



INTERNATIONAL HYDROLOGICAL PROGRAMME

**12th IHP Regional Steering Committee
meeting for Southeast Asia and
Pacific**

Adelaide, Australia, 25-26 November 2004

FINAL REPORT

**IHP-VI Regional Steering Committee meeting | No. 12
Regional Steering Committee for Southeast Asia and the Pacific
UNESCO Jakarta Office, 2004**

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**The 12th IHP
Regional Steering Committee Meeting for
Southeast Asia and the Pacific**

**Adelaide, Australia
25-26 November 2005**

Chairman: Mr Tran Thuc (Vietnam)
Secretary: Prof Kaoru Takara (Japan)

UNESCO Representative: Mr Giuseppe Arduino (Jakarta Office)
Mr Hans Decker Thulstrup (Apia Office)

Countries Represented: Australia, Cambodia, China, Indonesia, Japan, Korea, Lao PDR, Malaysia, New Zealand, Papua New Guinea, Philippines, Niue (representing Pacific Island Countries), Vietnam, Thailand.

Observing Countries

1 OPENING

Mr Tran Thuc welcomed the participants, and encouraged collaboration among member countries, and thanked the Australian Organising Committee for the excellent work they have done for the meeting here.

2 ADOPTION OF AGENDA

The agenda was discussed and then adopted (Annex 1). Mr Trevor Daniell and Mr Ross James (Australia) were appointed rapporteurs.

3 SECRETARIAT REPORTS

3.1 UNESCO JAKARTA OFFICE REPORT

Mr Arduino reported on the activities carried out in the region since the last RSC meeting. Mr Arduino spoke to his report which is attached as Annex 3.

Mr Arduino highlighted that individual countries should support their representatives to the RSC. NZ, Australia, Japan, Korea were named as countries that should seek funding from their own governments. NZ and Japan already do this.

3.2 RSC SECRETARY REPORT

Mr Takara spoke to his report attached as Annex 8.

Mr Heng added some information on Centre Activities in China of ITRCHWE and ITRCES (International Training and Research Centre on Erosion and Sedimentation).

Mr Mohd Nor raised the concern of funding for the Nagoya Training Course to enable it to be carried out outside Japan. Mr Arduino stated that the 2005 training course will be carried out in Japan. Mr Nor was also concerned re funding to the Region from UNESCO Paris through the Regional Office.

3.3 UNESCO APIA REPORT

Mr Thulstrup spoke to his report (Annex4).

Mr Thulstrup apologised for not attending the 11th RSC in Fiji and reported on activities in the Region. The relationship with SOPAC was considered to be extremely important. Vanuatu has now a designated HELP basin. Support to enable the Pacific region to use this basin is required and this will be enabled with assistance from NZ and Australia. Other details are included in the Pacific Report.

Mr Thulstrup requested that it would be very timely for a new edition of the book Hydrology of Small Islands as the Apia Office are reprinting copies of the first edition of this very valuable book.

Mr Stewart said Australia would be happy for Mr Falkland to prepare a second edition of the book Hydrology of Small Islands.

ACTION ITEM: Australian delegates to contact Mr Tony Falkalnd

4 COUNTRY REPORTS

All country reports are listed in Annex 5.

4.1 AUSTRALIA

Mr Stewart reported on a new member from CSIRO who is associated with a HELP basin and it is hoped he will make a strong contribution to the IHP. He highlighted that the CRCs in water are reaching the final years of funding and are now putting a proposal as eWater in a new round of research CRCs. This submission was successful. Mr Stewart directed attention to the joint UNESCO/WMO flood initiative and the Japanese CHARM centre to address flood issues.

4.2 CAMBODIA

Mr Long reported on the Cambodia National Committee future activities as listed in Annex 5. Cambodia has difficulty in funding research projects and undertaking activities for the IHP.

4.3 PR CHINA

Mr Liu Heng summarised IHP China's activities and the broad range of activities that the Chinese hydrological practioners are undertaking.

4.4 INDONESIA

Mr Jan Sopaheluwakan reported on activities on the Indonesian IHP committee. He highlighted the collaboration and activites which Indonesia undertook in Ecohydrology and especially the book on Water resources reform.

4.5 JAPAN

Mr Takeuchi spoke to Japan's summary with special emphasis on the success of the support for the establishment of CHARM in Japan. A report on Japan's international involvement through funding international activities was reported on. One basin was designated as a HELP basin. He also reported on the contribution of a HELP basin to the Catalogue of River. Mr Takeuchi and Mr Takara both urged the developed countries of the region to support the activities of the RSC, both through in-kind resources and funding.

4.6 REPUBLIC OF KOREA

Mr Lee outlined that there were an increased number of future activities of the national IHP committee.

4.8 LAO PDR

Mr Somphanh Vithaya spoke to the country report in Annex 5 and highlighted the activities in which they had been involved over the last twelve months. Mr Vithaya indicated that Lao PDR was very keen to establish an IHP National Committee and RSC members were very supportive of this proposal.

ACTION: Assist LaoPDR with the process and models that are available for establishing a Committee.

4.9 MALAYSIA

Mr Mohamed Nor reported on behalf of Ir. Keizrul Abdullah, Chairman of the National Committee and commented on the appointment of a new Secretary of the IHP National Committee, Ir. Abdul Rahin Kaparawi. Mr Nor reported on activities of the National Committee, including representation at the IHP IG in Paris in September 2004, workshops, seminars and basic courses in hydrology.

4.10 NEW ZEALAND

Mr Ibbitt summarised activities in NZ including those associated with the International Year of Freshwater and disaster mitigation. Three posters from the IYFW were displayed. He provided information on the HELP basin in New Zealand and also a NZAID funded project on stream health monitoring kit (SHMAK) which was implemented in Fiji. He described the establishment of good relationships with SOPAC as forming a basis for the establishment of activities in the Pacific.

4.11 PAPUA NEW GUINEA

Mr Virobo presented the PNG report and highlighted the following issues: the proposed improvements to community water supply and sanitation, the application of permits to use water, the inadequacy of the hydrological networks and the wide range of activities water resources officers are now addressing such as river bank and bed erosion.

4.12 PHILIPPINES

Mr Liongson reported on the international region activities that the Philippines had been involved in over the past twelve months. The highlights included the coordination of the international activities across the water sector, the National Water Forum, the implementation of an integrated water resources management approach, the August 2004 flood event and subsequent improved cooperation and collaboration (including a national flood mitigation workshop), two groundwater resources assessment studies, flood control projects and technical reforms in the water sector.

4.13 THAILAND

Mr Khao-Uppatum reported on IHP activities noting the National Committee review of all committee work to develop a new policy and master plan on hydrology, establishment of river basin management committees, collaboration with the Mekong River Commission, a study of hydrological network requirements and involvement in training courses. He invited participants to attend a planned conference in Thailand in 2006. Mr Tingsanchali also invited participants to be involved in a training course at AIT.

4.14 VIETNAM

Mr Hoang commented on activities and new ministerial arrangements within Vietnam. There are future plans to IHP Vietnam committee were heavily involved in the organisation of the Conference associated with this meeting. Membership is changing as some senior members retire.

4.15 PACIFIC ISLANDS

Mr Siohane (Niue) reported on a number of projects being undertaken in the Pacific Island countries, including the Catchment and Communities project in Vanuatu. One of the catchments in Vanuatu has now been adopted as a basin in UNESCO's HELP initiative. He reported on the first course on surface water which was held at the SOPAC Secretariat in Suva in May 2004. There was some discussion on the representation of the Pacific Island Countries at the RSC meeting and participants were reminded of the decisions made at the last RSC meeting in this regard.

5 CENTRE FOR EXCELLENCE IN WATER EDUCATION PRESENTATION

Prof Graeme Dandy Interim Director of International Centre of Excellence in Water Resources Management (WaterEd) presented a brief overview of the program of activities that are to be undertaken by this centre.

Mr Takeuchi commented on the similarity of this centre with two Japanese Centres - The Centre for Monsoonal Research and the International Centre for Water Hazard and Risk Management. Bruce Stewart suggested that an increased cooperation between WaterEd and the Bureau of Meteorology could be developed.

6 REPORT FROM APF-TSC

Mr Daniell outlined an Action Plan for APF program. The minutes of the meeting held on Tuesday 23rd are included as Annex 6. The Date for the meeting in KL was amended to April 12th and 13th 2005.

7 PROGRESS OF THE CATALOGUE OF RIVERS (COR)

Mr Tachikawa presented the report of the editorial committee and referred to the publication of the 5th Volume and CDROM and then asked the question of whether Catalogue of Rivers Number VI should be published and whether Volumes 1 or 2 should be updated.

Mr Takeuchi supported the publishing of the sixth catalogue.

Mr Ibbitt commented that it had been decided at the 10th Meeting that after the 5th Volume of the Catalogue of Rivers there should be a review of the production of a 6th Volume.

Mr Mhd Nor commented that the present volumes are “too heavy” and expensive to print.

Mr Takeuchi commented that the COR is a “face of the RSC” within the region and world. The COR provides an extensive amount of metadata which supplements the APFRIEND archive.

It was suggested that more of the information be inserted into the archive and keeping it up to date as a high priority.

Mr Tawatchai commented that he thought the next volume should be progressed.

It was reinforced by Mr Ibbitt that all the COR data should be made available on the archive before progressing to Volume VI.

Mr Lee supported the COR as a useful document and that there should be a review committee to examine the need for further publications.

Mr Mhd Nor supported the production of a further copy of the Catalogue of Rivers.

Mr Tawatchai then supported the production of a further volume taking into account the comments of New Zealand.

Mr Liu Heng highlighted the fact that there was limited data from China in the present volumes and there was a need to have data that was more comprehensive.

Mr Stewart commented that a review needs to examine the benefits of any further production and agreed with Japan that there is need to gain greater benefits from the data base of review activities.

Mr Daniell commented that a small committee could undertake such a review but the review should not be prolonged.

Mr Lee nominated Mr Daniell as Chairman of this Committee in his role as Chairman of the TSC. Mr Daniell nominated Mr Tachikawa and Mr Lee to be members of the Committee.

It was determined that a review of the Catalogue of Rivers program and the archive should be updated with all available data from the Catalogues.

ACTION: Terms of Reference for the Review of the Catalogue of Rivers to be determined and a Report be produced for the April Meeting of the TSC in KL.

ACTION All data for uploading to the Archive be made available and uploaded onto the Archive. All countries to submit data to Archive Manager in Malaysia.

8 REPORT ON THE IHP INTERGOVERNMENTAL COUNCIL, PARIS, SEPTEMBER 2004.

Mr Arduino outlined the decisions made at the Intergovernmental Council and Resolution 7 was circulated.

The draft Procedure and Criteria for Managing the Solidarity Fund for the Program Safe Water for all was outlined. There was interest from member countries how should they be involved in the process to achieve the best outcome for individual countries to obtain funding.

Resolution 7 was debated with many countries participating. There was no substantial resolution and the discussion highlighted the special nature of the governing process which the RSC operated under. It was felt that forcing an intergovernmental structure on the Region would be detrimental to the processes that have been established. The meeting was adjourned following much discussion.

9 REPORTS OF CENTRES UNDER AUSPICES OF UNESCO

9.1 THE HUMID TROPICS CENTRE

Mr Mohd Nor reported on the Activities of the Centre, noting that the CC Meeting had been held Earlier in the Week and that the Report is available to those that request it.

9.2 INTERNATIONAL CENTRE FOR WATER HAZARD AND RISK MANAGEMENT

Mr Yoshitani circulated a number of documents and then reported on the Centre and the accommodation that the PWRI has developed. He outlined that the Centre would initially look at Flood Issues and the progress that has been made in developing the establishment. Attendance at a number of meetings that were relevant to the Centre has been undertaken.

There is much information on the website www.unesco.pwri.go.jp.

Mr Nor asked how many staff were going to be part of the Centre. Mr Yoshitani replied that there would be a total of twenty staff be employed in the centre and be fully operational in 2007. Mr Stewart commented that any work on Global Flood forecasting should be passed onto the appropriate WMO committee.

9.3 ASIA PACIFIC CENTRE FOR ECOHYDROLOGY

Mr Sopaheluwakan thanked all the countries for their support of the Centre. He spoke to a paper which was circulated and outlined the location and accommodation that the Centre would have. Some discussion ensued on the particular research that would be undertaken at the centre.

10 STATUS OF RSC LOGO SELECTION

Mr Mohd Nor showed the Logos submitted by Japan and Malaysia. After much discussion a modified form of Japanese No 1, with blue waves and text external to the IHP Logo, was considered.

11 RSC 13TH MEETING IN 2005, BALI, INDONESIA

It is proposed that an International Symposium on Ecohydrology will be held in conjunction with the RSC Meeting. An initial program was circulated describing the themes. The programme structure was reviewed with a 2-days symposium, 1day field trip, 2days for meetings.

ACTION: The Dates and Meeting structure to be confirmed by the Indonesian Committee.

12 RSC 14TH MEETING IN 2006, THAILAND

The 3rd APH WR will be held in Bangkok, 16th-17th October 2006. Committee meetings have already been held to define the programme for the Conference.

13 OTHER BUSINESS ARISING

The terms of Reference for the Review of Catalogue of Rivers (Annex 7) were discussed.

Mr Lee suggested that the review was too comprehensive and there was a need for countries to examine what is required.

Mr Tachikawa stated that there is a need to evaluate the content of the Archive and at the same time continue on with input to the Archive. Much discussion then centred around the timing and scope of the review.

Mr Takeuchi stated that we are committed to the review and then decide on what publication should be made.

Mr Ibbitt stated that the TOR should not presuppose that a future publication is going to be produced.

Mr Mohd Nor was concerned that there needed to be staff to input the data into the archive to satisfy the use of the Catalogue of rivers.

Mr James stated that there is a need for commitment to the amount of information that individual countries are prepared to present for addition to the archive.

14 RESOLUTIONS

14.1 LAO PDR IHP NATIONAL COMMITTEE

A resolution was prepared to enable the establishment of a Lao PDR IHP Committee (Annex 10). Mr Arduino is to liaise with UNESCO Paris and develop the process to progress this with the IHP Secretariat.

14.2 IHP GOVERNANCE

A resolution was prepared to show the concerns of the region on governance (Annex 11). A statement was prepared to show our concern on the proposed Regional Intergovernmental Council Structure.

The meeting agreed to the resolution attached.

15 ELECTION OF RSC SECRETARY

The Chairman raised the matter of the election of the Secretary.

Mr Soontak Lee suggested that Mr Takara be nominated to continue as Secretary for the next two years and, after his acceptance of continuing in the position, he was unanimously supported.

16 CLOSING OF MEETING

Mr Tran Thuc Chairman of the RSC closed the meeting at 1:50 pm on 26 November. He thanked participants for their deliberations and encouraged collaboration among member countries before the next RSC meeting.

ACTION ITEMS	BY WHOM	Date
1. Review and update of the Small Island Hydrology Publication	Australian delegates to contact Mr Tony Falkland	Feb 2005
2. RSC to assist LaoPDR in establishment of National IHP committee	Mr Arduino to forward resolution and appropriate structures and processes for such a committee	Feb 2005
3. Terms of Reference for the Review of the Catalogue of Rivers to be determined and a Report be produced for the April Meeting of the TSC in KL	Mr Daniell, Mr Tatchikawa, Mr Soontak Lee	11 th April
4. All data for uploading to the Archive be made available and uploaded onto the Archive.	All countries to submit data to Archive Manager in Malaysia	Before June 2005
5. RSC 13 th Meeting Dates and Programme to be Circulated	Indonesian IHP Committee	April 2005
6. Resolution on Governance to be submitted to Intergovernmental Council Executive Committee	Mr Liu Heng and Mr Arduino to organize letter.	Feb 2005
7. Action item of TSC on information with regards APFriend Research and Meeting	All countries	Jan 2005

ANNEX 1

**PARTICIPANTS, 12TH MEETING OF THE IHP
REGIONAL STEERING COMMITTEE FOR
SOUTHEAST ASIA AND THE PACIFIC**

ANNEX 1
PARTICIPANTS, 12TH MEETING OF THE IHP
REGIONAL STEERING COMMITTEE FOR
SOUTHEAST ASIA AND THE PACIFIC

NAME	COUNTRY
DANIELL Trevor	Australia
JAMES Ross	Australia
PETROPOULOS Tina	Australia
STEWART Bruce	Australia
WHITE Ian	Australia
LONG Saravuth	Cambodia
CHEN Yuanfang	China
JAYAWARDENA A.W.	China
Li Zhijia	China
LIANG Zhongmin	China
LIU Heng	China
XU Zongxue	China
IBRAHIM Agung Bagiawan	Indonesia
LOEBIS Joesron	Indonesia
SOPAHELUWAKAN Jan	Indonesia
CHIKAMORI Hidetaka	Japan
KANZAKI Keiko (Ms)	Japan
KAWAMURA Akira	Japan
KIM Sunmin	Japan
KINOUCI Tsuyoshi	Japan
SAYAMA Takahiro	Japan
TACHIKAWA Yasuto	Japan
TAKARA Kaoru	Japan
TAKEUCHI Kuniyoshi	Japan
YOSHITANI Junichi	Japan
JEE Hong Kee	Korea
LEE Soontak	Korea
SHIN Hyun-Suk	Korea
VITHAYA Somphanh	Lao PDR
MOHAMED DESA Mohamed Nor	Malaysia
CURRY Bob	New Zealand
IBBITT Richard	New Zealand
SIOHANE Andre	Niue(PIC)
LIONGSON Leonardo	Philippines
VIROBO Maino	PNG
AEKARAJ Sukontha (Ms)	Thailand
KHAO-UPPATUM Virat	Thailand
PROMMA Kitchakarn	Thailand
TINGSANCHALI Tawatchai	Thailand
ARDUINO Giuseppe	UNESCO
THULSTRUP Hans	UNESCO
HOANG Tuyen	Vietnam
TRAN Thuc	Vietnam

ANNEX 2

**AGENDA, 12TH MEETING OF THE IHP
REGIONAL STEERING COMMITTEE FOR
SOUTHEAST ASIA AND THE PACIFIC**

ANNEX 2

AGENDA, 12TH MEETING OF THE IHP REGIONAL STEERING COMMITTEE FOR SOUTHEAST ASIA AND THE PACIFIC Hilton Hotel, Adelaide, Thursday 25 and Friday 26 November 2004

Thursday 25 November

- 1) Opening (9.00 a.m.)
- 2) Adoption of the Agenda
- 3) Election of Rapporteur
- 4) Secretariat reports
- 5) Country Reports (5-10 minutes each), discussion
- 6) Centre for Excellence in Water Education (Prof. Graeme Dandy)
- 7) Report from the Asia-Pacific FRIEND Technical Sub-committee Meeting (APF-TSC)
- 8) Progress of the Catalogue of Rivers
- 9) Report on the IHP Intergovernmental Council, Paris, September 2004

Friday 26 November

- 10) Development of Centres under auspices of UNESCO
- 11) Status of RSC Logo Selection
- 12) Organization of the 13th RSC Meeting in Bali Indonesia, November 2005
- 13) Organization of the 14th RSC Meeting in 2006
- 14) Other issues raised
- 15) Adoption of Resolutions
- 16) Election of RSC Secretary
- 17) Closing of the Meeting (approximately at 12.30)

ANNEX 3

**SECRETARIAT REPORT
BY
UNESCO JAKARTA OFFICE**

**12TH IHP REGIONAL STEERING COMMITTEE MEETING
FOR SOUTHEAST ASIA AND THE PACIFIC**
Adelaide, Australia, 25-26 November 2004

UNESCO JAKARTA OFFICE
Secretariat Report

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

1.1 Follow-up to the 11th IHP-RSC meeting

A number of actions to be followed-up were identified during the 11th RSC meeting (UNESCO Office, Jakarta, 2003). Here below is a brief report on the current status:

1. *Mr. Jayawardena to provide all available information for Catalogue of Rivers Volume 1 to Mr. Takara*
2. *Organizers of regional training programs to try and include at least one representative from Pacific Island Countries*
One participant from Fiji attended the 14th IHP Training Course “Hydrology in Asia” in Kuala Lumpur, October 2004.
3. *Countries are urged to consider projects that may be suitable for submission for funding under the UNESCO Participation Programme*
Australia and Niue have achieved in their tasks, being their proposal accepted and granted by the Participation Programme
4. *Mr. Arduino to review IHP Governance issues of Southeast Asia and the Pacific Committee in the previous RSC meetings and Chairman Keizrul to prepare and submit a draft resolution to the Ad Hoc Committee prior the IHP IGC in June 2004*
The information was provided to Chairman Keizrul and the reported completed for the IHP 16th Intergovernmental Council, Paris, September 2004.
5. *Countries to submit ideas for a logo*

1.2 Workshops, training courses and symposia

1.2.1 The 13th IHP Training Course: “Effects of Pollutants on Atmospheric Environment” (Nagoya and Tokyo, Japan, 7 – 20 March 2004)

The general aim of the course was to help the participants to develop their basic knowledge on the effects of pollutants on the atmospheric environments and on climate changes, as well as to contribute to solve current global environmental problems. The course focused on two major subjects. First, the examination of gases, aerosol particles and clouds with direct aircraft/ground and radar/satellite observations. Second, the study of the effect of anthropogenic pollutants on atmospheric environments with mathematical modelling and simulation. The lectures and practical activities were conducted in Nagoya University and Toyohashi University of Technology. The course

was attended by 9 participants from Indonesia, Lao PDR, Bhutan, Philippines, Thailand, New Zealand, Nepal, Vietnam, and Japan.

1.2.2 Computer Aided Workshop on Groundwater Contamination

(AIT, Pathumthani, Thailand, 26 April - 4 May 2004)

This workshop was the sixth of a series jointly organized in the Asia-Pacific region since 1994 by the IHP National Committee of Germany and UNESCO Jakarta, in co-operation with the hosting of Member States. The main purpose of these workshops, which are specifically tailored to regional researchers, hydro-geologists and engineers, is to increase knowledge and awareness on how to identify and prevent groundwater contamination. Apart from theoretical and computer-based sessions on analytical and numerical modeling of aquifers, every workshop also included the presentation of case studies from the Asian Pacific Region and technical field trips.

This workshop, attended by 12 participants from Indonesia, Tanzania (Japan), Philippines, Lao PDR, DPR Korea, Malaysia, Myanmar, Pakistan, Thailand, and Vietnam, in which UNESCO Office, Jakarta led in managing the regional organization, was organized by the Asian Institute of Technology (AIT) with financial support from the German IHP/OHP-Secretariat and UNESCO Office Jakarta.

1.2.3 14th IHP Training Course: “ Hydrology in Asia”

(The Humid Tropics Centre, Kuala Lumpur, Malaysia, 11-15 October 2004)

The main goal of the 14th IHP Training Course was to recognize the current environmental and hydrological problems faced by Asian countries. During the course, the participants reviewed and evaluated the past IHP Nagoya training courses. Discussions on trends and directions for future training courses were held.

The Course was attended by 16 participants from Malaysia and 13 participants from Indonesia, Bangladesh, China, Egypt, Fiji, Lao PDR, Nepal, New Zealand, Philippines, Sri Lanka and Vietnam.

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

1.3.1 5th Meeting of FRIEND Intergroup Coordination Committee (Koblenz, 9 July 2004) and International Workshop on Hydrological Extremes, Modelling and Managing Low Flows, Droughts and Floods FRIEND NE/AMHY (5-8 July 2004)

The 5th meeting of FRIEND Intergroup Coordination Committee (FIGCC) held in Koblenz, Germany, 9 July 2004, was an attempt to link researchers who are partners in AP-FRIEND and to develop activities in low and high flow research areas.

The International Workshop on Hydrological Extremes, Modeling and Managing Low Flows, Droughts and Floods was held beforehand from 5th to 8th July 2004. The workshop was jointly organized by the German IHP/OHP National Committee and UNESCO Division of Water Sciences.

The workshop was a contribution of the German IHP/OHP National Committee to the Phase VI of IHP of UNESCO. It was implemented within the framework of Theme 2 Integrated Watershed and Aquifer Dynamics, focal area 2.1 Extreme Events in Land and Water Resources Management.

UNESCO Office, Jakarta, provided a travel grant to support Mr. Trevor Daniell, from University of Adelaide, South Australia, to attend both the international workshop and the 5th FRIEND Inter-Group Coordination Committee held in Koblenz, as AP FRIEND Coordinator. During the meeting, different points were underlined, such as the possibility to establish a meteorological and hydrological drought forecasting modeling system to guarantee proper drought management; the importance of collecting high quality information and data; the need to extend and improve the application of the techniques developed in Europe for low flow analysis in semi arid regions or regions with significant zero flows recorded.

1.3.2 Catalogue of Rivers for Southeast Asia and the Pacific

The 5th volume of the Catalogue of Rivers has been published in May 2004, both in digital (CD-ROM) and hard copy. Contributions from 12 countries were provided with information regarding 21 river basins.

1.4 Activities within UNESCO Jakarta

1.4.1 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 km², 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 km² 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 (1111 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 Scientific Council of the Ha Noi Institute of Geophysics and the Viet Nam National Assembly and Jakarta Office started discussing in July 2003 the need of a pilot and production project in the Binh Thuan Province. The main activities include a hydro-geological investigation for the definition of a drilling campaign and the choice of a suitable site for the artificial recharge project, a regional workshop on artificial aquifer recharge experiences and techniques in Southeast Asia (scheduled 15-17 December 2004), training courses for Vietnamese scientists and a period of one year monitoring.

This project, which is currently under implementation, is co-funded by the Vietnamese Government, UNESCO Office, Jakarta, ICSU (International Council for Science) and the Italian Ministry for the Environment and Territory.

1.4.2 Pilot Project for Community-based Flood Mitigation and Preparedness – Phase 2

“During floods in early 2002, at least 30 people were killed and 300,000 were forced to flee their homes. The biggest flood in the city's history hit 168 of 262 sub-districts and paralysed the capital for days.” (The Jakarta Post, 10.09.2003)

With its population exceeding twelve millions, Jakarta is considered as one of the most problematic “mega-cities” in the world for its intricate urban development issues. Being located in a coastal lowland area and cut across by thirteen rivers and many other streams, Indonesia’s capital city is affected by recurrent inundations, especially during the high rainy season. In February 2002, disastrous floods affected 24 % of its total area (around 650 km²), claiming at least 30 lives, and paralysing the city for days. One of the most-severely affected areas was the sub-district of Kelurahan Bidara Cina (East Jakarta), which is inhabited by approximately 44.000 persons. A high-density area (57.000 inhabitants/km²) was selected as pilot site for the implementation of the project (concerning more than 3.000 residents). Located along the Ciliwung River, this area is particularly vulnerable to inundations and was affected by five-year recurrent severe flooding.

The Flood Mitigation Project, a collaboration between UNESCO Office, Jakarta, and LAPI-ITB (Foundation for Research Affiliation and Industry - Institute of Technology Bandung), is designed to improve the community’s understanding and awareness of natural and social components of floods and aims at strengthening the people’s preparedness to deal with these dramatic events. The final objective is to improve the community’s behavior in order to reduce the vulnerability of the residents and their belongings. Each phase of the project was conceived in a way to be easily replicated at larger scale, with the ultimate goal of improving flood control in Jakarta.

The main activities of this project focused on non-structural flood mitigation and preparedness measures. The project was structured in two phases. The first phase, from July 2003 to January 2004, was characterized by the facilitation process, which included activities aimed at assessing the community’s capacity and vulnerability in relation to flood events, and by public education and training courses for the community representatives. At the end of the first phase, a community forum was established. The forum’s first responsibility was to develop several proposals about possible activities aimed at improving the assessed capacity and decreasing vulnerability.

The second phase consisted in the implementation of the community forum’s proposals. From May to August 2004, the community’s representatives attended new training courses, such as search and rescue, post-flood health management, waste management and leadership training. Besides the training courses, a waste collection system was established, promoting also recycling.

The establishment of a trained and prepared community forum can be considered as the major achievement of this project. The forum acquired the knowledge and the capacity to better deal with floods, to be prepared before, during and after disaster occurrence. Most of all, through its visibility within the community and through the daily contacts with the other residents, the forum is an important channel for disseminating the information to the rest of the community and ensuring that the whole community can better react to future floods. Another major achievement was the establishment of a waste collection system, which has two long-terms positive results: the improvement of both the environment and the community’s quality of life and the reduction of flood

impacts (the river is no longer used as waste disposal, which obstructed dykes and channels, impeding water to drain and therefore increasing the impact of these events).

1.4.3 Water quality, water supply and water use

In the framework of UNESCO's IHP, Theme 4 Water and Society focal Area 4.4 "Human security in water-related disasters and degrading environment", and in conjunction with the implementation of the Pilot Project for Community-based Flood Mitigation and Preparedness in Bidara Cina, East Jakarta, the project "*Water quality, water supply and water use*" implemented with the Laboratory for Industrial Hygiene and Toxicology – Institute Technology of Bandung, aimed at assessing the water supply resources of a community in a highly populated area, with particular focus on how a community faces water borne diseases, through both surface and groundwater supply.

The project carried out field investigations for the localisation and characterisation of water points (both from surface water and water wells), and water sampling for water quality chemical analyses. The main objective of the study was to gather information about the existing water supply's conditions, consumption and quality in the administrative area of Bidara Cina RW 06 (local unit under the authority of the Sub sub-District, with 3,076 inhabitants). Chemical analysis on 25 groundwater samples from open and closed wells showed high contamination by Arsenic, occurrence of Cadmium and Antimony with concentrations over the maximum tolerable levels. The bacteriological analyses showed contamination by both total coliform and faecal coli at concentrations higher than 2400/100 ml (standard level is 0/100 ml), indicating that the water is highly polluted by faecal matter.

The results of the chemical and bacteriological analysis conducted within RW 06 areas, will be integrated with the result of the flood project, setting up the basis for the implementation of further UNESCO initiatives intended to address urban water problems.

1.4.4 Indonesia - Italy round table on "Ecohydrology: river load and eutrophication"

According to the International Conference on World Water Resources held in Paris in 1998, a serious decline of water resources has been observed in many parts of the world. One of the main causes identified is the lack of knowledge of how to establish sustainable water management. The decline of water quality and biodiversity observed in both developed and developing countries provides an evidence that purely hydro-technical solutions and fragmented approach to water resources at the global scale, has been unsuccessful. An efficient approach should be based on the understanding of the temporal and spatial patterns of catchment-scale water dynamics. Ecohydrology is a concept, which aim is to create a new interdisciplinary background for assessment and sustainable management of freshwater resources, i.e. improving the understanding of basin scale processes by integrating of biological and hydrological factors toward enhancement of resistance and resilience of fresh water ecosystems against anthropogenic stress:

"The general idea of the concept is that, by applying an understanding of the interplay between hydrology and biota, considering the range of techniques from the molecular to the catchment scales, an augmentation of the absorbing capacity can be achieved". (ZALEWSKI M., 2003, Proceedings of the 2nd Asia Pacific Training Workshop on Ecohydrology, IHP, Cibinong-Indonesia, p.1.)

The Indonesia – Italy Round Table on "Ecohydrology: River Load and Eutrophication", was held in Jakarta from 21 to 22 June. The main objective of the meeting was the exchange of scientific experiences and methodologies on freshwater and coastal ecosystems management. In particular, the round-table focused on scientific assessment, cause-effect relations, innovative methodology, and remediation strategies of eutrophication. Starting from a common scientific background between the Italian and the Indonesian counterparts and having the opportunity to discuss watershed and

ecological processes under different climatic conditions (temperate vs. tropical), the round table was intended to become the seed for future scientific collaborations.

