving sustainable rural water management*

- Development of a new flood management method utilizing paddies into river management against global warming [National Institute for Rural Engineering (NIRE), Univ. of Tsukuba, Univ. of Tokyo]

THEME 5: Water Education for Sustainable Development

FA 5.1 – Tertiary water education and professional development

FA 5.2 – Vocational education and training of water technicians

FA 5.3 – Water education in schools

FA 5.4 – Water education for communities, stakeholders and mass-media professionals

- Nagoya University Training Courses: The 20th and 21st Training Courses have been conducted by Nagoya University and Kyoto University, respectively, with collaboration of Research Institute for Humanity and Nature (RIHN), etc.
- 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 has been jointly conducting a three-year doctoral course, “Disaster Management”, with GRIPS since October 2010.
- Six short-term training courses have been conducted about Hazard Map, Early Warning System and Climate Change Adaptation, November 2010-May 2012. [ICCHARM]
- Capacity building and education for observation experts for continuous monitoring of terrestrial environments in Asia [Univ. of Tsukuba]
Workshops focusing on the training for the young scientists and engineers in the field of water and environment were held in July 2010 and 2011 in Tunisia, October 2010 and September 2011 in Mongolia in collaboration with UNESCO Chair Program on Groundwater in Mongolia and Environmental Diplomatic Leader Education Program, funded by MEXT.

Other regional and cross-cutting themes activities include:

(1) Catalogue of Rivers: The format of the Catalogue of Rivers for Southeast Asia and the Pacific, Vol. 6 was announced at the 15th Session of IHP Regional Steering Committee (RSC) for Southeast Asia and the Pacific (SEAP) in Manila, the Philippines, on 22-23 November 2007. Japanese contribution to Vo. 6 is the Yoshiigawa, of which draft was prepared by Dr. Hidetaka Chikamori, Okayama Univ. This volume contains seven rivers from seven countries with the inclusion of first time contributions from Korea (D.P.R.), Mongolia and Myanmar, and brings the total number of rivers catalogued in the region, including those in volumes I to VI, to 121. The information of previous five volumes locates at:

http://flood.dpri.kyoto-u.ac.jp/ihp_rsc/riverCatalogue/index.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) Hydrology for Environment, Life and Policy (HELP):

No activities during this period.

(4) Prediction in Ungauged Basins (PUB) by IAHS:

PUB-Japan members will attend IAHS 90th anniversary PUB Symposium, Delft, the Netherlands, on 23-25 October 2012 [Takeuchi, Sayama, Hishinuma].

ICHARM Director Kuniyoshi Takeuchi was awarded “2012 IAHS International Hydrology Award” at this meeting.

(5) 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 and IAHR. 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. ICHARM made active contribution to the organization of the ICFM5, held in Tokyo in September 2011.

- ICHARM, as an ICFM5 Secretariat organized the 5th International Conference on Flood Management (ICFM5) in Tokyo from 27 to 29 September 2011. More than 450 participants from 41 different nations and region participated in the conference. More than 250 participants came from abroad and others came from Japan. The ICFM5 Secretariat received 417 abstracts covering all the announced topic areas. The ICFM5 international scientific committee reviewed all submitted abstracts for relevance to the ICFM5 objectives. In total, 256 presentations were delivered during the 3-day conference at various opportunities including plenary sessions, special sessions, oral parallel and poster sessions.

-During the 19th Session of RSC-SEAP on 24-28 October,2011 the organizer invited Professor Manfred Spreafico (UNiv. of Berne, Switzerland), the leader of ISI, and organized an ISI session on the first day of the IHP Symposium EXTREME2011.

3.2 Activities at national level in the framework of the IHP

3.2.1 National/local scientific and technical meetings

(1) The JFIT Annual Reviews and Evaluation Meetings on the Proposed Science Sector Activities of UNESCO Office Jakarta were held in the UNESCO Jakarta Office in May 2011 and May 2012. The status and progress of the UNESCO science programmes in the region were reported and evaluated. Jakarta Office explained the IHP-WINGA ASPAC (Water Interoperability Networks for Global Change Adaptation in Asia and Pacific Region) project, which includes four components: RSC activities, IHP Training Course, Flood Disaster Prevention and Mitigation Measures in ASPAC region, and Sustainable Water to Improve Tomorrow’s Cities Health – Integrated Programme for Asia (SWITCH-*in-Asia*).

(2) IHP Training Course Task Forth Meetings were held several times in Tokyo and Uji (Prof. Uyeda, Prof. Nakamura, Prof. Takara, Prof. Kojiri and Dr. Takemon) and in Kyoto (Prof. Uyeda, Prof. Nakamura, Prof. Takara) to discuss the organization of the Training Courses, the plan for the 22nd Training Course, future direction, and the reviews.

(3) The 28th IHP National Committee meeting was held at MEXT on 7 May 2012 to discuss various issues relating to the 20th Session of IHP Intergovernmental Council (June 2012) and IHP-VIII (2014-2021).

3.2.2 Participation in IHP Steering Committees/Working Groups

Regional Steering Committee (RSC) for IHP in Southeast Asia and the Pacific (SEAP):

(1) The 19th RSC was held in Kyoto, Japan on 24 to 28 October 2011. The RSC adopted a resolution “Archiving hydrological disaster management/reduction technologies”. Dr. Trevor Daniell (Australia) was elected as the RSC Chairperson. [Takara, Tachikawa]

(2) The 20th RSC was held in Langkawi, Malaysia in conjunction with NESCO-IHP and the 2nd International Conference on Water Resources (ICWR2012) “Sharing Knowledge of Issues in Water Resources Management to Face the Future” *Langkawi, Malaysia, 5-9 November 2012*. The RSC Secretariat Prof. Takara was re-elected for 2010-2012. [Takara, Kawamura, Tachikawa, Kobayashi]

(3) IHP Eighth Phase (IHP-VIII) Task Force meeting at UNESCO Headquarters on 5-7 June 2011 [Oki].

(4) The 8th Steering Committee meeting of IWRM Guidelines at River Basin Level Initiative at UNESCO Headquarters on 7-11 December 2011. [Mr. Otsuki, a steering committee member]

3.2.3 Research/applied projects supported or sponsored

- MEXT Kakushin Program “Flood forecasting and management” 2007-2012, changes of water-related disasters and water resources under global warming [ICHARM, PWRI, IFNet, Kyoto Univ., Univ. Tokyo and others]
- MEXT SOSEI Program “Climate Change Risk Information” 2012-2016, changes of water-related disasters and water resources under global warming [ICHARM, PWRI, IFNet, Kyoto Univ., Univ. Tokyo and others]
- Global COE Program “Sustainability/Survivability Science for a Resilient Society Adaptable to Extreme Weather Conditions” 2009-2014 sponsored by MEXT-JSPS [PL: Prof. Kaoru Takara]
- JSPS-Asian Core Program, " Research and Education Center for the Risk Based Asian Oriented Integrated Watershed Management," 2011-2015 [PI: Prof. Yoshihisa Shimizu].
- Program for Leading Graduate Schools “Inter-Graduate School Program for Sustainable Development and Survivable Societies” 2011-2018 sponsored by MEXT-JSPS [PC: Prof. Kaoru Takara]

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

The Japanese IHP National Committee has been closely collaborating with:

- (1) 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).
- (2) The national government and its branches relating to hydrology and water resources administration,
- (3) Nagoya University and Kyoto University for IHP Training Courses and Graduate School and other universities and research institutes,
- (4) The Japan Water Forum (JWF),
- (5) World Meteorological Organization (WMO), and
- (6) International NGOs/NPOs such as the International Association of Hydrological Sciences (IAHS), the International Water Resources Association (IWRA) and the International Consortium on Landslides (ICL).

3.2.5 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. Dr. Kuniyoshi Takeuchi, the former chairman of the Japanese National Committee for UNESCO-IHP, was assigned as the founding Director of ICHARM. In its inception, 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 related disasters at the initial stage. It is important to cooperate with existing

UNESCO water Centers such as IHE in the Netherlands, IRTCES in China, HTC in Malaysia and RCUWM in Iran, etc. The outline of ICHARM is as follows.

1) Objectives: The objective of the Centre is to function as the world centre of excellence to provide and assist implementation of best practicable strategies to localities, nations, regions and the globe to manage the risk of water related disasters including flood, drought, landslide, debris flow, storm surge, tsunami and water contamination. The Centre conducts research, capacity building and information networking activities in an integrated manner for preventing and mitigating the impacts of water related disasters and thus to achieve sustainable and integrated river basin management.

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, with the advice from the Advisory Board.

See other information at: <http://www.icharm.pwri.go.jp/html/about/index.html>

The events related to the ICHARM are summarized as below.

- (1) UNESCO Science Sector Flood Mission to Islamabad, Pakistan (23-26 August 2010)
- (2) Water and Development Information for Arid lands-Global Network G-WADI meeting 24 September 2010, Cairo, Egypt
- (3) ICHARM Advisory Board (IAB) Members as third IAB held on September 2010.
- (4) Seminar "Early warning system for flood disaster mitigation", 6-7 November 2010, Hanoi, Vietnam
- (5) Short course "Early warning system for flood disaster mitigation", 6-7 November 2010, Hanoi, Vietnam
- (6) Workshop on "Space Application to Reduce Water-related disaster risk in Asia", 7-9 December 2010, Bangkok, Thailand
- (7) Explanation meeting for inspection reports to ADB, 9-24 December 2010, Dhaka, Bangladesh and Solo, Indonesia
- (8) Visit of UNESCO Evaluation Team to ICHARM (13-14 January 2011)
- (9) International workshop on Education for managing hydrological extremes and related geo-hazards, 24-26 January 2011, Islamabad, Pakistan
- (10) Meeting with UNESCO and Pakistan Governmental organization for the support of Pakistan flood disaster mitigation, 26-28 January 2011, Islamabad, Pakistan
- (11) Discussion with UNESCO for finding mission to the flooded areas of Sri Lanka, 20-29 January 2011, Sri Lanka
- (12) "Local Emergency Operation Plan with Hazard Map" The second phase was conducted for four weeks from 12 January to 16 February 2011 in Japan by ICHARM. Twelve people participated from Bhutan, Indonesia, Lao PDR, Myanmar, Nepal, Pakistan, Tajikistan, Thailand and Bangladesh.
- (13) "Capacity development for Adaptation to Climate change" has been conducted for 5 weeks from 8 February to 10 March 2011.
- (14) Workshop on Developing Capacity for resilience to water-related disasters in Pakistan through Space Applications and Disaster Risk Management, 1-4 March 2011, Islamabad, Pakistan
- (15) Organize stakeholder workshop in Dhaka and conduct community based disaster risk reduction activity, 9-24 March 2011, Solo, Indonesia.
- (16) Training on floods and climate change for 20 engineers and governmental officials from Sri Lanka, 10-24 July 2011, Bangalore, India 12 July 2011, Islamabad, Pakistan
- (17) Signing Ceremony of the project Strategic Strengthening of Flood Warning and Management Capacity of Pakistan,

- (18) ADB-TA 7276-REG IFAS New Version Installation and Training Workshop with BBWS Solo and CRBOM engineers, 4-6 July 2011, Solo, Indonesia
- (19) “Local Emergency Operation Plan with Hazard Map” The third and last phase were conducted for four weeks from 4 July to 2 August 2011 in Japan by ICHARM. Eleven people participated from Bhutan, Indonesia, Lao PDR, Myanmar, Pakistan, Sri Lanka, Tajikistan, and Bangladesh.
- (20) The 2nd international MAHASRI /HyARC Workshop on Asian Monsoon and Water Cycle, 22-24 August 2011, Nha Trang, Vietnam
- (21) Inception meeting for Strategic Strengthening of Flood Warning and Management Capacity in Pakistan, 17-19 August 2011, Bangkok, Thailand
- (22) ADB Water Learning Week, 8-10 November 2011, Manila, Philippines
- (23) Progress report with regard to ADB TA7276 Bangladesh Component, 16-19 November 2011, Dhaka, Bangladesh
- (24) 2nd IFAS Training Workshop, 20-27 November 2011, Solo, Indonesia
- (25) Sentinel-Asia Flood WG-IFAS Seminar 16-29 November 2011, India, and Myanmar
- (26) Parallel Session for ADB Water Learning Week and field survey, 8-14 November 2011, Manila, Philippines and Bangkok, Thailand
- (27) Field Survey for Chao Phraya flood, 24-29 November 2011, Thailand
- (28) IFAS Workshop in Tehran, 6-9 February 2012, Tehran, Iran
- (29) Field Survey and Discussion meeting with NDRI, 13-22 December 2011, Nepalgunj and Kathmandu, Nepal
- (30) 8th Steering Committee meeting of IWRM Guidelines at River Basin Level Initiative, 7-11 December 2011, Paris, France
- (31) International Training Workshop of Stakeholders Capacity Building in Flood Warning and Management, NUST, Islamabad, Pakistan, 20-23 December 2011, Islamabad, Pakistan
- (32) Field survey for the “Project on a Comprehensive Flood Management Plan for the Chao Phraya River Basin”, 11-16 December 2011, Thailand
- (33) Cooperation to JICA, “The Project for Building Disaster Resilient Societies In Central Region in Vietnam”, 10-14 January 2012, Hanoi and Hue, Vietnam
- (34) Knowledge sharing workshop on water-related disaster risk management, 11-25 January 2012, Kathmandu, Nepal
- (35) 1st joint seminar of integrated water resources management for Chao Phraya River by strategic formulation committee for water resources management of the kingdom of Thailand, 14 January 2012, Thailand
- (36) Making Implementation Partners Agreement for “Strategic strengthening Flood warning and management capacity of Pakistan” with UNESCO on 20 January, 2012
- (37) Field survey for the JICA course “General Information on Capacity Development For Flood Risk Management with IFAS”, 28 January to 4 February 2012, Kenya, Africa
- (38) ADB-TA 7276-Reg. Workshop on Flood Vulnerability Assessment, 7-11 February 2012, Phnom Penh, Cambodia
- (39) The 6th World Water Forum, 12 -17 March 2012, Marseille, France
- (40) Assessment of flood and inundations under the effect of climate change in lower West Rapti River Basin in Nepal, March 5 2012, Kathmandu, Nepal
- (41) ADB TA 7276-REG-Courtesy visit to the DGWR Ministry of Public Works and IFAS Follow up Training for Engineers, 2-6 March 2012, Jakarta, Indonesia
- (42) ADB-GWP meeting on Integrated Flood and Water Resources Management, 15-16 April 2012, Manila, Philippines
- (43) Workshop “Capacity Development for Integrated Flood Risk Management in Pakistan” as short term training course from 15-24 May 2012.

3.3 Educational and training courses

3.3.1 Contribution to IHP courses

UNESCO IHP Nagoya Training Courses (TC) have been held by Nagoya University since 1991 every year. Topics of the course were relevant to fit the IHP-VII themes: Water Resources for Sustainable Development, Hydrology and Water Resources under Vulnerable Environment, and Water Interactions (Systems at Risk and Social Challenges). The host or convener body is the Hydrospheric Atmospheric Research Center (HyARC), Nagoya University. After the 19th TC, the

Disaster Prevention Research Institute (DPRI), Kyoto University joined as a convener body. After that, HyARC and DPRI took 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 took lectures and practices every year in the training course. The 20th was with a title of “Groundwater as a key for adaptation to changing climate and society” under a collaboration of the Research Institute for Humanity and Nature (RIHN), the 21st was with “Introduction to river basin environment assessment under climate change” organized by DPRI.

An important development of TC is information dissemination on website. The broadcasting of the lectures to universities in Asia via Internet was successfully performed with collaboration of 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 internet, and many participants at remote sites can join the TC's. The lectures are also opened to graduate school students in the host universities such as Nagoya University and Kyoto University. TC is a good opportunity for graduate school students, and conveners of TC encourage graduate students to join the TC's.

3.3.2 Organization of specific courses

ICHARM has been providing a training course on flood hazard mapping (5 weeks every year) since 2004. In November 2007, 16 trainees participated from 8 countries in Asia Pacific region.

ICHARM also 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). Seven students in the class of 2008 graduated on 16 September 2009 with a master's degree in disaster management. The class of 2009 started the program on 6 October 2009 with 13 students. The new doctoral program in disaster management started its admission process in December 2009 in collaboration with GRIPS.

ICHARM organized a short-term training course with JICA as Local Disaster Operation Plan with Flood Hazard Mapping Training Course (in 2010-2011)

This training course is designed especially for flood management organizations to enhance organizational resilience against floods. The course started in 2010. The second phase was conducted for four weeks from 12 January to 16 February 2011. Twelve people participated from Bhutan, Indonesia, Lao PDR, Myanmar, Nepal, Pakistan, Tajikistan, Thailand and Bangladesh. During the four weeks, the participants studied local disaster prevention practiced in Japan through lectures, exercises and field trips, and finally made an action plan for future activities in flood management for their own local areas. The third and last phase were conducted also for four weeks from 4 July to 2 August 2011. Eleven people participated from Bhutan, Indonesia, Lao PDR, Myanmar, Pakistan, Sri Lanka, Tajikistan, and Bangladesh.

as well as Master's Course Program “Water-related Disaster Management Course of Disaster Management Policy Program”, and Doctor Course Program, “Disaster Management.”

3.3.3 Participation in IHP courses

N/A

3.4 Cooperation with the UNESCO-IHE Institute for Water Education and/or international/regional water centres under the auspices of UNESCO

(1) Dr. Takahiro Sayama (ICHARM) visited UNESCO-IHE on 8 to 13 September 2010, giving a lecture at Summer Seminar.

(2) Dr. Shigenobu Tanaka (ICHARM) attended “International Workshop on Water Disaster” held by UNESCO-HidroEX (Brazil) on 17 to 19 November 2010, giving a lecture.

(3) Dr. Guangwei Huang (ICHARM) attended the course “Climate Change in Integrated Water Management” on 10 to 16 July 2011 as an exchange instructor under the agreement with UNESCO-IHE.

(4) Prof. Tomoharu Hori (Kyoto Univ.) is active as a member of IHE Steering Board.

3.5 Publications

- (1) Lecture materials for the 20th IHP Training Course “Groundwater as a key for adaption to changing climate and society” via website “<http://www.ihpnagoyaforum.org>”.
- (2) The textbook for 21st IHP Training Course in 2011, “Introduction to river basin environment assessment under climate change”, Nagoya University, Kyoto University and UNESCO.
- (3) «IWRM Guidelines at River Basin Level» Part 1: Principles, UNESCO-IHP, WWAP and NARBO, 24 pp., ISBN: 978-92-3-104100-6.
- (4) «IWRM Guidelines at River Basin Level» Part 2-1: The Guidelines for IWRM Coordination, UNESCO-IHP, WWAP and NARBO, 173 pp., ISBN: 978-92-3-104101-3.
- (5) «IWRM Guidelines at River Basin Level» Part 2-2: The Guidelines for Flood Management, UNESCO-IHP, WWAP and NARBO, 76 pp., ISBN: 978-92-3-104102-0.
- (6) «IWRM Guidelines at River Basin Level» Part 2-3: Invitation to IWRM for Irrigation Practitioners, UNESCO-IHP, WWAP and NARBO.
- (7) Taniguchi, M. and Holman, I. “Groundwater system responses to changing climate”, Taylor and Francis, 2010, 200pp
- (8) Taniguchi, M. ed. “Groundwater and Subsurface Environments – Human Impacts in Asian Coastal Cities – “, Springer, 2011, 312pp
- (9) Treidel, H., Martin-Bordes, J.L., Gurdak, J.J. eds.,”Climate Change Effects on Groundwater Resources: A Global Synthesis of Findings and Recommendations” , CRC Press Taylor and Francis Group., 2011, 414 pp.
- (10) In Forms of Community Participation in Disaster Risk Management Practices Flood risk management culture and its role in changing natural and physical environments of lower West Rapti river basin in Nepal Gautam M. R., Osti R., Gautam D. R., Inomata, H., Dhakal S. Osti R. and Miyake K. (Eds.), Nova Science Publishers, Inc., New York 2011
- (11) Forms of community participation in disaster risk management practices Rabindra Osti, Katsuhito Miyake NOVA Science Publisher Mar 2011
- (12) Tsunamis Causes, Characteristics, Warnings and Protection Chapter 4 Application of Coastal Forest in Tsunami Disaster Mitigation Rabindra Osti, Dinar Istianto Neil Veitch and Gordon Jaffray (Eds.), Nova Science Publishers, Inc., New York 87-112 2010
- (13) Planning and Design of Tsunami-mitigative Coastal Vegetation Belts Shigenobu Tanaka, Dinar Istiyanto, Daisuke Kuribayashi Technical Note of PWRI No.4177 Aug 2010
- (14) Dynamics of hydrometeorological and environmental hazards, Environmental Hazards A. W. Jayawardena The Fluid Dynamics and Geophysics of Extreme Events, Lecture notes series, Institute for Mathematical Sciences National University of Singapore Vol. 21 229-267 2011
- (15) Large-scale Flood Report Ali Chavoshian ICHARM Book Series ICHARM No. 1 1-207 Sep. 2011
- (16) Forms of Community Participation in Disaster Risk Management Practices Rabindra Osti, Katsuhito Miyake Forms of Community Participation in Disaster Risk Management Practices NOVA science NY USA 1-170 Jun. 2011
- (17) Groundwater Management in Mongolia “Bridging Disciplines and Sectors”, 24th February 2011, University of Tsukuba, 19 pp.
- (18) Proceedings of IHP Symposium on Extreme Events: “Meteorological, Hydrological and Tsunami Disasters: Social Adaptation and Future (EXTREME2011)”, Kyoto University Uji Campus, 24-26 October 2011.
- (19) Special Issue: Predictions in Ungauged Basins –Japan Society of Hydrology and Water Resources, Y. Tachikawa, Y. Yamashiki, and M. Tsujimura (Eds), Hydrological Processes, vol. 26, Issue 6, John Wiley & Sons, March, 2012.

