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INTERNATIONAL HYDROLOGICAL PROGRAMME

16th IHP Regional Steering Committee meeting for Southeast Asia and Pacific

Ulaanbaatar, Mongolia, 2-3 October, 2008

FINAL REPORT

IHP-VII Regional Steering Committee meeting | No. 16
Regional Steering Committee for Southeast Asia and the Pacific
UNESCO Jakarta Office, 2008

CONTENTS

ANNEXES

The 16th IHP
Regional Steering Committee Meeting for
Southeast Asia and the Pacific

Ulaanbaatar, Mongolia,
2-3 October 2008

Chairman:	Mr Leonardo Liongson (Philippines)
Secretary:	Mr Kaoru Takara (Japan)
UNESCO Representatives:	Mr. Giuseppe Arduino (Jakarta Office) Mr. R. Jayakumar (Beijing Office)
Countries Represented:	Australia, China, Indonesia, Japan, Korea (Republic of), Korea (DPR), Malaysia, Mongolia, New Zealand, Papua New Guinea, Philippines, Thailand, Vietnam. (See Annex 1 for the list of participants)

Observing Countries and Organizations: None

1 OPENING

The RSC Chair Mr Leonardo Liongson (Philippines) opened the meeting at 09:05 am on 2 October 2008 and welcomed the participants. The Mongolian National Committee was thanked for organizing the conference and meeting.

2 ADOPTION OF AGENDA

The draft agenda was presented by the Chairman. At the request of the organizers for 17th RSC meeting, Item 14 was moved to 2 October and renumbered as item 10. The Agenda in Annex 2 was adopted.

3 ELECTION OF RAPPORTEUR

It was agreed that the task of Rapporteur would be carried out by Mr Dennis Jamieson (New Zealand).

4 SECRETARIAT REPORTS

4.1 UNESCO JAKARTA OFFICE REPORT

Mr Arduino presented his report in seven topic areas. Some key points follow, with details of other topics being noted elsewhere in these minutes and the complete report as Annex 3.

The status of 10 action items from the 15th RSC meeting in Manila, Philippines, were reviewed with feedback from participants at the current meeting. Specific items were updated as follows:

- Item 2: Myanmar participation. Mr. Takara confirmed he has written to Myanmar but has received no response to date. The correspondence took place around the time of Cyclone Nargis

which caused extensive damage in Myanmar. Initially it was decided Mr Takara should contact Myanmar again, but this approach was revised as a result of resolution RSC XVI-2
- Item 5: Intensity Frequency Distribution (IFD) rainfall project. Mr. Daniel reported that a draft report has been produced and is currently being edited. All countries submitted information. The next version was expected to be available for inspection by 3 October 2008
- Item 10. RSC achievement award. Mr. Takara noted there was a need to define the purpose of the proposed Achievement Award. This was put aside to be covered under agenda item 17 (other issues) later in the meeting.

The involvement in, or organization of, 3 workshops/courses/seminars involving a total of 55 participants, as well as the provision of travel grants enabling 32 regional scientists to attend a range of meetings and conferences, were briefly described. Mr. Arduino also described a number of activities organized by other UNESCO field offices which were supported by 20% of the Jakarta IHP budget.

A number of activities undertaken by UNESCO Jakarta, such as two Hydrogeological investigations in Viet Nam and the rainfall station operated in Jakarta, were described. As well as providing local rainfall information, the Jakarta rainfall station contributes to a regional monsoon monitoring project. The UNESCO Jakarta office contributed to the acquisition of Volume 4 (issues 1-4) of the JOURNAL of Landslides, and to the distribution to focal points in the region as support for the work of the International Consortium of Landslides.

Mr Arduino summarized the outcomes of the June 2008 review and evaluation meeting on activities supported by the Japanese Fund in Trust. A number of resolutions were adopted during the meeting to refine the work process.

Significant advances have been made in the database for the IHP Training Course participants and an associated online information and discussion forum (www.ihpnagoyaforum.org). This website directly supports delivery of courses by providing access to electronic textbooks, presentation notes and the facility to raise questions after the course. These features overcome previous problems associated with tracking course material after training courses are completed and allow a wider range of users to learn the course via the internet without necessarily physically attending course workshops.

The complete report, including status of action items from the 15th RSC meeting, is included as Annex 3.

4.2 UNESCO BEIJING OFFICE REPORT

Mr. Jayakumar reported on Capacity Building activities with different training courses, such as:
- Workshop on National Training Workshop on Hydraulic Projects Construction and Ecological Environment, Oct 21 – Nov. 8, 2007, in Hangzhou, Zhejiang Province, China
- 4th UNESCO training course on Climate Change and Ecosystem Adaptability with Focus on the Yangtze River Basin
- e-Learning courses under UNESCO Chair on Sustainable Water Management
- Asian G-WADI: Afghan officials training on Remote Sensing and GIS Modelling for Hydrological Research, Asian G-WADI Secretariat, CAREERI, Lanzhou, China, 20 October -2 November 2008
- International Workshop on Water Management through Forest Management – Chinese Academy of Forestry, 12-16 November 2007.

Mr Jayakumar also reported on activities such as the UNESCO Chair on sustainable groundwater management in Mongolia, on research and pilot projects as well as participation in the International

Initiative of IHP and cooperation with other cluster offices in the region. A complete report is included as Annex 4.

5. REPORT ON THE IHP INTERGOVERNMENTAL COUNCIL

An outline of important points from the meeting of the Intergovernmental Council held in Paris in June 2008 was given by Mr Takara, Ms Zandaryaa and Mr Arduino. The full proceedings of this meeting have been published by UNESCO.

A key concern for IHP was the reduction in the future IHP budget. The Council has undertaken to prepare an appeal to have the funding restored to at least the previous level. No clear reason has been given for the budget cutback, although suggestions were made that it was part of an attempt to have a balanced scale of operations across all UNESCO areas including Earthquake/Tsunami and Africa.

At the Council meeting Mr Daniell was elected chair of the finance committee. Mr Daniell briefly described new procedures introduced by UNESCO that will increase overhead costs and emphasised the need to be aware of these additional costs when preparing budgets. It was also noted that this was part of a process to ensure that all members measure costs and better link spending with outputs.
Four main issues were covered at the Intergovernmental Council Meeting:

- How the IHP 7th phase should proceed. The budget for 2008-9 was approved.
- UNESCO Category 2 Centres. There are many Category 2 Centres around the world. A number of new centres were approved
- UNESCO Category 1 Centre. This is the Delft Institute of Hydraulic Engineering (IHE). This centre has serious financial issues and is looking to UNESCO for funding support.
- Promotion of water related education. This is part of the UNESCO Decade of Education for Sustainable Development (2005-2014).

6 COUNTRY REPORTS

All country reports are included as Annex 5.

6.1 AUSTRALIA

Mr Trevor Daniell noted that the Federal government has indicated a large increase in funding for water issues. At this stage none of this funding was directly linked to IHP and proposals for Category 2 centres were languishing. Mr Daniell noted that IHP activities continued to receive the interest and support of Bruce Stewart (Bureau of Meteorology/WMO) and Terry Falconer.

6.2 PR CHINA

Ms Huang Yan presented the report for the China IHP National Committee. The full report contains details of many activities, both carried out and planned, across all IHP areas. Some selected highlights follow.

The Ministry of Water Resources has approved new members for the China IHP National Committee. The China IHP committee now consists of 29 distinguished water experts. As in previous years the Bureau of Hydrology, Changjian Water Resources Commission continues its important role as a contributor to IHP-VII.

Dr. Szöllösi-Nagy, Deputy Assistant Director General of UNESCO, Secretary of the IHP and Director of Division of Water Sciences visited IHP China on 24-29 May 2008. The objective of the mission was to broaden links between IHP/UNESCO and the significant water sector in China. Dr. Szöllösi-Nagy also participated in a Seminar on the Impact of Climate Change on Water Resources which was organized in the Ministry of Water Resources of China (MWR) by the Chinese National Committee for IHP.

Ms Huang Yan became coordinator of the Hindu Kush Himalayan Flow Regimes from International Experimental and Network Data (HKH-FRIEND) programme in November 2008. Activities in this role have included attendance at the 7th FRIEND Intergroup Coordination Committee (FIGCC) meeting in Adelaide, Australia in April 2008, and a meeting at UNESCO Paris, France, in September 2008 to expand opportunities for joint research.

The International Small Hydropower Centre organised a training workshop on small hydropower and community sustainable development in Hangzhou, China in April-May 2008. This course linked directly to the IHP-VII theme related to water and energy and involved 46 participants from 23 developing countries.

6.3 INDONESIA

Mr Hidayat Pawitan presented the report of the Indonesian IHP National Committee and passed on an apology from the Committee Chair, Mr Hery Harjono who was unable to attend. The report contains descriptions of a wide range of activities and meetings, with selected highlights below.

The Indonesian National Committee for IHP has 7 new members among its 12 members and is restructuring its activities to align with IHP-VII and to increase participation by stakeholders.

The Asia Pacific Centre for Ecohydrology (APCE) is actively participating in projects related to reservoir eutrophication and to possible water scarcity issues affecting major cities. It also continues a programme of training workshops.

A National Seminar Series on water resources conditions to support improved rice production was held through 2007. This involved cooperation between the Indonesian Society of Hydrology, the Department of Public Works, the Department of Agriculture and the Agency of Meteorology and Geophysics.

The Department of Public Works has commenced a study of global climate change. The objective is to adapt to the effects of climate change on public infrastructure.

Three calibration laboratories are planned to provide WMO standard calibration for hydrology equipment across Indonesia. These will be located in Medan (West), Jogjakarta (Central) and Makassar (East).

National Guidelines on Quality Assurance for hydrological management are being established. This involves collaboration among a wide range of operational hydrology agencies across Indonesia.

6.4 JAPAN

Mr Kaoru Takara presented the Japan IHP National Committee report. The report covered progress on the Catalogue of Rivers, the Asia-Pacific FRIEND project, the Predictions from Ungauged Basins (PUB) project, and the International Consortium on Landslides (ICL).

The review and evaluation meeting on IHP activities supported by the Japanese Fund In Trust (FIT) was presented. This is covered in more detail in the UNESCO Jakarta report (Annex 3).

6.5 KOREA DPR

The Korea DPR delegation expressed their thanks to UNESCO for the opportunity to participate in the meeting. They particularly noted this is the first meeting they have attended since 2005. They expressed their desire to expand links with both the IHP and UNESCO.

6.6 KOREA (REPUBLIC OF)

Mr Soontak Lee presented information on the wide range of activities related to the IHP undertaken in the Republic of Korea. The work described, included a comprehensive range of projects associated with the completion of IHP–VI, and the implementation of IHP-VII.

The implementation plan for IHP-VII includes the continuation of HELP and FRIEND as cross-cutting programmes and associations with a wide range of additional initiatives such the International Flood Initiative (IFI), the International Sediment Initiative (ISI) and the World Hydrogeological Map (WHYMAP). Mr Lee also referred to contributions to university training, the organization of courses and seminars, and close cooperation with ICHARM.

6.7 MALAYSIA

Mr Lim noted there has been a major change of guard on the Malaysian IHP (MIHP) National Committee. He passed on the best wishes of the Chair, who was unable to attend.

MIHP plans its activities through its Executive Committee and implements work through three standing committees and associated working groups on Research, Education Training and Public Information, and on Standardization of Hydrological Practices. The stranding committee on research coordinates and formulated proposals for research projects. Mr Lim went on to give an overview of projects executed under IHP-VI and planned under IHP-VII.

6.8 MONGOLIA

Mr Basandorj presented an overview of national activities including progress on a major project on “Strengthening Integrated Water Resource Management in Mongolia” with the Netherlands, organization of the international “MoMo” (Integrated Water Resources Management Mongolia) project with Germany, the development of a national programme on “Protection of headwaters in Mongolia” and the running of a Integrated Water Resources Management (IWRM) training course for 50 senior engineers at the Research and Training Centre in January 2008. A number of regional and international activities were detailed including the international conference on “Uncertainties in water resources management: causes, technologies and consequences”, and 16th Regional Steering Committee Meeting for the UNESCO IHP for Southeast Asia and the Pacific in Sept-Oct 2008, and case studies in hydrological regimes in the Artic Ocean basin and four glacier systems.

Significant events in Mongolia included the establishment of a UNESCO Chair at the Institute of Geoecology under the Mongolian Academy of Science, and continuation of the Selbe river basin water balance study. Mr Bassandorj concluded by stressing the need for support from UNESCO for the implementation of IHP VII, especially for improved water education in both urban and rural areas.

6.9 NEW ZEALAND

Mr Dennis Jamieson briefly described IHP related activities in New Zealand, highlighting freshwater resources data collection, effects of land use intensification on water quality and quantity, reducing the effects of weather related hazards and the FRIEND Motueka Basin project. The importance of collaboration was emphasized with examples given of the New Zealand Government's Sustainable Water Programme of Action (SWOPA), work with the WMO and the South Pacific Applied Geosciences Commission (SOPAC), and important ongoing and active linkages between the New Zealand Hydrological Society and the Korean Water Resources Association (KWRA).

Additional information was presented on initiatives to work in a collegial manner with Pacific Island based water specialists, introduce new technology via education and training, and to ensure international linkages were maintained and expanded. New areas for 2009 are expected to include increased application of the nationwide Topnet hydrological model as a tool to allow application of new hydrology techniques and knowledge to all parts of New Zealand and a new research programme on "Reducing impacts of climate change on the urban and built environment".

6.10 PAPUA NEW GUINEA

Mr Virobo presented the PNG report which noted the challenges facing the water resource work given a switch in emphasis and resources from protection and conservation of the environment to policy development. Activities related to national water events have been carried out, and a number of hydrological stations have been rehabilitated as part of the Pacific HYCOS project, run by SOPAC with EU funding support. Significant developments reported include an upsurge in mining, infrastructure and energy related activity.

6.11 PHILIPPINES

Mr Tabios described the operation of the National Committee over the previous year, highlighting the committee's organization of the International Conference on Hydrology and Water Resources Management for Hazard Reduction and Sustainable Development (HRSD 2007), and the 15th RSC meeting. Planning for the transition from IHP-VI to IHP-VII has commenced with priorities for the Philippines being set for focal areas identified by the UNESCO-IHP Paris Office. A range of activities were reported on by Mr Tabios. These included meetings and training associated with the Philippine Water Partnership and participation in IHP training courses conducted by the University of Nagoya.

6.12 THAILAND

Ms Runghirunviros noted that the Thai National Committee (TNC-IHP) Chair is now Mr Hungspreung and that the committee has a total of 23 members. Information was given on IHP-VI activities including the implementation of Integrated Water Resources Management (IWRM) in 29 small sub-basins, extension activities with local communities, flood forecasting on the Chi-Lower Mun river basin, the installation of Flood and Landslide early warning systems and the construction of village water supply systems. Specific highlighted issues for IHP-VII are integrated river basin management, public awareness of water management, institutional development, guidelines for IWRM with public participation, increasing available water sources and flood and drought management. Ms Runghirunviros described collaboration with a wide range of national and international organizations including multiple projects with the Mekong River Commission, the Asian Working Group on Water Resources Management and ADB projects. Other initiatives include a Hydro-Agronomic Economic Model for the Mekong River Basin, the Mekong HYCOS

project, and an impact study of climate change on irrigation systems. The presentation concluded with an overview of expected future activities.

6.13 VIETNAM

Mr Hoang. noted that the focus of IHP activities in Vietnam were at the national level. Of particular concern to Vietnam are the effects of climate change and sea level rise. A priority has been the development of dry season reservoir rules for Central Vietnam.

7. REPORT FROM THE ASIA-PACIFIC FRIEND

Mr Daniell distributed a draft report and noted that Part 1 of the project is complete. The next step proposed is an Intensity Frequency Duration (IFD) workshop in March 2009. This would involve 10 to15 invited participants. This would be a two day (three night) meeting with one day spent on IFD and one day on flood estimation methods.

Part 2 would look at flood prediction methods for the whole AP region. The function of workshop would be to share techniques. It is proposed to hold this in Ho Chi Minh City, Vietnam. The workshop would progress the four points raised at the 2005 workshop in Kuala Lumpur which were:

- Developing a process for design flood analysis including flood frequency analysis and development of flood hydrographs through runoff models.
- Regional processes that were applicable to design flood estimation (e.g. flood frequency analysis).
- Quality control of data
- Software and techniques that could be exchanged.

Mr Daniell noted that the need for such work was included in the minutes of the 2007 RSC minutes, but names of proposed participants were not recorded. A flood working group could contain representatives from Vietnam, ICHARM, Australia, Japan and China and also from Malaysia, Cambodia, New Zealand and the Philippines. Mr Daniell proposed that the working group would be aiming to fit into Japanese initiatives, and that Australia would participate, but did not wish to lead the working group on floods.

Further consideration of AP Friend occurred later in the meeting and is included below as item 23.

8 PROGRESS OF THE CATALOGUE OF RIVERS, VOLUME VI

Mr Chikamori gave a presentation that gave details of the website for the Catalogue of Rivers, the data being accumulated, and the location of the website. An interactive discussion followed where options for uploading at multiple sites (e.g. Kyoto, Melbourne, Kuala Lumpur), or a single site with linked nodes, were developed. It was noted that HTC have been successful in assembling data from 51 rivers in 13 countries but that some issues with uploading data were occurring. It was concluded that the best option was to move data to Kyoto and to also ensure that links were included to open data access sites where the data were available. The latter point is intended to avoid open data access where the country providing the data does not wish this to occur.

⇒ **ACTION: Data to be moved to Kyoto with links to open data access sites where these are available, and provided by the country providing the data**

⇒ **ACTION: Data for new sites to be supplied by end of February 2009**

The schedule for publication of the Catalogue of Rivers Volume 6 is included in Annex 6.

9 IHP TRAINING COURSES IN THE REGION (18TH IHP NAGOYA TRAINING COURSE, JAPAN 2008)

Mr Arduino gave a presentation on the 18th IHP Nagoya Training Course. The course content was focused on "Satellite remote sensing of atmospheric constituents". The key point of the presentation was to draw attention to changes in the method of delivery for this course and future courses. Electronic textbooks will be uploaded to the site before courses and lecture presentations will be uploaded immediately after the lecture. Non-participants in the training course who have an interest in the topic will be able to participate in an interactive forum for a certain period following the course. This is to increase the availability of course content to a wider audience.

10 ORGANIZATION OF THE 17TH RSC MEETING IN CHINA IN 2009

The delegation from China gave a short presentation and initially proposed the topic of "Natural disasters and hydrology" for a five day programme between 7-25 September 2009, noting that a public holiday in early October defined the finishing date. The site proposed is the city of Wuhan, a city of 8 million people and the home of the Yangtze River Commission.

After discussion it was concluded that the preferred dates would be in November and the topic would be "Hydrology and Disaster Management". The hosts indicated that the schedule would allow time for field trip which would ideally be a post commissioning visit to the Three Gorges Dam. Owing to the amount of travel that was potentially involved in the field trip, options were discussed for holding the conference in Wuhan and the much smaller RSC meeting in Yichang. The Chinese delegation was asked to consider the discussion points in their planning.

11 DEVELOPMENT OF CENTRES UNDER THE AUSPICES OF UNESCO (AUSTRALIA, INDONESIA AND THAILAND)

Updates were sought and provide as follows

- Australia: Mr Daniell noted there was considerable uncertainty due to a change of government and no indication of the next likely steps was available.

- Mr Pawitan noted that in Indonesia training workshops on ecohydrology were held in March and July. These focused on training university staff so that they could disseminate ecohydrology principles to students.

- Thailand: A proposal for a Hydraulic Engineering Centre had been sent to UNESCO via the Asian Institute of Technology (AIT) in 2007. This has been sent back with review comments, but no further information has been received from AIT.

12 REPORTS FROM UNESCO CATEGORY II CENTRES (HTC, ICHARM, ETC.)

A report was presented on International Sediment Initiative (ISI) activities by the delegation from China. Key components have included a series of capacity building workshops in areas such as hydrology/ecology.

The Humid Tropics Centre (HTC) report presented by Mr Yussof described a range of activities to date. He noted that he had been appointed as Deputy Director of HTC with effect from 1 August 2008. A key future activity for the HTC will be an external review prior to consideration of a new Memorandum of Understanding (MoU) between UNESCO and the Government of Malaysia to replace the current MoU which expires in 2009.

Mr. Yamashiki gave a comprehensive presentation on the International Center for Water Hazard and Risk Management (ICHARM). Information presented showed that flood related disasters remained the first priority due to a trend of increasing losses. The wide range of international activities reported on reflected the presentation title of "Knowledge Hub on Water-Related Disaster Management". Important initiatives include training courses, international collaboration and publication of research letters.

13 REPORT FROM UNESCO CHAIR IN MONGOLIA (T. TANAKA)

Mr Tanaka noted the UNESCO –Tsukuba agreement signed on 22 June 2007. Progress has included climate stations at 3 locations around Ulaanbaatar associated with water supply, together with groundwater monitoring in Tuul River basin. Capacity building programmes with two week exchanges in Japan have also commenced. Details for a significant collaborative transboundary project on Lake Baikal are being discussed.

14 NEW RESEARCH PROPOSAL (FLOOD AND DRH) (G. ARDUINO, K. TAKARA AND H. KAMEDA)

Mr Arduino spoke to the topic of "Flood disaster prevention and mitigation measures in Asia and the Pacific region". He noted it is timely to look at the effectiveness of the present flood forecasting, early warning, control and management systems put in place in these countries in terms of non-structural measures.

Mr Kameda and Mr Takara then followed on with an overview of a proposed "Disaster Reduction Hyperbase (DRH)" which would use a wide range of web based technology to share information amongst collaborators.

Considerable discussion followed with participants noting the need to manage knowledge about both new and indigenous technology and exploring ideas around how data could be held and served. One approach that emerged for consideration was to carry out a "web-mining" activity to identify technologies, and then to approach web information authors to incorporate their work.

15 TRANSBOUNDARY AQUIFERS IN ASIA (R. JAYAKUMAR)

Mr Jayakumar noted that the Internationally Shared Transboundary Aquifer Resources Management (ISARM) had been established in 2000, but had no sites in Asia. It was noted that an initial desktop reconnaissance using WHYCOS had identified twelve potential transboundary aquifers in Asia, including eight in China, of which four were in "surface water rich" areas. The resulting discussion concluded mapping of aquifer extent is essential before informed debate is practical.

16 ORGANIZATION OF THE 18TH RSC MEETING IN 2010

Nominations were called for the RSC for 2010. Vietnam indicated an intention to host the RSC in 2010.
Japan noted it would be available if Vietnam is unable to confirm its intention. Japan noted it was a candidate for 2011 if not the venue for 2010.

⇒ **ACTION: Vietnam requested to confirm its intention to hold the 2010 RSC meeting as soon as possible.**

17 OTHER ISSUES

The RSC Achievement award was put forward for discussion by Mr Takara. A discussion around the purpose and process commenced at the end of day one of the meeting. After considerable discussion and recognition of the need to consult carefully with UNESCO, a resolution was developed and adopted. See also Resolution **RSCXVI-1** below.

Mr Takara noted that it was timely to consider whether to issue invitations to new members or members not present at this meeting for future participation. Candidates include Myanmar, Singapore, Brunei and Timor Leste. Mr Arduino noted that material had been sent to all potential participants and that invitation would continue to be extended from UNESCO Jakarta as opportunities arose. See also Resolution **RSCXVI-2 below**.

The meeting participants conveyed their congratulations to Mr Soontak Lee for his award of membership to the Mongolian Academy of Sciences during his current visit to Ulaanbaatar.

18 ELECTION OF THE RSC SECRETARY (2008-2010)

Meeting participants suggested Mr Takara continue as RSC Secretary for 2008-2010 and this was passed by acclamation and accepted by Mr Takara.

19 TEMPLATE OF DRH DATABASE

Mr. Kameda gave a detailed outline of the format of the DRH database forms.

20 ADOPTION OF RESOLUTIONS

(1) RSCXVI-1: Honouring Achievements in the Region

Initial discussions focused on the ability to give such awards under the auspices of UNESCO. The use of the name of UNESCO is strictly controlled by the legal section of UNESCO. Any resolution would need to be presented via UNESCO Jakarta as a case to the UNESCO Intergovernmental Council (IGC) for scrutiny, and it could anticipated that the IGC would refer the matter to the legal section of UNESCO as there is no precedent for these awards.

The funding, timing and format of the awards was the subject of further wide ranging and comprehensive discussion. The proposal supporting the draft resolution was edited interactively during the meeting by Mr Daniell.

The wording of the resolution was then discussed and edited interactively by Mr Takara in response to matters considered by the RSC. The final version was adopted by the RSC after a vote and is included in Annex 7.

(2) **RSCXVI-2: Invitation of new members**

The resolution was conceived in response to the return of Singapore to UNESCO in 2007. It recommends that all related countries and UNESCO field offices encourage nonparticipating countries such as Singapore, Brunei Darussalam and Timor Leste to participate in RSC activities as delegates or observers. The Draft resolution was edited interactively during the meeting in response to matters discussed. The final version was adopted by the RSC after a vote and is included in Annex 7.

21 FORMAT OF THE RSC REPORT

Mr. Ibbitt suggested the report be published as a small printed volume with all content on CD. It was decided to incorporate the minutes only in the printed document with annexes as electronic files only.

22 AP FRIEND DISCUSSION

The draft document circulated by Mr Daniell on 2 October 2008, and considered earlier in the meeting (see item 7) was discussed further. The likely date for a meeting was identified as the last week Feb 2009. New Zealand was nominated to coordinate this meeting. The input required from each country for the meeting is a two page document covering the four points from item 7, together with an outline of flood forecasting methods for each country. Information should cover both existing techniques and new methods in preparation.

Mr Takara and Mr Arduino noted the flood disaster prevention and mitigation measures in Asia and the Pacific region project (item 14 of this meeting) had been approved by the Japanese government agency MEXT. Mr Takara noted the benefits of integrating flood estimation and early warning as flood estimation will be part of any rainfall/runoff modeling underlying warning systems. Discussion followed on how to best integrate AP FRIEND with above project and a concept of considering both projects in conjunction with Climate Change effects emerged.

Action pts

⇒ **ACTION: New Zealand to coordinate meeting in Ho Chi Minh City on 9-10 March 2009**
⇒ **Each country to provide two page outline of flood estimation and flood forecasting methods to Mr Dennis Jamieson 31 Jan 2009.**

23 CLOSING OF THE MEETING

The Chairman thanked the Mongolian National Committee for hosting the meeting and the excellent organization, Mr Arduino and his UNESCO colleagues for their assistance and, all the Delegates for their contributions during the meeting. The meeting was closed at 12.40 on 3 October 2008.

ACTION ITEMS	BY WHOM	DATE
1. Write to relevant authorities who can be identified in Myanmar Singapore, Brunei Darussalam and Timor Leste inviting participation in 17th RSC meeting in China	UNESCO field office Jakarta	When 17th RSC details and timing confirmed

2.	IFD Project. All countries to review next draft available for inspection at the end of October 2008 and forward comments to Mr Daniell & Mr Tabios	All Countries who wish to respond	Mid Nov 2008
3.	IFD Final Report ready for print by UNESCO Jakarta	Mr Daniell & Mr Tabios	Mid Nov 2008
4.	IFD Final Report Printed	UNESCO Jakarta	End Dec 2008
5.	IFD /Flood Workshop (2-day) March 2009 in HCM City	Mr Tran Thuc (Vietnam) to confirm dates (9-10 March) and venues suitable	End October 2008
6.	IFD /Flood Workshop (2-day) 9-10 March 2009 in HCM City	UNESCO Jakarta/Vietnam for logistics. Mr Takara, Mr Jamieson & Mr Daniell for technical coordination (copy to UNESCO Jakarta)	Programme by End Nov 2008
7.	Data for Catalogue of Rivers Volume 6 and supplement Number 1 to be assembled in Kyoto with links to open data access sites where these are made available by the country providing the data	Mr Chikamori and countries with linked data.	End Feb 2009
8.	Word template for basin description to be sent to all countries	Mr Chikamori	End Oct 2008
9.	Countries to provide basin description/ data for new basins for inclusion in Volume 6	All countries	End February 2009
10.	Organisation of 18th RSC meeting in 2010	Vietnam to confirm offer (First candidate Vietnam: Alternate Japan)	End October 2008
11.	First Announcement for 17th RSC Meeting and associated conference	China to inform Jakarta	Mid-Dec 2008
12.	Identify available Hydrogeological mapping information on Trans-boundary Aquifers -	All countries with Transboundary Aquifers	Mid Nov. 2008

ANNEX 1

PARTICIPANTS, 16TH MEETING OF THE IHP REGIONAL STEERING COMMITTEE FOR SOUTHEAST ASIA AND THE PACIFIC

16th RSC Meeting, UB 2-3 October 2008

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ANNEX 2

AGENDA, 16TH MEETING OF THE IHP REGIONAL STEERING COMMITTEE FOR SOUTHEAST ASIA AND THE PACIFIC

ANNEX 2

AGENDA 16th MEETING OF THE IHP REGIONAL STEERING COMMITTEE FOR SOUTHEAST ASIA AND THE PACIFIC

Chinggis Khaan Hotel, Ulaanbaatar, Mongolia,

Thursday 2 October

1) Opening (9.00 am.)

2) Adoption of the Agenda

3) Election of Rapporteur

4) Secretariat reports

5) Report on the IHP Intergovernmental Council (K. Takara, S. Zandaryaa, G. Arduino)

6) Country Reports (5-10 minutes each), discussion

7) Report from the Asia-Pacific FRIEND

8) Progress of the Catalogue of Rivers, Volume VI

9) IHP Training Courses in the Region (18th IHP-Nagoya Training Course, Japan 2008)

10) Organization of the 17th RSC Meeting in China in 2009

Friday 3 October

11) Development of Centres under auspices of UNESCO (Australia, Indonesia and Thailand)

12) Reports from UNESCO Category II Centres (HTC, ICHARM etc.)

13) Report from UNESCO Chair in Mongolia (T. Tanaka)

14) New research proposal (Flood and DRH) (G. Arduino, K.Takara and H. Kameda)

15) Transboundary Aquifers in Asia (R. Jayakumar)

16) Organization of the 18th RSC Meeting in 2010

17) Other issues

18) Election of the RSC Secretary (2008-2010)

19) Template of DRH database

20) Adoption of Resolutions

21) Closing of the Meeting

ANNEX 3

SECRETARIAT REPORT
BY
UNESCO JAKARTA OFFICE

16TH IHP REGIONAL STEERING COMMITTEE MEETING
FOR SOUTHEAST ASIA AND THE PACIFIC
Ulaanbaatar City, Mongolia, 2–3 October 2008

UNESCO OFFICE, JAKARTA
Secretariat Report

TABLE OF CONTENTS

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

1.1 Follow-up to the 15th IHP-RSC meeting

A number of actions to be followed-up were identified during the 15th RSC meeting (UNESCO Office, Jakarta, 2007). Here below is a brief report on the current status:

1. *National Committees to help trace 'missing' participants of Nagoya courses.*
   UNESCO Office, Jakarta has sent request on the 18 December 2007 to 7 IHP National Committees, namely Indonesia, Japan, Malaysia, Mongolia, Philippines, Thailand, and Vietnam to trace 30 missing contacts of former IHP Nagoya Training Course's participants. To date, UNESCO Office, Jakarta only received responses from 4 countries (Indonesia, Japan, Philippines, and Vietnam) for 6 contacts.