“In the last 50 years, the volume of clean water on the island of Jawa has decreased up to 30%, The Minister of Research and Technology Hatta Radjasa said. When opening the Indonesia-Italy Round Table on Ecohydrology: River Load and Eutrophication in Jakarta yesterday, Hatta Radjasa explained that the problem of decreasing clean water volume in Indonesia is the main topic of the Round table, which is part of the Italy-Indonesia cooperation. Italy, he said, has succeeded in managing its water resources and it has been asked to share its experience in the forum.”
(Bisnis Indonesia Daily, 22 June 2004)

The event was promoted under the umbrella of the Executive Programme (2004-2007) of Science & Technology cooperation between the Government of the Republic of Indonesia and the Government of the Italian Republic. The meeting was jointly organized by the Ministry of Research and Technology (RISTEK), the Embassy of Italy in Jakarta, the Indonesian Institute of Science (LIPI), and the UNESCO Office, Jakarta (Regional Science Bureau for Asia and the Pacific), in collaboration with LIPI - Limnology Research Centre, the Italian National Research Council (CNR) - Water Research Institute-IRSA and Institute of Ecosystem Study-ISE, the Italian National Agency for New Technologies, Energy and the Environment (ENEA) and the Italian Institute of Culture (IIC – Jakarta).

The discussions focused on the following scientific aspects: 1) Load evaluation, point and no point sources; nutrient loads and transport; 2) Circulation of organic matter; 3) Ecological implication of eutrophication and remediation strategies; 4) innovative methodology; 5) Interdisciplinary approach to research.

“The information-sharing may be particularly useful considering that, (...), Italy has experienced most of the fresh and coastal water problems Indonesia is facing”.
(The Jakarta Post, 29 June 2004)

1.5 Purchase and distribution of 32 copies of journal “Landslides” (Vol. 1)

UNESCO Office, Jakarta, purchased 32 copies of Volume 1 (4 issues) of “Landslides”, the journal of the International Consortium on Landslides, which were later distributed to the following 14 IHP National Committees: Australia, Cambodia, China, Indonesia, Korea DPR, Republic of Korea, Lao PDR, Malaysia, Myanmar, New Zealand, Papua New guinea, Philippines, Thailand, Vietnam. Other copies were given to IRTCES, CCOP, SOPAC and UNESCO Jakarta.

1.6 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 1998-2003, was presented by UNESCO Office, Jakarta, at the meeting held in UNESCO Office, Jakarta, from 18 to 19 May 2004. 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 Jakarta will continue to seek financial support for IHP Regional Steering Committee Meetings from other member countries. The IHP member countries may continue to explore the possibility of funding through the Participation Programme. More effort should be made in order to ensure the IHP Regional Steering Committee Meetings be attended by competent national participants.
2. UNESCO should establish a mechanism that would encourage Member States to send 2 participants to the IHP Regional Steering Committee, ensuring that at least one could rightly represent their respective governments on policy-making. All possible means should be explored such as:
 - encouraging countries such as New Zealand, Australia, and Republic of Korea to self-fund their participants and such as Malaysia and China at least one participant while UNESCO will fund the other participants.
3. UNESCO should make an effort to acquire and document the level of contributions of the IHP member states to the funding of participants and other activities (such as the publication of the catalogue of rivers).

2. PUBLICATIONS SINCE NOVEMBER 2003

Proceedings of the International Conference on Managing Water Resources under Climatic Extremes and Natural Disasters. Sigatoka, Fiji, 27-28 October 2003. Edited by K. Takara and T. Kojima. IHP-VI Technical Documents in Hydrology. No. 2. UNESCO Jakarta Office, 2003.

11th IHP Regional Steering Committee meeting for Southeast Asia and the Pacific. Sigatoka, Fiji, 30-31 October 2003. Final Report. IHP-VI. No. 11. UNESCO Jakarta Office, 2003.

Catalogue of Rivers for Southeast Asia and the Pacific- Volume V. Edited by Y. Tachikawa, R. James, K. Abdullah, M. N. M. Desa. UNESCO-IHP Regional Steering Committee for Southeast Asia and the Pacific, May 2004.

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ANNEX 4

**SECRETARIAT REPORT
BY
UNESCO APIA OFFICE**

**12th IHP REGIONAL STEERING COMMITTEE MEETING FOR SOUTHEAST
ASIA AND THE PACIFIC
Adelaide, Australia, 25-26 November 2004**

**UNESCO Apia Office
Informal Secretariat Report**

Introduction

The Pacific sub-region will be represented at the 12th RSC by Niue as per the agreement reached between Pacific representatives at the 11th RSC in Fiji, 2003. The main national report on IHP activities in the sub-region will be delivered by Niue as a sub-regional report. The present report UNESCO Apia Office (UNESCO Office for the Pacific States) should be seen as an appendix to this main account of Pacific IHP activities.

UNESCO Apia apologizes for the absence of an office representative at the 11th RSC meeting in Sigatoka, October 2003. At the same time, UNESCO Apia thanks all members of the RSC and in particular the Secretariat and the host agency SOPAC for ensuring a successful RSC meeting and Symposium – the first of its kind in a Pacific small island country.

Partnerships

The main modality of the UNESCO Apia Office IHP programme remains the development and maintenance of regional partnerships. A major such undertaking during 2003-2004 has been the Type II Pacific Partnership on Sustainable Water Management under which WMO, NZAID, SOPAC, NIWA, UNESCO and other partners cooperate on addressing - in a strategic manner - urgent needs of the region related to water resources. NZAID has provided funding for activities under this partnership, the activities of which are coordinated by SOPAC in the context of the Pacific Regional Action Plan on Sustainable Water Management. The SOPAC/WMO/UNESCO/NIWA three-year training course for hydrologists and hydrological technicians, now entering its second year, is an example of the outputs of this programme. UNESCO Apia Office recognizes the considerable contribution of the Government and research community of New Zealand through NZAID and NIWA as well as the substantial coordinating role of SOPAC towards this partnership. Further details are available in the Pacific national report.

New, emerging partnerships include cooperation on *Education for Sustainable Water Management*, now under discussion with SOPAC and the Melbourne-based regional NGO Live & Learn Environmental Education.

Catchments and Communities – HELP in the Pacific

The ongoing project *Catchments and Communities*, which has been implemented by the Government of Vanuatu with support from UNESCO Apia since 2000, led to the nomination of the Talise catchment area as a HELP Basin in January 2004. In order to ensure the maximum benefit of this development to Vanuatu as well as to the Pacific as a whole, UNESCO Apia and SOPAC will organize – with additional support from UNESCO Jakarta Office - a Pacific HELP Experts' Symposium during the second half of 2005. Proposed to be held in Port Vila, Vanuatu, the Symposium will discuss the development of the Talise HELP Basin as well as develop guidelines on the development of a Pacific HELP programme taking into account the particular challenges facing the Pacific, such as human resource and financial capacity. Participants will include key experts from the region, representatives from national agencies and organizations in Vanuatu, as well as representatives of other Pacific island countries.

Smaller projects and activities

Under the long-standing UNESCO Apia – SOPAC partnership, a number of smaller activities are currently ongoing or foreseen for the near future. These include the provision of technical and financial support for the development of a drought index for the Cook Islands, strengthening of the hydrometric monitoring network in Samoa, and support for groundwater monitoring in Niue (in association with the approved UNESCO PP project).

In partnership with SOPAC, UNESCO Jakarta and the Government of Japan, support will be provided for the undertaking of a water resources assessment study in the Federated States of Micronesia (FSM). The activity will take place as part of a joint HYD-ECO project for FSM, which will also see the development of two Biosphere Reserves in And Atoll (Pohnpei) and Utwe-Walung (Kosrae), respectively.

Publications

In consultation with UNESCO Headquarters and SOPAC, UNESCO Apia is providing financial support for the re-printing of 200 copies of Dr. Tony Falkland's "Hydrology and Water Resources of Small Islands" (Studies and Reports in Hydrology No. 49, UNESCO, 1991). Currently out of print, the publication remains in high demand in the region. The reprinting will ensure that the book will be available at the coming two years' sessions of the WMO/SOPAC/NIWA/UNESCO hydrological training course. In the longer term, UNESCO Apia will discuss with Dr. Falkland and IHP Australia about the possibility of developing a new, revised and updated edition of "Hydrology and Water Resources of Small Islands".

ANNEX 5

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NATIONAL REPORT ON IHP RELATED ACTIVITIES AUSTRALIA

1. ACTIVITIES UNDERTAKEN IN THE PERIOD OCTOBER 2003 – SEPTEMBER 2004

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. Members of the national UNESCO Science and Technology Network last met in Canberra on Monday 9 February 2004 in association with a visit by Dr Mike Bonell from the Secretariat of the UNESCO International Hydrological Program (IHP) in Paris.

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	ACTEW Corporation
Trevor Daniell	Urban/Flood 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 (and Water Research Foundation of Australia)
Erwin Weinmann	Flood management/water resource management	CRC for Catchment Hydrology
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 Land & Water, Griffith

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 Cooperative Research Centre (CRC) for Catchment Hydrology 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 regularly contributed to international data centres for use in global and regional studies. The Cooperative Research Centre for Catchment Hydrology (<http://www.catchment.crc.org.au/>) is undertaking research on the use of GCM outputs to provide “natural” hydrological parameters in near real time. 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.

- *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 Australian National University (ANU) is researching artesian groundwater processes in the lower Great Artesian Basin. ANU, with Ecowise Environmental, are investigating shallow groundwater recharge, socio-cultural aspects of groundwater management and impacts of drought in low coral islands as part of an UNESCO-IHP project. Most Australian water agencies are in the process of developing river basin management plans 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 Australian National University and Ecowise Environmental have ongoing projects in conjunction with UNESCO-IHP investigating shallow groundwater recharge, socio-cultural aspects of groundwater management and impacts of drought in low coral islands. Research into hydrological process in and the sustainable management of wetlands is being undertaken in a number of universities and cooperative research centres in Australia (CRC for Freshwater Ecology, CRC for Catchment Hydrology, CRC for Coastal Zone, Estuary and Waterway Management). 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/full> 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 is currently receiving a lot of attention in Australia and is a potential resource for other similar projects in other countries.
- *Theme 5 Water Education and Training*
Each of the Cooperative Research Centres (CRC) (<https://sciencegrants.dest.gov.au/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:
[CRC for Catchment Hydrology](http://www.catchment.crc.org.au/) (<http://www.catchment.crc.org.au/>)
[CRC for Coastal Zone, Estuary and Waterway Management](http://www.coastal.crc.org.au/) (<http://www.coastal.crc.org.au/>)
[CRC for Freshwater Ecology](http://enterprise.canberra.edu.au/WWW/www-crcfe.nsf) (<http://enterprise.canberra.edu.au/WWW/www-crcfe.nsf>)
[CRC for Tropical Rainforest Ecology and Management](http://www.rainforest-crc.jcu.edu.au/) (<http://www.rainforest-crc.jcu.edu.au/>)
[CRC for Water Quality and Treatment](http://www.waterquality.crc.org.au/) (<http://www.waterquality.crc.org.au/>)

These CRCs are 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.
- Centre for Resource and Environmental Studies, 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, water and land policy and related socio-economic impacts, ecological economics.

- *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 HELP International Steering Committee (ISC) has accepted CSIRO Griffith and Charles Sturt University Wagga Wagga as a Regional Coordinating Unit for HELP and the Lower Murrumbidgee Catchment has been included as the only HELP Reference Basin in the Pilot Phase and also in the Demonstration Phase in the lead up to the full implementation of HELP. The Mount Lofty Ranges in South Australia was proposed as an Operational Help Basin.

1.1.3 Decisions regarding contribution to/participation in IHP-VII

At this stage, the Australian IHP Network is still considering how it will be best placed to contribute to the IHP-VII. It is anticipated that activities currently underway or planned in Australia of relevance to the IHP-VII will be identified as part of this process.

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

1.2.1 National/local scientific and technical meetings

- Water Recycling Australia, 2nd National Conference, 1-3 September 2003, Brisbane showcased the latest development in research and development and practical applications of water recycling, including stormwater and rainwater across Australia and overseas.
- Sixth International River Symposium, 2-5 September 2003 with the theme Urban Rivers – balancing the expectations.
- Drought Management Workshop, 15-16 September 2003 Sydney with the theme Drought Management – Will Your System Cope.
- Ozwater Convention & Exhibition, Perth 2003 with the theme of Innovations in Water focused on innovative solutions to the many technical and financial issues confronting the industry.
- UN Association of Australia National Water Conference, 7-8 October 2003, Melbourne with the theme Towards a National Water Policy Framework: Vision to Implementation.
- The 2003 International River Health Conference, 19-21 October 2003, Mildura, Victoria. The Conference is Australia's only environment event for kids and by kids. The International River Health Conference provides hands on, student-centred learning to bring about a cultural change in the way we perceive our natural environment, and to raise awareness of the importance of environment education, and the value of the "Kids Teaching Kids" model of education.
- 2003 ANCOLD Conference on Dams, 24-28 October 2003 in Hobart, Tasmania. The theme for the technical conference was "*Technological Development – Its impact on Dam Management and the Triple Bottom Line*".
- 28th Hydrology and Water Resources Symposium, 10-13 November 2003, Wollongong. The main conference theme was "About Water", getting back to basics to assist our understanding of the fundamental relationships between water and related environments.
- ATSE Annual Symposium – Water the Australian Dilemma, 17-18 November 2003, Melbourne. The Symposium was broadly conceived to enable effective coverage of critical technical and policy issues at regional and national level and to seek integration of effort to address them.
- Climate Impacts on Australia's Natural Resources, 25-27 November 2003, Surfers Paradise, Queensland. The aim of the conference was to provide natural resource managers with the most up-to-date scientific knowledge regarding climate change and climate variability impacts on natural and managed systems.
- IWA 6th Specialist Conference on Small Water & Wastewater Systems & 1st International Conference on Onsite Wastewater Treatment & Recycling 11-13 February 2004 at the Esplanade Hotel Fremantle, Western Australia

- ENVIRO 04 28 March to 01 April 2004, Sydney, New South Wales. The annual convention and exhibition of 5 environmental industry associations covering sustainable industry, water, waste, sustainable energy, business of the environment and advances in odour management.
- UN - Hilltops 2 Oceans – Global H2O Partnership Conference, 10-14 May 2004, Cairns, Queensland. A conference to share expertise, experience and solutions to the problems of marine pollution
- 8th National Conference on Hydraulics in Water Engineering, 13-16 July 2004, Surfers Paradise Queensland. The conference theme “Hydraulics – The Next Wave” focused the conference on the latest techniques and challenges in hydraulics and to reflect the changes in public attitude and variability in climate that drive innovation in hydraulics.
- 7th International RiverSymposium, 31 August – 03 September 2004, Brisbane, Queensland. The theme of the symposium is *Threats to Sustainable River Systems – beating the odds*.
- International Year of Freshwater
 - Postcard competition – primary school children studied water issues resulting in postcards being published for sale.
 - Promotion of IYFW objectives using IYFW badged promotional material (hats, magnets, balloons etc) by a wide range of catchment management authorities, water boards and local and regional water agencies
 - Sponsorship of breeding research into a rare freshwater tortoise by South Australia Water.
 - Development of promotional and educational material, including web sites, for teachers and schools by a number of educational organisations.
 - Trial water recycling projects by the City of Port Philip to save water used for watering of sports grounds, parks and gardens.
 - Performance of the "The Water Show" by the Splash Theatre Company to over 80 primary schools in South Australia in May and June. Sponsored by United Water "The Water Show" is an entertaining adventure about the water problems we could face in the future unless changes are made.
 - Student photographic competition based on IYFW themes with entries being used to produce a display poster.
 - Production of an Australian Water Map by Earth Systems Pty Ltd with sponsorship by a number of government departments. The map provides valuable information on the distribution and use of Australia’s vital freshwater resources. The Australian Water Map was officially launched in mid June as a contribution to the IYFW.
 - School competitions to raise water awareness in Western Australia.
- 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>).
- The Australian Government has undertaken a national land and water resources assessment to enable improved decision making in sustainable use of the resources. This assessment was completed in early 2002 and a range of publications has resulted. Details of the assessment projects and output products are at <http://www.nlwra.gov.au/full/index.html>. The results of the assessment are available from the web based Australian Natural Resource Atlas at <http://www.nlwra.gov.au/atlas>.
- Dr Mike Bonell from the Secretariat of the UNESCO International Hydrological Program (IHP) in Paris meet with members of the national UNESCO Science and Technology Network and representatives from CSIRO in Canberra in February 2004.
- Professor Andras Szöllösi-Nagy, Secretary of the UNESCO IHP, visited Canberra on Monday 30 August 2004 and then attended the 7th International Riversymposium in Brisbane where he made a Key Note presentation. Professor Szöllösi-Nagy met with representatives from the Department of the Environment and Heritage, the Department of Agriculture, Forestry and Fisheries, the Murray-Darling Basin Commission, CSIRO, the CRC for Freshwater Ecology and the UNESCO Science Network.

Professor Szöllösi-Nagy also made a presentation at the CSIRO Discover Theatre on the Monday afternoon.

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.

The following people were nominated by Australia for inclusion in the IHP Expert Pool.

Name	Expertise
Prof. T.A. (Tom) McMahon	Stochastic hydrology, reservoir storage-yield analysis, rainfall-runoff modelling, regionalisation in hydrology, modelling water demand in urban areas, tools for assessing adoption of research results
Dr Peter Dillon	Groundwater, aquifer storage and recovery, brackish and saline aquifers, irrigation, storm water runoff, management of aquifer recharge for sustainability
Assoc.Prof Rodger Grayson	River flow routing, large scale distribution modelling, high resolution spatial measurement, modelling and analysis of soil moisture and hydrological response, environmental management
Professor Ian White	Downstream impacts of landuse, management of acid sulfate lowlands to minimise acid discharges, water use and extraction from freshwater lenses, convection of dense surface waste water into groundwater.
Mr Trevor Daniell	Post Graduate studies in Engineering Management and Planning, Environmental Engineering & Design, Water Resources Management
Dr Francis Chiew	Hydrologic modelling, climate variability and climate change impact, El Nino and seasonal streamflow forecasting, and urban stormwater quality
Mr Steve Appleyard	Groundwater Contamination levels, Storage of Dangerous Goods
Dr Tom Hatton	The measurement and modelling of tree water use, ecohydrology, and catchment hydrological modelling
Dr Jennifer McKay	water resources laws and policies, sustainable water markets, water allocation, corporatisation and privatisation of management and private dam safety policies, corporate governance, codes of conduct

Steve Barnett of South Australia Department of Water Land and Biodiversity Conservation is coordinating Australian input to the UNESCO IHP-VI preparation of the Hydrogeological Map of the World. He has been involved for many years in hydrogeological mapping of the Murray Darling Basin and is Chair of IAH Australian Chapter.

CSIRO is the Australian research organisation linked to the Water and development information for arid lands (WADI) project being set up by the IHP.

Dr. Xia Jun visited Australia 19-24 June 2003 for discussions with a number of people regarding the external evaluation report of IHP V.

1.2.3 Research/applied projects supported or sponsored

Experience gained as a result of UNESCO/SOPAC sponsored groundwater and sanitation projects undertaken in a number of Pacific Island Countries were presented in a paper titled 'Hydrology of and conflicts over shallow groundwater use and management in low coral atolls.' By WHITE, I., FALKLAND, A., CRENNAN, L., METEUTERA, T., ETUATI, B., METAI, E., PEREZ, P., and DRAY, A. which was presented at the conference *In Low-lying Coastal Areas-Hydrology and Integrated Coastal Zone Management. International Symposium, Bremerhaven Germany, 9-12 September 2002.* Deutches IHP/OHP-National Komitee, Koblenz, Germany.

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.

Hydrology for Environment, Life and Policy (HELP)

Australia continues to contribute to the two projects established under the HELP banner. These are the Mount Lofty Ranges (South Australia) and the Lower Murrumbidgee catchment in the Murray Darling River Basin.

Mount Lofty

A case study of the third phase of an exemplar framework (in train for 8 years already as a partnership of Governments, Private sector and community) for integrating expertise of water policy makers, managers and scientists in the further development of an integrated natural resource management investment strategy for the mount lofty ranges, and a case study of the impact of on ground works under phases 1, 2 and 3 of MLRCP on water quality and quantity.

Key issues being addressed:

- creating and sustaining partnerships between stakeholders toward integrated Natural Resource Management including the private sector,
- using these to devise a integrated set of legislative instruments, and
- evaluating the above.

Contact point: Jennifer McKay (University of 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: Dr Shahbaz Khan (CSIRO) (shahbaz.khan@csiro.au)

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

As one of Australia's members of the WMO Commission for Hydrology, 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 sub-committee on the ethics of freshwater use of UNESCO's COMEST and is a member of the recently formed Asian Pacific Association of Hydrology and Water Resources.

1.2.5 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 has been funded for the 1st year by NZAID. In 2004 a start will be made with the 1st set of lectures on surface water for volcanic and bigger limestone island countries. The 2nd set of lectures expected to be held towards the end of the following year will involve, besides a follow-up on surface water, groundwater topics for coral atolls and raised limestone islands.

1.3.2 Organisation of specific courses

1.3.3 Participation in IHP courses

A number of international students attended the UNESCO accredited postgraduate courses in hydrology and water resources at the Joint Universities Masters Program (JUMP), Adelaide, South Australia.

1.3.4 Other courses

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.

1.4 Publications

Water Management in the Mekong Delta: Changes, Conflicts, and Opportunities

By Ian White. IHP – V | Technical Documents in Hydrology | No. 61 UNESCO, Paris, 2002

(This is an Australian and Asian Pacific region contribution to the HELP project.)

White, I., Falkland, T., Meteutera, T., and Metai, E. (2003). Impact of Drought on Groundwater Resources in a Low Coral Atoll. *In Managing Water Resources under Climatic Extremes and Natural Disasters*, K. Takara and T. Kojima (eds). IHP-VI, Focal Area 4.4, Technical Documents in Hydrology, No. 2, Regional Steering Committee for South East Asia and the Pacific, UNESCO Jakarta Office, pp 197-212.

White, I., and Wasson, R. (2003). Sources of Stream Salinity in the Eastern Murray-Darling Basin, Australia. *In Managing Water Resources under Climatic Extremes and Natural Disasters*, K. Takara and T. Kojima (eds). IHP-VI, Focal Area 4.4, Technical Documents in Hydrology, No. 2, Regional Steering Committee for South East Asia and the Pacific, UNESCO Jakarta Office, pp 213-222.

Perez, P., Dray, A., White, I., Le Page, C. and Falkland, T. (2003). Atollscape: A multi-agent system for simulating freshwater management in Pacific atolls. *In Managing Water Resources under Climatic Extremes*

and Natural Disasters, K. Takara and T. Kojima (eds). IHP-VI, Focal Area 4.4, Technical Documents in Hydrology, No. 2, Regional Steering Committee for South East Asia and the Pacific, UNESCO Jakarta Office, pp 223-228.

(The three papers above are Australian and Asian Pacific region contributions to IHP VI, Focal Area 4.4).

1.5 Participation in international scientific meetings

1.5.1 Meetings hosted by Country

See Section 1.2.1 of this report.

1.5.2 Participation in meetings abroad

Trevor Daniell and Ross James attended 11th regional Steering Committee for Southeast Asia and the International Conference on Managing Water resources under Climatic Extremes and Natural Disasters in Sigatoka, Fiji during October 2003.

Trevor Daniell participated in the meeting of the FRIEND Intergroup Coordination Committee (FIGCC) and the International Workshop on Modelling and Managing low Flows, Droughts and Flood held in Koblenz, Germany, 5-8 July 2004.

In July 2004, Bruce Stewart attended a meeting of the WMO sub-group of the joint UNESCO/WMO Taskforce developing material in support of a Joint UNESCO/WMO Initiative on Floods to be presented to the UNESCO IHP IC in September 2004 and the WMO Commission for Hydrology in October 2004.

Bruce Stewart attended the 16th Session of the Intergovernmental Council of the International Hydrological Programme of UNESCO that was held at the UNESCO Headquarters in Paris from 20-24 September 2004.

1.6 Other activities at a regional level

A project is currently underway titled: Enhanced Application of Climate Predictions in Pacific Island Countries in order to meet the general goals of improving weather and climate services and products. AusAid developed the project proposal outlining procedures for developing a climate prediction capacity in participating countries, and in particular, providing a framework for incorporating climate prediction information into planning across a broad range of agencies and industries. The scheme will be based upon the seasonal climate prediction system of the Australian Bureau of Meteorology, which has successfully issued climate predictions for some years.

The Pacific HYCOS Project proposal developed by WMO in 2001 has received support from the WMO Tropical Cyclone Committee, Pacific Region Global Climate Observing System, Pacific Island Country National Hydrological Services, SOPAC and received a high recommendation as one of the priority Actions identified by the regional consultation meeting. Efforts are underway to discuss funding opportunities with interested donor agencies and prepare submission through the Global Environmental Facility (GEF) mechanism.

WMO plans to organise a workshop on groundwater management for the small island countries. The workshop will be conducted in English for three days and will involve ten (10) participants from selected states. The participants will present country papers on the status of groundwater in their country or case studies from their country. Dates of the workshop are to be announced.

Funding from UNESCO in 2002 enabled the start of the Catchment and Communities project in Vanuatu executed by the Directorate of Geology, Mines and Water Resources (DGMWR) in collaboration with NIWA (New Zealand) and SOPAC. The catchments in Vanuatu are now projected to become one of the basins within UNESCO's Hydrology for the Environment Life and Policy project (HELP).

During a WMO Experts Meeting in Nadi, Fiji (October 1999) the exchange of climate information and capacity building through hydrology training were identified as high priorities for small island countries in the Pacific. Thanks to a partnership arrangement between WMO, UNESCO, SOPAC and NIWA with a financial contribution from New Zealand (NZ AID) these priorities are now being addressed through the NIWA Island Climate Update (ICU) and a Hydrology Training Programme. The ICU publication is already being distributed throughout the Pacific region and next year a start will be made with the 1st set of lectures on surface water for volcanic and bigger limestone island countries. The 2nd set of lectures expected to be held towards the end of next year will involve, besides a follow-up on surface water, groundwater topics for coral atolls and raised limestone islands.

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 2005

- The biennial convention of the Australian Water Association (AWA) 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 Brisbane 2005 Ozwater Convention & Exhibition, with have the theme of Watershed – The turning point for water. The convention will cover the national water agenda and include all aspects of management, water and wastewater treatment, water infrastructure, drinking water quality, pollution control, reuse and water resources.
- National Water Week – *Water for Life*. 17-23 October 2004
- 4th Australian Stream Management Conference, 20-22 October 2004, Launceston, Tasmania. The theme of the conference is *Linking Rivers to Landscapes*.
- 1st National Salinity and Engineering Conference, 9-12 November 2004, Perth, Western Australia (<http://www.congresswest.com.au/salinity2004>) The conference theme is "Salinity - an enormous environmental, economical and social challenge" with major themes of: Innovation, Design, Climate Change, Integrated Systems and Management, Engineering, Economics, Education and Training, and Environmental Impact and assessment.
- 16th Australia new Zealand Climate Forum – *Climate and Water*, 8-10 November 2004, Lorne, Victoria
- Water Sensitive Urban Design 2004 – *Cities as Catchments*, 21-26 Nov 2004, Adelaide, South Australia. The conference aims to explore the relationship between WSUD principles and the sustainability of urban and regional areas.
- 29th Hydrology and Water Resources Symposium, 21-23 February 2005, Canberra, ACT
- Management of Aquifer Recharge – includes the publication of 'Wise Strategies for Groundwater Recharge Enhancement', further workshops and symposia targeting arid and semi arid areas and possibly also small islands, triple bottom line evaluation of effectiveness of recharge enhancement in developing countries (also with FAO) and development and linkage of web pages on recharge enhancement.
- The UNESCO World Commission on Science and Technology is also pursuing the theme of hydrology through a program with the acronym of COMEST. This program has been largely the initiative of the Australian member of the Commission, Professor Barry Ninham from the ANU. Activities are planned in relation to the COMEST programme.

2.2 Activities Planned for 2006-2007

- Continuation of assistance to Pacific Island Projects.
- Continuation of involvement in Asian Pacific FRIEND.
- Training courses in the Pacific Island Countries.

2.3 Activities envisaged in the long term

NATIONAL REPORT ON IHP RELATED ACTIVITIES. CAMBODIA

1. Introduction

The Royal Government of Cambodia has implemented a policy of promoting economic growth and social development through the introduction on market economy. The development of water resources is deemed to play the key role in economic growth, as contributes to agricultural and industrial development.

The ministry of Water Resources and Meteorology (MOWRAM) was established in 1999, the main duty is respond for hydro-meteorological data collection and water resources development in the whole country.

Since 1997, the National Committee for IHP was established and head by H.E. Mr. LIM KEAN HOR is Minister of Ministry of Water Resources and Meteorology.

2. Activities at National Level in the Framework of IHP

Today, the main activities in framework of IHP has some limited because of human resources, capacity building in the field of water (Hydrologist) and finance support. However, in National Programs on Water Resources have prepare some legislation, strategy, water profile, etc.

2.1 *National/Local scientific and technical meeting*

The technical meeting are generally held in framework national activities cooperate with NGO's, MRC, WB, ADB, etc. to carry out the activities and plan for sort, medium, long terms for sustainable of development of water resources in Cambodia and in Lower Mekong Basin as well.

2.2 *Collaboration with other national and international organizations/ programs*

The chairman of Cambodia National Committee for IHP(CIHP) is a Permanent Representative of WMO, so he has contact and coordination with WMO' s activities.

The member of CIHP have participated and contributed to many national and international organizations councils in Cambodia related to water resources management and development, environment, natural resources etc. especially flood management and flood forecasting.

World Water Day was celebrated in Phnom Penh as National Level that involve from many ministries, organizations.

2.3 *Research/applied projects sponsored*

None

3. Educational and Training Courses

None

3.1 *Contribution to IHP Courses/Organization of Specific Courses.*

None

3.2 Participation in IHP Courses.

One Hydrologist of Ministry of Water Resources and Meteorology Department Hydrology and River Works has participated in IHP Training Course in Malaysia from 13-17 October,2003. This course was sponsored by UNESCO to Cambodia participation.

4. Plan for 2005

- To collaborate IHP activities and meeting as possibility.
- Improve flood forecasting system with more leading time 5 days, 7 days and link to the flood plane.
- Station network improvement.
- Improving hydrological database.
- To celebrate World Water Day 2005.

National Report on IHP Related Activities

Chinese National Committee

1. ACTIVITIES UNDERTAKEN IN THE PERIOD October 2003 — November 2004

1.1 Meetings of the Chinese National Committee for IHP

1.1.1 Decision regarding the composition of the Chinese National Committee

The National Committee has been reorganized in year 2003, since some of members were retired or leave their original position. New national committee includes 22 members and has approved by the Ministry of Water Resources. The Namelist of National Committee members (22) was reported in the last country report (Fiji, Oct. 2003). In order to make close contacting, one representative for each member has been assigned, just for keeping online connecting in case the member is not available.

1.1.2 Status of IHP-VI 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.

Chinese delegation with 14 delegates, headed by Ms. Liu Yaming, Director of Bureau of Hydrology of Ministry of Water Resources, Chairperson of Chinese National Committee for IHP, participated **16th Intergovernmental Council** in Headquarter of UNESCO-IHP, Paris, 20-24 September 2004.

6th International Workshop on Hydrological Experiment and Planning was held from 24-28 March 2004 in Hefei, the capital of Anhui Province. The workshop was co-organized by German Environment and Health Institute and Water Resources Department of Anhui Province. UNESCO, IAHS and China-IHP also supported the workshop.

It is a contribution for IHP VI Theme 1 and Focal area 1.3: Focal Area 1.3 Integrated assessment of water resources in the context of global land-based activities and climate change.

80 participants from 14 countries attended the workshop. 64 papers and posters were received. The main topics were: global climate change impact on hydrology and water resources, urban autonomous water operation and irrigation policies, dike leakage and flood control, groundwater sustainable use, water resources optimal control and use, river basin hydrology and offing protection.

National Hydrological Forecasting Meeting was held on 21 June 2004 in Shijiazhuang, Hebei Province. It is a contribution for IHP VI Theme 2 and Focal area 2.1: Extreme events in land and water resources management. This was also first time to organize a national meeting before flood season comes by Bureau of Hydrology of Ministry of Water Resources. Since hydrological forecasting took very important role for flood-control in the country, the forecasting experiences in

1. This report is submitted to the 12th RSC meeting for the IHP UNESCO Southeast Asia and the Pacific, Adelaide, Australia, 21-26 November, 2004.