3.6 Participation in international scientific meetings

3.6.1 Meetings hosted by the country

- (1) International Symposium "Groundwater as a key for adaptation to changing climate and society" was held at Kyoto on 14 November 2010, co-organized by RIHN, UNESCO, Japanese National Commission for UNESCO, HyARC, DPRI and MEXT.
- (2) UNESCO Chair Workshop on International Strategy for Sustainable Groundwater Management: Transboundary Aquifers and Integrated Watershed Management was held at the University of Tsukuba, Japan on 24 February 2011.
- (3) Special event entitled "International Forum on Mega-Water-Disaster", which was held on the first day (27 September 2011) of ICFM5 at UNU. For this purpose, some high-level national and international officials were invited for the conference.
- (4) International symposium, "Floods – A global problem that needs local solutions", was jointly held by ICHARM and UNU on 28 September 2010 at UNU in Tokyo. The symposium was followed by a panel discussion on "Global cooperation to help local solutions" by members of international disaster prevention organizations.
- (5) The 5th International Conference on Flood Management (ICFM5) was held in Tokyo on 27-29 September 2011. Japan with more than 450 participants gathered from 41 different nations throughout the world.
- (6) IHP Symposium on Extreme Events: "Meteorological, Hydrological and Tsunami Disasters: Social Adaptation and Future (EXTREME2011)" (24-28 October 2011) was held in conjunction with the 19th Regional Steering Committee Meeting for UNESCO-IHP for Southeast Asia and the Pacific in Kyoto, organized by Japanese National Committee for UNESCO-IHP; DPRI; Global COE Program "Sustainability/Survivability Science for a Resilient Society Adaptable to Extreme Weather Conditions" (GCOE-ARS); UNESCO Jakarta Office: 96 participants from 23 countries.
- (7) IUGG-IAHS Sub-Committee Meeting was held in Makuhari, Chiba, Japan on 23 May 2012 at the occasion of JpGU (Japan Geoscience Union) meetings on 20-25 May 2012 [Taniguchi, Takara, Tsujimura].
- (8) 90th Anniversary meeting of IAHS and PUB final symposium was organized at TU Delft, the Netherlands, on 23-25 October 2012.

3.6.2 Participation in meetings abroad

- (1) FRIEND Database Harmonization Workshop at UNESCO Headquarters, 7-8 June 2010. Dr. Hidetaka Chikamori (Okayama Univ.) attended as the representative of AP-FRIEND.
- (2) The 10th IHP-IAHS George Kovac Colloquium "Hydrocomplexity: New Tools for Solving Wicked Water Problems" at UNESCO Headquarters, 2-3 July 2010. [Nakajo]
- (3) Emeritus Prof. Tadashi Tanaka attended the international conference on "Transboundary Aquifers: Challenges and New Directions", which took place from 6-8 December 2010 at UNESCO Headquarters in Paris and was convened by UNESCO IHP and IGCP programmes, IAH, and UNEP.
- (4) IRDR Conference 2011 took place in Beijing, China, from October 31 to November 2, 2011. The conference was hosted by the Integrated Research on Disaster Risk International Programme Office (IRDR) and the China Association for Science and Technology. Prof. Takeuchi (ICHARM) served the session B1 "Improving the Quality of Decision-Making Practice – Japanese Earthquake" as a chairperson.
- (5) The 6th World Water Forum « Time for Solution », Marseille, France, 12-17 March 2012 [Takara, Watanabe and others]
- (6) The 20th Session of the IHP Intergovernmental Council at UNESCO Headquarters, 4-7 June 2012. [Takara, Tachikawa and others]
- (7) ASLO summer meeting: Lake Biwa, 8-13 July 2012
- (8) The International Workshop of the UNESCO Chair in Mongolia will be held at Ulaanbaatar in July/August 2012.
- (9) The 90th Anniversary meeting of IAHS and PUB final symposium was organized at TU Delft, the Netherlands, on 23-25 October 2012 [Takeuchi, Sayama (ICHARM), Takara, Tani (Kyoto Univ.)].
- (10) JAPAN WATER 2012, an IAHS-IHP Joint National Workshop for Water Issues, MEXT, Tokyo, 15 October 2012.

3.7 Other activities at regional level

3.7.1 Institutional relations/cooperation
N/A

3.7.2 Completed and ongoing scientific projects
N/A

4. FUTURE ACTIVITIES

4.1 Activities planned until December 2012

(1) The 22nd IHP Training Course with the theme “Precipitation Measurement from Space and its Applications” will be held in Nov.-Dec. 2012 (see Annex II).

4.2 Activities foreseen for 2013 - 2014

- (1) The 6th International Conference on Water Resources and Environment Research (ICWRER), Koblenz, Germany, 3-7 June 2013.
- (2) IAHS/IASPEI/IAPSO joint Assembly – Knowledge for the Future: Gothenburg, Sweden on 22-20 July, 2013
- (3) IGU 2013 Kyoto Regional Conference, organized by IGU Commission Biogeography and Biodiversity, Kyoto International Conference Center, Kyoto, Japan, 4-9 August 2013.
- (4) Groundwater-surface water interaction research in arid/semi-arid regions (Mongolia, Tunisia, China) in collaboration with Alliance for Research on North Africa and Japan-China Center on Hydrological Cycle Research, University of Tsukuba.
- (5) ISRS2013 (The 12th International Symposium on River Sedimentation, Kyoto Japan, Sept. 2-5, 2013)
- (6) The 21st Session of the IHP Regional Steering Committee (RSC) for Southeast Asia and the Pacific will be held in Rep. Korea in 2013.

4.3 Activities envisaged in the long term

- (1) Participation in IHP-VIII projects and RSC activities.
- (2) Information dissemination through a web page of the National Committee.
- (3) Activities relating to “Sustainability Science” that is a key promotion by the Japanese Commission for UNESCO

**NATIONAL REPORT ON IHP RELATED ACTIVITIES
IN REPUBLIC OF KOREA
In the period of 2010-2012**

November, 2012

**Korean National Committee
for
The International Hydrological Programme
Republic of Korea**

Abstract

Since the beginning of the seventh 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 2010~2012 have been executed according to the implementation plan of IHP-VII phase.

Particularly, during this period, the IHP-KNC proposed to establish 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, and this Centre was unanimously endorsed in the 20th Session of the Intergovernmental Council of the IHP.

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 will be organized during 2012-2013 as the IHP-VII activities of IHP-KNC.

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) and the seventh phase of IHP project(2008-2013) 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 training in hydrology and water resources.
- From the beginning of the New Millennium through this year(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, Transport and Maritime Affairs.
- Decisions regarding most of IHP related activities are made by this committee which is held regularly and on request in special occasion.

Status of Contribution to / Participation in IHP-VII

- In the beginning of the seventh phase of IHP(2008-2013) the Korean National Committee for the IHP has prepared the implementation plan of IHP-VII during the period(2008-2013) and the potential activities to be undertaken by the Korean National Committee for the IHP as listed in the following tables both according to the core programme Themes and Focal Areas;

Implementation Plan of IHP-VII Phase

Name of the IHP National Committee	Country Priorities 2008-2009	Country Participation in Theme and Focal area 2008-2013	Events organized in the Country	Activity lead/Coordinated by the Country
<u>REPUBLIC OF KOREA IHP-NC</u>				
IHP VII Themes and Focal areas				
Theme 1:				MLTM/KWRA*
Focal area 1.1	●	2008-2009		MLTM/KWRA
Focal area 1.2	●	2009-2010		MLTM/KWRA
Focal area 1.3		●2011-2013		MLTM/KWRA
Focal area 1.4	●	2008-2009		MLTM/KWRA
Focal area 1.5				
Theme 2:				MLTM/KWRA
Focal area 2.1		●2010		MLTM/KWRA
Focal area 2.2	●	2008-2009		MLTM/KWRA
Focal area 2.3		●2010-2011		MLTM/KWRA
Focal area 2.4		●2011-2013		MLTM/KWRA
Focal area 2.5				
Theme 3:				
Focal area 3.1	●	2008-2009		MLTM/KWRA/IHES*
Focal area 3.2	●	2008-2009		MLTM/KWRA/IHES
Focal area 3.3		●2010-2011		MLTM/KWRA/IHES
Focal area 3.4		●2011-2012		MLTM/KWRA/IHES

Theme 4:				
Focal area 4.1	●	2008-2009		MLTM/KWRA
Focal area 4.2				MLTM/KWRA
Focal area 4.3		●2010-2011		MLTM/KWRA
Focal area 4.4		●2011-2013		MLTM/KWRA
Theme 5:				
Cross-cutting programmes				
HELP	●	2008-2013		MLTM/IHES
FRIEND	●	2008-2013		MLTM/IHES
Associated programmes :				MLTM/IHES
International Flood Initiative(IFI)	●	2008-2013		
International Sediment Initiative(ISI)				
Water for Peace(PCCP)				
UNESCO-IAEA Isotope(JIHP)				
Shared Aquifer(ISARM)				
Global Network Arid Lands(G-WADI)				
Unban Water Management(UWMP)	●	2008-2013		MLTM/KWRA
World Hydrogeological Map(WHYMAP)				

* MLTM : Ministry of Land, Transport and Maritime Affairs

KWRA : Korea Water Resources Association

IHES : International Hydrologic Environmental Society

* NOTE : Education, Training and Capacity Building activities are to be undertaken across all the themes

Activities to have been and to be undertaken by the Korean National Committee

Name of the IHP National Committee <u>REPUBLIC OF KOREA IHP-NC</u>	Activities suggested by the IHP National Committee and their method of implementation
IHP VII Themes and Focal areas	
Theme 1:	
Focal area 1.1	Case studies on facility management techniques for abnormal climate
Focal area 1.2	Case studies of climate change impact on hydrological cycle Case studies of effect on water resources by climate change and development of evaluation system
Focal area 1.3	Case studies on regional hydrological extremes and water-related disasters
Focal area 1.4	Case studies of large scale groundwater dependencies related global change
Focal area 1.5	

Theme 2:	
Focal area 2.1	
Focal area 2.2	Best practices of good governance, capacity development and stakeholder participation at regional level
Focal area 2.3	
Focal area 2.4	
Focal area 2.5	
Theme 3:	
Focal area 3.1	Case studies of ecohydrological measures to protect and remediate catchment process
Focal area 3.2	Case studies on complementing engineering solutions with ecological measures resulting in sustainable carrying capacity of ecosystems Case studies on gravel contact oxidation process technology applied to improvement of stream quality
Focal area 3.3	
Focal area 3.4	
Theme 4:	
Focal area 4.1	Methodologies for safeguards against water borne biotic and abiotic pollutants
Focal area 4.2	
Focal area 4.3	
Focal area 4.4	
Theme 5:	
Cross-cutting programmes	
HELP	Regional case studies in HELP experimental river basins
FRIEND	Regional comparative case studies in Asia-Pacific river basins
Associated programmes :	
International Flood Initiative (IFI)	Regional case studies on flood and water-related disasters
International Sediment Initiative (ISI)	
Water for Peace (PCCP)	
UNESCO-IAEA Isotope (JIHP)	
Shared Aquifer (ISARM)	
Global Network Arid Lands (G-WADI)	
Urban Water Management (UWMP)	Development of urban water management strategies and technologies
World Hydrogeological Map (WHYMAP)	

* NOTE : Education, Training and Capacity Building activities are to be undertaken across all the themes

- During the period of 2008-2012 of the seventh phase of IHP, the Korean National Committee for the IHP has been and being 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) Global changes and feedback mechanism of hydrological processes
 - (2) Climate change impacts on the hydrological cycle and consequent impact on water resources
 - (3) Managing groundwater systems' response to global changes
 - (4) Strengthening water governance for sustainability
 - (5) Ecological measures to protect and remediate catchment process
 - (6) Improving ecosystem quality and services by combining structural solutions with ecological biotechnologies
 - (7) FRIEND and HELP basin studies

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(The 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.

Participation in IHP Regional Steering Committees / Working Group

- Republic of Korea was one of most active member countries in IHP Regional Steering Committee's activities for Southeast Asia and the Pacific.
- Republic of Korean delegates actively participated in the IHP Regional Steering Committee, Workshop and Working Group meetings held in the period of 2010-2012

Research / Applied Projects Supported or Sponsored

- Research projects supported by the Government in the framework of the IHP in the period of 2010~2012 have been executed according to the above given table.
- Some other research or applied projects were also supported or sponsored by the Government and other water-related organizations such as Korea Water Resources Corporation(The K-Water) during this period.
- The following projects have been and are being implemented for the Asian Pacific FRIEND in the representative river basins chosen as the Korean Asian Pacific FRIEND, and a HELP basin(Kumho river) which was accepted as a HELP basin in Korea by UNESCO;.
 - 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
- HELP river basin studies with UNESCO international joint cooperative studies

Cooperation with the International /Regional Water Centres under auspices of UNESCO

- The Korean National Committee for the IHP proposed to establish 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, and this Centre was unanimously endorsed by all member states in the 20th Session of the Intergovernmental Council of the IHP

Publications

- The Korean National Committee for the IHP is publishing IHP Annual Research Report and the Catalogue of Rivers in Korea in the form of Government Publication since 1975.
- These reports are distributed to all water-related organizations and IHP-KNC members and research results are published on the journals of academic societies or organizations.
- Some other technical reports, proceedings of scientific meetings and specific course's materials are also published by the IHP-KNC.

Participation in International Scientific Meetings

- Meetings hosted by the country
The following IHP meetings were hosted and organized by the IHP-KNC and IHES.
 - 2010 International Conference on Hydrology and Water Resources
 - 2011 UNESCO IHP Joint HELP/Ecohydrology International Symposium on Restoring and Managing River for Future, 13-15 April 2011, Daegu, Korea - Formulated and issued "A Statement of River Restoration"
 - 2012 Nakdong River Water Week/International Water Forum (Na-Ri IWW/IWF 2012) held between 12-15 September 2012, Daegu Gyeongbuk area (Andong & Sangju), Republic of Korea.

- 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, Asian Pacific FRIEND Project and its workshops, working Group meetings and etc.

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 will be organized during 2012-2013 as the IHP-VII activities of IHP-KNC.
 - Korean Workshops of HELP during 2012-2013
 - 7th WWF Kick-off Meeting, Daegu Gyeongbuk, March, 2013
 - 2013 International Water Forum(Na-Ri IWW/IWF 2013) and 21st IHP RSC Meeting, Gyeongju, Republic of Korea

**The 20th Regional Steering Committee Meeting
UNESCO-IHP for Southeast Asia and the Pacific,
4 – 9 November 2012, in Langkawi, Malaysia**

**Country Report On
IHP Related activities of Lao PDR**

1. Activities undertaken in the period November 2011-October 2012

1.1. Meeting of the IHP National committee

1.1.1. Decision regarding the composition of the IHP National Committee

- Refer to the decree of the Prime Minister in July 2011, the Ministry of Natural Resources and Environment (MONRE) was established. At present it combines:
 - Department of Water Resources
 - Department of Environment
 - Department of Meteorology and Hydrology
 - Department of Geology and Mines
 - Department of Land Management
 - Department of Forest Conservation Management
 - National Disaster Prevention and Climate Change Department
 - Department of Pollutant Management
 - Department of Environment – Social Impact Assessment
 - Department of Great Mekong Sub-region
 - Lao National Mekong Committee Secretariat
 - Natural Resources and Environment Research Institute

- Under MONRE, Mr. Sithanh SOUTHICHACK, Director General of DMH has cooperated and collaborated with national line Ministries concerned to performance and carry out all activities related to UNESCO – IHP for Southeast Asia and The Pacific as national IHP Lao.

1.1.2. Status of IHP-VII Activities

- The activities related to IHP-VII was under taken, ongoing and will be implemented such as river monitoring, forecasting, early warning and IWRM in the whole basin of the country.

1.1.3. Decision regarding contribution to/ participation in IHP – VII

- Involved and contributed to IHP-VII

1.2. Activities at National Level in the framework of the IHP

1.2.1. National local scientific and technical related activities

- Hydro – Meteorological and earthquake data collection, processing and analysis.
- Weather and flood forecasting.
- Issued early warning on severe weather situation, flood and Typhoon storm.
- Attended in various scientific and technical meeting in particularly on hydrology, meteorology, earthquake, water resources management and environment.

- Organizing of various technical meeting in term of Meteorology, hydrology, earthquake and water resources management.
- 1.2.2. Participation in IHP steering committees/working groups
- Attended the 19th Regional Steering Committee Meeting of the UNESCO-IHP for Southeast Asia and the Pacific in Kyoto, Japan, 27 - 28 October 2011.
- 1.2.3. Research / applied project supported or sponsored
 - Applied Agro-meteorological Research Project in Champasack Province, southern part of Lao to JICA.
 - Proposed to establish the early warning System in three provinces: Saravane, Sekong and Attapeu to world bank/
 - Proposed to implement the IWRM in Nam Ngum river basin.
- 1.2.4. Collaboration with other national and international organization and / or program
 - Collaborate with Mekong River Commission (MRC) in Appropriate Hydrological Network Improvement Project (AHNIP), Basin Development Plan (BDP), Environment Program (EP), Flood Mitigation Management Program (FMMP), Drought Management Program and Information Knowledge Management Program (IKMP).
 - Collaborate with World Meteorological Organization as a member.
 - Collaborate with UNESCAP/WMO Typhoon Committee as a member.
- 1.2.5. Other Initiatives
 - None

1.3. Education and Training Courses

- 1.3.1. Contribution to IHP courses
 - During 2011 – 2012 no have contribution to IHP Course
- 1.3.2. Organization of specific courses
 - None

1.4. Publication

- Both Hydrological and Meteorological Year Books for 2010.
- Climate Bulletin

1.5. Participation in international Scientific Meeting

- 1.5.1. Meeting hosted by the country
 - None
- 1.5.2. Participation in meeting abroad
 - 1 participant attended the 1st meeting of TC Working Group on Hydrology, Seoul, Republic of Korea, October 2012.
 - 1 participant attended the Regional Workshop on climate services at national level for the least developed in Asia, Bangkok, Thailand, 8 -10/10/2012.
 - 1 participant attended the 7th Meeting of TC Working Group on Disaster Reduction, Republic of Korea, 30 -31/05/2012.
 - 2 participants attended the Workshop on WMO Data and Information Exchange Networking System and Data Base, 22 – 24 October 2012, Tokyo, Japan.

- 1 participant attended the Regional Integrated Multi-hazards early Warning System (RIMES), New Delhi, India, 18 -21 June 2012.
- 1 participant attended the workshop on Data Collection and Survey for Disaster Management and Development of Regional Flood Risk Assessment Guideline, 11 - 12 June 2012, Indonesia.
- 2 participant attended the 34th Meeting of the ASEAN Sub-committee on Meteorology and Geophysics, 24-26 April 2012, Siamreap, Cambodia
- 1 participant attended the workshop on Climate Data Analysis and Modeling for Southeast Asia, 19 - 20 June 2012, Singapore.

1.6. Other Activities at Regional level

1.6.1. Institutional relation / cooperation

- Cooperate with Asian Disaster Preparedness Center (ADPC).

1.6.2. Completed and ongoing scientific projects

- The MRC's Mekong HYCOS Project is under implemented.
- The establishment of early warning system in southern provinces is ongoing.

2. Future Activities

2.1. Activities planned until/December 2013

- Continue Hydro-meteorological and earthquake data collection, forecasting and warning dissemination.
- Publication of hydrological and meteorological year books for 2010.
- Participate in various scientific and technical meeting, training courses at national, regional and international levels.
- Continue to cooperate with UNESCO – IHP for Southeast Asia and the Pacific.
- Continue to collaborate with WMO.
- Continue to collaborate with UNESCAP/WMO Typhoon Committee.
- Continue to cooperate with MRC.
- Continue to cooperate and collaborate with national, regional and international organizations concerned.



COUNTRY REPORT

of the
**NATIONAL COMMITTEE FOR
MALAYSIA INTERNATIONAL HYDROLOGICAL PROGRAMME**

20th MEETING OF THE IHP REGIONAL STEERING COMMITTEE
FOR SOUTH EAST ASIA AND THE PACIFIC

[ACTIVITIES UNDERTAKEN FOR THE PERIOD OF NOV 2011 – OCT 2012]

8 – 9 NOV 2012
LANGKAWI , MALAYSIA

EXCO MEETING - MEETINGS OF THE IHP NATIONAL COMMITTEE

- 5th EXCO Meeting : 19 Dec 2011 in Kuala Lumpur
- IHP Malaysia Trust Account Meeting: 16 Mar 2012 in Kuala Lumpur
- 6th EXCO Meeting : 25 Apr 2012 in Kuala Lumpur
- 7th EXCO Meeting (EXCO Re-election) : 28 Aug 2012 in Kuala Lumpur
- 8TH EXCO Meeting : Dec 2012 in Kuala Lumpur
- IHP Malaysia Trust Account Meeting: Dec 2012 in Kuala Lumpur

STANDING COMMITTEE

1. Committee on Research under the chairmanship of the Director of Humid Tropics Centre, Kuala Lumpur (HTC KL)
2. Committee on Education, Training and Public Information headed by the University of Science Malaysia (USM)
3. Committee on Standardization of Hydrological Practices headed by the Department of Irrigation and Drainage Malaysia (DID)

STATUS OF IHP-VII ACTIVITIES

1. A series of workshops on Review of the National Water Resources Study (2000-2050) and Formulation of National Water Resources Policy are held on timely basis continuously. This is a contribution for IHP VII Theme 2: Integrated Watershed and Aquifer Dynamics.
2. A contribution to IHP VII Theme 5: Water Education and Training: under the flag of the UNESCO-IHP Malaysia, consisting of stakeholders related to water have took place in the annual World Water Day since year 1994. Its main objective is to conduct campaign through training, educating and dialogue, and seminar programmes to augment public participation. Annual themes were changed according to the prevailing national needs. Three strategic target groups have been prioritized, namely school children and their teachers, decision makers cum academics, and farmers.

RESEARCH PROJECTS

2011-2012

- Malaysia UNESCO Cooperative Programme (MUCP)
- Monitoring Of MSMA Eco-Hydrology At HTCKL
- Upscaling Of MSMA Eco-Hydrology At Catchment Level (Sg. Langat)
- Impact on Reservoir Sediment & Water Quality at Sembrong Dam & Study on Agricultural Non
- Erosion Risk Categorization Potential at Sg. Langat
- Monitoring Rainwater Harvesting Effectiveness in Pulau Perhentian
- Remediation of Pollution From Large Point Sources for Sg. Hiliran – MUWAREC

EDUCATIONAL AND TRAINING COURSES

1. Malaysia IHP Technical Talks (3 sessions in 2010, 12 sessions in 2011, 12 sessions in 2012). The talks will cover topics on hydrology, water resources, meteorology, agriculture, civil & structures etc.
2. International Conference on Water Resource (ICWR) | 5-9 Nov 2012 , Langkawi Kedah, Malaysia
3. IWRM Seminar : Best Management Practice | 2-4 Nov 2011, Malacca, Malaysia
4. World Water Day Colloquium 2012 | Bukit Merah, Perak
5. Regional Water Watch Programme for Young Leaders (4 sessions yearly for each zones - North, South, East and Borneo)
6. National Water Watch Programme for Young Leaders (once yearly)
7. Operational Training for Integrated Flood Forecasting : Detailed Project Design, Supply, Installation And Testing of Hydrology Equipment, Forecast And Warning System For Integrated Flood Klang Valley | 7-14 May 2012, iFFRM Center, DID Malaysia

Participation in courses / meetings / conferences

(Courses/Seminars attended by IHP Malaysia & members)

2012

Dato' Ir. Hj. Hanapi bin Mohamad Noor

Construction of Comprehensive Advance Numerical Run-Off Model Meeting
Chiba University, University of Tokyo & ICHARM
20 – 26 May 2012

Dato' Ir. Hj. Hanapi bin Mohamad Noor

12th ASEAN Working Group on Water Resources Management (AWGWRM)
Ha Long City, Quang Ninh Province, Vietnam
25 – 27 July 2012

Dato' Ir. Hj. Hanapi bin Mohamad Noor

Groundwater Technical Visit
Bandung, Indonesia
27 – 30 Sep 2012

Dato' Ir. Hj. Hanapi bin Mohamad Noor

The 1st Meeting of Typhoon Committee Working Group on Hydrology on
“Comprehensive Counterplan for Extra-ordinary Flood”
Seoul, Korea
7 – 10 Oct 2012

Dr. Asnor Muizan bin Hj. Ishak

Training Course for Pilot Cities
Guangzhou, China
24 – 26 Sep 2012

Dr. Asnor Muizan bin Hj. Ishak

China-ASEAN Seminar on Space Information Products
Sharing in Disaster Risk Reduction
Beijing, China
4 - 7 Nov 2012

Mr. Mohamad Radzi bin Abdul Talib

Training on Disaster Risk management Technology on
Volcanic Eruption, Debris Flow and Landslide.