2. *Write to Myanmar advising of the Resolution passed at the 14th RSC meeting*
   Mr. Takara to report

3. *Countries to provide data for basins being included in Volume I to V for inclusion in Supplement 1 to Mr Chikamoriby the end of February 2008*
   Mr Chikamori reported that for supplement to Vol. 1, data from 2 basins were received from Australia, regarding Torres River and Scott Creek.

4. *Countries to provide data for new basins for inclusion in Volume VI*
   Mr. Chikamori reported that for Volume VI, 1 new basin from Malaysia was received (Damansara River)

5. *All countries participating in the IFD project to respond by 25 December 2007 to the material emailed to them on 22 November 2007*
   Mr. Daniell to report

6. *All countries interested in the flood project to respond by 25 December 2007 to the material emailed to them on 22 November 2007*
   Mr. Daniell to report

7. *MLA presentation to be distributed to RSC members*
   Mr. Arduino sent the presentation to all RSC members on 18 March 2008.

8. *Synthesize IHP VII priorities from country reports and distribute*
   On 18 March 2008, Mr. Arduino synthesized IHP VII priorities from country reports and distributed the draft to National Committees for further inputs. To date, UNESCO Office, Jakarta only received two inputs from Malaysia and Philippines. The draft SEAP Country Priorities of IHP VII table is as follows:

No.	Country	Theme 1					Theme 2					Theme 3				Theme 4				Theme 5				Crosscutting & Assoc. Prog
		1	2	3	4	5	1	2	3	4	5	1	2	3	4	1	2	3	4	1	2	3	4	
1	Australia	x	x	x	x		x	x	x	x		x	x	x	x	x	x	x	x					
2	Cambodia	General																		General				FRIEND
3	China																							
4	Indonesia	General						x				General												FRIEND
5	Japan	x		x	x							x						x		General				FRIEND, IFI
6	Korea Rep. of	x	x		x			x				x	x			x								HELP, FRIEND, IFI, UWMP
7	Laos			x			General																	
8	Malaysia											General								General				
9	Myanmar																							
10	Mongolia	General																		General				
11	New Zealand	General																		General				
12	Pacific Island	x	x	x	x											General								HELP
13	Philippines	General					General					x				General				General				FRIEND
14	PNG	General																		General				HELP
15	Thailand	General					General									x								HELP, FRIEND
16	Vietnam	General																						

The present Table was included in the Document IHP/IC-XVIII/Inf. 12 "Implementation of IHP VII: Focus on 2008-2009 Activities", IHP 18th Intergovernmental Council, Paris, June 2008.

Description:

Theme 1: ADAPTING TO THE IMPACTS OF GLOBAL CHANGES ON RIVER BASINS AND AQUIFER SYSTEMS

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

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

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
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
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

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Cross-cutting programmes: HELP, FRIEND
Associated programmes: International Flood Initiative (IFI)
International Sediment Initiative (ISI)
Water for Peace: From Potential Conflicts to Cooperation Potential (PCCP)
Joint International Isotope Hydrology Programme (JIIHP)
Internationally Shared Aquifer Resources Management (ISARM)
Global Network on Water and Development Information in Arid Lands (G-WADI)
Urban Water Management Programme (UWMP)
World Hydrogeological Map (WHYMAP)
Education, Training and Capacity Building across all the themes

9. *At future RSC meetings Resolutions be introduced early in the meeting and a structured process by followed to ensure there is time to discuss and finalize the drafting of the resolution*
   To be carried out from 16th RSC Meeting on.

10. *Consider the merits of establishing a RSC Achievement Award*
    Mr. Takara to report

1.2 Workshops, training courses, symposia

1.2.1 17th IHP Nagoya Training Course "Numerical Prediction of High-Impact Weather Systems", Nagoya, Japan, from 2 to 15 December 2008

The general aim of the 17th IHP Training Course was to help participants to develop their basic knowledge of numerical prediction of high-impact weather systems, which is necessary for prediction and prevention/reduction of meteorological disasters. The course was mainly focused on understanding the basic knowledge of numerical prediction of high-impact weather systems. Participants were practicing how to perform simulation experiments of weather systems to understand how to use the cloud-resolving model, CReSS (cloud resolving storm simulator) developed in

HyARC (Hydrospheric Atmospheric Research Center, Nagoya University). High resolution numerical simulation using the CReSS model will clarify a detailed structure of high impact weather systems and make a quantitative prediction of the associated precipitation. The 2 technical tours were carried out to the Japan Meteorological Agency (JMA), Tokyo and the Earth Simulation Centre, Yokohama.

Fourteen participants (7 ladies and 7 gentlemen) from 9 countries have attended the Training Course, namely from Bangladesh (2), China (1), Indonesia (2), Lao P.D.R (2), Malaysia (2), Nepal (2), Philippine (1), Thailand (1), and Vietnam (1). Eight participants were supported by UNESCO Office Jakarta through Japanese Fund In Trust, two participants were supported by other funds, and the rest were participants from the Graduate School of Environmental Studies, Nagoya University.

1.2.2 Training Course on "Urban Stormwater Management ", Kuala Lumpur, Malaysia, from 3 to 7 December 2007.

The training course was organized by UNESCO Office Jakarta in collaboration with Humid Tropics Centre, Kuala Lumpur. It was aimed to impart latest appropriate techniques and concepts in Urban Stormwater Management (USWM) in the tropics for sustainable environment. Current practices on USWM were reviewed during the course as well as explanation on Sustainable Urban Drainage System, Water Sensitive Urban Design and Hydrometeorology of the Humid Tropics.

A total of 41 participants from 10 countries, namely Australia, China, India, Indonesia, Lao P.D.R, Malaysia, Philippines, and United Kingdom were attending the course. The contribution and participation of participants as well as presenters from the course was encouraging.

After the course, a meeting was held to established future collaboration between Humid Tropics Centre Kuala Lumpur, Imperial College London, University of South Australia, University of Science Malaysia, and University of Mahasarakham Thailand. The objective of the meeting was to expand network and formulate action plan in USWM and Flash Flood as well as identify initial national projects (in particular for Malaysia and Thailand) such as Advance Urban Drainage Modelling, Advance Pluvial Flooding, etc.

1.2.3 Consultation Meeting for Project Review and Planning on "Poverty alleviation in urban and rural area of Viet Nam: Capacity building and skills development to enhance for employability in the water and sanitation sector", Nikko Hotel, Ha Noi, 8-9 April 2008

In line with the UNESCO Education Sector's communication strategy, the UNESCO-UNEVOC International Centre (Bonn), UNESCO Office Jakarta, and InWEnt (Germany), in partnership with NIVA (Norway), the UNEVOC Centre in Vietnam, and with support from UNESCO Office Hanoi, organised the consultation meeting with stakeholders and potential project partners with the aim of promoting capacity building and skills development initiatives for employability in the water and sanitation industry in Vietnam.

The meeting included 1 day presentations from the different participants, both from Viet Nam and overseas and group discussion on the project intents and developments, while the 2nd day was dedicated to group discussions on the reframe of the proposal in order to submit it to potential donors with the help of a facilitator, Mr. Stephen Duggan from Australia.

1.3 Travel grants

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

- 13 scientists were supported to attend International Conference on "Hydrology & Water Resources Management for Hazard Reduction and Sustainable development" which was held Manila, Philippines, from 19 to 23 November 2007. 5 of 13 scientists were supported through UNESCO Office, Jakarta Regular Programme, whereas the rest was supported by Japanese Fund in Trust;
- 14 participants were supported by UNESCO Jakarta through Japanese FIT to the 17th IHP Nagoya Training Course "Numerical Prediction of High-Impact Weather Systems", Nagoya, Japan, from 2 to 15 December 2007;
- 1 scientist was supported to attend G-WADI Steering Committee meeting in Santiago, Chile, form 16 to 19 Dec 2007;
- 1 scientist was supported to the Kick-Off Workshop "Groundwater and Human Security – Case Studies project" which was held in Bonn, Germany, from 24 to 25 January 2008;
- 2 scientists were supported to the Consultation Meeting for project review and planning on "Poverty alleviation in urban and rural area of Viet Nam: Capacity building and skills development to enhance for employability in the water and sanitation sector", Ha Noi, Vietnam, from 8 to 9 April 2008;
- 1 expert for Managing Aquifer Recharge was supported to carry out an evaluation to the overall groundwater monitoring system in Binh Thuan Province and to carry out investigation activities in Ninh Thuan Province, Vietnam from 02 July to 13 July 2008.

1.4 Asian Pacific Flow Regimes from International and Experimental Network Data (AP FRIEND)

1.4.1 Catalogue of Rivers for Southeast Asia and the Pacific

In May 2007 Mr. Hidekata Chikamori sent an example of data sheets for the next volume of the Catalogue of Rivers. As an example, hydrometeorological data and other general statistics of the Shimanto River Basin in Japan have been compiled in an Excel file that was downloadable in a web site.

1.5 Regional Activities with other UNESCO Field Offices

To date UNESCO Office Jakarta has co-supported activities organised by the other field offices, as:

- Hanoi to support IHP-MAB activity in particular concerning the project 'Biosphere Reserves as Learning Laboratories for sustainable development, with focus on the role of local communities in conservation and sustainable land management' and organise the consultation meeting for project review and planning on "Poverty alleviation in urban and rural area of Viet Nam: Capacity building and skills development to enhance for employability in the water and sanitation sector"
- Beijing to organise the ISI Steering Committee meeting and one day workshop on Impact of Global Change in Erosion and Sedimentation from 5 to 7 November 2008 at IRTCES Beijing, China

1.6 Activities within UNESCO Jakarta

1.6.1 Hydrogeological project for artificial aquifer recharge in Hong Phong District, Binh Thuan Province, Viet Nam

The Binh Thuan Province, whose principal city is Phan Tiet, is located along the coastal plain in the lower part of Central East Viet Nam. It extends for approximately 8,000 km^2, with a total population of one million. The Province is divided in 7 districts, each of them subdivided in further sub districts. Hong Phong sub district (Bac Binh District), located at 25 km NE from Phan Tiet and reaching a height of approximately 200 m above sea level, has an area of approximately 300 km^2 and comprises 3 villages.

Before 1975, the area was covered by a dense forest, which was abruptly cut to make place to rice pads which were never developed and resulted massive desertification took place. Due to an uneven rainfall distribution (1112 mm/year of average) and a three months period (from December to March) characterized by very little precipitation (23 mm in 4 months averagely), the area suffers considerable water shortage during the dry season, never experienced prior the complete removal of the land cover (forest). Due to the particular geological settings (permeable sands) and the impossibility to storage surface water during the dry season (due to rapid run-off and high evaporation rates), an artificial recharge and further water storage in the sand aquifer is envisaged.

The project consists of three major components, as follows:

1. Research and investigation carried out by Vietnamese and foreign experts
2. Development of a pilot project with the aim of supply water to the Hong Phong sub district
3. Capacity building through different international and local training courses/workshops. Participation of Vietnamese scientists to international conferences/symposium and meetings on MAR (Managing Aquifer Recharge) techniques is also envisaged.

Besides the scientific and capacity building approach, the project is now providing the delivery of 220 m^3/day of fresh water to the Hong Phong communities, through a system inaugurated in November 2006.

To ensure a reliable performance of the delivery system as well as the continuation of the overall monitoring system, in 2008, UNESCO Office, Jakarta provided the project with 2 extra pumps for the water delivery (therefore currently 3 in total), 3 new data loggers for groundwater level, temperature and conductivity monitoring of groundwater as well as the continuation of the meteo data acquisition through the 2 existing meteo station in Hong Phong and Bau Noi until December 2008. The Office also carried out an investigation campaign to collect 33 groundwater (springs, seepage and wells) and surface water samples for both chemical and isotopic analyses.

1.6.2 Hydrogeological investigation in the coastal area of Ninh Thuan Province, Viet Nam, July2008

Following a request from the Ministry of Science and Technology (through the Vietnamese Academy of Science and Technology -VAST), a hydrogeological investigation was also carried out in the coastal areas of Ninh Thuan Province (350 km North east of Ho Chi Minh), for a preliminary survey and general advices on water resources occurrence and evaluation.

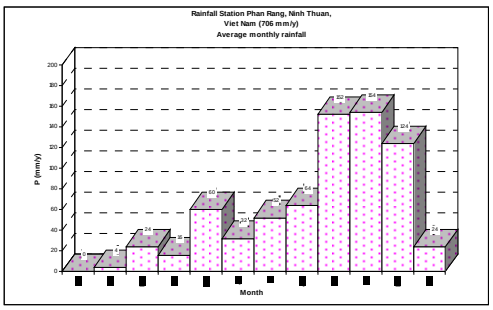
1.6.2.1 Introduction

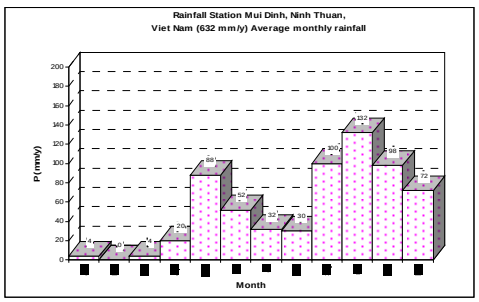
The Ninh Thuan Province, located in the southern part of Vietnam Central Coastal region, borders Khanh Hoa in the north, Binh Thuan in the south, Lam Dong in the west and the South China Sea in the east.

The province has a total surface of 3,360 km^2 with over half a million inhabitants (571,200 in 2006), 6 administrative units, 1 city and 5 districts. The city of Phan Rang Thap Cham, as provincial city, represents the political, economic and cultural centre of the province.

The morphology of Ninh Thuan can be characterized as gradually sloping from north-west to south-east, with three typical topologies such as mountains (63% of the area), plain areas (14%) and coastal plain areas (23%).

Ninh Thuan has a typical tropical monsoon climate with two different seasons, the rainy season (Sept–Nov) and the dry season (Dec-Aug), with annual average temperature around 26 -27^0C; annual average rainfall of 700–800 mm in the coastal area (706 mm in Phan Rang, 632 mm in Mui Dinh and 762 in Ca Na) gradually increasing to more than 1,800 mm in the mountainous areas.





1.6.2.2 Geology and Hydrogeology of the investigated area

The geological setting of the investigated area, located mainly along the coastal zones of Ninh Thuan is characterised by a magmatic bedrock of cretaceous age (granite, granodiorite and granosyenite) overlain by a Pleistocene-Holocene marine deposits of both terrigenous and calcareous origin. Recent and ancient sand dunes also occur in the southern part of the Province (Lu Thien, Son Hai and Mui Dinh) as well as in the northern coast (from My Hoa to Vinh Hai).

The hydrogeology of the investigated area is characterised by the occurrence, in the sediments, of several unconfined aquifers at different elevations (maximum elevation reached by the investigation was around 40 m a.s.l. – Tram Bang) exploited trough both drilled wells (up to 28 m deep) and hand dug wells (the majority) with diameter ranging from 0.7 to 6 m and depths ranging from 3 to 9 m from ground level.

The natural morphological lowland settings along the coastal areas with the development of salt evaporation ponds as well as uncontrolled pumping for agricultural purposes causes seawater intrusion in the coastal aquifers. In the investigated areas located at higher elevation (15-20 m a.s.l) and at a distance of several kilometres from the sea salinity of groundwater can also reach up to 0.5 g/l .

1.6.2.3 July 2008 Investigation Campaign in Ninh Thuan Province

Following a priority list on the environmental problems identified by the Province representatives, it was decided to focus on hydrological investigations mostly in the coastal area of Ninh Thuan thought some water samples related to inland shallow aquifers were collected for comparison. The scope was to identify through a preliminary inland-coastal transects, the physio-chemical variations of groundwater resources from higher grounds to the coast where sea water intrusion represents a serious environmental hazard.

A number of wells were located in the investigated area and a total of 57 samples of groundwater and surface water were collected for chemical and isotope analyses to perform both in Italian labs (University “La Sapienza” and Geokarst Engineering) as well in Ho Chi Minh (chemical analyses).

The major physio-chemical parameters (electric conductivity, total dissolved solids, salinity, pH and water temperature) were measured *in situ* in all the assessed water occurrences, with electrochemical WTW portable instruments.

Increasing groundwater salinity from inland towards the sea seems primarily due to man induced pumping of brackish – salty water from shallow coastal sand dune aquifers mainly for irrigation purposes. However salt production at industrial level (with salt evaporation ponds located also at elevation of more than 10 metres above sea level) might increase groundwater salinization by gravity and diffusion processes. Savage groundwater abstraction by well pumping and channelling sea water in the salt production areas, represent the most important factor that seriously affects the equilibrium between fresh and sea water. Therefore salt water intrusion in the coastal area of Ninh Thuan Province should be considered a process that will probably spread inland, increasing progressively groundwater

salinity locally even at levels higher than the sea. Besides the sea intrusion hazard due to uncontrolled groundwater resource exploitation for industrial salt production and agriculture activity (irrigation), a further general problem is related to a limited knowledge of the hydrogeological setting and the assessment lack of surface and groundwater resources of the Province. Hydrological monitoring (water level variations and most important physio-chemical parameters) of selected hydrogeological global systems inland and above all in coastal areas, is strictly recommended to evaluate the existing level of salt intrusion by means of observation wells and detailed geophysical investigations.

1.6.3 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, rain water monthly samples are available for isotopes analyses from February to September 2008.
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. Monthly samples are also provided to BATAN (Indonesian National Nuclear Energy Agency) also interested in different rainwater sampling sites in Jakarta. Results will be available soon.

In 2008, UNESCO Office, Jakarta continued the activity and collected both single and monthly events from January until now.

1.6.4 World-wide Hydrogeological Mapping and Assessment Programme (WHYMAP)

In the framework of the global programme WHYMAP, started in 1999, an important result has been achieved with the publication of an educational wall map (160x130 cm) at the scale of 1:25.000.000 published in the spring 2008 and presented to the 33rd International Geological Congress in Oslo in August 2008. UNESCO Office, Jakarta, since 2003 contributed to the compilation of such a map with coordination in southeast Asia with

reference to Indonesia, Malaysia, Thailand, Viet Nam, Laos and Cambodia, as well as the Philippines and Republic of Korea.

1.6.5 International Consortium on Landslides

In May 2008 UNESCO Office, Jakarta, contributed to the acquisition of the Volume 4 (issues 1-4) of the JOURNAL of Landslides and distribution to focal points in the region.

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 2007-2008, was presented by UNESCO Office, Jakarta, at the meeting held in UNESCO Office, Jakarta, from 2 to 3 June 2008. The report describes the activities carried out in the Asia Pacific Region within two main areas:

- the Regional Steering Committee (RSC) of IHP for Southeast Asia and the Pacific and
- the IHP Training Courses**,** annually organised by the Nagoya University in Japan.

The resolutions adopted during the meeting are as follows:

1. UNESCO will continue and further expand the intersectoral topics of IHP training courses by creating linkage to other fields.
2. UNESCO will expand the benefit of the training courses by identifying different target groups to be reached and disseminating the proceedings and outputs of the training courses and conferences.
3. UNESCO will explore the possibility with other partners to include the IHP training courses as part of a Masters Degree programme.
4. UNESCO will explore the possibility to organize a discussion forum following a training course to attract a larger number of participants from different backgrounds.
5. UNESCO will consider developing its activities by utilizing the framework of DRH (Disaster Reduction Hyperbase) on a new proposal "Assessment of flood forecasting and warning system for the humid tropics region".

1.8 IHP Nagoya Training Courses Databases

17 IHP Nagoya Training Courses have been conducted since 1991 and were attended by around 182 participants from 25 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 (http://www.unesco.or.id/activities/science/water_sci/ihp/300.php)

Evaluation of the feedback form showed that 44 % of the participants are affiliated to a university, 48% to governmental organizations or government related research institutes and around 8 % come from other institutions or organizations such as from the private sector.

Participants reported that the Training Course has contributed to their work and professional development by having:

- improved professional knowledge,
- provided valuable input and inspiration for research, projects and lectures,
- improved career possibilities,
- enlarged the originally narrow national view, and
- provided access to international professional hydrology network.

The knowledge and experiences they have gained during the training course they shared back home through

- initiation of professional discussions,
- provision of seminars/lectures,
- presentations on conferences (e.g. Conference of the International Commission on Irrigation and Drainage), and by
- dissemination of training materials.

From 2007, the training courses online feedback form was replaced by a comprehensive report that participants have to prepare after having attended the training course. Guidelines for this report were defined and provided to participants of the 17th IHP Training Course on "Numerical Prediction of High-Impact Weather Systems" (Nagoya, Japan, 2 – 15 December 2007). The report will be then uploaded to the ihp Nagoya forum upon agreement with the participants.

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,
- a questionnaire to trace back participants and evaluate the impact of the training courses,
- 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 3 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) represent therefore a wider expansion and dissemination of the training courses, enabling wider attendance form many parts of the world.

2. PUBLICATIONS SINCE NOVEMBER 2007

Proceedings on the "International Conference on Hydrology and Water Resources Management for Hazard Reduction and Sustainable Development (HRSD 2007)", Makati City, Metro Manila, Philippines, 19-23 November 2007, Edited by: Guilermo Q. Tabios III and Leonardo Q. Liongson, IHP-VI Technical Documents in Hydrology, No. 7. UNESCO Office, Jakarta, 2007.

Final Report of the"15th IHP Regional Steering Committee meeting for Southeast Asia and the Pacific" Makati City, Metro Manila, Philippines, 19-23 November 2007. IHP-VI. No. 15. UNESCO Jakarta Office, 2007.

Petunjuk Praktis "Partisipasi Masyarakat dalam Penanggulangan Banjir" (Practical Guide in Community Participation in Flood Management), Language: Indonesian , UNESCO Office, Jakarta, 2007.

Proceedings of Workshop "Assessment of Snow Glacier and Water Resources in Asia, Almaty, Kazakhstan, 28-30 November 2006". Language: Russian. UNESCO Office, Jakarta 2007.

3. CONTACT REFERENCES

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ANNEX 4

SECRETARIAT REPORT
BY
UNESCO BEIJING OFFICE

16th IHP Regional Steering Committee Meeting for Southeast Asia and Pacific
Ulaanbaatar, Mongolia, 2-3 October 2008

UNESCO Office Beijing
Secretariat Report from East Asia

Introduction: UNESCO Office Beijing is a cluster office representing for East Asian countries, China P.R, Democratic People's Republic of Korea, Japan, Mongolia and Republic of Korea. All five countries are very well represented in the RSC and individual country reports will be presented by members and this report is from the UNESCO Secretariat.

1. Capacity Building activities:

1.1. National Workshop on National Training Workshop on Hydraulic Projects Construction and Ecological Environment, Oct 21 – Nov. 8, 2007, in Hangzhou, Zhejiang Province, China

As China is one of the sediment laden countries in the world, the National Government supported National Capacity building on sediment issues, under this initiative a National Training Workshop on Hydraulic Projects Construction and Ecological Environment, within the framework of the UNESCO's International Hydrological Programme (IHP-VI), under International Sediment Initiative (ISI) was held. The workshop was sponsored by Ministry of Water Resources, Government of People's Republic of China. The Workshop was organized by IRTCES in cooperation with UNESCO.

1.2. Training workshops under UNESCO Chair on Sustainable Water Management

The UNESCO Chair in "Sustainable Water Management" was established in 2005 at Hohai University, Nanijing, China and is coordinated by UNESCO Office Beijing. Activities are mainly sponsored by Schlegel GmbH & Co.KG, Munich Germany and also during the first year by WASY GmbH, Institute for Water Resources Management and Systems Research.

1.2.1. 4th UNESCO training course on Climate Change and Ecosystem Adaptability with Focus on the Yangtze River Basin

This training programme was jointly organized by UNESCO Chair on Sustainable Water Management, World Wildlife Fund for Nature (WWF) and China Ecosystem Research Network (CERN), Institute of Geographical Sciences and Natural Resources Research (IGSNRR) CAS, was held at IGSNRR during 7-9 April 2008.

The major objectives of the Training Course are to address the scientific issues on climate change and ecosystem adaptation, to exchange findings and best practices on climate change and ecosystem research in Yangtze River basin, and to advance long-term ecosystem monitoring and research on climate change science. The themes of the Training Course includes: (1) Scientific issues and methodologies on climate change and ecosystem adaptation, (2) Impact of climate change on hydrology and water resources, (3) Vulnerability and adaptation of ecosystems to climate change, and (4) Response and adaptation of major ecosystems in the Yangtze River basin to climate change.

Three international and ten Chinese scientists with expertise on climate change science are invited to give presentations with about 150 participants in which 20 participants with travel award provided by the organizers. The three-day training course provided a good opportunity for the participants to develop new ideas and priority for further study on climate changes and ecosystem adaptation in the near future, especially on the snow storms in the South China.

1.2.2. e-Learning courses under UNESCO Chair on Sustainable Water Management

The UNESCO Chair in Sustainable Water Management upon the capacity development of engineers and scientists at three Chinese Universities i.e. Tongji University Shanghai, Ocean University of China, Qingdao and Jinan University. The courses offered by the UNESCO Chair are designed both as blended learning as well as pure e-learning units. The system includes a self-assessment function enabling the students to independently test the knowledge gained. This is where the full range of media-supported options and self-determined learning makes its appearance: multiple choice, single choice, yes-no questions, allocation questions and questions with short answers. Entirely interactive exercises or programme supported calculations complete the knowledge test. The system finally allows the students to receive additional information. This may include references to other scripts, internet portals or classical specialist literature.

Experience has revealed that students having received a positive feedback from the knowledge tests are much more inclined to give attention to further details on a subject area.

The e-learning courses were developed by UNESCO Chair with the financial support from German IHP/HWRP Secretariat, this system is being further developed and planned to address a wider range of topics as well as to open the system to other languages.

The e-learning courses can be accessed at: http://unesco-china.lfi.rwth-aachen.de

1.3. Asian G-WADI: Afghan officials training on Remote Sensing and GIS Modelling for Hydrological Research, Asian G-WADI Secretariat, CAREERI, Lanzhou, China, 20 October -2 November 2008

Upon the special request from Afghanistan Government through UNESCO Tehran Office, Asian G-WADI Secretariat is organizing a special training course for experts from Water Resources Planning Unit, Ministry of Water Resources on application Remote Sensing and GIS Modeling in Hydrological Research. During this training programme the experts will be introduced to various remote sensing satellite images and GIS software.

1.4. International Workshop on Water Management through Forest Management – Chinese Academy of Forestry, 12-16 November 2007

The international workshop “Water Management through Forest Management” was organized by the Research Institute of Forest Ecology, Environment and Protection, CAF, and the Forest Ecosystems Research Center of University Goettingen, in cooperation with IUFRO, UNESCO and FAO. The general topics of the workshop focused on the forest-water interrelation, which are highly relevant in current environmental protection, forest restoration and forest management, notably with respect to the limited water resources in dry regions under increasing impact of climate change.

In total 77 participants from 11 countries (China, Germany, USA, Austria, Australian, Finland, Spain, Croatia, Japan, India and Republic of Korea) and 3 international organizations (IUFRO, UNESCO, FAO) have attended this workshop. The workshop aimed at presenting and discussing the state-of-the-art in various disciplines. During the workshop, the potential cooperation in integrated forest-water management was evaluated. Furthermore, a field excursion in the water resource protection area around Miyun Reservoir, which is the most important drinking water resources for Beijing, was organized.

1.5. UNESCO Chair on Sustainable Groundwater Management

The UNESCO Chair was established at Institute of Geo-Ecology, Mongolian Academy of Sciences with the co-host from University of Tsukuba, Japan. Dr. Lunten Janchivdorj from

Institue of Geo-Ecology has been nominated as a Chair holder and Prof. Tadashi Tanaka from University of Tsukuba has been nominated a Co-Chair holder.

The Chair and Co-Chair holders held two meetings in February, 2008 at IMG, MAS, and in June, 2008 at University of Tsukuba, Japan to discuss the activities of UNESCO Chair. Based on the work plan so far the Chair has collected all the Mongolian policy and laws related to water, set up three groundwater monitoring station as study locations, collected various historical data related to groundwater level, groundwater chemistry, water supply and utilization, etc.

In addition to the above the University of Tsukuba has organized the ACCU Programme on "For the Sustainable Groundwater Resources Management: Through the UNESCO Chair in Mongolia" from 9th to 22nd of March, 2008 in Mongolia and P.R. China with the collaboration of UNESCO Office Beijing as one of the 2007 University Student Exchange Programme within the framework of the International Exchange Programme between Japan and other UNESCO Member States for the Promotion of International Cooperation and Mutual Understanding supported by the ACCU. 13 Japanese students and one Indonesian scholarship student participated in this programme accompanied by two UNESCO Chair members, Prof. T. Tanaka and Dr. M. Tsujimura. In Mongolia, Director of IGE, MAS, J. Tsogtbaatar, two UNESCO Chair members, Dr. L. Janchivdorj and Ms. B. Erdenechimeg and two young researchers from IGM, MAS participated in the programme The results of the programme are summarized as the report of "For the Sustainable Groundwater Resources Management: Through the UNESCO Chair in Mongolia" published by the Terrestrial Environment Research Center, University of Tsukuba, 176p. + 5 Annexes + CD-ROM, April, 2008

1.6. Water Science Education at School level – contribution to Decades on Education for Sustainable Development and Water for Life – Supported jointly by Ministry of Environment, Land and Sea Government of Italy and Ministry of Water Resources, Government of People's Republic of China

Education for Sustainable Development has crystallised as a result of international agreements and the global call to actively pursue sustainable development. Originally perceived as education about sustainability it is being increasingly recognised, through the influence of Agenda 21 and the more recent World Summit on Sustainable Development at Johannesburg (2002), as more than the dissemination of knowledge.

Under the existing bilateral agreement between Government of Italy and Government of People's Republic of China on Sustainable Water Integrated Management (SWIM) project UNESCO Proposed to develop education and learning materials for school children in Chinese language to enhance the future generations understanding on water, without which we may not be able to achieve sustainable development.