2003 were summarized. The discussion and debates were focused on how to improve forecasting for the year 2004. Follow on, the meeting will be held biannual year.

China-IHP Chairperson and some members working in hydrological fields attended the meeting with presentation on advanced technologies.

National Workshop on Urban Water Resources was held from 10-12 May 2004 in Shaoxing, Zhejiang Province. It is a contribution for IHP VI Theme 4 and Focal area 4.1: Water, Civilization and Ethics. Urbanization and urban water issues were debated in the country for a couple of years. The workshop themes included water culture and water sceneries, city and water environment, urban ecological system, and urban water management. 80 participants attended the workshop.

A preparing workshop for the theme was held from 16-18 September 2003 in Shanghai.

1.1.3 Decision regarding contribution to/participation in IHP-VII

China IHP National Committee had a Chairperson's meeting on 20 August in Beijing, 2004. Generally, China IHP will expand international cooperation with other national committees. Five detail proposals are recommended:

- (1) National Committee encourages research and education institutions to work with counterparts in the following fields beside traditional cooperation: water and ecology, water and society, enhancement of hydrological service, education and training on capacity building.
- (2) In order to improve the cooperation efficiencies and to achieve expected results, some working teams for specific themes and subjects will be established when the IHP-VII is endorsed.
- (3) National Committee will try best to make a regular budget for national activities through Bureau of Hydrology and Department of International Cooperation of Ministry of Water Resources in year 2005.
- (4) Two UNESCO training Centers (ITRCES and ITRCHWE) in China will be supported for regional cooperation with regional centers under IHP-VII.
- (5) Selected Experts and National IHP Secretariat will keep contacting with IHP Headquarter and Task Force for modification of IHP-VII. The national and international cross-cutting projects will be supported with high priority by National Committee.

China IHP National Committee organized an annual meeting on 11 November 2004 in Nanjing. The National Committee Regulation and Secretariat Working Method have been reviewed and approved. A visiting report on 16th Intergovernmental Council meeting in Paris has been delivered to members. National Committee also approved the decision of Chair's meeting in August this year and guarantee to work closely with regional national committees for regional cooperation, especially for IHP-VII.

1.2 ACTIVITIES AT NATIONAL LEVEL IN THE FRAMEWORK OF THE IHP

1.2.1 National/local scientific and technical meetings

Workshop on National Water Information Standard was held on 28 November 2003 in Wuhan, Hubei Province. Five draft standards distributed and discussed which include: Category of

Water Information Standard, Dictionary and Table Structure of Real-time Rainfall Database, Protocol of Real-time Water Information Exchange, Water Resources Geological Space Data - Metadata Standard, Basic Electronic Map Product Mode.

Through prepare the national standard of hydrological and water related data, it will be very useful for data exchange and experience sharing in the country.

Some members of China-IHP were invited to attend the draft version preparing and the workshop.

1st National Workshop on Reservoir Flood-control Operation was held from 22-24 December 2003 in Dalian, Liaoning Province. 60 participants represented 7 large river basins and 32 provincial flood-control headquarters, universities and institutes attended the workshop. Three China-IHP members were invited to give presentations on their nearest researches.

5th National Hydrological Science and Technology Meeting was held from 20-21 November 2003 in Beijing. It was a high official and scientific level meeting to focus on history of national hydrological science and technology development, and problems at present and in the near future.

Chief Engineer of Ministry of Water Resources and high officials and four academicians attended the meeting.

Ms Liu Yaming, Chairperson of China-IHP and Director-general of Bureau of Hydrology of Ministry of Water Resources chaired the meeting.

1st Youth Science and Technology Forum by China Water Conservancy Society was held from 11-13 November 2003 in Shenzhen, Guangdong Province. Theme of the forum is *Innovation-Historical responsibility of Younger Scientists and Technicians*. The awarded young scientists and technicians will have higher priorities to be involved in IHP activities, based on our discussion with the Society experts.

8th National Conference of China Water Conservancy Society was held from 8-10 April 2004 in Beijing. About 150 members participated the conference and approve some resolutions on membership of council, awarding of excellent youth scientists and technicians, out-standing publications etc. Two vice ministers, Mr. Chen Lei and Mr. Suo Lisheng were invited to give lectures.

China-IHP is key associated member agency and closely cooperated with the Society.

1st National Problem Seminar was held in Wuhan, Hubei Province in 16-18 October, 2003. The seminar focused on three fields: theory and technology of flood control and disaster mitigation; drought issues and water resources optional allocation; water pollution control and water environment protection. The organizers are mainly from IHP China National Committee. It is expected to be forum for regular water problem discussion.

National Training Course and Workshop on Advanced Technology Application in Hydrology was held from 1-7 December 2003 in Yangzhou University, Jiangsu Province. 48 participants were from river basin, bureaus of hydrology each province. Advanced technologies for enhancement of hydrological services were introduced. Participants also presented their practices using new technologies in recent years. The course is part of hydrological modernization action, while the training was more focused on capacity building.

China-IHP sent 2 key lectures for the course.

2004' National Hydrological Service Meeting was held from 7-9 April 2004 in Dalian, Liaoning Province. Mr. Er Jinping, Vice Minister, attended the meeting and delivered a speech on *Speeding Development for Hydrological Service Modernization*. The meeting is a biennium meeting for reviewing hydrological services, summarizing experiences and looking forward the direction of national hydrological services, as well as checking commitment of international convention.

China highlight hydrological services both technical updating and service extending. Hydrological modernization is a symbol for increasing hydrologic services capacity, especially advanced technical development and application including data collection, transmission, treatment, application, services and management

Ms. Liu Yaming, China-IHP Chairperson is also head of Bureau of Hydrology of Ministry of Water Resources. Therefore, international commitment and cooperation usually emphasized during the meeting.

National Mayor Forum of Water Cities was held from 18-19 October 2003 in Shaoxing, Zhejiang Province. About 40 mayors and water experts attended the forum and discuss the water city protection and development. Vice-Minister, Mr. Suo Lisheng, delivered a key speech during the opening ceremony.

The discussions were focused on water environment treatment, water culture protection, water-ecological system recovery.

China-IHP is one of national sponsors under theme IHP-VI framework.

1.2.2 Participation IHP Steering Committees/Working Groups

Mr. Wei Xinping, engineer of Bureau of Hydrology of Ministry of Water Resources participated in Hydrological Archives Training Course at The Regional Humid Tropics Hydrology and Water Resources Center for Southeast Asia and the Pacific (HTC) in Kuala Lumpur, from 13-17 October, 2003.

Ms. Zhu Xiaoyuan, Dr. Liu Heng and Dr. Xu Zongxue participated in the International Symposium on Managing Water Resources under Climate Extremes and Natural Disasters and 11th Regional Steering Committee Meeting for Southeast Asia and the Pacific" which was held in Fiji, from 26-31 October 2003. They also participated in FRIEND technical sub-committee (TSC) meeting and coordination meeting of HTC during the symposium and promised to closely cooperate with regional counterparts to work on FRIEND projects and other activities.

1.2.3 Research/applied projects supported or sponsored

River Catalogue V of Southeast Asia and the Pacific has been discussed and 1 river basin in China, which is Rong Jiang, will be catalogued under the regional cooperation framework.

Chinese Homepage of IHP on Internet has been supported by UNESCO Beijing office and will be updated regularly.

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

International Flood Forecasting and Management Training Course was held in Yichang near Three Gorge Dam Site in Hubei Province from 16-19 September. Since the course was combined with an international symposium on GIS and RS application in Hydrology and Water Resources, some experts from USA, Japan, Belgium, UK and China presented their recent research achievement. 43 participants from provincial level and ministerial level hydrological organizations

attended the course. The training contents included China flood forecasting system and application, distributed hydrological model and application in flood forecasting, digital metrological radar and application in flood forecasting in USA, new procedures of flood forecasting and flood management in Japan, etc. Hydrological Committee of China Hydraulic Engineering Society was organizer and IHP National Committee sent members to join the activities.

18th China-Japan Water Resources Cooperation Meeting is an annual higher official activities which headed both by Dr. Gao Bo Director-General of International Cooperation of Ministry of Water Resources in Chinese side and head of water resources supervision department of Ministry of Civil Land and Communication in Japanese side. The annual meeting started from 1984, and has been responsible for cooperation and scientific exchange on water resources between two countries. The 18th meeting was concentrated on water resources sustainable development, water saving, water environment protection. IHP National Committee is member of Chinese delegation.

Sina-USA Seminar on Water and Soil Conservation was held on 3 November 2003 in Beijing, Agricultural adviser of USA Embassy in Beijing and Director-general of Department of International Cooperation of Ministry of Water Resources delivered speeches in the opening ceremony.

Based on Chinese experiences, ecological economic benefits and social effectiveness could be integrated in the treatment through water and soil treatment in small river catchments, such as engineering, biological, agricultural technical measures. USA Advisor and Scientists also presented their experiences as well.

China-IHP was invited as observer for the seminar.

9th International Symposium on River Sedimentation was held from 18-21 October 2004, in Yichang, Hubei Province, where is near Three Gorge Dam site. About 450 participants including scientists, officials and engineers from 40 countries, international organizations and non-governmental organizations, attended the symposium. Mr. Wang Shucheng, Minister Water Resource, Mr. Li Yongan, General Manager of Three Gorge General Corporation and Dr. A.Szollosi Nagy, Deputy Assistant Director General of UNESCO, and Dr. Christopher George, Executive Director of IHRA delivered speeches in the opening ceremony.

Main theme of the symposium was Interactions between Fluvial Systems and Hydraulic Projects and Pertinent Environmental Impacts. Six sessions included 6 topics, (1) Large-scaled hydraulic projects and their impacts; (2) River sedimentation; (3) Estuarine and coastal engineering; (4) Environmental problems in sedimentation; (5) Soil and water; (6) Sediment information.

World Association for Sedimentation and Erosion Research (WASER) was initiated during the symposium. The Secretariat is located in UNESCO-ITRCES in Beijing.

1.2.5 Other initiatives

1.3 EDUCATION AND TRAINING COURSE

1.3.1 Contribution to IHP courses

International training and research center for hydrology, water resources and water environment (ITRCHWE) continued the training course on River Basin Sustainable Water Resources Management.

Another center named Hangzhou Regional Center (HRC) for rural small hydropower research

and training was combined their activities under IHP framework. Two training courses for developing countries are organized in Hangzhou, China annually.

1.3.2 Organization of specific courses

4th Advanced Technology Training Course on Flood Defense and Disaster Mitigation was supported by National Flood Prevention and Drought Fight Office and held in Beijing from 13-17 October 2003. Special training contents were: National Flood Control System, Provincial and Basin level Flood Control System, Flood Warning and Forecasting System for large Reservoirs, Introduction of US HEC-RAS and FLO-2D Packages and Application. 20 participants joined the training. IHP National Committee is member of organizing committee.

UNESCO-IHE Refresh Seminar on River Basin Management was held from 10-15 November 2003 in Nanjing. Most of 30 participants are IHE alumni. The seminar was focused on water disaster management, issues and challenges of river basin management, decision support system, disaster simulation software development, etc.

The refresh seminar is also an activity under framework of UNESCO-IHE PoWER. Nanjing Hydraulic Research Institute and Hohai University are members of the PoWER and actively work together with IHE to conduct education, training and research actions.

1.3.3 Participation in IHP courses

As an important members of IHP National Committee, Nanjing Hydraulic Research Institute and Hohai University signed a fundamental Chart with UNESCO-IHE and other knowledge centers for a global partnership framework for water science education and training in November 2002. Monthly telephone meeting on training topic, module and other issues has being held.

1.4 PUBLICATION

Water Resources Assessment – Handbook for Review of National Capacities, published by WMO/UNESCO in June 1997, has been translated to Chinese. The handbook is distributing for national and provincial training and reviewing use.

Principles and Methods of PMF/PMP Calculations – a translated version from the same book in Chinese is under editing and compiling. The author is Prof Wang Guo'an who has been working in the field for about 40 years. He is also expert on PMP/PMF in WMO-CHY. The book will be available by the end of year 2005 with support of UNESCO.

1.5 PARTICIPATION IN INTERNATIONAL SCIENTIFIC MEETINGS

1.5.1 Meeting hosted by the country

Special Technical Workshop on Hydrological Progress was co-organized by IAHS/IHP National Committees. Prof. K. Takeuchi, president of IAHS, was invited to give a lecture in Beijing 15 September, 2003. Prof. Takeuchi's presentation topic is Global Hydrological Research and Local Needs.

1st International Yellow River Forum has been held in the 21-24 October 2003 in Zhengzhou, China. National Committee sent more than 10 members and experts to join the activities. It attracted about 300 participants, in whom about 70 international participants, to share experiences on climate change, hydrological cycle, flood control, drought and water resources management, wetland and ecosystem protection etc. It was a successful forum in international hydrological and water resources research. The national committee will continue to support and join

the organizing activities in the future.

International Forum and Celebration of Dujiang Weir 2260 year Anniversary was held from 7-8 August, 2004 in Dujiang Weir, Sichuan.

Dujiang Weir is a heritage constructed in year 256 B.C. Mr. Li Bing, local Governor in that time headed the project construction. After 2260 years, the Weir is still benefit to 20 million local people. It is model of people-nature harmony. About 100 experts including 12 international ones attended the forum. During the forum, three problems are quoted for the Weir sustainable development: (1) Unbalance of water supply and demand, (2) Lack of new construction and maintenance, (3) Institution arrangement to economic situation. These are also problems to other historical projects.

China-IHP send experts to attend the ceremony and the forum.

International Workshop on River Basin and Water Resources Management in Shanxi Province was held on 26 April 2004 in Taiyuan, the capital of Shanxi Province. The special topic was issues on water-transfer from Yellow River and Water Management in Water Scarcity Region. Participants were from World Bank, USA, Australia and China. Tarim River Basin Authority was invited to deliver water management experiences in Tarim Basin which is one of the extreme water scarcity basin in China.

Workshop on Water and Sustainable Development of Pearl River was held from 2-3 April 2004 in Guangzhou, Guangdong Province. The workshop was organized by Global Water Partner (GWP) and Pearl River Water Resources Commission. Beside National Advisory Committee, three provincial sub-committees, Fujian, Hebei and Shaanxi were composed as well in China. Since GWP is a trans-agency NGO, water-related experts from different sections such as, river basin, navigation, environment protection, agriculture etc participated the workshop. The topic covers river basin and regional water management, water resources modernization, water resources allocation, urban development and water resources, water resources protection, water price and reform, city and water sceneries, hydropower and navigation etc. 30 papers and reports, 12 of them were presented in oral. Following the activities, GWP-Shaanxi Association was established on 2 June 2004 in Xian Shaanxi Province.

China-IHP is closely cooperating with GWP National Advisory Committee.

International Workshop on Integrated River Basin Management was held on 9-11 November 2003 in Nanchang, Jiangxi Province. The workshop was co-organized by International Cooperation Committee of China's Environment and Development, World Nature Foundation, Jiangxi Provincial Government and Yangtze River Commission. The workshop was focused on integrated water resources management of Yangtze River, Boyang Lake and Dongting Lake.

Workshop on Water Disaster Prevention and Control in Yangtze River Basin was held from 9-13 January 2004 in Wuhan. The workshop was sponsored by the World Bank and co-organized by China Science Academy and Yangtze River Water Resources Commission. 120 participants were from China, France, UK, Italy, Germany, Denmark, Netherlands, Viet Nam and Thailand. The workshop focused on experiences of international flood control, flood disaster mitigation and assessment. The Yangtze river basin flood control was discussed more deeply, after 1998 Big Flood occurred. A journey to Three Gorge Dam site was organized by local organizers.

International Symposium on Estuary and Coast Zone was held from 9-11 November 2003 in Hangzhou, Zhejiang Province. The symposium was organized by UNESCO-ITRCES and sponsored

by UNESCO, IAHS, China Water Resources Society. More than 100 participants from China, Netherlands, UK, USA, Japan attended the symposium. The main themes of the symposium are Estuary, Coast Zone and Human Environment. Six sub-themes included environment evaluation of estuary and coast zone, harbor and channel training, estuary treatment and environmental impact, salty water intrusion and pollution, estuary environment protection, simulation technology. About 70 participants gave oral presentations during the symposium.

Workshop on Dam Management was held from 23-24 October 2003 in Nanjing. The workshop was organized by Ministry of Water Resources with support of World Bank. Mr. Zhai Haohui, Vice Minister attended the workshop and delivered a speech. About 80 participants, including 10 international participants from other Asian countries, participated in the workshop. Participants shared experiences on dam management in their countries and organizations, as well as discussed dam management technology, legislation and institution, sedimentation management etc. Mr. Liu Heng, Vice Chairperson of China-IHP attended the workshop and host the closing ceremony.

1.5.2 Participation in meetings abroad

Chinese participants Ms. Li Qiongfang and Dr. Chen Yuanfang, with their papers on hydrology and water resources participated in 14th IHP Training Course - Hydrology in Asia, which is jointly organized by the Humid Tropic Centre in Kuala Lumpur, the Hydrospheric Atmospheric Research Centre, Nagoya University and UNESCO Office, Jakarta. The course will be held at the HTC, Kuala Lumpur, from 11 to 15 October, 2004.

1.6 OTHER ACTIVITIES AT A REGIONAL LEVEL

1.6.1 Institutional relations / co-operation

To enhance relationship with IAHS at national level, Asian Water Resources Association (AWRA) at regional level, as well as WMO, IAEA, UN-ESCAP at UN system level would be highly concentrated. To cooperate with national committees for hydrological and water resources research in Southeast Asia and the Pacific are key fields.

1.6.2 Completed and ongoing scientific projects

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

2. FUTURE ACTIVITIES

2.1 ACTIVITIES PLANNED TO UNTIL DECEMBER 2005

The National Committee will continue and pay high attention for regional cooperation under IHP framework. WWAP and WWDR is key issue at present.

2.2 ACTIVITIES FORESEEN FOR 2006-2007

More projects related to IHP-VI 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.

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 cooperation.

**REPORT OF THE
INDONESIAN IHP NATIONAL COMMITTEE
ADELAIDE, NOVEMBER, 2004**

1. ACTIVITIES UNDERTAKEN IN THE PERIOD NOVEMBER 2003 – OCTOBER 2004

1.1 Meetings of the IHP National Committee

1.1.1 Decisions regarding the composition of the IHP National Committee

The organizational structure of the Indonesian National Committee are represented by a Chairman, a Vice chairman, Secretaries, and 14 members from universities and multisectoral-departmental. They are the Indonesian Institute of Sciences (LIPI), Departments of Settlement and Regional Infrastructure, Agriculture, Transportation, Forestry, and from Universities.

The composition of the National Committee Organization are:

Chairman	: Jan Sopaheluwakan
Vice Chairman	: Dyah Rahayu Pangesti
Secretary I	: Gadis Sri Haryani
Secretary II	: Ridwan Jacub

Members:

1. P.E. Hehanussa	LIPI
2. M. Rahman Djuwansyah	LIPI
3. Hadikusumah	LIPI
4. Sudaryati Cahyaningsih	LIPI
5. Bogie Soedjatmiko	LIPI
6. Indreswari Guritno	University of Indonesia (UI)
7. Hidayat Pawitan	Bogor Agriculture Institute (IPB)
8. Istiqlal Amien	Dept. of Agriculture
9. Sutardi	Dept of Settlement and Regional Inf.
10. Joesron Loebis	Dept of Settlement and Regional Inf.
11. Willem Putuhena	Dept. of Settlement and Regional Inf.
12. Eulis Retnowati	Dept. of Forestry
13. Hery Harjanto	Meteorology and Geophysics Institute
14. Jusman Sihombing	Dept. of National Education

The committee normally hold a bimonthly coordination meeting and additional technical meetings as needed for the planning and implementation of seminars and workshops organized by the committee. The committee routine meetings are also attended by the chairman of the Indonesian Committee for UNESCO and Program Specialist of the UNESCO Jakarta Office. Members of the national committee through regular meetings distribute and report information related to these activities and bridge closer contacts between them. The mailing address are as follows :

Indonesian National Committee for IHP
c.o. Indonesian Institute of Sciences (LIPI)
Jln. Gatot Subroto No. 10, Jakarta, 12710, INDONESIA
Telp.: 62-21-52257111/5207226,

Or

Ms. Gadis Sri Haryani
Research Centre for Limnology LIPI
Indonesian Institute of Sciences
Jalan Prof.Dr.Dody Tisna Amidjaja
Cibinong, 16911, INDONESIA
e-mail: gadissh@indo.net.id or limno@indo.net.id

1.1.2 Status of IHP-VI activities:

Activities related to IHP-VI programme are implemented by and in various departments, universities, and research institutions members of IHP National Committee. A bi-monthly committee meeting received reports from each group activities, delivered and of use to other national members and for other related IHP-VI activities.

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

Contribution to the planned IHP-VII programme are two topics that should have additional attention in the coming years i.e.

- Traditional wisdom, to be used for environmental and water management
- Water and religion, water has an eminent place in many religions

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings:

- The national committee hold a bimonthly meeting to update, process, and distribute informations related to IHP activities to and between members of the committee.
- In mid October 2004 the national committee meeting has decided the personels for an organizing committee to prepare the quarto-joint-event in Bali 2005 which comprise of an International Symposium on Ecohydrology, the 3rd Regional Training-workshop in ecohydrology, the 13th annual RSC IHP Meeting, and the coordination meeting of the Scientific Advisory Committee on Ecohydrology UNESCO to be held in Bali on 21-26 November 2005.
- Chairman and members of the committee took active part in the preparation of an IHP-MAB-IOC-MOST coordination meeting to be held in January 2005 in Bogor, the meeting was intended to better facilitate overlapping and closely related activities between palnned and ongoing activities under framework of the four UNESCO bodies.

1.2.2 Participation in IHP Steering Comittees/Working Groups:

- The Ecotone meeting by MAB was held in Camboja, October 2003, was attended by Hidayat Pawitan.
- The IHP Bureau meeting in March 2004 at the IHP-UNESCO Paris Office was attended by the Ambassador of RI to UNESCO and Peter Hehanussa
- The SAC-EH meeting held in Paris, May 2004 was attended by Peter Hehanussa

1.2.3 Research/applied projects supported or sponsored:

- A new atlas named the Indonesian Agricultural Atlas scale 1 to 1.000.000 was produced by the Institute of Meteorology and Geophysics, Indonesia.
- A flood forecasting map of Jawa island is prepared by BMG and Bakosurtanal (Institute of Meteorology and Geophysics and the National Survey and Mapping Institute).

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

- A close cooperation between members of the Asia Pacific national committees are the annual meetings held in the region (Kuala Lumpur 2002, Fiji 2003), activities on Asia Pacific FRIEND, and production of the River Catalog of Asia Pacific Rivers.

- An Indonesian proposal on IHP-UNESCO declaration for establishment of a regional Ecohydrological Centre in Cibinong, Indonesia, was accepted by the 16th IGC Meeting in Paris, September 2004.
- A general lecture on ecohydrology Principles was presented during the inauguration of a regional organization, IHES or International Hydrology on Environmental Sciences held in Daegu, Korea, October 2004.

1.2.5 Other activities:

- Activities related to celebration of the Water Day was held in March 2003 and 2004 in Jakarta
- An event related to the Water Day was inaugurated in Jakarta by a book launching day with two new books related to Water Policy Reformation in Indonesia and a River Catalog booklet with informations on six rivers in Indonesia.
- A new water law have been delivered, its drafting was actively supported by members of the Indonesian national committee.
- A team to retard flood and drought events are supported by members of the Indonesian national committee, June 2004.
- A new plan on Community based flood mitigation and preparedness project was prepared for 2004, UNESCO Office Jakarta.
- A new national regulation on Groundwater has started activities since July 2004.

1.3 Educational and training courses

1.3.1 Contribution to IHP courses:

- The MAB held international workshop related to Wetland and eutrophication problems, was held August 2002 and in 2003, supported by one lecturer from the national IHP member
- The 2nd Ecohydrology Training Workshop was held in July 2003, attended by 12 members from Asia Pacific nations, including (new) participants from Mongolia and Bangladesh.

1.3.2 Organization of specific courses:

The second regional Ecohydrology course was held in Cibinong, 2003 to be followed by the 3rd course to be held in Bali island, November 2005.

1.3.3 Participation in IHP courses:

- Training Course on “Preparation and Maintenance of Hydrological Archives” 13 - 17 October 2003 Kuala Lumpur, Malaysia : Gatut Bayuadji (Ministry of Settlement and Regional Infrastructure)
- 13th IHP Training Course on “Effects of Pollutants on Atmospheric Environment” 7 March – 20 March 2004 Nagoya and Tokyo, Japan: Asep Sofyan (Toyohashi University of Technology-Japan) & Eka Suharguniyawan (Meteorological and Geophysical Agency)
- Computer-aided Workshop on Groundwater Contamination 26 April – 4 May 2004 Bangkok, Thailand: Sudaryati Cahyaningsih (Indonesian Institute of Sciences).

1.4 Publications

- Proceedings of the 2nd Training Workshop on Ecohydrology, 246 pp.
- Water Resources Management Reform in Indonesia, 241 pp.
- Catalog of Six Indonesian Rivers, 81 pp.
- A book containing edited papers describing research and methodologies on hydrology of small islands of Indonesia is being edited, to be published on early 2005.

1.5 Participation in international scientific meetings

1.5.1 Meetings hosted by the country:

- The 2nd Regional Workshop on Ecohydrology held in Cibinong, 2003.
- An Indonesia-Italy Roundtable Meeting related to eutrophication of the Saguling and the coastal zone of Jakarta was held in June 2004.

1.5.2 Participation in meetings abroad:

- Eulis Retnowati attended the IHP Nagoya Training course
- Sudaryati Cahyaningsih attended Computer-aided Workshop on Groundwater Contamination 26 April – 4 May 2004, Bangkok, Thailand
- An inaugural speech related to the establishment of IHES regional organization, on the principles of ecohydrology, was presented in Daegu, Korea, October 2004.
- Jan Sopaheluwakan and Peter Hehanussa represented Indonesia in the 16th IGC Meeting in Paris, during which Indonesian Proposal on the establishment of Category 2 water related center (Asia Pacific Center for Ecohydrology) was presented.

1.6 Other activities at regional level

1.6.1. Institutional relations/co-operation:

- The 2nd APHW meeting was held in Singapore, June 2004,
- A workshop on COE on river catchment was held in Kofu Japan, March 2004
- A river basin management activity, NARBO held in East Jawa, July 2004

1.6.2 Completed and ongoing scientific projects:

Preparations for the third ecohydrology regional workshop, to be held in conjunction with the 13th Asia Pacific RSC meeting was planned for November 2005 in Bali Island. It was also planned that the SAC-EH meeting will be held during this time. The three meetings will be joined during the period November 2005 to be held in Bali.

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2005

- The Indonesia - Italy initiative is expected to be followed up in February 2005 by a proposal to be implemented for 2005 – 2007.
- The Asia Pacific Center for Ecohydrology (APCE) under the Indonesian Institute of Sciences is planned to be operational and host activities in the region
- Translation of the Ecohydrology Manual is planned to be finished in mid 2005
- The third training workshop on ecohydrology, Bali, November 2005
- The 13th IHP-RSC meeting Bali, November 2005
- Publication of a book on hydrology of small island and a book on ecohydrology of small island are planned for 2005
- A coordinational meeting on IHP-MAB-IOC-MOST activities is planned for January 2005 in Bogor
- The MAB course on eutrophication will be supported by lecturers from IHP National Committee members, planned for August 2004 and the next for 2005.

2.2 Activities foreseen for 2006-2007

- The 14th IHP-RSC meeting is planned to be held in Bangkok, Thailand, October 2006 or November 2006
- Various activities related to implementation and starting of activities by the APCE centre

2.3 Activities envisaged in the long term

- APCE in Cibinong and The Saguling demo-site will have routine activities related to the training of eutrophication and sedimentation control for participants coming from the country as well as regional participants. A potential site for future ecohydrology activities and its related training in East Kalimantan Province, along the lower Mahakam River, the dynamic Delta and its coastal plain.

NATIONAL REPORT ON IHP RELATED ACTIVITIES

JAPAN

Various activities of UNESCO have been implemented under the supports of the Ministry of Education, Culture, Sports, Science and Technology (MEXT). The following summary includes the activities of Japanese National Committee for UNESCO undertaken during October 2003 to November 2004 for the International Hydrological Programme (IHP).

1. ACTIVITIES UNDERTAKEN IN THE PERIOD OCTOBER 2003 – NOVEMBER 2004

1.1 Meetings of the IHP National Committee

1.1.1 Decisions regarding the composition of the IHP National Committee

The composition of the National Committee is indicated in **3**. The Committee appointed new members in December 2003.

1.1.2 Status of IHP-VI activities

- 1 Catalogue of Rivers: Manuscripts for three Japanese rivers were compiled in the Catalogue of Rivers, Vol. 5, which was published in May 2004 (Editors: Dr Tachikawa, Japan; Ross James, Australia; Dr Keizrul Abdullah, Malaysia; Dr Mohd Nor bin Mohd Desa, Malaysia). Selected three rivers were Nagara-gawa, Natori-gawa and Yasu-gawa. A working group for the Catalogue was formed by Dr Tachikawa as coordinator with three contributors: Prof Shinoda (Gifu Univ.), Dr Kazama (Tohoku Univ.) and Dr Tachikawa (Kyoto Univ.), respectively. The Vol. 5 and its CD-ROM were distributed at the Sixteenth Session of IHP Intergovernmental Council, UNESCO Headquarters, Paris on 20 September 2004, as well as the 12th Session of IHP Regional Steering Committee (RSC) for Southeast Asia and the Pacific (SEAP). Special Coordination Funds for Promoting Science and Technology (Prof Takara, DPRI, Kyoto University) was used for the publication.
- 2 Asian Pacific FRIEND (Flow Regimes from International Experimental Network Datasets): Asian Pacific FRIEND Report Phase 1 (1997-2001), which was published in 2002 as IHP-V Technical Documents in Hydrology No. 9, was distributed at the International Conference on Managing Water Resources under Climatic Extremes and natural Disasters, Sigatoka, Fiji, 27-28 October 2003 at the occasion of the 11th Session of the RSC-SEAP on 30-31 October 2003 in Sigatoka, Fiji. The APF Technical Sub-Committee (TSC) at the 11th Session decided to continue low flow and flood research in the Second phase of the AFP. Mr Trevor Daniell (Australia) and Prof Takara were selected as coordinators of the two topics, respectively.

1.1.3 Decisions regarding contribution to/participation in IHP-VI

Decisions were made to contribute to:

- 1 The implementation of Asian Pacific FRIEND (Flow Regimes from International Experimental Network Datasets) and HELP (Hydrology for Environment, Life and policy)
- 2 Publication of the Catalogue of Rivers for Southeast Asia and the Pacific, Vol. 5 and continuation of the publication (Vol. 6).
- 3 IHP International Training Course

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

- 1 The Committee members attended various technical sessions at the Third World Water Forum (WWF3) the International Conference on Managing Water Resources under Climatic Extremes and natural Disasters (FIJI-2003), Sigatoka, Fiji, 27-28 October 2003.
- 2 On 13 November 2003, the Committee hosted a special meeting in Tokyo, welcoming Dr Andras Szollosi-Nagy, Secretary of IHP, UNESCO. Special lecture on water-related activities in the world was given by Dr Szollosi-Nagy, together with some reports by Prof Takara (IHP activities), Mr Kitagawa (new plan under auspices of UNESCO in Tsukuba) and Prof Takeuchi (IAHS-PUB).
- 3 On 2 June 2004, a meeting for discussing Japanese contributions to IHP-VII (2008-2013) was held in Tokyo. Based on the discussion, the committee submitted Japanese tentative plan for IHP-VII.