Japan

3 Jun – 3 Nov 2012

Mr. Mohd Faizul bin Mustapha / Mr. Mohd Fahmi bin Hamid

“Hydrography Skills Set” course

Scoresby, Melbourne, Victoria, Australia

18 – 22 Jun 2012

Mrs. Livia binti Lahat

Training for Expert on Flood-Related Disaster Mitigation (J12-00801)

Japan

1 Oct 2012 – 18 Sep 2013

Miss Wong Phei Yean

‘Water Related Disaster Management in Asian Region (J12-04133)’

Japan

19 Aug – 15 Sep 2012

Mr. Asmadi Ahmad

Construction of Comprehensive Advance Numerical Run-off model Meeting under
Research and Development Programme for Reducing Geo Hazard Damage In Malaysia
Caused By Landslide and Flood. Joint-venture by Japan (JICA) & Malaysia
(UNITEN/DID).

21-28 Apr 2012

Chiba University, Tokyo, Japan

Japan International Cooperation Agency (JICA)

Mr. Abdul Hafiz Bin Mohammad

APEC Training Course on Quantitative Precipitation Estimation/Forecasting

27-30 Mar 2012

Quezon City, Philippines

Asia-Pacific Economic Corporation (APEC)

Mr. Livia binti Lahat

Short Training for Integrated Flood Analysis System (IFAS)

10 Jan 2012 - 9 Mar 2012

ICHARM Institute, Japan

Japan International Cooperation Agency (JICA)

Mr. Mohd Khardzir Bin Hj Husain

17th MANCID Annual Conference & World Water Day Colloquium 2012

22 - 23 Mar 2012

Bukit Merah Laketown Resort, Perak, Malaysia

IHP Malaysia, MANCID & Ministry of Agriculture Malaysia

Mr. Engineer Hanapi Mohamad Nor

6th World Water Forum

12 - 17 Mar 2012
Marseille, France
French National Committee & World Water Council

Mr. Mohamad Radzi Abdul Talib
Training on Disaster Risk Management Technology on Volcanic Eruption, Debris Flow
and Landslide
3 Jun - 23 Nov 2012
Japan
JICA

2011

Mr. Hafizul Aimme
Short Training for Integrated Flood Analysis System (IFAS)
Nov 2011
ICHARM Institute, Japan
Japan International Cooperation Agency (JICA)

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

A number of Malaysian students are currently pursuing post-graduate studies at master's and PhD levels at this institute.

PUBLICATIONS

- Environmental Education For Sustainable Development (EEfSD) For Everyone Series (by Prof. Nabsiah Abdul Wahid, University of Science Malaysia) :
 - Application of Simple and Effective Domestic Water Management for Household Consumers
 - Family Recreational Activity: Learning River Water Quality Estimation Using Biological Indicator
- Guide To Hydrological Practices of Design Flood Discharge In Malaysia. Expected to be released by early 2013.
- Malaysia National Water Resources Policy. Released in 2012. IHP Malaysia as contributor.

PARTICIPATION IN INTERNATIONAL/REGIONAL ACTIVITIES

1. Meetings hosted by Malaysia

IHP Malaysia is proud to host the INWRDAM (The Inter-Islamic Network on Water Resources Development and Management) Expert Group Meeting at Melia Hotel, Kuala Lumpur from 9 – 13 July 2012. The theme of the meeting is 'Priority water issues among

OIC countries with emphasis on strengthening trans-boundary water cooperation'. The meeting was represented by 12 member countries with 20 participants. Malaysia was represented by IHP Malaysia Chairman and Secretary.

2. Other activities at regional level

- 2nd International Conference on Water Resources from 5 – 6 Nov 2012 at Citi Bayview Hotel, Langkawi. Co-organized by IHP Malaysia.
- IHP Malaysia participation in Malaysia UNESCO Day celebration from 3 – 4 Nov 2012 at KLCC.
- Malaysia UNESCO Cooperative Programme (MUCP)
- World Water Day celebrations for 2012
- National Exhibition for World Water Day (yearly)
- Best Hydrology and Water Referees Thesis Award (Gold, Silver & Bronze medals)
- Water Watch Programme For Young Leaders (regional and National levels)
- Water Treatment Plants open day (nationwide) co-op with Water Supply Department & National Water Management Commission
- Secretariat for Asia Water Resource 2012 Expo & Forum | 27-29 Mar 2012, Kuala Lumpur Convention Center
- Advising for Urban Storm Water Management Manual 2nd Edition 2011 by DID Malaysia
- Seminar on Best Management Practice for Water Resources | 2 – 4 Nov 2011 at Mahkota Hotel, Melaka

3. Activities planned until December 2012

- 8TH EXCO Meeting & Trust Account Meeting
- Legislation for Malaysia National Standard for National Guidelines of Quality Assurance for Hydrological Management
- Preparing Guidelines of Quality Inspection for Hydrology Management
- Preparing Guidelines of hydrology data validation
- Preparing Guidelines of Water Balance Condition.
- Participation in IHP-RSC Meeting, Asian Pacific FRIEND and Catalogue of Rivers
- Participation in Training course in 2012 at Nagoya University
- Participation in programme at the International Center for Water-related hazards and risk management (ICHARM)
- Workshop for National Water Resource Policy : Strategic Action Plan (in collaboration with DID)

4. Activities foreseen for 2013-2014

- Participation in IHP-RSC meeting Asian Pacific FRIEND and Catalogue of Rivers
- Participation in IHP-Training course at Nagoya University
- The On Job Training (OJT) IHP Training Course: "The Tank Model"
- Implementation of projects related to IHP-VII.

- Implementation of Malaysia-UNESCO Cooperative Programme funding by Government of Malaysia for South-South Country and Small Island.
- Collaboration with UNESCO-IOC activities.
- The 3rd International Conference on Water Resource in 2014

COUNTRY REPORT 2012
OF
THE MONGOLIAN NATIONAL COMMITTEE FOR THE UNESCO-IHP
For 20th Regional Steering Committee meeting for Southeast Asia & the Pacific, 5-9th November
2012, Langkawi, Malaysia

Implementation IHP in Mongolia
Main activities and outputs in 2011 – 2012

By Prof.D.Basandorj, Chair NC-IHP-Mongolia

I. Main activities and outputs in 2012:

Organized workshops in national level:

1. Improvement air quality in Ulaanbaatar city, water and soil pollution problems, March 2012, MUST, City Government
2. PPP or Private & Public Partnership meeting on “Increasing water tariffs and “right prices” in Mongolia, 26 March 2012, State Government building, Ulaanbaatar, Mongolia
3. Third conference on Climate change adaptation: Reducing vulnerabilities in the water sector of Mongolia, 17-18th October 2012, Ulaanbaatar, Mongolia
4. Development Integrated Water Resource management plan in Orkhon River basin of Mongolia, consultation meeting. 22nd October 2012, Ulaanbaatar, Mongolia
5. Development Integrated Water Resource management plan in Tuul River basin of Mongolia, consultation meeting. 23rd October 2012, Ulaanbaatar, Mongolia
6. Development infrastructure and planning Ger area of Ulaanbaatar city, State Government building, 26th October 2012
7. Water supply and sanitation problems and policy of New Government of Mongolia, 27th October 2012, Ulaanbaatar, Mongolia
8. Development standard of small sized wastewater treatment plants in rural area, UNDP, 25th October 2012, Ulaanbaatar, Mongolia
9. Green development policy and vision of Mongolia, organized by UNDP, UN-ESCAP, Ministry Environment and Green Development of Mongolia, 12th October 2012, Ministry of Foreign Affairs
10. Development advanced technology for water reuse and recycling, presenter Prof. Basandorj, Ministry Environment and Green Development, 1st November 2012
11. WASH Cluster Workshop: “Latest trends and policies in the Water and Sanitation Sector in Mongolia”, City Governor’s Administration Department, Mongolia Red Cross Society (MRCS), October 2012

In international level:

1. “Water Demand & Supply management: water projection in future” high level workshop led by President of Mongolia, February, 2012
2. Water security and safety in Asian cities, international conference hosted by Government of Mongolia, 5-7th October 2012, Ulaanbaatar, Mongolia

Involvement and development water related policy document and guidelines:

- I. Preparation and sending comments to Strategic plan UNESCO-IHP phase VIII, focusing improving water quality changes, development more hydrological tools and techniques for

- arid and semi-arid zones and needs to develop unified and good experiences sharing water education for all
- II. Renewed and updated Environmental and water related laws in June 2012 at Parliament of Mongolia such as Water law for establishment River basin counsels, increasing water tariffs, new law about pollution water sources.
 - III. Adopted national standard of 50 PE wastewater treatment plant
 - IV. Adopted new classification improved and unimproved water supply and sanitation at national level
 - V. Developed methodology access improved Water supply and Sanitation
 - VI. Established New Government, water become more serious policy of Government, leading and ruling Ministry Environment and Green Development, under this Ministry 3 division: Administration River basin counsels, water cadastre and monitoring and Water resource management division, also National water Committee as Coordinating agency under Prime Minister office and established Mongol Water Company hosting water related investment and development
 - VII. Due to the changes in the State Government, IHP-NC will reorganized and renewed in late November 2012,
 - VIII. Will be established Mongolian Water partnership, Mongolian President had meeting with World Water partnership leaders, water has more political commitment in Mongolia,
 - IX. IWRM concept is more close in Government policy, new River basin counsels' are established, in near future will be established 29 River basin counsels.

Active participation and consultation ongoing projects:

- Involvement and Consultation UNDP-WASH project, developed methodology define access water supply and sanitation in national level
- Implementation pilot project from UN-ESCAP and Ministry of Environment of Korea to introducing “mobile drinking water treatment equipment”, tested SMDT20 mobile car treatment unit in Gobi area/Orgon, zamiin-Uud soum/, Mongolia
- Co-working with international NGO from France, ACF and Technological University of Beijing for sharing knowledge development sanitation , preparing 6 master students in greywater, wastewater treatment and urine diversion. 3 student selected from Mongolia
- Implemented MoMo project in Kharaa River basin, as model region in water management in Asia funded by Federal Ministry of Germany
- Successfully ending Dutch project “Development IWRM in Mongolia”, 2008-2012, main output are development Tull and porkhon River basin management plans and improvement capacity building in water sector, especially within Universities collaboration

- Implementation scientific project "Development water reuse and recycling" under Ministry Education, Environment and Construction
- Tested nanotechnology named "nanomize" for treatment wastewater, cooperation Keosan center from Korea
- Tested SBR technology for domestic wastewater and develop design wastewater treatment plant up to 50 cubic meter per day
- Ongoing project study climate change impact and establishment monitoring network in glaciers in Mongolia
- Establishment groundwater monitoring in over 100 points
- Under development water saving technology for Mining and Coal power industry
- Under testing M-Fine technology /Japan/ MBR system for wastewater treatment
- Conducted testing "Bio-cleaner" technology for wastewater treatment in rural area/collaboration with Philippines and USA/
- Develop design number of improved sanitation unit for "GER" area in Mongolia, testing UDDT/Urine Diverted Dry Toilet/

Strengthening Capacity building in water sector of Mongolia

- Trained and provided certificate for 25 senior engineers in water sector, January 2012, in Research and Training Center in IWRM
- Trainer 36 master student in water management courses
- Trained PhD in hydrology in Spain
- Under development project proposal in "Water education for preschool children"
- Invited Visiting professors for teaching water sciences for master and PhD students/UNESCO-IHE. USA, Nederland's, Korea, Japan/

Regional and International activities:

1. International Symposium on "Addressing Water Quality Challenges in Asia" Daejeon, Republic of Korea, 07-09 December 2011
2. World toilet conference in China, Haikou march 2012
3. IFAT2012, Advanced wastewater treatment technology, Munich, Germany, April 2012.
4. 2nd Dry toilet conference, September 2012, Tampere, Finland
5. The 20th Regional Steering Committee Meeting for Southeast Asia and the Pacific, UNESCO-IHP and the 2nd International Conference on Water Resources (ICWR2012) "Sharing Knowledge of Issues in Water Resources Management to Face the Future", Langkawi, Malaysia, 5-9 November 2012

Presented and prepared papers:

5 PAPERS AT NATIONAL AND 3 PAPERS AT INTERNATIONAL LEVELS, DEVOTED TO WATER RESOURCES AND HYDROLOGY WERE PRESENTED AND PUBLISHED.

1. Prof.Basandorj. Water quality challenges in Mongolia, International Symposium on “Addressing Water Quality Challenges in Asia” Daejeon, Republic of Korea, 07-09 December 2011
2. Dr.Davaa. Impact climate change on water resources in Mongolia, 3rd conference on climate change adaptation: Reducing vulnerabilities in the water sector of Mongolia, October, 2012
3. Prof.Basandorj Testing result nanotechnology for treatment wastewater of Ulaanbaatar city, IFOST2012, Tomsk, Russia, September 2012.

Forthcoming activities:

- Development road map of sanitation in Mongolia by UNDP activity
- Organizing “Water power” conference for all University students in late November 2012
- Start new project on Wastewater management, facilitating UN-ESCAP, first partnership meeting in January 2013 in Ulaanbaatar
- IHP-NC of Mongolia leading for the Establishment Mongolian water partnership and planning organize high level meeting early December 2012
- Renewing and reorganizing IHP national Committee of Mongolia within November 2012

NATIONAL REPORT ON IHP RELATED ACTIVITIES

MYANMAR

1. ACTIVITIES UNDERTAKEN IN THE PERIOD November 2011 - October 2012

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. The present composition of MNC-IHP is as follow;

Chairman: Minister for Transport

Vice Chairman: Deputy Minister for Transport

Secretary: Director General of Department of Meteorology and Hydrology

Members: Representatives from departments and committees concerned are as follows;

1. Deputy Minister for the Ministry of Science and Technology
2. Deputy Minister for the Ministry of Agriculture and Irrigation
3. Director General of the Directorate of Water Resources and Improvement of River System
4. Professor of Civil Engineering Department, Yangon Institute of Technology
5. Professor of Civil Engineering Department, Mandalay Institute of Technology
6. Director General of the Irrigation Department
7. Director General of the Water Resources Utilization Department
8. Director General of the Department of Forestry
9. Secretary of National Commission for Environmental Affairs
10. Director General of the Department of Progress of Border Areas and National Races
11. Director General of the Department of Hydroelectric Power
12. Director General of the Department of Health
13. Professor of Department of Mathematics, Yangon University
14. Mayor of Yangon City Development Committee
15. Head of Department of Engineering (Water & Sanitation), Yangon City Development Committee

16. Mayor of Mandalay City Development Committee

17. Head of Department of Engineering (Water & Sanitation),
Mandalay City Development Committee

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. The MNC-IHP normally held one session each for the National Committee (NC) and Working Committee (WC) during 2003-2005. Activities related to the themes of IHP-VII are implemented by the members of the working committees. The WC prepared the (27) research papers and shared the knowledge and experiences to the other national committee members during 2003-2005. The session could not be hold during 2006 to 2011. But the MNC-IHP will try to implement the water related activities in line with the themes of IHP.

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

-

1.2.2 Participation in IHP steering committees/working groups

Participants from DMH attended the UNESCO-IHP 13th, 14th, 15th, 17th, 18th and 19th Regional Steering Committee Meetings for Southeast Asia and Pacific during 2005 to 2012

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 collaborate with EANET's activities.

Preparatory survey on the project for establishment of Disastrous Weather Monitoring System in the Republic of The Union of Myanmar started in July, 2012. It is

implemented by Japan International Cooperation Agency(JICA) and government of the Republic of the Union of Myanmar, joint venture of Japan Weather Association(JWA) and International Meteorological Consultant(IMC).

1.2.5 Other Initiatives

-

1.3 Educational and Training Courses

1.3.1 Contribution to IHP courses

- Training of Hydrology Grade 3 course was held on 28 November 2011 to 10 February 2012 at Yangon, Myanmar. This training was organized by DMH, 14 participants attended at this training.

1.3.2 Organization of specific courses

-

1.3.3 Participation in IHP courses

-

1.4 Publication

-

1.5 Participation in International Scientific Meeting

1.5.1 Meeting hosted by the country

- A coordination meeting for launching small satellite for observing the globe with the assistance of Japan for the Meteorological and Hydrological Department was held at the Ministry of Transport, Nay Pyi Taw, on 21st August 2012.
- Panel on Tropical Cyclones 39th Session Meeting was held on 5 to 9 March 2012 at Nay Pyi Taw, Myanmar. This meeting was organized by WMO and DMH. In this meeting, the participants discussed about the Coastal Inundation Management and the impact of tropical cyclone.
- Monsoon Forum was held on 17 November 2011 at Yangon, Myanmar. This meeting was organized by FAO and DMH. In this meeting, the participants discussed about the Monsoon Characteristics of Current year and the climate change impact.

1.5.2 Participation in meetings abroad

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

The representatives of MNC-IHP participated in

- 34th Meeting Asian Sub committee on Meteorology and Geophysics, Cambodia, 24-26 April, 2012.

- Informal Additional of the AD, HOC, Working Group, Bangkok, 24.8.2012 to 5.9.2012.
- 19th Regional Steering Committee Meeting for Southeast Asia and the Pacific, Kyoto, 24-28 October 2011.
- Training Program on ' Local Emergency Operation Plan with Flood Hazard Map', Japan, 3.7.2011 to 3.8.2011.
- The 8th meeting of the GEOSS Asian Water Cycle Initiative(AWCI) International Coordination Group(ICG) and the 1st Climate Change Assessment and Adaptation(CCAA) Workshop, Korea, 6.10.2011 to 8.10.2011.
- ' South-East Asia Flood Risk Reduction Forum ' and ' Workshop on Using Space Applications and Flood Analysis System to Reduce Water Related Disaster Risks in South-East Asia, Thailand, 20.2.2012 to 22.2.2012.
- 5th GEOSS Asia Pacific Symposium and the Associated 9th meeting of the GEOSS Asian Water Cycle Initiative(AWCI) International Coordination Group(ICG), Japan, 2.4.2012 to 4.4.2012.
- Third Workshop on Water and Adaptation to Climate Change in Transboundary basin: Making Adaptation Work and 5th Meeting of the Task Force on Water and Climate, Switzerland, 25.4.2012 to 27.4.2012.
- The Conference on Cryosphere of the Hindu Kust Himalayan Cryosphere Data Shearing Policy Workshop, Nepal, 14.5.2012 to 16.5.2012.

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 2011

-

2.2 Activities foreseen for 2011-2012

- 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 20th Regional Steering Committee for Southeast Asia and the Pacific.

- The members of MNC-IHP will participate in the international and national activities of IHP.

NATIONAL REPORT ON IHP RELATED ACTIVITIES

MYANMAR

1. ACTIVITIES UNDERTAKEN IN THE PERIOD November 2010 - October 2011

1.1 Meeting of the IHP National Committee

1.1.1 Decision regarding the composition of the IHP National Committee

1.1.2 Status of IHP-VII Activities

1.2 Activities at National Level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

1.2.2 Participation in IHP steering committees/working groups

1.2.3 Research / applied projects supported or sponsored

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

1.2.5 Other initiatives

1.3 Educational and Training Courses

1.3.1 Contribution to IHP courses

1.3.2 Organization of specific courses

1.3.3 Participation in IHP courses

1.4 Publication

1.5 Participation in International Scientific Meeting

1.5.1 Meetings hosted by the country

1.5.2 Participation in meetings abroad

1.6 Other activities at regional level

1.6.1 Institutional relation / cooperation

1.6.2 Completed and ongoing scientific projects

2. FUTURE ACTIVITIES

2.1 Activities planned until / December 2009

2.2 Activities foreseen for 2010-2011

**20th IHP REGIONAL STEERING COMMITTEE MEETING FOR
SOUTH EAST ASIA AND THE PACIFIC
LANGKAWI, MALAYSIA
(5 November 2012 – 9 November 2012)**

NATIONAL REPORT OF NEW ZEALAND

3. ACTIVITIES UNDERTAKEN IN THE PERIOD NOVEMBER 2011– NOVEMBER 2012

1.1 Meetings of the IHP National Committee

1.1.1 Composition of the IHP National Committee

Mr Jamieson continues as Chair of the IHP Committee. M S Srinivasan (National Institute of Water and Atmospheric Research) is now Secretary of the IHP Committee and member of the UNESCO-New Zealand Science sub-commission.

1.1.2 Status of IHP-VII activities

The following projects continue to be funded through the Ministry of Innovation, Business, Industry and Employment (MBIE), which replaced the Science and Innovation (MSI) in a further restructuring of science administration and funding:

WG 1.1 Information on New Zealand's Freshwaters: Water Resources Database;

WG 2.7 Land Use Intensification: Sustainable Management of Water Quality and Quantity

The water quality component is combined with agricultural research. During the reporting period the effort was focused more clearly on effects of increased irrigation development. Adaptive management will be required as the results of water science activities will not be available within the development timetable proposed by the government.

Water quantity is part of a "Waterscape" project quantifying water availability in New Zealand.

WG 2.8 Reducing the Impacts of Weather Related Hazards – funding continues, see section 1.6.2. (Refer IHP-V Technical Documents in Hydrology No.2 UNESCO Jakarta Office 1999 for details).

WG 1.1 "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) implemented a policy of "free" data access for most users from 1 July 2007.

1.1.3 Contribution to participation in IHP-VII

Components of the New Zealand hydrological research programme have had good alignment with IHP-VII themes ("Continuity with change"). The bulk of hydrological research in New Zealand continues to be funded through the MBIE. As in the past, projects must continue to demonstrate that

results will address national needs, and alignment with IHP themes is possible only to the extent that these themes are relevant to resource management requirements in New Zealand. Additional sources of support (e.g. WMO, internal support from NIWA and other institutes) are important to maintain links with colleagues in the Asia-Pacific region.