The project launching workshop on Water Education in China was jointly organized by China Institute of Water Resources and Hydropower Research (IWHR) and UNESCO on July 13, 2007. During this event national and international experts presented various aspects of water education and what could be done to enhance the water education in China. The proceeding volume in Chinese has been published and in addition under this project learning and teaching materials for Chinese schools will be prepared (at the level of middle and secondary school) and based on this materials the training workshop for teachers will be organized to improve the water educationin China.

Publication of the workshop proceeding: The publication was a product of the launching workshop of Sino- Italy cooperation water education project organized by UNESCO and China Institute of Water Resources & Hydropower Research. It contains the papers on water education provided by both Chinese and international experts, and was published in Chinese.

Student contest: A contest for school students on water knowledge was held in the progress of SWIM-EDU. The poster-design contest was combined with one of the activities affiliated to CAST's 2007 national science communication events targeting children from primary schools

all over China. It served to test water knowledge grasped by students already, and that gained through SWIM-EDU. The first 3 winners of the contests, as well as their supervisors, got the chance to visit critical water environment in China. The contest requested the participating students to formulate a set of posters concerning water resource or other water-related issues in their cities. Students were encouraged to work as a team. 125 primary schools in total from 31 provinces participated in the contest and finally 240 classes submitted the digital images of their posters via email at the end of the contest before August 1. After strict evaluation, 33 outstanding pieces were selected as the winners, three for the first award, ten for the second and twenty for the third. All the winning pieces were exhibited on the National Science Day on September 15th and 16th and were applauded by visitors of different backgrounds.

Publication of a calendar: As part of the output of the student contest, and to enlarge its influence regarding water conservation, a calendar was designed using pictures selected from the winning pieces, with the name of the project and donors included as well. The calendars were printed and distributed to all the 31 provinces of China, 100 pieces for each.

Publication of books: To improve the knowledge of students at high school level two books targeted towards students is being developed in addition one more book is being prepared for teachers with pedagogy techniques for water education. The published books will be distributed to all the model schools in all provinces of China and master teachers training programme will be organized for teachers. This project expected to improve the awareness and knowledge of students on water related issues in China.

1.7. High Level Round Table meeting on the protection of water resources and water environment of China – GWP China (Beijing, November 2, 2007)

As China has been confronted with the problem on the protection of water resources and water environment, the GWP China, together with the Chinese Hydraulic Engineering Society (CHES), Ecological Society of China (ESC), The Nature Conservancy (TNC) and China Institute of Water Resources and Hydropower Research (IWHR) held the High Level Roundtable Meeting on the Protection of Water Resources and Water Environment in China in Beijing on Nov. 2nd, 2007. It was to establish a multidisciplinary and cross sectoral exchange and dialogue platform discussing mechanism, institutional and managerial issues of safe drinking water. The main topics of the meeting were 1) Water source protection and policies of water pollution precaution and control, 2) Surveillance and management mechanism of safe drinking water, 3) Emergency management system of public water safety event.

Senior leaders, renowned international and national experts from the departments concerned were invited to discuss and communicated with each other on the basis of equality, so that good suggestions may be put forward for the protection of water resources and water environment in China. The representatives and experts discussed ardently on the strategies, rules and regulations, mechanisms, systems and technologies for the protection of water resources and water environment. Their ideas and suggestions made great contributions to the management of resources and environment in China. The meeting was highly recognized throughout the country by dedicated participation from media reporting the messages.

1.8. ISI website and ISI Information System construction and improvement

The ISI website http://www.irtces.org/ISI/ and ISI Information System (http://www.irtces.org/ISI/info.asp) were constructed to serve the ISI Steering Committee, international scientific communities, planers and policy makers, as well as common people in the society in drawing people's attention on sediment related problems and importance of sustainable sediment management. The updated websites are expected to bring better management of erosion and sediment related issues. Also, it will become a better scientific website which not only serves for the ISI Steering Committee but also attracts more attention from planers and policy makers, as well as common people in the society.

For safety reason, the website server is being switched to a new one and the website operational environment will be changed from original ASP Web to J2EE Web. Most importantly, web pages and database will be updated regularly reflecting current activities within ISI.

2. Research / Pilot Projects:

2.1. Groundwater for Emergency Situation (GWES) a Case study for Beijing

UNESCO in close cooperation with China Institute for Geo-environmental Monitoring and the Beijing Geo-environmental Monitoring Station carried out a pilot research project under GWES (Groundwater for Emergency Situation) initiative of UNESCO-IHP. On the basis of the analysis of the natural geography, geological and hydro-geological background and the water resource in Beijing, this report summarizes the suggestion and measures of releasing the water supply crisis during the consecutive drought year in Beijing and presents the suggestion and measures of sustainable management of water resource after the completion of the Nanshui Beidiao project aiming at the Beijing status.

The natural geography of Beijing determines the uneven allocation of water resources in terms of space and time. Such allocations have led to the uneven allocation of water resources. According to the monitoring data on annual precipitation, consecutive droughts led to Beijing's serious water shortage.

The geo-structure, geological and hydro-geological conditions in Beijing determined that groundwater is mainly allocated in the Quaternary aquifers on the Beijing plains and the bedrock aquifersof the mountains. The Quaternary pore groundwater in Beijing is mainly stored in the alluvial fans and alluvial plains of the five rivers; the Karst groundwater is mainly distributed in the mountainous Ordovician aquifers and the middle-upper section of Cambrian limestones, Wumishan and Gaoyuzhuang formations and the Tieling formation carbonate rocks.

The calculation shows that the total water resources in Beijing is 3.905 billion m^3/a of which the surface water resources are about 2.3 billion m^3/a, the groundwater is 3.375 billion m^3/a and the calculated amount is around 1.77 billion m^3/a. The total available water resources in Beijing are about 247 m^3/per capita, far below the international average standards for per capita water resources.

Groundwater is the main water source for Beijing, and accounts for about 2/3 of the total water supply. The amount of annual average water consumption is 4.13 billion m^3 with 2.63billion m^3 of groundwater and 1.5 billion $m^3$of surface water being consumed. According to the forecast for social development, the water supply in 2010 will reach about 4.2 billion m^3.

Under the condition of limited surface water resources, Beijing has taken measures to alleviate stress on the water supply. Such measures include economizing water resource, using recycled water, collecting rainwater and flood water, diverting water out of Beijing, and constructing emergency well fields to effectively alleviate the stress on the water supply in Beijing. Emergency well fields are just one measure to ensure a supply of water for Beijing

and therefore the potential for “emergency” scenarios should be emphasized for this well field, and during years of with lots of precipitation the pumping should be stopped to allow recharge and recovery for the groundwater level.

Before the implementation of the SNWTP, the Beijing municipality needs to execute the “expanding resources and water saving” plans, which are based on local conditions, to ensure a sufficient water supply to Beijing. After completion of the SNWTP, the Beijing municipality will remain a city with a water shortage. In this circumstance, relevant technical measures must be taken, including the construction of groundwater reservoirs to realize the joint use of surface water and groundwater, establish the coordinating mechanism between surface water and groundwater and realize the sustainable utilization and management of the water resources in Beijing.

2.2. Integrated Physical and Ecological Management of Rivers – with Particular Reference to the East River

The East River, 520 km long and with drainage area of 27,040 km^2, is one of the three major rivers of the Pearl River system – the largest river system in South China. The river is a main source of water supply for Hong Kong, Shenzhen, Guangzhou and Dongguan. It currently supplies 0.78 billion m^3 per year to Hong Kong; and this is projected to increase to over 1 billion m^3 in 2010. The integrated management of the East River is of foremost importance in the sustainable development of Hong Kong and the Pearl River Delta yet an integrated understanding is lacking on key water environment issues related to river dynamics, water quality, river ecology, river-coast interaction, and trans-boundary environmental material flows.

Under this project IRTCES has carried out field investigations, basic laboratory studies and numerical modeling on watershed management, river dynamics, river eco-system, and water quality control, with particular reference to the East River. A comprehensive river health index will be developed based on the following 10 indices: (1) climate, (2) hydrology and sediment, (3) floods and their risk, (4) water resources and water safety, (5) vegetation and soil erosion, (6) river patterns and river morphology, (7) biodiversity and diversity of bio-habitats, (8) human-induced stress. In addition to the above parameters an Integrated Water Resources Management System also worked out for Pearl River System and the same is being considered for implememation for Government of China. This project was carried out during 2006-2007and jointly supported by UNESCO Office Beijing and Ministry of Water Resources, Government of People’s Republic of China and executed by IRTCES.

2.3. Urban Rainwater Harvesting - Case Study in Shenzhen City

UNESCO Office Beijing in cooperation with Beijing Normal University and Shenzhen city authority carried out a pilot research and developed urban hydrological cycle model, in order to prevent the flooding during peak rainfall season and reduce water shortage during dry season, by harvesting and storing rainwater for dry season.

This project has generalized and analyzed the present status, dynamic states and the latest applications for rainwater resource utilization. The gap between China and other advanced countries is also realized. On this basis, a combination of remote sensing techniques and hydrological models were used to model rainfall and runoff in urban regions. Through the practical application of models, the data published by water resources gazette was basically confirmed; the established relationship between rainfall and runoff could be used in estimations of the potential utilization of rainwater resources. At the same time, the model used in Shenzhen, simulated the numeric variations of annual runoff of different urbanization stages in Shenzhen. The analysis of the effect of urbanization on the relationship between rainfall and runoff provided the basic data and technical support for creating rainwater resource utilization programs. Finally, having combined climatic and hydrological characteristics and considering the present status of economical and social development, the

conclusion, measures and recommendations for rainwater resource utilization in Shenzhen are presented.

It should be pointed out that this project was carried out for a relatively short time, less than a year. The data and information that needed to be collected, such as basic data on the economy, society, meteorology, hydrology, facilities of water conservancy, etc., was a large task. Therefore, the time for theoretical research was insufficient. We hope that profound study will continue in combination with related projects, to contribute reliable technical support and protection in future discussions and studies, not only in Shenzhen but in the rest of China as well.

2.4. Research on sustainable development of society, economy and environment in Heihe River Basin, Northwestern China

The Heihe River Basin (HRB) is the second largest inland river basin, with an area of 140 thousand km^2, in arid and semi-arid area of Northwest China. There are diverse landform units, complex water resources transformation mechanism, vulnerable ecological environment and serious water problems in the HRB. To understand the water resources transforming processes, to rationally and effectively utilize and allocate water resources, and to harmonize economic development and environmental protection, are some of main challenges in front of local hydrologists. From the inception of over 20 years ago, the research in the HRB has begun to incorporate more fields, e.g., hydrological modeling, integrated basin research, and development of decision support system, etc. A broad range of data have been collected during past research activities. Due to its specific location in the developing West part of China as well as the deterioration of ecological environment in the downstream area, the HRB has been a concern of the national Chinese government. Under the supervision of the national government, the water diversion from the upstream and midstream areas of the Heihe River to the downstream area has been carried out once a year to satisfy the need of ecological demand in tail region. UNESCO jointly working with Chinese Academy of Science and other provincial authorities to come up with IWRM of Heihe River Basin under G-WADI network.

2.5. Variation in Runoff and Sediment Load in the Pearl River Basin and Its Cause A pilot research project under ISI with the support from Ministry of Water Resources and IRTCES

The goal of study on the variation in runoff and sediment load in the Pearl River Basin and its cause is to contribute to the ISI project for increasing awareness of global changes in runoff and sediment loads to promote sustainable management of water and sediment resources and to adapt to new challenges in water management in the next decades. IRTCES will cooperate with China Institute of Water Resources & Hydropower Research (IWHR) and Pearl River Conservancy Commission (PRCC) for conducting the project in consideration of various aspects involved in the project.

The project will introduce a general situation of the Pearl River Basin and report some new research results about variation in runoff and sediment load in the Pearl River Basin. At the same time, it will address the cause of variation in runoff and sediment load in the Pearl River Basin as well as encouraging more researchers in the world to be involved in the study of the variation in runoff and sediment loads and its impact on the Pearl River estuary delta. Through this research project, the impact of human activities on the environment of Pearl estuarine will be revealed and a hint will be presented to lessen the negative impact on river ecological system due to human activities.

3. Participation in the International Initiative of IHP and cooperation with other cluster offices in the region:

3.1. Cooperation with International Sedimentation Initiative (ISI) a Global Initiative of UNESCO IHP

IRTCES has been identified as ISI Project Technical Secretariat and UNESCO Office Beijing working together for implementing ISI activities, organizing ISI project steering committee, development of web site and information portal for ISI.

The updated ISI website and information portal will have database to share and scientific publication related to sediment issues for download. The ISI is also developing sediment database network for representative basins and ISI in the process of developing data sharing protocol with interested countries to share the sediment and erosion data under ISI.

3.2. Cooperation with World Water Assessment Programme (WWAP) for World Water Development Report 3 – Water in a Changing World

World Water Assessment Programme is UN-wide programme seeking to develop the tools and skills needed to achieve a better understanding of those basic processes, management practices and policies that will help improve the supply and quality of global freshwater resources.

The WWDR 3 will be released during 5th World Water Forum in Turkey the main focus of the report will be Impact of Global and climate change in water resources. For WWDR there is tow national case study is being prepared from China P. R and Republic of Korea.

Case Study from China P.R.: The Yellow River, the great river across China, has created with its high silt load the present landscape of China in its spacious flood plain, and so fostered the Chinese civilization along its riverbanks, therefore it is called the mother river of China. The Yellow River basin is also the center of China's political, economic, and social development. The Yellow River is the second largest river in China; it originates from the Qinhai-Tibetan plateau and flows through 9 provinces over a length of 5,464 km. Within its catchment of 795,000 km2, live more than one hundred million people.

Case Study from Republic of Korea: The Korean Peninsula is located at the eastern tip of the Asian continent, and southern part of the peninsula is the Republic of Korea (ROK). Most of ROK is covered by the basins of the five largest rivers (the Han, Nakdong, Geum, Youngsan and Seomjin Rivers), with high eastern locales and gentle slope of western parts, and seventy percent of the land is mountainous.

The present study is being carried out in the Han River - one of the representative rivers of Korea - situated in the center of the Korean Peninsula. The management of the Han River region is divided into the main Han River basin and the Imjin River basin. This study will focus only on the main Han River basin.

3.3. Asian G-WADI (UNESCO's Global network for WAter and Development Information for arid lands)

UNESCO recognised the needs of arid areas as a global priority and established G-WADI in 2003 to support networking between centres and individuals across the arid and semi-arid regions of the world. The strategic objective is to strengthen the global capability to manage the water resources of arid and semi-arid regions.

Across Asia, UNESCO Cluster Offices (Almaty, Beijing, New Delhi and Tehran) joint hands and formulated G-WADI Asia. Asian G-WADI network organize regular training programme for its members and provide other services like remote sensing data products, satellite based real time rainfall forecast etc. The Asian G-WADI web site provides training manual download Hydro Archives for Asia (news on water related issues with in Asia appeared in the media around the world will be populated and available for members)

The following products of the Global G-WADI are available for everyone at www.gwadi.org

- A **news watch feature** highlighting water issues related to arid and semi-arid regions
- Educational and knowledge-based modules related to water resources issues of the dryland regions and tools and techniques e.g. **Isotopic and Chemical Tracers in Hydrology**
- Provision of data sources, e.g. **HyDIS** satellite-based precipitation data
- Educational modules prepared for short course and seminar purposes, e.g. 2005 Roorkee Workshop on **Hydrological Modelling in Arid and Semi-Arid Areas**, and Cairo workshop on **Climate Change in North Africa and the Middle East**.
- Software tools provided through the SAHRA **Hydroarchive**
- Educational information provided through SAHRA's **Globe education and science programme**.

Part of Asian G-WADI UNESCO helped the project secretariat to develop a web site, brochure and poster on Asian G-WADI. The details can be found at www.asian-gwadi.org

3.4. Transboundary Aquifers in Asia

UNESCO-IHP 14th Intergovenmnetal Council passed resolution XIV-12., by Member States, to promote studies in regard to internationally shared aquifers and subsequently launched the Project on **Internationally Shared Transboundary Aquifer Resources Management (ISARM).** Already there is cooperation within American states, Africa, Europe and Balkan countries transboundary aquifer management.

With a view of starting ISARM-Asia UNESCO office Beijing initiated a pilot project on Heilongjiang-Amur River basin between China and Russian Federation with support from Chinese Geological Survey. Also with the help of WHYMAP project 12 major transboundary aquifers has been identified with in Asia, based on these maps China Geological Survey has identified 8 transboundary aquifers shred with other neighbouring countries. UNESCO is willing to explore further on trnasboundary aquifers of Asia at the research level.

3.5. China Climate Change Partnership Framework under Spanish MDG Achievement Funds

As one of the major developing countries in the world, China experienced accelerated development in the past decades. However, in the meantime of development, China is also faced with serious environmental challenges. With half of the national territory under threat of desertification, per capita water sources of China are only 2,300 cubic meters that is much less than the world's average. Moreover, a changing climate could continue to worsen the situation. As was introduced by the Chinese National Climate Change Assessment report published in 2007, climate change could lift snow line, and melt glaciers in Chinese western Qianghai-Tibet plateau-- source area of the Chinese major rivers feeding billions of people.

Unfortunately, there hasn't been a comprehensive assessment in China, taking a holistic approach, to investigate status of water resources under climate change, as well as its implications towards the socio-economic, ecosystem, health perspectives. In this situation, under the China Climate Change Partnership Framework (CCCPF) supported by the UN Spanish-MDG fund, UNESCO is taking the lead to collaborate with Ministry of Water Resources, Government of China, UN agencies, and other stakeholders to develop such comprehensive water resources assessment, which is among one of the first in China. Investigations enclosed would mainly focus on the yellow river basin that, with only 2% runoff of the nation supports 12% national population, 15% irrigation, and more than 600 cities. Due to specific hydrological conditions, the yellow river basin is an area rich in sediment but few in water. It is often faced with water-related disasters, including floods, droughts and pollution, specifically in the source and middle stream areas. The yellow river basin is thus an area sensitive towards climate change, and also attracting attention from both home and abroad.

UNESCO's component under CCCPF is aimed to first identify and measure current status of water resources in the yellow river basin under climate change, and further to analyze the

status to explore feasible mechanism to set up integrated water resources management, which would facilitate local adaption countermeasures towards climate change. The suggestions and conclusions reached will be further proposed and incorporated into the national policymaking process. A holistic case study approach that is developed through the WWDRs would also be applied, and the result is expected to constitute a case study on situation and management of water resources in China enclosed within subsequent WWDRs. Since 2008, three phases will be carried out till 2011. The first phase largely focuses on data collection and the second endeavoured to data analysis. Policy suggestions, projected changes, as well as adaption countermeasures, would be developed within the third phase. A series of research workshops, dialogues, and field trips would also be initiated throughout all the phases to share and exchange expertise on integrated water resources management from concerned stakeholders. It is expected that the conclusions and suggestions reached will be a result with full participation and recognition of concerned stakeholders. For UNESCO's component, a launching workshop would soon be held after the formal launching of CCCPF on 9th October 2008.

ANNEX 5

COUNTRY REPORTS

NATIONAL REPORT ON IHP RELATED ACTIVITIES
AUSTRALIA

1. ACTIVITIES UNDERTAKEN IN THE PERIOD OCTOBER 2006 – Sept 2008

At the 33rd session of the UNESCO General Conference (2005), Australia was elected 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 activities of the IHP network are reported on at meetings of the national UNESCO Science and Technology Network. The Australian National Commission (NATCOM) for UNESCO (www.dfat.gov.au/intorgs/unesco) has 12 members, two parliamentary representatives and four honorary members. Mr Bruce Stewart and Professor Ian White 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.

Name	Expertise	Organization
Bruce Stewart	Water Resources Assessment	Bureau of Meteorology
Tony Falkland	Island Hydrology	
Trevor Daniell	Urban, Low and High Flow Hydrology	University of Adelaide
Ross James	Hydrological Data & Networks	Bureau of Meteorology
Peter Martin	Public Relations	CRC for Weed Management
Ian White	Hydrology/Water Quality	Australian National University
Erwin Weinmann	Flood management/water resource management	Monash University
Ian Cordery	Flood/Drought Hydrology	University of New South Wales
Peter Dillon	Groundwater	Centre for Groundwater Studies
Anne Jensen	Ecotones	Wetlands Care Australia
Shahbaz Kahn	Sustainable irrigation systems	CSIRO now Unesco (April 2008)
Ray Volker	Groundwater	University of Queensland

1.1.2 Status of IHP-VI 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-VI. A description is provided below of some activities pertinent to IHP-VI.

- *Theme 1 - Global Changes and Water Resources*

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/) is continuing 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. 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 Ecowise 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, Ecowise Environmental and the University of Adelaide have been investigating the vulnerability of water supply catchments in the Australian Capital Territory to global change.

- *Theme 2 – Integrated Watershed and Aquifer Dynamics*

The Centre for Groundwater Studies (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 especially using aquifer storage and recovery. 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 Ecowise 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. 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.

- *Theme 3 - Land Habitat Hydrology*

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 conjucion 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.

- *Theme 4 – Water and Society*

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 negotations and reduce conflict over groundwater use in low atolls.

- *Theme 5 Water Education and Training*

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/)
CRC for Water Quality and Treatment (http://www.waterquality.crc.org.au/)
On 30 June 2008 the Cooperative Research Centre for Water Quality and Treatment completed its term of operation under the Commonwealth Agreement. During its 13 years of operation the CRC undertook a broad portfolio of research and educational activities addressing issues relating to water quality management and health risk reduction, from catchment and reservoir management and water treatment to the distribution of drinking water to consumers' taps.
The CRC has been succeeded by Water Quality Research Australia Limited (WQRA), a national not-for-profit scientific research institution. WQRA will develop and undertake a program of research and education to build on the achievements of the CRC.

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.
Centre for Groundwater Studies (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 indigeneous 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)

- *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. The CSIRO Griffith and Charles Sturt University Wagga Wagga is a Regional Coordinating Unit for HELP and the Lower Murrumbidgee Catchment has been classified as a Demonstration HELP basin and was the only Demonstration basin of the HELP Pilot Phase. The Burdekin basin and the Fitzroy basin have been classified as Operational Help basins. Both basins are in Queensland.

1.1.3 Decisions regarding contribution to/participation in IHP-VII

Australia is in a strong position to provide input across the range of Focal Areas identified. The research programs of the CRCs, CSIRO and relevant Australian University groups are closely

aligned with the activities proposed within the four major theme areas. Some areas in which initial contributions are anticipated include:

Theme I- Global Change, Watersheds and Aquifers

Objective **:** Achieve improved definition of water dependencies in the face of continuing global change, assess particularly stressed areas and develop institutional synergies to mitigate them.

Primary Focal Area:
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.
- Research activities involving the Pacific Island Countries
- eWater CRC Research Activities on water quality and catchment processes
- Groundwater dependent ecosystems

Theme II: Governance and Socio-Economics

Objective: Strengthen good governance, wise stewardship of the resources; achieve capacity development and promote assured flow of finances.

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

Focal Area II-2: Good Governance, capacity development and stakeholder participation. Empowerment of human resources.
- Assisting in training on MAR (management of aquifer recharge) including management policies, codes of practice
- Frameworks for determining sustainable yield of aquifers
- Aquifer storage and recovery

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

Theme III: Ecohydrology and Environmental Sustainability

Objective: Enhance the designation of water both as an abiotic resource, and as a service, delivered by eco system processes; identify, quantify and improve the critical linkages for environmental 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

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

Theme IV: Water Quality, Human Health and Food Security

Objective: Improved understanding of the distribution of abiotic and biotic pollutants in the water cycle and their impact on human heath; access to water for long term food security

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.

- 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.

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

- 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.
- Free exchange of info from Australian Water Conservation Reuse Research Program and UNESCO

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

- Climate variability and change and water resources for agriculture

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

1.2.1 National/local scientific and technical meetings

- 30th Hydrology and Water Resources Symposium, 4-7 December 2006 Launceston, Tasmania
- 9th Australasian Environmental Isotope Conference and 2nd Australasian Hydrogeology Research Conference with the theme *Integrating research and Innovation*, 13-15 December 2006, Adelaide (http://groundwater.com.au/aust-isotope-and-hydro-conferences.html).
- The biennial convention of the Australian Water Association (AWA) (www.awa.asn.au) is the Australian water industry's largest and most prestigious event. It is an internationally recognised and well attended occasion, attracting delegates from across Australia and around the globe. The Ozwater 2007 Convention & Exhibition, was held 4-8 March 2007 in Sydney.
- 5th Australian Stream Management Conference, 21-25 May 2007, Albury, NSW.
- 3rd AWA WATER REUSE AND RECYCLING CONFERENCE 16th - 18th July 2007. University of New South Wales.
- RAINWATER & URBAN DESIGN 2007, 21-23 August 2007, Sydney. This event incorporated the 13th International Rainwater Catchment Systems Conference, 5th International Water

Sensitive Urban Design Conference and 3rd International water Association Rainwater Harvesting and Management Workshop.

- 10th INTERNATIONAL RIVERSYMPOSIUM & ENVIRONMENTAL FLOWS CONFERENCE, Brisbane 3 - 6 September 2007. The symposium includes the Thiess International Riverprize.
- Water for Life Forum 2007: Leading practice in water education was held on 19 September 2007 in Sydney.
- National Water Week, 21-27 October 2007 (www.nationalwaterweek.org.au)
- Greenhouse 2007 convened by CSIRO held 12-5 October 2007 in Sydney had the theme Projections, Probabilities People, Perceptions.
- Hydrological consequences of climate change symposium, November 15-16, 2007, Canberra. brings together Australia's leading climate and water scientists to improve understanding of the likely hydrological consequences of future climate.
- 5th National Waterwatch Conference (www.waterwatch.org.au) was held in Canberra, 26-29 November 2007.
- MODSIM2007, 8-16 December 2007, Christchurch, New Zealand. International Congress on Modelling and Simulation.
- Securing Groundwater Quality in Urban and Industrial Environments. Fremantle, Western Australia, 2-7 December 2007.
- 3rd NATIONAL WATER EDUCATION CONFERENCE, WATER EFFICIENCY 2008 and WICD 2008. All three conferences were held 30 March - 2 April 2008 on Queensland's Gold Coast. Education website (Website 1), Efficiency website (Website 2), WICD website (website 3).
- **2nd International Salinity Forum,** Adelaide, South Australia, 30 March to 4 April 2008
- **Water Down Under 2008,** incorporating the **31st Hydrology and Water Resources Symposium** and the **4th International Conference on Water Resources and Environment Research (ICWRER),** Adelaide Convention Centre, 14-17 April 2008
- ENVIRO08 A conference and exhibition for showcasing the Australian environment industry. Will be held 5-7 May 2008, Melbourne (www.enviroconvention.com.au/).
- 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.

Prof Shahbaz Khan was Chair of the International Steering Committee of the Hydrology for the Environment, Life and Policy (HELP) Program and the Regional Coordinator for the Australasian region. Since April he has been in Unesco Paris as Chief, Sustainable Water Resources Development and Management Section, Division of Water Sciences. Mr Tariq Rana of CSIRO will be the new Regional Coordinator for for UNESCO HELP based at the CSU International Centre of Water for Food Security. Email Tariq.Rana@csiro.au.

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 Trevor Daniell was elected Chairman of the Friend Inter-Group Coordinating Committee at it meeting in Havana, Cuba in December 2006. The 7th FIGCC Meeting was held in Adelaide on April 9th, 2008. Trevor was also selected as the Munro Orator for 2008 giving an oration at the 31st Hydrology and Water Resources Symposium.

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 is 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. A start has been made with the first phase of the project in Kiribati focussing on equitable groundwater use in North and South Tarawa. The project is being carried out in conjunction with the French agency CIRAD, the South Pacific Applied Geoscience Commission and government agencies in Kiribati and Tonga. This work is using Multi Agent Systems and a companion modelling approach to develop Negotiation Support Systems to minimise conflicts over water resource development and use.

The Australian Water Research Facility, a partnership between AusAID and the International Water Centre (www.watercentre.org/research/awrf) has a project to research catchment-based risk assessment in the Solomon Islands. The project will develop a framework for determining priorities for water resources management action in catchments.

White I., Falkland A., Metutera T. and Metai E. (2005). Effects of Landuse on Groundwater Quality in a Low Coral Atoll. Coliforms, Nutrients and Metals. ACIAR Project LWR1/2001/050, Equitable Groundwater Management for the Development of Atolls and Small Islands, prepared for the Australian International Agency for Agricultural Research, May 2005

White I., Falkland A., Perez P., Dray A. , Metutera, T. , Metai E., and Overmars M. (2005). Challenges in freshwater management in low coral atolls. Journal of Cleaner Production, Special Edition Water Management in Coastal Zones.

White I., Falkland A., Metutera, T. , Metai E., Perez P., Dray A. and Overmars M. (2005). Climatic And Human Influences On Water Resources In Low Atolls. In Proceedings Of The International Seminar On: Climatic And Anthropogenic Impacts On The Variability Of Water Resources Umr Hydrosciences Montpellier / Unesco / Omm Maison des Sciences de L'eau de Montpellier, 22 - 24 November 2005.

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, Burdekin River basin (Queensland), Fitzroy River basin (Queensland) and the Mount Lofty Ranges (South Australia).

Lower Murrumbidgee Catchment
Cooperation between researchers, farmers and industry in the Lower Murrumbidgee catchment, and its power to achieve useful and practical on-ground results, is the focus of this HELP initiative. The southern New South Wales catchment has been named as the UNESCO HELP program's first global reference basin. This means that the region's farmers, researchers and irrigation companies will be used as an example to showcase practical solutions for water resources

management under competing water uses and economic concerns. The research efforts in the area are addressing problems including rising water tables and salinity, reduced river flows, legislative reforms, competition between water users (including the environment) and falling deep aquifer pressure levels. The catchment is significant; with 2730 farms spread over 560,000 hectares in the Murrumbidgee and Coleambally irrigation areas. Almost a quarter of the water extracted from the Murray-Darling Basin each year is used to produce more than $1 billion worth of crops – almost 16% of Australia's agriculture produce. The lower Murrumbidgee catchment presents an excellent example of community involvement in hydrological research and the development of integrated catchment management policies using a range of tools. In addition, CSIRO Griffith and Charles Sturt University Wagga Wagga have been accepted as a Regional Coordinating Unit for HELP.

Contact Point: Mr Tariq Rana (CSIRO) (tarig.rana@csiro.au)

Charles Sturt University, Wagga Wagga, New South Wales is nearing completion of the process of establishment the International IHP-HELP Centre of Water for Food Security (IC WATER) as a UNESCO Category II Centre. The Centre aims to emphasize the pursuit of sustainable development and integrated water resources management in rural and peri-urban food production zones, through the development of scientific research, education, training and awareness-raising at all levels. The development of appropriate policies and practices, the international networking of scientists and the transfer of information and knowledge through IHP-HELP twin basin approach. On 28-30 May 2007 Prof Siegfried Demuth and Mr Giuseppe Arduino visited Charles Sturt University to discuss the establishment of the centre.