1.2.2 Participation in IHP Steering Committees/Working Groups

- 1 Participation in 16th Session of Intergovernmental Council (IGC). UNESCO, Paris, 20-24 September 2004 (Prof Kuniyoshi Takeuchi, Prof Kaoru Takara, Mr Kazuo Akiyama (MEXT), Mr Masaru Kunitomo (MLIT), Mr Kiyofumi Yoshino (MLIT), Ms Mariko Kobayashi (Permanent Delegation to UNESCO), Mr Tadahiko Sakamoto (PWRI), Mr Akira Terakawa (PWRI), Mr Daisuke Kuribayashi (PWRI), Mr Shigenobu Tazou (PWRI), Mr Kenji Suzuki (MLIT) and Mr Seiji Ito (MLIT)).
- 2 Japan participated in the establishment of the Regional Steering Committee (RSC) for Southeast Asia and the Pacific in 1993. Since then at least a couple of National Committee members have attended and participated actively in all of the annual meetings of the RSC. The Chairman of the Japanese National Committee for the IHP, Prof Takeuchi, had served as the RSC Secretary (1993-1999) Chairman of the Technical Sub-Committee (TSC) for Asian-Pacific FRIEND Phase 1 (1997-2002) in the framework of the RSC, while Prof Takara is playing a role of the RSC Secretary (1999-2004).

1.2.3 Research/applied projects supported or sponsored

The MEXT granted a Grant-in-Aid for Scientific Research to Prof Ikebuchi, Kyoto University, for 2001-2003, to Prof Takeuchi, Yamanashi University, for 2002-2003, and to Prof Takara, Kyoto University, for 2004-2006. Another fund (Special Coordination Fund for Promoting Science and Technology) for coordination of international meetings on monitoring, forecasting and mitigation of water-related disasters was allocated by the MEXT to Prof Takara, Kyoto University, for 2002-2004.

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

The Japanese IHP National Committee has closely collaborated with:

1. The Liaison Committee on Hydrological Science, Science Council of Japan.
2. The GAME Sub-Committee of the Special Committee on WCRP, Science Council of Japan.
3. The national government and its branches relating to hydrology and water resources administration.
4. Nagoya University and other universities and research institutes.
5. The Chairman of the National Committee, Prof Takeuchi, is currently the President of International Association of Hydrological Sciences (IAHS) and information exchange is done from time to time between IAHS and IHP.

1.2.5 Other initiatives

None.

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

1. Doctor of Science degree on atmospheric and hydrospheric science:

The Graduate School of Science of Nagoya University accepts students from Asia and the Pacific region for the Graduate School of Environmental Studies, with the financial support from the Ministry of Education, Culture, Sports, Science and Technology (MEXT).

2. IHP Training Courses :

The Hydrospheric 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 for IHP.

The 14th IHP training course (TC) on «Hydrology in Asia» was carried out at Kuala Lumpur, Malaysia to gather many participants (11 lecturers and 13 trainee (excluding 16 Malaysians) from 14 countries including Malaysia in Asia and Pacific regions. The humid Tropics Centre, Kuala Lumpur (HTC KL) kindly hosted the training course.

The course was focused on three major objectives: (1) Review of past TC's, (2) Activities on water issues in each country, (3) Discussion on the direction of future TC. Lectures and an excursion were also included. For the objective (1), UNESCO IHP activities and TC activities including HTC KL activities were introduced. For the objective (2), presentations from the participants from many countries were held. For the objective (3), first, the census of questionnaires to the past TC participants were presented. The opinions and comments were invited in a discussion sessions, one of which was a group discussion: one was on short-term, and the other was on long-term.

1.3.2 Organization of specific courses

None.

1.3.3 Participation in IHP courses

None.

1.4 Publications

1. « Managing Water Resources under Climatic Extremes and Natural Disasters», IHP-VI Technical Documents in Hydrology No. 2, UNESCO Jakarta Office, (Eds.) K. Takara and T. Kojima, 2003 (with CD-ROM).

2. « IHP », Newsletter on IHP activities of Japan, Nos.16 and 17 (double number), was published in December 2003 (in Japanese).

3. The Text books for the 12th «Precipitation and water resources » and 13th «Effects of Pollutants on Atmospheric Environment » Training Courses.

4. « IHP Papers presented at the International Conference on Water Sensitive Urban Design 'Cities as Caatchment' », IHP-VI Technical Documents in Hydrology No. 3, UNESCO Jakarta Office, (Eds.) R. James, T. Daniell and K. Takara, 2004.

1.5 Participation in international scientific meetings

1.5.1 Meetings hosted by the country

1 International Workshop on Water Hazard and Risk Management, 22-23 January 2004, the Public Works Research Institute, Tsukuba, Japan

2 International Symposium on “Approaches for Global Water Hazard and Risk Management in the 21st Century”, Urban Center Hotel, Tokyo, Japan

- 1.5.2 Participation in meetings abroad
- 1 11th Regional Steering Committee (RSC) Meeting, 27 October-1 November 2003, Sigatoka, Fiji (Prof Takeuchi, Prof Takara, Dr Tachikawa, Dr Chikamori, Mr Kitagawa, Mr Ikeda)
 - 2 The 36th IHP Bureau, 31 March-2 April 2004, Paris, France (Mr. Hiroki, Mr.Kitagawa, Mr.Yoshitani)
 - 3 Task Force Meeting for IHP-VII (2008-2013), Paris, March and June 2004 (Dr Kuraji, University of Tokyo)
 - 4 Seventh IHP/IAHS George Kovacs Colloquium, Paris, 17-18 September 2004 (Prof Takeuchi and Prof Takara)
 - 5 16th Session of the IHP Intergovernmental Council, 20-24 September 2004, Paris, France (Prof Takeuchi, Prof Takara, Mr Akiyama and others)

1.6 Other activities at regional level

- 1.6.1 Institutional relations/co-operation
None
- 1.6.2 Completed and ongoing scientific projects
None.

2. FUTURE ACTIVITIES

2.1 Activities foreseen until December 2005

The Japanese IHP National Committee plans the 15th IHP Training Course in 2005, which will be organized by HyARC, Nagoya University, with a provisional theme "Land Atmosphere Interaction". The first week, trainees will be at Nagoya University, followed by the second week in which trainees will have some field practices as well as instructions on instrumentation, flux measuring technique, flux imbalance problem, etc.

2.2 Activities planned for 2006-2007

1. Participation in RSC activities including Asian Pacific FRIEND and the Catalogue of Rivers.
2. Nagoya University IHP Training Courses, 2006 and 2007.
3. Implementation of projects related to IHP-VI Focal Areas.
4. Research on HELP basins.
5. Collaboration with UNESCO-MAB activities.
6. Activities related to the new UNESCO center named as the Center for Water-related Hazards and Risk Management (CHARM), which will be established in Tsukuba in 2005.

2.3 Activities envisaged in the long term

1. Participation in IHP-VI (2002-2007) projects and RSC activities.
2. Nagoya University IHP Training Courses.
3. Information dissemination through a web page of the National Committee.
4. IHP-VII (2008-2013) plannings.

3. MEMBERS OF THE COMMITTEE

Chairman:	TAKEUCHI, Kuniyoshi*	Professor	Yamanashi University
Members:	FUKUSHIMA, Yoshihiro	Professor	Res. Institute for Humanity and Nature
	HADA, Shigeki	Professor	Kobe Women's University
	IKEBUCHI, Shuichi	Professor	Water Resources Research Center, DPRI, Kyoto University
	KOIKE, Toshio	Professor	University of Tokyo
	MATSUI, Saburo	Professor	Graduate School of Global Environment Research, Kyoto University
	MUSHIAKE, Katsumi	Professor	Japan Science and Technology Agency ; Fukushima University
	NAKAMURA, Kenji	Professor, Director	Hydrospheric Atmospheric Research Center, Nagoya University
	NAKAYAMA, Mikiyasu	Professor	University of Tokyo
	TAKARA, Kaoru	Professor	DPRI, Kyoto University
	TANAKA, Tadashi	Professor	Tsukuba University
	YOSHIKAWA, Hiroyuki*	President	National Institute of Advanced Industrial Science and Technology
YOSHITANI, Junichi	Precedence Researcher	Public works Research institute	

(Note: * indicates the member of the Japanese National Commission for UNESCO.)

**NATIONAL REPORT ON IHP RELATED ACTIVITIES
IN
REPUBLIC OF KOREA**

November, 2004

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

1. ACTIVITIES UNDERTAKEN IN THE PERIOD JUNE 2002-NOVEMBER 2004

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) and the sixth phase of IHP project(2002~2007) 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, and education and training in hydrology and water resources.

In the beginning of the New Millennium, 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 Construction and Transportation.

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 is paying its efforts to achieve the objectives set by UNESCO for this phase of IHP and the following projects are being and be 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 and will be 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. 2002 IHP Representative Basin Studies	<ul style="list-style-type: none"> ·Distribution of hydrological data by electronic publication() ·Assessment of hydrologic behavior due to agricultural land use and paddy cropping system changes() ·Review and evaluation for IHP fifth phase studies ·Collection and fundamental analysis of hydrological data of the Representative basins ·Preparations of River Catalogue - Vol. 9 	Theme 1, 2 and 5	Korean rivers	MOCT	Major Gov. input	Report and Papers
2. 2003 IHP Representative Basin Studies	<ul style="list-style-type: none"> ·Distribution of hydrological data by electronic publication() ·Analysis of runoff effect by agricultural land use changes() ·Study on flash flood forecasting and management for mountainous region() ·Water science studies ·Development of internet water education program ·Collection and fundamental analysis of hydrological data of the Representative basins ·Preparations of River Catalogue - Vol. 10 	Theme 1, 2 and 5	Korean rivers	MOCT	Major Gov. input	Report and Papers
3. 2004 IHP Representative Basin Studies	<ul style="list-style-type: none"> ·Distribution of hydrological data by electronic publication() ·Study on flash flood forecasting and management for mountainous region() ·Study of urbanization effect on river water and sewage quality ·Water conflict factors and solution in Korean river basins ·Development of image education system for water resources education and training ·Collection and fundamental analysis of hydrological data of the Representative basins ·Preparations of River Catalogue - Vol. 11 	Theme 1, 2, 4 and 5	Korean rivers	MOCT	Major Gov. input	Report and Papers
4. Asian/Pacific FRIEND Studies	<ul style="list-style-type: none"> ·Preparation of River Catalogue data ·Basic hydrologic analysis in AP FRIEND river basins 	Theme 1 Area 1.1	Korean rivers	MOCT		Report and Papers
5. Special program on the low-flow management	<ul style="list-style-type: none"> ·Low-flow management system simulation ·River water quality variation ·Changing climate and runoff conditions 	Theme 1 and 2	Korean rivers	MOCT MOE MOA		Report and Papers
6. Water resources management during extreme flood and drought	<ul style="list-style-type: none"> ·Extreme flood and drought modelling ·Water resources management techniques during extreme hydrologic periods 	Theme 1, 2 and 3	Korean rivers	MOCT MOA		Report and Papers
7. Special program of regional cooperation		Theme 4 and 5		MOCT MOE		

MOCT : Ministry of Construction and Transportation
 MOE : Ministry of Environment
 MOA : Ministry of Agriculture

In the beginning of the sixth phase of IHP (2002~2007), the Korean National Committee for the IHP has prepared the research programme of IHP-VI phase as given in Table-2 to achieve the objectives set by UNESCO for this phase of IHP.

Table-2 Planned Research Programme of IHP-VI Phase

Theme	Title	Potential Contribution and Research Activities	Executing Milestone						Remark
			2002	2003	2004	2005	2006	2007	
Theme 1	Global Changes and Water Resources								
Focal Area 1.1	Global estimation of resources : water supply and water quality	<ul style="list-style-type: none"> Low-flow management in consideration of water quality improvement and changing environment in river systems Developing environmentally sound – sustainable development and management strategies of water resources Development of water archive and contribution of Korean hydrological data and water quality data to global and regional studies Comparative global and regional analyses of water resources Developing national water quality management strategies 							
Focal Area 1.2	Global estimation of water withdrawals and consumption	<ul style="list-style-type: none"> Comprehensive studies of alternative means to save and conserve water resources for future demand Evaluation of national water use and demand Evaluation of groundwater resources and developing suitable management strategies for their withdrawals and consumption 							
Focal Area 1.3	Integrated assessment of water resources in the context of global land based activities and climate change	<ul style="list-style-type: none"> Integrated studies of water resources changes due to man-made activities Comprehensive analyses of climate change and its effect to water resources Assessment of water resources due to land use change 							
Theme 2	Integrated Watershed and Aquifer Dynamics								
Focal Area 2.1	Extreme events in land and water resources management	<ul style="list-style-type: none"> Hydrological studies of extreme events in Korean river basins Developing the best flood warning systems and the use of radar-based rainfall information Evaluation of national drought characteristics and their alternative measures Water resources management during extreme flood and drought 							
Focal Area 2.2	International River Basins and Aquifers	<ul style="list-style-type: none"> Developing strategies of international river basin management 							
Focal Area 2.3	Endorheic Basins								
Focal Area 2.4	Methodologies for integrated river basin management	<ul style="list-style-type: none"> Development of integrated river basin management systems in Korean river basins Integrated urban water management Assessment of surface water and groundwater resources in watershed and aquifers 							
Theme 3	Land Habitat Hydrology								
Focal Area 3.1	Drylands								
Focal Area 3.2	Wetlands								
Focal Area 3.3	Mountains	<ul style="list-style-type: none"> Studies of hydrological processes in mountain watershed Flash flood and runoff characteristics in mountain hillslope basins 							
Focal Area 3.4	Small islands and coastal zones	<ul style="list-style-type: none"> Studies of hydrology and water management in small islands and coastal zones Assessment of groundwater resources in small and volcanic islands Studies of water supply and alternate water resource systems in small islands and coastal zones 							
Focal Area 3.5	Urban areas and rural Settlements	<ul style="list-style-type: none"> Development of stormwater management model in urban areas Studies of change of urban rivers to environmentally sound – natural rivers Studies of decreasing methods of urban runoff Assessment of urban stormwater quality systems 							
Theme 4	Water and Society								
Focal Area 4.1	Water, civilization and ethics	<ul style="list-style-type: none"> Studies of relationship of water with culture and civilization in Korean river basins - - - characteristics of water culture 							
Focal Area 4.2	Value of water	<ul style="list-style-type: none"> Assessment of water price for effective consumption Studies of water consumptive habit in the society 							
Focal	Water conflicts –	<ul style="list-style-type: none"> Evaluation of water conflict problems in Korean river 							

Area 4.3	prevention and resolution	basins : case studies							
Focal Area 4.4	Human security in water – related disasters and degrading environments	·Review and assessment of prevention activities in water – related disasters ·Studies of environmental impacts by water – related disasters							
Focal Area 4.5	Public awareness raising on water interactions	·Development of public awareness and participation programs in water resources project ·Studies of public awareness in water resources							
Theme 5	Water Education and Training								
Focal Area 5.1	Teaching techniques and material development	·Evaluation and development of teaching and training techniques in water – related education ·Development of internet-based teaching materials for water resources education							
Focal Area 5.2	Continuing education and training for selected target groups	·Development of continuing education and training programs for practicing hydrologists and water – related engineers							
Focal Area 5.3	Crossing the digital divide	·Development of the internet program of water education & information							
Focal Area 5.4	Institutional development and networking for WET	·Access to hydrological and water resources educational expertise within Korea							

1.1.3 Decisions regarding contribution to / participation in IHP-VI

Upon having received the progress report on the seventh phase of the international hydrological programme(IHP-VI, 2008-2014), the Korean National Committee for the IHP decided to prepare the potential contribution and research programme of IHP-VI during the IHP-VI period(2002-2007) based on the proposed concept and structure of IHP-VI as the followings ;

- Global Changes, Watersheds and Aquifers
- Governance and Socio-Economics
- Water and Environmental Management
- Water Quality, Human Health and Flood Security

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 the Korea Water Resources Association, Korean Society of Civil Engineers, ICOLD Korean National Committee, IWRA Korea Geographic Committee, 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 2002~2004. As Chairman of Working Group 3 (WG3) of the Asian Pacific FRIEND project, one delegate (Professor Soontak Lee) organized and sponsored a WG3 report preparation meeting and an International Symposium in 2002 at Yeungnam University, Taegu, Republic of Korea.

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 2002~2004 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 basins(Pyungchang-gang, Wichun, Bochungchun river basins).

(1) Hydrological data base (Asian Pacific Water Archive)

- to create a common hydrological data base for the region by bringing together existing data sets from individual member countries.
- Collecting hydrological data from river basins of the Catalogues of Rivers as the first step and then from the river basins for Asian Pacific FRIEND.
- Compiling all catchment characteristics including hydrological data from related river basins

(2) Floods

- to analyze the flood data to develop design procedures in the region.
- Evaluating characteristic regional patterns in flood regimes.
- Reviewing flooding frequency analysis and rainfall/runoff analysis methods of flood estimation.

(3) Low flows

- to analyze the low flow data to develop for estimating a range of low flow and water resourcesthroughout the region.
- Investigation of the characteristics of low flow regimes from the data base for the estimation of dryseason flows.
- Developing appropriate standard analysis techniques to account for the observed variability of flow regimes in the region.
- Regional modelling of low flows physically based and conceptual modelling, studies to multi-variate low flow studies at the regional and Asian scale.

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; Korea Water Resources Association; Korean Society of Civil Engineers; Korean Society of Agricultural Engineers; Korean Meteorological Society; ICOLD Korean National Committee; IWRA Korean Geographic Committee; International Hydrologic Environmental Society(IHES) ; Korea Institute of Construction Technology; 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 the Korean Water Resources Association. In these specific courses, special topics are dealt with practical application in river basins.

1.4 Publication

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.

1.5 Participation in international scientific meetings

1.5.1 Meetings hosted by the country

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

- Asian Pacific FRIEND Working Group 3 Meeting
- International Symposium on Drought Problems and Alternate Water Resources
- 2004 International Symposium on Hydrological Environment

Both meetings were held at the Yeungnam University and Grand Hotel, Taegu, Republic of Korea in 2002 and 2004

1.5.2 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 2005, foreseen for 2006-2007 and envisaged in the long term

From the beginning of 2002, IHP-KNC prepared concrete national plan for the sixth 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.

IHP-KNC will also prepare the potential contribution and research programme of IHP-VI by the end of IHP-VI period (2007) and organize some international and regional activities within this period.

The following international symposia will be organized until December 2005 as the IHP-VI activities of IHP-KNC.

- 2005 International Symposium on Hydrological Environment
- International Symposium on Hydrology, Ecohydrology and Water Resources

**National Report on IHP Related Activities
Lao PDR**

1. Activities undertaken in the period of November 2003 – November 2004

1.1 National / local scientific and technical meeting

1.2 Participation in IHP Steering Committee / Working group

One representative from Lao PDR attended the 11th Regional Steering Committee Meeting for Southeast Asia and the Pacific – UNESCO IHP in conjunction with the International Conference on Managing Water Resources under Climatic Extremes and Natural Disasters on 27 October – 1 November 2003 in Sigatoka, Fiji. He presented the paper on hydrological extreme events in Lao PDR

1.3 Research / applied projects supported or sponsored

Nam Ngum Basin, Water Sector Development Project under implemented

1.4 Collaboration with other national and international organization / programmes

Collaboration with WRCC, LNMC, FMMP, MRC, SEATAC, JICA, WMO ...

1.5 Educational and training courses

Participation to IHP and other specific courses

1.6 Publications

- Publishing of Climatological Bulletin for 2003
- Publishing of Hydrological Year book for 2003
- Publishing of Water Resources Guide Book of Lao PDR
- Contribution of 3 rivers (Nam Ngiep, Nam Sane and Nam Song) for the Catalogue River vol. 5

1.7 Meeting and workshops

National level

- More than twenty representatives attended National Seminar on Flood Preparedness Planning on 18 June, 2004 in Vientiane, Lao PDR
- Three representatives attended the Integrated Basin Flow Management Meeting in the lower Mekong basin on 21-22/10/2004 in Vientiane, Lao PDR

- Two representatives attended the advanced DSF Training Course on 20 – 24 September 2004 in Vientiane, Lao PDR
- Three representatives attended the Integrated Basin Flow Management Meeting in the lower Mekong basin on 21-22/10/2004 in Vientiane, Lao PDR
- Twelve representatives attended the International Conference on Advances in Integrated Mekong River Management on 25-27/10/2004 in Vientiane, Lao PDR

International level

- Twenty two representatives attended the First Southeast Asia Water Forum on 17-21 November, 2003 in Chiang Mai, Thailand
- One representative attended the 13th IHP Training Course on Effects of Pollutants on Atmospheric Environment on 7-20 March, 2004 in Nagoya and Tokyo, Japan
- One representative attended the IHP Training Course on Groundwater Contamination on 25 April – 4 May, 2004 in Bangkok, Thailand
- One representative attended the KAGI – 21 Conference on 11-27 July, 2004 in Ban Dung, Indonesia
- One representative attended the Training Program on GIS Remote Sensing for Disaster Risk Assessment on 13-24 September, 2004 in Bangkok, Thailand
- One representative attended the 14th IHP Training Course on Hydrology in Asia on 11-15 October, 2004 in Humid Tropics center, Kuala Lumpur, Malaysia

2. Future activities

2.1 Activities planned for 2005

- Continuation of improvement of hydro-meteorological network, data collection and processing
- Continuation of implementing of Nam Ngum basin, water sector development project
- Extending of flood forecasting and flood early warning system in southern part of the country
- Participation in IHP Training and other specific related Courses
- Attend the next 13th RSC Meeting

2.2 Activities envisaged in the long term

- Strengthening cooperation with riparian countries in the Mekong Sub-region
- Enclosed collaboration with RSC for Southeast Asia and the Pacific
- Continuation of River catalogue contribution for next volume

In the recent year, Lao PDR has gained some achievements in water resources management, especially the approval of water and water resources law, which opened a new phase of management, protection, exploitation and utilization of water resources at

the central level to the provincial level. The goal of Lao Government is to reduce the poverty and to preserve sustainable water and water resources and to ensure quantity and quality of water for people's living requirements, promotion agriculture, forestry, developing the natural social-economic and ensuring environment.

3. Hydro-meteorological activities undertaken in the period November 2003 – October 2004:

3.1 Data collection and processing

- Continuation of hydrological data collection for MRC
- Continuation of hydro- climatic data collection for Nam Theun 2 hydro-power project
- Data processing by using two software models such as CLICOM for meteorological and HYMOS for hydrological analysis

3.2 Activities related to flood forecasting

3.2.1 Flood forecasting along Mekong river

- Data information exchange on water level and rainfall was operated from May 2004
- Issuing 48 hours (2 days) of water level forecast for 6 major provinces, located along Mekong river including Vientiane Capital
- Data information exchange on flood forecasting with MRCS was started from early June until October

3.2.2 Inflow forecast to Nam Ngum Reservoir

- Issuing inflow forecast to the reservoir for 3 Months ahead (July-September), based on rainfall-runoff relationship to guarantee the sufficient water for electric generation
- Issuing weekly inflow forecast to serve the reservoir operation and its temporal distribution to avoid or minimize property losses at the downstream of the reservoir

4. Meeting and workshops

4.1 National level

- One representative participated in “ Consultation Workshops on Establishing Lao Water Partnership” 29/8/03, supported by SEATAC
- One representative attended National Seminar on Flood Preparedness Planning on 18 June, 2004 in Vientiane, Lao PDR
- Three representatives attended the Integrated Basin Flow Management Meeting in the lower Mekong basin on 21-22/10/2004 in Vientiane, Lao PDR

- Twelve representatives attended the International Conference on Advances in Integrated Mekong River Management on 25-27/10/2004 in Vientiane, Lao PDR
- One representative participated in “Consultation Workshops on Data Information Exchange” 22/10/2003 in Vientiane, Organized by LNMC

4.2 International level

- Twenty two representatives attended the First Southeast Asia Water Forum on 17-21 November, 2003 in Chiang Mai, Thailand
- One representative attended the 13th IHP Training Course on Effects of Pollutants on Atmospheric Environment on 7-20 March, 2004 in Nagoya and Tokyo, Japan
- One representative attended the IHP Training Course on Groundwater Contamination on 25 April – 4 May, 2004 in Bangkok, Thailand
- One representative attended the KAGI – 21 Conference on 11-27 July, 2004 in Ban Dung, Indonesia
- One representative attended the Training Program on GIS Remote Sensing for Disaster Risk Assessment on 13-24 September, 2004 in Bangkok, Thailand
- One representative attended the 14th IHP Training Course on Hydrology in Asia on 11-15 October, 2004 in Humid Tropics center, Kuala Lumpur, Malaysia

5. Publication

- Publishing of Climatological Bulletin for 2003
- Publishing of Hydrological Year book for 2003
- Publishing of Water Resources Guide Book of Lao PDR
- Contribution of 3 rivers for the Catalogue River vol. 5

6. Activities planned for 2005

- Improvement of hydro-meteorological network, data collection and processing
- Implementing of Nam Ngum basin, water sector development project
- Extending of flood forecasting and flood warning system in southern part of the country
- Participation in IHP Training Courses

7. Activities envisaged in the long term

- Strengthening cooperation with riparian countries in the Mekong Sub-region
- Enclosed collaboration with RSC for Southeast Asia and the Pacific

**12th RSC IHP UNESCO MEETING
FOR SOUTHEAST ASIA AND THE PACIFIC
ADELAIDE AUSTRALIA**

(21 NOVEMBER 2004 - 26 NOVEMBER 2004)

COUNTRY REPORT

OF

MALAYSIAN NATIONAL COMMITTEE FOR IHP

(OCTOBER 2003 – OCTOBER 2004)

BY

DATUK IR. HAJI KEIZRUL BIN ABDULLAH

CHAIRMAN

MALAYSIAN NATIONAL COMMITTEE FOR IHP

**COUNTRY REPORT 2004 OF
MALAYSIAN NATIONAL COMMITTEE FOR IHP**

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1. ACTIVITIES UNDERTAKEN IN THE PERIOD OCTOBER 2003 – OCTOBER 2004

The Malaysian National Committee for IHP was formed in 1975, and comprises 27 governmental agencies and institutions of Higher Learning as listed in Appendix A.

1.1 Meetings of the IHP National Committee

a) The EXCO meeting were held as follows:-

Year 2004 in Kota Kinabalu 13 January 2004
 In Kuala Lumpur 18 June 2004

b) The Annual General Meeting were held as follows:-

Year 2004 34th AGM on 17 September 2004
 Centiury Mahkota Hotel, Melaka.

1.1.1 Decisions regarding the composition of the IHP National Committee

The National Committee of IHP Malaysia consists of 8 Executive Committee (EXCO) members, of which 4 are permanent and the other 4 are elected during the Annual General Meeting for a two (2) years term. The Chairman of the National Committee is Ir. Keizrul Abdullah, the Director General of the Department of Irrigation and Drainage(DID) Malaysia and the Secretary is Ir. Abdul Rahim Kaparawi (from 2nd Jan 2004) who took over from Ir. Chong Sun Fatt (from May 2003 to December 2003) who succeeded Ir. Liew Chin Loong, all were from DID respectively. The Secretariat is provided by the DID.

The EXCO elected in the 33rd AGM were from the following Agencies:-

1. The Universiti Sains Malaysia, (USM)
2. Forest Research Institute of Malaysia (FRIM)
3. Malaysian Institute for Nuclear Technology (MINT)
4. Department of Environment (DOE)

The permanent EXCO members are:-

1. Department of Irrigation and Drainage Malaysia (DID)
2. Malaysian Meteorological Service (MMS)
3. Department of Minerals and Geosciences (DMG)
4. Malaysian National Commission for UNESCO (MNCU)

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

- (a) Committee on Research (JKP) under the chairmanship of Humid Tropics Center, Kuala Lumpur HTCKL
- (b) Committee on Education, Training and Public Information (JKPLPA), headed by the University Technology Malaysia (UTM).
- (c) Committee on Standardization of Hydrological Practices (JKPAH), under the chairmanship of Department of Irrigation and Drainage (DID)

The Chairmen of these standing committees report their activities in the quarterly EXCO meeting.

There was no election of EXCO in the 34th AGM as the election of EXCO in the 33th would serve the two (2) year term from September 2003 to September 2005

1.1.2 Status of IHP-V and IHP VI activities

MIHP through its Standing Committee on Research played important role in preparing proposal for research project. Among the committee members are the experts from various government departments, universities and research institution. The meeting were frequently held to discuss research project in line with the proposed plan of IHP VI UNESCO (2002 – 2007).

MIHP has identified several proposed research projects to be undertaken by the respective lead agency. see Table1(a)

1.1.3 Decisions regarding contribution to/participation in IHP-VI

None

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

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

1.2.2 Participation in Regional IHP Steering Committee

None

1.2.3 Research projects sponsored

See Table 1(b)

1.2.4 Collaboration with other national and international organizations/programmes

Dr. Mohd. Tadza b. Abdul Rahman of Malaysian Institute for Nuclear Technology Research (MINT) has been nominated as the expert by the MIHP. He acts as focal point for the UNESCO – IAEA Joint International Isotopes in Hydrology Programme (JIHP)

The Chairman and Secretary of the MIHP are in frequent contact with the Regional Hydrological Advisor to the President of the WMO Regional Association. This contact enables coordination of activities under the aegis of IHP and the WMO OHP in Malaysia to be executed successfully.

1.2.5 Other initiatives

MIHP organised activities including workshops, seminars and basic course in Hydrology at National Level. In addition MIHP organized the 2004 World Water Day Celebration in collaboration with government agencies, NGOs and private sectors. The activities carried out included launching by Honorable Minister of Development and Infrastructure Sabah, the national seminar, the national exhibition, drawing and coloring contest, articles and feature writings in the electronic and mass media (see Table 2)

MIHP co-organised the National Dialogue on Water for food and Environment in collaboration with Malaysian Water Week 2004 organised by Malaysian Water Partnership in Renaissance Kuala Lumpur Hotel from 7 – 12 June 2004

1.3 Educational and training courses

In the Year 2003 several school talks on hydrology and environment were organised with participation over 5,000 secondary students.

Seminar and workshop on Sustainable Water Management was organized at Aminuddin Baki National Secondary School in Kuala Lumpur on 14th October 2004 . 104 students participated in one day seminar. School teachers and JKPLPA committee were involved in organizing the seminar and workshop.

1.3.1 Contribution to IHP courses

None

1.3.2 Organisation of specific courses

None

1.3.3 Participation in IHP courses / seminars

The 14th IHP Training Course on Hydrology in Asia held in Kuala Lumpur Malaysia from 11 October – 15 October 2004 was attended by several representatives from Malaysian IHP members as follows:

Mr. Asnor Muizan bin Dato' Ishak from DID
Mr. Mohammad bin Deris from DID rep. the past participants from Malaysia
Prof. Madya Dr. Ismail Abustan from USM
Mr. Kamaruddin Samdin from MINT
Mr. Abdul Rahman from MINT
Mr. Ahmad bin Che Abdul Salam from Forest Research Institute
Mr. Kuan Woei Keong from UiTM
Mr. Andee Raidha Dziaudin from UiTM
Miss Chua Lee Hua from PWD
Mrs. Noriah Bt Abu Bakar from PWD

Mr. Zahir bin Yahya from Department of Mineral and Geoscience Malaysia (IHP member) attended the "Computer Aided on Ground Water" course in Pathumthai Thailand from 7 – 20 March 2004

1.4 Publications

Publications contributed by MIHP are as follows:

1. The Report on Sungai Pahang for River Catalogue Vol. 5
2. The Proceeding of The International Conference on Urban Hydrology fir 21st Century edited by Dr. Haji Mohd. Nor bin Haji Mohd Desa. The proceeding becomes IHP – VI – Technical Document in Hydrology No. 1 UNESCO Jakarta Office, 2002
3. The Proceeding of The International Symposium on Comparative Regional Hydrology Mission for IHP Phase VI of UNESCO edited by Dr. Haji Mohd. Nor bin Haji Mohd Desa. The proceeding becomes IHP – VI – Technical Document in Hydrology No. 1 UNESCO Jakarta Office, 2002

1.5 Participation in international scientific meetings

1.5.1 Meetings hosted by the country

None

1.5.2 Participation in meetings abroad

MIHP Chairman Ir. Haji Keizrul bin Abdullah attended the 11th Regional Steering Committee IHP UNESCO Meeting in Sigatoka, Fiji from 30 –31 October and the World Water Forum in Japan. He also attended the International World Water Day Celebration at Geneva Switzerland from 22 – 23 March 2004 where he delivered a keynote paper.