Preparations for IHP-VIII (2014-19) have been followed with interest to determine whether the interests of New Zealand and the Asia-Pacific Region have been taken into account.

The final version of IHP-VIII Strategic Plan indicates a close fit with NZ priorities in:

Theme 1 - Water related disasters and hydrological change

Theme 2 - Groundwater in a changing environment

Theme 3 - Addressing water scarcity and quality

Theme 5 - Ecohydrology

A specific alignment is with the Chapter 6 topic of “Putting science into action” where the following two major initiatives covered elsewhere in this report apply:

- Canterbury Water Management Strategy (CWMS)
- Land and Water Forum (LAWF)

1.2 Activities at 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 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

The Chair is a member of New Zealand’s UNESCO Science Sub-Commission where he is able to promote hydrological matters at a national level.

Dr Ibbitt and Mr Jamieson attended the 19th RSC meeting held in Kyoto, Japan and attended the 17th Technical Sub-Committee meeting associated with the 19th RSC meeting. Mr Jamieson is acting as coordinator for the APFRIEND project and Disaster Reduction Hyperbase component on Flood Design methods with Prof. Trevor Daniell.

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

Land and Water Forum (LAWF) and Canterbury Water Management Strategy (CWMS)

IHP activities under IHP-VI& IHP-VII and capabilities related to these activities have been used extensively to inform water management in New Zealand. This includes science briefings for a stakeholder-led collaborative process under the Land and Water Forum (LAWF) (previously known as the Sustainable Land Use Forum) which is being used to develop a shared understanding of the issues and strategic outcomes wanted for New Zealand, and options for achieving those outcomes. In June 2009 the New Zealand government launched a new focus on freshwater known as the “New Start for Freshwater” produce by the Land and Water Forum (LAWF) process. A second report was produced in May 2012 which provides a national framework within which Regional Councils will work with their communities and iwi to set freshwater objectives and develop limits for its use. It provides a

consistent and transparent process for setting objectives and limits, and one that will lead to effective and enduring outcomes, including greater certainty for investment and development.

A third report on managing within limits, including allocation, will be provided to the Government later in 2012. The overall objective is to ensure that water contributes to New Zealand's economic growth and environmental integrity

IHP activities under IHP-VI& IHP-VII and capabilities related to these activities have been used extensively to inform this new process. This includes science briefings for a stakeholder-led collaborative process under the Land and Water Forum (LAWF) (previously known as the Sustainable Land Use Forum) which is being used to develop a shared understanding of the issues and strategic outcomes wanted for New Zealand, and options for achieving those outcomes.

Central government has actively intervened where it was not satisfied with progress made by local government. In particular central government has continued support for a process known as the "Canterbury Water Management Study" (CWMS), which is seeking to balance development needs against environmental values. The CWMS aligns with the description of "Adaptive Integrated Water Resources Management (AIWRM) included in IHP-VIII as The Chair of the NZ IHP Committee has been appointed to a role in leading the Infrastructure project associated with this initiative from 31/10/2011.

In addition the Land and Water Forum (LAWF) has produced two important reports. The Forum's objective is to develop a shared vision and a common way forward among all those with an interest in water, through a stakeholder-led collaborative process.

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

The KWRA and NZHS have had a Memorandum of Understanding (MOU) in place since 2007. There have been regular exchanges between the organisations. The importance of the relationship has been recognised by the NZ Ministry of Foreign Affairs and Trade (MFAT).

Links with other International and Regional organisations

The Chair of the National Committee is in regular contact with Charles Pearson, the Regional Hydrological Advisor to the President of the WMO Region V (Asia Pacific). Contact is also maintained directly and indirectly with SOPAC's Suva based Water & Sanitation Unit, through its role of representing the SW Pacific Island states on water related issues.

SOPAC – Pacific HYCOS project

The Chair and secretary maintain an interest in follow up to this project which was concluded in late 2010. Hydrologists in NIWA are continuing to communicate the value of operational support for ongoing hydrological data collection, when opportunities allow, both in New Zealand and in the Pacific. This aligns with IHP-VIII. New Zealand hydrologists, particularly those at NIWA, continue to seek opportunities to work with their colleagues around the Pacific. Opportunities are sought to link the work programmes of major funders to achieve operational improvements, particularly through support for the effective collection and dissemination of data and information to inform and guide public interest projects. A major concern is the semi-commercialization of data access which may prevent data from being used effectively and efficiently. New Zealand hydrologists continue to note their experiences of the positive effects of the free data access policy in terms of both public support and effective use of data and information.

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

None.

1.3.2 Organisation of specific courses

Courses and workshops run in New Zealand generally meet national needs. Courses are increasingly adapted for participants from Pacific Island countries who gain confidence from working with a supportive regionally based group of hydrologists and other specialists and from observing similar technical and organisational challenges in a relevant, albeit cooler, context.

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 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:

Regular climate and water bulletins

The National Climate Centre (NCC) publishes monthly New Zealand climate outlooks through web publications and media releases.

The “Island Climate Update” monthly bulletin

The National Climate Centre (NCC) This NZAID funded bulletin provides an overview of the present climate in tropical South Pacific Islands and a forward outlook, and continues to be published, and circulated widely throughout the South Pacific. (<http://www.niwa.co.nz/our-science/climate/publications/all/icu>).

The ICU, produced by NIWA’s NCC in collaboration with SOPAC, 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.

“Freshwater Update” bulletin

The National Centre for Freshwater has changed publication of the bulletin entitled “Freshwater Resources Update” back to a quarterly basis (<http://www.niwa.co.nz/our-science/freshwater>). This publication summarizes national freshwater conditions, and focuses on a number of topical issues confronting New Zealand scientists and water management.

Access to climate and water resources information

The NIWA real time environmental data site EDENZ (**E**nvironmental **D**ata **E**xplorer **N**ew **Z**ealand) is available to the public on the web (<http://edenz.niwa.co.nz/>).

EDENZ provides visitors with near real-time access to Ministry of Science and Innovation (MSI) funded data that are collected from the NIWA nationwide network of monitoring stations, installed as a component of the Nationally Significant Database programme. Data on this site are automatically transferred using a national telemetry network and are un-audited.

Data from this network is then audited and added to the Climate and Water Resources Databases. These are classified as “nationally significant databases” by MBIE. The data include air temperature, barometric pressure, wind direction, rainfall, lake and river water levels, river flows and sediment loads, and river water quality variables. The goal of these databases, and the EDENZ system, is to provide comprehensive and accessible data as a basis for improved knowledge on New Zealand's climate and freshwater resources.

A key aspect of the archiving programme is application of stringent quality control procedures ensuring national consistency and providing assurance that data can be confidently used for scientific and planning purposes.

An additional system deployed by NIWA for enabling access to the results of modeling based on data is: <http://wrenz.niwa.co.nz>. This website enables access to model results including catchment sediment yield, rainfall and runoff, river water quality, flood frequency and suitability for kayaking. It also allows an initial assessment of hydropower potential for all streams in New Zealand.

1.5 Participation in international scientific meetings

1.5.1 Meetings hosted by the country

New Zealand Hydrological Society Annual Symposium

The annual conference of the New Zealand Hydrological Society (NZHS) was held from the 5-9 December 2011 in Wellington, New Zealand with the theme “Learning from the Past: Creating the Future”. A delegation from the Korea Water Resources Association (KWRA) attended continuing the important collaborative relationship between the KWRA and NZHS.

1.5.2 Participation in meetings abroad

Dr Ibbitt and Mr Jamieson represented New Zealand at the 19th RSC meeting held in Kyoto, Japan in October 2011.

New Zealand Hydrologists participated in a range of international conferences related to IHP themes.

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, principally through overseas development assistance and consulting. For example, the Tideda hydrological database management system has been or is being installed in various agencies in Australia, Cambodia, Indonesia, Malaysia, Vietnam, Cook Islands, Fiji, Samoa, Solomon Islands, Papua New Guinea, Vietnam and Vanuatu. This is being augmented by an expanded range of work around the use of climate data and information around the Pacific which includes development

and deployment of a new database system with participation of the Bureau of Meteorology (BOM), Australia. Many such contacts have been enabled via the IHP, even though subsequent work has been in the context of bi-lateral arrangements and Pacific regional projects and entities (e.g. SOPAC).

1.6.2 Completed and ongoing scientific projects

The Reducing Impacts of Weather Related Hazards programme (WG2.8) is continuing with additional support gained for its ongoing operations. The programme concentrates on forecasting of extreme weather, floods and landslides.

The programme on “Reducing impacts of climate change on the urban and built environment” has developed a “toolbox” of procedures that show practitioner different options for tackling climate change issues they are faced with. A particularly useful example is that of urban water supplies.

NIWA is working hard to maintain hydrology staffing in four groups (Hydrological Processes, Applied Hydrology, Freshwater Ecology, and Sediment) based in Christchurch. While NIWA has expanded hydrology related capability and capacity, government led approaches to emerging national scale hydrology issues including surface/groundwater interaction, water allocation and water quality and efficient use of hydropower resources continue to change and evolve creating ongoing new challenges in how science results are actually applied.

2. Future Activities

2.1 Activities foreseen until December 2012

New Zealand Hydrological Society Annual Symposium

The annual conference of the NZHS will be held in Nelson, New Zealand from the 27-30 November 2012. This year’s conference theme “Water: know your limits” reflects the stress surrounding water allocation and water quality.

20th Regional Steering Committee Meeting

Attendance at the 20th RSC meeting in Langkawi, Malaysia from 5 - 9 November 2012 and associated meetings.

2.2 Activities planned for 2013

Scientific activities planned at the national level are, as explained in Section 1.1.3, within the context of the research programme funded by MBIE. 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. Implementation of science programmes (CWMS, LAWF) will be a strong focus in 2013.

Future activities are expected to depend very much on decisions reached by the Regional Steering Committee, and we are committed to participate in its deliberations, with the intention of being involved in future scientific work at the regional level.

NIWA Courses

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

2.3 Activities envisaged in the long term

Continuation of the:

- Upgraded research programme on extreme rainfall and flood design
- NZAID funded Pacific Hydrological Training Programmes as required;
- NZAID funded monthly “Island Climate Update” publication with stronger links to end users.
- Regular New Zealand “Climate Update” and “Climate Outlook” (web) publications.
- Regular “Freshwater Update” (web) publication
- Canterbury Water Management Strategy (CWMS)
- Land and Water Forum (LAWF)

NATIONAL REPORT ON IHP RELATED ACTIVITIES

PHILIPPINES

20th Regional Steering Committee Meeting
UNESCO International Hydrological Programme
(UNESCO IHP)
for Southeast Asia and the Pacific
held at Langkawi, Malaysia
8-9 November 2012

NOVEMBER 2012
Philippine National Committee
for the
UNESCO International Hydrological Programme
Republic of the Philippines

1. ACTIVITIES UNDERTAKEN IN THE PERIOD OCTOBER 2010 – OCTOBER 2011

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 Council for Aquatic and Marine Research and Development (PCAMRD), 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: Leonardo Q. Liongson (UP Diliman)

Treasurer: Lino P. Aldovino (LPA & Associates)

Secretariat: NHRC and PWP staff (on secondment)

Agency Lead Representatives:

Ramon B. Alikpala, MWSS

Virgilio Basa, NAMRIA

1. Antonio Morano, DPWH-BRS

Resito David, DPWH-FCSEC

Virgilio Rivera, MWCI

Lennie Santos-Borja, LLDA

Finance Sub-Committee members:

Leonor Cleofas, MWSS

Dolores Hipolito, DPWH-FCSEC

Ms. Lyn Almario, MWCI

Francisco Arellano, MWSI

Romualdo Beltran, NPC

Lino P. Aldovino, PNC-UNESCO-IHP Treasurer

Technical Sub-Committee members::

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

Romualdo Beltran, NPC

Samuel Contreras, BSWM

Emiterio Hernandez, LLDA

Milo Landicho, NIA

Rosa Perez, PAGASA

Program Sub-Committee members::

Peter Paul Castro, UP- NHRC & I.C.E. Dept.

Maria Antonia Tanchuling, UP- En.E. Program

Susan Abano, NWRB

Margarette Bautista, PAGASA

Isidora Camaya, NIA

Efren Carandang, NAMRIA

Maristel Espiritu, LLDA

George Estioko, NWRB

Myrna Lansangam, LWUA

Nicanor Mendoza, DENR-EMB

Jesusa Roque, NWRB

Teresita Sandoval, BSWM

Status of IHP-VII activities

In response to the questionnaire from the UNESCO-IHP Paris office, the following has been indicated in 2008 as the Philippines Country Priorities for IHP-VII Themes:

Theme 1: ADAPTING TO THE IMPACTS OF GLOBAL CHANGES ON RIVER BASINS AND AQUIFER SYSTEMS (General priority of the Philippines in all focal areas)

Focal area 1.1 - Global changes and feedback mechanisms of hydrological processes in stressed systems

Focal area 1.2 - Climate change impacts on the hydrological cycle and consequent impact on water resources

Focal area 1.3 - Hydro-hazards, hydrological extremes and water-related disasters

Focal area 1.4 - Managing groundwater systems' response to global changes

Focal area 1.5 - Global change and climate variability in arid and semi-arid regions

Theme 2: STRENGTHENING WATER GOVERNANCE FOR SUSTAINABILITY

(General priority of the Philippines in all focal areas)

Focal area 2.1 - Cultural, societal and scientific responses to the crises in water governance

Focal area 2.2 - Capacity development for improved governance; enhanced legislation for wise stewardship of water resources

Focal area 2.3 - Governance strategies that enhance affordability and assure financing

Focal area 2.4 - Managing water as a shared responsibility across geographical & social boundaries

Focal area 2.5 - Addressing the water-energy nexus in basin-wide water resources

Theme 3: ECOHYDROLOGY FOR SUSTAINABILITY (priority of the Philippines for focal area 3.1)

2. *Focal area 3.1 - Ecological measures to protect and remediate catchments process*

Focal area 3.2 - Improving ecosystem quality and services by combining structural solutions with ecological biotechnologies

Focal area 3.3 - Risk-based environmental management and accounting

Focal area 3.4 - Groundwater-dependent ecosystems identification, inventory and assessment

Theme 4: WATER AND LIFE SUPPORT SYSTEMS

(General priority of the Philippines in all focal areas)

Focal area 4.1 - Protecting water quality for sustainable livelihoods and poverty alleviation

Focal area 4.2 - Augmenting scarce water resources especially in SIDS

Focal area 4.3 - Achieving sustainable urban water management

Focal area 4.4 - Achieving sustainable rural water management

Theme 5: WATER EDUCATION FOR SUSTAINABLE DEVELOPMENT

(General priority of the Philippines in all focal areas)

Focal area 5.1: Tertiary water education and professional development

Focal area 5.2: Vocational education and training of water technicians

Focal area 5.3: Water education in schools

Focal area 5.4: Water education for communities, stakeholders and mass-media professionals

Cross-cutting programmes: FRIEND (Asia Pacific FRIEND - priority of the Philippines)

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

National Academy of Science and Technology (NAST) and Philippine Water Partnership (2011). *Report on the Round Table Discussion (RTD) on Priority Legislation for the Philippine Water and Sanitation Sector*, held on 22 November 2010, Discovery Suites, 25 ADB Avenue, Ortigas Center, Pasig City,

NAST Roundtable Discussions on Water Themes:

Roundtable Discussion on Climate Change and Water, 16 November 2011, Traders Hotel, Roxas Blvd., Pasay City.

Roundtable Discussion on Water Rights and Water Wrongs: Towards Good Water Governance for Development on January 26, 2012, Hyatt Hotel and Casino Manila.

Roundtable Discussion on Laguna de Bay: Status, Concerns, Opportunities, and Plans, 8 March 2012, Traders Hotel, Roxas Blvd., Pasay City.

Roundtable Discussion on the Ecology and Biodiversity of Lake Lanao and Agusan Marsh, April 12, 2012, Traders Hotel, Roxas Blvd., Pasay City.

Roundtable Discussion on Water Supply and Sewerage Plans, Drainage and Flood, April 13, 2012, Traders Hotel, Roxas Blvd., Pasay City.

Roundtable Discussion on Water Borne Diseases, 10 May 2012, Thursday, 9:00 am at the Hyatt Hotel and Casino Manila, 1588 Pedro Gil cor M.H. Del Pilar, Malate, Manila.

Roundtable Discussion on Water and Agriculture, 18 May 2012, Friday, 9:00 am at the Hyatt Hotel and Casino Manila, 1588 Pedro Gil cor M.H. Del Pilar, Malate, Manila.

Roundtable Discussion on “How Safe is the Water We are Drinking, 24 May 2012, Traders Hotel Manila, Roxas Blvd., Pasay City

National Academy of Science and Technology (NAST), *34th Annual Scientific Meeting (ASM 34): Philippine Water 2050*, 11-12 July 2012, Manila Hotel, Roxas Blvd., Manila.

Keynote Speaker (L. Q. Liongson) - Plenary Session on Flood Control & Drainage, Water Supply & Sewerage: Managing Water in Both Excess and Scarcity, National Academy of Science and Technology (NAST), 34th Annual Scientific Meeting, 11-12 July, 2012, Manila, Philippines.

National Academy of Science and Technology (NAST), *Roundtable Discussion on Flood Control & Drainage and Water Supply & Sewerage (Sanitation): Closing the MDG Gaps Now*, 8 October 2012, Traders Hotel Manila, Roxas Blvd., Pasay City.

Philippine Water Partnersip (PWP), *Seminar on Waste Water Treatment and Sludge Management*, 15 November 2011, MWSS Bldg., Balara, Quezon City.

- The seminar was organized in collaboration with Degremont-Suez Environnement, one of the worldwide leaders for water treatment, and attended by about 70 participants coming from the Metropolitan Waterworks and Sewerage System (MWSS), Manila Water Company, Inc., Maynilad Water, Department of Public Works and Highways, water districts and the academe.
- The highlight of the seminar was the presentation of the latest state of the art and innovations in the field of wastewater treatment and management.

Philippine Water Partnership (PWP), *The 4th National Conference of Small Water Service Providers (SWSPs) with the theme: "Building Capacities for Improved Water Service Delivery*, 28-29 November 2011, Hotel H2O, Luneta, Manila.

- This was jointly organized by the Philippine Water Partnership, National Water Resources Board (NWRB), National Water and Sanitation Association of the Philippines (NAWASA), and the Streams of Knowledge.
- The two-day event was a mixture of plenary sessions dealing with technical and managerial aspects of managing sustainable water service provision, updates on current IWRM and water and sanitation sector initiatives that are likely to impact on SWSP operations as well capacity development oriented session focusing on technical and financial aspects of water service provision.

Philippine Water Partnership (PWP), *Seminar on the 4th Edition of the World Health Organization (WHO) Guidelines for Drinking Water Quality*, 16 December 2011, MWSS Bldg., Balara, Quezon City.

- in coordination with Maynilad Water Academy, the first learning institution in the Philippines dedicated to the advancement of the water and sanitation.
- About forty (40) participants from the water districts, small water service providers, national government agencies, academe including government-owned and controlled corporations and NGOs involved in water service provision.

Philippine Water Partnership (PWP), *World Water Day - Philippine Walks for Water and Record-Setting for Largest Human Water Drop*, 22 March 2012, Quirino Grandstand, Luneta, Manila.

Philippine Water Partnership (PWP), *The Integrated Water Resources Management (IWRM) Conference and the PWP General Assembly / Election of Vice Chairman and Sectoral Representatives*, 29 March 2012, GT Toyota Center, University of the Philippines, Diliman, Quezon City.

The Local Government of Iloilo City, *The 1st Philippine International River Summit*, 30 May 30 - 1 June 2012, the Centennial Resort Hotel and Convention Center, Alta Tierra Village, Jaro, Iloilo City.

- A global forum on challenges, issues and best practices in the management of our rivers. The theme of the summit was "My River, My Life" and it focused on 4 important issues:

1. Governance
2. Biodiversity Conservation Management
3. Climate Change and Disaster Risk Reduction Management
4. Water Quality Management.

- Leading experts in the field of river management, biodiversity, and global climate change from U.S.A., Canada, Korea, Japan, Vietnam, Philippines and other Asian countries converged in Iloilo City to share sustainable river basin management practices that can be replicated to other cities.

Participation in IHP Steering Committees/Working Groups

Country Representative, 19th RSC Meeting, UNESCO-IHP for Asia Pacific, and Paper Presenter, IHP Symposium on Extreme Events - Meteorological, Hydrological and Tsunami Disasters: Social Adaptation and Future (EXTREME 2011), 24-28 October 2011, Kyoto University, Kyoto, Japan.

Country Representative, 20th Regional Steering Committee Meeting for Southeast Asia and the Pacific, UNESCO IHP SEAP, and the 2nd International Conference on Water Resources (ICWR2012) - "Sharing Knowledge of Issues in Water Resources Management to Face the Future", 5-9 November, 2012, Langkawi, Malaysia.

1.2.2 Research/applied projects supported or sponsored

National Academy of Science and Technology (NAST)

NAST Research Fellowship on Flood Control & Drainage and Water Supply & Sewerage (Sanitation) (2012) (L. Q. Liongson).

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

Hydrological Modeling Studies for Proposed Flood-Control Dams in the Marikina River Basin (2010-2011) (L. Q. Liongson), Team Energy Professorial Chair, Institute of Civil Engineering, College of Engineering, University of the Philippines, Diliman. Paper presented:

Liongson, L. Q. and A. S. Escolano (2011). Rainfall-Runoff Modeling and Flood Routing of Upper Marikina River Floods for 2009 Tropical Storm Ondoy (Ketsana) and Lower Return Period Events, Proceedings of the IHP Symposium on Extreme Events - Meteorological, Hydrological and Tsunami Disasters: Social Adaptation and Future (EXTREME 2011), 19th RSC Meeting, UNESCO-IHP for Asia Pacific, 24-28 October 2011, Kyoto University, Kyoto, Japan.

The analytical DO-BOD phase-space equilibrium states predicted by the mass loading functions and the transport and reaction parameters in hydrodynamic systems (2011-2012) (L. Q. Liongson), Team Energy Professorial Chair, Institute of Civil Engineering, College of Engineering, University of the Philippines, Diliman.

Downscaling Global Climate Change Projections to Local Scales: Methods, Problems and Uncertainties (2011-2012) (Guillermo Q. Tabios III), Dean Marino Mena Professorial Chair in Engineering, Institute of Civil Engineering, College of Engineering, University of the Philippines, Diliman.

Need for Climate Change Studies and Parameters Prior to Climate Change Adaptation Efforts in the Philippines (2010-2011) (Guillermo Q. Tabios III), Dean Marino Mena Professorial Chair in Engineering, Institute of Civil Engineering, College of Engineering, University of the Philippines, Diliman.