Contact Point: Dr Shahbaz Khan (CSIRO) (shahbaz.khan@csiro.au)

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

As President of the WMO Commission for Hydrology and also Chair of the Australian IHP Network, Mr Bruce Stewart provides a link between the UNESCO IHP and WMO's Operational Hydrology Programme. Tony Falkland and Ian White are members of the Water Working Group of the Science, Technology and Resources Network of the South Pacific Applied Geoscience Commission. Ian White is a member of the Asian Pacific Association of Hydrology and Water Resources.

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 affective, 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 $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 or 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 data 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 a range of legislation enacted by the eight State and territory governments

1.2.7 Other initiatives

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

The Bureau of Meteorology provided input to the meteorology and climatology components of the SOPAC/UNESCO/WMO Hydrological Training Programme that was funded by NZAID and run over the 3 years to 2006 in Fiji.

1.3.2 Organisation of specific courses

A groundwater training course for the Ministry of Public Works and Utilities, Republic Of Kiribati was held at the Australian National University in 12-21 June 2007. The training course was designed to increase capacity in groundwater assessment, monitoring and management and included the maintenance and calibration of Ministry equipment.

1.3.3 Participation in IHP courses

1.3.4 Other

The Centre for Groundwater Studies (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.

Funding support was provide to enable Mr Amos Ona from the PNG WWF to gain experience through participation in and presentation of a paper at the RiverSymposium held in Brisbane, September 2007.

The Brisbane-based International Water Centre announced a new Masters of Integrated Water Management course in December 2006. The course brings together expertise from Australia's leading universities to build capacity for today's water resource managers MIW website. The course starts August 2007.

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

Charles Sturt University, Wagga Wagga, New South Wales is nearing completion of the process of establishment the International IHP-HELP Centre of Water for Food Security (IC WATER) as a UNESCO Category II Centre. The Centre aims to emphasize the pursuit of sustainable development and integrated water resources management in rural and peri-urban food production zones, through the development of scientific research, education, training and awareness-raising at all levels. The development of appropriate policies and practices, the international networking of scientists and the transfer of information and knowledge through IHP-HELP twin basin approach. On 28-30 May 2007 Prof Siegfried Demuth and Mr Giuseppe Arduino visited Charles Sturt University to discuss the establishment of the centre.

1.4 Publications

White I., Falkland A., Metutera, T. , Metai E., Perez P., Dray A. and Overmars M. (2005). Climatic And Human Influences On Water Resources In Low Atolls. *In Proceedings Of The International Seminar On:* Climatic And Anthropogenic Impacts On The Variability Of Water Resources Umr Hydrosciences Montpellier / UNESCO / OMM, Montpellier, 22 - 24 November 2005.

Daniell T., and White I. (2005) Bushfires and their Implications for Management of Future Water Supplies in the Australian Capital Territory. *In Proceedings Of The International Seminar On:* Climatic And Anthropogenic Impacts On The Variability Of Water Resources Umr Hydrosciences Montpellier / UNESCO / OMM, Montpellier, 22 - 24 November 2005.

F Ghassemi and I White (2007). Inter-basin Water Transfer: Case Studies from Australia, United States, Canada, China and India., Cambridgement University Press, UNESCO International Hydrology Series, Jan 2007

Cordery, I; Weeks, B; Loy, A; Daniell, T; Knee, R; Minchin, S; Wilson, D (2007) Water Resources Data Collection and Water Accounting, Australian Journal of Water Resources; Volume 11, Issue 2; 2007; 257-266.

Daniell; Trevor, Nathan Rory, Chiew Francis and Osti Alexander, (2008) Chapter 11, Low Flow Forecasting, in World Meteorological Organisation, 2008, Manual on the Estimation and Prediction of Low Flows, Contribution to the topic Disaster Mitigation: Floods and Droughts (hydrological aspects), WMO

White I., Falkland A., Perez P., Dray A., Metutera T., Metai E., And Overmars M. (2007). Challenges In Freshwater Management In Low Coral Atolls. *Journal Of Cleaner Production* 15, 1522-8.

White I., Falkland A., Metutera T., Metai E., Overmars M., Perez P., and Dray A. (2007). Climatic and Human Influences On Groundwater In Low Atolls. *Vadose Zone Journal* 6, 581–590.

White I., Falkland A., Metutera T., Katatia M., Abete-Reema T, Overmars M., Perez P., and Dray A. (2008). Safe Water for People in Low, Small Island Pacific Nations: The rural-urban dilemma. *Development*, **51**, (In press)

1.5 Participation in international scientific meetings

1.5.1 Meetings hosted by Country

See Section 1.2.1 of this report for international conferences hosted.

1.5.2 Participation in meetings abroad

Trevor Daniell participated in the Coordination Committee of the GRDC in Koblenz 19th to 21st September 2007.

Trevor Daniell and Francis Chiew participated in the FRIEND 2006 Meeting in Cuba on Climate Variability and Change-Hydrological Impacts.

1.6 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 launched at a workshop in Brisbane, Australia 16-19 April 2007 organized 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.

1.6.1 Institutional relations/co-operation

No information available at this time.

1.6.2 Completed and ongoing scientific projects

Refer section 1.2.3 re ongoing Pacific Island projects.

2. Future Activities

2.1 Activities foreseen until December 2008

- 11th INTERNATIONAL RIVERSYMPOSIUM & ENVIRONMENTAL FLOWS CONFERENCE, Brisbane, September 2008.
- National Water Week, October 2008
- 9th National Conference on Hydraulics in Water Engineering, 23 - 26 September 2008 at Darwin Convention Centre. Within this overall theme the conference sub-themes are: Climate Change, Methods in Hydraulics, Applied Hydraulics, Geophysical Hydraulics and Coastal Hydraulics.

2.2 Activities Planned for 2008-2009

- Continuation of assistance to Pacific Island Projects.
- Continuation of involvement in Asian Pacific FRIEND.
- Continuation of involvement in HELP
- Participation in the FRIEND Symposium 2010, Fes, Morocco, 25-29th October.

2.3 Activities envisaged in the long term

No information available at this time.

CHINA

National Report on IHP Related Activities

for

the 16th RSC-IHP meeting for the Southeast Asia and the pacific

at Ulaanbaatar Mongolia 2-3 October 2008

Chinese National Committee for the IHP

1. This report is submitted to the 16th RSC meeting for the IHP at Ulaanbaatar, Mongolia, 29 Sep. - 3 Oct. 2008.

National Report on IHP Related Activities

Chinese National Committee

1. ACTIVITIES UNDERTAKEN IN THE PERIOD December 2007 – September 2008

1.1 Meetings of the Chinese National Committee for IHP

1.1.1 Decision regarding the composition of the Chinese National Committee

April 2008, new members have been recommended by the National Committee and have been approved by the Ministry of Water Resources, China. The new committee consists of 29 distinguished water experts who are active in hydrology and water resources work in China. Their participation will strengthen the implementation of IHP activities/projects and facilitate IHP China with broad and effective contributions. In particularly the Bureau of Hydrology, Changjiang Water Resources Commission will be playing major role in coordinating and applying future IHP China activities.

1.1.2 Status of IHP-VII activities

Some key activities are provided in the following paragraphs. More activities with more themes and focal areas are going on, thus a series of national and international workshops will be held when projects are finalized.

On 24-29 May 2008, Dr. A. Szollosi-Nagy, Deputy Assistant Director General, Secretary of the International Hydrological Programme, Director, Division of Water Sciences, UNESCO, visited the IHP China. The objective of this mission was to: design the principles of a major large-scale UNESCO programme towards jointly developing sustainable water resources management strategies and policies for China; Strengthen relation and cooperation: IHP-VII will seek the generation of policy-relevant science and appropriate guidelines for sustainable water management, including addressing water governance issue; and develop cooperation and possible joint approaches to address Global Change impacts on Water resources.

The missions consists of various activities including a meeting with the vice minister of MWR, Mr. Hu Siyi, a workshop on climate change in the Ministry of water resources, a visit to the International Research and Training Center on Erosion and Sedimentation (IRTCES), a visit to the Institute of Geography , Chinese Academy of Sciences, the kick-off meeting of the Climate Change Impacts on Water Resources project (financed by the Spanish MDG fund) in Zhengzhou city, Yellow River Conservancy Commission, and a seminar in Tsinghua university, Beijing.

The visit turned out a fruitful mission. It has clarified some wonders on both sides regarding IHP work in China and in UNESCO. The workshop and seminar given by Dr. Szollosi-Nagy and other Chinese experts have shared different views and research findings on climate change in particular global change impact on water.

With UNESCO IHP, Changjiang Water Resources Commission (CWRC) is now organizing a workshop on "integrated river basin management" which will be held under the framework of the 3rd Yangtze Forum in April 2009. The workshop aims to bring

excellent and world-wide known professionals on river basin and water resources management (WRM), to share knowledge and experiences on a global level, which will not only benefit WRM practical needs in China particularly on Yangtze River, but also contribute the IHP-VII with sharing and developing of IWRM knowledge and experiences based on big rivers such as Yangtze River from China. Currently the activity is on the preparation stage.

1.1.3 **Decision regarding contribution to/participation in IHP-VII**

In the annual meeting of CHINA-IHP last year, it was decided to fully participate in all themes and. Some working groups were proposed, and more detail participation plan will be decided in the annual meeting in November 2008 in Beijing.

1.2 ACTIVITIES AT NATIONAL LEVEL IN THE FRAMEWORK OF THE IHP

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

Workshop for Extending Hydrological Service was held from 25-27 December 2007. 15 invited experts and 30 delegates from each provincial hydrological bureau were invited to present their opinions. Beside traditional observation, forecasting, calculation, hydrological services extended to water resources assessment, water quality monitoring, groundwater survey, drought monitoring and prediction, ecological hydrology service, flash flood disaster prediction, international rivers flood forecasts etc. Hydrological service and water resources management have been closely coordinated. International hydrological programme will play important role to introduce advanced experiences around the world.

2008' National Hydrological Planning and Plan Meeting was held on 9 January 2008. Mr. Deng Jian, Chairman of CHINA-IHP and Director-General of Hydrology Bureau, delivered a speech in the opening ceremony. Each provincial bureau of hydrology reported their planning and plan. Under the framework of international cooperation, IHP was prior for future cooperation. About 100 participants attended the meeting.

2008' Annual Water Department Directors meeting was held from 24-26 January 2008 in Hangzhou, Zhejiang Province. The meeting usually summarized achievements in the last year and arranges important work and highlight guideline for future. More than 120 participants from river basin authorities and provincial water resources directors attended the meeting. Some successful experiences from different sectors presented. Chinese National Committee sent participants to the meeting. The activities and achievements of Chinese National Committee were included in MWR annual report.

The 16th World Water Day and 21st Chinese Water Week were initiated on 22 March 2008. The theme for World Water Day 2008 is "Sanitation Matters." The theme of the Chinese Water Week is "Developing Water for Improving People's Livelihood".

Minister Chen Lei published an article on the People's Daily to commemorate the 16th World Water Day and 21st Chinese Water Week. He wrote that water is closely related to the people's livelihood; flood relief is related to the safety of people's life; drinking water is related

to people's health, thus water development is vital for the improvement of people's livelihood.

The Chinese Government has been attached great importance to water development. A series of measures have been taken for flood control and drought relief, safe drinking water supply, reservoir reinforcement, resettlement arrangement and later stage assistant, control of major rivers and lakes, irrigation and drainage and rural water supply.

Chinese National Committee for the IHP was involved in the activities.

National Water Science Conference was held in Beijing from 31 March to 1 April. The conference usually organizes once in four years. Vice-premier Hui Liangyu attended the opening ceremony. Some outstanding young experts and excellent project achievements were awarded. Science and technology innovation for water resources were hot topics. More investment and project budget were appealed for the next years. Hydrology science and water resources management with climate change pressure will be emphasized from the conference documents.

Symposium on "Advances in Water Resources Management" cum 10th Anniversary IAHR-HK Chapter was held on 25-26 March 2008 at Hong Kong University, Hong Kong. They symposium was joint sponsored by Hong Kong University and the Bureau of Hydrology (BOH), Changjiang Water Resources Commission (CWRC). Experts from BOH CWRC contributed the symposium with presentations covering topics of hydrometry, flood forecasting, sediment modeling and water resources management on Changjiang River. Researchers and engineers from HK universities and water offices shared their experiences and knowledge of water resources management from HK area.

National Hydrology conference was held in Nanning, Guangxi Autonomous Region of Southwestern China, from 2-3 April 2008. Vice minister, Mr. E Jingping, Chair of China-IHP national Committee, Mr. Deng Jian, SG of CHINA-IHP, Ms. Zhu Xiaoyuan and some members of the National Committee participated the conference. This is the first conference after Hydrology Regulation issued. All participants, especially from provincial hydrological units, highly appreciated the regulation. Four important tasks were emphasized: (1) enhancing hydrological regulations and rules; (2) improving information system for flood control and drought mitigation; (3) increasing investment for hydrological infrastructures; (4) enhancing basic hydrology researches. A logo of China Hydrology was announced for public use.

2008' annual water and soil conservation conference was held in Bijie City of Guizhou Province of Southwestern China from 17-18 April. The conference emphasis water and soil conservation is quite related to eco-civilization. To establish eco-compensation mechanism is new requirement for water and soil erosion. Water conservation oriented people daily life is a new definition for water resources development and management, such as clean drinking water, rural hydropower, water and soil conservation, etc. About 100 participants attended the conference. IHP national committee representatives were involved.

1.2.2 Participation IHP Steering Committees/Working Groups

The 4th Steering Committee meeting of the Hindu Kush Himalayan flow Regimes

From Experimental Network Data (HKH-FRIEND) was held at the International Centre for Integrated mountain Development (ICIMOD), Nepal from 15-16 November 2007. Dr. HUANG Yan was called on behalf of China national committee to participate the meeting. The meeting reviewed the past activities, discussed the evaluation report and provided guidance for the way forward. The Steering Committee (SC) members, research group members and observers were present during the meeting. Dr. HUANG Yan volunteered to be the coordinator of HKH-FRIEND.

The 7th Friend Intergroup Coordination Committee (FIGCC) meeting was held in Adelaide Australia on 19/April/2008. As the coordinator of HKH FRIEND Dr. Yan Huang participated the meeting, and write this report afterwards. In the meeting, the regional FRIEND coordinator to report their work progress for the past two years during 2006-2007, and to discuss the work plan for the coming 2 years of 2008-2009 in particular the organizing and themes of the next international FRIEND conference which are to be hold in Morocco in 2010. Issues related to the development of FRIEND are also discussed.

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

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

Hindu-Kush-Himalayan (HKH) FRIEND Project, Dr. Ms Huang Yan from Bureau of Hydrology, Changjiang Water resources Commission is now the coordinator of the HKH FRIEND project. She is assisting the member parties to develop joint cooperation proposals at the region, and helping on applying for funds to support the proposed projects. On 10/Sep/2008 in UNESCO Paris, Mr. Siegfried Demuth, Mr. B. R. Neupanne, Mr. Alan Gustard and Dr. Huang Y. had a meeting, the meeting reviewed the HKH FRIEND proposals and future plans, and made specifications on how to modify the proposals. Currently the 4 research group coordinators are modifying/developing the proposals according to the requirements of being joint-research.

The International Symposium on Hydrometry entitled "Experiences and Advancements in Hydrometry" was held on 18-19 March, 2008 in Seoul Korea. The symposium brought together hydrometry experts world-wide, to present and share experiences and the latest technical advancements in the field of hydrometry. Ms. Cui Yulan and Ms. Xiong Shanshan from the ministry of water resources, Ms. Huang Yan and Mr. Chen Songsheng from Changjiang Water Resources Commission and Mr. Zhang Liuzhu from Yellow River Commission attended the symposium and presented the hydrometry work in China.

14th China-Korea water resources management workshop was held on 6-10 May 2008, in Seoul Korea. Mr. Liu Zhiguang, Vice-Chairperson of Chinese IHP National Committee leaded a 9-person delegation to attend the workshop. The workshop has some topics, such as control indicators of total water volume withdraw in a river basin, reservoir flood-control dynamic stages, river basin simulation model, large-flood control strategy, alternative water

source technology etc. The delegation also spent a day fieldtrip of Korean flood control projects.

A workshop entitled 'Adapting to the impacts of global changes on river basins and aquifer system' was held in UNESCO Paris on 8-9 September 2008. The aim of the workshop is to bring together scientists from different networks to: identify key research topics related to global change issues, common topics for synergy and coordination of research agendas for different IHP projects and networking partners focusing on the major drivers related to global change and their impacts on hydrology and water resources, and to develop a background paper on global change issues. Dr. HUANG Yan from Changjiang Water Resources Commission was invited to attend the workshop and gave a presentation entitled "Review and Way Forward - How can we obtain an Integrated Water Resources Management for Yangtze River". The finalized background paper, which has been discussed on 9-Sep 2008, will contribute to the global change and risk management theme of the World Water Forum 2009.

1.2.5 Other initiatives

1.3 EDUCATION AND TRAINING COURSE

1.3.1 Contribution to IHP courses

International Small Hydropower Center organized a training workshop on small hydropower and community sustainable development in Hangzhou, from 21 April to 5 May 2008. 46 participants from 23 developing countries participated in the workshop. The course is directly link to IHP-VII theme related to water and energy.

1.3.2 Organization of specific courses

A special training course for hydrology and water resources assessment was organized by Bureau of Hydrology, Ministry of Water Resources from 13-17 November, 2007. The course was 15th regularly activity for improving national water resources assessment level. 172 participants passed examination and received certificate for their professional position. China-IHP experts delivered lectures during this and last courses.

A 6-week training course on mete-hydrological forecasting technology was given for two north Korean hydrologists in the Bureau of hydrology, Changjiang Water Resources Commission during April-May 2008. The training course consists of filed trips to hydrological stations in Sichuan and Hubei Provinces at regional level, and learning of information management, mete-hydrological forecasting technology, application of various mathematic models etc. It turned out a very useful experiences and knowledge sharing for the north Korean hydrologists.

1.3.3 Participation in IHP courses

Each year about 20 participants were sent to UNESCO-IHE with academic recommendation from China-IHP.

1.4 PUBLICATION

Proceedings of Workshop on Ecological Effect of Hydro-Engineering, 11-12 November 2007.

1.5 PARTICIPATION IN INTERNATIONAL SCIENTIFIC MEETINGS

1.5.1 Meeting hosted by the country

Sino-UK steering committee of water resources demand management project meeting was held on 14 May, 2008 in Beijing. Mr. Hu Siyi, Vice-Minister of Water Resources and Mr. Davis, Representative of UK DfID in Beijing attended the meeting. The project started from 2006 and will be completed by 2010. Main purpose is to introduce UK water demand management and to apply in Liaoning and Gansu provinces. In this steering committee meeting, experiences from pilot application were summarized. From central government, all these experiences from pilot basins and projects will be disseminated to all country in the next years. IHP-China has been involved for consultation and implementation in Liaoning Province.

Sino-Dutch workshop of on "technology of dike observation" was held on 8-10/Sep, Zhenzhou, China. There are high similarity regarding between Yellow River and the Netherlands – both are protected by dikes and the ground level inside the dike can be lower than the water level in the river/sea. Thus, a workshop on exchanging and sharing knowledge and experiences on dike observation and management was held between Yellow River Commission and Rijkswaterstaat the Netherlands. After the indoor presentation and discussions, the Dutch experts joined a filed trip to investigate the dike situation at Yellow River and to further exchange ideas regarding dike observation and management.

Sino-Denmark workshop on environment and water resources management was held on 26/Sep at Wuhan China. During visit in China, the Danish Minister of Environment Mr. Troels Lund Poulsen and experts from Denmark visited and shared Danish experience of the EU Water Framework Directive (WFD) with the Changjiang (Yangtze River) Water Resources Commission (CWRC). This workshop contributed as part of implementation of the EU China River Basin Management Programme (RBMP). A half day roundtable meeting was given focusing on the motivation of Denmark to endorse/adopt/subscribe to the EU Water Framework Directive, as well as willingness of sharing experiences regarding water resources management on strategic level from CWRC.

1.5.2 Participation in meetings abroad

UENSCO IHP 18th session of the Intergovernmental Council meeting was held on 9-14 June 2008, Paris. Due to the earthquake occurred in Sichuan, most IHP committees were busy with risk/damage mitigation and rescuing work at the earthquake area, and could not attend the meeting as planned. Thus, the vice chairman of national IHP committee Mr. LIU Heng, international affair office head Mr. GUAN yiqing, and the permanent delegation of China Mr. Hong Tianhua attend the meeting. There were 36 council member countries, 37 observation countries, 14 non-governmental organizations and 3 UN agency representatives attend the meeting (in total there were about 180 participants). As usual, the Chinese delegation attended actively the full programme and represent China IHP participated in discussions.

1.6 OTHER ACTIVITIES AT A REGIONAL LEVEL

1.6.1 Institutional relations / co-operation

1.6.2 Completed and ongoing scientific projects

FRIEND projects for flood/low flow forecasting/predictions in Southeast-Asian group work.

A joint programme entitled "climate change partnership framework" (2008-2010). The joint programme has been developed by the nine UN Agencies with Spanish fund in coordination with the respective counterpart Ministries/National/Local Agencies, scientific community, and the private sector, and under the coordination of the UN Theme Group on Energy and Environment, the Ministry of Commerce (MOFCOM) and the Office of National Climate Change Coordination Committee at the National Development and Reform Commission (NCCCC/NDRC). Yellow river is selected as the case study area. The case study of the Yellow River basin regarding Climate Change Impact and Water Resources Assessment will identify the water resources situation, development strategies and policies etc. of the river basin, provide suggestions of approaches and methodologies, and help to build effective indicator system for the Yellow River basin and adapting the river basin management to climate change.

2. FUTURE ACTIVITIES

2.1 ACTIVITIES PLANNED TO UNTIL DECEMBER 2008

The National Committee will continue and pay high attention for regional cooperation under IHP framework.

2.2 ACTIVITIES FORESEEN FOR 2008-2009

Some projects related to IHP-VII themes will be supported by Ministry of Water Resources though IHP national Committee. IHP National will continue to encourage scientific and technical symposia and workshops. Meanwhile, some initiatives for IHP-VII themes will be encouraged and arranged by the National Committee. Cooperation among the Southeast Asia and the Pacific will be top priority. The activities will include, but not only as below:

- Annual IHP national committee meeting shall be hold later 2008. The objective is to strengthen participation from members and cooperation between them. Framework of how IHP China should contribute the hydrology and water work at national and international level shall be discussed and determined.
- Implement a collaborative research project with IRTCES on erosion and sedimentation
- Establish a research center focusing on climate change impact on the hydrological cycle and water resources
- Develop disaster reduction objectives through cooperation with UNSGAB high-level expert panel on water and disaster
- Prepare a country report with a case study to WWDR 3 under climate change issues focusing groundwater system response
- Organizing Climate Change and Water Safety sub-forum under the 3rd Yangtze Forum, April 2009, to share knowledge and experience on climate change impact, migration and adaptation on water issues. Promote the concept that global change, i.e. to clarify that climate change is not the only driving forces for changes in water but also other forces such as land-use change, urbanization, human activity impact etc which are identified as part of global change.
- Together with UNESCO IHP, organize an international workshop on IRBM and/or IWRM in the 3rd Yangtze Forum, April 2009, develop joint project to promote and improve IWRM practices in China river(s), investigate and summarize public participation in some areas
- Cooperate with regional IHP national committees to develop a development strategy on Small Hydropower
- Implement an international initiative of “Lighting up Rural Africa” through cooperation with African counterparts.
- Organize an international or national conference on water, energy and poverty mitigation focusing on small hydropower development
- Implement a research project on risk management focusing environment and society with

case of South-North water transfer project

- 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, develop water quality protection technology
- Workshop on trans-boundary river water ecosystem security (Cooperate with CITWES: Center of International Trans-boundary Waters and Ecosystem Security of Tsinghua University)
- Refresher course for UNESCO-IHE alumni on IRBM

2.3 ACTIVITIES ENVISAGED FOR THE LONG TERM

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

2008 UNESCO IHP Activity Report in DPR Korea

1. Research and Survey Works

i. Established flood forecasting system based on hydraulic model of 2-dimessional steady/unsteady flow in Taedong river.

ii. Establishing of DEM using 1:50000 map and configuration of GIS database for flood risk assessment\

iii. Development and rational uses of groundwater for water drinking in the lower of Taedong river basin.

iv. Assessment of balance between water demand and water supply in Taedong river basin and water value

v. Impacts of climate change on hydrological runoff in Taedong river basin

vi. Field survey for identification of flood risk units in Taedong river Basin

vii. Survey of the cross-sections in the tributary rivers of Taedong river.

2. Training

1) Local training

i. Training of hydrological experts focused on hydrological models, water resources management, information engineering and so on through educational network such as **KIM Il Sung** University and HydroMeteorological College

ii. Local training course on “Operational Flood Forecasting System and Information Service“ held periodically in Pyongyang on June every year before the beginning of rainy season to raise the practical qualification of members engaged in the operational flood forecasting.

iii. Local raining course on “Observation Method and Information Communication” attended by staffs of province and county observation stations in Pyongyang on May

2) Oversea training

Participation of 2 persons of DPR Korea in study tour on “Flood forecasting and Database Management” organized in China, April to May, 2008, under bilateral cooperation of the Ministry of Water Resources, China

3. Raising the public awareness

i. Development and dissemination of the understanding and awareness materials relating to flood disaster prevention through media such as TV, newspaper, radio and so on.

ii. Publishing the quarterly bulletin “HydroMeteorological Science and Technology”

4. Services of hydrological information and products

i. Communication of real time hydrometeorological data and information to decision-makers, stakeholders and end-users through modem dial-up access

ii. Issues of flood forecasting and warning numbering 50 and delivers to decision-makers, stakeholders and the public during the rainy season

iii. Making the proposal for water pollution prevention in Taedong river

iv. Ten days runoff forecasting for water management and deliver to users

REPORT OF THE
INDONESIAN IHP NATIONAL COMMITTEE
ULAAN BATAAR, MONGOLIA
October 2008

1. ACTIVITIES UNDERTAKEN IN THE PERIOD OCTOBER 2007 – SEPTEMBER 2008

1.1 Meetings of the IHP National Committee

1.1.1 Composition of the IHP National Committee

The organizational structure of the Indonesian National Committee for IHP consists of a Chairman, a Vice Chairman, two Secretaries, and 14 members from vrious research institutes, universities and sectoral-departments. These institutes and agencies consist of the Indonesian Institute of Sciences (LIPI), University of Indonesia (UI), Bogor Agricultural Agriculture (IPB), National Agency of Meteorology and Geophysics (BMG), Departments of Public Works, Agriculture, and Forestry and related research and development institutes.

The Indonesian National Committee for IHP is on the threshold of restructuring its activities based on considerations: (i) retuning the program within the new path of IHP Programme phase VII; (ii) obtaining better participation from key stakeholders.

The present composition of the National Committee is:

Chairman	: Hery Harjono
Vice Chairman	: Arie Setiadi
Secretary I	: Gadis Sri Haryani
Secretary II	: Nenny Sintawardani

Members:

1. Dr. H. Arief Rachman	Department of National Education
2. P.E. Hehanussa	LIPI
3. Igna Hadi Suparyanto	LIPI
4. Edi Iswanto Wiloso	LIPI
5. Bogie Soedjatmiko	LIPI
6. Indreswari Guritno	University of Indonesia (UI)
7. Hidayat Pawitan	Bogor Agricultural University (IPB)
8. Istiqlal Amien	Department of Agriculture
9. Sudarto Notosiswoyo	Technology Institute of Bandung (ITB)
10. Satriyo Hadipurwo	Department of Energy and Mineral Resources
11. Endro Santoso	Agency of Meteorology and Geophysics
12. Budi Suhardi	Agency of Meteorology and Geophysics

The committee holds bimonthly coordination meetings and in addition to several technical meetings as needed for the planning and implementation of seminars and workshops organized under coordination of the Committee. The committee routine meetings are also attended by the Chairman of the Indonesian National Committee for UNESCO and by Program Specialist of the UNESCO Jakarta Office. Members of the IHP National Committee through regular meetings distribute informations gathered during the meetings as well

as report to the meeting on hydrological and related activities in their organizations.

The mailing address of the IHP National Committee is as follows :

Dr. Gadis Sri Haryani
Indonesian National Committee for IHP
Research Centre for Limnology LIPI
Indonesian Institute of Sciences
Cibinong, 16911, INDONESIA
E-mail: gadissh@indo.net.id or limno@indo.net.id

And/cc to:

Bureau of Science and Technology Cooperation and Promotion, the Indonesian Institute of Sciences (LIPI)
Jln. Gatot Subroto No. 10, Jakarta, 12710, INDONESIA
Telp.: 62-21-52257111/5207226,
e-mail: bkpi@lipi.go.id

1.1.2 Status of IHP-VI activities

Selected activities related to the IHP-VI programme were implemented by and in various departments, universities, and research institutions of members of the IHP National Committee. During the Committee meetings, reports of activities were delivered for the knowledge and use by other members and for related IHP-VI activities.

A series of workshops on Preparation and Formulation of Indonesia's IWRM & WE (Integrated Water Resources Management and Water Efficiency) was held starting February 2005: This is a contribution for IHP VI Theme 2: *Integrated Watershed and Aquifer Dynamics*.

A contribution to IHP VI Theme 5: *Water Education and Training*: under the flag of the Indonesia Water Partnership, consisting of stakeholders related to water have taken place in the annual World Water Day since year 2000. Its main objective is to conduct campaign through training, education and dialogue, and seminar programs to augment public awareness and participation. Annual themes were selected 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.

1.1.3 Decisions regarding contribution to/participation in IHP-VII

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

- The Asia Pacific Center for Ecohydrology (APCE) in LIPI-Cibinong has held series of activities since 2001 that were attended by regional participants in the region. Series of training workshops are being prepared with the establishment of APCE under LIPI Decree in 2008.
- National Seminar Series on Water Resources conditions to Support Improved Rice Prodution, in Cooperation between Indonesian Society of Hydrology with Department of Public Works, Department of Agricutures and the Agency of Meteorology and Geophysics, February 2007, August 2007 and November 2007.