1.6 Other activities at a regional level

Application for a participation programme grant 2004-2005 for the project on “River Eco–Expedition” for Regional (S.E.A.) Student Exchange Programme on Hydrological and Environmental Expedition has been resubmitted for consideration to the Malaysian National Commission for UNESCO.

1.6.1 Institutional relations/co-operation

The MIHP was represented by Deputy Director General II of Department of Irrigation and Drainage Malaysia at the 16th IGC Meeting in UNESCO Paris from 16 – 24 September 2004 as a member of the ad hoc Committee on IHP Governance.

1.6.2 Completed and on-going scientific projects

Refer to Table 3 & 4.

2. FUTURE ACTIVITIES

2.1 Activities planned for 2005 and beyond

The “Eco-Hydrology Expedition” for Regional (S.E.A.) Student Exchange Programme on Hydrological and Environmental Expedition under the sponsorship of Malaysian National Commission of UNESCO (SKUM) is planned to be held in 2005 and the “River Expedition” for the student at national level will be carried out in Jun 2005 at Endau Rompin, Johor also under the sponsorship of the Malaysian National Commission of UNESCO (SKUM).

Other proposed activities are listed in Table 5

2.2 Activities foreseen for 2006 - 2007

Yearly programme similar to programme for the year 2005

2.3 Activities envisaged in the long term

Being planned.

Table 1(a): Proposed research projects by MIHP/DID under Experimental Applied Research (EAR) IRPA 2004 in conjunction with IHP phase VI

Theme / Focal Area	Title	Agencies
Theme 2	Integrated Watershed Dynamics	
Focal Area 2.1	a) Establishment of Landside Hazard Assessment Map Expressway and Cameron Highlands	UiTM,MINT,KUiTTHO,JPS JMG
	b) Runoff Generation of Processes and Time of Concentration Forested and Agricultural Experimental Catchment	UTM,MINT,USM,FRIM,JMG
Focal Area 2.2	a) Determination Of Event Mean Concentration (EMC) Values Of Suspended Sediments And Nutrients Urban Discharge Monotoring At Stations Of Sg. Kerayong And Taman Mayang WP. Kuala Lumpur	UiTM, MINT,,KUiTTHO,DID, MMS,UPM
Focal Area 2.3	a) Establishment of a Rainfall Erosivity Profile along North-South Expressway	UiTM,MINT,KUiTTHO,DID, MMS,UPM
Theme 3	Regional Perspective	
Focal Area 3.1	a) Development of Temporal Pattern for Urban Areas and PMP Derivation for Peninsular Malaysia	HTC,MMS
Focal Area 3.2	a) Heat Island Effects in Urban Areas and Correlation with Rainfall Runoff Pattern	MINT,USM,UiTM
	b) Detailed Hydrological Balance Study of Paya Indah	HTC,DID,UTM,FRIM, MINT,MMS,JMG
Focal Area 3.5	a) Effects of Logging on the Muda/ Pedu Reservoir Phase II	DID,UPM,MINT,UTM, MADA,DOAKedah, UKMLestari,JPnk,JMG,DOA,FRIM
Focal Area 3.7	a). Development of runoff characteristics to validate Manual Saliran Mesra Alam (MASMA)	USM,DID,MINT,KUiTTHO HTC
	b) Development of Urban Stormwater Management Model (SWMM) and GIS for Decision Support System	USM,JPS
	c). Performance Indicator of Stormwater Gross Pollutant Trap for Urban Drainage System	JPS,USM,UTM,HTC

Table 1(b): Research projects sponsored by IRPA carried out under IHP phase VI

Theme / Focal Area	Title	Agencies
Theme 2	Integrated Watershed Dynamics	
Focal Area 2.1	a) Development of Temporal Pattern for Urban Areas and PMP Derivation for Peninsular Malaysia	HTC Kuala Lumpur, MMS
Theme 3	Regional Perspective	Agencies
Focal Area 3.2	a) Development of Runoff Generation and Catchment Responses in Forested and Agricultural Sites	UTM, MINT,USM,JMG
	b) Detailed Hydrological Balance Study of Paya Indah Wetlands, Selangor	DID,UTM, FRIM, MINT, MMS, JMG, HTC Kuala Lumpur
Focal Area 3.7	a). Development of runoff Characteristics to Validate Manual Saliran Mesra Alam (MASMA)	USM, DID, MINT, KUiTTHO, HTC Kuala Lumpur,

Table 3: Malaysian IHP Research Activities Under IHP Phase V

* No .	Title	Status	Agencies Involved	Completion Date	Funding Agency
1. (6.1/6.2)	Effects of Logging on the Muda/Pedu Reservoirs.	Study in progress and scheduled to be completed in December 2005. Progress as scheduled.	DID/UPM/UTM/JPSM/MINT/MADA/FRIM/LESTARI/UKM/JPNK/DOA	December 2005	DID & MADA
2. (6.2)	Highlands Hydrology Study phase 2.	Received RM 146 000 in 2001. Applying for additional allocation under the 8 th . Malaysian Plan (2001 – 2005)	UTM/ITM/UPM/DID/JBA/TNB/JAS/MINT/JKR/FRIM	December 2005	IRPA
3.	Research on Urban Hydrology Kerayong Catchment	Data Processing and Analysis	HTC/DID/USM/UiTM	December 2004	DID

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

Table 4 : Asian Pacific FRIEND research project

No .	Title	Status	Agencies Involved	Completion Date	Funding Agency
1.	Establishment and Dissemination of Water Archive started 1997	2 more river basins are included ie. Muda River & River Pari.	DID	2005	Malaysian Government.
2.	Assessment and modification of available hydrological computer models to suit local conditions and possible applications for the region.	Study on going	HTC / USM	2005	Malaysian Government.
3.	Assessing the performance of a topographic-based model, TOPMODEL, in simulating runoff response in tropic regions, in particular for basin in Malaysia.	Study in progress	DID	2005	Malaysian Government.

Table 2. Activities Carried Out by Malaysian IHP for 2003/2004
(from October 2003 - October 2004)

Item	Activity	Period and Venue	Lead Agency
1.	World Water Day 2004		
i.	Launching by Hon. Minister of Development and Infrastructure Sabah	9 May 2004 Kota Kinabalu	MIHP
ii.	National Exhibition	8 – 9 May 2004 Kota Kinabalu	DID Sabah
iii.	Drawing and Coloring Contest	9 May 2004 Kota Kinabalu	MOE
iv.	National Seminar on “Water and Disasters”	10 – 11 May 2004	MANCID
v.	Publicity	During the World Water Day Celebration	Radio & TV Malaysia, local newspapers and bulletin
vi.	Open Day of Water Treatment Plant	22 March 2004 – 6 May 2004	PWD
vii.	Quiz on Radio Malaysia	6 March 2004 – 15 May 2004 (weekly)	MIHP Members
2.	Seminar /Workshop/Technical Talk		
i.	Seminar and Workshop on Sustainable Water Management at Aminuddin Baki National School.	14 October 2004 Kuala Lumpur	JKPLPA
ii	Talks on Hydrology to school	Through out Malaysia in the year 2004	JKPLPA
iii	Technical talk on Hydrology and water resources	27 July 2004	MIHP/MHS

Table 5: Future Activities by Malaysian IHP for 2004 - 2005**A) Seminar/Conference/Workshop**

Item	Activity	Period and Venue	Prop. Lead Agency	Funding Agency
1.	Water Resources Assessment Course.	7 – 10 December 2004 Kuala Lumpur	UTM/MIHP	Government of Malaysia
2.	World Water Day 2005.	March 2005	MIHP	Government of Malaysia
3.	Talks on Hydrology to Schools.	Through out Malaysia in the year 2005	MIHP	Government of Malaysia
4.	Seminars and Workshops on MIHP research projects.	Through out the year 2005 in Kuala Lumpur	HTC/DID	Government of Malaysia
5.	Technical Talks on Hydrology and Water Resources Issues	February 2005 July 2005 December 2005	MIHP	Government of Malaysia
6.	Technical Visits to water Resources Project	December 2004 April 2005 September 2005	MIHP	Government of Malaysia
7.	River Expedition	June 2005	MIHP	Suruhanjaya UNESCO Malaysia (SKUM)
8.	Seminar and Workshop on Hydrology for the selected Schools in Kuala Lumpur	January 2005 April 2005 June 2005 October 2005	MIHP	Government of Malaysia

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.	MINT * ²	-	Malaysian Institute of Nuclear Technology
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 Technology Tun Hussein Onn
25.	UiTM	-	University of Technology MARA
26.	NAHRIM		National Hydraulics Research Institute of Malaysia
27.	HTC	-	The Regional Humid Tropics Hydrology Water Resources Center for Southeast Asia and the Pacific

Note: *¹ - Permanent EXCO Member

*² - Elected EXCO Member

12th IHP REGIONAL STEERING COMMITTEE MEETING
FOR
SOUTH EAST ASIA AND THE PACIFIC
ADELAIDE, AUSTRALIA
(21 – 25 November 2004)

NATIONAL REPORT OF NEW ZEALAND

1. ACTIVITIES UNDERTAKEN IN THE PERIOD OCTOBER 2003 – SEPTEMBER 2004

1.1 Meetings of the IHP National Committee

1.1.1 Decisions regarding the composition of the IHP National Committee

Dr R P Ibbitt and Mr R J Curry continued as Chairman and Secretary respectively on the IHP National Committee.

1.1.2 Status of IHP-V activities

Projects:

- WG 1.1 (Information on New Zealand's Freshwaters: Water Resources Archive);
 - WG 2.7 (Water Fluxes and Pathways in River Basins); and
 - WG 2.8 (Linked Precipitation Runoff Modelling System for Mountainous Catchments)
- (refer IHP-V Technical Documents in Hydrology No.2 UNESCO Jakarta Office 1999 for details) continue to be funded.

While WG 1.1 is an on-going long-term project, projects WG 2.7 and 2.8 have undergone name changes to reflect changes in research direction and the way research projects are now organized in New Zealand. Funding for WG 2.7 now extends to the end of June 2005. Project WG 2.8 was "re-bid" to the funding agency in late 2003 as part of a larger package on research into natural physical hazards. There has been extensive re-distribution of funds between project components. In particular a large contingency component has been added to the project as a consequence of two major floods in the North Island of New Zealand during February and July 2004.

1.1.3 Decisions regarding contribution to/participation in IHP-V

Some components of the New Zealand hydrological research programme are aligned with IHP-V 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.

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).

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 Curry attended the 11th RSC meeting held in Sigatoka, Fiji and attended the Technical Steering Committee meeting associated with the 11th RSC meeting.

1.2.3 Research/applied projects supported or sponsored

None

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

- The Chairman and Secretary of the National Committee are in frequent contact with the Regional Hydrological Advisor to the President of the WMO Regional Association V, and with the Hydrological Adviser to New Zealand's Permanent Representative to the WMO. This contact enables coordination of activities under the aegis of IHP and the WMO OHP in New Zealand.
- A National report was provided for the 16th Session of the IHP Inter-Governmental Meeting held in Paris in 20-24 September 2004.
- The Chairman visited Malaysia during June 2004 and gave two presentations to a joint meeting of the Malaysian Hydrological Society and the Malaysian IHP Committee.
- The Chairman was again in Malaysia in September 2004 and gave a presentation to staff and students of the Faculty of Civil Engineering, Universiti Teknologi Malaysia, in Johore.
- International Year of Freshwater initiatives

There have been a number of national initiatives associated with the International Year of Freshwater in order to raise awareness of the importance of protecting and managing freshwater.

 - The New Zealand Hydrological Society in collaboration with The National Institute of Water and Atmospheric Research Ltd (NIWA), The Institute of Geological and Nuclear Sciences Ltd (GNS), and Landcare Research Ltd., has produced three large and colourful posters on freshwater (See the following two pages) aimed at schools and at the general public. The posters show a pictorial expression of the hydrological cycle, the spatial distribution New Zealand's rainfall and water resources, and a pictorial expression of the conflicts over use of the water resource. Each poster includes a number of interesting questions (with answers) and facts designed to encourage the viewer to think about freshwater availability issues in New Zealand.
 - The Royal Society of New Zealand organised the New Zealand wide sampling of streams by school groups to determine stream health. NIWA is providing assistance to schools through making staff available to comment on the results.
 - The Royal Society of New Zealand, UNESCO (Wellington) and NIWA combined to hold a conference on "Fresh Water New Zealand: problems, process and priorities" at the University of Auckland on 13-14 November 2003.
(<http://www.rsnz.org/secure/events/freshwater.php>).

The Water Cycle

Water is always moving around and through the Earth, continually changing between liquid, vapour and ice. This process is called "The Water Cycle".



Where's Hydro?

Hydro appears in 9 places on this poster. Oain clues to his whereabouts by answering the following questions.

1. What is an aquifer?
2. What is Geothermal water?
3. How much does a cloud weigh?
4. Which is heavier, saltwater or freshwater?
5. Can you taste water?
6. How much of the world's freshwater is underground?
7. Does groundwater mainly flow in caves?
8. How long does it take a drop of water to travel through an aquifer?
9. What happens to the water table when you draw water from a well?
10. What do wetlands do?

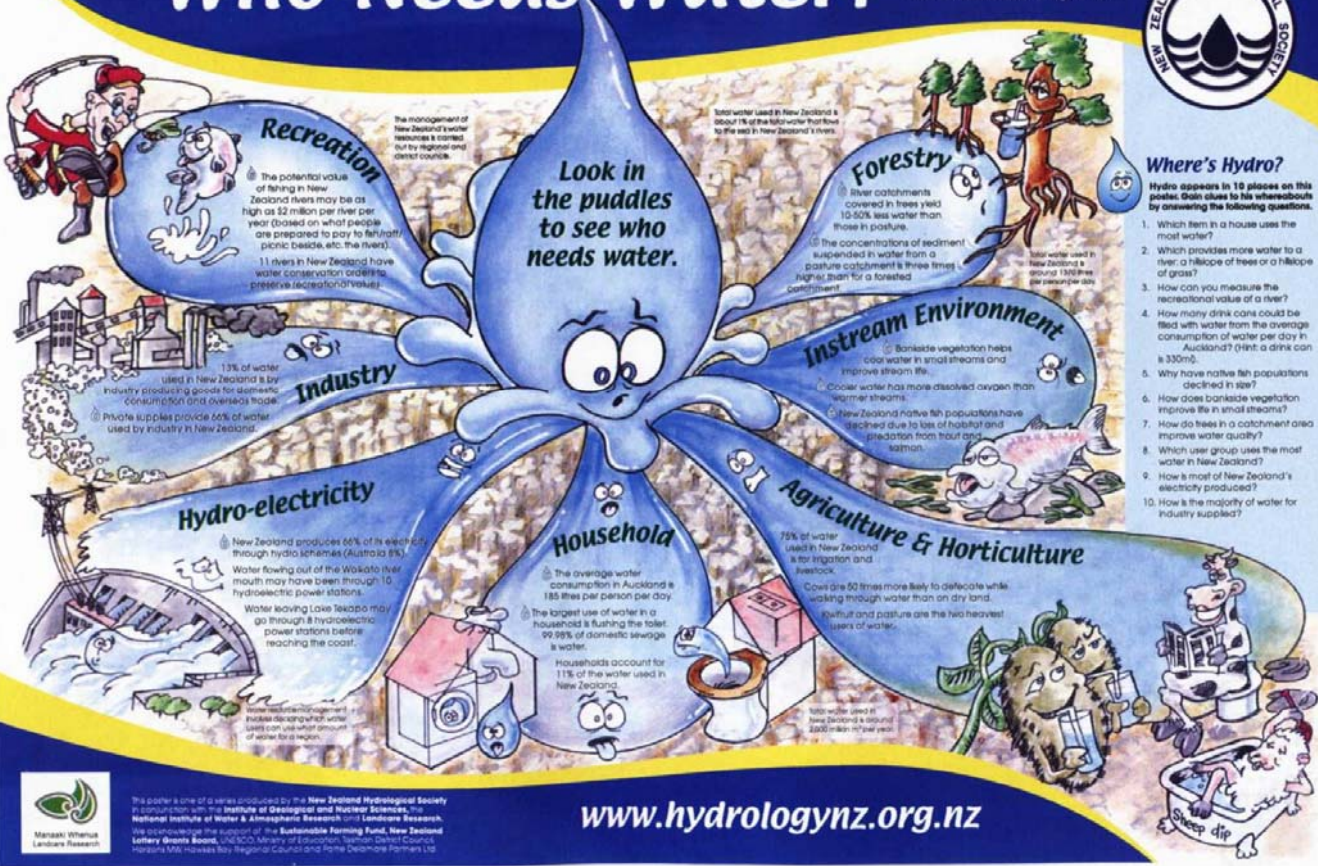


This poster is one of a series produced by the New Zealand Hydrological Society in partnership with the Institute of Geological and Nuclear Sciences, the National Institute of Water & Atmospheric Research and Landcare Research. Use intended for the support of the Sustainable Farming Fund, New Zealand Lottery Grants Board, UNESCO Ministry of Education, Tairāwhiti District Council, Hawke's Bay Regional Council and Puna Delemore Partners Ltd.

www.hydrologynz.org.nz

Who Needs Water?

There are many users of water, all have a right to it.



Where's Hydro?

Hydro appears in 10 places on this poster. Oain clues to his whereabouts by answering the following questions.

1. Which item in a house uses the most water?
2. Which provides more water to a river: a hillside of trees or a hillside of grass?
3. How can you measure the recreational value of a river?
4. How many drink cans could be filled with water from the average consumption of water per day in Auckland? (Hint: a drink can is 330ml)
5. Why have native fish populations declined in NZ?
6. How does bankside vegetation improve life in small streams?
7. How do bees in a catchment area improve water quality?
8. Which user group uses the most water in New Zealand?
9. How is most of New Zealand's electricity produced?
10. How is the majority of water for industry supplied?



This poster is one of a series produced by the New Zealand Hydrological Society in partnership with the Institute of Geological and Nuclear Sciences, the National Institute of Water & Atmospheric Research and Landcare Research. Use intended for the support of the Sustainable Farming Fund, New Zealand Lottery Grants Board, UNESCO Ministry of Education, Tairāwhiti District Council, Hawke's Bay Regional Council and Puna Delemore Partners Ltd.

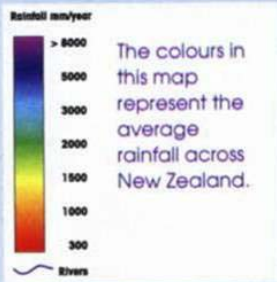
www.hydrologynz.org.nz

Where is Our Water?

Our freshwater exists as rainfall, river water or groundwater.



New Zealand Rainfall and Rivers



Where's Hydro?

Hydro appears in 10 places on this poster. Gain clues to his whereabouts by answering the following questions.

1. What is the New Zealand record for the largest amount of rain to fall in one hour?
2. Where is New Zealand's largest freshwater wetland?
3. Where is the North Island's largest measured annual rainfall?
4. Where is the driest place in the North Island?
5. What is New Zealand's largest river catchment?
6. What is the most amount of rain to fall in one year in New Zealand?
7. What was the highest measured flow during a flood in New Zealand?
8. Where is the driest place in New Zealand?
9. What is the longest glacier in New Zealand?
10. Where is New Zealand's dirtiest river?

New Zealand Aquifers



This poster is one of a series produced by the **New Zealand Hydrological Society** in conjunction with the **Institute of Geological and Nuclear Sciences**, the **National Institute of Water & Atmospheric Research** and **Landcare Research**.
 We acknowledge the support of the **Sustainable Farming Fund**, **New Zealand Lottery Grants Board**, **UNESCO Ministry of Education**, **Tairāhira District Council**, **Horowhenua Māori Whānau Bay Regional Council** and **Partic Discharge Partners Ltd.**

www.hydrologynz.org.nz

SHMAK Validation in Fiji

NIWA has had its NZAID project "Development of a Stream Health Monitoring Kit (SHMAK); Education leading to action" approved. This project commenced with NIWA developing a stream health assessment kit, similar to SHMAK, for use by schools and community groups in Fiji. Collaboration with the Fiji based NGO Live & Learn is being undertaken in conjunction with staff and students of the Fijian Institute of Technology, and is set to run over a period of 2 years. The final outcome will be a mixture of scientific reports summarizing the state of Fijian freshwaters and the pressures they are facing, as well as the development of a kit to measure stream health. This will enable villagers to monitor the effects of land use activities and seek to develop ways to mitigate any adverse effects of unsustainable industrial and land use practices. Once application of the kit has been validated for Fiji streams, the technique is considered to be relatively easily applied in other South-west Pacific Island countries with minimal validation testing.

1.2.5 Other initiatives

HELP – Motueka catchment

Work on the Hydrology for the Environment, Life and Policy (HELP) basin at Motueka continues. This basin was New Zealand's contribution to Volume 5 of the Catalogue of Rivers. Details of the Motueka HELP project are available at <http://icm.landcareresearch.co.nz/>.

3rd World Water Forum Follow-up Meeting

The NZ Waste Water Association, Australian Water Association, Pacific Water Association and SOPAC jointly hosted the 3rd World Water Forum Follow-up Meeting in Oceania and the Pacific in Wellington on 18-19 March 2004 to report on the implementation of actions since the Water Forum was held in 2003 in Kyoto. New Zealand reported on the development of the NZ Water Programme of Action, a national review and strategic programme to achieve sustainable water resources management. A representative from the meeting took the recommendations from the meeting to the Mexican preparation committee for the 4th World Water Forum. The result is that the Mexico World Water Forum will recognise the Small Island Countries as a separate region.

Asia and Pacific Regional Consultation Meeting

The NZ National Commission for UNESCO hosted the Asia and Pacific Regional Consultation on the Draft 33C/5 and the 13th Quadrennial Conference in Wellington on 22-27 May 2004.

NZ Water Directory

The New Zealand Hydrological Society has developed a Water Information Directory. This project has been funded by Ministry of the Environment and regional councils and aims to put people in touch with information on water in New Zealand. This Directory comprises a collection of 'metadata' sets which describe the nature of the data and where the information exists. They don't contain observed data, but provide information on how to access the data. Information can be searched on a geographic and/or topic basis. The web site address for the database is:

<http://www.waterinfo.org.nz/>

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

14th IHP Training Course - Hydrology in Asia

New Zealand sent a participant to the UNESCO funded "14th IHP Training Course - Hydrology in Asia" that was held in Kuala Lumpur, 11-15 October 2004. This course was jointly organised by the Humid Tropics Centre in Kuala Lumpur, the Hydrospheric Atmospheric Research Centre, Nagoya University, and UNESCO Office, Jakarta.

1.3.2 Organisation of specific courses

Courses and workshops are generally organized in New Zealand to 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.

Workshop on Continuous Water Quality Monitoring

The New Zealand Hydrological Society hosted a Workshop on Continuous Water Quality Monitoring in Masterton on 10 March 2004 to promote the innovative use of the latest technology to provide time-series, and real-time, water quality datasets. This was well attended by regional council and NIWA staff and included presentations on the need for continuous water quality data, deployment of water quality loggers, new technologies for remote logging of water quality parameters and standardisation of methodologies.

NIWA Courses

Courses were provided by NIWA for regional council and NIWA staff on:

- Environmental data logging
- Optimising hydrological data quality
- Use of hand-held and continuous water quality sensors
- Hydrological statistics
- Managing extreme weather and flooding

Pacific Hydrological Training Programme

As a contribution to the implementation of the Regional Action Plan on Sustainable Water Management and the associated Type II Partnership Initiative, NZAID agreed to fund a three year Hydrological Training Course developed for hydrological technicians from the Pacific region. The first course on surface water was held at the SOPAC Secretariat in Suva, Fiji, and included a mix of both theoretical and practical aspects of surface water hydrology. It consisted of 4 weeks of training provided by experienced hydrologists from the NIWA from 19 April - 14 May 2004 with attendance of hydrologists from the Cook Islands, Fiji, Federated States of Micronesia, Papua New Guinea, Samoa, Solomon Islands and Vanuatu.

The second course is to be run in April/May 2005 and will include an introduction to Groundwater and Climate Information as well as a follow-up on Surface Water. In addition to the countries mentioned above Kiribati, Marshall Islands, Palau, Nauru, Niue, Guam, Tonga and Tuvalu will be in attendance.

Pacific Island Training Institute on Climate and Extreme Events

NIWA contributed trainers at a two week workshop on climate and extreme events at the Suva campus of the University of the Pacific (USP) from 15-28 June 2004 in collaboration with USP and the East-West Center and sponsored by the Asia-Pacific Network for Global Change Research (APN) and the US National Oceanic and Atmospheric Administration. The workshop aimed to enhance the capacity of Pacific island jurisdictions to understand, anticipate and effectively respond to the consequences of current and future patterns of climate variability and climate-related extreme events such as droughts, floods, and tropical cyclones.

1.3.3 Participation in IHP courses

New Zealand sent a participant to the Thirteenth IHP Training Course on the "Effects of Pollutants on Atmospheric Environment", held in Nagoya, Japan, 7-20 March 2004.

See also 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:

- “Freshwaters of New Zealand” published jointly by the New Zealand Hydrological Society and the New Zealand Limnological Society 2004. This book contains 46 chapters that provide an up to date and comprehensive account of hydrology and limnology in New Zealand (www.hydrologynz.org.nz).
- A description of the modelling of surface water runoff at Mahurangi, as part of the “MARVEX” research project. A paper, including new methods for estimating surface runoff more reliably, was published in the Journal of Hydrology (Amsterdam), Vol 293, pp 205-218. The study found that a mismatch in measurements scales between digital elevation data and soil hydraulic conductivity causes poor hydrological model estimates of near-surface water table elevation. Until now, the standard method for improving these estimates has been to adjust the value of hydraulic conductivity. However, as noted by other investigators, this approach leads to a distortion of the runoff-producing mechanism. A new method was developed to correct for this distortion, and it was successfully tested against field observations of the spatial extent of soil saturation at the ground surface.
- An improved model for predicting average annual low flow in ungauged catchments has been developed. The current version of the model is far more accurate than previous prediction methods, but requires knowledge of river flow recession characteristics. Progress on estimating river flow recession behaviour in ungauged catchments has been made, and a wide range of catchment attributes have been extracted from the River Environment Classification (REC) for use as predictors of streamflow behaviour.
- An extensive analysis of river water quality in New Zealand has been completed by NIWA for New Zealand’s Ministry for the Environment. The analysis used the REC as a basis for grouping data gathered from regional councils across the country. The report is entitled “Nation-wide and regional state and trends in river water quality, 1996-2002”. The key conclusions were:
 - water quality state is generally good in mountain and hill fed rivers within undeveloped catchments
 - low elevation and pastoral rivers throughout the country are degraded or at risk of degradation
 - most urban rivers are degraded
 - temporal trends in water quality at all spatial scales are small – the magnitude of most trends being less than 1% of the median value per annum. These observations suggest that marked differences in water quality among river classes represent stable conditions, and that recent changes in land use practices have had relatively small effects on water quality.
- The “Climate Update” monthly bulletin
The National Climate Centre (NCC) has published a further 12 issues (52 to 63) 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 months climate, soil moisture and river flows, and states how good was the previous months forecast.
- The “Island Climate Update” monthly bulletin
The National Climate Centre (NCC) has published a further 12 issues (37 to 48) 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, that 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 from 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. It also includes an editorial on some topical aspect of interest to endusers.

Support is being sought from NZAID to extend this activity through to 2006 and beyond 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 5 issues (4 to 8) 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. Plans are to publish three issues of Water Resources Update per annum.

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 18-21 November 2003 in Taupo, New Zealand.

1.5.2 Participation in meetings abroad

New Zealand was represented at the 11th RSC meeting and scientific conference held in Sigatoka, Fiji, 26-30 October 2003 by Dr Ibbitt and Mr Curry.

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 assistance.

During June and July the Malaysian Drainage and Irrigation Department sponsored four one-week courses on the application of the Tideda hydrological software to the building and maintenance of hydrological archives.

New Zealand Government Assistance In Development (NZAID) recognises the importance of effective water management in efforts to achieve sustainable development in the Pacific and look forward to continuing their engagement in the Pacific Type II Partnership Initiative on Sustainable Water Management.

NZAID – Cook Islands

In-country technical assistance and training was provided as part of a five-year bilateral aid project through the NZAID funding to Cook Islands.

UNESCO – Catchment & Communities Project – Vanuatu

NIWA provided a further one-week in-country training in December 2003 to the Vanuatu Department of Geology, Mines & Water Resources as part of UNESCO's Catchment & Communities project

1.6.2 Completed and ongoing scientific projects

None

2. FUTURE ACTIVITIES

2.1 Activities foreseen until December 2004

NZ Hydrological Society Annual Symposium

The annual conference of the New Zealand Hydrological Society, will be held in Queenstown, New Zealand from the 16-20 November 2004.

Attendance at the 12th RSC meeting.

2.2 Activities planned for 2005

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. A significant proportion of this activity will be in areas that are included within the IHP, but is 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

These courses are also open to overseas participants.

Hydrological support programme proposal for the Pacific

During the 1st course of the Pacific Islands Hydrological Training Programme held in Suva in April/May 2004, it was identified that major constraints to effective operation for most countries were skills shortages, failure of equipment, inadequate resources for repair or upgrading and the lack of funds for software. It is obvious that many of these constraints have a massive negative effect on the availability of information on water – but that they are individually minor issues that could be resolved by some carefully targeted, practical training and “collegial” support.

A project whereby NIWA provides hydrological database software maintenance, instrument and equipment repairs and maintenance, database management support, an in-country technical colleague mentoring and a year-round technical support service has been proposed jointly with SOPAC and in collaboration with the National Hydrological Services (NHS's) in the Pacific. NZAID have indicated its support for such a programme which will provide continuity of assistance to NHS's and compliment parallel bilateral water resources based aid projects. Plans are to commence this support programme if approved.

Pacific Hydrological Training Programme

As mentioned in Section 1.3.2 above the second course of the Pacific Hydrological Training Programme is to be run in April/May 2005 and will include an introduction to Groundwater and Climate Information as well as a follow-up on Surface Water. In addition to the countries mentioned above Kiribati, Marshall Islands, Palau, Nauru, Niue, Guam, Tonga and Tuvalu will be in attendance.

2.3 Activities envisaged in the long term

Continuation of:

- Year 3 of the NZAID funded Pacific Hydrological Training Programme and subsequent repeats 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.

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

**12th UNESCO-IHP REGIONAL STEERING COMMITTEE MEETING
FOR
SOUTH EAST ASIA AND THE PACIFIC**
in conjunction with the
International Conference on Water Sensitive Urban Design –
Cities as Catchments (WSUD2004)
**ADELAIDE, AUSTRALIA
(22 – 26 November 2004)**

NATIONAL REPORT OF THE PHILIPPINES

by

Leonardo Q. Liongson
Director, National Hydraulic Research Center
University of the Philippines
and
Acting Chairman, Philippine National Committee for UNESCO-IHP

1.0 Introduction

The institutional members of the Philippine National Committee for the IHP are the following organizations:

- 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
- Metropolitan Waterworks and Sewerage System (MWSS)
- Mines and Geoscience Bureau (MGB), Department of the Environment and Natural Resources (DENR)
- National Economic 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 (NAPOCOR)
- 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)

2.0 Activities of the Water Resources Sector in the Philippines

This brief section provides an enumeration of the recent activities of the water resources sector in the Philippines during the period 2003-2004 as well as activities in previous years not included in the Philippine National Report submitted in 2003. These were incidental yet official activities undertaken or attended by the principals and nominees of Philippine institutions and stakeholders in the water sector who are the members of the PNC-IHP.

2.1 International and Regional Activities (2003-2004)

First International Conference on Asian Water Environment, October 23-25, 2003, Asian Institute of Technology, Bangkok, Thailand.