Proposed Marikina River Stormwater Tunnel to Agus River Basin or Pacific Ocean (2012) (G. Q. Tabios III, National Hydraulic Research Center, UP Diliman).

Dredging and Pumping Laguna Lake to Accelerate Lake Level Recession (2012) (G. Q. Tabios III, National Hydraulic Research Center, UP Diliman).

Creation of a National Water Resources Management Office to address institutional fragmentation and improved science-based decision making (2011-2012) (G. Q. Tabios III, National Hydraulic Research Center, UP Diliman).

A Methodology for the Engineering Design and Analysis of Foreshore Basins for Beach Erosion Protection (2011-2012) (Dr. Eric C. Cruz), Semirara Professorial Chair in Hydraulics, Institute of Civil Engineering, College of Engineering, University of the Philippines, Diliman.

University of the Philippines - Diliman, Department of Geodetic Engineering (UP-GE Dept) and Remote Sensing & Image Processing Laboratory

Remote Sensing and GIS for Soil Moisture Estimation II (2011-2012) (Dr. Rhodora M. Gonzalez), Filadelfo Panlilio Professorial Chair, Department of Geodetic Engineering, College of Engineering, University of the Philippines, Diliman.

High-Resolution Digital Elevation Dataset Derived from Airborne LIDAR for Flood Hazard Assessment and Mapping Applications” (2011-2012) (Dr. Enrico C. Paringit), Prof. Jose Jovellanos Professorial Chair in Engineering, Department of Geodetic Engineering, College of Engineering, University of the Philippines, Diliman.

Preliminary Investigation on the Use of Radon Monitoring and Electrical Resistivity Tomography for Spatio-Temporal Characterization of Salinity Intrusion (2011-2012) (Dr. Ariel C. Blanco), Phinma Professorial Chair/Research Grant Department of Geodetic Engineering, College of Engineering, University of the Philippines, Diliman.

University of the Philippines - Diliman (UPD), Office of the Vice-Chancellor for Research & Development (OVCRD):

Contact: UPD Vice Chancellor for R&D, Dr. Benito M. Pacheco, Professor of Civil Engineering - Philippine recommended focal point for DRH program of UNESCO-MEXT-Kyoto University.

Disaster Risk Management and Climate Change, UP Research and Extension (Dr. Benito M. Pacheco), UP CIDS Symposium on the Environment, 30 January 2012, Department of Science and Technology (DOST) and University of the Philippines Diliman (UPD).

Disaster Reduction and Risk Management (DRRM) Proposal, UP CIDS Workshop, 30 August 2012, University of the Philippines Diliman (UPD).

Impacts of Flooding on Population Growth Changes and Migration in Malabon City, School of Urban and Regional Planning (SURP), University of the Philippines Diliman (UPD) - PhD Incentive Awards OVCRD, 15 November 2011 - 14 November 2012.

Enhancing Risk Analysis Capacities for Flood, Tropical Cyclone Severe Wind and Earthquake for Greater Metro Manila Area or the Risk Analysis Project: Development of Vulnerability Curves of Key Building Types in the Greater Metro Manila Area, Philippines, Institute of Civil Engineering, College of Engineering, University of the Philippines Diliman (UPD) - DOST-PAGASA, DOST-PHIVOLCS, 29 November 2011 - February 2013.

Disaster Risk Management Using Sensors, Networks and Computing: Early Warning System for Landslides, Slope Failures and Debris Flow: Project 1: DYNASLOPE: Development of Dynamic Model for Landslides, Slope Failures & Debris Flows - Year 4 with extension (Year 5), Institute of Civil Engineering, College of Engineering, University of the Philippines Diliman (UPD) - DOST, 1 June 2011 to 31 May 2013.

Nationwide Disaster Risk Exposure and Assessment for Mitigation (DREAM) Program, Geodetic Engineering, College of Engineering, University of the Philippines Diliman (UPD) - DOST, 20 December 2011 to 19 December 2013.

Modeling of Flashflood Events by Integrated GIS and Hydrological Simulations - Year 2, Geodetic Engineering, College of Engineering, University of the Philippines Diliman (UPD) - DOST, 1 April 2012 to 31 March 2013.

Disaster Plans of Selected Filipino Families, College of Home Economics, University of the Philippines Diliman (UPD) - Creative Work and Research Grant, OVPAA, 1 February 2012 to 31 January 2013.

MECO-TECO: Philippine-Taiwan Integrated Predictive Studies of Geometeorological Hazards, National Institute of Geological Sciences, College of Science, University of the Philippines Diliman (UPD) - DOST-GIA, 15 November 2011 to 16 November 2012.

Establishment of the Flood Information Network (FloodNET), National Institute of Geological Sciences, College of Science, University of the Philippines Diliman (UPD) - DOST-GIA, 1 May 2012 to 30 April 2013.

Satellite and Field Detection and Analysis of Ground Subsidence in KAMANAVA, Metro Manila, & other Coastal Areas such as Hagonoy and Obando Bulacan, National Institute of Geological Sciences, College of Science, University of the Philippines Diliman (UPD) - DOST-GIA, 1 December 2011 to 30 November 2012.

Department of Science and Technology (DOST) and University of the Philippines - Diliman (UPD).

Nationwide Operational Assessment of Hazards (Project NOAH)

Executive mission: to put in place a responsive program for:

- (a) Flood mitigation, specifically targeting a 6 hour flood early warning system for communities along 18 major river systems;
- (b) Improving communications for weather and other hazards

Activities:

- (a) Integrated Flood Early Warning System Rollout 2012
 - Target: July 2012 - Marikina River Basin, Bicol River Basin, Cagayan de Oro River Basin, Iligan River Basin, Pampanga River Basin, Agno River Basin, Infanta, Lucena;
 - Target: December 2012 - Jalaur River Basin, Ilog-Hilabangan River Basin, Panay River Basin, Davao River Basin, Magasawang Tubig River Basin (Mindoro), Agus River Basin, Tagum-Libuganon River Basin, Tagoloan River Basin, Buayan-Malungun River Basin;
 - Target: June 2013 - Agusan River Basin, Cagayan River Basin, Mindanao River Basin;
 - Target: December 2013 - Other vulnerable river basins
- (b) Airborne LIDAR survey: GPS, IMU, Laser Rangefinder
- (c) Precision watershed surveying for modeling of watersheds and flood zones
- (d) Accomplishments - Purchase, Inspection and Delivery of LiDAR Equipment, Training Lease of Aircrafts
- (e) Advanced Works
 - Establishment/Relocation of GCPs for base stations
 - At least two base stations are needed for LiDAR Survey
 - Reconnaissance and Preparation for LiDAR survey
 - Flood Plain Extent Delineation
 - Development of tools for DEM correction
 - Mobile Lidar Processing
 - Integration of Satellite, Terrestrial and Bathymetric Data
 - Automated 6-Hour prediction of Water Level in Montalban
 - Marikina Watershed Modeling
 - Rapid Flood Simulation for Flood Events

Philippine Water Partnership (PWP)

Coping With Climate Change in the Philippines with Focus on the Water Sector (May 2011), funded by Global Water Partnership South East Asia (GWP-SEA).

Formulation of the Philippine Water Sector Development Plan - (2011), Cabinet-level policy paper (ongoing) by Guillermo Q. Tabios III (UP-NHRC) and Rosario Villaluna (Chair-elect, PWP), funded by ADB-Philippines National Economic and Development Authority (NEDA).

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:

Construction of the Pampanga River Flood Forecasting Center.

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.

Establishment of *Early Warning System for disaster mitigation* in the south (Iloilo) under the Korean Government - project began March 2008.

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

No additional information is available.

1.2.4 Other Initiatives

National Water Resources Board (NWRB)

Reforms in the Water Sector - Philippine Development Plan (2011-2016)

Strategy: Practice IWRM in the Water Sector,

- Whole Water Cycle Management and River Basin Approach

The Integrated Water Resources Management (IWRM) Plan Framework

- Working together to for all secure sustainable water
- Philippine IWRM Plan Framework (2007) Sustainable Outcome
 - (a) Effective Protection and Regulation for Water Security and Ecosystem Health
 - (b) Sustainable Water Resources and Responsive Services for Present and Future Needs
 - (c) Improved Effectiveness, Accountability, and Synergy among Water Related Institutions and Stakeholders
 - (d) Adaptive and Proactive Response to Future Challenges

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.

Proposed Programs:

- Establishment of an Integrated 3D GIS Based Water Resources Management Information System in the Provinces of Pampanga and Bulacan (KOICA funding, 2013-2014)
- Science-based Management Strategies for Sustainable Groundwater Resource Development in Metro Manila (Submitted to NEDA/JICA)

National Initiatives

- Legislative :Proposed Water Regulatory Commission and Water Reform Act
- Executive: Creation of a National Water Resources Management Office to address institutional fragmentation and improved science-based decision making.

Metropolitan Waterworks and Sewerage System (MWSS)

Water Supply Projects

- Angat Dam and Dyke Strengthening Project 2013 - 2016 National Government Remediation and strengthening of the Angat Dam and Dyke in order to ensure its stability should the West Valley fault moves
- New Centennial Water Supply Project 2013 - 2017 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.

- Sumag River Diversion Works 2012 – 2013 MWSS' Concessionaires

Construction of a diversion tunnel to supplement the water coming from Umiray River going to the Angat Reservoir.

- Umiray-Angat Transbasin Tunnel Rehabilitation Works 2012 - 2013 MWSS' Concessionaires

Rehabilitation and strengthening of existing tunnel structures/facilities to withstand future typhoons in order to ensure the continuous flow of raw water from the Umiray River to the Angat Reservoir.

- Bulacan Bulk Water 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

- 15 CMS Water Source Development Project 2014 -2017 PPP /ODA

Construction of a new source for irrigation water intended as a replacement of the 15 cms NIA's irrigation allocation currently allocated to MWSS for domestic water supply. To be coordinated with NIA.

- Rehabilitation, Operation and Maintenance of Angat Dam AN4 & 5 2013 onwards PPP

Rehabilitation, Operation & Maintenance of MWSS-owned Auxiliary Turbines 4 & 5 installed in the Angat Hydro-Electric Power Plant.

- Angat Water Utilization and Aqueduct Improvement Project Phase 3 2013 - 2015 ODA

Investigation and rehabilitation of the existing raw water conveyances (5 aqueducts and 3 tunnels) to Metro Manila.

Note: PPP = Public-Private Partnership; ODA = Official Development Assistance

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 scheme 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

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 WQMA 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.

Bureau of Soils and Water Management (BSWM)

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

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

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

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

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

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

Laguna Lake Development Authority (LLDA), *Environmental User Fee Program* (as centerpiece of Environmental Management Program).

Laguna Lake Development Authority (LLDA), *River Rehabilitation Program* .

Laguna Lake Development Authority (LLDA), *Lake Fishery Management Program.*

Laguna Lake Development Authority (LLDA), *Laguna de Bay Shoreland Management.*

1.3 Educational and training courses

1.3.1 Contribution to IHP Courses

None

1.3.2 Organization of specific courses

None

1.3.3 Participation in IHP courses

Ecohydrology International Symposium on New Ecohydrology Demosite Project, 22-23 March 2011, Jakarta, Indonesia. Philippines Participant: Ruth Gamboa, University of the Philippines, Davao City, Philippines.

21st IHP Training Course on "Introduction to River Basin Environment Assessment under Climate Change", 28 November – 10 December 2011, Kyoto, Japan. Philippine participant: Cornelio Q. Dizon, Institute of Civil Engineering, University of the Philippines, Diliman, Quezon City, Philippines.

22nd IHP Training Course on "Precipitation Measurement from Space and its Applications", 18 November - 1 December, 2012, Nagoya, Japan. Philippine participant: Ma. Rosario O. Ang, Department of Geodetic Engineering, University of the Philippines, Diliman, Quezon City, Philippines.

Papers and Publications

Department of Environment and Natural Resources (June 2010), *Philippine Strategy on Climate Change Adaptation 2010-2022*.

National Economic and Development Authority (2010), *Philippine Water Supply Sector Roadmap, 2nd edition*.

National Economic and Development Authority (2010), *Philippine Progress Report on the Millennium Development Goals*.

1.4 Participation in international scientific meeting

19th Regional Steering Committee Meeting for Southeast Asia and the Pacific Pacific, UNESCO IHP SEAP, and the International Symposium on Extreme Events "Meteorological, Hydrological and Tsunami Disasters: Social Adaptation and Future" (EXTREME2011), 24-28 October 2011, Uji, Kyoto, Japan.

20th Regional Steering Committee Meeting for Southeast Asia and the Pacific Pacific, UNESCO IHP SEAP, and the 2nd International Conference on Water Resources (ICWR2012) - "Sharing Knowledge of Issues in Water Resources Management to Face the Future", 5-9 November, 2012, Langkawi, Malaysia.

1.4.1 Meetings hosted by the country

No additional information is available.

1.4.2 Participation in meetings abroad

No additional information is available.

1.5 Other activities at regional level

Global Water Partnership - South East Asia (GWP-SEA), 23rd Steering Committee Meeting and IWRM Workshop, 19-24 September 2011, Bangkok, Thailand.

Global Water Partnership - South East Asia (GWP-SEA), 24rd Steering Committee Meeting, 24th GWP-SEA Steering Committee, 10–11 April 2012, Phnom Penh, Kingdom of Cambodia.

Global Water Partnership - South East Asia (GWP-SEA), 25rd Steering Committee Meeting, 24th GWP-SEA Steering Committee, 10-11 October 2012, Vientiane, Lao PDR.

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 2012-2013

Participation in the 21th RSC Meeting.

Participation in currently RSC-supported programs and activities such as APFRIEND, Catalogue of Rivers for SEAP, FFWS, DRH and the IHP training courses conducted by the University of Nagoya.

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.

NATIONAL REPORT ON IHP RELATED ACTIVITIES

THAILAND

for

The 20th Regional Steering Committee Meeting
for Southeast Asia and the Pacific

5-9 November 2012

Langkawi, Malaysia

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 - 2.2 Activities foreseen for 2012-2013
 - 2.3 Activities envisaged in the long term

1. Activities undertaken in the period of November 2011 – October 2012

Meeting of the IHP National Committee

Decision regarding the composition of the IHP National Committee

4. THE PRESENT COMPOSITION OF THC-IHP CONSISTS OF 18 MEMBERS

AS FOLLOWS:

5. **CHAIRMAN: MR. JATUPORN BURUSPAT, DIRECTOR GENERAL, DEPARTMENT OF WATER RESOURCES**
6. **VICE CHAIRMEN: DEPUTY DIRECTOR GENERAL, DEPARTMENT OF WATER RESOURCES**
Deputy Director General, Royal Irrigation Department
- Secretary: Director, Bureau of Research, Development and Hydrology, Department of Water Resources
- Members: Representatives from concerning agencies and individuals are as follows:
1. National Park, Wildlife and Plant Conservation Department
 2. Department of Groundwater Resources
 3. Royal Irrigation Department
 4. Meteorological Department
 5. Marine Department
 6. Hydrographic Department
 7. National Research Council of Thailand
 8. Bureau of Royal Rainmaking and Agricultural Aviation
 9. Secretarial of the Thai National Commission for UNESCO
 10. Electricity Generating Authority of Thailand
 11. The Thailand Research Fund
 12. Thai Hydrologist Assembly
 13. Mr. Veeraphol Taesombat
 14. Director of Research and Hydrology Development Division, Department of Water Resources

7.

8. **THE MAILING ADDRESS ARE AS FOLLOW :**

Thailand National Committee for the IHP
Department of Water Resources
180/3 Rama 6 Road, Samsennai District,
Phayathai, Bangkok, 10400, Thailand
Tel : +66-22986604 Fax: +66-22986604
Email : sukontha.a@dwr.mail.go.th

Status of IHP-VII activities

The activities related to IHP-VII was undertaken, ongoing and will be implemented such as the enhancement of Radar network and the Meteorological Satellite Data Receiving Station, improvement of storm surge forecasting, flood forecasting and warning system, implement of integrated water resources management in overall river basin focused on public participation.

Decisions regarding contribution to participation on IHP-VII

During November 2011 – October 2012, there was no Thailand National Committee – IHP meeting or discussion. However, the committee still encourages IHP members to continue sharing knowledge and technology, and cooperate in various ways to promote hydrological improvement and water resources criteria.

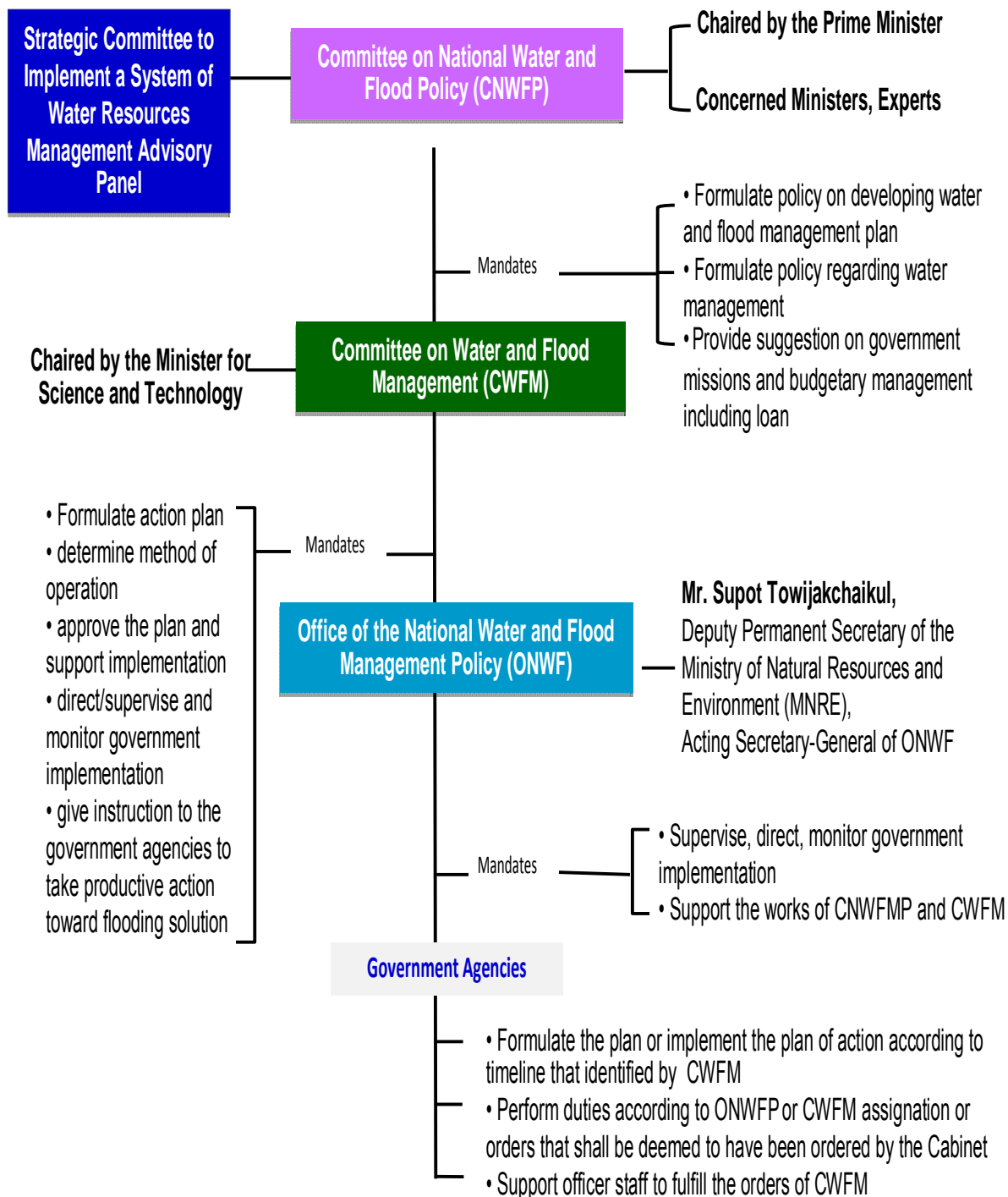
Activities at national level in the framework of the IHP

From the Experience Severe Flood in 2011, The Government has established a single command center in accordance with the Regulation on National Water and Flood Management, B.E. 2555, issued by the Office of the Prime Minister. The Government, led by Ms. Yingluck Shinawatra, Prime Minister of Thailand, has formulated the Water and Flood Management Strategy, in response to the incidence of flooding in the year 2011 and its aftermath.

The single command office offers real time data and serves as a War Room that assists in decisions made by the Prime Minister. The War Room incorporates strategic objectives to take practical actions in response to challenges to prevent and control floods and mitigate their effects, and thus benefit the people. The single command office covers upstream, middle stream and downstream areas of the Large Chao Phraya Watershed which consists of eight sub-watersheds, as follows: Ping, Wang, Yom, Nan, Sakae Krang, Pasak, Chao Phraya, and Tachin. These watersheds *typify* the country's watershed nationwide and are crucial to intensive backbone projects under the Action Plan for the Prevention and Mitigation of Floods. The action plan has been developed with due regard to the criteria for *setting priorities* to be met in pursuing urgent goals. The Action Plan is supported by a 300,000 million Baht budget to *fund* the following eight programs: Rehabilitation and conservation of forest and soil, natural dikes, and so on; Management of water and major reservoirs and building appropriate and sustainable reservoirs; Development of land use maps for watershed areas and designated major areas; Improvement of irrigated agriculture in the Phitsanulok Irrigation Project area; Improvement of major canals and dikes along major rivers; Establishment of floodways and/or flood diversion channels; Improvement of database, forecasting and warning system, and water management; and Improvement of institutions.

And the Action Plan is supported by a 40,000 million Baht budget to *fund* the following six programs : Rehabilitation and conservation of forest and soil, natural dikes, and so on; Management of water and major reservoirs and building appropriate and sustainable reservoirs; Development of land use maps for watershed areas and designated major areas; Improvement of database, forecasting and warning system, and water management; and Improvement of institutions.

Organization Structure



National/local scientific and technical meetings

Attended in various meeting in particularly on hydrology, meteorology, flood forecasting and warning system, water resources management and environment.