- Department of Public Work is studying global climate change to adopt the effect on the public infrastructures

1.2.2 Participation in IHP Regional Steering Committees/Working Groups Meetings

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

- SARCS Carbon and Water Cycle Research Project: *Carbon, Nutrient and Water Fluxes of River Basins of the Java Island*, implemented by Bogor Agricultural University (IPB Bogor) and the Agency for the Assessment and Application of Technology (BPPT Jakarta) between May 2006 to October 2007. Subsequent SARCS research project continue in 2007 to 2008 for Musi river in South Sumatra on similar subject.
- In order to meet the WMO Standard in hydrological measurement, it is proposed to develop calibration laboratory for hydrology equipments (current meter, rainfall recorder, climatology, water level recorder) in Medan for west region, Jogja for central region, and Makassar for east region of Indonesia.
- Erosion protection study is conducting at the Eretan waters, Indramayu in 2006 – 2007 by Research Center for Oceanography - LIPI. The objective of this study is to understand the dynamics change process of coastline area caused by the existence of the interaction among air, sea and land which causes the coastal erosion. The development of numerical model will be conducted in 2007 based on Horikawa (1988) and groin design based on US Army Corps Engineers (1975) which is able to be used for the prediction of erosion protection of coastline changes.
- Operational Hidrometeorological observations: Meteorological and Geophysical Agency (BMG) operated rain gauges for observing rainfall throughout the country. Totally amount of rain gauges active are at 2678 stations (Source : BMG, 2006). Another instruments also operated by BMG i.e Monitoring Automatic Weather Station (MAWS) at 29 location stations. BMG and JAMSTEC (Japan Minister of Science and Technology) collaborated to monitor convective cloud activities at Jambi and Padang with Automatic Weather Station (AWS).

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

- JSPS-DGHE Joint Research Project FY 2007-2009 on *Watershed Management for Sustainable Water Resources Development in a Humid Tropical Regions*, implemented in Indonesia side by Bogor Agricultural University, Research Centre for Geotechnology- LIPI, and Research and Development Agency - Department of Agriculture, started April 2007 to March 2010.
- Establishment of National Guidelines of Quality Assurance for Hydrological Management that is done in collaboration among hydrology operator in Indonesia (c.q. Directorate General of Water Resources, Research Center of Water Resources, Agency for Meteorology and Geophysics, Department of Energy and Mineral

Resources, Department of Agriculture, Department of Forestry, Indonesian Institute of Science, Agency for Research and Technology Dissemination, etc)

1.2.5 Other initiatives :

- The Research Institute of Water Resources – Public Works organized national hydrological training program every year. The RIWR is planning to strengthen the program through national activities. In conjunction with WMO that endorses and supports the Indonesian proposal and will conduct a Regional Hydrology Training Center for Asia Pacific. It will be held in Indonesia in conjunction with the national training program.
- Establishment of National Sector Capacity Building Network on Water Resources and Irrigation Sector Management Program (NS CBN-WISMP) in 2008 to become a national institution that will coordinate and integrate all institutions/network concerned with and active in Integrated Water Resources Management (IWRM)

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

1.3.2 Organization of specific courses

- Directorate of Water Resources Management, Directorate General of Water Resources has conducted meetings in order to establish concept of National Guidelines of Quality Assurance for Hydrological Management in 3 phases in November 2007, of Evapotranspiration in 2008.
-

1.3.3 Participation in IHP training courses

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 : -

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

- Government of Indonesia hosted the COP 13 of United Nation Forum on Climate Change UNFCCC) in Bali, December 2007
- Indonesian Hydrological Society in cooperation with RIHN-Kyoto organized an International Conference on Groundwater Problems in Developing Countries, December 2007 in Denpasar Bali.

1.6.2 Participations in meetings abroad

- Prof.Hehanussa attended a meeting of the Directors of UNESCO's Water Related Center, 22 – 26 September 2007, Bangkok Thailand.
- Dr. Hery Harjono, Mr. Eddy A. Djadjadiredja, Agung B. Ibrahim, Rahmat S.L, Prof. Hidayat Pawitan participated UNESCO IHP 15th RSC Meeting for Southeast Asia & The Pacific (SEAP), Manila, Philippines, 19 – 23 November 2007 in conjunction with a "International Conference on Hydrology and Water Resources

Management for Hazard Reduction and Sustainable Development (HRSD 2007)".

1.7 Other activities at regional level

1.7.1 Institutional relations/cooperation : -

1.7.2 Completed and ongoing scientific projects

- The Asia Pacific Center for Ecohydrology (APCE) have ongoing activities in the Saguling Reservoir in the Upper Citarum River, West Jawa. This is an activity to understand and regulate the eutrophication process that has taken place in the region.
- APCE is also starting to take part in the SWATCH Asia Programme under coordination and coordination with Europe SWATCH Programme. This is a programme under the coordination of IHE-Delft, an activity that is trying to understand, plan and foresee the cities of the future related to water scarcity to be faced in the next decades.

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2009

- Preparing Report on IFD Analyses by using Indonesian methods. The report has been sent to Prof. G. Tabios.
- Preparing River catalogue Vol VI and sent it to UNESCO Jakarta. The name of the river K. Ciujung-Kragilan dan K. Ciliman-Leuwikopo.
- Legislation for Indonesia 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 and Technical Meetings, Asian Pacific FRIEND and Catalogue of Rivers
- Participation in Training courses in 2008 and 2009 at Nagoya University
- Participation in program at the International Center for Water-related hazards and risk management (ICHARM)

2.2 Activities foreseen for 2010-2011

- Participation in IHP-RSC meeting Asian Pacific FRIEND and Catalogue of Rivers
- Participation in IHP-Training course at Nagoya University

2.3 Activities envisaged in the long term

- Indonesian National committee for IHP will promote activities to public participations at national level to augment people's awareness through educations and trainings on hazards caused by global warming, as well as hazards caused by geological and volcanological events, in which Indonesia is one of the most prone areas. The objective is to promote people's preparedness, by the communities as well as governments institutions, in facing the oncoming hazards.
- Asia Pacific Center for ecohydrology (APCE) has been set up in Cibinong Science Center in close cooperation with Research Center for Limnology, Indonesian Institute of Sciences. It has prepared a demo-site which is located at the upper Citarum Basin. The reservoirs collect water that drains the Bandung Basin where urban and industrial wastes are still a major problem.

Eutrophication of the reservoir is being studied to promote alternatives to reduce the pollutants. Water cycle related to erosion and sedimentation is also being studied in a small Cililin Basin. Results of studies will be shared as study cases with other Asia – Pacific scientists interested in ecohydrology implementation.

- 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. The following summary includes the activities of Japanese National Committee for the International Hydrological Programme (IHP) of UNESCO undertaken during November 2007 to September 2008.

1. ACTIVITIES UNDERTAKEN IN THE PERIOD NOV. 2007 – SEP. 2008

1.1 Meetings of the IHP National Committee

1.1.1 Decisions regarding the composition of the IHP National Committee

The new composition of the Japanese IHP National Committee has been decided as follows:

Members of the IHP National Committee as of May 2008.

	Name	Position	E-mail
Chair *	TAKEUCHI Kuniyoshi	Director, ICHARM	kuni.t@pwri.go.jp
*	NAKANISHI Hisae	Prof., Nagoya Univ.	nakanishi@gsid.nagoya-u.ac.jp
*	YAMAGATA Toshio	Prof., Univ. of Tokyo	yamagata@eps.s.u-tokyo.ac.jp
	UYEDA Hiroshi	Prof., HyARC, Nagoya Univ.	uyeda@rain.hyarc.nagoya-u.ac.jp
	OKI Taikan	Prof., IIS, Univ. of Tokyo	taikan@iis.u-tokyo.ac.jp
	KURAJI Koichiro	Lecturer, Univ. of Tokyo	kuraji_koichiro@uf.a.u-tokyo.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
	JINNO Kenji	Prof., Kyushu Univ.	jinno@civil.kyushu-u.ac.jp
	TAKARA Kaoru	Prof., DPRI, Kyoto Univ.	takara@flood.dpri.kyoto-u.ac.jp
	TANAKA Tadashi	Prof., Univ. of Tsukuba	tadashi@geoenv.tsukuba.ac.jp
	TERAKAWA Akira	Deputy Director, ICHARM	terakawa@pwri.go.jp
	NAKAYAMA Mikiyasu	Prof., Univ. of Tokyo	nakayama@k.u-tokyo.ac.jp
	WATANABE Tsugihiro	Prof., RIHN	nabe@chikyu.ac.jp

Notes:
* Member of the Japanese National Commission for UNESCO;
ICHARM: The International Centre for Water Hazard and Risk Management (UNESCO Category II Centre);
RIHN: Research Institute for Humanity and Nature;
HyARC: Hydrospheric Atmospheric Research Center, Nagoya University;
IIS: Institute for Industrial Sciences, University of Tokyo; and
DPRI: Disaster Prevention Research Institute, Kyoto University.

Secretariat of the Japanese National Committee for IHP, UNESCO:
c/o Ms. HIMATA Eriko
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: akiyamak@mext.go.jp
TEL: +81-(0)3-6734-2595 / FAX: +81-(0)3-6734-3679
http://flood.dpri.kyoto-u.ac.jp/ihp_japan/index.htm

1.1.2 Status of IHP-VI activities

Various activities relating to IHP-VI Themes have been implemented during 2002-2007 as follows.

Theme 1: Global changes and water resources

- Climate change research especially using "Earth Simulator": MEXT Kyosei-Project (RR2002, 2002-2006) and Kakushin Project (2007-2011).
- Global Earth Observation System of Systems (GEOSS) and Asian Water Cycle Initiative (AWCI)
- GWSP-Asia
- Research on "virtual water"
- Collaboration with IHP-LAC for Rio de La Plata Basin Workshops

Theme 2: Integrated watershed and aquifer dynamics
- Groundwater research such as GRAPHIC
- GWES (Groundwater in Emergency Situations)
- Collaboration with Mongolian UNESCO Chair on

Theme 3: Land-habitat hydrology
- Ecohydrology symposia and sessions at AOGS meetings

Theme 4: Water and society
- Seventeen CREST (Core Research for Evolutional Science and Technology) research projects supported by the JST (Japanese Science and Technology Agency)
- Water hazards and disaster reduction research by universities, institutions and ICHARM

Theme 5: Water education and training
- Nagoya University Training Courses and a Doctor degree course in Graduate School of Science
- ICHARM Training Programmes and a one-year Master Degree Program on water-related risk management with the National Graduate Institute for Policy Studies (GRIPS) supported by JICA.

Other regional and cross-cutting themes activities includes:

(1) Catalogue of Rivers: The format of the Catalogue of Rivers for Southeast Asia and the Pacific, Vol. 6 was discussed by Dr. Chikamori with the former editors Prof. Takara and Dr. Tachikawa. It was presented 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. The information of previous five volumes locates at: http://flood.dpri.kyoto-u.ac.jp/ihp_rsc/riverCatalogue/index.html

(2) Asian Pacific FRIEND: Prof. Takeuchi, Prof. Takara and Dr. Chikamori attended the Asian Pacific FRIEND Technical Sub-Committee (TSC) on 21 November 2007 at the occasion of the 15th Session of RSC in Manila, the Philippines. Prof. Takara has submitted a report of the current status of rainfall IDF (intensity-duration-frequency) analysis and practice in Japan and in the region in March 2008, based on an action item decided at the TSC.

(3) Hydrology for Environment, Life and Policy (HELP): No activities during this period.

(4) Prediction in Ungauged Basins (PUB) by IAHS: Prof. Takeuchi (ICHARM, formerly the Univ. of Yamanashi), Dr. Tachikawa (Kyoto Univ.) and others are conducting PUB research and formed PUB-Japan to organize a number of PUB sessions. Next meeting will be held in Chéngdū, China on 7-9 November 2008.

(5) International Flood Initiative (IFI) and International Programme on Landslides (IPL): ICHARM is playing a role of the Secretariat of IFI. IFI was launched at a Session organized by UN agencies, ICSU, WFEO and the International Consortium on Landslides (ICL) at the World Conference on Disaster Reduction (WCDR) in Kobe, Japan in January 2005. Since then both IFI and IPL are promoted continuously and actively. IPL could also have a linkage with the International Sedimentation Initiative (ISI).

1.1.3 Decisions regarding contribution to/participation in IHP-VII

The Japanese National Committee for IHP has sent comments on IHP-VII Draft Plan to the UNESCO-IHP Secretariat. Japan has indicated their intention to contribute to the following Themes and Focal Areas (FA) in the Updated Draft Strategic Plan for the 7th Phase of the IHP (2008-2013), IHP/Bur-XL/11, Paris, 2 May 2007. After that the IHP National Committee also had a working group meeting on 15 December 2007 in Tokyo to further discuss actions for IHP-VII. Additionally proposed FAs are indicated by asterisks (*):

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
- FA 1.2 – Climate change impacts on the hydrological cycle and consequent impact on water resources*
- FA 1.3 – Hydro-hazards, hydrological extremes and water-related disasters
- FA 1.4 – Managing groundwater systems' response to global changes
- FA 1.5 – Global change and climate variability in arid and semi-arid regions*

THEME 2: Strengthening Water Governance for Sustainability
- FA 2.1 – Cultural, Societal, and scientific responses to the crises in water governance*
- FA 2.2 – Capacity development for improved governance; enhanced legislation for wise stewardship of water resources*

THEME 3: Ecohydrology for Sustainability

FA 3.1 – Ecological measures to protect and remediate catchments process
FA 3.4 – Groundwater-dependent ecosystems identification, inventory and assessment*

THEME 4: Water and Life Support Systems
FA 4.3 – Achieving sustainable urban water management
FA 4.4 – Achieving sustainable rural water management*

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

The following contributions are expected to each Theme and FA.

FA 1.1:
- Global water cycle assessment: IHP contribution to GEOSS [Univ. of Tokyo]
- Interaction between hydrological cycle and physical/biochemical oceanography by cooperation between IHP and IOC [Nihon Univ., JAMSTEC, Univ. of Tokyo, Kyoto Univ.]

FA 1.2:
- Second Phase of PUB project in cooperation with IAHS [Kyoto Univ.]
- Climate change impacts on water-related disaster risk [MEXT Kakushin Program, Kyoto Univ.]

FA 1.3:
- 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
- Case studies on human security and water-related disasters
- Best practices on water risk management
- Provide ICHARM coordination as focal point for possible networking activities
- Hydro-hazards and their impact on society
- Flood management [MEXT Kakushin Program, ICHARM, PWRI, IFNet, Kyoto Univ.]

FA 1.4:
- Groundwater resources assessment under the pressure of humanity and climate change (GRAPHIC) [Research Institute for Humanity and Nature (RIHN)]

FA 1.5:
- Hydrological and ecological impact assessment of long-term global warming on river basins in the world [Kyoto Univ.]

FA 2.1:
- Community-based integrated river basin management as a HELP follow-up [Univ. of Tokyo, Kyoto Univ.]

FA 2.2:
- Relative impact evaluation in water resources dynamics and social system with large development in river basins [Kyoto Univ.]

FA 3.1:
- 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]

FA 3.4:
- 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.]

FA 4.3:
- Hydrogeological and sociological survey on development processes of East-Asian cities co-existing with floods [Kyoto Univ.]
- Vulnerability assessment of urban groundwater resources in Asia and Oceania [Geological Survay of Japan]

FA 4.4:

- 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:

- Nagoya University Ph.D. program
- Nagoya University IHP Training Course in cooperation with a number of Japanese universities
-
- ICHARM 1-year Master degree program on disaster prevention policy in cooperation with the National Graduate Research Institute for Policy Studies (GRIPS) supported by JICA
- ICHARM training course on flood hazard mapping
- Capacity building and education for observers for continuous monitoring of terrestrial environments in Asia [Univ. of Tsukuba]

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

(1) The JFIT Annual Review Meeting on Science Sector Activities of UNESCO Office Jakarta was held in the conference room of the UNESCO Jakarta Office from 2 to 3 June 2008. Two MEXT officers (Ms. Watanabe and Ms. Himata) attended. The status and progress of the UNESCO science programmes in the region were reported and evaluated. Mr. Arduino proposed Flood Forecasting and Warning System as a new IHP project, which is suggested by MEXT to be linked with other projects such as Disaster Reduction Hyperbase (DRH) managed by Prof. Kameda, National Research Institute for Earth Science and Disaster Prevention (NIED).

(2) The 26th IHP National Committee meeting was held at MEXT to discuss various issues relating to the 18th Session of IHP Intergovernmental Council (June 2008) and IHP-VII (2008-2013) on 30 May 2008.

1.2.2 Participation in IHP Steering Committees/Working Groups

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

(1) The 15th RSC was held on 22-23 November 2007 in Manila, the Philippines in conjunction with the International Conference on Hydrology and Water Resources Management for Hazard Reduction and Sustainable Development (HRSD 2007) on 19-23 November 2007. The RSC adopted two resolutions for promoting flood research, Asian Pacific FRIEND and Catalogue of Rivers. It is decided that RSC meetings would be held in Mongolia in 2008 and in China in 2009. New RSC Chairman was elected: Prof. Leonardo Liongson, Professor, the University of Philippines.! See http://hrsd-2007.pnc-unesco-ihp.upd.edu.ph/

(2) The 16th RSC is held on 29 September-3 October 2008 in Ulaanbaatar, Mongolia, the Philippines in conjunction with the International Conference on Uncertainties in Water Resources Management: causes, technologies and consequences (WRM-Mon2008) on 29-30 September 2008.

1.2.3 Research/applied projects supported or sponsored

N/A

1.2.4 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),

(2) The national government and its branches relating to hydrology and water resources administration,

(3) Nagoya 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).

1.2.5 Other initiatives

1) The 3rd Asian Water Cycle Symposium (2-4 Dec. 2007) was held at Oita Kokusai Koryu Kaikan (Oita International House), Beppu, Oita Prefecture, Japan [Prof. Koike].
2) The 1st Asia-Pacific Water Summit was held in Beppu, Oita Prefecture, Japan on 3-4 December 2007, with the participation of top-level decision makers from the Asia-Pacific region. ICHARM has organized a session as a leading agency for water-related disaster management and compiled a proposition document [ICHARM, Prof. Takeuchi].
3) The 3rd Asian Water Cycle Symposium (2-4 Dec. 2007) was held at Oita Kokusai Koryu Kaikan (Oita International House), Beppu, Oita Prefecture, Japan [Prof. Koike].
4) Japan PUB meeting was held in Kyoto on 3-4 March 2008 [Prof. Takeuchi, Dr. Tachikawa].

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

Seventeen UNESCO IHP Nagoya Training Courses have been held since 1991. Topics of the course were relevant to Water Resources for Sustainable Development, Hydrology and Water Resources under Vulnerable Environment, and Water Interactions (Systems at Risk and Social Challenges). About ten participants from East and Southeast Asian countries took lectures and practices every year in the training course. A few students of IHP special program for foreign students in Nagoya University (see (1) below) participated in the course every year. In late years, some of trainees are participating in the course at their own expenses. The training course is expected to be continued with strong requests of East and Southeast Asian countries. Activities of the UNESCO IHP Nagoya Training Course are introduced on the website, http://www.ihpnagoyaforum.org/. Based on these experiences, the training course will be further renewed to fit to the themes of IHP Phase VII (2008-2013).

(1) Doctor of Science degree on atmospheric and hydrospheric science:
The Graduate School of Science and the Graduate School of Environmental Studies of Nagoya University accepts students from Asia and the Pacific region, with the financial support from the Ministry of Education, Culture, Sports, Science and Technology of Japan (MEXT).

(2) IHP Training Courses:
The Hydroshperic Atmospheric Research Center (HyARC) of Nagoya University offers IHP Training Courses for both foreign students of Graduate School of Science, Nagoya University and trainees chosen by UNESCO Regional Science Bureau for Asia and the Pacific in Jakarta. The training courses are financed by the Japanese Fund-in-Trust (JFIT) for IHP.
The 17th IHP Training Course with the theme “Numerical Prediction of High-Impact Weather Systems” was held in Nagoya, Tokyo and Yokohama, Japan, on 2-15 December 2007. Expected participants are eight from Indonesia (2), Laos, Malaysia, Nepal, Vietnam, the Philippines, and Thailand supported by UNECO Jakarta Office; two from Malaysia and Laos with self-support; and three from China, Bangladesh and Nepal attending the Special Graduate School Course at Nagoya University.

1.3.2 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. New one-year Master Degree Program (Disaster Prevention Policy Programme, water-related risk management

course) was initiated in October 2007 in cooperation with the National Graduate Research Institute for Policy Studies (GRIPS), supported by JICA. 10 practical engineers from 5 countries are attending the course for the first year.

1.3.3 Participation in IHP courses

N/A

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

(1) ICHARM: **I**nternational **C**entre for Water **Ha**zard and **R**isk **M**anagement 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 chairman of the Japanese National Committee for UNESCO-IHP, was assigned as the founding Director of ICHARM. ICHARM was established as the core of 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 be operated under the responsibility of its Chief Executive, with the advice from the Advisory Board.
4) ICHARM 2nd Advisory Board meeting is held in Tsukuba in October 2008.

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

(2) The 5th Workshop on Rio de La Plata Basin was held at Itaipu Binacional, Brazil on 11-14 March 2008, organized by UNESCO-IHP LAC, UN Water Decade, UNEP GEMS/Water, ICHARM and Japan Water Forum. Scientific outcomes of the meeting will be published as UNESCO-IHP publication series by UNESCO Montevideo Office with Japanese cooperation [Dr. Yamashiki (Nihon Univ.)].

1.5 Publications

1. «Numerical Prediction of high-Impact Weather Systems» -The Textbook for 17th IHP Training Course in 2007-, Tsuboki, K. and Sakakibara, A. (Eds.), Hydrospheric Atmospheric Research Center, Nagoya University and United Nations Educational Scientific, November 2007, 273 pp.

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

(1) Japan is managing PUB (Prediction in Ungaged Basins) activities of IAHS. Asian PUB is developing quite well under Dr. Yasuto Tachikawa's initiative. Domestic PUB meetings were held in Mie Prefecture on 8-10 November 2006 and in Kyoto on 3-4 March 2008.
(2) A Post-GAME project, MAHASRI led by Dr. Jun Matsumoto (Univ. of Tokyo) is now activated with many participants from Asian countries. They are collaborating with IHP FRIEND as well as with PUB.
(3) ICHARM and NARBO (Network of Asian River Basin Organizations) secretariat participated in the Regional Consultation Meeting for Candidate Water Knowledge Hubs held at the Singapore Public Utility Board on 29-30 October 2007. 26 representatives from 14 organizations discussed for establishing a novel network, called "water knowledge hubs", to share knowledge and experience on water management among Asia-Pacific countries. The meeting was a part of the preparation process for the Asia-Pacific Water Summit (December 2007). Dr. Wouter Lincklaen Arriens, Lead Water Resources Specialist of ADB (Asian Development Bank) and Dr. Jan Luijendijk, Professor of UNESCO-IHE, led the meeting. The two-day meeting concluded that ICHARM would be a candidate water knowledge hub on water related disaster management in the region.
(4) The 3rd Asian Water Cycle Symposium took place in Beppu, Oita, Japan on 2-4 December 2007 with 84 participants. An implementation plan is adopted and now on going with participation of 17 countries each of which is providing a demonstration research basin in the country. See further at! http://monsoon.t.u-tokyo.ac.jp/AWCI/.
(5) GWSP-Asia (Global Water System Project) Working Group activities includes discussion on data collection and future research direction [http://www.chikyu.ac.jp/USE/GWSP/GWSPasia.htm; Dr. Makoto Taniguchi (RIHN)].
(6) The 4th International Symposium on Flood Defence was held in Toronto, Canada on 6-8 May 2008. ICHARM organized a session on flood disaster risk reduction strategy as the Secretariat of IFI, which is jointly promoted by international organizations such as UNESCO, WMO, ISDR, UNU, IAHS, and IAHR.
(7) HydroChange 2008 “Hydrological Changes and Managements from Headwater to the Ocean” is held in Kyoto, 1-3 October 2008 [Dr. Taniguchi].

1.6.2 Participation in meetings abroad

Japan has played important roles in the IHP Intergovernmental Council (IGC) as a member. In particular, Prof. Kuniyoshi Takeuchi had been the Chairperson of the Council and Bureau of IHP from 1998 to 2000 then served as Vice Chairperson (2000-2002). Prof. Takara has also elected as Vice Chairperson for 2008-2010.

Japan participated in the establishment of the Regional Steering Committee (RSC) for Southeast Asia and the Pacific in 1993. The first RSC chairperson was Prof. Yutaka Takahasi (Univ. of Tokyo), who used to be the Vice Chairperson of the IGC (1990-1991) elected from the Group IV, Asia and the pacific. Since the establishment of RSC, at least a couple of Japanese National IHP Committee members have attended and participated actively in all of the annual meetings of the RSC. Prof. Takeuchi had served as the RSC Secretary (1993-1999) and the Chairman of the Technical Sub-Committee (TSC) for Asian Pacific FRIEND (APF) Phase I (1997-2001) in the framework of the RSC, while Prof. Takara is playing a role of the RSC Secretary (1999-) and a member of TSC-APF Phases I (1997-2001) and II (2002-).

(1) The International Conference on Hydrology and Water Resources Management for Hazard Reduction and Sustainable Development (HRSD 2007) was held in Manila, the Philippines, on 19-23 November 2007 as an IHP-related event. http://hrsd-2007.pnc-unesco-ihp.upd.edu.ph/
(2) The 5th Workshop on Rio de La Plata Basin at Itaipu Binacional, Brazil on 11-14 March 2008, organized by UNESCO-IHP LAC, UN Water Decade, UNEP GEMS/Water, ICHARM and Japan Water Forum [Dr. Yamashiki (Nihon Univ.)].
(3) Participation in the 9th IHP/IAHS George Kovacs Colloquium, Paris, 6-7 June 2008 [Prof. Takara].
(4) Participation in the GRAPHIC meeting on groundwater and climate change in Uganda in June

2008 [Dr. Taniguchi].

1.7 Other activities at regional level

1.7.1 Institutional relations/cooperation

N/A

1.7.2 Completed and ongoing scientific projects

N/A

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2009

(1) Asian Pacific FRIEND Workshop in Hanoi, Vietnam in 2008 (to be confirmed) [Prof. Takara]..
(2) IAH (International Association of Hydrogeologists) meeting in Toyama, Japan in October 2008 including GRAPHIC discussion [Dr. Taniguchi].
(3) The 4th International Conference of Association of Asia Pacific Hydrology and Water Resources (APHW2008) will be in Beijing on 3-5 November 2008. A PUB Session will also be convened.
(4) The 1st World Landslide Forum will be held at UNU, Tokyo on 18-21 November 2008. ICHARM and other UNESCO-related organizations will attend it as well as a pre-event on 17 November.
(5) The 18th IHP Training Course with the theme "Satellite Remote Sensing of Atmospheric Constituents" will be held in 2008. See details at http://www.ihpnagoyaforum.org/.
(6) The 17th Session of the IHP Regional Steering Committee (RSC) for Southeast Asia and the Pacific will be held in China in 2009.
(7) The 19th IHP Training Courses will be hosted by Kyoto University in 2009.

2.2 Activities foreseen for 2010-2011

(1) Participation in RSC-SEAP activities including Asian Pacific FRIEND and the Catalogue of Rivers.
(2) The 20th anniversary of UNESCO IHP Training Course: Special lectures and meetings on "Adaptation to the impacts of global changes on river basins and aquifer systems" (to be confirmed).
(3) The 21st IHP Training Course: Ecohydrology for sustainability" (to be confirmed).
(4) Implementation of projects related to IHP-VII.
(5) The 2nd Asia Pacific Water Summit, Dates and place T.B.D.
(6) Research on HELP basins.
(7) Collaboration with UNESCO-MAB and UNESCO-IOC activities.
(8) The 5th International Conference of Association of Asia Pacific Hydrology and Water Resources (APHW2010). Dates and place T.B.D.

2.3 Activities envisaged in the long term

(1) Participation in IHP-VII projects and RSC activities.
(2) Nagoya University IHP Training Courses.
(3) Information dissemination through a web page of the National Committee.
(4) University of Tsukuba UNESCO Chair in Mongolia.

NATIONAL REPORT ON IHP RELATED ACTIVITIES
IN
REPUBLIC OF KOREA

September, 2008

Korean National Committee
for
The International Hydrological Programme
Republic of Korea

1. ACTIVITIES UNDERTAKEN IN THE PERIOD OCTOBER 2006-SEPTEMBER 2008

1.1 Meetings of the IHP National Committee

1.1.1 Decisions regarding the composition of the IHP National Committee

For the solution of water problems and the protection of mans welfare and the quality of human life, a UNESCO Resolution in 1964 created the International Hydrological Decade(IHD). 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(2008), Korean National Committee for the IHP was reorganized and strengthened to fulfill the IHP activities more effectively and actively. 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.

1.1.2 Status of IHP-Ⅵ activities

During the sixth phase(2002~2007) of IHP, the Korean National Committee for the IHP paid its efforts to achieve the objectives set by UNESCO for this phase of IHP and the following projects have been executed in Korean river basins and in the field of hydrology and water resources in Korea.

(1) Global changes and water resources

(2) Integrated watershed and aquifer dynamics

(3) Land habitat hydrology

(4) Water and society

(5) Water education and training

Based on these projects(themes), more practically-oriented-projects for Korean hydrologic and water resources conditions have been executed and their detailed information are listed in Table-1.