The 11th Regional Steering Committee Meeting for Southeast Asia and the Pacific & the International Conference on Comparative Regional Hydrology and Mission for IHP Phase VI of UNESCO in Conjunction with International Conference on Managing Water Resources Under Climatic Extremes and Natural Disasters, October 27 – November 1, 2003. Sigatoka, Fiji, organized by UNESCO-IHP Regional Steering Committee for South East Asia and the Pacific (IHP-RSC-SEAP) and the South Pacific Applied Geoscience Commission (SOPAC).

First Southeast Asia Water Forum, November 17-21, 2003, Chiang Mai, Thailand, organized by the former GWP-SEATAC.

International Symposium of University of Yamanashi, 21st Century COE Program: The Fuji River and Asia Connected by River Basin Management, March 3-5, 2004, BellClassic Kofu, Kofu, Japan, organized by the University of Yamanashi, Center of Excellence Program (UY-COE) “Research and Education of Integrated Water Resources Management for the Asia and Pacific Region”.

The 13th IHP Training Course. Effects of Pollutants on Atmospheric Environment, March 7-20, 2004, Nagoya and Tokyo, Japan.

Computer-Aided Workshop on Groundwater Contamination, April 26 – May 4, 2004, Asian Institute of Technology (AIT) Conference Center, Bangkok, Thailand, organized by AIT, UNESCO-IHP for Southeast Asia and the Pacific, and Thai National Committee for IHP.

The GWP ToolBox Training of the Trainers Workshop, June 9, 2004, Kuala Lumpur, Malaysia, organized by the GWP South East Asia Water Partnership (GWP-SEAWRP).

Second International Conference of the Asia Pacific Association of Hydrology and Water Resources (APHW2004), July 5-8, 2004, SunTec, Singapore, organized by the Asia Pacific Association of Hydrology and Water Resources (APHW).

The 1st Organizational Meeting of GWP-SEAWRP, October 4-5, 2004, Lankawi, Malaysia, organized by the GWP South East Asia Water Partnership (GWP-SEAWRP).

The 14th IHP Training Course (IHP). Hydrology in Asia, October 11-15, 2004, Kuala Lumpur, Malaysia, organized by the Humid Tropics Center Malaysia.

The 2nd GWP Southeast Asia Steering Committee Meeting, November 5-6, 2004, Hanoi, Vietnam, organized by the GWP South East Asia Water Partnership (GWP-SEAWRP).

2.2 National Activities (2004)

Membership Meeting of the Philippine National Committee for UNESCO-IHP & National Committee for IAHS, July 26, 2004, National Hydraulic Research Center (NHRC), University of the Philippines, Diliman, Quezon City, attended by members UP-NHRC, NWRB, PAGASA, NIA, LLDA, PCAMRD, and LPA & Associates.

National Water Forum 2004. "Theme: Securing Our Future: Effectively Managing Water Now". March 22, 2004, Pasig City, Philippines, organized by the National Water Resources Board (NWRB).

Signing of the Philippine Clean Water Act of 2004 by Her Excellency President Gloria Macapagal-Arroyo, March 22, 2004, Malacañang Palace, Manila, Philippines.

World Water Day 2004 & Annual Meeting of the Philippine Water Partnership (PWP), March 23, 2004, Pasig City, Philippines, organized by the Philippine Water Partnership (PWP).

A Dialogue on Integrated Water Resources Management (IWRM) & River Basin Organizations (RBOs). Theme: Integration and Sharing in Water Resources (Pagbabuklod-buklod at Pagbabahagi ng Yamang Tubig), June 29-30, 2004, Baguio City, Philippines, organized by the National Water Resources Board (NWRB), Agno River Basin Development Commission (ARBDC), and Philippine Water Partnership (PWP).

Public Consultation on the Proposed Amedment to the Implementing Rules and Regulations (IRR) of the Philippine Water Code, organized by the National Water Resources Board (NWRB):

September 21, 2004 – Cebu City, Region 7

October 7, 2004 – Lucena City, Region 4

October 15, 2004 – Quezon City, National Capital Region

October 21, 2004 – Iloilo City, Region 6

October 28, 2004 – Dagupan City, Region 3

November 4, 2004 – Cagayan de Oro City, Region 10

November 10, 2004 – Tacloban City, Region 8

November 16, 2004 – Zamboanga City, region 9

November 17, 2004 – Legaspi City, Region 5

Ongoing and completed projects of the Philippine Water Partnership (PWP) in 2004:

SEA Output 1.2 - Convene National Dialogues/Multi-sectoral Forums -

Public Consultation were conducted jointly with the National Water Resources Board (NWRB) on the Proposed Amendment to the Implementing Rules and Regulations (IRR) of the Philippines Water Code. Regional consultations have been undertaken (as enumerated above).

SEA Output 2.4 - Raise Regional and National Awareness on IWRM and Implement Enhanced Communication Strategy.

SEA Output 4.2 - Establish and/or Strengthen Country Water Partnerships.

Roundtable Discussion on Metro Manila Floods. September 28, 2004, organized by the University of the Philippines Center for Integrative and Development Studies (UP-CIDS), and attended by UP-NHRC, DPWH-FCSEC, DPWH-Major Project Clusters 1, LLDA, Metro Manila Development Authority (MMDA), NEDA, and PAGASA.

National Flood Mitigation Summit Workshop, November 24, 2004, Malate, Manila, organized by the Office of the Civil Defense – National Disaster Coordinating Council (OCD-NDCC) and the Philippine Institute of Civil Engineers (PICE).

2.3 Ongoing and Completed studies (2003-2004)

Member institutions of the Philippine National Committee have undertaken studies and R&D projects in the field of hydrology and water resources during the period 2003-2004, including some with foreign technical assistance and aided by consultants. Some notable activities are as follows:

Japan International Cooperation Agency (JICA) and DPWH-PMO–Flood Control and Sabo Engineering Center (PMO-FCSEC) (March 2004). *The Basic Research/Study on Fine Sediment Movement around Volcanic Area*, National Hydraulic Research Center, University of the Philippines, Diliman, Quezon City, Philippines.

Japan International Cooperation Agency (JICA) and Department of Public Works and Highways (DPWH) (August 2004). *The Study on Flood Control Project Implementation System for Principal Rivers in the Philippines*. Under the Project for Enhancement of Capabilities in Flood Control and Sabo Engineering of the DPWH, Draft Final Report Summary, CTI Engineering International Co., Ltd., Manila, Philippines.

Metropolitan Waterworks and Sewerage System (MWSS) (December 2003). *Study of the Effects of the Proposed MWSS Housing Project on the La Mesa Watershed and Reservoir*, National Hydraulic Research Center, University of the Philippines, Diliman, Quezon City, Philippines.

National Water Resources Board (May 2004). *Final Report on the Proposed Organization and Staffing Structure for the National Water Resources Board*, Ateneo Research Network for Development, Philippines.

National Water Resources Board (June 2004). *Water Resources Assessment for Prioritized Critical Areas (Phase I). Final Report (Metro Manila)*, CEST, Inc., Philippines.

National Water Resources Board (June 2004). *Water Resources Assessment for Prioritized Critical Areas (Phase I). Final Report (Metro Cebu)*, CEST, Inc., Philippines.

2.4 Major Water Resources Development Projects in the Philippines

Department of Interior and Local Government (DILG) - 1 Project
Rural Water Supply and Sanitation Project (Phase 5)

Department of Public Works and Highways (DPWH) - 10 Projects
Agno and Allied Rivers Urgent Rehabilitation Project
Agno River Flood Control Project (Phase 2-A)
Agno River Flood Control Project (Phase 2-B)
Iloilo Flood Control Project (Phase 2)
KAMANAVA Area Flood Control and Drainage System Improvement Project
Laoag River Basin Flood Control and Sabo Project
Lower Agusan Development Project (Flood Control Component Phase 2)
Metro Manila Flood Control Project - West of Mangahan Floodway
Pasig-Marikina River Channel Improvement Project (Phase 1)
Pinatubo Hazards Urgent Mitigation Project (Phase 2)

Development Bank of the Philippines (DBP) – 1 Project
LGU Urban Water Sanitation Program (APL2)

Land Bank of the Philippines (LBP) – 1 Project
Water District Development Project

Local Water Utilities Administration - 4 Projects
Expansion and Rehabilitation of the Baguio Water System
Provincial Cities Water Supply Project (Phase 4)
Provincial Cities Water Supply Project (Phase 5)
Provincial Towns Water Supply I/II

Metropolitan Waterworks and Sewerage System - 1 Project
Second Manila Sewerage Project

National Irrigation Administration - 10 Projects
Bago River Irrigation System Rehabilitation and Improvement Project
Banaoang Pump Irrigation Project
Bohol Irrigation Project (Phase 2)
Central Luzon Irrigation Project (CLIP)
Help for Catubig Agricultural Advancement Project (HCAAP)
Irrigation Systems Improvement Project II (ISIP 2)
Lower Agusan Development Project (Irrigation Component)
Malitubog - Maridagao Irrigation Project
Southern Philippines Irrigation Sector Project (SPISP)
Water Resource Development Project

3.0 Participation in IHP Activities

3.1 Catalogue of Rivers for Southeast Asia and the Pacific

The Philippines has contributed to Volume V of the Catalogue of Rivers one chapter on the largest lake-river basin of the country, the *Pasig-Marikina River and*

Laguna de Bay (Ilog Pasig-Marikina at Lawa ng Laguna de Bay). Contributions for at least two river basins are being decided for Volume VI.

3.2 AP-FRIEND

The Philippine national committee responded to the two (2) AP-FRIEND surveys prepared and communicated by Professor Trevor Daniell, listed as follows:

- (a) APFRIEND Phase 2: Data Availability. The purpose of the survey is that a review of organisations that collect rainfall data, the availability of rainfall data for projects, and methods for determining Intensity Frequency Durations would become a project for Phase 2. The information collected will also allow the need for further development of IFD methods across the region to be assessed. The survey form was accomplished by a PNC-IHP member, Ms. Margaret Bautista of PAGASA (weather service of the Philippines).

Meteorological Data

Which organisations collect rainfall data? If there is more than one organisation, put organisations in approximate order of the size of the rainfall network operated. Use a new page for each organisation.

Name of organisation Collecting	Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA)				
Address	Weather and Flood Forecasting Center Bldg., PAGASA(W.B.), BIR Road, Diliman, Quezon City, Philippines				
Website	http://www.pagasa.dost.gov.ph				
Please indicate data that is available from this organization					
Data interval	Daily	Hourly	15mins	10 mins	6 mins
Availability	Yes	Yes	Yes	Yes	Minimum period of short duration rainfall available: - 10 min for recording raingage stations - 20 min for telemetered stations
Approximate number of stations	50	50	50	38	
Mode of storage*	Both digital and Paper form	Paper (80%) Digital(20%) (currently being updated)	Paper (80%) Digital(20%) (currently being updated)	Paper (80%) Digital(20%) (currently being updated)	

* Indicate mode of storage-eg digital, paper

Is the data available to other organisations within the country? Please explain any difficulties in obtaining the data.

PAGASA has a databank of its own for meteorological and hydromet data. Clients needing the data will have to contact the Agency. A minimum charge is imposed to any requested data in electronic form. Data copied manually from their raw form is free.

Is the data available to researchers in other countries? What is the process for requesting data and are there any difficulties expected?

PAGASA recognizes the need to strengthen regional/international cooperation and thus, the Agency is willing to share its data to international organizations. The only requirement is a letter of request addressed to the Director of PAGASA, stating the purpose of the data and assurance that the data will be used solely for the stated purpose. If this is for research purposes, PAGASA may opt to request for a copy of the documentation of the research, once completed.

APFRIEND Phase 2: IFD Design Procedures

What terminology does your country use to refer to Intensity Frequency Durations?

Rainfall Intensity-Duration Frequency (RIDF) analysis

Does your country have a formal design procedure for calculating Intensity Frequency Durations?...Yes

Which organisation is responsible for its development?

It is the Flood Forecasting Branch of PAGASA that provides the output of this particular analysis to the public.

Was the procedure developed using a particular empirical method? Yes/No

If so briefly describe the method.

The 1981 version of this analysis adopted the EV1 frequency distribution method to come up with the RIDF values of PAGASA stations with short duration rainfall values.

At present, the Flood Forecasting Branch is pursuing data recovery to complete the database of its short duration rainfall in electronic form. Once this activity is completed, it is the objective of the Agency to explore other known frequency distributions in hydrology. This is to determine, in a more objective manner, the distribution that could best fit the rainfall data of a particular station.

Are the design procedures generalised for the whole country or only used for individual locations?

The existing method is still subject for revision. Generalization of the method will be pursued once the new procedure has been implemented.

If regional approaches are used what methods are employed?

This particular analysis has not been initiated by the Agency, but it is included in its future activities. In this aspect, the use of L-moments for regional frequency analysis will be explored, including other empirical methods.

Please identify any papers or reports that describe the development of the design procedure.

Rainfall Intensity-duration-frequency data of the Philippines Volume 1

(National Flood Forecasting Office, 1981)

Please identify any papers, reports or manuals that describe how to apply the design procedure. same publication as mentioned above

.....

- (b) FRIEND inputs on “low flows and flood”, “droughts and high rainfalls” particularly during the next IHP Council and to prepare for the Next meeting of the RSC and Technical Steering Committee:
1. Written contribution about the strategy of your organization (easy) or IHP group (harder) future research regarding these topics.
 2. Written contribution of the past activities in these above areas in our country -- even reference to a book or major report would be helpful for the past activities.

In response to the above, the APFRIEND inputs from the Philippines were compiled and submitted on August 11, 2004 by Prof. Leonardo Q. Liongson of UP-NHRC:.

STRATEGY for FUTURE RESEARCH on Rainfall, Low Flows and Floods in the National Hydraulic Research Center, University of the Philippines, Diliman (U.P. Diliman) and other cooperating research bodies:

Statistical and Design-oriented Studies:

- Regionalization of rainfall-duration-frequency relationships.
- Updated regional flood frequency analyses of Philippine flood data.
- Updated PMP and related major storm studies.
- Updated regional low flow studies (correlation with climate, soils, geology, land-use/cover).

Rainfall and Streamflow Modeling Studies:

- Multivariate stochastic modeling of streamflows (daily to monthly).
- Multi-dimensional, multivariate stochastic rainfall modeling.
- Distributed physically-based catchment modeling to predict effects of climate, urbanization and other land-use changes on low flows and floods.
- Hydrologic, hydraulic and hydrodynamic modeling for prediction of floodplain inundation.

In the case of the last three items above, future research efforts will be to continue research activities in the past by using stochastic models to generate rainfall and other relevant forcing variables as input to physically-based hydrologic and hydraulic models to determine floods and droughts variables.

PAST RESEARCH ACTIVITIES on Rainfall, Low Flows and Floods:

- References provided on Faculty Researches on Rainfall, Low Flows and Floods in the University of the Philippines, Diliman (U.P. Diliman).
- References provided on relevant Graduate Student Researches in the University of the Philippines, Diliman (U.P. Diliman).

3.3 The Sixth Phase of IHP (IHP VI)

The Philippines continues to be supportive of the activities within the themes covered by the IHP-VI (2002-2007) - Water Interactions : Systems at Risk and Social Challenges.

3.4 IHP Workshops, training courses and symposia

The Philippines has nominated three participants to three training workshops in 2004:

The 13th IHP Training Course. Effects of Pollutants on Atmospheric Environment, March 7-20, 2004, Nagoya and Tokyo, Japan.

Computer-Aided Workshop on Groundwater Contamination, April 26 – May 4, 2004, Asian Institute of Technology (AIT) Conference Center, Bangkok, Thailand, organized by AIT, UNESCO-IHP Southeast Asia and the Pacific, and Thai National Committee for IHP. (participant: Engineer David S. Rojas, Jr.).

The 14th IHP Training Course (IHP). Hydrology in Asia, October 11-15, 2004, Kuala Lumpur, Malaysia, organized by the Humid Tropics Center Malaysia. (participant: Prof. Peter Paul M. Castro).

4.0 Concluding Remarks

The Philippine National Committee for IHP expresses its thanks and gratitude to the IHP-RSC and the UNESCO Jakarta Office for their continuing support to the Philippines to participate in the IHP activities in the region.

12th IHP REGIONAL STEERING COMMITTEE MEETING
FOR
SOUTH EAST ASIA AND THE PACIFIC
ADELAIDE, AUSTRALIA
(21 – 25 November 2004)

NATIONAL REPORT OF PACIFIC ISLAND COUNTRIES

by

Andre Maurice Siohane
Manager, Water Supply Division
Public Works Department
Government of Niue Island

INTRODUCTION

The Pacific Island Countries (PIC) Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, and Vanuatu are members of UNESCO.

The 11th Meeting of the Regional Steering Committee convened in Fiji from 27th to 31st October 2003 enabled the participation of representatives from many PICs and resulted in the admission of the Pacific Island Countries as new members to the RSC.

It also marked the culmination of several years of dialogue and cooperation between SOPAC, UNESCO and the World Meteorological Organisation (WMO), on water and sanitation activities and provided an excellent opportunity to further advance regional cooperation within the Pacific and establish linkages to potential partners and donors in the Southeast Asia region.

1. ACTIVITIES UNDERTAKEN IN THE PERIOD OCTOBER 2003 – SEPTEMBER 2004

1.1 Meetings of the IHP National Committees

1.1.1 Decisions regarding the composition of the IHP National Committee

The current 14 member countries of Asia have opened the door for further collaboration between water resources managers from the Pacific and hydrological scientists from Southeast Asia, under the programmes of UNESCO, WMO and SOPAC.

During a side meeting for PICs held on 29 Wednesday 2003, it was generally agreed that there was value in continued collaboration and that the process to achieve this could be facilitated by the creation of an IHP focal point in each country (to be established through the National Hydrological Service).

Attendees: SOPAC, Phillip Komor (FSM), Michael Wau (PNG), Andre Siohane (Niue), Rishi Raj, Malakai Finau, Samuela Tubui (Fiji), Giuseppe Arduino (UNESCO), Chris Ioan (Vanuatu), Taboia Metutera (Kiribati) Robert Curry, Richard Ibbitt, (New Zealand), David Scott (PDWC), Daryl Rairi (Cook Islands).

The proposal to represent the region in future RSCs and associated conferences on a rotational basis was accepted. Requirements for the chosen country delegate were presentation of the region's activities relevant to the RSC and presentation of a scientific paper at the associated conference.

The order of representing countries was discussed and by ballot the countries will be approached for attendance in the following order: Niue; FSM; Cook Islands; Kiribati; Fiji; Vanuatu; Solomon Islands; Nauru; Tonga; Marshall Islands; Samoa; Tuvalu; Palau. The countries that were in attendance at the 11th RSC meeting got the privilege to start the sequence. When more than one country can be invited, the list will automatically drop down to the next country.

Letters were sent in April 2004 from SOPAC and UNESCO Apia Office to seek endorsements of IHP focal points and a deputy. It is proposed that future involvement and correspondence regarding Pacific contributions to the International Hydrological Programme (IHP) of UNESCO, the Hydrology and Water Resources Programme of WMO and the Hydrology and Water Resources Programme of SOPAC be dealt through the IHP focal point. In order to keep the three organisations informed, all correspondence will be copied to each respective National Representative.

The harmonization of these three programmes will greatly benefit the efficiency and effectiveness of delivery into the PICs. This has been demonstrated by the collaboration on the WMO/UNESCO/SOPAC Hydrology Training Programme, which commenced this year through invaluable support provided by NZAID. This assistance is part of New Zealand's contribution to the Pacific Partnership Initiative on Sustainable Water Management under the Johannesburg Programme of Implementation.

Other actions that will be supported under this tripartite partnership include studies on floods and droughts in the region, a programme that involves communities in catchment management and monitoring, and activities under the Hydrological Cycle Observing System (HYCOS) programme.

We are grateful that the IHP National Committee gave recognition to the Pacific region by asking SOPAC to co-organise the 11th RSC meeting in Fiji with participation from the Pacific Island Countries water resources specialists.

1.1.2 Status of IHP-VI activities

Based on earlier UNESCO and SOPAC meetings held in 1994 and 1997 water resources projects to be carried out under the International Hydrological Programme were identified and included:

- projects on catchments and communities;
- groundwater recharge;
- groundwater pollution by sanitation.

An additional ENSO workshop in September 1999 had identified drought assessment in the Pacific as an additional priority.

Funding from UNESCO in 2002 enabled the start of the Catchment and Communities project in Vanuatu executed by the Directorate of Geology, Mines and Water Resources (DGMWR) in collaboration with NIWA (New Zealand) and SOPAC. One of the catchments in Vanuatu has now been adopted as one of the basins within UNESCO's Hydrology for the Environment Life and Policy project (HELP).

1.1.3 Decisions regarding contribution to/participation in IHP-VI

1.2 Activities at regional level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

None.

1.2.2 Participation in IHP Steering Committees Working Groups

None.

1.2.3 Research/applied projects supported or sponsored

UNESCO PP grant proposal developed by Niue.

Niue presented a project proposal aimed at improving the managements of Niue's groundwater resources for its sustainable use for domestic, agricultural and environmental purposes. This was directly in line with UNESCO's Major Programme II. Natural Sciences, Programme II.1 – Science, Environment and Sustainable Development, Sub programme II.1.1 Water Interaction: Systems at Risk and Social Challenge, Main line of Action 1 – Global Change and Water: Advancing Hydrological Sciences for Improved Assessment and in particular, in the frame of the International Hydrological Programme (IHP) Phase VI, Theme 2 – Integrated Watershed and Aquifer Dynamics and Theme 4 – Water and Society.

It is proposed that the development of a groundwater monitoring programme will be tackled in three stages: an initial programme and a short to medium term programme leading to a long term groundwater monitoring system. **Funding is being sought for the first two stages only**, after which final scoping of a drilling programme can be completed.

The overall output is a Groundwater Monitoring System with a dedicated groundwater measurement and sampling regime, linked to a national planning mechanism, enabling informed decision-making to be made by the Government of Niue on economic development options which may impact upon the groundwater regime, notably through additional groundwater abstraction and commercial effluent disposal.

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

Island Climate Update

NZAID agreed to the funding of a programme to provide monthly climate information through the Pacific Island Climate Update (ICU) and develop and strengthen the basic hydrological training needs of small island countries in the Pacific.

The publication of the ICU has been continued and plans are being developed to broaden its scope to include additional information for end users in Pacific islands, such as effects of forecasted climate on island's water resources (rainfall, surface and ground waters).

A wider distribution of the ICU will enhance the application of climate information by climate sensitive sectors such as energy, water supply, agriculture, etc. As a result of SOPAC's involvement, the ICU will be disseminated to a wider group of end-users in the Pacific, including national hydrological services, water utility managers and disaster managers.

www.niwa.co.nz/ncc

NIWA

Besides being involved in the development of the hydrological training programme and the Catchments and Communities project NIWA collaborates with the Fiji Institute for Technology (FIT) to test a water quality testing kit called SHMAK in catchments in Fiji with schools and communities. If the trial proves successful this method can be used in other countries.

NIWA will be assisting in developing a Hydrology Support Programme for the Pacific to augment the needs of National Hydrological Services beyond the current hydrological training programme.

www.niwa.co.nz

1.2.5 Other initiatives

Pacific Dialogue on Water and Climate

The Pacific Dialogue on Water and Climate will be continued in the Pacific through:

- ADB support for a clearing house on water and climate to be based at SOPAC.
- Exchange of climate information and capacity building through the NIWA Island Climate Update.
- Development of Disaster Preparedness Plans for Water Utilities facilitated by the East West Centre and the Pacific Water Association (PWA).
- Development of a drought index for the Pacific region.
- The Caribbean and Pacific (CEHI and SOPAC) collaborate towards the implementation of the Joint Programme for Action on Water and Climate and provide input into the preparations for Barbados +10.

www.waterandclimate.org/home.html

World Meteorological Organisation

The Pacific HYCOS Project proposal developed by WMO in 2001 has received support from the WMO Tropical Cyclone Committee, Pacific Region Global Climate Observing System, Pacific Island Country National Hydrological Services, SOPAC and received a high recommendation as one of the priority Actions identified by the regional consultation meeting. The Global Environmental Facility (GEF) is considering support for HYCOS implementation in the Pacific as part of a full-sized GEF project on Sustainable Integrated Water Resources Management in Pacific Island Countries. The development of the PDF-B stage is expected to commence by the end of 2004.

<http://www.wmo.int/indexflash.html>

BOM

A project has been initiated on the “Enhanced Application of Climate Predictions in Pacific Island Countries” in order to meet the general goals of improving weather and climate services and products. AusAid developed the project proposal outlining procedures for developing a climate prediction capacity in participating countries, and in particular, providing a framework for incorporating climate prediction information into planning across a broad range of agencies and industries. The scheme is based upon the seasonal climate prediction system of the Australian Bureau of Meteorology, which has successfully issued climate predictions for some years.

Workshops and training are ongoing with 8 participating National Met Services: (Cook Islands, Fiji, Niue, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu).

<http://www.bom.gov.au/climate/pi-cpp/index.shtml>

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

None.

1.3.2 Organisation of specific courses

Hydrology Training

During a WMO Experts Meeting in Nadi, Fiji (October 1999) hydrological training needs were identified as a high priority for small island countries in the Pacific. Thanks to a partnership arrangement between WMO, UNESCO, SOPAC and NIWA with a financial contribution from NZAID this is now being addressed through the establishment of a Hydrological Training Programme for the Pacific region.

As contribution to the Pacific Type II Partnership Initiative on Sustainable Water Management, NZAID made funds available for the hydrological training programme in 2003 and the 1st course on surface water was held at the SOPAC Secretariat in Suva, Fiji from 19 April – 14 May 2004 with participation of hydrological technicians from the Cook Islands, Fiji, Federated States of Micronesia, Papua New Guinea, Samoa, Solomon Islands, and Vanuatu.

Lectures provided were on:

- Techniques of data collection
- Processing and analysis of data
- Quality Assurance
- Safety

1.3.3 Participation in IHP courses

Mr Ashok Kumar, Hydrologist for the Western Division Hydrology Section of the Public Works Department of the Fiji Islands attended the 14th International Hydrology Training Programme: Hydrology in Asia from the 11-15 October 2004 at Midvalley, Kuala Lumpur. The course was sponsored by UNESCO Jakarta and co-organized by Humid Tropics Centre (HTC) Kuala Lumpur and Nagoya University.

1.4 Publications

The UNESCO/SOPAC research projects on groundwater recharge and pollution that were carried out in Kiribati and Tonga resulted in several IHP publications that have been distributed throughout the region.

Many requests have also been issued for the publication by Tony Falkland: UNESCO Publication "Hydrology and Water Resources of Small Islands: A practical guide" edited by Tony Falkland of Australia (Studies and Reports in Hydrology no. 49. UNESCO 1991). UNESCO Apia Office took the initiative to get the document reprinted so that it can be used at the SOPAC/WMO/UNESCO hydrological training programme.

1.5 Participation in international scientific meetings

1.5.1 Meetings hosted by the Pacific Island Countries

The IHP National Committee gave recognition to the Pacific region by asking SOPAC to co-organise the 11th RSC meeting in Fiji with participation from the Pacific Island Countries water resources specialists. The meeting convened in Fiji from 27th to 31st October 2003. A two-day conference was held on Water Resources Management under Climatic Extremes and Natural Disasters with attendance of hydrologists from 22 mainly Asian, and Pacific countries, but also from Canada, United Kingdom, the Netherlands.

46 papers were presented which are included in "Managing Water Resources under Climatic Extremes and Natural Disasters", IHP Technical Publication No. 2. RSC-SEAP. UNESCO Jakarta Office 2003. Additional papers were handed out during the meeting.

Other activities:

AP FRIEND

A side meeting was held by the Technical Sub Committee for AP FRIEND on Monday evening 27 October and it was agreed that the new phase of the project will have a news structure focusing on two areas: Low Flows and High Flows. Pacific island countries were invited to participate in either one of these Working Groups adding their experiences on floods and droughts.

Fieldtrip

A fieldtrip on Wednesday 29 October to the interior of the Sigatoka Valley catchment was co-organised by SOPAC and the Mineral Resources Dept of the Fiji Government.

Participation Programme UNESCO

This funding programme was presented during the RSC meeting. There is scope for countries to obtain funding of up to 40,000 US \$ through submission via each countries' UNESCO National Commission. A list of all NatComs was circulated and Niue and Vanuatu should be encouraged to submit proposals. SOPAC to assist on request.

UNESCO Centre Tsukuba, Japan

SOPAC was officially invited to attend a closed side-meeting on the establishment of the UNESCO Centre on Water Hazard and Risk Management in Tsukuba, Japan to be hosted at the Public Works Research Institute (PWRI). Proposal to be submitted as resolution to the Intergovernmental Council of IHP Paris and 33rd UNESCO General Conference in 2005. Centre to focus on Research, Training and Information Networking. Side meeting concluded that additional work is needed to specify what this adds to existing centers and activities. Focus will be on flood management.

Science, Technology and Resources Network (STAR) Meeting, 2004

The Science, Technology and Resources Network (STAR) meeting (September 17-20) provides a platform for scientists, experts and practitioners to exchange information and present findings from scientific researches of relevance to the themes chosen for the STAR Meetings.

At this year's STAR Session, held at the Warwick International Hotel, in the Fiji Islands, scientists, experts and scholars all convened for 2 days of presentations and dialogue. They also exchanged information and provided recommendations to SOPAC's Council relevant to the different working programmes for SOPAC, for e.g. Community Lifelines' Water programme (CLP), the Energy Programme, Tsunami Working Group.

The Water, Sanitation & Hygiene Working Group (WASH WG) was attended by water resources people from across the Pacific Islands: Members present were: Tevita Fatai, (Tonga); Isaac Lekelalu, (Sol.Is); Andrew Matthews, (NIWA); Alex Malahoff, (GNS, NZ); Paula Wilisoni (Fiji); Andre Siohane (Niue); Ben Parakoti (Cook Is); Tamara Tait, (GNS, NZ); Petero Lafaele (ASPA, Am. Samoa); Esmond Moses (PUC, Pohnpei); David Dengokl (BPW, Palau); Anthony Chargualaf (Guam Waterworks Authority); George Laman, (Yap Water Authority); Lameko Talia, (Met. Samoa); Malakai Finau, (MRD, Fiji); Amataga Penaia, (SWA, Samoa); Moefaauro Taputoa Titimaea, (SWA, Samoa); Amo Mark, (PNG Waterboard); Taboia Metutera, (PUB, Kiribati); Lucio Haller, (CPUC, Chuuk); Eita Metai, (WEU, Kiribati); Ian Fry, (Env. Division, Tuvalu). Alena Lawedrau-Moroca, (SOPAC); Rhonda Bower, (SOPAC); Marc Overmars, (SOPAC); Sarabjeet Singh, (SOPAC); Sarah Davies, (SOPAC); Stephen Booth, (SOPAC).

Outcomes

The following recommendations were submitted to the Governing Council for the benefit of the Community Lifelines Programme (CLP) and individual Member Countries:

- i) The WASH WG recommends the CLP continues to build its Water Sector programme upon the Regional Action Plan on Sustainable Water Management (Pacific RAP).
- ii) The WASH WG recommends the CLP continues to host the Coordination Unit and facilitate the Pacific Partnership on Sustainable Water Management as a modality for the implementation of the Pacific RAP.
- iii) The WASH WG recommends SOPAC Member Countries to use the Pacific RAP to develop and implement National Water Action Plans for Sustainable Water Management.
- iv) The WASH WG recommends CLP to assist in improving the availability and access to information on water and sanitation on national and regional levels through the development of databases and GIS/GPS.
- v) With reference to the six thematic areas of the Pacific RAP the WASH WG specifically recommends CLP to provide contributions to the following programmes and actions:

I Water Resources Management

A hydrology support programme for National Hydrological Services to augment the regional hydrological training programme.

II Island Vulnerability

Improve access to climate information and assistance in drought mitigation and disaster preparedness for water managers.

III Awareness

Improve communication and coordination between all stakeholders in water, sanitation and hygiene.

IV Technology

A comprehensive regional water demand management and leak detection programme to reduce unaccounted-for water.

V Institutional Arrangements

Develop National instruments (including national visions, policies, plans and legislation) for good water governance appropriate to each island country and adopt an Integrated Water Resources Management approach.