Participation in IHP Steering Committees/Working Groups

The representatives from TNC – IHP and the Department of Water Resources, Thailand attended the 19th RSC-IHP Meeting for the IHP in Southeast Asia and the Pacific and the International Conference on Extreme Events “Meteorological, Hydrological and Tsunami Disasters: Social Adaptation and Future” (EXTREME 2011), 24-28 October 2011, Kyoto, Japan

Research/applied projects supported or sponsored

- Flood Probability Analysis in the Lower Yom Basin
- Water resources research project: Integrated Water Resources Management (IWRM) in Songkhla Lake Basin
- Strengthen and Develop the Process of Community Participation in Water Resources and Forest Management : a case study-Ping and Eastern Coast Basin
- Research driven integrated water resources management in the country to practice: a case study of Wang Basin
- Research and community life and the role of local flood crisis: a case study of the South Basin
- Participation of communities in the management of water resources in the river basin of Huai Kha mosquitoes
- A study of water management community

Collaboration with other national and international organizations and/or programmes

- Cooperate with Ministry of Natural Resources and Environment (MNRE) and other concerned agencies to organize a meeting /events on the occasion of the World Water Day.
- Cooperate with JICA for project implementation on Comprehensive Flood Management Plan for the Chao Phraya River Basin during July 2012 – July 2013.
- Trilateral Cooperation; Lao PDR, Thailand and GIZ on Nam Xong Sub-River Basin Management, Vangveiang District, Vientiane Province, Lao PDR.
- Collaborate with Karlsruhe Institute of Technology, Germany and Royal Thai Embassy, Berlin to contribute the Thai-German Cooperation for Integrated Water Resources Management Project Case Study: Huay Saibat River Basin, Northeastern Thailand)

Other initiatives

Bilateral Cooperation on Improved Management of Extreme Events through Ecosystem-based Adaptation in Watershed between DWR, Thailand and GIZ under the support of German Federal Ministry of Environment, Nature Conservation and Nuclear Safety: BMU.

Educational and training courses

Contribution to IHP courses

None

Organization of specific courses

- Training on Operation and Maintenance of Mekong-Hydrological Cycle Observing System : Mekong-HYCOS on 13-15 December 2011, Chiang Rai
- National Workshop on MRC TOOLBOX on 3 Feb 2012, Department of Water Resources, Bangkok.
- Workshop on Development of a National Strategy for Integrated Flood Management for Thailand Between 19 – 22 March 2012 at Nakhonpathom, and 23 March 2012 at TMD Headquarters,
- Training on Sediment Sampling Technique on 20-21 June 2012, Chiang Rai

In December 14th, 2004 the Cabinet's Resolution assigned the department of water resources to implement the Early Warning system in the high risk areas, the mountainous slope and plain areas of flash flood and landslide.

The purpose are as follows :

- o To study and develop the system of water data collecting and disaster surveillance with efficient early warning systems along the assigned villages.
 - o To provide and install the meteorological and hydrological apparatus with the telecommunication for warning the risky flash flood and landslide villages.
- Seminar on Early Warning System in the High Risky Areas of Flash Flood and Landslide between 28 August 2012- 31 October 2012, cover with 46 provinces and 15 days. These seminar to increase for Public Relations and hear comments from the public and representatives of the early warning system for flood risk areas - landslide prone areas in the foothills and plains for 2012

Seminar on Early Warning System in the High Risky Areas of Flash Flood and Landslide between 28 August 2012- 31 October 2012

Item	Provinces	No. of Station	No. of Participants	Location/Venue	
				Date	Hotel/Resort
1	Chiang Mai Lam Pang and Lam Pun	32	450	28 Aug. 2012	Centara Duangtawan, Chiang Mai

2	Chiang Rai and Payao	25	280	29 Aug. 2012	Rim Kok Resort, Chiang Rai
3	Maehongson	14	180	11 Sep.2012	Imperial Tara, Maehongson
4	Kampangpetr and Tak	24	260	13 Sep.2012	Wiang Tak Riverside, Tak
5	Pisanulok, Utaradit, and Sukhothai	15	130	25 Sep.2012	Topland Plaza, Pisanulok
6	Prae	10	220	26 Sep.2012	Mae Yom Palace, Prae
7	Nan	12	270	27 Sep.2012	Tawarat, Nan
8	Surat, Krabi, Chumporn, Ranong and Pangnga	16	250	9 Oct 2012	Daimond Plaza
9	Nakhonsritamarat, Trang, Patalung, Satul and Songkhla	15	220	10 Oct 2012	Twin Lotus, Nakhonsritamarat
10	Rachaburi, Kanjanaburi, Supanburi, Prajuabkerekhan and Petchaburi	19	180	17 Oct 2012	Western Grand, Rachaburi
11	Saraburi, Uthaiburi, Petchaboon, Lopburi and Nakhonsawan	12	150	18 Oct 2012	Saraburi Inn
12	Rayong, Chonburi, Chantaburi, Trat, Chachoengsao, Prajinburi, and Srakaew	10	200	25 Oct 2012	Rayong City, Rayong
13	Nakhon Rachasima and Srisakate	8	100	29 Oct 2012	Heritage, Nakhon Rachasima
14	Chaiyapoom and Khonkane	7	100	30 Oct 2012	Deprom, Chaiyapoom
15	Loei, Udonthani	13	220	31 Oct 2012	Loei Palace, Loei
	Total 46 Provinces	232	3,210		

Participation in IHP courses

A Thai representative participated in the 21th IHP Training Course on Introduction to River Basin Environment Assessment under Climate Change, 28 November – 9 December 2011, Kyoto, Japan

Publications

There are numerous Publications from various conferences.

Participation in international scientific meeting

Meetings hosted by the country

Thailand by Ministry of Natural Resources and Environment hosted the 12th ASEAN Ministerial Meeting on the Environment in September 2012.

Participation in meetings abroad

A representative from Thailand participated in

- Singapore International Water Week 2012, July 2012, Singapore
- World Water Week 2011, Sweden
- 12th ASEAN Working Group on Water Resources Management, Vietnam, July 2012.

- 23th ASEAN Senior Official on the Environment, Cambodia, August 2012.
- World Water Forum, Marseille, France, March 2012.
- 2012 World River Forum, Daegu, Republic of Korea, September 2012.
- Andong International Waterfront City Summit 2012, Andong City, Republic of Korea, September 2012.
- The 5th International Yellow River Forum, Zheng Zhou, PR China, September 2012.

Other activities at regional level

Institutional relations /co-operation

- TNC-IHP has remained close coordination and contacts with UNESCO Jakarta Office.
- The research on Assessment of Flood Forecasting and Warning System (FFWS) for Tropical Region cover with 3 basin of Thailand, Laos PDR and Cambodia. Prof.Dr. Mohd Nor Bin Mohd Desa, RSC-IHP for the IHP in Southeast Asia and the Pacific and Director of Center for Stormwater and Geohazard Management) visit Meteorological Radar , weather forecast and warning Center, Thai Meteorological Department and the early warning system and telemetry system of Nam Mun Basin Nakhon Rachasima, Department of Water Resources, on 9-11 January 2012.

1.6.2 Completed and ongoing scientific projects

- Mekong-Hydrological Cycle Observing System Project (Mekong-HYCOS) The Mekong-HYCOS is an Mekong River Commission project operated by the Information and Knowledge Management Programme (IKMP). This project is funded by Agence Française de Développement (AFD) and Fonds Français pour l'Environnement Mondial (FFEM). Since 2006, it has upgraded existing hydro-meteorological stations in Cambodia, Lao PDR, Thailand, Viet Nam and China with state-of-the-art equipment and tools as well as operating systems to meet the standards of the World Meteorological Organization, the project's partner. The project also installed new posts in the countries. Currently, there are 49 stations throughout the region, 17 on the mainstream, 30 on the tributaries and 2 tidal stations in the Mekong Delta. These stations share raw data on rainfall and water levels through the MRC's data sharing platform. Moreover, the MRC's Flood Management and Mitigation Programme and national flood forecasting agencies use the data for their flood modelling and trigger flood warnings if waters reach critical levels. Near real-time flood forecasting information is also available on the MRC's website: <http://www.mrcmekong.org>
- Implementation of Joint-Discharge and Sediment Transport and Bedload Measurements on Mekong River of Thailand,
- MRC Toolbox and Decision Support Framework (DSF) Application for Thailand Regional Workshop on National Pilot Studies 2011
- MRC Toolbox and Decision Support Framework (DSF) Application in various aspect for Integrated Water Resources Management (IWRM) in 2 Pilot Study area for 3 year (2011 -2013)
 - Pilot Study No.1: MRC Toolbox and Decision Support Framework (DSF) Application for Flood Study and Water Quality Management in Lam Ta Kong Basin (LTK)
 - Pilot Study No.2: MRC Toolbox Application for Integrated Water Resources Management in Nam Pong Basin (NP)

The objective are 1) To Disseminate a MRC Toolbox and DSF model package by capacity building and improving skills in MRC Toolbox and DSF application to TNMC, Department of Water Resources and Line Agencies.

2) To study the Water resources system and Water Quality in pilot study area by using MRC Toolbox. and

3) To study an assessment of scenarios for water resources Planning, Development and Management in pilot study area.

1.6.1 FUTURE ACTIVITIES

Activities planned until December 2012

Thai representatives will participate in the 22th IHP Training Course on “Precipitation Measurement from Space and its Applications” 18 November–1 December 2012, Nagoya, Japan.

Activities foreseen for 2012-2013

- Continuation of Collaboration with RSC for Asia and Pacific
- Continuation of involvement in *Asian-Pacific FRIEND*
- Enhancing activities contributed to IHP-VII
- Enhancing activities in Flood and Drought Management
- Continuation of promotion on Integrated Water Resources Management
- Expansion of an Integrated Water Resources Management implementation to the rest of the country
- Promotion on Capacity Building on Water Resources Management for River Basin Committee
- Due to the flood disaster in Thailand last year (2011), the two events has been postponed as follows;
 - a) The 2nd Asia–Pacific-Water Summit. The Government of Thailand rescheduled for hosting the 2nd APWS on 17-20 May 2013.
 - b) The 1st International Environment Forum for Basin Organization, in cooperation with the United Nations Environment Programme (UNEP) will be organized in 2013.
- Participate in the international forum/conference on water resources management.

Activities envisaged in the long term

- Enhancing activities contributed to IHP-VII
- Enhancing activities in Flood and Drought Management
- Highlight on Integrated Water Resources Management in 25 river basins
- Continuation of raising public awareness and education in water resources management
- Continuation of raising public awareness in efficient water resources management
- Continuation of raising public participation for better water resources management

VIET NAM NATIONAL COMMITTEE FOR THE IHP
23/62 Nguyen Chi Thanh, Dong Da, Ha Noi, Viet Nam
Tel: (84-4) 8359540, Fax: (84-4) 8355993, Email: thuc@netnam.vn

NATIONAL REPORT ON IHP RELATED ACTIVITIES

I. ACTIVITIES UNDERTAKEN IN THE PERIOD NOVEMBER 2011 - OCTOBER 2012

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. Dr. Tran Thuc, Director of Vietnam Institute of Meteorology Hydrology and Environment (IMHEN) - Ministry of Natural Resources and Environment (MONRE).

Ass Prof. Dr. Hoang Minh Tuyen, secretary of IHP National Committee.

The current IHP National Committee consists of 5 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. Center for Water Resources Planning and Investigation

1.1.2 Status of IHP-VII activities

Viet Nam national committee has arranged projects and activities in all themes and almost all focal points of IHP-VII through national committee members, focal points and working groups around the country.

Prepare for the participation/contribution to HP-VIII activities. In June 2012, conducted commenting to the International Hydrological Programme, Formulation of the Eighth Phase of IHP. Scoring has been made for the priorities of country needs and cross-cutting themes.

1.1.3 Decision regarding contribution to/participation in IHP-VII

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

1.2.1 National/local scientific and technical meetings

1. Cooperation with Water Resources Department (WRD) in meetings on water resources issues of Viet Nam such as: Maintained minimum flow, developing reservoir system regulation rules, upgrading Water Resource Law, Vietnam river basin catalogue, water transboundary, Water resources monitoring network... ect
2. Collaboration with Ha Noi University for Natural Resources and Environment to upgrade subjects in Climate Change, Integrated water resources management, flood forecasting ...for education programme



3. From 23 to 27 July 7, 2012, CSIRO-IMHEN organize the Workshop of Project on Initiate for research collaboration in downscaling climate change scenarios for Vietnam. Results cooperation projects between CSIRO, IMHEN and VNU-HUS promise provides more information on the climate change scenarios for managers, policy makers, ministries, sectors and localities to apply effective scenario in developing and implementing action plans to respond to climate change.

4. Members of Vietnam NC IHP participated in the 35th anniversary of the Viet Nam National Commission for UNESCO and the Tehird independent medal award ceremony, Ha Noi 16 June 2012



5. August 17, 2012, the Ministry of Natural Resources and Environment in collaboration with the United Nations Development Programme (UNDP) organized the "International Workshop on climate change and extreme climate in Vietnam" with the targets to announce the results of the Special Report on risk management of disaster and enhance adaptation to climate change (SREX) of IPCC, discusses the impact of climate extremes caused to Vietnam.

1.2.2 Participation in IHP Steering Committees/Working groups

The members of the Vietnam 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

- *Study on Virtual Water Trade in VietNam*, Research Project funded by the Ministry of Natural Resources and Environment (MONRE).
- *Assessment impact of water utilization on upstream to downstream of Red river basin*. Research project funded by MONRE, 2012
- *Development of Operation rules in low flow season for reservoir system on Red, Ba, Thu Bon, Sesan-Srepok rivers*, Projects funded by MONRE.

- *Study on exploited water resources threshold for Ma and Ca basins*, Project funded by MONRE
- *Study on flash flood in Central Highlands an Central Area of VietNam*, Research Project funded by MONRE
- *Study on maintained minimum flow on main rivers of Vietnam*, Research project funded by MONRE
- *Updated Climate change Scenario for Vietnam in 2012*, Project funded by the the Government, 2012.

1.2.4 *Collaboration with other national and international organizations*

- From 23 to 27 July 2012, climatic experts from Australia and IMHEN met in Hanoi to begin implementation of the project: Development of climate change scenarios with high detail level for Viet Nam.
- IMHEN participated and contributed with Viet Nam Mekong River Committee to assess impact of water utilization in Mekong river Basin to Vietnam.
- Members/representatives of Vietnam NC IHP participated and contributed to many national councils.
- The VNNC IHP has yearly meeting with the Vietnam National UNESCO Commission,
- The Chairman and Secretary General of the National Committee are in frequent contact with the Vietnam's Permanent Representative to the WMO. This contact enables coordination of activities under the aegis of IHP and the WMO in Viet Nam,

1.2.5 *Other initiatives*

1.3 **Education and training courses**

1.3.1 *Contribution to IHP courses*

Training Course on Integrated Flood Analysis System, ICHARM and IMHEN, HaNoi, June 2012.

- Japan's experience in the management and flood control.
- Introduction of integrated flood analysis system.
- Presentation of participants in management system, local flood warning system.
- Training using the integrated flood analysis system.
- Apply for a river basin in Vietnam.
- Practice model based on hydrological data of Vietnam.



1.3.2 *Organization of specific courses*

None.

1.3.3 *Participation in IHP courses*

1.4 **Publications**

- Water Resources in Major river basins of Viet nam, March 2012
- Flash flood in Viet Nam and Warning, August, 2012
- Wind Energy of Viet Nam, June, 2012

1.5 Participation in international scientific meetings

None.

1.6 Other activities at a regional level

1.6.1 Institutional relations/co-operation

Continue developing Vietnam-Korea Environment Center for Research and Training (VietNam-KOICA)

The CSIRO and IMHEN promote cooperation to downscaling climate change scenarios for Vietnam with higher resolution.

1.6.2 Completed and ongoing scientific projects

Nil

II. FUTURE ACTIVITIES

2.1 Activities planned for 2012-2013

Participate in the compilation and promulgation of the guidelines of the Water Resources Law

Assess the impact of climate change on water resources and extreme hydrological events;

Research on degradation and impact of water utilization on Water resources;

Study on maintained minimum flow on main rivers.

Develop operation rules for reservoir systems on major river basins

Continue to improve warning and forecasting flood in central of Vietnam

2.2 Activities envisaged in the long term

Enhance activities contributed to IHP-VIII

Strengthen the integrated management of water resources.

Participate in the national action plan on water resources management and building regulations on river basin management organizations; National Water Resources Program,

Actively participate in the National Target Program to respond to climate change;

Continuation of raising public awareness and education in water resources management

Contribute more practical activities in the modernization program of Hydro-Met Service

ANNEX 7

DEVELOPMENT OF CENTRES UNDER THE AUSPICES OF UNESCO (INTERNATIONAL CENTER FOR WATER SECURITY AND SUSTAINABLE MANAGEMENT I-WSSM)



UNESCO IHP Category II Centre

International Centre on Water Security and Sustainable Management(*i*-WSSM)

Republic of Korea

1



i-WSSM: IHP Category II Centre

- **Korean government proposed the establishment of a UNESCO Category II center under the auspices of UNESCO and endorsed by the IHP Intergovernmental Council during its 20th Session in June, 2012**
- ***i*-WSSM (International Center on Water Security and Sustainable Management) will be located in K-water Institute in Daejeon**
- **To be dedicated to achieve the goals of UNESCO IHP**
 - Pursuing commitments to researches and recommendations on sustainable water security and resource management
 - Capacity build-up and technology transfer in water sectors

2



i-WSSM: IHP Category II Centre

Mission

Preparing Water Security Strategies for Climate Change Adaptation and Sustainable Development

Vision

Contributing to the human rights to water and sanitation and the quality of life

Goals

Convergent Research

- Water Cycle
- IT·BT·NT linkage research
- Problem-solving research

Practical Education

- Case program
- Field program
- Integrated capacity building program

Information Network

- Hub for water-related information
- Information sharing & exchange
- Linkage of

Strategy



i-WSSM: IHP Category II Centre

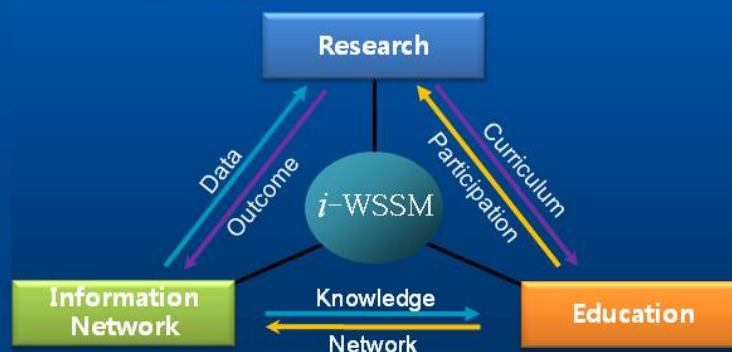
Objectives

- Performing integrated **researches** to contribute to the solving of global water problems and the realization of sustainable water management
- Providing practical **education and training programs** with focus on field-oriented cases to help developing countries and build up their national capacity
- Preparing for projects over various areas under the support of UN systems
- Developing capacity to adapt to Climate change found in river basins through securing not only scientific knowledge but also technological and institutional capabilities

i-WSSM: IHP Category II Centre

Objectives

- Developing evaluation technique for climate change impacts on water resources and making strategy for responding to climate change
- Restoring aquatic ecosystems
- Developing technologies for producing hydropower energy, and operating and managing relevant infrastructure



- Developing global academic research network
- Collecting, analyzing and sharing information
- Holding and supporting workshop and symposium

- Capacity building
- Practical education
- Follow up

5

i-WSSM: IHP Category II Centre

Major Activities

- **To be helpful to developing countries in achieving economic growth in terms of globalization**
- **Contributing to the fulfillment of international agenda and initiatives**
- **Solving water problems based on interdisciplinary and integrated approach**
- **To be helpful in achieving the goals of IHP programs through developing technologies, addressing sedimentation problems, and improving knowledge and analysis methods**
 - International Flood Initiative (IFI)
 - International Sediment Initiative (ISI)
 - Urban Water Management Program (UWMP), etc.

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i-WSSM: IHP Category II Centre

Major Activities

RESEARCH

- Pursuing an effective adaptation to climate change and achieve sustainable development
- To sustainably manage water resources and achieve water security
- Supporting the operation and management of water and wastewater
- Producing hydropower energy
- Operating and managing relevant infrastructure

EDUCATION

- Integrated water management covering dams and river systems, etc.
- Building and operating water infrastructure
- Producing green energy using water
- Operating and managing relevant infrastructure
- Management polices for supporting the efforts of developing countries to develop water industries

7



i-WSSM: IHP Category II Centre

Cooperative Partnership

i-WSSM

- Research
- Education
- Information Network



UNESCO IHP

- IHP Phases VII & VIII
- FRIEND
- HELP
- Associated Programmes
 - IFI, ISI, PCCP, JIIHP, ISARM, G-WADI, UWMP, WHYMAP

- Contributing to the solutions of global water problems
- Identifying how to secure a successful adaptation to the global impacts of climate change
- Building up a governance system for securing sustainability
- Developing eco-hydrological capacity and transfer water knowledge to developing countries
- Networking and collaborating with UNESCO IHP Category I & II Centres and Chairs

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ANNEX 9

PROGRESS OF THE CATALOGUE OF RIVERS

Catalogue of Rivers – Future

November 8, 2012

Hidetaka Chikamori

1. Publication of the Volume VI
2. Issues of Catalogue of Rivers
3. Recognition of the Catalogue of Rivers
4. Future of the Catalogue of Rivers
5. Issues to Discuss



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

1

1. Publication of the Vol. VI

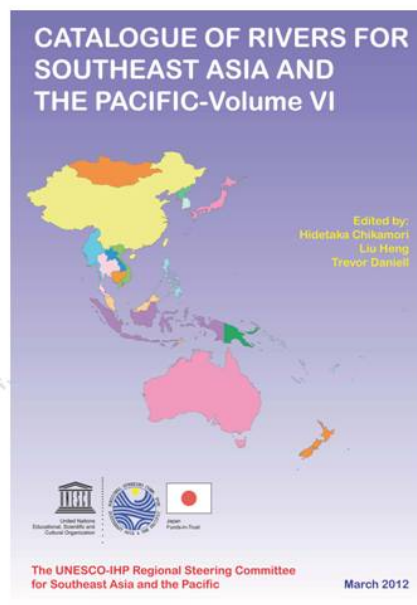
- Catalogue of Rivers for Southeast Asia and the Pacific – Volume VI was issued in March, 2012
- **Seven** new rivers are contained in Vol. VI.
- Including the first time contribution from 3 new member countries:
Korea (D.P.R.), Mongolia and Myanmar



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2

Rivers for Vol. VI



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3

2. Issues of Catalogue of Rivers

For Vol.VI:

- **Long interval**
 - 8 years interval between Vols. V and VI
 - (Prev. vols. issued every 2 years on avg.)
- **Much fewer rivers**
 - 7 river basins for Vol. VI (20 in Vol. V)

Difficult to collect new more data?

For All Volumes:

- **No update** since the Vol. I publication
- Since 1995, for 17 years



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

- How to update?
- How to reflect to the vols.?

Number of Rivers in the Catalogue Vols.