Table-1 IHP National Events in IHP-Ⅵ

Projects/Activities	Brief Description	IHP-Ⅵ Subprogram	Location and Duration	Supporting Body	Gov. Input	Output
1. 2006 IHP Representative Basin Studies	· Water demand management planning and its studies · Runoff characteristics change and runoff reduction studies according to large-scale housing area development · Runoff analyses by future landuse and climate change · Int'l river management examples investigation and development of management strategy of South-North Korean co-boundary river basins · River basin management manual for Integrated River Basin management(IRBM) · Optimal water resources use and its management technique development in island and coastal region · Groundwater variation characteristics in urban areas · River and culture/civilization studies in river basin · Selection and design of new Representative basins for hydrological data collection · Review of study results and future direction of present Representative basins	Theme 1, 2, 4 and 5	Korean rivers	MOCT	Major Gov. input	Report and Papers
2. 2007 IHP Representative Basin Studies	· Water demand management planning and its studies(cont'd) · Runoff characteristics change and runoff reduction studies according to large-scale housing area development(cont'd) · Runoff analyses by future landuse and climate Change(cont'd) · River basin management manual for Integrated river Basin management(IRBM)(cont'd) · Optimal water resources use and its management technique development in island and coastal region(cont'd) · Groundwater variation characteristics in urban areas(cont'd) · River and culture/civilization studies in river basin(cont'd) · Electronic publication and distribution of hydrologic and water quality data · New representative basin operation and studies	Theme 1, 2, 4 and 5	Korean rivers	MOCT/MLTM	Major Gov. input	Report and Papers
3. Asian/Pacific FRIEND & HELP Studies(2006-2007)	· Basic hydrologic analyses in AP FRIEND river basins · Comparative regional analyses of hydrology and water resources in AP FRIEND regions	Theme 1 Area 1.1	Korean rivers	MOCT/MLTM		Report and Papers
4. Water resources management during extreme flood and drought	· Extreme flood and drought modeling · Water resources management techniques during extreme hydrologic periods	Theme 1, 2 and 3	Korean rivers	MOCT/MLTM		Report and Papers
5. Special program of regional hydrology	· FRIEND & HELP basin studies · PUB studies			MOCT/MLTM MOE		

MOCT : Ministry of Construction and Transportation (from 2008, MOCT was reorganized as MLTM)
MLTM : Ministry of Land, Transport and Maritime Affairs
MOE : Ministry of Environment

1.1.3 Decisions regarding 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) as listed in Table-2 and the potential

activities to be undertaken by the Korean National Committee for the IHP as listed in Table-3 both according to the core programme Themes and Focal Areas, overviews of which are shown as follows;

WATER DEPENDENCIES: SYSTEMS UNDER STRESS AND SOCIETAL RESPONSES

Theme 1: ADAPTING TO THE IMPACTS OF GLOBAL CHANGES ON RIVER BASINS AND AQUIFER SYSTEMS

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

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

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

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

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

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Cross-cutting programmes: HELP, FRIEND

Associated programmes: International Flood Initiative (IFI)
International Sediment Initiative (ISI)
Water for Peace: From Potential Conflicts to Cooperation Potential (PCCP)
Joint International Isotope Hydrology Programme (JIIHP)
Internationally Shared Aquifer Resources Management (ISARM)
Global Network on Water and Development Information in Arid Lands (G-WADI)
Urban Water Management Programme (UWMP)

World Hydrogeological Map (WHYMAP)

Education, Training and Capacity Building across all the themes

Table-2 Implementation Plan of IHP-VII Phase

Name of the IHP National Committee REPUBLIC OF KOREA IHP-NC	Country Priorities 2008-2009	Country Participation in Theme and Focal area 2008-2013	Events organized in the Country	Activity lead/Coordinated by the Country
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(JIIHP)				
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

Table-3 Activities to be undertaken by the Korean National Committee

Name of the IHP National Committee REPUBLIC OF KOREA IHP-NC	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 casse 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(JIIHP)	
Shared Aquifer(ISARM)	
Global Network Arid Lands(G-WADI)	
Unban 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

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

1.2.1 National / local scientific and technical meetings

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

1.2.2 Participation in IHP Steering Committees / Working Groups

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 and Working Group meetings held in the period of 2006~2008.

1.2.3 Research / applied projects supported or sponsored

Research projects supported by the Government in the framework of the IHP in the period of 2006~2008 are listed in Table-1. 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 during this period.

The following projects have been and are being implemented for the Asian Pacific FRIEND in the three representative river basins chosen as the Korean Asian Pacific FRIEND and HELP basins(Wichun, Kumho and Hwang river basins).

· Basic hydrologic analyses and data collection

· Comparative regional flow regimes analyses

  - Rainfall models and design storm

  - Flood models and design flood

· FRIEND river basins studies

· HELP river basins studies

1.2.4 Collaboration with other national and international organizations / or programmes

The Korean National Committee for the IHP is functioning in the execution of IHP activities in collaboration with the following national and international organizations/or programmes; Korea Water Resources Corporation(The K-Water); Korea Water Resources Association(KWRA); Korean Society of Civil Engineers(KSCE); Korean Society of Agricultural Engineers(KSAE); Korean Meteorological Society(KMS);

ICOLD Korean National Committee(KNCOLD); IWRA Korean Geographic Committee; International Hydrologic Environmental Society(IHES); Korea Federation of Water Science and Engineering Societies(KFWSES); Korea Institute of Construction Technology(KICT); Korean Universities Hydrology and Water Resources Programmes.

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

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

1.3.2 Organization of specific courses

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

1.3.3 Participation in IHP courses

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

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

The Korean National Committee for the IHP had particularly close cooperation with International Center for Water Hazard and Risk Management(ICHARM) under the auspices of UNESCO in its preparatory activities for the establishment during last two years through the participation in workshops and strong support at the UNESCO Council and regional meetings. Furthermore, Korea Water Resources Corporation(The K-Water) which is a member of the Korean National Committee for the IHP established a special cooperation program with the UNESCO-IHE since 2007.

1.5 Publications

The Korean National Committee for the IHP is publishing IHP Annual Research Report and the Catalogue of Rivers in Korea every year 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.

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

The following IHP meetings were hosted and organized by the IHP-KNC, IHES and KFWSES.

· 2006 International Symposium on Hydrological Environment(in Sri Lanka)
· 2007 International Symposium on Climate Change and Flood

1.6.2 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.

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2009, foreseen for 2010-2011 and envisaged in the long term

From the beginning of 2008, IHP-KNC prepared concrete national plan for the seventh phase of IHP and began to implement this plan in Korean river basins. IHP-KNC will also actively continue and participate in the Asian Pacific FRIEND project to complete with successful results for the Southeast Asia and the Pacific.

The following international symposiums and workshops will be organized until December 2009 and during 2010-2011 as the IHP-VII activities of IHP-KNC.

· 2008 International Symposium on Hydrological Environment
· 2009 International Symposium of Hydrologic Environment
· Korean Workshops of FRIEND, HELP and PUB during 2010-2011

16th REGIONAL STEERING COMMITTEE MEETING FOR UNESCO-IHP SOUTHEAST ASIA AND THE PACIFIC

28 SEPTEMBER – 4 OCTOBER 2008
ULAANBAATAR, MONGOLIA

COUNTRY REPORT OF MALAYSIAN NATIONAL COMMITTEE FOR IHP

(NOVEMBER 2007 – SEPTEMBER 2008)

BY
DATO' IR. LIM CHOW HOCK
SECRETARY
MALAYSIAN NATIONAL COMMITTEE FOR IHP

COUNTRY REPORT 2008
OF
MALAYSIAN NATIONAL COMMITTEE FOR IHP

CONTENTS

1. ACTIVITIES UNDERTAKEN IN THE PERIOD NOVEMBER 2007–SEPTEMBER 2008

The Malaysian National Committee for IHP was formed in 1975, and comprises 30 governmental agencies and institutions of Higher Learning as listed in Appendix A.

1.1 Meetings of the IHP National Committee

One EXCO meeting was held on 21st January 2008 in Kuala Lumpur and another meeting is scheduled to be held in November 2008

1.1.1 Composition of the IHP National Committee

The EXCOs to serve for another two (2) year term 2007 – 2009 are as follows:

i) Universiti Sains Malaysia, (USM)
ii) Universiti Tun Hussein Onn Malaysia (UTHM)
iii) Malaysian Nuclear Agency (MNA)
iv) National Hydraulic Research Institute of Malaysia (NAHRIM)

The permanent EXCO members are:-

i) Department of Irrigation and Drainage Malaysia (DID)
ii) Malaysian Meteorological Department (MMD)
iii) Department of Minerals and Geosciences (DMG)
iv) Malaysian National Commission for UNESCO (NATCOM)

MIHP plans its activities through its Executive Committee, and they are carried out by the three standing committees and their working groups. The three standing committees comprise:

(i) Committee on Research (CoR) under the chairmanship of the Director of Humid Tropics Center, Kuala Lumpur (HTC KL).
(ii) Committee on Education, Training and Public Information (CoETPI) headed by the University of Technology Malaysia (UTM).
(iii) Committee on Standardization of Hydrological Practices (CoSHP) headed by the Department of Irrigation and Drainage (DID) Malaysia.

1.1.2 Status of IHP-VI and IHP-VII activities

MIHP through its Standing Committee on Research plays an important role in coordinating and formulating proposals for research projects. The members of this Standing Committee consist of engineers and researchers from various government departments, universities and research institutions. Meetings were periodically held to discuss and implement research projects in line with the IHP-VI (2002-2007) and IHP-VII (2008-2013) UNESCO project plan.

MIHP Standing Committee on Research has carried out several research projects through the respective lead agencies (*see Table 1 and Table 5*).

1.1.3 Decisions regarding contribution to/participation in IHP-VII

Chairman of MIHP on his capacity as Vice Chairperson of IGC IHP attended the 40th Session of the International Hydrological Programme (IHP) Bureau at IHE Institute for Water Education, Delft, Netherlands.

1.2 Activities at national level in the framework of IHP

1.2.1 National/local scientific and technical meetings

Several scientific and technical meetings were organized in association with the Malaysian Hydrological Society, the Water Resources Division of the Institution of Engineers Malaysia (IEM), the International Commission on Irrigation & Drainage (ICID), and the Malaysian National Committee on Irrigation & Drainage (MANCID).

1.2.2 Participation in Regional IHP Steering Committee

The 15th RSC Meeting for IHP UNESCO for South East Asia and the Pacific in Manila, Philippines from 19 – 23 November 2007 were attended by the Chairman of MIHP, Secretary of MIHP, the Director of HTC Kuala Lumpur and the Assistant Secretary of MIHP.

1.2.3 Research projects sponsored

See Table 2 and Table 3.

1.2.4 Collaboration with other national and international organizations/programmes

1.2.4.1 Mangroves Awareness Programme, at Larut Matang Mangroves Swamp, Perak and Langkawi Geoforest Park, Langkawi Kedah, 4th – 10th May 2008. Collaboration with MNCU, Ministry of Education, Forestry Department, LADA Langkawi, Institute of Environment and Development (Lestari) UKM, DID Perak and DID Kedah.

1.2.4.2 University Sains Malaysia Community Programme : 'Rivers Is For Keeps' The Sg. Sedim – Sg. Pinang Expedition : Capacity Building For Early Youngsters, was held from 14th – 17th Jun 2008.
Collaboration with MNCU, USM, DID Malaysia

1.2.5 Other initiatives

MIHP organised the World Water Day 2008 Celebration in collaboration with government agencies, NGOs and private sectors. The activities carried out include national exhibition, drawing and coloring contest, Debate on Environmental Issues, articles and feature writings in the electronic and mass media (see Table 4).

1.3 Educational and training courses

MIHP has succesfully organized the awareness programme to the students of primary and secondary schools. The educational programmes are as follows.

(i) **Mangroves Awareness Programme, at Larut Matang Mangroves Swamp, Perak and Langkawi Geoforest Park, Langkawi Kedah, 4th – 10th May 2008.**
Collaboration with MNCU, Ministry of Education, Forestry Department, LADA Langkawi, Institute of Environment and Development (Lestari) UKM, DID Perak and DID Kedah. It consists of practical activities in hydrology, workshop and educational visit to mangroves area and also learn to planting of mangroves. The programme continued visit to Geo-Forest Park, Mat Cincang Hill at Langkawi Island. About 74 secondary students and 20 teachers which selected from the difference state of Malaysia was participated in this programme.

(ii) **University Sains Malaysia Community Programme : 'Rivers Is For Keeps' The Sg. Sedim – Sg. Pinang Expedition : Capacity Building For Early Youngsters, USM P.Pinang, 14th – 17th Jun 2008.**
The programme was organised by MIHP in collaboration with the Ministry of Education Malaysia with participations from DID, MNCU and other government agencies. This programme was participated by 44 students from primary schooland 10 facilitator.. New activities which complimented this programme include hydrological expeditions at Sg. Sedim. Students learn to know various types of trees and animals. The students also visit the Botanical Garden, P.Pinang and also visited water treatment plant at the sorrunding area and learned about flora and fauna.This programme received overwhelming response from students and teachers and will be continued in the future activities

1.3.1 Contribution to IHP courses

Some members of MIHP were appointed as resources persons for the following courses:

1.3.1.1 Integrated River Basin Management (IRBM)
March 2008 | Kuala Lumpur

1.3.1.2 Hydrological Practice
March 2008 | Kuala Lumpur

1.3.1.3 Flood Forecasting and Warning
April 2008 | Kuala Lumpur

1.3.2 Organisation of specific courses

1.3.2.1 **Regional Short Training Course on Urban Stormwater Management** has been conducted on 3 – 7 December 2007 in Kuala Lumpur. It will be organised by HTCKL and UNESCO Jakarta and supported by MIHP, ICHARM, JCUD and other agencies.

1.3.2.2 **Regional Cooperation Project Implementation Plan (RCPIP) Working Group of Hydrology, Typhoon Committee has succesfully organizes On the Job Training on Flood Forecasting using Modified**

Tank Model. It was held on January - February 2008 at Hydrology and Water Resources, DID Malaysia. There were six local participants and two foreign participiants namely from Vietnam and Phillipines respectively.

1.3.3 Participation in IHP courses / seminars

1.3.3.1 Participation from MIHP and DID Malaysia in the International Conference on Hydrology and Water Resources Management for Hazard Reduction and Sustainable Development (HRSD 2007) in Manila, Philippines from 19 – 23 November 2007. Attended by 3 members of MIHP

1.3.3.2 Participation from MIHP member for the Seventeenth IHP Training Course "Numerical Prediction of High-Impact Weather Systems" in Nagoya, Japan from 2 – 15 December 2007.

1.3.3.3 International Seminar On Climate Variability, Change and Extreme Weather Events, National University of Malaysia, Bangi, Malaysia, February 2008.

1.4 Publications

Publications contributed by MIHP are as follows:

1.4.1 The Proceedings of The International Conference on Urban Hydrology for 21st Century edited by Dr. Mohd. Nor Desa. The proceedings become IHP–VI – Technical Document in Hydrology No. 1 UNESCO Jakarta Office, 2002 .

1.4.2 GUIDE TO WATER QUALITY MONITORING PRACTICES IN MALAYSIA, Standardisation of Practices and Techniques of Water Quality Sampling in Malaysia (manual) by CoSHP.

1.4.3 The Proceedings of Seminar of Water Resources and Environment – Application of Nuclear and Related Technologies.

1.4.4 Proceedings (CD) Regional Training Course On Urban Water Management, 3 – 7 December 2007, Kuala Lumpur.

1.5 Participation in international scientific meetings

1.5.1 Meetings hosted by the country

Southeast Asia Ministerial Meeting on Water was held in Putrajaya from 25-27 October 2007. The meeting was also attended by Ministers and Senior Officials in related field from respective countries.

1.5.2 Participation in meetings abroad

MIHP secretary Dato' Ir. Lim Chow Hock attended "XIII World Water Congress, 1-7 September 2008, Montpellier, France.

1.6 Other activities at a regional level

Application for a participation programme grant to carry out a project on "River Eco–Expedition" for S.E.A. regional student exchange programme on Hydrological and Environmental Expedition has been re-submitted to the Malaysian National Commission for UNESCO for consideration.

1.6.1 Institutional relations/co-operation

None

1.6.2 Completed and on-going scientific projects

Refer to Table 2.

2. FUTURE ACTIVITIES

2.1 Activities planned for 2008 and beyond

1) The implementation of the proposed project on "River Eco-Hydrology Expedition for S.E.A. Regional Student Exchange Programme" to be held in 2008 is very much dependent on the availability of financial sponsorship from UNESCO.

2) The second "National River Expedition" is planned to be carried forward to 2009 under the sponsorship of MNCU and that other local agencies who are members of the standing committee (CoETPI) will be participating in this event.

3) 2nd On the Job Training (OJT) on Flood Forecasting using Modified Tank Model will be held in December 2008 in Kuala Lumpur. It will be organised by DID and the participants for this programme are from the members of the Typhoon Committee.

Other proposed activities are listed in Table 5.

2.2 Activities envisaged in the long term

2.2.1 Proposal to establish a UNESCO Chair in Stormwater Management for the Humid Tropics.

2.2.1 Best Thesis Award for University Undergraduate

MIHP is in the proses of creating more awareness on hydrology among university students by encouraging them to participate in the award for best thesis related to hydrology and water resources.

Table 1. Research projects by MIHP/DID under Experimental Applied Research (EAR), IRPA in conjunction with IHP phase Vl

Theme / Focal Area	Title	Status	Agencies Involved	Impl. period	Funding Agency Project Cost
Theme 2	***Integrated Watershed Dynamics***				
Focal Area 2.2	a) Development of Runoff Generation and Catchment responses in Forest and Agricultural sites	Project is completed and in the process of preparing the final report.	UTM, MNA, USM, FRIM, JMG	2004 - 2007	IRPA RM 298,000
	b) Modelling of Convective Rain for Predicting Flash Flood	Project is completed and in the process of preparing the final report.	UTM		IRPA RM 186,000
Theme 3	***Regional Perspective***				
Focal Area 3.1	a) Development of Temporal Pattern for Urban Areas and PMP Derivation for Peninsular Malaysia	Project is completed and the final report has been submitted to the Ministry of Science, technology and Innovation (MOSTI).	HTC, MMS	2004 - 2006	IRPA RM 166,000
Focal Area 3.5	a) Detailed Hydrological Balance Study of Paya Indah Wetlands, Selangor	Project is completed and the final report has been submitted to the MOSTI .	HTC, DID, UTM, FRIM, MNA, MMS, JMG	2004 - 2007	IRPA RM 277,000
Focal Area 3.7	a). Development of runoff characteristics to validate Manual Saliran Mesra Alam (MASMA)	Project is completed and in the process of preparing the final report	USM, DID, MNA KUiTTHO, HTC	2004 - 2007	IRPA RM 241,000
	b) Development of Urban Stormwater Management Model (SWMM) and GIS for Decision Support System	Project is completed and in the process of preparing the final report	USM, JPS	2004 - 2007	IRPA RM 163,000

Table 2: Malaysian IHP Research Activities Under IHP Phase VI

No .*	Title	Status	Agencies Involved	Completion Date	Funding Agency
1. (6.1/6. 2)	Effects of Logging on the Muda/Pedu Reservoirs.	Late start of logging activity of modified logging compartment. Continue with hydrological data collection including sediment transport for post-logging assesment.	DID , UPM , UTM , JPSM , MNA , MADA , FRIM , LESTARI , UKM , JPNK , DOA	Ongoing	DID and MADA

* - Numbers in bracket refers to IHP-V theme and project number

Table 3: Asian Pacific FRIEND Research Project

No .	Title	Status	Agencies Involved	Completion Date	Funding Agency
1.	Water Archive	System upgrading	DID	Dec 2008	M'sian Govt.
2.	Catalogue of Rivers for South East Asia & the Pacific.	Data supplied	DID	2007	M'sian Govt.
3.	AP FRIEND – IDF Project and Design Flood Project	Report completed	DID , UNITEN , HTC , UTM	2008	M'sian Govt.

Table 4 : Activities Carried Out by Malaysian IHP for 2007/2008 (from November 2007 - September 2008)

Item	Activities	Period and Venue	Lead Agency
1.	**World Water Day 2008 celebration**	25 – 27 July 2008 Seremban	MIHP
i.	Launching by The Honourable Datuk Seri Mohamad Hsan, Chief Minister of Negeri Sembilan	26 July 2008 Seremban	MIHP
ii.	National Exhibition	25 – 27 July 2008 Seremban	DID Negeri Sembilan
iii	Drawing and Colouring Contest	27 July 2008 Seremban	DID Negeri Sembilan
iv	Debate	26 July 2008 Seremban	DID Negeri Sembilan
v	Publicity	During the World Water Day Celebration	Radio & TV Malaysia, BERNAMA, local newspapers and bulletin
2.	**Talks to Secondary school students on Hydrology and Environment Issues.**	Ongoing	MIHP Members

Table 5: Future Activities by Malaysian IHP for 2008-2013 under IHP Phase VII

A) Research

No	Research Title/Focal Area	Theme/ Focal Area	Project Leader	Researches	Remarks
1.	Leachate Problem in Landfills Area - Drainage System of Landfill	**Theme 1** Focal Area 1.4	Dr. Mohamed Roseli bin Zainal Abidin (DID)	Pn. Rohani Ahmad (DID) En. Mohd Norli Abdullah (DOE)	Preparation of draft proposal
2.	Roles of Constructed Wetlands for Storm Water Management	**Theme 1** Focal Area 1.4	Cik Anita Ainan (DID)	Prof. Madya Dr. Ismail Abustan (USM) Dr. Zainuddin Othman (NUKLEAR MALAYSIA) Dr. Wan Roslan Wan Ismail Pn. Hezrin Haslinda Hashim (HTCKL)	Preparation of draft proposal
3.	Threshold of Stormwater Parameters on Hillside Drainage System - Development of Mudflows Warning System	**Theme 1** Focal Area 1.4	Prof. Dr. Roslan Zainal Abidin (UiTM)	Pn. Norlida Mohd. Dom (DID) Dr. Wan Zakaria Wan Mohd Tahir (NUKLEAR MALAYSIA) Cik Norazizah Abdul Kadir (HTCKL)	Will be submitted through UiTM
4.	Non Point Source (NPC) Pollution Loading on Urban Catchment	**Theme 4** Focal Area 4.3	Prof. Dr. Zulkifli Yusof (UTM)	Dr. Zelina Zaiton Ibrahim (UPM)	Will be submitted through UTM
5.	Effectiveness of Erosion and Sediment Control Measures	**Theme 4** Focal Area 4.3 Focal Area 4.4	Dr. Mohd. Nasir Mohd Noh (DID)	Prof. Dr. Zulkifli Yusof (UTM) Prof. Ruslan Hassan Pn. Janmaizatulriah Jani (UiTM)	Preparation of draft proposal
6.	Gross Pollutant Trap (GPT)	**Theme 4** Focal Area 4.3	Ir. Dr. Lariyah Sidek (UNITEN)	Ir. Dr. Mohd. Nor Mohd. Desa (HTCKL) Prof. Madya Dr. Aminuddin Abdul Ghani (USM)	Approved under UNITEN
7.	Bio- Remediation Media for Storm Water Management	**Theme 4** Focal Area 4.3	En. Nasehir Khan E.M. Yahya (DID)	Prof. Madya Dr. Ismail Abustan (USM) Hj. Mat Supri Kasa (DID)	Preparation of draft proposal

B) Meeting / Seminar / Conference / Workshop / Talks

Item	Activity	Period and Venue	Lead Agency	Funding Agency
1	World Water Day 2008	March 2008	MIHP	Government of M'sia
2	Talks on Hydrology to Schools	2006 - 2008 Kuala Lumpur	CoETPI	Government of M'sia
3	Seminars and Workshops on MIHP research projects.	2006 - 2008 Kuala Lumpur	HTC , DID	Government of M'sia
4	Workshop on Wetland Hydrology	2008 Kuala Lumpur	MIHP-CoSHP	Government of M'sia
5	IRPA Seminar on Urban Hydrological Characteristics of Sg. Kerayong	2008 Kuala Lumpur	MIHP-CoSHP	Government of M'sia

Appendix A

CURRENT MEMBERS OF THE MIHP

1.	DID *[1]	-	Department of Irrigation and Drainage (Secretariat)
2.	DOA	-	Department of Agriculture
3.	DOE *[2]	-	Department of Environment
4.	DOF	-	Department of Forestry
5.	EPU	-	Economic Planning Unit
6.	FELDA	-	Federal Land Development Authority
7.	FRIM *[2]	-	Forest Research Institute of Malaysia
8.	DMG *[1]	-	Department of Minerals and Geosciences
9.	MACRES	-	Malaysian Center for Remote Sensing
10.	MMS *[1]	-	Malaysian Meteorological Service
11.	MNCU *[1]	-	Malaysian National Commission for UNESCO
12.	MOA	-	Ministry of Agriculture
13.	MOE	-	Ministry of Education
14.	MOF	-	Ministry of Finance
15.	MOH	-	Ministry of Health
16.	MNA *[2]	-	Malaysian Nuclear Agency
17.	PWD	-	Public Works Department
18.	TNB	-	Tenaga Nasional Berhad
19.	UKM	-	Universiti Kebangsaan Malaysia
20.	UM	-	University of Malaya
21.	UPM	-	Universiti Putra Malaysia
22.	USM *[2]	-	Universiti Sains Malaysia
23.	UTM	-	Universiti Teknologi Malaysia
24.	KUiTTHO	-	Kolej Universiti Technologi Tun Hussein Onn
25.	UiTM	-	University Institute of Technology MARA
26.	NAHRIM	-	National Hydraulics Research Institute of Malaysia
27.	HTC	-	The Regional Humid Tropics Hydrology and Water Resources Center for Southeast Asia and the Pacific
28.	MHLG	-	Ministry of Housing and Local Government
29.	JBA	-	Department of Water Supply , Ministry of Energy, Water and Communication
30.	MOSTI	-	Ministry of Science, Technology and Innovation

Note: *[1] - Permanent EXCO Member

*[2] - Elected EXCO Member

IHP COUNTRY REPORT MONGOLIA

Ulaanbaatar 2008

IHP country report, Mongolia, 2008

I. Main activities and outputs in 2008:

A. In national level:

- Organized and participated numbers of meetings related to "Strengthening Integrated Water Resource Management in Mongolia". March- April 2008. Completed Inception phase of the project on "Strengthening IRBM" and implementation of IRBM in particular basin (Orkhon River) and started the project implementation by Government of Mongolia and Government of Netherlands, financed by Government of Netherlands.

- Report on "Water & Sanitation in rural area" /UNDP, UNISEF and WHO in Mongolia/ completed in June 2008.

- Co-organized international workshop within the "MoMo" project "Kharaa River basin" sponsored by Germany, May 2008 and field surveys organized and 2 students are taking opportunity being studied in Master in science program.

- Drinking water treatment equipments were installed in 16 soums (smallest administrative unit) in Gobi region in 2008.

- National program on "Protection of head waters in Mongolia" has been developed and its under considerations of Ministry of Environment and Tourism.

- Developed report "Assessment groundwater resources in Southern Gobi region to World Bank office in Ulaanbaatar, March 2008.
- Within the program UNESCO chair organized students tour and lessons, March 2008.
- Organized the Meeting with Japanese professor to exchange and visiting 10 students from Japanese University in Mongolia in March 2008.

- Established Organization Committee for 16th RSC Meeting for UNESCO-IHP for SEAP in 2008 Ulaanbaatar, Mongolia.
- Organized workshop "Improvement Water governance in Mongolia", May 2008.
- Organized Consultative meeting with UNDP, UNISEF and WHO on case study service delivery water supply and sanitation in rural areas Mongolia. UNDP office, Ulaanbaatar, May 2008.

- Organized training course for 50 senior engineers in water sector in January 2008 in Research and Training Center in IWRM.

B. Regional and International activities:

- International conference on “Uncertainties in water resources management: causes, technologies and consequences” and 16th Regional Steering Committee Meeting for the UNESCO IHP for Southeast Asia and the Pacific since 29 September to 3 October, 2008, in Ulaanbaatar, Mongolia.

- Have been conducted case studies focused to reveal reasons of changes in hydrological regimes rivers in Arctic Ocean basin, and 4 glacier systems;

- Long-term Water balance experimental study in the Selbe river basin jointly organized by Mongolian (G. Davaa, Institute of Meteorology and Hydrology) and Japanese (Prof. I. Kaihotsu, Hiroshima University) IHP committees, since 2000 till present continued.

- IHP, NC, Mongolia was informed on establishment UNESCO Chair in Institute of Geoecology under Mongolian Academy of Science

- Improvement of capacity building in Water sector of Mongolia is ongoing process and 22 students have been trained in various foreign Universities in Netherland, Japan, India and China and etc;

C. Presented and prepared papers:

1. G.Davaa “Results of studies on flat-top glacier at Tsambagarav Mts. in Mongolia”, International conference on “Uncertainties in water resources management: causes, technologies and consequences” and 16th Regional Steering Committee Meeting for the UNESCO IHP for Southeast Asia and the Pacific since 29 September to 3 October, 2008, in Ulaanbaatar, Mongolia.
2. G. Davaa, “Water resources of Mongolia and recent changes and future projections”, Proceedings of the conference on “Nature and Envoronment-20 years”, Ulaanbaatar, 2008
3. **D.Basandorj “Current situation and key problems on water supply and sanitation in Mongolia**
4. D.Basandorj, J.Dalai and Sh.Ganzorig
   “Technology of water transmission pipeline on long distance and its application for Gobi and Steppe regions of Mongolia”

D. **General objectives and Conclusions**

- Improvement capacity building and legal mandate in water sector of Mongolia within the support PP, UNESCO;

- Needed support from UNESCO-Beijing office for implementation IHP phase VII, especially improvement water education in urban and rural area.
- Improve cooperation in regional and international level, especially for implementation IHP phases;

National Committee for IHP, Mongolia

Address: C.P.O.Box-1650, Ulaanbaatar-13, Mongolia, tel/fax 976-11-323519, email: b_green@mongol.net and watersect@yahoo.com

16th IHP REGIONAL STEERING COMMITTEE MEEETING FOR SOUTH EAST ASIA AND THE PACIFIC
ULAAN BATAAR, MONGOLIA
(29 September – 2 October 2008)

NATIONAL REPORT OF NEW ZEALAND

1. Activities undertaken in the period October 2007 – September 2008

1.1 Meetings of the IHP National Committee

1.1.1 Composition of the IHP National Committee

Dr Richard P Ibbitt and Mr. Dennis D Jamieson continued as Chairman and Secretary respectively of the IHP National Committee during the reporting period.

1.1.2 Status of IHP-VI activities

The following projects continue to be funded:

WG 1.1 (Information on New Zealand's Freshwaters: Water Resources Archive);

WG 2.7 (Land Use Intensification: Sustainable Management of Water Quality and Quantity);

WG 2.8 (Reducing the Impacts of Weather Related Hazards)

(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 hydropower and 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.

Significant developments in the last 12 months relate to data access and funding.

Data Access

As reported last year, 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. This policy has been in place for a full year and the increase in data requests is summarized in Table 1.

Table 1: Comparison of data requests from Climate and Water Resources databases in years ending 30/6/2007 and 30/6/2008.

	Climate	Water Resources	Total
2006/7	118,000	68,000	186,000
2007/8	360,000	88,000	448,000
% Increase	305%	129%	240%

The change in charging policy has received much favorable comment. While revenue has been foregone, it was adjudged that the consequences of barriers to data access were potentially large, and of national significance, due to poor policy and design decisions made on the basis of limited data.

Funding

While funding has been increased for the networks after a number of years of "static" funding, it is apparent that current resources will not be sufficient to meet increasing national needs for uniform, quality assured, long-term records of environmental state. These records are a necessary basis to make good decisions on future national, regional and local development pathways with major economic and environmental consequences.

Examples of areas where such records are important include:

- Water allocation, where many systems are approaching, or have even exceeded prudent allocation limits with consequent risks to business and the environment,
- Effects of intensive land use, where the effects of changes in practices affect many landowners,
- Climate change, where the effects of variability and change processes need to be both quantified and differentiated between,
- International negotiations, where government needs accurate and defensible information to advance New Zealand interests

Increased funding is currently being sought from central government as follows:

1. Add projects to "core activities" (currently short term funded only):
   (a.) National Water Quality Network
   (b) National Sea Level Monitoring Network

2. Upgrading field sensor systems:
   (a) Upgrading field capability and servicing in Climate Network, to include:

(i) Snow & Ice network

(ii) Rainfall intensity network

(iii) Soil moisture network

(iv) Converting key manual rainfall sites to multi-parameter automated sites

(b) Upgrading field capability and servicing in the Hydrometric Network:

(i) Re-installation of sites previously dropped from the network due to a lack of funds;

(ii) Installation of new sites at strategically critical;

(iii) System redundancy to ensure continuous data supply from critical sites (e.g., for flood warning systems).