VI Financing

Reduces costs through improved operational efficiencies using benchmarking, asset management, development of water-loss reduction programmes and improved work practices.

1.5.2 Participation in meetings abroad

Global Water Partnership Meeting, Langkawi, Malaysia, 4-5 October, 2004.

Australia and the Pacific were invited to the Joint Regional Meeting of GWP Southeast Asia and GWP South Asia. An overview of GWP South Asia & South East Asia was presented followed by the 2005 Regional Workplan & Budget.

SOPAC presented the history of the Pacific Partnership Initiative on Sustainable Water Management, the concept of Integrated Water Resources Management "Island Style", the Pacific IWRM priority actions and Workplan for 2005 as well as examples of national initiatives and an indication of future opportunities.

1.6 Other activities at regional level

1.6.1 Institutional relations/co-operation

Pacific Regional Action Plan on Sustainable Water Management

Leading to the World Summit for Sustainable Development (August 2002) and the World Water Forum (March 2003) an ADB/SOPAC-led regional consultation on Water in Small Island Countries was held in Sigatoka, Fiji. The consultation led to a Pacific Regional Action Plan on Sustainable Water Management (Pacific RAP) and Ministerial Declaration that was signed by 16 Pacific island countries. The meeting identified key messages for six themes viz. Water Resources Management, Island Vulnerability, Awareness, Technology, Institutional Arrangements and Finance.

UNESCO's International Hydrological Programme is an important partner for the development and implementation of the Pacific RAP.

http://list.sopac.org.fj/Secretariat/Programmes/H2O/3rd_world_water_forum/index.html

Pacific Partnership Initiative on Sustainable Water Management

The Pacific Regional Action Plan has been incorporated in a partnership arrangement under the so-called Type II initiatives submitted by the Pacific Island Countries to the Commission for Sustainable Development (CSD) in Johannesburg during the World Summit for Sustainable Development (WSSD) in August 2002. The Type II mechanism is now used by donor, international and regional organisations to help implement actions in the Pacific region towards achieving the United Nations Millennium Development Goals, and the WSSD target to halve the proportion of people without access to safe and affordable drinking water and basic sanitation by 2015. The partnership aims to assist in implementing the actions identified by the consultation on national and regional levels.

1.6.2 Completed and ongoing scientific projects

CROPPRO

The Universities of USP (Alafua Campus, Samoa), Leuven in Belgium and Wageningen and Delft in The Netherlands are collaborating with government counterparts in Fiji, Samoa and Tonga on a research project named CROPPRO. The project is European Commission funded and focuses on sustainable agricultural use and management of natural (water/soil) resources in the Pacific region, aiming at reducing soil erosion processes (mountainous islands) and pollution of underlying groundwater reservoirs (uplifted coral islands).

The project results are now being collated and updates can be found on the CROPPRO website:

http://www.alterra-research.nl/pls/portal30/docs/folder/croppro/croppro/p_frameset.htm

ACIAR

Follow-up is provided to the UNESCO/SOPAC research projects in Kiribati and Tonga through a 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 focusing on equitable groundwater use in North and South Tarawa.

www.aciar.gov.au/

2. FUTURE ACTIVITIES

2.1 Activities foreseen until December 2004

2.2 Activities planned for 2005

Following the 1st course of the hydrological training programme, the 2nd course will be carried out in April 2005 and will be focused on Groundwater and Climate Issues in the 1st week and a specialised programme into two split groups: one on surface water (continuing from the 1st course) and one on groundwater. Participation in the course is expected from the countries attending the 1st course: Cook Islands, Fiji, Federated States of Micronesia, Papua New Guinea, Samoa, Solomon Islands, and Vanuatu and in addition: Kiribati, Marshall Islands, Palau, Nauru, Niue, Guam, Tonga and Tuvalu.

Hydrological support programme proposal

During the 1st course of the Pacific Islands Hydrological Training Programme held in Suva in April/May 2004, it was identified that major constraints to effective operation for most countries were skills shortages, failure of equipment, inadequate resources for repair or upgrading and the lack of funds for software. It is obvious that many of these constraints have a massive negative effect on the availability of information on water – but that they are individually minor issues that could be resolved by some carefully targeted, practical training and “collegial” support.

A proposal has since been established in collaboration with the National Hydrological Services (NHS's) in the Pacific and the National Institute of Water and Atmospheric Research (NIWA) in New Zealand. It will build on the findings of the NZAID funded 1st course of the Hydrological Training Programme through NZAID's contribution to the Pacific Type II partnership Initiative on Sustainable water Management. Thus the proposal will seek funding for a support programme in addition to the training for the period 2005 - 2007.

2.2 Activities envisaged in the long term

GEF project PDF-A

The call for improved water resources management has been given prominent attention at the twelfth session of the United Nations Commission on Sustainable Development (CSD-12) with the thematic cluster for the CSD 2004-2005 implementation cycle (CSD 12 & 13) being **water, sanitation and human settlements**. During CSD-12 the Pacific Island Countries have been urged to use the CSD process to facilitate prioritization of water in their national sustainable development strategies, if they are to take optimal advantage of the global focus on water during CSD12/13 and the subsequent **Water for Life Decade (2005-2015)**.

Pacific Island Ambassadors to the United Nations based in New York advocated strongly for action on Sustainable Water Management and the CSD 12 event provided the opportunity to liaise with international agencies such as UNEP's Global Programme for Action as well as the Global Environment Facility (GEF) and UNDP.

Fruition of the meeting with these organisations is taking shape with the development of a proposal for funding a Pacific programme for implementation of the Regional Action Plan with a strong focus on integrated water resources management. We are extremely pleased that the first steps towards such a programme is being realised for the Pacific region through the signing of an agreement between GEF/UNDP and SOPAC.

UNESCO-IHE municipal wastewater 2005

The planned activity is an adaptation of the existing UNEP/GPA - UNESCO-IHE - UN/DOALOS Train-Sea-Coast course 'Improving Municipal Wastewater Management in Coastal Cities' to:

- (i) address specific regional needs and
- (ii) a modus of course delivery that has proven to be cost-effective in the region (e.g. blended learning).

“Training of trainer”, a pilot course and replication are scheduled for 2005.

Twelfth Meeting of IHP Regional Steering Committee
for the Southeast Asia and the Pacific
26th November, 2004
Adelaide, Australia

**Country Report on Papua New Guinea International
Hydrological Program Activities: 2003-2004**

Prepared & presented by:
Maino Virobo
Principal Hydrologist
for Papua New Guinea IHP National Committee

**Country Report on
PAPUA NEW GUINEA IHP Activities:
2003-2004**

1. Introduction

The Department of Environment and Conservation (DEC) participated in the activities of the International Hydrological Decade (IHD) through then Bureau of Water Resources (BWR) 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 total membership of the PNG IHP National Committee is five (5), and drawn from various government departments and agencies, and institutions of higher learning. Over the period 2003-2004, PNG experienced rapid decline and to some extent virtual halt in IHP participation. Perhaps, it can be attributed to some dramatic events that unfolded in 2002 and 2003, and lack of committee and government support. The current chairman of PNG IHP National Committee is the former acting head of the Water Resource Management (WRM) branch. Arrangements are in progress to officially hand over the chairmanship to the incumbent head of WRM branch.

The secretarial support has been provided by the principal hydrologist and the assistant secretary of WRM branch of DEC, and occasionally by the office of PNG National Commission for UNESCO. The secretariat disseminates to all members information on meetings/seminars, training courses and workshops organized by the UNESCO. It also distributes publications and newsletters that it receives from UNESCO.

The PNG IHP National Committee performs its roles which are formulated by an Executive Committee consisting principally of Department of Environment and Conservation (DEC), University of Papua New Guinea (UPNG), Geological Survey and National Weather Service (NWS).

2. Activities Organized by the National Committee

The national committee was unable to organize tangible activities for the given period.

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

3.1 Rural water supply and sanitation

The national Department of Health (DoH) through its Community Water Supply and Sanitation division, and in conjunction with other line agencies such as Geological Survey, National Weather Services, PNG Waterboard and Department of Works are embarking on the program for a better and reliable rural and community water supply. The PNG Water Supply and Sanitation Committee by the way only performs the coordinating role.

The imminent threat posed by the upcoming El-nino phenomena has once again regrouped all agencies responsible and dealing with water to devise ways to minimize the envisaged impacts.

3.2 Water use permitting

Permit to use water either as an abstracted volume or as dilution fluid, in PNG is processed through the national Environment Council. The Council meets to deliberate on numerous water-

use permit applications, ranging from small-scale domestic use to industrial processing. DEC generates about 85% of its annual revenue through water use permitting.

3.3 Hydrometeorological data monitoring

3.3.1 DEC hydrometric network

The present network of hydrometeorological stations in PNG operated by DEC is well below the minimum number required to provide accurate representation of the country's hydrological, and some components of meteorological regime. And according to the World Meteorological Organization (WMO) guidelines for network design and establishment (station density), this is extremely inadequate to meet the growing hydrological and meteorological needs of the country.

Routine data collection from the national hydrological network has virtually ceased. Sites of significant value however, were to visit to check on the conditions of the operations. Moreover, these visits were in parallel to a UN sponsored UNSCEP pilot project on integrated water resources management.

3.3.2 Public services

Individuals, non-government organizations, landowners groups, private and business entities have engaged DEC's WRM technical officers to conduct water resources and environment impact assessment studies, investigate issues relating to flooding, river bank and bed erosion, and loss of immobile water. In 2004, there has been a remarkable increase in demand for technical officers' to take up such challenges, and combating new issues never been explored. The user pay policy, which is enshrined in the PNG **Environment Act 2000**, is paving the way for the marketing of our capabilities.

4. Participation in Regional Programs

4.1 Research and publications

PNG's obligation to regional activities includes one research project, river catalogue publication and establishment of a regional database as outlined below:-

- (i) Continuing research into AP FRIEND. Subject not specified.
- (ii) River Catalogue Volume VI (Laloki River) currently in progress.
- (iii) Contributing to the regional database. Data used in the river catalogue (vol. II, III, IV & V) have been supplied to Kuala Lumpur, Malaysia.

4.2 Meetings and short term training

Mr. Michael Wau attended the *Third World Water Forum* held in Kyoto, Japan from 22nd - 23rd March, 2003.

Mr. Walimu Apaka attended a short training program on *Preparation and Maintenance of Hydrological Archive* held in Kuala Lumpur, Malaysia from 13th to 17th October, 2003.

Mr. Michael Wau attended the 11th RSC Meeting and the International Conference on Managing Water Resources Under Climatic Extremes and Natural Disasters, held in Sigatoka, Fiji from 27th October to 01st November, 2003.

Mr. John Ari attended a month's training program on *General Hydrology* held in Suva, Fiji from 18th April to 14th May 2004.

5. Future Tasks

A number of tasks have been identified and to be taken aboard for 2004 and 2005. They include;

- (a) Continuation of the River catalogue project (if still being pursued)
- (b) Regional data base upgrade
- (c) Short term tailored training programs
- (d) Planning for IPH-VII phase
- (e) Laloki River integrated water resources management workshop

6. Concluding Remarks

The activities presented in this report clearly reflects how strong Papua New Guinea's IHP is committed to IHP, either nationally or regionally. Because of the slow national economic recovery and poor annual budgetary allocations, the PNG IHP National Committee's commitment to hydrology and water resources matters and issues is yet to be recognized at all levels of participation.

The Laloki River system, which was to be included in the 'River Catalogue Project, Volume VI' issue is currently in progress. The next issue once again depends on the funding levels and how enthusiastic DEC is in pursuing this project and other related projects.

Participating in regional affairs do not come easy. Most importantly, PNG IHP National Committee does not receive regular financial support from the members, which are all state entities. UNESCO Jakarta office and most recently the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) have funded most of the international workshops and IHP RSC meetings.

The compiling of the volume VI issue of the river catalogue was a task not competently handled by the officers assigned in its early stages of development, nevertheless, the progress is remarkable.

NATIONAL REPORT ON IHP RELATED ACTIVITIES

THAILAND

1. ACTIVITIES UNDERTAKEN IN THE PERIOD November 2003 – October 2004

- 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 2005
- 2.2 Activities foreseen for 2006-2007
- 2.3 Activities envisaged in the long term

National Report on IHP Related Activities Thailand

1. Activities undertaken in the period of November 2003- October 2004

1.1 Meeting of the IHP National Committee

1.1.1 Decision regarding the composition of the IHP National Committee

Thailand National Committee for IHP (THC-IHP) have a new establishment on 20 September 2003. It consists of 22 members. The present composition of THC-IHP is as follow:

- Chairman : Mr.Kasem Chancharoonpong, Director-General of Department of Water Resources
- Vice Chairmans : Professor Kasem Chunkao, Environmental College, Kasetsart University
Mr.Virat Khao-Uppatum , Deputy Director-General of Department of Water Resources
- Secretary : 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. Mrs.Wajee Ramnarong
 13. Mr.Thawatchai Tingsanyachalee
 14. Associate Professor Suravuth Pratishtananda
 15. Mr.Satcha Sethabuth
 16. Mr.Veeraphol Taesombat
 17. Ms.Sukontha Aekaraj
 18. Mrs.Poonsook Vimukatayon

During this period, Thailand National Committee for IHP (THC-IHP) held a meeting to revise and review all activities to conduct the new National Policy and Master Plan on Hydrology.

1.1.2 Status of IHP-VI activities

- a) Completely establishment of the 29 River Basin Management Committees in 25 majors river basin of Thailand
- b) Implementation of 8 river basins of Integrated Water Management Plan
- c) Training and Information Education and Communication to the stakeholders and local communities in the river basins

1.1.3 Decisions regarding contribution to/participation in IHP-VII

Thailand National Committee for the IHP presented its support to the proposal framework for IHP-VII. Some specific issues that should be highlighted are : considering socio-economics, funding for local water resources projects/initiatives and their

sustainability should be explored and the health scope should include the component of increasing water supply in rural area both quantity and quality in order to contribute to attaining the MDG goals.

Please find our suggestions for each theme as follows :

Theme 1 : Global Change, Watershed and Aquifers :

- Impact of global change on environment, natural resources and hydrological system
- Creation of network systems for hydrological data collection
- Development of water resources indicators on water assessment
- Development of water resources information systems : GIS and MIS
- Sharing the information and knowledge on hydrology
- Support the hydrological research on climate change, risk management on flood and drought

Theme 2 : Governance and Socio-Economics

- Dissemination of knowledge on water resources law, water rights and water transfer to protect on water resources conflicts in the community
- Requirement of economic instruments for water resources management
- Funding for local water resources projects/initiatives and their sustainability

Theme 3 : Water and Environmental Management

- Development of water resources forecast system and risk management to alleviate flood and drought crisis
- Dissemination of knowledge and technology transfer on water and environmental management

Theme 4 : Water Quality, Human Health and Food Security

- Assessment of critical problems on water resources at basin level
- Impact of land use and land-based activities to water quality degradation
- Degradation of aquatic ecosystem
- Impact of water quality to human health and food security
- Increasing water supply in rural areas

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

- a) The representatives from TNC-INP attended the 11th Regional Steering Committee Meeting for the IHP in Southeast Asia and Pacific on 27 October - 1 November 2003

1.2.3 Research/applied projects supported or sponsored

- a) study on Hydrological and Meteorological Monitoring Network in 25 River Basin of Thailand. It's objective is to consider and identify proper Network in this field in order to facilitate integrated water resources management of the country.
- b) Integrated Master Plan of Water Resources Management in 5 Major River Basin in Thailand namely Mae Klong Basin, Yom Basin, Nan Basin, Chi Basin and Mun 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 in the Lower Mekong Basin
 - b) Collaboration with Mekong River Commission in Basin Development Plan, Water Utilization Program and Environment Program
- 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
 - a) One representative attended training courses on the Preparation and Maintenance of Hydrological archives on 13-17 October 2003
- 1.4 Publications
 -
- 1.5 Participation in international scientific meeting
 - 1.5.1 Meetings hosted by the country
 - a) Thailand organized the 1st Southeast Asia Water Forum and the Ministerial Meeting during 17-21 November 2003.
 - b) Thailand organized 2nd and 4th Meetings of ASEAN Working Group on Water Resources Management on 21-22 November 2003 and 22 October 2004.
 - c) Thailand hosted IUCN World Conservation Congress during 17-25 November 2004.
 - 1.5.2 Participation in meetings abroad

Representatives from Thailand participated in

 - ADB's Water Week, Philippines, 26-30 January 2004
 - First General Meeting of Network of Asian River Basin Organization, Indonesia, 23-26 February 2004
 - Meeting on Preparation of the World Water Development Report II, France, 31 March-2 April 2004
 - Workshop on National Water Sector Apex Body, Vietnam, 17-21 May 2004
 - Third Meeting of ASEAN Working Group on Water Resources Management, Malaysia, 9-10 June 2004
 - Environmental Policy Dialogue Between China and ASEAN, China, 16-20 August 2004
 - Meeting to review GWP-Toolbox, Malaysia 4 November 2004.
- 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.
 - 1.6.2 Completed and ongoing scientific projects

Participating in World Water Assessment Programme as one of the case study

2 FUTURE ACTIVITIES

- 2.1 Activities planned until December 2005
- 2.2 Activities foreseen for 2006-2007
- 2.3 Activities envisaged in the long term

NATIONAL REPORT ON IHP RELATED ACTIVITIES

I. ACTIVITIES UNDERTAKEN IN THE PERIOD AUGUST 2003 - OCTOBER 2004

1.1 Meetings in the IHP National Committee

1.1.1 Decisions regarding the composition of the IHP National Committee

- Dr. Tran Thuc, Director of Institute of Meteorology and Hydrology - Ministry of Natural Resources and Environment, has been promoted as new Chairman of Vietnam National Committee for the IHP to replace Dr. Bui Van Duc.
- Other members were kept unchanged.

With the inclusion of the former Hydro-meteorological Service of Viet Nam and the Institute of Meteorology and Hydrology into the newly formed Ministry of Natural Resources and Environment, the VNNC IHP is reorganized to fit the new structure.

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 Secretary General and the Chairman of the IHP National Committee meet regularly to discuss IHP matters.

1.2.2 Participation in IHP Steering Committees/Working groups

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

Chairman of the VNNC IHP was elected as Chairman of IHP Regional Steering Committee for Southeast Asia and the Pacific, for the 2003-2005 term.

1.2.3 Research/applied projects supported or sponsored

- Development of a Knowledge Base for Water Management for Ca River Basin, Research study funded by the Ministry of Natural Resources and Environment, Viet Nam.

- Climate change adaptation for Viet Nam, Research study funded by the Government of the Netherlands.
- Development of a Flood Forecast and Warning for the Red River, Research study funded by the Ministry of Natural Resources and Environment, Viet Nam.
- Application of NWSRF for Flood Computations and Forecast for the Red River System, Research study funded by the Vietnamese Government.

1.2.4 Collaboration with other national and international organizations/programs

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.

Members/representatives of Vietnam NCIHP participated and contributed to many national councils such as:

- Head of National Working Group I on Modeling for the Water Utilization Program of the Mekong River Commission.
- Member of the Steering Committee for preparing National Plan for Environmental Monitoring Network up to 2010.
- Member of the Steering Committee of Water Resource Management Program of Viet Nam.
- Member of Committee for Environmental Impact Assessment of various development projects.

1.2.5 Other initiatives

- Together with Indonesia and Malaysia prepare proposal on "Assessment of Flood Forecasting and Warning for the humid tropics Region".
- Together with the United Nation University, Tokyo University and Asian Institute of Technology carried out a study on "Catastrophic Flood Risk Assessment for Ha Noi City".

1.3 Education and training courses

1.3.1 Contribution to IHP courses

None.

1.3.2 Organization of specific courses

None.

1.3.3 Participation in IHP courses

Several Vietnamese have participated in IHP courses and workshops during the reporting period, including:

- IHP Training course, Kula Lumpur, Malaysia.
- Workshop on ground water contaminant, Bangkok, Thailand.

1.4 Publications

- Thuc T. and Phuc N.H. (2004), “Hydraulics Computations to Study Flood Control for Ha Noi City, Viet Nam”, Proceeding, *International Symposium on New Technologies for Urban Safety of Mega Cities in Asia*, Agra, India.
- Thuc T. and Tuyen H. M. (2004), “Flood Drainage Improvement Study for the Plain of Reeds, Mekong River Delta, Viet Nam”, Proceeding, National Workshop, Ho Chi Minh City, Viet Nam.
- Thuc T., Ca V. T., and Hien N. X. (2004), “Scientific base for Determining Lines between River Dike, River mouth Dike and Sea Dike”, Proceeding, National Workshop, Ha Noi, Viet Nam.
- Thuc T. and Hien N. X. (2004), “Flood Forecast for the Red River System”, Proceeding, National Workshop, Ho Chi Minh City, Viet Nam.
- Thuc T. (2003), Development and Application of a Mud Transport and Bed Evolution Model for Estuary, Proceeding, International Conference on "Managing Water Resources under Climatic Extremes and Natural Disasters", Fiji.
- Huong H. L. and Thuc T. (2003), Application of Distributed Hydrological Model for Impact Assessment of Land use Change on flow Regime of Tra Khuc River Basin, Proceeding, National Workshop, Ha Noi, Viet Nam.

1.5 Participation in international scientific meetings

- Attending and presenting papers at the International Conference on "Managing Water Resources under Climatic Extremes and Natural Disasters".
- Attending the 11th Regional Steering Committee Meeting for Southeast Asia and the Pacific.
- Attending and presenting paper at the International Symposium on New Technologies for Urban Safety of Mega Cities in Asia, Agra, India.

1.6 Other activities at a regional level

1.6.1 Institutional relations/co-operation

None

1.6.2 Completed and ongoing scientific projects

None under the aegis of IHP-VI

II. FUTURE ACTIVITIES

2.1 Activities planned for 2004-2005

- Attending meeting of IHP Regional Steering Committee for Southeast Asia and the Pacific, Adelaide, 2004.
- Participating in regional and national activities of IHP.

2.2 Activities envisaged in the long term

Unknown at this time.

ANNEX 6

**MINUTES OF MEETING OF THE 10TH TECHNICAL SUB-COMMITTEE
FOR THE ASIA PACIFIC FRIEND PROJECT**

ASIAN PACIFIC FRIEND 10th TECHNICAL SUB-COMMITTEE MEETING

Hilton Hotel
Adelaide, Australia, 23 November 2004

Minutes

Attendees:

Participating Sub-committee Member or Observer		Country
JAMES	Ross	Australia
DANIELL	Trevor	Australia (Chairman)
WHITE	Ian	Australia
LONG	Saravuth	Cambodia
XU	Zongxue	China
CHEN	Yuanfang	China
JAYAWARDENA	A.W.	China
LIU	Heng	China
LOEBIS	Joesron	Indonesia
IBRAHIM	Agung Bagiawan	Indonesia
KAWAMURA	Akira	Japan
CHIKAMORI	Hidetaka	Japan
TACHIKAWA	Yasuto	Japan
TAKARA	Kaoru	Japan (Secretary RSC)
TAKEUCHI	Kuniyoshi	Japan
LEE	Soontak	Korea
SHIN	Hyun-Suk	Korea
JEE	Hong Kee	Korea
VITHAYA	Somphanh	Lao PDR
MOHAMED DESA	Mohamed Nor	Malaysia
CURRY	Bob	New Zealand (Rapporteur)
IBBITT	Richard	New Zealand
LIONGSON	Leonardo	Philippines
VIROBO	Maino	PNG
TINGSANCHALI	Tawatchai	Thailand
KHAO-UPPATUM	Virat	Thailand
PROMMA	Kitchakarn	Thailand
AEKARAJ	Sukontha (Ms)	Thailand
TRAN	Thuc	Vietnam (Chairman RSC)
ARDUINO	Giuseppe	Indonesia

1. Welcome

The Chairman of the Technical Sub-committee (TSC), Mr Daniell opened the meeting at 3:50 pm and welcomed all participants.

2. Election of Rapporteur

Mr Bob Curry was elected as Rapporteur for the meeting.

3. Confirmation of agenda

The draft agenda was accepted (Attachment 1).

4. Report from TSC Chairman - FIGCC

The Chairman briefly outlined the status of the action items from the 9th meeting of the TSC held in Sigatoka, Fiji, on 28 October 2003 and referred to his (Trevor Daniell's) report as APFRIEND Co-ordinator on the FRIEND Inter-group Co-ordination Committee (FIGCC) meeting and associated Extreme Flows Workshop held in Koblenz, Germany for 5-8 July 2004 (Attachment 2) which summarised progress to date.

Chairman Daniell outlined the activities of Asia Pacific FRIEND as reported to the FIGCC meeting explaining how APFRIEND suffered from a lack of funding and that it was a problem to know how to continue and develop the work without financial support. He noted that the current themes for the next IHP phase matched the floods and low flows of other regions.

The Chairman noted that in Allan Gustard's (Northern European FRIEND - observer) opinion, scientists working in the APFRIEND region, especially those from small islands, should be encouraged to participate in the Cuba conference because the problems of small islands in the Pacific are similar to those in the Caribbean. He further noted that Gustard believed that it would be a good opportunity to strengthen links but cautioned that there needed to be more co-ordination between sponsors in order to avoid the duplication of projects and research.

Chairman Daniell also noted that Siegfried Demuth (Northern European FRIEND delegate) had described the co-operation and liaison in organising workshops in Asia and told the FIGCC meeting about the international study course on hydrological drought assessment planned to take place in Bangkok in November 2005.

5. Discussion on APFRIEND Phase 2 - Questionnaire and direction

Chairman Daniell further noted that country response to the rainfall intensity-frequency-design (IFD) questionnaire on data both within and between countries, source organisations for data, and design standards / guidelines and analyses techniques used by countries, had been poor with only 5 countries responding (Australia, Japan, Phillipines, New Zealand & Vietnam (part)). Mr Daniell noted that for the project to be successful input from all countries was required. In particular stated that there was a need for all countries to answer the questionnaire in order that progress could be made towards:

1. reporting the findings at the combined meeting on low flows workshop to be held at the HTC in November 2005; and,
2. presenting papers at the FRIEND 2006 Conference in Havana Cuba November / December 2006.

Mr Daniell went on to ask why most countries had not responded to the questionnaire.

Mr Nor apologised for Malaysia's non response and suggested a new deadline be set for responses – within the next few weeks (December 2004).

The Chairman reminded the meeting that the direction was more important than the questionnaire but that the results of the questionnaire were needed to form a draft plan of action at the drought and low flows workshop in 2005. He advised the meeting that the next step was to apply for a UNESCO PP Grant for the proposed research.

Mr Arduino noted that the Drought and Low Flow Workshop/ training course to be held in conjunction with the RSC meeting in November 2005 will need TSC assistance.

Chairman Daniell suggested that 2 days would be required for the workshop prior to the RSC meeting as it would not be satisfactory holding the workshop after the IHP meeting in Brazil on 3-9 April 2005.

The Chairman also suggested that based on the current questionnaire response only Australia, Japan, Phillipines, New Zealand and Vietnam would be contributors.

Mr Arduino advised of the need to ensure that the workshop did not clash with other IHP activities or Ramadan (5 October – 5 November).

Mr Takeuchi suggested late November 2005.

Mr James advised that a PP Grant application had been submitted to UNESCO to hold this workshop and some funding assistance had been pledged.

Mr Arduino confirmed that some funds were available for the workshop.

Chairman Daniell suggested that IFD techniques eg Australia as a model could be used, but there was a need to prepare a proper proposal and PP Grant application.

Mr Tacheuchi suggested that in order to be ready for the November workshop the PP Grant needed to be prepared and submitted by February 2005

Chairman Daniell suggested that the 2-day workshop in February 2005 comprise:

- Day 1 – Research to be undertaken
- Day 2 – Draft PP proposal

and, noted that the amount required for significant research would be large especially without volunteer time.

Mr Tacheuchi suggested that countries be requested to advise within the next month:

1. How much they could do without financial support?
2. How much they could do with \$1-2k support?

Chairman Daniell noted that questionnaires were not successful and suggested feed back by the end of this RSC meeting; however the others noted that those in attendance may not be in a position to commit whether their country could provide services without financial support.

Mr Daniell further noted that the first thing to do is to collate the country responses and the second is to hold the meeting at the HTC in February or April 2005 (date to be agreed at the RSC meeting).

Mr Arduino noted that the PP Grant application for the research proposals need to be in by February 2006 to be considered in the next bi-annual round and that there would be no PP funding available until approvals were announced in September 2006.

Mr Thuc suggested that the TSC needed more information and suggested that each country should have a detailed proposal on what they are proposing to do.

Chairman Daniell noted that the completed questionnaires would show which countries have good data and techniques to produce IFD statistics.

Mr Tacheuchi commented that people do no care about data but need to know about research direction and the Chairman noted that this information was sought through the country questionnaire. Mr Tacheuchi asked that countries to suggest a title for their presentations and Mr Daniell commented that country titles were be largely identified in the first questionnaire under the reasons which led to

IFD development. Because flooding was the big problem followed by droughts, a big improvement was sought on design flood techniques, as these have not been worked out in many countries.

Mr Thuc suggested that countries should work on their IFD presentations

Mr Ibbitt suggested that in order to break the deadlock on non response to questionnaires, that attendance at the February/April 2005 workshop be on the basis of no paper – no funding.

Mr Nor asked how many would be attending the February/April 2005 workshop, to which the Chairman replied around 12 people (one from each country).

Mr Arduino advised that in order to get 2 full days at the workshop there would be a need for participants to stay for at least 3 nights.

Much discussion continued on proposed arrangements towards the proposed IFD research with a suggested timetable summarised as follows:

December 2004	- Country questionnaire on data availability and IFD techniques used; - Country response on extent of contributions possible: 1. Without financial support 2. With ~\$1-2k support (Both to be completed and returned to Trevor Daniell)
12-13 April 2005	Workshop on IFD research direction at HTC Day 1 – Research direction Day 2 – Drafting PP proposal - Attendance based on no presentation – no funding; 2 days / 3 nights (dates confirmed at RSC mtg)
September 2005	Global Friend Report submission
November 2005	13 th RSC meeting at Bali - Presentation of IFD results to date & proposed research
February 2006	- PP funding applications close (IFD research proposals) - Submission of papers for Global Friend Report
September 2006	PP funding for IFD research known

(An overhead summary (Attachment 3) of this “Action Timeline” was prepared by Bob Curry and was presented by the TSC Chairman at the RSC meeting where delegates agreed that the 2-day workshop would be held at the HTC on 12-13 April 2005).

6. Reports from representatives from National Committees

Nil

7. Development of activities to be completed before the next RSC meeting

Based on the discussion and the Chairman’s summary the following action is proposed to progress the Phase 2 Plan.

- Questionnaire – finalize and evaluate

- Country input
Based on a template to be distributed and will cover
 - Availability of data both within and between the countries
 - Source organisations for data
 - Design standards/guidelines and analysis techniques used by countries
- Prepare draft plan of actions
By email and based on country input.
- Develop a detailed work plan
For identified actions in each area of activity. This should be done at the April 2005 workshop.
- Source funding
Explore funding options for research projects such as
 - UNESCO PP grants
 - European Union Framework 6
 - Internal country funding

ACTION: To complete the APFRIEND Phase 2 Plan for implementation prior to the 2005 RSC Meeting.

Action is still required following Mr Gustard presentation to the 2003 TSC meeting where he informed the meeting that European FRIEND was about to publish a book on droughts and low flows. He said that funds were available to enable European FRIEND people to travel to Asia to run workshops on the techniques in the book and also to learn from AP FRIEND researchers. European FRIEND is also considering holding a meeting at AIT during 2005.

ACTION: AP FRIEND to prepare a proposal to participate with European FRIEND in a Drought and Low flow activity in the region during 2005.

8. APF Water Archive

Mr James advised the meeting that the APF Water Archive was light on data and that many of the datasets that supported the Catalogues of Rivers had not been submitted by the contributing countries.

Chairman Daniell reminded the meeting that all datasets supporting the Catalogue of Rivers needed to be archived and should be made a priority task.

9. Preparation for Global FRIEND Report

Chairman Daniell noted that abstracts for the Global Friend Report needed to be submitted by 30 September 2005 and papers by February 2006.