Country	Number	I 1995	II 1997	III 2000	IV 2002	V 2004	VI 2012
Australia	7	2	2	2		1	
Cambodia	2	1	1				
China	15	3	3	3	4	1	1
Indonesia	12	3	3	2	2	2	
Japan	16	3	3	3	3	3	1
Korea (DPR)	1						1
Korea (Rep. of)	14	3	3	3	3	1	1
Lao PDR	12		3	3	3	3	
Malaysia	5	1	1		2	1	
Mongolia	1						1
Myanmar	1						1
New Zealand	6	1	2	1	1	1	
Papua New Guinea	3		1	1	1		
Philippines	4	2	1			1	
Thailand	13	2	1	2	4	4	
Viet Nam	9	4			2	2	1
Total	121	25	24	20	25	20	7

3. Recognition of the Catalogue of Rivers

- The Vols. I-V are **highly appreciated** as a great achievement of the IHP-AP.
- The publication of Vol.VI was **anxiously expected**.
- UNESCO member countries are taking great interest in the FRIEND Programme and **its hydrological databases**
- UNESCO is pleased that the FRIEND databases **are maintained** by some of the member countries.



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

4. Future of the Catalog of Rivers

- **New Data**
- **Updating**... periodically/nonperiodically
 - Required to remain “flesh”
- **Print and/or Online**... Issue of cost
 - **Print** ... certain evidence of the achievement
 - **Online** ... easy to update
- **Coordination with the other databases**
 - Asian Pacific Water Archives (APWA)
 - Catalogue of Rivers, Supplement No.1
 - Coordination with national databases... ?

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for Southeast Asia and the Pacific

7

5. Issues to Discuss

Toward Vol. VII

- Collect more data/information for the Catalogues?
- Print and/or online?

For all volumes

- Update the previous volumes?
- Database?



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for Southeast Asia and the Pacific

8

Refer to Objectives of Catalogue of Rivers

To promote

- Mutual understanding (member countries)
- Information exchange (in each country)
- Establishment of
 - an international data exchange, and
 - collaborative research network

- New data
- New Volume

- Database
- Updating



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

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ANNEX 9

**PRESENTATION ON
THE 22nd IHP NAGOYA TRAINING COURSE**



The 22nd IHP Nagoya Training Course

Precipitation Measurement from Space and its Applications

18 November - 1 December, 2012
Nagoya, Japan

The 20th IHP Regional Steering Committee Meeting for Southeast Asia and the Pacific, 8-9 November 2012, Langkawi, Malaysia



Major topics:



- (1) Precipitation as one of the major components of the Earth climate system.
- (2) Precipitation has a big impact as a major fresh water resource to the ecosystem and human activity.
- (3) Observation of precipitation distribution is crucial not only for understanding and predicting changes of precipitation under the current global climate change but also for human activities. Global or even locally, precipitation observation is, however, difficult, because it has large spatiotemporal variations.

The 20th IHP Regional Steering Committee Meeting for Southeast Asia and the Pacific, 8-9 November 2012, Langkawi, Malaysia



Lectures



- (1) Basics of precipitation measurement from space
- (2) Radar measurement from space
- (3) Microwave radiometer measurements
- (4) Microwave radiometer/radar combined rain retrieval
- (5) Ground validation of rain data
- (6) Global rain map
- (7) Rain maps in the Tropical Cyclones
- (8) River runoff and flood warning

The 20th IHP Regional Steering Committee Meeting for Southeast Asia and the Pacific, 8-9 November 2012, Langkawi, Malaysia



Practices and Technical Tours



- **Experiments at Ujigawa Open Laboratory (technical visits)**
 - (1) Exercise on satellite data
 - (2) Exercises on global rain map
- **Technical visits and field surveys**

Research and Survey Division, Nakanihon Air Service, Co., Ltd.

The 20th IHP Regional Steering Committee Meeting for Southeast Asia and the Pacific, 8-9 November 2012, Langkawi, Malaysia



E-learning

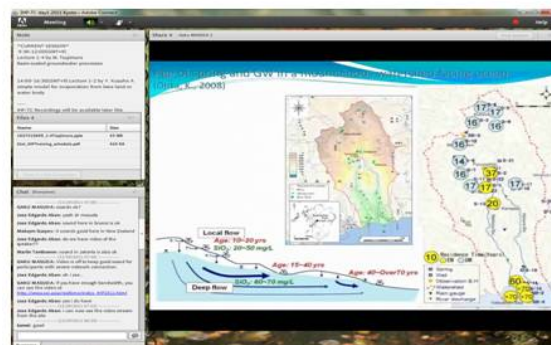


All lectures will be broadcasted through 3 connection possibilities:

1. **Teleconference system (Polycom)**
2. **SOI Livestreaming (interactive with chat board)**
3. **Ustream**



Please press "Join" to communicate with other participants, and submit your questions -- and wait for about 30-40 seconds until the server connection established.



The 20th IHP Regional Steering Committee Meeting for Southeast Asia and the Pacific, 8-9 November 2012, Langkawi, Malaysia



IHP Nagoya Forum Website



- **Further information on the course is available on the IHP Nagoya Forum Website :**
www.ihpnagoyaforum.org
- **This website will enable participants to :**
 - Connected to e-learning course
 - Get information on trainings courses (leaflet and registration form) and download training course materials
 - Build up a network and exchange ideas and expertise in an online discussion forum
 - Provide or update their contact details

The 20th IHP Regional Steering Committee Meeting for Southeast Asia and the Pacific, 8-9 November 2012, Langkawi, Malaysia



IHP Nagoya Forum Website



- New features have been added to the website:
 - Download of Textbooks from previous Training Courses
 - Photo Gallery
 - Guidelines to Participant's Report
 - Questionnaire
 - E-learning feature

- The website and its e-learning features expected to represent therefore a wider expansion and dissemination of the training courses, enabling wider attendance from many parts of the world

The 20th IHP Regional Steering Committee Meeting for Southeast Asia and the Pacific, 8-9 November 2012, Langkawi, Malaysia

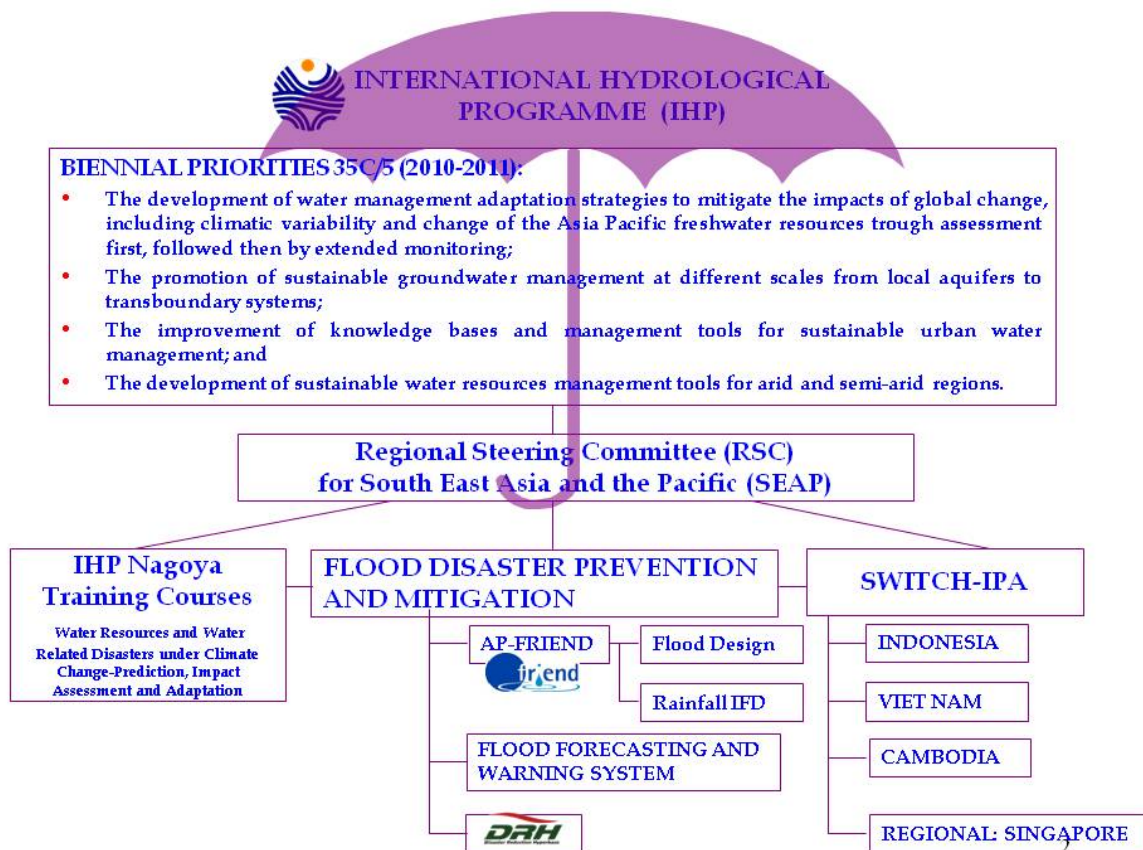
ANNEX 10
DRH-IHP REPORT

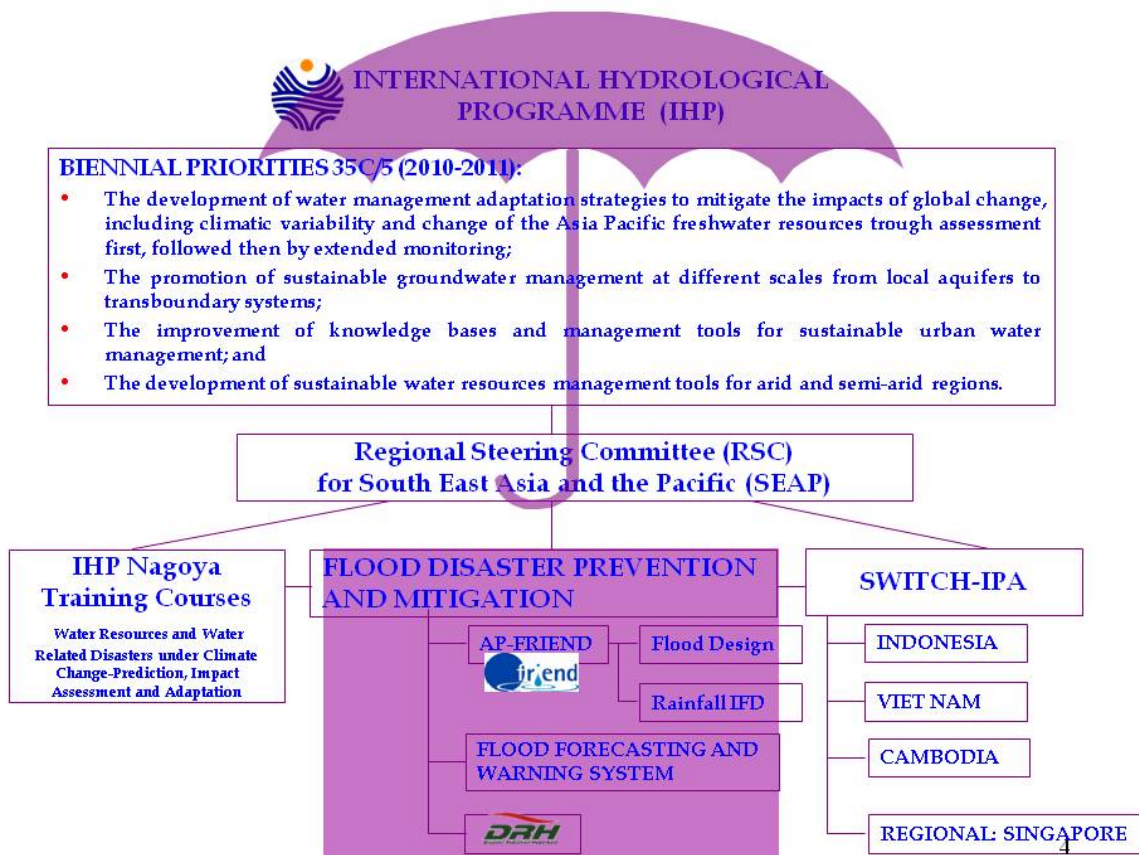
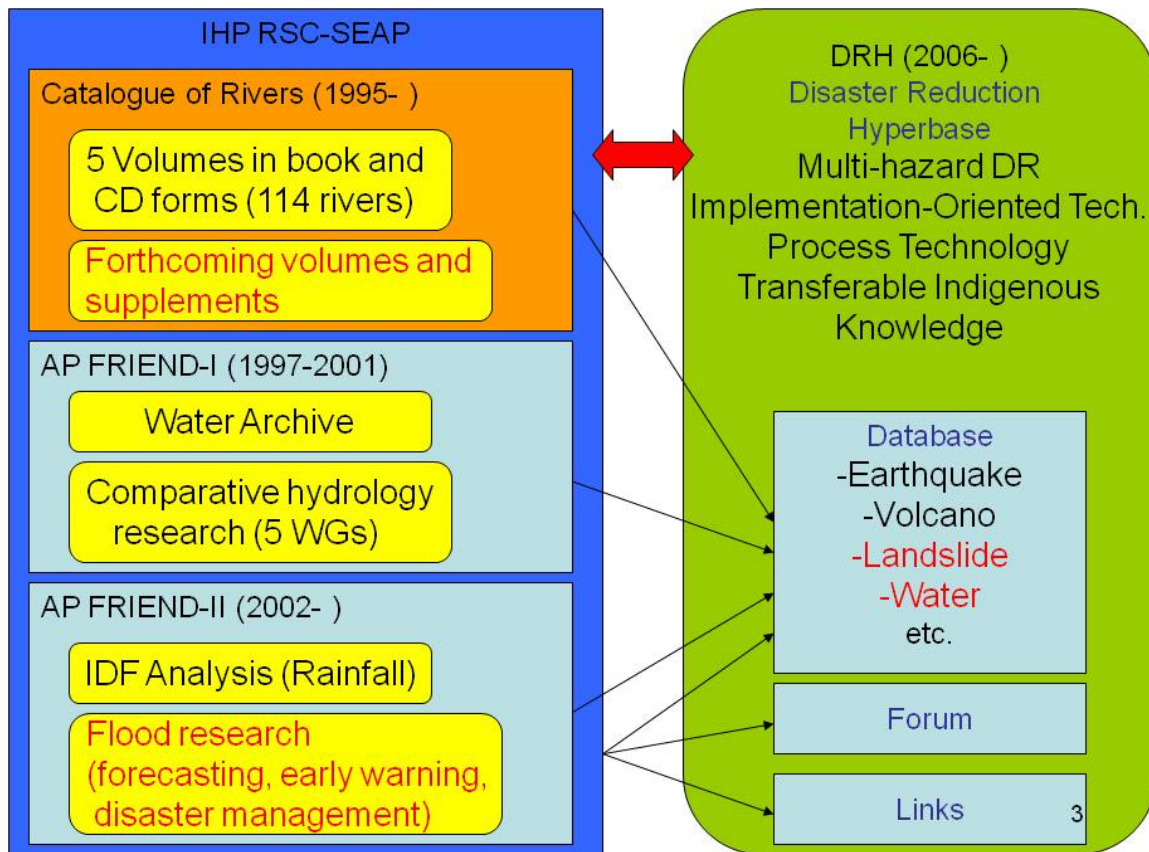
IHP-DRH Workshop for Application to Hydrology

9 November 2012

Langkapuri Inn, Langkawi, Malaysia

1

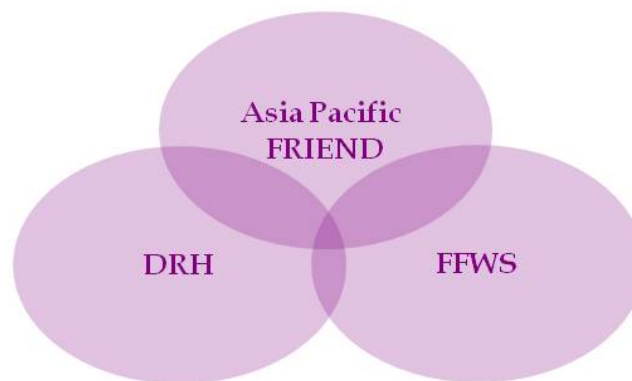




FLOOD DISASTER PREVENTION AND MITIGATION MEASURES IN ASPAC REGION

The Flood Disaster Prevention and Mitigation Measures consists of three interlinked components:

1. Asia Pacific FRIEND
2. Flood Forecasting and Warning System (FFWS) for Tropical Region
3. Disaster Reduction Hyperbase (DRH)



5

FLOOD DISASTER PREVENTION AND MITIGATION MEASURES IN ASPAC REGION

- Realisation of the needs to have a better forecasting, warning will be implemented through Asian Pacific FRIEND Phase II and FFWS for Tropical Region and integrated into knowledge-base system (DRH) for implementation to reduce flood losses in different countries of the region
- The system will last and able to be adapted to changing environment especially for climate variability and change
- Expected Results:
 1. Integrated state-of-the-art report that will highlight comparisons between various systems employed in participating countries.
 2. Water hazard-related countermeasure contents will be prepared and uploaded in the DRH platform.

6



IHP-DRH Project Phase I

* Reports on IHP-DRH Project, Phase 1

- Executive report: submitted to UNESCO on 5 March 2010
- Activity report: submitted to FFWS on 13 March 2010

* Accomplishments (1): Establishment of IHP-DRH collaboration scheme

IHP-DRH Workshop,
Wuhan, 3 November 2009



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2. IHP-DRH Project

+ UNESCO-NIED Contract

- Phase I (April 2009-March 2010)
- Phase II (April 2010-March 2011)

+ Tasks of the IHP-DRH Project:

- 1) Implementation of research outputs from the IHP Flood Project as DRH Contents (Main objective)
- 2) Organize IHP-DRH management meetings
- 3) Organize IHP-DRH Workshops

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+ Major Events in the IHP-DRH Project

- **Sep. 2009: Project management meeting (Kyoto & Tokyo)**
- **Nov. 2009: 1st IHP-DRH Workshop and 17th RSC (Wuhan)**
- **May 2010: FFWS Seminar and management meeting (Kuala Lumpur)**
- **Sep. 2010: Project management meeting (Kyoto & Tokyo)**
- **Nov. 2010: 2nd IHP-DRH Workshop and 18th RSC (Hanoi)**
- **Oct. 2011: 3rd IHP-DRH Workshop and 19th RSC (Uji, Kyoto)**
- **Nov. 2012: 4th IHP-DRH Workshop and 20th RSC (Langkawi, Malaysia)**

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2nd IHP-DRH Workshop Hanoi on 9 November 2010



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Action Plan decided

- 1) Finish the 5 proposed of DRH contents before January. Final report will be made by Kameda.
- 2) Phase III proposal by Kyoto Univ. with consultation with IHP Member countries
- 3) Propose the result of this workshop to encourage member countries to contribute and select focal points per countries that will be discussed in the RSC Meeting

11



DRH Application WS, Uji Kyoto 1-2 August 2011



12

DRH Application WS, Uji Kyoto 1-2 August 2011



13

1) Direct User

- Teacher (in this case, “Practitioner”)
- Trainer (in this case, “Practitioner”)
- Motivated citizen
- Motivated young field workers
- Student learning DR
- Local government leaders
- (etc.)

2) Purpose

- Introduction / Fundamentals
- School education
- Remain good practices
- Training for being DR specialist
- Learning DR management
- Learn/realize importance of measures

3) Usage

- teaching material of class
- learning material of self-study
- Manual for experiments/demonstration
- manual for actual DR measures
- As example of good practice (as only data)
- Guide to practical data on the other media (e.g., video/application on Internet)(as “Meta data”)

indirect user

- Student
- Trainee
 - Citizen
 - Local government staff
 - (etc.)

4) How to use

- Teaching
- Group learning
- Self schooling /independent learning

In this case, two kinds of materials may be needed.

#e.g.,

- a. Textbook/material that students use
- b. Textbook/instruction manual for teachers/trainers on “how to teach by using a.”

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DRH Contents are applied to Educational Purposes.

U-Y-03

Self-organized/voluntary seminar for sustainability/survivability science

2011A: Disaster Risk Reduction Technology Database (DRH Exercise)

(1) October 18: 8:45-10:15 at Yoshida (main) Campus [Takara and Kameda]
Civil Engineering Building 2F Conference Room

(2)-(4): Some examples of educational materials for disaster risk reduction

(5)-(6): Man-to-man training about how to use DRH database

(7): Selection of a content

(8)-(12): self-work

(13)-(15): Presentations by students

2012B: Disaster Risk Reduction Technology Database (DRH Exercise)

15



Objectives

- To learn various disaster risk reduction technologies available in practice
- To learn how to use DRH database
- To consider how to make use of DRH, especially for educational purposes
- To consider submitting your own contents

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Suggestions to students 2012

▪ Classes

- (2)-(4) Some examples of educational materials for disaster risk reduction
- (5)-(7) introduction of DRH and manipulation exercise
- (8)-(11) self-learning, (12) presentation of students' ideas
- (13)-(15) presentations by students and discussions.

▪ Visiting proposers (option)

Students may visit the proposers abroad/in Japan to learn the background of the content.

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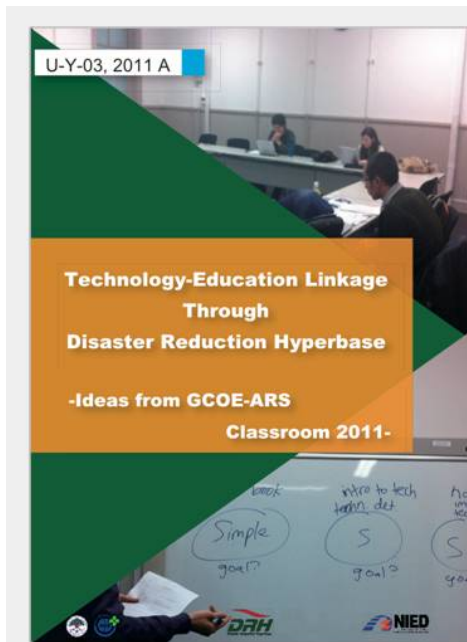


Progresses during one year (2011-2012)

- An abstract book introducing the course and eight teaching (educational) materials produced by using DRH contents.
- Multilingual setting of DRH system by using Google translation.

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Program 1

Disaster Reduction Education Program for students majoring in pedagogy

Proposer: Tomoko TERAMOTO

- Objectives: Teachers are expected to protect their students in the event of a disaster, so this lecture aims at providing teacher candidates with knowledge regarding disasters, as well as skills on how to teach about it.
- Target: students majoring in pedagogy
- Type: Lecture, experiment and field trip
- Project: one-week intensive lecture learn about earthquakes and their consequences.

Lecture Contents

Day 1: Lecture about earthquake mechanism. Then learn recent earthquakes (DRM4E) and teaching materials about risk management and disaster prevention.
 - Learning about earthquakes to teach children.
 Learning about past earthquakes and experiences in order to reduce damage.