(c) Upgrading field capability and servicing in Water Quality Network, to include;

(i) Real-time data collection (e.g., temperature, nitrates etc)

(ii) Re-instatement of the lake water quality monitoring component of the network and add some key wetland sites;

(iii) Addition of water quality parameters to sea level sites.

3. Improved support and maintenance:

(a) Better systems/support for field data transmission etc.;

(b) Upgrading and running new Quality Assurance & Standards systems, plus on-going training;

(c) Software systems development and support services (e.g., for 'free' data supply to the public).

4. Improved Health & Safety standards. Additional funding of:

(a) Infrastructure maintenance/upgrading (e.g. cableways)

(b) Additional staff resourcing of field activities to meet increased safety standards.

Current central government funding is some NZ$4.6M (US$3.2M). Meeting all requirements listed above could double the need for funding. This is unlikely to be achieved in one adjustment.

1.1.3 Decisions regarding contribution to/participation in IHP-VI

Some components of the New Zealand hydrological research programme are aligned with IHP-VI themes in eco-hydrology and sustainable water management. It should be noted that the bulk of hydrological research in New Zealand is funded through the Foundation for Research Science and

Technology (FRST), whose mandate is to fund research that is in the national interest. All proposals submitted to the Foundation must therefore 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.

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 organized by the Ministry for the Environment under the aegis of its National Agenda for Sustainable Water Management and the governments inter-departmental Water Plan of Action).

The Secretary and Chairman of the IHP National Committee have met regularly to discuss IHP matters.

1.2.2 Participation in IHP Steering Committees Working Groups

The Chairman 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 15th RSC meeting held in Manila, Philippines and attended the 13th Technical Sub-Committee meeting associated with the 15th RSC meeting.

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

Sustainable Water Programme of Action (SWPOA)

The NZ government launched a set of actions, coordinated through the Ministry for the Environment and Ministry of Agriculture and Forestry in 2006 to:

- Improve the quality and efficient use of freshwater by building and enhancing partnerships with local government, industry, Māori, science agencies and providers, and rural and urban communities

- Improve the management of the undesirable effects of land use on water quality through increased national direction and partnerships with communities and resource users

- Provide for growing demands on water resources and encourage efficient water management through increased national direction, working with local government to identify options for supporting and enhancing local decision making, and developing best practice.

The SWPOA takes a "whole of government approach" to deal with the situation where the existing regulatory environment was struggling to cope with issues such as water allocation where the available water resources were becoming fully allocated.

IHP activities under IHP-VI and capabilities resulting from these activities are being used to inform the process. Specific initiatives under the SWPOA include the development and adoption of National Environmental standards for Water Measuring Devices, Ecological Flows and Water Levels, and National Policy statements for Flood Risk Management and Freshwater Management. The above tasks are particularly challenging given they aim to bring consistency to a government system that was devolved to regional authorities some 25 years ago.

Primary sector water partnership: Plan of action

Major organizations involved in the primary industries (e.g. Agriculture, Forestry) have formed a grouping to target the key industry issues of nutrient management, water use and sediment and microbial management. Their aim is to have industry "anticipate and engage proactively on environmental issues". This can be seen as an example of industry responding to meet the objectives of a central government agency programme (SWPOA as above) and as with the original government programme, IHP activities under IHP-VI and capabilities resulting from these activities are being used to inform the process.

Republic of Korea Water Resources Association – MOU with NZ Hydrological Society

This MOU has been in place since February 2007. The Korean Water Resources Association (KWRA) recently hosted 4 NZHS delegates to their annual conference in Daejeon (central South Korea) between May 22-23, 2008. This initiative was funded by NZHA and KWRA. The papers presented are as below.

1. Joseph THOMAS (Tasman District Council),

   New Zealand Hydrological Society, International Liaison Committee Chairman

   Title of paper: Investigations into a Multipurpose Dam in Tasman District - New Zealand

2. Graeme SMART (NIWA)

   Senior Scientist, National Institute for Water and Atmospheric Research (NIWA)

Title of paper: Why more Flood Disasters are occurring, - New Zealand examples & solutions.

Co-authors: Alistair McKerchar

3. Gordon EUINTON (Riley Consultants)

Senior Engineer, Riley Consultants Ltd

Title of paper: Design and Construction of 7km of 2.5 cumecs canal in Otago for a hydropower project.

Co-authors: Don TATE

4. Yoon-Seok (Timothy) HONG (GNS)

Senior Scientist GNS Science

Title of paper: 3-D dynamic river-aquifer interaction modeling incorporating climate variability and future water demand.

The Chairman and Secretary of the National Committee are in regular contact with Charles Pearson, the Regional Hydrological Advisor to the President of the WMO Region V (Asia Pacific). Contact is also maintained with SOPAC's Suva based Water & Sanitation Unit, through its role of representing the SW Pacific Island states on water related issues.

Motueka River Integrated catchment Management Project

This programme, begun in 2000 (http://icm.landcareresearch.co.nz), is developing and demonstrating a toolbox to guide sustainable management of land and water resources at small to large catchment scales, including the adjacent coast. It involves a collaboration comprising a committed and continuous partnership among researchers, policy makers, resource users, and community members, including iwi (Māori tribes). Programme goals are: i) the equitable allocation of increasingly scarce natural resources, in a manner acceptable to catchment communities; and ii) the application of tools for managing the cumulative effects of land and water use. This programme is recognised as one of the inaugural operational pilot basins in the UNESCO/WMO global HELP project (Hydrology for the Environment, Life and Policy).

SOPAC – Pacific HYCOS project

The Chair and Secretary maintain interest in this project. A key objective is to ensure that interaction between NZ and Pacific Island based hydrologists is productive and opportunities for productive joint work are identified. The most important issue for all hydrologists in the Pacific is the need for ongoing operational funding. Often resources are available for equipment and training, but ongoing network operation is inadequately supported. Another important issue is the introduction of "inappropriate" technology. Unfortunately systems that can be easily supported in industrial economies do not have the correct attributes and qualities to work in the Pacific.

1.2.5 Other initiatives

Diatom invasion - Didymosphenia geminata

The diatom *Didymosphenia geminate* continues to cause concern, particularly for the tourism industry and for operators of water intakes, where screens used to exclude debris and fish can be blocked by accumulations of the algae. The algae, which forms massive slimes over riverbeds, is the subject of containment action by the Ministry of Agriculture and Forestry (MAF) which has implemented a wide-scale, public focused, strategy. Actions have included trials of control methods, preparing fact sheets, provision of information on the alga's biology to regional government agencies, and work to assess rates of dispersal, potential risks, habitat requirements, and border control / disinfection measures.

EcoConnect

EcoConnect is a system aimed at making accurate weather forecasts for environmental forecasting. The system represents a significant advance in national-scale technical capability. In addition to its technical significance, the application of the system to water resources represents a practical and tangible outcome of greater collaboration between hydrologists and meteorologists.

EcoConnect uses a meso-scale weather model (NZLAM) run on a super-computer to downscale global weather forecasts with assimilation of satellite data. Forty-eight hour forecasts are produced on a 12 km grid covering New Zealand. As well as terrestrial coverage there a large area of ocean and coastal waters is covered, where forecasts of sea state have application to many offshore activities.

Output from the weather model is now input to five calibrated river basin models. Furthermore the operation of the rainfall-to-runoff models has been enhanced by introducing assimilation of hydrological data into each model. This process enables more accurate forecasts as the latest data on the state of the catchments is automatically included in each forecast.

Current applications are focusing on sites of flood risk that have resulted in government recognizing the need for improved practice. In addition to managing flood risks, forecasts are of great interest to electricity transmission network operators who are subject to both weather related demand and supply. The systems ability to forecast wind for wind electricity generation is one aspect of this, as is the ability to forecast the movement of cold fronts associated with high electricity demand for heating.

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. Because of the country's relative remoteness and distinctive resource management requirements, courses are not always suitable for participation by people from overseas.

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

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

NZ Hydrological Society Workshops

The following workshops were conducted by the NZ Hydrological Society in conjunction with the NZ Association of Resource Management and the Meteorological Society of NZ at their annual joint symposia in Rotorua:

- Water programme of action and emerging freshwater issues
- GIS in hydrology
- Forest hydrology
- Water quality and allocation in the horticulture industry

ADCP Training for regional councils

NIWA provided training to several regional councils in the use of Acoustic Doppler Current Profiler (ADCP) instrumentation to measure river flows. This training was provided on a one-to-one basis with individual council staff through an "Envirolink" funding initiative offered by the New Zealand Government to foster technology and knowledge transfer from research institutions to smaller regional councils.

1.3.3 Participation in IHP courses

See 1.3.1.

1.4 Publications

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

The "Climate Update" monthly bulletin

The National Climate Centre (NCC) has published a further 12 issues (100 to 111) of the monthly circular entitled "The Climate Update". (http://www.niwa.co.nz/ncc/cu/archive) This publication summarises each month of New Zealand's climate, including soil moisture and river flows. It also predicts the following three month's climate, soil moisture and river flows, and states how good the previous month's forecast was. Prediction of river flows continue to be used by Greater Wellington Water as input to its water supply planning for summer low flow periods.

The "Island Climate Update" monthly bulletin

The National Climate Centre (NCC) has published a further 12 issues (85 to 96) of the monthly circular entitled "The Island Climate Update" (ICU). This NZAID, funded bulletin provides an overview of the present climate in tropical South Pacific Islands and a forward outlook, which continues to be published, and circulated widely throughout the South Pacific. (http://www.niwa.co.nz/ncc/icu/archive).

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.

NZAID via SOPAC continues to support this activity through 2008 and to focus on climate effects on end users and a more collaborative and consultative approach with the recipient countries.

"Water Resources Update" bulletin

The National Centre for Water Resources (NCWR) has published a further 4 issues (24 to 27) of the bulletin entitled "Water Resources Update"

(http://www.niwa.co.nz/ncwr/wru/archive) This publication summarises seasonal groundwater, river flows, water clarity, water temperature and slime (periphyton) and focuses on a number of topical issues confronting New Zealand scientists.

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://www.edenz.niwa.co.nz).

EDENZ provides visitors with near real-time access to Foundation for Research, Science & Technology (FRST) Public Good Science and Technology (PGS&T) 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. The goal of this programme is to provide comprehensive and accessible data as a basis for improved knowledge on New Zealand's climate and freshwater resources.

The programme collects, stores, and disseminates data from national monitoring networks, and comprises two core nationally significant databases - the Climate Database and the Water Resources Archive. 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.

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.

As from the 1st July 2007 free access has been provided to all 100% FRST funded climate and hydrological data via the automated web based systems “CliFlo” and “EDENZ” (Environmental Data Explorer New Zealand) located on the NIWA website. This includes all hydrometric data from NIWA owned sites which are fully or partially funded by FRST, the terms and conditions for release of data from jointly funded sites being subject to individual site arrangements with the respective co-funders.

The change in NIWA policy reflects changes in expectations by NIWA’s owner and aligns with the long term position of NIWA personnel that easier access to data provides local, regional, national and international benefits. The increase in data requests under the policy is summarized in Table 1 in section 1.1.2 of this report.

1.5 Participation in international scientific meetings

1.5.1 Meetings hosted by the country

NZ Hydrological Society Annual Symposium

The annual conference of the New Zealand Hydrological Society, was held from the 20-23 November 2007 in Rotorua, New Zealand with the theme “Water and Land”

1.5.2 Participation in meetings abroad

Dr Ibbitt and Mr Jamieson represented New Zealand at the 15th RSC meeting held in Manila, Philippines and attended the 13th Technical Sub-Committee meeting associated with the 15th RSC meeting.

Dr R A Woods attended the fall meeting of the American Geophysical Union meeting in December 2007 in San Francisco, USA, and presented on hydrological processes.

Dr R A Woods attended the General Assembly of the European Geophysical Union meeting in April 2008 in Vienna, Austria and presented on catchment classification systems for hydrology. Further presentations related to similarity, estimating low flows in ungauged catchments and modeling were made at this meeting and at other locations in Italy and the Netherlands.

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. Many such contacts have been enabled via the IHP, even though subsequent work has been in the context of bi-lateral arrangements.

Pacific Island Mentoring and Technical Assistance

NIWA staff were involved in liaising with, and mentoring, of staff of the water resources agencies in the various Pacific Island nations throughout the year. This involved technical assistance with hardware and software systems and general advice on the installation and operation of hydrometric stations. It is apparent that a primary issue for agencies throughout the Pacific is access to resources (fuel, vehicles and other "routine" expenses) ongoing operation. In many cases there is sufficient technical knowledge and equipment.

1.6.2 Completed and ongoing scientific projects

During 2007/8 The Reducing Impacts of Weather Related Hazards (WG2.8) was presented to the Central Government funding organization for review. The response was favorable so that the implementing agency only has to renegotiate the content rather than re-bid the programme. Renegotiation is currently underway and a new contract is expected to be in place before 31/12/2008.

While renegotiation is a much simpler process than rebidding, it precludes increased funding so that the level of activity will reduce over the life of the programme due to inflation. The new programme is expected to advance forecasting of extreme weather, floods and landslides.

A new programme on "Reducing impacts of climate change on the urban and built environment" has been funded and will commence on 1 October 2008.

2. Future Activities

2.1 Activities foreseen until December 2008

NZ Hydrological Society Annual Symposium

The annual conference of the New Zealand Hydrological Society will be held in Greymouth, New Zealand from the 18-20 November 2008. This will be a joint conference with the NZ Meteorological Society. The theme for this year's conference is "Meteorological and Hydrological Extremes".

International ICCE Symposium

The International Commission on Continental Erosion (ICCE) will hold a symposium on 'Sediment dynamics in changing environments' in Christchurch, New Zealand on 1st - 5th December 2008.

The Symposium incorporates field trips to New Zealand gravel bed rivers with a scientific programme including the following topics:

1. Scaling issues in sedimentary systems - from point to continents
2. Dating and source tracing technologies.
3. Global Change and erosion.
4. Linking Erosion with environmental and societal impacts.

16th Regional Steering Committee Meeting

Attendance at the 16th RSC meeting in Ulaanbaatar from 29-30 October 2008 and associated meetings.

NZ Association of Resource Management Annual Conference

NZ Association of Resource Management Annual Conference, in association with the ICM Motueka research programme, Nelson. 13 October 2008 - 15 October 2008. Theme: 'Integrated Catchment Management -are we wiser than we were?'

2.2 Activities planned for 2009

Scientific activities planned at the national level are, as explained in Section 1.1.3, within the context of the research programme funded by the Foundation for Research Science and Technology (FRST). 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.

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

Further training courses for regional council and NIWA staff will be provided as follows:

- Hydrological data collection
- General environmental data logging
- Hydrological statistics
- ADCP flow measurements
- Advanced flow regime analysis

For a full list of courses refer to http://www.niwascience.co.nz/edu/unitech

These courses are also open to overseas participants.

National TopNet model

NIWA has a new project to estimate parameters for the hydrological TopNet model for all of New Zealand. Guillermo Martinez, a PhD student at the University of Arizona, is visiting NIWA for three months to work on this project. This research will be a large part of his doctoral thesis. Guillermo's PhD advisor, Hoshin Gupta, visited NIWA for two weeks and worked with NIWA on defining a research strategy for building national TopNet models.]

Hydrological support programme proposal for the Pacific

A project whereby NIWA provides hydrological database software maintenance, instrument and equipment repairs and maintenance, database management support, and an in-country technical colleague mentoring and a year-round technical support service, has been proposed jointly with SOPAC in collaboration with the National Hydrological Services (NHS's) in the Pacific. This project will be effective only if complemented by an increase in operational support for NHS's from each individual Pacific Island Country. At present most NHS's are unable to work to their potential due to lack of access to vehicles, fuel and other operational necessities.

While NZAID have indicated its support for such a programme NZAID support is still to be finalised pending assessment of the need that is being carried out by the Pacific HYCOS implementation personnel. In the meantime the HYCOS program is providing some support so that a partial service can be maintained.

2.3 Activities envisaged in the long term

Continuation of the:

- NZAID funded Pacific Hydrological Training Programmes as required;
- NZAID funded monthly "Island Climate Update" publication with stronger links to end users.
- Monthly NZ "Climate Update" publication.
- Periodic "Water Resources Update" publication.

Commencement of the formal Pacific-wide hydrological support programme (if approved), as outlined in Section 2.2 above.

NATIONAL REPORT ON IHP RELATED ACTIVITIES

PHILIPPINES

OCTOBER 2008

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

1. ACTIVITIES UNDERTAKEN IN THE PERIOD NOVEMBER 2007 – SEPTEMBER 2008

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, NWRB & PWP(2007)
Francisco Arellano, MWSI
Virgilio Basa, NAMRIA
Macra A. Cruz, MWSS
Antonio Morano, DPWH-BRS
Resito David, DPWH-FCSEC
Prisco Nilo, PAGASA
Virgilio Rivera, MWCI & PWP(2008)
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 & C.E. Dept.
Romualdo Beltran, NPC
Samuel Contreras, BSWM
Emiterio Hernandez, LLDA
Milo Landicho, NIA
Peter Lim, University of Sto. Tomas, C.E. Dept.
Rosa Perez, PAGASA
Roberto Soriano, Mapua I.T.- School of C.E.

Program Sub-Committee members::
Peter Paul Castro, UP- NHRC & C.E. Dept.
Genandrialine Peralta, UP- En.E. Program
Susan Abano, NWRB
Joylynn Accad, NEDA
Margarette Bautista, PAGASA
Isidora Camaya, NIA
Efren Carandang, NAMRIA
Robert Domingo, NEDA
Maristel Espiritu, LLDA
George Estioko, NWRB
Myrna Lansangam, LWUA
Nicanor Mendoza, DENR-EMB
Jesusa Roque, NWRB
Teresita Sandoval, BSWM
Beverly Sarausad, Univ. of Sto, Tomas

1.1.2 Status of IHP-VI activities

The Philippine National Committee for UNESCO-IHP hosted the *15th Regional Steering Committee Meeting for Southeast Asia and the Pacific UNESCO International Hydrology Programme (15th RSC Meeting for SEAP, UNESCO-IHP),* in conjunction with the *UNESCO-IHP International Conference on Hydrology and Water Resources Management for Hazard Reduction and Sustainable Development (HRSD 2007*), on 19-23 November 2007, at Makati City, Metro Manila, Philippines.

Co-hosting with the Philippine National Committee were the National Academy of Science and Technology (NAST), and the Philippine Water Partnership (PWP). The International Conference HRSD-2007 consisted of two-days of opening ceremonies and technical sessions (19-20 Nov.), one-day technical visit (21 Nov.), and two-days (22-23 Nov.) of the 15th RSC Meeting.

The aims of the International Conference on Hydrology and Water Resources Management for Hazard Reduction and Sustainable Development (HRSD 2007) are to share and disseminate knowledge, information and technology in the hydrological and water management sciences, and to foster cooperative and collaborative activities in several focal areas contributory to the five core Themes of the IHP-VI (2002-2007). This scientific conference is also a timely culminating event to take stock of the major accomplishments of the region for that phase, including the cross-cutting scientific programme of APFRIEND (Asia-Pacific Flow Regimes for International Experimental and Network Data) and the Catalogue of Rivers for South East Asia and the Pacific, which are within the scope of regional coordination activities of the RSC.

The general conference themes of "Hazard Reduction and Sustainable Development" or HRSD 2007, are devoted to the focal areas of IHP-VI as follows:

Theme 1: Global Changes and Water Resource -Global estimation of resources: water supply and water quality; Global estimation of water withdrawals and consumption; Integrated assessment of water resources in the context of global land-based activities and climate change.

Theme 2: Integrated Watershed and Aquifer Dynamics - Extreme events in land and water resources management; International river basins and aquifers; Endorheic basins (closed basins); Methodologies for IWRM and IRBM.

Theme 3: Land Habitat Hydrology – Drylands; Wetlands; Mountains; Small islands and coastal zones; Urban areas and rural settlements,

Theme 4: Water and Society - Water, civilization and ethics; Value of water; Water conflicts - Prevention and resolution; Human security in water-related disasters and degrading environments; Public awareness raising on water interactions.

Theme 5: Water Education and Training (WET) - Teaching techniques and material; development; Continuing education and training for selected target groups; Crossing the digital divide; Institutional development and networking for WET

1.1.3 Decisions regarding contribution to/participation in IHP-VII activities

In response to the questionnaire from the UNESCO-IHP Paris office, the following has been indicated 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)
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

First GWP Consulting Partners Inter-Regional Meeting, involving South Asia, Southeast Asia, China, Caribbean, Pacific and Australia, 24-25 November 2007, ADB, Pasig City, Metro Manila, organized by the Philippine Water Partnership (PWP).

Philippine National Committee on Large Dams (PNCOLD) 2007 Technical Conference/Workshop, 27-28 November 2007, National Power Corporation, Quezon City, Philippines.

Roundtable Discussion on Water, 29 November 2007, San Juan, Metro Manila, Philippines. UNESCO Philippine National Commission, Philippine National Committee for UNESCO-IHP and other UNESCO national scientific committees..

Roundtable Discussion on Climate Change, 22 February 2008, Manila, Philippines. National Academy of Science and Technology (NAST).

Roundtable Discussion on Water Issues and Reforms (2007-2008), National Academy of Science and Technology (NAST) and National Water Resources Board (NWRB), sponsored by the UNESCO Philippine National Commission.

Technical Working Group Meetings: 8 May 2008, hosted by NWRB
20 June 2008, hosted by NWRB
4 July 2008, hosted by NHRC
30 July 2008, hosted by NHRC

The Regional Conference in Environmental Engineering: Environmental Challenges Facing the ASEAN Region, 8-9 September 2008, Pasig City, Metro Manila, ASEAN University Network Southeast Asia Engineering Education Development Network (AUN/SEED-Net).

Roundtable Discussion on Basic Research for National Development (Sub Themes on Sustainable Development in the Areas of Energy and Disaster Management), 11 September 2008, Manila, National Research Council of the Philipines (NRCP) and National Academy of Science and Technology (NAST).

1.2.2 Participation in IHP Steering Committees/Working Groups

Leonardo Q. Liongson (UP Diliman) – Philippine national representative to the RSC (2002-2007); and elected as Chairman of RSC (two-year term: 2008 and 2009) durng the 15th RSC Meeting held in Manila on 22-23 October 2007.

Guillermo Q. Tabios III (UP Diliman), RSC member - has served as co-coordinator with RSC member Prof. Trevor Daniels of Adelaide University in the RSC-assigned task group for APFRIEND (2005-2008) on the development of Rainfall Intensity Duration Frequency (IDF) relations in the SEAP region.

1.2.3 Research/applied projects supported or sponsored

National Academy of Science and Technology (NAST)

Roundtable Discussion on Climate Change (2008), National Academy of Science and Technology (NAST).

Roundtable Discussion on Water Issues and Reforms (2007-2008), National Academy of Science and Technology (NAST) and National Water Resources Board (NWRB), sponsored by the UNESCO Philippine National Commission,

National Hydraulic Research Center (NHRC)

Completed Projects (2007-2008):

- *Feasibility Study of the Proposed Infiltration Gallery Project*, Manila Water Company Inc. (MWCI).
- *Value Engineering Study for the Detailed Engineering Design of Pasig-Marikina River Channel Improvement Project, Phase I*, Department of Public Works and Highways (DPWH) and CTI Engineering International Co., Ltd
- *Reservoir Sedimentation Study and Management Plan for the San Roque Multi-Purpose Plant*, National Power Corporation (NPC).
- *Measurement, Analysis and Modeling of Pollutant Transport in Surface Water and Groundwater Bodies in Selected Sites in Lao PDR and the Philippines (2006-2008)* - AUN-SEED-Net Collaborative Research
  PhD En.E. Student: Sioudom Khamfeuane
  Adviser: Prof. L. Q. Liongson
  Co-Adviser: Prof. S. Ikeda, Tokyo Institute of Technology
  Sponsor: ASEAN University Network / Southeast Asia Engineering Education Development Network (AUN-SEED-Net)

National Research Council of the Philippines (NRCP)

Updating of the *Philippine Encyclopedia of Science and Technology*
(Chapters on Hydrology, Hydraulics and Water Resources Management)

National Water Resources Board (NWRB)

Completed Projects (2007):

- *Policy Formulation and Coordination*
- *Regulation on Water Utilization*
- *Regulation on Water Utilities*
- *National IWRM and Water Efficiency Plans* (UNEP)
- *Development of Knowledge Management Portal for Water Supply and Sanitation*

Ongoing Projects (2007-2008):

- *Price Policy for Public Goods, Philippines (Study on Raw Water Pricing)* (GTZ: 2005-2008)
- *Economic Valuation of Groundwater in Metro Manila.*
- *Development of Water Supply Sector Roadmap* (GTZ-Water and Sanitation Prigram)

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

Priority Programs of the Flood Forecasting Branch (2007-2008)

- 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.

Philippine Water Partnership (PWP)

Organizer of the *1st GWP Consulting Partners Inter-Regional Meeting* involving South Asia,Southeast Asia, China, Caribbean, Pacific and Australia, 24-25 November 2007.

Regional Training of Trainers (ToT) on Integrated Water Resources Management, 15-19 October 2007.

Together with GTZ (German Agency for Technical Cooperation) and the National Water Resources Board, PWP organized a *nationwide photo contest with the theme "Water is Life"*.

Organized an *Educational Tour to the Seven Lakes of San Pablo City* with a total of 45 participants coming from government offices, NGOs, academe, private sector and the media.

Conduct of small group meetings with PWP members on the preparation for the forthcoming *4th SEA Water Forum* in 2009.

Participated in the *Singapore International Water Week*.

Conduct of organizational meeting in preparation for the *4th SEA Water Forum*.

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

No additional information is available.

1.2.5 Other Initiatives

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.*

Metro-Manila Development Authority (MMDA), *Effective Flood Control Operations System (EFCOS).*

1.3 Educational and training courses

1.3.1 Contribution to IHP Courses

None.

1.3.2 Organization of specific courses

Tabios, G.Q. III, 2008, Lecturer on 2-day short course on *Hydrology for Hydropower Development*, National Engineering Center, University of the Philippines, Quezon City, August 13-15, 2008.

1.3.3 Participation in IHP courses

17th IHP Training Course on Numerical Prediction of High-Impact Weather Systems, 1-15 December 2007, Nagoya, Japan -

Philippine participant: Josefina Calapan Argete. Institute of Environmental Science and Meteorology, College of Science, UP Diliman.

18th IHP Training Course on Satellite Remote Sensing of Atmospheric Constituents, 3-15 November 2008. Nagoya, Japan –

Philippine participant: Rhodora Gonzales, Dept. of Geodetic Engineering and Training Center for Applied Geodesy and Photogrammetry (TCAGP), College of Engineering, UP Diliman.

1.4 Papers and Publications

Liongson, L. Q. (2007). *1999-2006: A Flood Management Retrospective of the Last Decade of Water-related Disasters, Challenges and Changes*. A paper commissioned by the Philippine National Academy of Science and Technology (NAST) and presented in the regular NAST Meeting, DOST Complex, Bicutan, Taguig, 22 February 2007.

Liongson, L. Q. (2008), *Horizontal Wells in Heterogeneous Media*, Proceedings of the International conference "Uncertainties in Water Resource Management: causes, technologies and consequences" /WRM-Mon2008 in conjunction with the 16th Regional Steering Committee (RSC) Meeting for the UNESCO International Hydrological Programme for Southeast Asia and the Pacific (UNESCO-IHP SEAP). Chinggis Khaan Hotel, Ulaanbaatar city, Mongolia, 29 September – 3 October 2008. UNESC-IHP Phase VII Technical Document in Hydrology No. 1.

Tabios, G. Q. III (2008), *Implications of Water Resources Developments and the Need for Ecology-based Hydrologic and Engineering Studies for Agusan Marsh, Philippines,* Proceedings of the International conference "Uncertainties in Water Resource Management: causes, technologies and consequences" /WRM-Mon2008 in conjunction with the 16th Regional Steering Committee (RSC) Meeting for the UNESCO International Hydrological Programme for Southeast Asia and the Pacific (UNESCO-IHP SEAP). Chinggis Khaan Hotel, Ulaanbaatar city, Mongolia, 29 September – 3 October 2008. UNESC-IHP Phase VII Technical Document in Hydrology No. 1.

Tabios, G.Q. III and L.Q. Liongson (editors) (2007), Proceedings of International Conference on Hydrology and Water Resources Management For Hazard Reduction and Sustainable Development (HRSD 2007), UNESCO-International Hydrology Program, Makati City, Philippines, 19-23 November 2007. Enumerated below are titles of the 22 technical papers by Philippine authors:

The Impacts of Climate Variability in the Management of a Multi-Purpose Reservoir
by Jorge M. Estioko and Pacita F. Barba

Climatic Change Impact In Water Potential Processes On The Albanian Hydrographic River Network
by Niko Pano, Alfred Frasheri and Bardhyl Avdyli

Transmutation Procedure In Flood Estimation For Philippine Watersheds
by Danilo C. Terante

Flood Routing Studies for Urban Drainage Channel Realignment
by Eric C. Cruz and Martin Luther L. Cocson

Technical Enhancement through Hydraulic Laboratory Experiments by Jessie C. Felizardo and Resito V. David

Water Resources Assessment and Management in Panglao Island, Bohol
by David L. Caloza, Roberto Clemente, Genandrialine L Peralta and Elizabeth Ventura

Watershed Sediment Yield Study for Lower Agno River Basin in Benguet-Pangasinan, Philippines
by Guillermo Q. Tabios III, Tommy T. Valdez and Victor M. Delgado Jr.