Day 2: Earthquake experiment and Shaking table demonstration (DRM2 and DRM22).
 - Learn to understand earthquakes by making a simple model.
 - Seeing to the difference in damage between low buildings with different structure.

Day 3: Lecture about disaster triggered by earthquakes (tsunami, liquefaction and so on).

Day 4: Simple quiz & impression presentation.

Day 5: Experiment about disaster management and making a hazard map of the inside and outside of the school (DRM3, DRM4, DRM11).
 - Learning about the school buildings are earthquake resistant.
 - Identifying the dangerous places within the school.
 - Making a panel in each classroom to show what kind of risks exist and how to evacuate when an earthquake occurs.

Outcomes

- The lecture and experiment allow students to understand earthquakes and related disasters easily.
- Shaking table and teaching practice is a valuable experience to teach children in the future.

KIDA Tree Model

Knowledge: Earthquake mechanism, Earthquake Disaster, Earthquake related Disaster (tsunami, liquefaction).

Action: Find the inside and outside of the school, Experiments.

Interest: Children can learn about earthquakes, Children can evacuate safely when a disaster happens.

Action

- Teachers provide an enjoyable way for children to learn about earthquakes.
- DRH evaluation.

References:
 DRH 2,2,2,23,38,40,41,48
 Others: Teaching materials about risk management and disaster prevention, Setona prefecture.



About GCOE-ARS

Global COE Program

Sustainability / Survivability Science for a Resilient Society Adaptable to Extreme Weather Conditions

About DRH

What is DRH ?

Disaster Reduction Hyperbase-Asian Application (DRH-Asia) is a web-based database whose objective is to disseminate disaster reduction technology and knowledge. It was designed for potential use by policy makers, community leaders, practitioners and motivated researchers who wish to access appropriate technical know-how that can help them for practical purposes as well as for education and training. DRH provides open and interactive access and easy participation. Fig.1 shows the top page of DRH-Asia.

What are the features of DRR technology and knowledge in DRH?

In-depth discussion was conducted during the DRH Project in order to define a "useful" DRR technology. This led to the concept of Implementation Technology (IT) that consists of the following components:

- Implementation Oriented Technology (IOT):** Products from modern research and development that are practiced under clear implementation strategies.
- Process Technology (PT):** Know-how for implementation and practice, capacity building and social development for knowledge ownership.
- Transferable Indigenous Knowledge (TIK):** Traditional art of disaster reduction that is indigenous to specific region(s) but having potential to be applied to other regions and having time-tested reliability.

The DRH-Asia site includes:
 *DRH Database (Find technologies)
 *DRH Forum-1 (Propose a technology)
 *DRH Forum-2 (Discuss technologies)
 *DRH Links (DRH partners).

It also provides:
 *DRH Project (DRH Project activities) allowing access to all records of the DRH Project (Phase I: April 2005-March 2006, Phase II: July 2006-March 2009 / major sponsor: NEXT).

LECTURE

During the lectures, students learnt about disaster risk reduction and disaster education tools, as well as DHR.

TRAINING

Students accessed the DRH website, and got acquainted with the structure and contents of the database. After accessing and discovering the DRH website, students proposed their own original education tool.

DEVELOPMENT OF TRAINING TOOL

Students developed original education tool using contents from DRH and from other academic sources.

PRESENTATION

Students gave presentations about the original education tools they created, and made corrections based on the educators' comments.

Figure 2. Flow of Classroom U-Y-03 2011



Comments from the Classroom

Students' young brains have produced new thinking about DRH, resulting in the educational materials presented here. I am very pleased to have such a nice output through the collaboration between students and teachers in the GCOE-ARS classroom.

GCOE-ARS Program Leader Kaoru Takara

The fresh ideas of students were impressive. I enjoyed discussion with them. I appreciate their contributions. This will be a new start for DRH developments. The educational use of DRH has been incorporated as a new conceptual pillar. "Educators" will be added to the anticipated stakeholders, practitioner, policy makers, community leaders, and motivated researchers.

Hiroyuki Kameda

Since I usually have office job and research activities mainly, the academic discussions with students are fresh and very interesting. A variety ideas and opinions on DRH contents representation and DRH system are very good to improve the system. I hope that the students who participated in this seminar will play a role in disseminating disaster reduction management in their countries as educator, and then provide original DRH contents.

Hiroaki NEGISHI

It is a great pleasure for me to be a member of GCOE-ARS/DRH lectures. I am very much impressed with all students' performance, their enthusiastic interaction during the lectures, and their presentations in the classroom. I believe these lectures have been a good opportunity both for educators and students, and it can be of some further assistance in our future development.

Bin HE

The presentations made by the students about DRH have clarified how they perceive the system. A database becomes useful when users can make full use of it. In that sense, the explicit and implicit suggestions from the students through the presentations and discussion have opened new paradigms for DRH development. The style of the lecture was also new, thus I very much enjoyed the time. I am looking forward to the next discussion about DRH in the coming semester.

Kenichiro Kobayashi

I am very pleased to have been involved in this lecture. I enjoyed how the students developed these educational tools. I learned many things through the lectures, your educational tools and their development process, and through the publishing of this book.

Yukiko Takeuchi

This seminar was very useful for me. First of all, I gained knowledge about disaster and disaster mitigation education. Using the DRH official homepage helped us to understand this seminar. Finally, it was a good opportunity to see our own ideas published, which seemed to be a challenging assignment.

EunBi Kang

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This seminar gave us a chance to study the disaster education methods of several countries as well as to propose an improved method based on DRH materials. It is an important experience for students specializing in disaster theory to experience its practical application.

YoungA Shin

It is a useful course for us. From the course, we know about DRH, a source for disaster reduction technology and knowledge. We can learn from its contents and use them for our future works. And with this course, we also can contribute something for disaster reduction activities with our education materials.

Duong Duc Toan

The objective and intention of the seminar are very interesting and good. Activities/projects given for the students help students to think creatively and involve us in finding methods on disaster education even though it is a little bit hard and we need to think very creatively. Thus, this increases our awareness on disaster education. However, I would like to make a few suggestions. The content of the classes kept repeating (introduction and description of the DRH database) throughout the whole semester. It would be better

if the class focused on each student project development so that more discussion and comments by teachers and students could be conducted. I realize a lot of my friends got confused on what we actually needed to do. But still we all managed and the teachers still accept it.

Nor Eliza Alias

I learned how to use DRH in disaster reduction education. It was a little bit hard in the beginning because all of the classes were in English, but that was fun. This class was definitely a very good learning experience. Thank you very much.

Maya Kusajima

The seminar was very interesting, especially because of the diversity of the topics presented by the students. Therefore, we can learn the experiences from different places or countries. It enhances our understanding about how to prevent, mitigate and adapt the disasters.

Iva Dewi Lestariningsih

This course allowed me to see a practical vision of the GCOE-ARS program through the DRH website. I can see how DRH can have much significance and positive impacts towards creating safer societies. Moreover, I hope to contribute to its growth and success through future involvement with GCOE-ARS.

Philip Nguyen

We learned a lot about disaster and disaster reduction from this lecture. We could create many type of disaster reduction education material using DRH. I think DRH will help people to understand disaster and disaster reduction. But now only few people know about the DRH, so I think who know about DRH should promote it.

Tomoko Teramoto

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DPRI-KU



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KU

GCOE-ARS Course # U-Y-03

+Instructions for the course works (revgised 8 Nov. 2012)

(Oct.11~Nov.8): preparation

1. Understand what is DRH all about / Visit the DRH site / Read the books on DRH, or acquire information from DRH Project web pages

(Nov.15)

2. Identify DRH contents you intend to handle

(Nov.29)

3. present your plan



GCOE-ARS Kyoto University

Slide23/



(Dec. 6~27)

4. Do case studies to understand the DRH contents (including visiting the original proposers : those who wish, contact Prof. Takara).
5. Feel free to contact instructors via e-mail. Sometimes face-to-face or skype discussion will be available upon appointment.
6. Write up your report of activities and outcomes,
7. Focuses of your report
 - (1) Develop your perception on disaster reduction technology and knowledge
 - (2) Develop your draft textbook for school children education based on any of the DRH Contents / or Develop a new DRH Contents proposal !

(Jan. 10, 17, 24)

8. Presentation

Slide24/

Purpose of Today's WS 9 November 2012

- Review our IHP-DRH activities
- Encourage contents submission
- Discuss future actions
- Other matters

ANNEX 11

REPORT FROM APCE

Asia Pacific Centre for Ecohydrology (APCE) Category II Centre of UNESCO REPORT 2011 – 2012

1. Introduction

APCE concerns with environmental/ ecological problems for sustainable provision of water as an environmental service and ecological component for all people. APCE activities are in line with the main mission of UNESCO in enhancing science, education and culture. In this context, APCE benefits people in general through environmental and ecological management by harnessing science and technology, education and culture.

In its activities, APCE commits to contribute in overcoming current and important issues of national, regional and global interests, such as poverty, climate change adaptation, and disaster risk reduction.

2. Activities

In achieving the objective of the APCE, we will do several activities as listed in Table 1 that also contains time and potential partners for each activity. These activities will benefit from results of past and current research activities conducted by Indonesian Institute of Science (LIPI) and their partners.

1. Activity 1: Research on Sediment Deposition System on Saguling Reservoir, West Java (2011-2012)

- In the first year of the project, we will focus on the selection of the demo-site location **demo-site location Saguling Reservoir**
- Saguling reservoir area is defined into several 1) restricted zone, 2) conservation zone, 3) fishing one, 4) aquaculture zone, and 5) Transportation zone.
- This activity will have an output of a report document, containing details of identified and defined ecological issues and problems in **demo-site location Saguling Reservoir, Indonesia.**

2. Activity 2: National seminar & workshop

National Seminar on Ecohydrology, held in Jakarta, 24 March 2011, with the theme: Integrating Ecohydrological Principles for Good Water Governance”

The topics discussed: a). Ecohydrology concepts and principles with its development, b). APCE and institutional programs, c). Ecohydrology applications in lake management, d). Concept educational and research necessity on ecohydrology, e). a national policy of water resource management, f). conservation of water resources, g). spatial planning in water resource management, h). sustainable water resource use. Keynote speakers were Prof. Dr. Maciej Zalewski, Director of International Institute of the polish Academy of science, European Regional Centre for ecohydrology under the auspices of UNESCO (ERCE) and Dr. Shahbaz Khan, Chief of Sustainable Water Resources Development & Management Section, UNESCO Division of Water Sciences, Paris, France.

3. Activity 3: International (Regional) workshop

International Workshop On New Ecohydrology Demonstration Site Projects “Ecohydrology For Managing Sustainable Water Futures” Jakarta, Indonesia,

21 – 23 March 2011. Organized by APCE, UNESCO Jakarta Office, IHP Indonesian National Committee.

Ecohydrology Programme (EHP) demonstration sites aimed to synthesize knowledge gaps for addressing issues related to critical water systems. The International workshop open by **Hery Harjono** LIPI Deputy Chairperson – and **Shahbaz Khan**, UNESCO HQ and **Giuseppe Arduino**, UNESCO Jakarta. The workshop was attended by EHP experts from Poland, Portugal, Germany, Philippines, Argentina, Cina, Australia, Ethiopia, Indonesia and focused on how better knowledge of the interrelationships between the hydrological cycle, livelihoods and ecosystems could be contributed to more cost-effective and environmental-friendly management. The existing projects related to landscape processes, water issues in cities, rivers, floodplains, wetlands, reservoirs and coastal areas was discussed at the workshop.

The workshop bring together experiences of the following areas of interest in the demo sites:

- Relationships among ecological pattern and hydrological process;
- Disturbance and dynamics in natural and anthropogenic ecology and hydrology;
- Ecohydrological approaches to biodiversity conservation, environmental management, and ecological restoration;
- Integrating hydrology with ecological planning, design, and architecture, or reverse;
- Transdisciplinary studies of regional sustainability from scopes of ecohydrology, ecology, or both.

The activities included a discussion of the key aspects of the selected EH demo projects followed by the steering committee of the program which will elaborate on future plans.

4. Other activities

- a. Attend to IHP RSC in Kyoto – Japan, 27 – 28 October 2011
- b. Attend to World Delta Summit in Jakarta – Indonesia, 21 – 24 November 2011
- c. Attend to Korea International Symposium : "Addressing water quality challenges in Asia/Pacific", in Daejon, Korea, 7 – 9 December 2011
- d. APCE Meeting with Deputy of Earth Sciences – Indonesian Institute of Sciences, 22 December 2011 : "Renewal of the composition of the APCE organization committee"
- e. Participate in preparing the Indonesia National Committee IHP Response to The Draft Strategic Plan of The Eight Phase of IHP (IHP-VIII, 2014 – 2021), 26 January 2012
- f. APCE Meeting with Director General of High Education of National Education Ministry, 31 January 2012
- g. Attend to Indonesia National Committee of IHP in Jakarta, 19 January 2012
- h. Attend to Meeting of Indonesian Institute of Sciences and Indonesia National Committee for Unesco in Jakarta, 24 January 2012

- i. Site Visit to Pondok Pesantren Al-Amanah, Cililin – Bandung, in order to promote a Demo-site Saguling Reservoir, 27 January 2012
- j. Site Visit to Saguling Power Plant in order to promote a Demo-site Saguling Reservoir, 05 March 2012
- k. Study of sediment deposition system on saguling reservoir, west Java (2011)
- l. To Build the official secretary of APCE 1000 M² (APBNP 2012)
- m. Presented a paper entitled “Concept & Application Of Ecohydrology In Indonesian Inland Waters”, International Workshop on New Ecohydrology Demonstration Site Projects “Ecohydrology for Managing Sustainable Water Futures”, in Jakarta, Indonesia, 21 – 23 March 2011
- n. Presented a paper entitled “APCE in Indonesia” on National Symposium on Ecohydrology “Integrating Ecohydrological Principles for Good Water Governance” on 24 March 2011 in Jakarta, Indonesia
- o. International Training Program on Technology for Water Management, Belgium, December, 2011
- p. 21st IHP Nagoya Training Course in Asia and Pacific Region on Introduction to River Basin Environment Assessment under Climate Change. 8 November – 9 December 2011, Kyoto University, Japan
- q. Dr. Gadis Sri Haryani, Prof. J. Sopaheluwakan and H. Pawitan will present a paper entitled “Concept and Application of Ecohydrology in Indonesian Inland Waters
- r. Reformation of APCE organizational structure (2012). This is done in order to improve institutional performance including additional structural and personnel

5. Organization Structure

The new composition of the ASIA PACIFIC CENTRE FOR ECOHYDROLOGY (APCE) is :

Board of Directors :

1. Chairman of The Indonesian Institute of Sciences (IIS)
2. Vice-Chairman of The Indonesian Institute of Sciences
3. Secretary of The Indonesian Institute of Sciences
4. Director of The Unesco Jakarta Office
5. Chairman of Indonesia National Committee for Unesco
6. Deputy Chairman for Earth Sciences - Indonesian Institute of Sciences
7. Deputy Chairman for Natural Sciences - Indonesian Institute of Sciences
8. Deputy Chairman for Scientific Services - Indonesian Institute of Sciences
9. Director General of Water resources – Ministry of Public Works
10. Director of Research Centre for Limnology

Executive Director	: Prof. Dr. Hery Harjono	IIS
Executive Secretary	: Dr. Ignasius Dwi Atma Sutapa Yovita Lambang Isti	IIS IIS
Research Division	: Prof. Dr. Hidayat Pawitan (Bogor Agriculture Institute) Dr. Gadis Sri Haryani	IIS IIS
Division of :		
Training and Workshop	: Drs. M. Fakhruddin Dr. Apip	IIS IIS

Public Awareness	: Dr. Munasri	IIS
	Dr. Deny Hidayati	IIS
Information System	: Prof. Dr. Robert Delinom	IIS
	Dr. Luki Subehi	IIS

6. APCE activities in Progress :

1. MOU with Tsukuba University : Activities to promote collaborative scientific projects will be commenced by representatives from both parties, such as the project on studies of Lake Maninjau and other lakes or reservoirs potentially useful for downstream/pollutant-accumulating lake studies
2. MOU with NordCEE University of Southern Denmark : collaborative studies of the Malili Lakes
3. MOU with Toulouse University : Impact of anthropogenic activities on fish diversity in Citarum river, (experts exchange)
4. MOU with Katingan Subprovinve : Implementation of Peatwater Treatment Plant (IPAG60) as an alternative technology to provide clean water in peatland area.
5. MOU with Soposulung Foundation : sustainable management of Toba lake (Hyacinth control with a biocontrol method)
6. MOU with Ministry of Education and Culture and Unesco Jakarta Office: International seminar, training and workshop of ecohydrology
7. Planning of APCE secretariat building (April – December 2012)
8. APCE secretariat will be planned to be inaugurated by the President of Republic of Indonesia and the President of UNESCO in 2013 or 2014
9. Received a visit from children's school and high school : learning relating to the management of sustainable water resources
10. Visit of Prof.Hidayat Pawitan to ERCE-Poland, September 12 to November 04,2011 financially supported through Program of Academic Recharging, DGHE, Ministry of Education RI
11. Participation of Prof.Hidayat Pawitan in the 4-th European Regional Workshop of IAP "Towards Engineering Harmony between Water, Ecosystems and Society", Liepzig, 26-27 September, 2011, Germany
12. Ignasius D.A. Sutapa gives presentation to the International Workshop "The Asia Pacific Water Museum : Concept and Development" NWM, Pathum Thani 24 – 25 June 2012.
13. Gadis Sri Haryani gives presentation to the International Seminar on Ecohydrology and Global Water Issues, University Algarve, Faro, Portugal, 4 – 5 September 2012

7. Publications

- Ecohydrology Approach for Rehabilitation of Lake Limboto in Gorontalo, Indonesia (T Chrismadha, GS Haryani, M Fakhrudin, Lukman, I Ridwansyah, PE Hehanussa, Research Center for Limnology, Indonesian Institute of Sciences). Will be Published in Special Edition Journal on Ecohydrology.
- Proceedings of National Symposium on Ecohydrology "Integrating Ecohydrological Principles for Good Water Governance" on 24 March 2011 in Jakarta, Indonesia

- Ignasius Sutapa, Water Quality Assessment In Giam Siak Kecil – Bukit Batu Biosphere Reserve, Riau Province. Proceeding of International Workshop on “Sustainable Management of Bio-resources in Tropical Peat-swamp Forest” LIPI, Bogor/Cibinong, July 19th, 2011
- Ignasius Sutapa, Alternative Technology To Provide Clean Water In Peatland Area Of Gsk – Bb Biosphere Reserve - Riau Province. Proceeding of The 2nd International Workshop on South-South Cooperation for “Sustainable Development in the Three Major Tropical Humid Regions in the World”, Pekanbaru, Indonesia, 4-8 October 2011
- Ignasius Sutapa, *Bio-Village* Development Concept In Giam Siak Kecil Bukit Batu Biosphere Reserve, Riau Province: Development Of Peat Water Treatment Technology To Provide Clean Water Basic Needs. Proceeding of Korea International Symposium on “*Addressing Water Quality Challenges in Asia*”, jointly organized by UNESCO’s International Hydrological Programme and K-Water Institute. Daejeon, Republic of Korea, 07-09 December 2011.
- Reliana Lumban Toruan, 2012, Zooplankton emerging from fresh and saline wetlands, *Journal of Ecohydrology and hydrobiology*, Vol.12 no 1. 2012
- Tjandra Chrismada, Gadis Sr Haryani, M Fakhruddin, Lukman, I Ridwansyah, and P E Hehanussa. Ecohydrology approach for rehabilitation of lake Limboto in Gorontalo, Indonesia, *Journal of Ecohydrology*. 2011.
- Proceedings of National Seminar on Ecohydrology, 24 March 2011: Integrating Ecohydrological Principles for Good Water Governance”. This Proceedings contain 20 papers which consist of nine papers presented orally and 11 papers were presented in poster session. Those papers derived from various research institutions from both within and outside the country, universities, ministries and other institutions, who have been through the process of review by a team of editors.
- Pawitan, H., Haryani, G.S., 2011 Water resources, sustainability and societal livelihoods in Indonesia, *Journal of Ecohydrology and hydrobiology*, Vol.11 no 3-4:231-243. 2011

8. Meetings hosted by the country

- Asia Pacific Centre for Ecohydrology, Indonesian National Committee for IHP-UNESCO, Indonesian Institute of Sciences, Indonesian National Committee of Indonesia conducted International Workshop on New Ecohydrology Demonstration Site Projects “Ecohydrology for Managing Sustainable Water Futures”, in Jakarta, Indonesia, 21 – 23 March 2011
- Asia Pacific Centre for Ecohydrology, Indonesian National Committee for IHP-UNESCO, Indonesian Institute of Sciences, Indonesian National Committee of Indonesia, organized National Symposium on Ecohydrology “Integrating Ecohydrological Principles for Good Water Governance” on 24 March 2011 in Jakarta, Indonesia
- Asia Pacific Centre for Ecohydrology, Research Center for Limnology - Indonesian Institute of Sciences, organized National Workshop on National Priority Lakes on 17 July 2012 in Cibinong, Indonesia

9. Participation in meetings abroad

- Dr. Gadis Sri Haryani, Dr. Ignasius D Sutapa, Dr. Tri Widiyanto, participated UNESCO IHP 19th RSC Meeting in Kyoto – Japan December 2011
- Prof. Peter Hehanussa and Dr. Gadis Sri Haryani, participated UNESCO IHP 18th RSC Meeting for Southeast Asia & The Pacific (SEAP) in Hanoi, Vietnam. in conjunction with a the Fifth APHW conference on Hydrological Regime and Water Resources Management in the Context of Climate Change (HWCC 2010) took place in Hanoi, Vietnam 8 – 12 November 2010.
- Dr. Gadis Sri Haryani, Dr. Ignasius D Sutapa, Dr. Tri Widiyanto attend to EXTREM Symposium in Kyoto Japan, December 2011
- Dr. Ignasius D.A. Sutapa attend to Korea International Symposium : "Addressing water quality challenges in Asia/Pacific", in Daejon, Korea, 7 – 9 December 2011
- Dr. Iskandar Zulkarnain, Dr. Tri Widiyanto, Dr. Ignasius D.A. Sutapa Attend to 20th Session of IC of IHP in UNESCO Paris 4 – 7 June 2012
- Dr. Ignasius D.A. Sutapa attends to the International Workshop "The Asia Pacific Water Museum : Concept and Development" NWM, Pathum Thani 24 – 25 June 2012
- Dr. Gadis Sri Haryani attends to the International Seminar on Ecohydrology and Global Water Issues, University Algarve, Faro, Protugal, 4 – 5 September 2012.