Application of Geographic Information System and Erosion Model in Watershed Management: The Case of the Bohol watershed, Philippines
by Imelida C. Genson

Impact of Reservoir Sedimentation on Water Yield and Hydropower Generation in San Roque Reservoir, Pangasinan
by Guillermo Q. Tabios III, Victor T. Delgado Jr. and Tommy T. Valdez

Steady Flow into a Horizontal Well from a Semi-infinite Aquifer with an Intervening Aquitard Layer under a Constant-Head Recharge Boundary
by Leonardo Q. Liongson

Design Aspects for Infiltration Galleries in Low Yield Aquifers
by Peter P. M. Castro

Stable isotopes as potential tracers for assessing groundwater contamination from the Montalban landfill
by Soledad S. Castañeda, Rosalina V. Almoneda, R.aymond J. Sucgang and Cynthia L. Iblan

Community Responses to Climate-Related Disasters: Case Studies of Flooding and Landslide Experiences in Leyte, Philippines
by Buenaventura B. Dargantes, Canesio D. Predo and Marx Anthony L. Dargantes

Philippines Progress on Implementing IWRM Reforms
by Isidra D. Penaranda

Enhanced Government Engineers: A Key to Reducing Flood Vulnerability
by Dolores M. Hipolito

The Politics of Sourcing Water in the Case of the Chico River Dam Project
by Katrina Bautista Maquilan

Pushing for Good Governance in the ADB Samut Prakarn Wastewater Management
by Teresa S. Encarnacion Tadem

Controlled Irrigation: An Alternative Technique of Water Savings in Rice Production in the National Irrigation Systems in the Philippines
by Vicente R.Vicmudo, Armilito T.Lactaoen, Teodoro M.Norte, Bas A.M.Bouman, Ruben M.Lampayan, Jovino L. de Dios and Alex J.Espiritu

Saving the Pasig River: A Potential Remedy to Reduce Phosphate Content in the Pasig River through Precipitation
by Rodolfo L. Manaligod and Shirley O. Banzuela

Limnological Behavior of Estero de San Miguel: Review and Evalution of Ecological Status
by Leonardo C. Sawal

SONOLEACHING: A Rapid Leaching Procedure to Predict Heavy Metal Leaching to the Ground Water
by Luzvisminda M. Bellotindos, Herman D. Mendoza and Genandrialine L. Peralta

Low Cost Modular Solar Desalination
by Nolan C. Tolosa and Genandrialine L. Peralta

Sioudom, K., L. Q. Liongson and S. Ikeda (2008), *Modeling of nitrogen and sediment transport in Nagura River, Ishigaki City and That Luang Wetlands, Vientiane City*, Proceedings of the Regional Conference in Environmental Engineering: Environmental Challenges Facing the ASEAN Region, Sept 8-9, 2008, Manila.

Tabios, G.Q. III (2007), *Influence of Storm Rainfall Movement on Watershed Sediment Yield,* Journal of Hydrologic Environment, IHES, Vol. 3, no.1, December, pp. 31-40.

Tabios, G.Q. III (2007), *Reservoir Sedimentation and Operations Study Using A Two-Dimensional Hydraulic Model,* Journal of Hydrologic Environment, IHES, Vol. 3, no.1, December, pp. 41-50.

Tabios, G.Q. III (2007), *Hydrology and Related Ecology-Based Aspects of Managing the Agusan Marsh,* In Proc of the First Agusan Marsh Scientific Conference, Butuan City, Agusan.

Tabios, G.Q. III (2007), *Two-Dimensional Finite Volume Hydraulic Model for Dam-Break Studies,* In Proc of Philippine National Committee on Large Dams (PNCOLD) 2007 Technical Convention/Workshop, Quezon City, Nov 27-28.

Tabios, G.Q. III (2007), *Applications of Isotope Techniques in Modeling Hydrologic Processes, Nuclear Science and Technology: Opportunities, Challenges and Prospects,* 35th Atomic Energy Week, Philippine Nuclear Research Institute, Diliman, Quezon City, December 10-14

1.5 Participation in international scientific meeting

No complete information is available.

1.5.1 Meetings hosted by the country

International Conference on Hydrology and Water Resources Management For Hazard Reduction

and Sustainable Development (HRSD 2007) in conjunction with the 15th RSC Meeting, UNESCO for SEAP, 19-23 November 2007, UNESCO International Hydrology Program, Makati City, Philippines.

First GWP Consulting Partners Inter-Regional Meeting, involving South Asia, Southeast Asia, China, Caribbean, Pacific and Australia, 24-25 November 2007. Philippine Water Partnership (PWP).

The Regional Conference in Environmental Engineering: Environmental Challenges Facing the ASEAN Region, 8-9 September 2008, Manila, ASEAN University Network Southeast Asia Engineering Education Development Network (AUN/SEED-Net).

1.5.2 Participation in meetings abroad

No additional information is available.

1.6 Other activities at regional level

1.6.1 Institutional relations /co-operation

No complete information is available.

1.6.2 Completed and ongoing scientific projects

No additional information is available.

2.0 Future Activities

2.1 Activities planned for 2007-2008

Participation in the 16th RSC Meeting and WRM-Mon2008 International Conference, 29 Septemebr – 3 Otober 2008, Ulaan Baatar, Mongolia.

Participation in the RSC-supported programs and activities such as APFRIEND and the IHP training courses conducted by the University of Nagoya.

2.2 Activities in the long term

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, IHP training courses conducted by host countries, and joint hydrologic training courses and researches among member countries.

Sixteenth Meeting of IHP Regional Steering Committee for the Southeast Asia and the Pacific
02-03 October, 2008
Ulaanbaatar, Mongolia

Country Report on Papua New Guinea International Hydrological Program Activities: 2007-2008

Prepared & presented by:
Maino Virobo
Acting Chairman
Papua New Guinea IHP National Committee

1. Introduction

The Department of Environment and Conservation (DEC) participated in the activities of the International Hydrological Program Decade through then Bureau of Water Resources from 1965-1974, the forerunner of the International Hydrological Program (IHP). With the launching of the latter in 1992, the Papua New Guinea (PNG) IHP National Committee was formed in January 1992 with a view to participating actively in IHP.

The current total membership of the PNG IHP National Committee is eight (8), and drawn from various government agencies and institutions of higher learning. Over the period 2007-2008, PNG experienced some upheaval in UNESCO participation, particularly the training component, and at the local level economy progressed considerably. Perhaps, this progress is attributed to the realization of significant regional and global water events linked to phenomena relating to climate change, sea level rise and global warming.

Up until the current stage, the position of PNG IHP National Committee chairperson has not been resolved nevertheless the secretariat has been performing all tasks and activities relating to IHP. Furthermore the current paradigm shift from traditional protection and conservation of the environment to policy development has diminished the value of water as a resource resulting in truncating of significant hydrological activities at the national level.

Despite the given circumstance the acting chairman disseminates to all members, information on meetings/seminars, training courses and workshops organized by the UNESCO. It also distributes publications and newsletters that are received from UNESCO and other water agencies.

As always, the PNG IHP National Committee performs its roles, formulated by the following key agencies;

(a) Department of Environment and Conservation (DEC),
(b) University of Papua New Guinea (UPNG),
(c) Geological Survey of Mineral Resources Authority (MRA)
(d) National Weather Service (NWS) of Department of Transport and Civil Aviation.

2. Activities Organized by the National Committee

Significant water events organized at national levels were;

(a) World Water Day commemoration in March 2008
(b) World Environment Day commemoration June 2008
(c) Oro Province Flood Disaster Preparation

No committee meetings were held.

3. Other Hydrological and Water Related Activities Conducted by Individual Water Agencies

3.1 Flooding a Natural Disaster

Brochures completed on effects of flooding and preparedness, were distributed to various educational institutions and the general public. Awareness programs were conducted through print and electronic media (60 seconds). This was an initiative of the office of the National Disaster and Management Center.

3.2 Environment Permitting

Permit to use water, either as an abstracted volume or as a dilution component in PNG has been absorbed into an environment permit system administered by DEC through the Environment Council. The Council meets regularly to deliberate on environment permit applications, particularly activities relating to mining, forest logging, oil palm, gas and oil, and infrastructural development. DEC generates about 85% of its annual revenue through environment permitting.

3.3 Sub Regional Programs

SOPAC initiated Ramu Hydrological Monitoring Stations Rehabilitation project in the Eastern Highland Province of PNG was completed at the end of 2007. About three water level stations and two rainfall stations were revived.

Another SOPAC initiated project funded by European Union through Pacific HyCOS program commenced at the end of 2007 and is progressing well. The project is based near Port Moresby city, primarily focusing on monitoring the Laoki River catchment through reviving the existing water level and rainfall stations but in an integrated approach. Instruments and database management systems have been supplied, while the data loggers will be installed in early October 2008. Trial data logging will commence thereafter.

3.4. General Assistance

Use of technical personnel and professionals from DEC has become frequent for the 2007-2008, period due to increase in resources development, particularly in the mining and the energy sector. Additionally, significant volumes of data have been sold to private sector and agencies involved in mining, energy development and infrastructure development.

Providing energy using mini hydro schemes to the rural sector and communities is on the rise, which is the current government's initiative to provide cheap and environment friendly energy to the rural population. Trained hydrologists have been engaged by the private and the cooperate sectors to assist in the hydropower studies.

4. Participation in Regional Programs

4.1 Research and publications

We did not participate in the above programs and activities during this period.

4.2 Meetings and short term training

Maino Virobo attended the 15th International Hydrological Program Regional Steering Committee Meeting and International Conference on Hydrology and Water Resources Management for Hazard Reduction and Sustainable Development, Manila, Philippines from 19-23 November 2007.

Kay Kalim attended the joint Pacific HyCOS steering committee and Integrated Water Resources Meeting in Niue, July 2008.

No short term courses attended.

5. Future Tasks

- Attend the 16th IHP RSC Meeting in Ulaanbaatar, Mongolia from 29/09-03/10/2008.
- Attend the 3rd Pacific HyCOS meeting
- Attend the 5th IWRM meeting in Suva, April 2009.
- Participate in the upcoming UNESCO IHP training courses.
- Complete Pacific HyCOS installation and commence data collection, processing and management
- Contribute to regional activities as and when required.

6. Concluding Remarks

I would like to thank UNESCO Jakarta office once again for meeting all the costs to enable me to participate in the RSC meeting and most significantly to attend the international conference.

NATIONAL REPORT ON IHP RELATED ACTIVITIES

THAILAND

1. ACTIVITIES UNDERTAKEN IN THE PERIOD November 2007 – September 2008
   - 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-VI activities
     - 1.1.3 Decisions regarding contribution to/participation in IHP-VII
   - 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 Publications
   - 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 relations/co-operation
     - 1.6.2 Completed and ongoing scientific projects
2. FUTURE ACTIVITIES
   - 2.1 Activities planned until December 2008
   - 2.2 Activities foreseen for 2009-2010
   - 2.3 Activities envisaged in the long term

National Report on IHP Related Activities
Thailand

1. Activities undertaken in the period of November 2007- September 2008

1.1 Meeting of the IHP National Committee

1.1.1 Decision regarding the composition of the IHP National Committee

According to the reshuffle of Director-General of Department of Water Resources in middle 2008, Thailand National Committee for IHP (THC-IHP) is now having Dr.Siripong Hungspreug, Director-General of Department of Water Resources served as a Chairman of this committee. The present composition of THC-IHP consists of 23 members as follow:

Chairman : Dr.Siripong Hungspreug, Director-General of Department of Water Resources

Vice Chairmans : Professor Nipon Tangtham, Kasetsart Universities
Deputy Director-General of Department of Water Resources

Secreatary : Mr.Boontham Sirichai, Director of Bureau of Research - Development and Hydrology

Members : Representatives from concerning agencies and individuals are as follows :

1. Bureau of Royal Rainmaking and Agricultural Aviation
2. Royal Irrigation Department
3. National Park, Wildlife and Plant Conservation Department
4. Hydrographic Department
5. Meteorological Department
6. Marine Department
7. National Research Council of Thailand
8. The Thailand Research Fund
9. Secretarial of the Thai National Commission for UNESCO
10. Department of Ground Water Resources
11. Electricity Generating Authority of Thailand
12. Thai Hydrologist Assembly
13. Thailand Water Resources Association
14. Mr.Virat Khao-Upatham
15. Mr.Veeraphol Taesombat
16. Mr.Chaiyut Suksri
17. Mr.Yingphew Supakittiwong
18. Mr.Jakrawut Sulayapong
19. Director of Research and Hydrology Development Division
20. Department of Water Resources

The mailing address are as follow :

Thailand National Committee for the IHP
Department of Water Resources
180/3 Rama 6 Road, Samsaennai District,
Phayathai Bangkok, 10400, Thailand
Tel : +66-22986604 Fax: +66-22986604
Email : sukonth_a@monre.go.th

During this period, Thailand National Committee for IHP (THC-IHP) held a meeting to revise and review the 25 major river basin and its tributaries boundaries .

1.1.2 Status of IHP-VI activities

a) Implementation of the Integrated Water Resources Management in 29 small sub-basins out of 25 major river basins.
b) Organization of the Training on Information, Education and Communication to the stakeholder and local communities in the river basins.
c) Flood Forecasting and Management in Chi-lower Mun River Basin
d) Continuing installation of Flood and Landslide Early warning System : People Participatory Approach and Community Based in Upland Risk Area
e) Continuing construction of the water supply systems to provide clean water and consumption targeting for all villages of the whole country.

1.1.3 Decisions regarding contribution to/participation in IHP-VII

Thailand National Committee for the IHP presents its support to the proposal framework for IHP-VII. Some specific issues that should be highlighted are

- Methodologies for integrated river basin management
- Promotion of public awareness raising on water management
- Institutional development and networking for WET
- Guidelines on the sustainable and Integrated water Management with due consideration to public's living quality and participation
- Increasing the available sources water by improving both existing natural and man-made sources
- Flood and Drought Management

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

- National Workshop on 2008 Decision Support Framework Application in Thailand. 7-11 Jun 2008, Bangkok.

1.2.2 Participation in IHP Steering Committees/Working Groups

The representatives from TNC-IHP attended the 15th Regional Steering Committee Meeting for the IHP in Southeast Asia and Pacific on the International Conference on "Hydrology and Water Resources Management for Hazard Reduction and Sustainable Development" 19-23 Nov 2007, Manila, Philippine

1.2.3 Research/applied projects supported or sponsored

1 Delineation of River basin Boundaries (25 Major River Basins including 254 Sub-river Basins).
2 Integrated Water Resources Management : Case study in Lower Loei Basin.
3 Integrated Water Resources Management in Nam Yom Basin
4 Study on Social Model for Water Confict in Bangpakong Basin

5 NDVI (Normalize Differential Vegetable Index) for Drought Forecasting.
6 API Application in Flash Flood and Landslide.
7 Application of Local Wisdom in Water Resources Management.
8 The Development of Participatory Process to empower Local Community in Water Resources Management : Case Study in Mun Basin.
9 Study on the Risk Factors and community livelihood in Flood and Landslide Hazard Area : Case Study in Upper Ping River Basin.

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

a) Collaboration with Mekong River Commission in Appropriate Hydrological Network Improvement Project, Basin Development Plan, Water Utilization Program, Environment Program, Flood Mitigation Management Program and Drought management program, Mekong HYCOS and start up Integrated Knowledge Management Program.

b) Collaboration with Typhoon Steering Committee

c) Collaboration with APN Inter-Government on Global Change

d) Collaboration in Convention on Climate Change

e) Collaboration with ASEM Waternet

f) Collaboration with NARBO (Network of Asian River Basin Organization)

g) Collaboration with ASIAN Working Group on Water Resources Management

h) Collaboration with ADB on CPWF (Challenge Program on Water and Food)

1.2.5 Other initiatives

- Hydro-Agronomic-Economic Model for Mekong River Basin and Local Adaptation in Thailand and Lao PDR Project in collaboration with ADB
- Hydrological Network Improvement for Mekong HYCOS Project in collaboration with MRC and WMO
- The impact studies of Climate Change on Irrigation systems and its adaptation measures in collaboration with JIID (The Japanese Institute of Irrigation and Drainage)

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

-

1.3.2 Organization of specific courses

- Training on Telemetry and InfoWorks and FloodWorks Model, 24 Apr-2 May 2008, Bangkok.
- Training on Standard Procedure on Hydrological Survey, 23-25 Jun 2008, Kanchanaburi, Thailand.

1.3.3 Participation in IHP courses

-

1.4 Publications

- Hydrological and meteorological Year Book 2006
- Development of Master Plan for Management of Natural Disasters : Floods and Droughts
- Flood Early Warning Model

1.5 Participation in international scientific meeting

1.5.1 Meetings hosted by the country

- Organized with NARBO(Network of Asian River Basin Organization) the thematic workshop on " 4th thematic workshop on Sustainable Management of water Resources Infrastuctures" 5-8 Febuary 2008 First Hotel, Bangkok, Thailand

1.5.2 Participation in meetings abroad

A representative from Thailand participated in

- Participating in the " 3th Southeast Asia Water Forum " 22-26 October 2007, Patra World Trade Center, Kuala Lumper, Malaysia
- Participating in the " 1th Asia-Pacific Water Summit" 3-4 December 2007 , Beppu, Japan
- Participating in Traning Course of Water Resources Planning and Management 13 Jul-5 Sep 2008, Australia

1.6 Other activities at regional level

1.6.1 Institutional relations /co-operation

- TNC-IHP has remained close coordination and contacts with UNESCO Jakarta Office in many activities.
- Close coordination and contacts with the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) and World Meteorological Organization (WMO) as member of the Typhoon Committee

1.6.2 Completed and ongoing scientific projects

- Developed and improvement in the hydrological and meteorological monitoring network in Chi-Lower Mun River Basin for Water Resources Management including Flood forecasting and management.
- Continued to develop and set up a flood and landslide warning system in mountain and upland area
- Promote the Day of National Conservative of River and Canal (20 Sep 2008)

- Preparation and Promotion the Master Plan for Short Term and Long Term Plan National Flood Mitigation.

2 FUTURE ACTIVITIES

2.1 Activities planned until December 2008

- Strengthening cooperation with other countries in Lower Mekong River Basin
- Raise public participation in Integrated Water Resources Management

2.2 Activities foreseen for 2009-2010

- 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

2.3 Activities envisaged in the long term

- Enhancing activities contributed to IHP-VII
- Enhancing activities in Flood and Drought Management
- Expansion of an Integrated Water Resources Management implementation to the rest of the country
- 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

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NATIONAL REPORT ON IHP RELATED ACTIVITIES

I. ACTIVITIES UNDERTAKEN IN THE PERIOD NOVEMBER 2007 - OCTOBER 2008

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 Dr. Tran Thuc, Director of Vietnam Institute of Meteorology Hydrology and Environment (IMHEN) - Ministry of Natural Resources and Environment (MONRE).

1.1.2 Status of IHP-VII activities

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

1.1.3 Decisions 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

Scientific and technical meetings are generally held within the context of the Ministry of Natural Resources and Environment and professional societies (particularly the Viet Nam Natural Resources and Environment, Viet Nam Fluid Mechanics, and Viet Nam Geography Societies). There have been no meetings specifically under the aegis of the IHP. The Chairman and the Secretary of the IHP National Committee meet regularly to discuss IHP matters.

1.2.2 Participation in IHP Steering Committees/Working groups

The members of the Viet Nam National Committee for the IHP have attended and participated actively in all of the annual meetings of the Regional Steering Committee.

1.2.3 Research/applied projects supported or sponsored

- *Development of Climate Change Scenario for Vietnam and the Region.* Research project funded by SEA START

- *Impact of Sea Level Rise and Adaptation Measures***,** Research project funded by DANIDA
- *Impact of Climate Change on Water Resources and Adaptation Measures.* Research project funded by DANIDA
- *Flash Flood Zoning and Warning for Mountainous Areas of Viet Nam*, Research project funded by the Vietnamese Government.
- *Development of a Decision Support System for trade-off on Water conflict for Ba River Basin*, Research study funded by the Ministry of Natural Resources and Environment.
- *Development of Operation rule in dry season for reservoir system on Huong river,* Research study funded by the Ministry of Natural Resources and Environment.

1.2.4 Collaboration with other national and international organizations

- 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,
- Cooperate with Ministry of Natural Resources and Environment of Viet Nam and other Agencies to organize a meeting on the occasion of the World Water Day,
- Cooperate with UNDP and Ministry of Natural Resources and Environment of Viet Nam to organize the Workshop on "*Climate change and Human development*" in Ho Chi Minh city.
- Members/representatives of Vietnam NCIHP participated and contributed to many national councils.

1.2.5 Other initiatives

1.3 Education and training courses

1.3.1 Contribution to IHP courses

None.

1.3.2 Organization of specific courses

Collaboration with NOAA on training of Climate forecast.

1.3.3 Participation in IHP courses

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

1.4 Publications

None.

1.5 Participation in international scientific meetings

1.6 Other activities at a regional level

1.6.1 Institutional relations/co-operation

Cooperate with Southeast Asia START Regional Center to down-scale data for CC scenarios

1.6.2 Completed and ongoing scientific projects

None

II. FUTURE ACTIVITIES

2.1 Activities planned for 2008-2009

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

2.2 Activities envisaged in the long term

Unknown at this time.

ANNEX 6

SCHEDULE FOR PUBLICATION OF CATALOGUE OF RIVERS VOL VI

Progress Report
Catalogue of Rivers

October 2, 2008

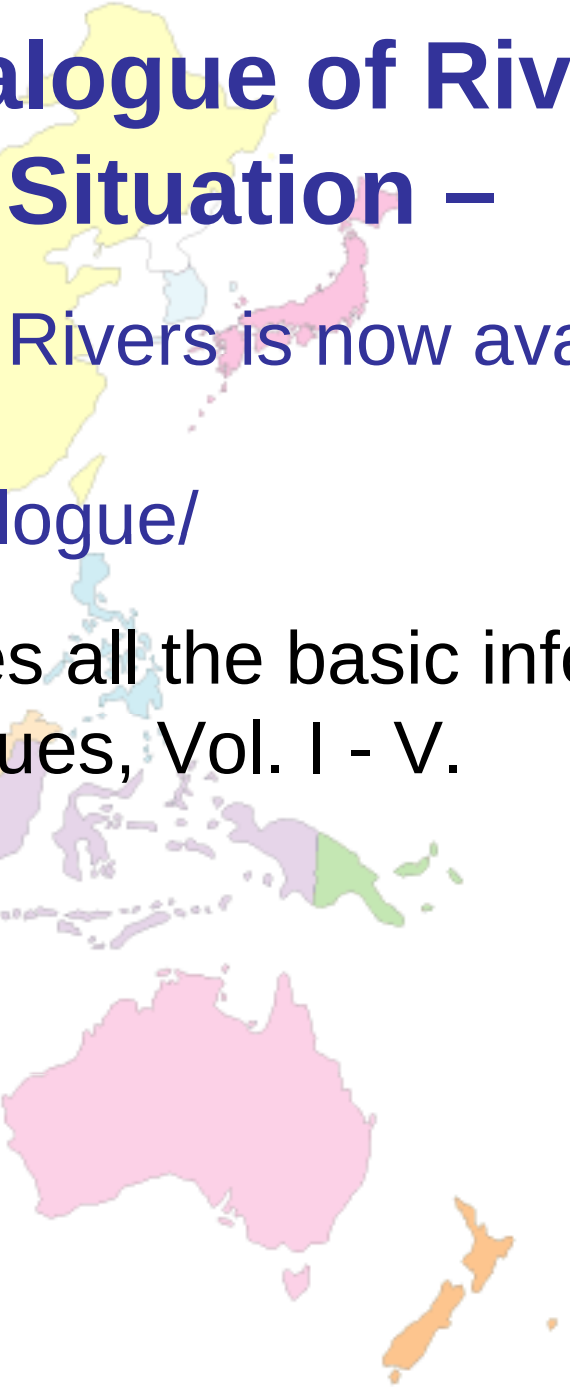
Hidetaka Chikamori

1. Website of Catalogue of Rivers
   – Present Situation
2. Data Accumulation
3. Location of Website of the Catalogue

The UNESCO-IHP Regional Steering Committee
for Southeast Asia and the Pacific
(A UNESCO-IHP Publication)

Website of Catalogue of Rivers
– Present Situation –

- Website of Catalogue of Rivers is now available. http://flood.dpri.kyoto-u.ac.jp/ihp_rsc/riverCatalogue/
- The new website includes all the basic information described in the Catalogues, Vol. I - V.



The UNESCO-IHP Regional Steering Committee
for Southeast Asia and the Pacific
(A UNESCO-IHP Publication)

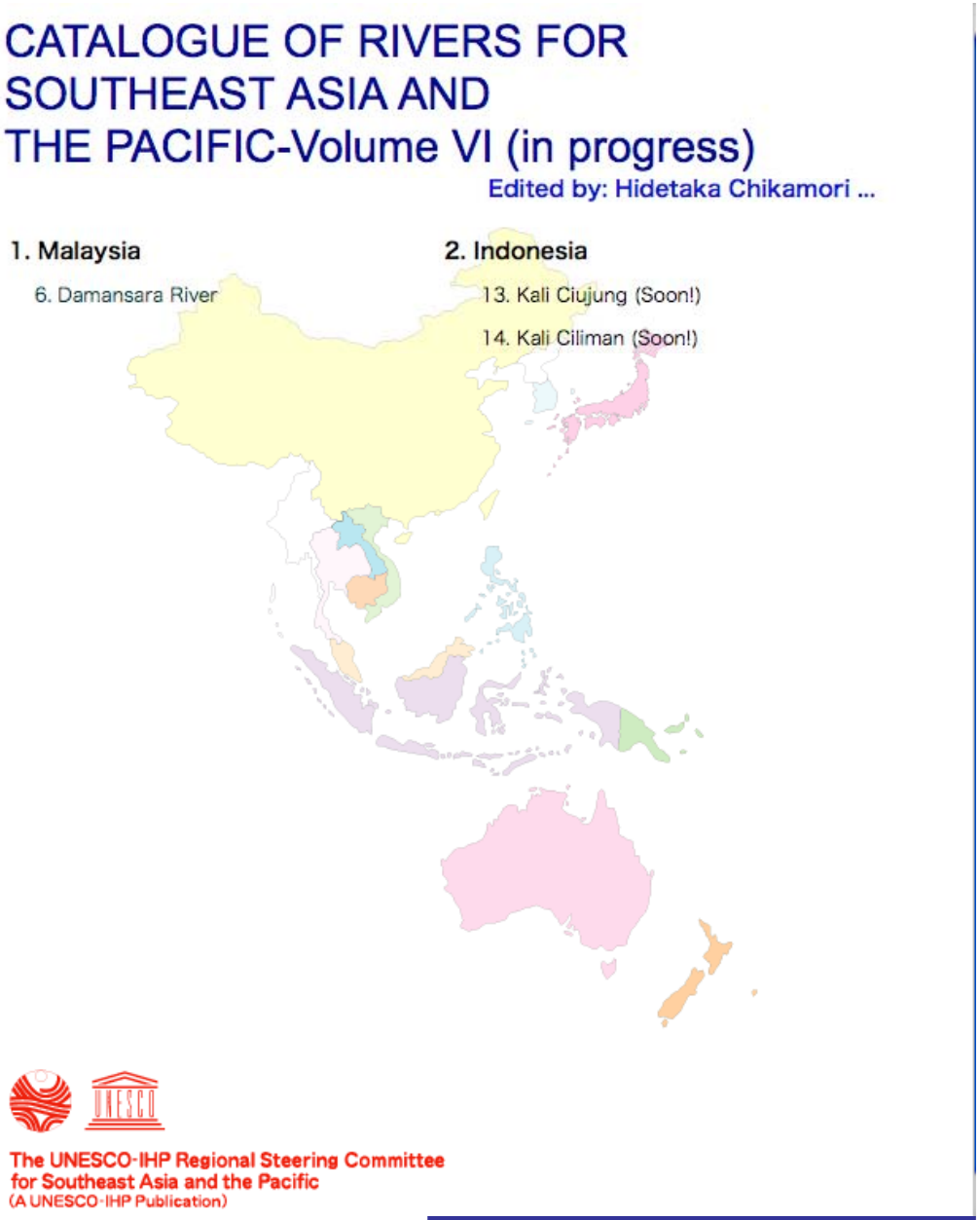
Website of Catalogue of Rivers – Present Situation –

- Compilation of Vol.VI is now in progress. Submitted data have been already uploaded.
  - One river in Malaysia
- Supplement No.1 is also in progress. Submitted data have been already uploaded.
  - Daily hydrometeorologigal data
  - Nine rivers (two in Australia, one in Japan, five in Malaysia, one in Thailand)

The UNESCO-IHP Regional Steering Committee
for Southeast Asia and the Pacific
(A UNESCO-IHP Publication)

Data Accumulation

- Submitted Data for Catalogue of Rivers would be accumulated as Vol. VI on the website.
- The information of each river can be updated anytime in the future.
- Everybody can access to the Catalogue of Rivers through this platform; the number of the printed book and CDs is limited.



Screenshot of the website of Vol. VI

Location of Website of the Catalogue

Two plans:

1. One of the IHP nodes already prepared in Asia-Pacific region:
   - Kofu, Melbourne or Kuala Lumpur.
2. Only web pages of the Catalogue are located in Kyoto, and linked from the all nodes.

… Which is better?

The UNESCO-IHP Regional Steering Committee
for Southeast Asia and the Pacific
(A UNESCO-IHP Publication)

Catalogue of Rivers Supplement

- Data for any rivers in the Catalogue will be published in CD form as
  “Catalogue of Rivers Supplement No.X”.
- This supplement will be published from time to time for upgrading data.
- Supplement No.1 will be published before May 2008 with 7 rivers already submitted by Malaysia (5), Thailand (1) and Japan (1).
- The data format is already proposed by Dr. Chikamori.
- Collected data for this publication will be sent to HTC.

The UNESCO-IHP Regional Steering Committee
for Southeast Asia and the Pacific
(A UNESCO-IHP Publication)

Progress Report
Catalogue of Rivers

October 2, 2008

Hidetaka Chikamori

1. Website of Catalogue of Rivers
2. Data Accumulation
3. Location of Website of the Catalogue

The UNESCO-IHP Regional Steering Committee
for Southeast Asia and the Pacific
(A UNESCO-IHP Publication)

ANNEX 7

RESOLUTIONS

Draft RESOLUTION RSC XVI-1

Honoring Achievements in the Region

The IHP RSC for South East Asia and the Pacific

Highlighting	its 16-year history since the establishment in 1993 and continuing active regional cooperation in producing scientific outcomes in the framework of UNESCO-IHP;
Recognizing	that there are a number of contributors who have made exceptional efforts to the RSC activities;
Establishes	an Award Committee in RSC to select recipients to be awarded for their remarkable achievement in activities such as management, research, and securing funds, facilities and in-kind services for progress in UNESCO-IHP and/or RSC activities;
Recommends	the IHP National Committees and UNESCO field offices in the region to nominate relevant candidates for the newly established awards.

Draft RESOLUTION RSC XVI-2

Invitation of new members

The IHP RSC for South East Asia and the Pacific

Noting	the return of Singapore to UNESCO on 8th October 2007;
Recognizing	that some countries such as Singapore, Brunei Darussalam and Timor Leste may wish to participate in the RSC activities;
Invites	these countries to join; and
Recommends	UNESCO field offices in the region to approach the relevant government agencies to enable participation in the RSC activities.