10. Other matters

No other matters were raised.

11. Closure

The Chairman closed the meeting at 4:50 pm.

12. Action Items

ACTION ITEMS	BY WHOM	WHEN
1. Countries who have not already responded to the IFD questionnaire should do so	All countries except Australia, Phillipines, New Zealand and Vietnam	December 2004
2. Countries to advise how much IFD research can be done (a) without financial support; and, (b) with US\$1-2k	All countries	December 2004
3. Countries to consider preparing project proposals relevant to the Phase 2 work areas for funding under the Participation Programme	All countries	Apr 05 (w/shop) Sep 05 (GFR) Nov 2005 (RSC)
4. Progress Research Plan as per list of actions	Mr Daniell	
5. AP FRIEND to prepare a proposal to participate with European FRIEND in a Drought and Low flow activity in the region during 2005.	Mr Daniell	

**Asian Pacific FRIEND
10th Technical Sub-committee Meeting
23 November 2004**

Agenda

1. Opening
2. Election of Rapporteur
3. Confirmation of Agenda
4. Report from TSC Chairman - FIGCC
5. Discussion on AP FRIEND Phase 2 – Questionnaire and direction
6. Reports from representatives from National Committees
7. Development of Program of Activities to be completed before next the Regional Steering Committee meeting
8. APF Water Archive
9. Preparation of Global FRIEND Report
10. Other matters
11. Closure

**REPORT BY TREVOR DANIELL ON FIGCC MEETING
AND EXTREME FLOWS WORKSHOP
– KOBLENZ, GERMANY: 5-9 JULY 2004**

**United Nations Educational, Scientific and Cultural Organisation
International Hydrological Programme VI**

**FRIEND: FLOW REGIMES FROM INTERNATIONAL EXPERIMENTAL
AND NETWORK DATA**



Report by

Trevor Daniell

APFRIEND Coordinator

on

FRIEND INTERGROUP COORDINATION COMMITTEE (FIGCC)

9 July 2004

And

**International Workshop on Hydrological Extremes, Modelling and
Managing Low Flows, Droughts and Floods,**

5 – 8 July 2004

Koblenz, Germany

Report on the
**FRIEND INTERGROUP COORDINATION COMMITTEE (FIGCC)
5th Meeting, Koblenz, Germany, 9 July 2004**

At the meeting I spoke to the report (Annexure 1) outlining activities in APFRIEND.

The Minutes of the Meeting are attached as Annexure 2. I will make some comments on the actions that have to be undertaken by the Regional Coordinators

Action 1

The coordinators of the regional groups will inform Eric Servat by 15 August 2004 of their group's future contributions on low flows and floods. This is to increase inputs on "low flows and floods", particularly during the next IHP Council. Each coordinator is to provide a written contribution about the strategy of their FRIEND group regarding these topics.

A two page document with a small part regarding past activities and major part on future activities is required.

Action 2

Proposals for themes of Friend International Conference Havana Cuba 27th Nov –1st Dec 2006 (the 5th FRIEND World Conference – Water Resources Variability: Processes, Analyses and Impacts) were to be determined.

Siegfried Demuth suggested the following objectives and themes of the conference:

Objectives and Themes

The objective of the conference is to present the results of the UNESCO IHP FRIEND (Flow Regimes from International Experimental and Network Data) programme that has stimulated and fostered international co-operation in the field of hydrology with a special emphasis on regional needs. A focus of the conference will be topics related to water resources variability, processes, analysis and impacts. The conference themes will cover:

- (1) Hydrological data - data basis, monitoring, dissemination through homepages and Internet;
- (2) Capacity building - knowledge transfer, education and training (e-learning, study courses);
- (3) Pan - national research programmes - what do we learn?
- (4) Prediction and forecasting hydrological extremes - teleconnections, medium range-, long term forecasts and GCMs; and
- (5) Climate impact - water management, water demand, land cover, snow and glaciers, small islands and semi-arid areas.

Results of meeting

The operation of other coordinators of FRIEND groups has demonstrated that there needs to be a greater coordinating role of the programs of research that are being undertaken in each country and then linking these research programs with those of adjacent countries or those countries with similar hydrological regimes. Discussions with the other coordinators were extremely fruitful. One action resulting from this meeting will be an attempt to link researchers who are in APFRIEND and develop activities in low and high flow research areas.

Report on International Workshop on Hydrological Extremes, Modelling and Managing Low Flows, Droughts and Floods, 5 – 8 July 2004

The time-table for this workshop is attached in Annexure 3.

The workshop was jointly organised by the German IHP/OHP National Committee and UNESCO Directorate of Water Sciences. The workshop was a contribution of the German IHP/OHP National Committee to the VI. Phase of the IHP of UNESCO. It was implemented within the framework of Theme 2 Integrated Watershed and Aquifer Dynamics, Focal area 2.1 Extreme Events in Land and Water Resources Management.

The papers presented and the discussions following the papers were extremely open.

One of the major aspects discussed was concerning the increase in water stress during periods of drought. There was a much discussion on processes that would ensure proper drought management and prediction. It was considered important to inaugurate a meteorological and hydrological drought forecasting modelling system to guarantee proper drought management and thereby mitigation. The result of this was perhaps the introduction of a European Drought Prediction Centre.

One major conclusion from this workshop is the value of collecting high quality information as all modelling and decision making is only as good as the data collected. This point needs to be stressed over and over again. No matter how sophisticated modelling becomes there still needs to be accurate and timely data collection programs .

The application of the techniques developed in Europe for low flow analysis will need to be developed further for semi arid regions or regions where there are significant zero flows recorded. Stemming from this will be the development of a Workshop in Bangkok in November 2005.

The papers on high flows and the problems with predicting floods to improve the ability of society to handle such emergencies showed that these are common problems world wide and again depended on good data collection facilities.

Discussions at all sessions were lively and informative and many conversations following the meeting were undertaken.

There are indeed many areas where the Asia Pacific Region can cooperate with the European community.

Annexure 1

FIGCC Report for AsiaPacific FRIEND

Details from the latest Technical Steering Committee for APFRIEND included the following items.

1. Phase 1 Report

Phase 1 report

The AP FRIEND Phase 1 Report has been Published as IHP-V Technical Document in Hydrology No 9, Regional Steering Committee for Southeast Asia and the Pacific UNESCO Jakarta Office 2003 also as a CDROM

2. Meetings to develop APFRIEND Phase 2

Technical Steering Committee was held at Port Dickson, Malaysia in 2002 where finalisation of material for report on Phase 1 was undertaken.

A Survey of the countries of the region to work out a program of research activities for the 2nd phase was developed and then circulated following this meeting in 2003.

At the Technical Steering Committee Meeting of APFriend Sigatoka Fiji 28th October 2003 in conjunction with 11th IHP Regional Steering Committee Meeting for South East Asia and Pacific the Draft Phase 2 Plan questionnaire for discussion at RSC 10 meeting was completed and results reviewed.

3. Discussion for APFRIEND Phase 2 Plan

It was proposed that the themes of high flows and low flows (including drought) be continued from Phase 1 to Phase 2. It was further proposed that activities within these themes initially be focused on rainfall. Specifically:

- What rainfall data are available in countries?
- How accessible is the data for research within each country?
- How accessible is the data for research outside the country?
- Availability and origin of design rainfall guidelines/standards in countries.
- Investigate development of regionally consistent rainfall design techniques and guidelines.

This work on rainfall would then logically lead on to work on high and low flow analyses.

The subsequent discussion agreed that rainfall was an essential input to high flow, low flow and drought analysis and highlighted that:

- Rainfall analysis was a priority in many countries.
- There was broad agreement it would be more valuable to focus on rainfall analyses to reduce fragmentation of effort.
- Design rainfall analyses are known by a range of names such as IFD, DDF and IDF

4. Pacific Islands

The Pacific islands have a detailed plan of actions and a strategy for their implementation already developed. It was felt that the much of the Pacific action plan would integrate with the high flow and low flow activities. Many of the other countries in the RSC also include small islands and there needs to be discussion to see if there should also be a small island theme.

5. Funding

The issue of funding was of considerable interest to the meeting as the lack of funding was a significant problem in Phase 1. The UNESCO Participation Programme was identified as a potential source of funds. It was summarised the process of submitting PP proposals through country National Commissions and stated that funds of about US\$40K could be available for projects in each country. Mr Arduino advised that developed countries could also seek PP funds and that projects that involved or were supported by a number of countries were considered more favourably.

ACTION FROM MEETING: Countries to consider preparing project proposals relevant to the Phase 2 work areas for funding under the Participation Programme.

Mr Alan Gustard attended the the meeting in Fiji and described the activities of European FRIEND and the support that was provided within the European Union. European FRIEND tried many sources of funding and there was a need to be constructive in securing sources of funds. Mr Gustard agreed that DDA/IFD/IDF was an important issue to be addressed. .

Some potential sources of EU funding for AP FRIEND activities were described by Mr Gustard as follows:

- Framework 6 The EU's Framework Program for Research and Technological Development. (http://europa.eu.int/comm/research/fp6/index_en.html)
Specifically the component for flood and drought funding of Framework 6 is relevant. Countries outside of Europe can link with EU countries in projects and so draw on funds for related activities.
- Twinning of basins
EU and other river basins could be twinned for research purposes with APF researchers participating in projects and thus being eligible for EU funding. Possibilities include twinning islands in the Mediterranean with islands in the Pacific or twinning major basins in Europe with major basins in RSC countries. Another possibility for twinning was in the area of integrated urban water management where an EU city could be twinned with an Asian city.

It was concluded that climate change was very important, particularly for the Pacific island countries, and it will need to be considered when preparing the work program

6 Development of activities

To be completed before the next RSC meeting 2004 .

The following actions were proposed to progress the Phase 2 Plan. 2004-2007

- Questionnaire – finalize and evaluate before Aug 2004
- Country input will be based on a template to be distributed and will cover
 - Availability of data both within and between the countries
 - Source organisations for data
 - Design standards/guidelines and analysis techniques used by countries
- Prepare draft plan of actions and by email and based on country input.
- Develop a detailed work plan for identified actions in each area of activity. This should be done at a workshop. If there are funding issues then this may have to be completed entirely by email.
- Source funding---Explore funding options such as
 - UNESCO PP grants
 - European Union Framework 6
 - Internal country funding

Progress a meeting in conjunction with European FRIEND at AIT (from conversations with A. Gustard) He said that funds were available to enable European FRIEND people to travel to Asia to run workshops on the techniques in the book and also to learn from AP FRIEND researchers. European FRIEND is also considering holding a meeting at AIT during 2005.

ACTION: AP FRIEND to consider preparing a proposal to participate with European FRIEND in a Drought and Low flow activity in the region during 2005(?).

At the meeting the Chairman identified the need for a champion for each theme area. He indicated that he would take on the area that the other "volunteer" did not want. Some meeting participants identified Mr Takara would be a good champion following his work in Phase 1. It was acknowledged that both Mr Takara and Mr Daniell were very busy people and others were encouraged to consider being a theme leader or to assist.

Countries participating in TSC meeting were Vietnam, Australia, NewZealand, China, Japan, Philippines, Malaysia, Canada and England

Annexure 2

Minutes of FRIEND INTERGROUP COORDINATION COMMITTEE (FIGCC), 5th Meeting, Koblenz, Germany, 9 July 2004

Participants

Eric Servat (Chair)	AMHY FRIEND
Siegfried Demuth	Northern European FRIEND
Mandira Shrestha	Hindu Kush-Himalayan FRIEND
Mohamed Abdelmotaleb	Nile FRIEND
Luc Sigha-Nkamdjou	Western and Central Africa FRIEND
Eduardo Planos Gutiérrez	Caribbean FRIEND/AMIGO
Simon Mkhandi	Southern African FRIEND
Trevor Daniell	Asian Pacific FRIEND
Mike Bonell	UNESCO, Paris

Observers

Jean-François Boyer	UMR Hydrosociences, University of Montpellier, France
Alan Gustard	CEH, Wallingford, UK
Abdelaziz Farouk Zaki	UNESCO, Cairo office
Gerhard Strigel	IHP/HWRP Secretariat, Koblenz
Francette Wallisch	IHP/HWRP Secretariat, Koblenz

1. Welcome

Eric Servat welcomed the participants and thanked Siegfried Demuth for organising the meeting. Eric Servat suggested two amendments to the agenda (Annex 1) and these were accepted unanimously.

2. Minutes and matters arising from FIGCC meeting, Cape Town, South Africa, 17 March 2002

The minutes of the 4th FIGCC meeting which took place in Cape Town were accepted as accurate.

Simon Mkhandi informed the meeting that a link had been established between Southern Africa FRIEND and the Global Water Partnership (GWP), but there were as yet no tangible results.

Mike Bonell reported that 23 HELP basins in Europe had now been established. He raised the possibility of holding a joint workshop between HELP and FRIEND in order to synergize.

3. Regional Coordinator reports

The coordinator of each FRIEND group gave a short résumé of the activities that had taken place since the last FIGCC meeting in March 2002 (Annex 2 i – vii).

3.1 Northern European FRIEND

In the discussion which followed Siegfried Demuth's report Alan Gustard suggested that encouragement should be given to water managers to attend workshops. He hoped that the ASTHyDA textbook, *Hydrological Drought – Processes and estimation methods for groundwater and streamflow*, would be disseminated in the regional groups. Mandira Shrestha expressed the wish that courses on low flows, such as the one held in Wageningen in September/October 2003, be held also in the Hindu Kush-Himalayan region.

3.2 Hindu Kush-Himalayan FRIEND

Mandira Shrestha was complimented on the new HKH-FRIEND website which not only provides information about the group's activities but is also the internet platform for the Regional Hydrological Data Centre (RHDC).

3.3 AMHY FRIEND

Eric Servat reported that the steering committee meeting in Montpellier in 2003 merged existing sub-groups to create a new group on extreme events to be coordinated by Dr Ferrari, Italy. In 2002 an international workshop on snow and ice was held in Beirut, Lebanon and, as a consequence, snow and ice were being considered as a new topic for the AMHY group. The main activity in 2003 was the organisation of the international conference *Hydrology of the Mediterranean and semi-arid regions* in Montpellier. The international conference in Ohrid, Macedonia in May 2004, supported by AMHY FRIEND, re-launched the topic of eco-hydrology which could be taken up as an active topic in the AMHY group. Eric Servat revealed that the future of the AMHY structure was being discussed and that developments may see the creation of a new group incorporating the Middle Eastern countries (Lebanon, Syria, etc.) and southern Mediterranean countries such as Tunisia, Morocco and Algeria. A written report for this group is not available.

3.4 Western and Central Africa (AOC) FRIEND

Luc Sigha-Nkamdjou gave an account of the AOC activities since March 2002. These included participation in the FRIEND conference in Cape Town with 20% of the papers and posters and a symposium in Cotonou, Benin in November 2003, during which the coordinators of AOC FRIEND and AMMA (African Monsoon Multidisciplinary Analyses) met to establish links and collaboration between the two groups. AOC FRIEND now has six projects coordinated by different institutions – low flows and the dynamics of groundwater, the dynamics of matters flux, variability of water resources, modelling and ungauged basins, eco-hydrology, and database and website.

In the future, encouragement will be given for scientific exchange on the Internet, meetings will be organised for the coordination of themes, a document will be produced on the work already done by AOC FRIEND group members and future activities will include the participation in the IAHS symposium in Foz do Iguacu, Brazil, in April 2005, in the symposium in Montpellier at the end of 2005 on the variability of water resources and in the FIGCC conference in Cuba in 2006.

3.5 Southern Africa FRIEND

Simon Mkhandi presented his report and informed the meeting of the activities that are planned for the next three years. He pointed out that the group of which he is coordinator did not lack ideas, but he regretted that there was often a lack of funding to allow these to be realised. There are now 12 members of the group, of which Mauritius is the latest addition; it is hoped that Congo will be the next.

3.6 Asian Pacific FRIEND

Trevor Daniell outlined the activities of APFRIEND. He sympathised with Simon Mkhanda as his group also suffered from a lack of funding and it was a problem to know how to continue and develop the work without financial support. The current themes for the next phase match the floods and low flows of other regions.

In Alan Gustard's opinion scientists working in the AP FRIEND region, especially those from small islands, should be encouraged to participate in the Cuba conference because the problems of small islands in the Pacific are similar to those in the Caribbean. It would be a good opportunity to strengthen links. He added that there needs to be more coordination between sponsors in order to avoid the duplication of projects and research.

Siegfried Demuth described the cooperation and liaison in organising workshops in Asia and told the meeting about the international study course on hydrological drought assessment planned to take place in Bangkok, Thailand in November 2005.

3.7 Nile FRIEND

Mohamed Abdelmotaleb presented the activities and projects of the Nile FRIEND group, of which the newest theme, drought and low flow analysis, was initiated this year. Alan Gustard's suggestion was that participants of the low-flow group should take part in the training workshop in Bangkok in November to help the transfer of knowledge, teaching tools, etc.

It is planned to hold a Nile FRIEND international conference in Egypt in November 2005 and Mohamed Abdelmotaleb agreed to distribute information concerning the conference to all those present at the meeting. It was suggested that Mohamed Abdelmotaleb and Siegfried Demuth should liaise to prevent an overlap of the dates of the conference and the international study course in Bangkok.

Action: Siegfried Demuth/Mohamed Abdelmotaleb

3.8 Caribbean FRIEND/AMIGO

Eduardo Planos Gutiérrez informed the meeting of the group's past and present activities and the preparatory work for the FRIEND 2006 conference. A written report is not available.

3.9 Shared implementation of FRIEND AMIGO, AMHY and AOC databases and websites

Jean-François Boyer presented the pilot project in which the databases of the Caribbean, Mediterranean and Western and Central African FRIEND groups will be jointly electronically accessible. This is an initial collaboration of three groups. When the system is ready, other groups would be welcome to add their databases. However, this may not always be possible as the structures of databases are not always compatible.

In parallel the web pages of these groups will be developed. There followed a discussion about the presentation of the FRIEND groups on the Internet. It was decided that each group should be responsible for its own website which can be updated individually as required. It was suggested that the FIGCC web page should have a map of the world with links to each FRIEND group.

4. Future of FRIEND with respect to a floods programme

Mike Bonell warned the meeting that in IHP Phase VII funding will be considerably restricted and this should be taken into account when planning for the years after 2007. He asked those present to consider putting greater emphasis on high flows, taking into account that climate change affects both low and high flows. Focus could possibly be on linking land-use change and climate change with hydrological extremes. Mike Bonell suggested coupling FRIEND's work on floods with that carried out by WCP Water of WMO. Closer links with HELP, possibly a joint FRIEND/HELP expert group, were recommended. Siegfried Demuth proposed to use the different regional groups on floods and make a list of flood topics. A group for floods could then summarise the findings.

It was agreed that four experts should be named to form a group for floods. Proposals are to be sent to Mike Bonell.

Action: All

A two-page strategy document on low flows and floods will be drawn up and sent to Mike Bonell before the IHP Intergovernmental Council on 24/25 September 2004.

Action: Eric Servat

The coordinators of the regional groups will inform Eric Servat by 15 August 2004 of their group's future contributions on low flows and floods.

Action: Regional coordinators

5. FRIEND International Conference, Havana, November/December 2006

A preliminary meeting was called in Montpellier to discuss the scope and timetable of the conference. Proposals had been requested for a venue. Eduardo Planos gave the meeting his presentation for Havana, Cuba. This venue was accepted and the dates for the conference were fixed on Monday, 27 November to Friday, 1 December 2006.

With respect to funding, the National UNESCO Commission in Havana should be contacted with a view to obtaining a programme participation grant. This process is to be commenced immediately and proposals should be in Paris by March 2006 at the latest.

Action: Eduardo Planos

The conference will be called: 5th FRIEND World Conference – Water Resources Variability: Processes, Analyses and Impacts.

The proposals for sub-topics included water quality, sediment transport, prediction and forecasting extremes, water management, water demand management, impacts of land-cover change vis-à-vis climate variability, tele-connection, median-range forecasts, capacity-building through knowledge transfer, education and training, e-learning, snow and ice hydrology with respect to low flows and floods, regional cooperation (projects on a mega-scale), tropical and small islands, semi-arid hydrology, GCM and long-term forecasts, time series and analyses, environmental flows. Parallel sessions and workshops are suggested for databases and web pages, and for HyCOS.

The procedure for the production of the first circular for the conference was discussed. A draft is to be drawn up by the chairman of the local organising committee, Eduardo Planos, chairman of the international committee, Mike Bonell, chairman of the scientific committee, Eric Servat, and chairman of the editorial group, Siegfried Demuth. The deadline for the submission of proposals to Eduardo Planos by regional coordinators is the end of August 2004. The draft of the leaflet will be circulated to all regional FRIEND coordinators.

Action: Eduardo Planos

At present the scientific committee includes Siegfried Demuth, Mandira Shrestha and Alan Gustard under the chairmanship of Eric Servat. As the members of this committee

will have to review the conference papers, additional members are required. Proposals should reach Eric Servat by the end of July 2004. **Action: All**

There is a shortage of French native speakers for reviewing and editing papers. Eric Servat agreed to make proposals to remedy this. **Action: Eric Servat**

Requests for financial support (from UNESCO, WMO, IAHS, etc.) should be made preferably already between January and July 2005. The draft information note should therefore be ready by this time. Eduardo Planos is asked to contact the regional UNESCO office to ask for financial support. In addition, the conference has to be taken into account in the budget for the biennium 2006-2007. **Action: Eduardo Planos**

6. FRIEND Report 2002-2006

There was a general discussion whether the FRIEND report should be structured regionally or thematically. Finally, it was decided to retain the regional format. However, Mandira Shrestha suggested adding a thematic summary with a forward look at the end of the book. The book should be ready by the time of the FRIEND conference in Havana. Eric Servat will send out instructions for the submission of material by the end of this year. The deadline for the submission of material was set for the end of 2005.

Action: Eric Servat

7. Future new directions for FRIEND 2006 onwards

Future directions were discussed with emphasis on a closer cooperation with other international programmes like HELP, PUB, etc.

7.1 Next biennial 2006-2007

Requests for the budget for the next biennium have to be sent to UNESCO in time.

Action: All

7.2 Cross-cutting themes

One or two cross-cutting themes should be developed for IHP VII. Greater cooperation between the regional groups should be a prime objective. In Alan Gustard's opinion websites proved to be a helpful vehicle, e.g. in announcing forthcoming meetings. The coordinators should try to keep their web pages up to date.

Action: All

7.3 IHP VII phase 2008-2013

Siegfried Demuth presented the IHP VII proposals. He recommended that IHP National Committees should consider FRIEND as being of paramount importance. He will distribute the proposals document electronically.

Action: Siegfried Demuth

7.4 New FRIEND groups (Andean FRIEND)

Eduardo Planos explained that the present situation is rather complicated. The proposed Andean FRIEND will be incorporated into a South American group, which may be merged with the Caribbean group to form a Latin American group. In November 2004 a meeting is planned to take place in Chile at which the situation will be clarified.

Action: Eduardo Planos

7.5 New AMHY structure

Eric Servat expanded on what he had already mentioned under item 3.3. The area covered by AMHY FRIEND now stretches across the north and south Mediterranean, the Balkan countries and the Middle East. The area includes great differences in climate, culture, etc. AMHY FRIEND finds the present structure inefficient and thinks it is now time to split the group into two, a Mediterranean group and a Black Sea group. It is, however, difficult to find a coordinator for the Balkan and Black Sea group. At present Marc Morell leads the BALWOIS project already working in the Balkan area and Eric Servat and his laboratory will continue to support the whole group. The idea of the group split was accepted by those present, but Mike Bonell recommended that the current AMHY group should continue until 2005.

7.6 Possible new FRIEND group – Mesopotamia

Alan Gustard informed the meeting that Hafzulla Aksoy from the Technical University of Istanbul, Department of Civil Engineering, Turkey, would like to launch a Mesopotamia FRIEND group. The group welcomed the initiative and Eric Servat agreed to write to him very soon to give him support.

Action: Eric Servat

8. FRIEND cooperation

8.1 IAHS/PUB Report from Koblenz meeting, May 2004

Alan Gustard reported on the meeting and its key recommendation to set up a working group. A reaction from PUB is now awaited.

8.2 HELP

This agenda item had already been dealt with by the presentation made by Mike Bonell at the workshop on hydrological extremes, which had been attended by all those present.

8.3 IHP Integrated Science Initiative

8.4 International Centre for Natural Hazards and Risk Management (UNESCO – CHARM)

Mike Bonell reported on the inauguration of the centre under the auspices of UNESCO. The centre will be located in Japan. The objectives are to conduct research, capacity-building and information-networking activities in the field of water-related hazards, and risk management at local, national, regional and global levels to prevent and mitigate impacts with a view to sustainable and integrated river basin management.

9. Procedure for electing new FIGCC chair in Havana 2006

Eric Servat proposed omitting discussion of this point and to await a meeting with Mike Bonell who had already left the meeting. He suggested making a proposal for the procedure at the end of 2004.

10 Any other business

Eric Servat suggested an amendment to the FIGCC Terms of Reference to allow past chairpersons to remain a member of FIGCC. The proposal was adopted and it was agreed that item 4.1.e) should be added to allow for this. The next FIGCC meeting will take place during the 5th World FRIEND conference in Havana, Cuba, 2006.

Annexure 3

International Workshop on Hydrological Extremes, Modelling and Managing Low Flows, Droughts and Floods, 5 – 8 July 2004

Timetable

Monday 5 July 2004

08.00 – 09.00	Registration
09.00 – 09.30	Opening <i>Volkhard Wetzel, Director of the Bundesanstalt für Gewässerkunde</i>
	Introduction <i>Siegfried Demuth, Head of the German IHP/HWRP Secretariat</i>
	Session 1 Low Flow – Process Analysis Chairman: <i>Siegfried Demuth</i> Rapporteur: <i>Alan Gustard</i>
09.30 – 10.00	Drought analysis <i>Lena Tallaksen (University of Oslo)</i>
10.00 – 10.30	Partnerships between research and operation <i>Alan Gustard (Centre for Ecology and Hydrology, Wallingford)</i>
10.30 – 11.00	Coffee break
11.00 – 11.30	Operational resource assessment – scales and precision <i>Dan Cadman (Environment Agency England & Wales, Peterborough)</i>
11.30 – 12.00	Impacts of climate and land use on low flow <i>Henny van Lanen (University of Wageningen)</i>
12.00 – 12.30	Water resources monitoring in Portugal <i>Rui Rodrigues (Instituto da Agua, Lisbon)</i>
12.30 – 12.45	Rapporteurs' summary and discussion
12.45 – 14.00	Lunch
	Session 2 Low Flow – Management Chairwoman: <i>Lena Tallaksen</i> Rapporteur: <i>Aleksandra Jaskula-Jousta</i>
14.00 – 14.30	Reporting and managing droughts in an operational environment <i>Jennifer Taylor (Environment Agency England & Wales, Peterborough)</i>
14.30 – 15.00	Continuous simulation of daily flows for all UK river reaches <i>Andy Young (Centre for Ecology and Hydrology, Wallingford)</i>
15.00 – 15.30	Coffee break
15.30 – 16.00	Pan-European monitoring <i>Siegfried Demuth (IHP/HWRP Secretariat, Koblenz)</i>
16.00 – 16.30	Rapporteurs' summary and discussion

Tuesday 6 July 2004**Session 3 Floods – Hydrological Extremes and Climate Change**Chairwoman: *Jutta Thielen*Rapporteur: *Manfred Spreafico*

- 09.00 – 09.30 Quality assurance of hydrological networks concerning high floods
M. Spreafico (Bundesamt fuer Wasser und Geologie, Bern)
- 09.30 – 10.00 Techniques for extreme rainfall and flood runoff estimation
Sarka Blazkova (T.G. Masaryk Water Research Institute, Prague)
- 10.00 – 10.30 Frequency analysis in extreme floods
Prof. Ennio Ferrari (Università della Calabria, Rende)
- 10.30 – 11.00 Coffee break
- 11.00 – 11.30 Simulation of extreme floods using a rainfall generator – The river Rhine case study
Peter Krahe (Federal Institute for Hydrology, Koblenz)
- 11.30 – 12.00 Extreme rainfalls and flash floods in the Mediterranean region:
A case study of the 8 and 9 September 2002 event
Luc Neppel (HydroSciences, Montpellier)
- 12.00 – 12.30 Rapporteurs' summary and discussion
- 12.30 – 14.00 Lunch

Session 4 Flood – Flood ForecastingChairman: *Klaus Wilke*Rapporteur: *Ezio Todini*

- 14.00 – 14.30 Flood forecasting – State of the art in knowledge and application
Ezio Todini (University of Bologna)
- 14.30 – 15.00 Use of quantitative weather forecasts in operational hydrological forecasting systems
John Schaake (NOAA, Washington)
- 15.00 – 15.30 Data assimilation and flood forecasting
Peter Troch (University of Wageningen)
- 15.30 – 16.00 Coffee break
- 16.00 – 16.30 European Flood Alert System (EFAS)
Jutta Thielen, (European Commission Joint Research Centre, Ispra)
- 16.30 – 17.00 Forecast adjustment procedures for operational forecasting
Ulrike Drabek (Technical University of Vienna)
- 17.00 – 17.30 New approaches in hydrological forecasting – The use of neuronal networks
Gert Schmitz (Technical University of Dresden)
- 17.30 – 18.00 Possibilities and limitations of fuzzy logic approaches in flood forecasting
Manfred Stüber, (University of Applied Sciences, Trier)
- 18.00 – 18.15 Rapporteurs' summary and discussion
- 19.00 **Reception**

Wednesday 7 July 2004**Session 5 Hydrological Extremes – Policies and Strategies**Chairman: *Rui Rodrigues*Rapporteur: *Manuel Menéndez*

- 09.00 – 09.30 UNESCO - philosophy, current activities and visions
Mike Bonell (IHP UNESCO, Paris)
- 09.30 – 10.00 Planning process in the Water Framework Directive and its links
with flood-related problems
Manuel Menéndez (CEDEX, Madrid)
- 10.00 – 10.30 Water Framework Directive & low flows and droughts
Aleksandra Jaskula-Jousta (Ministry of Transport and Water, Limburg)
- 10.30 – 10.45 Rapporteurs' summary and discussion
- 10.45 – 11.15 Coffee break
- 11.15 – 14.00 **Plenary Session**
Chairman: *Siegfried Demuth*
Rapporteur: *Gerhard Strigel*
- Session 1: *Alan Gustard*
Session 2: *Aleksandra Jaskula-Jousta*
Session 3: *Manfred Spreafico*
Session 4: *Ezio Todini*
Session 5: *Manuel Menéndez*
- 14.00 Lunch

Thursday 8 July 2004

- 09.00 – 16.00 **Field Trip on Rhein**

Attachment 3

**ASIAN PACIFIC FRIEND
10th TECHNICAL SUB-COMMITTEE MEETING**

Hilton Hotel
Adelaide, Australia, 23 November 2004

ACTION TIMELINE

2004

December 2004

Country questionnaire on data availability and IFD techniques used;

Country response on extent of contributions possible:

- 1. Without financial support**
- 2. With ~\$1-2k support**

(Both to be completed & returned to Trevor Daniell)

2005

12-13 April 2005

Workshop on IFD research direction at HTC

Day 1 – Research direction

Day 2 – Drafting PP proposal

(Attendance based on no presentation – no funding;
2 days / 3 nights 12-13 April)

September 2005

Global Friend Report abstract submission

November 2005

13th RSC meeting at Bali

- Presentation of IFD results to date & proposed research

2006

February 2006

**- PP funding applications close (IFD research proposals);
- Submission of papers for Global FRIEND
Report**

September 2006

PP funding for IFD research known

ANNEX 7

REVIEW OF THE CATALOGUE OF RIVERS

**UNESCO IHP REGIONAL STEERING COMMITTEE FOR
SOUTHEAST ASIA AND THE PACIFIC**

**FIFTH YEAR REVIEW OF THE CATALOGUE OF RIVERS FOR SOUTHEAST
ASIA AND THE PACIFIC**

TERMS OF REFERENCE

UNESCO IHP Regional Steering Committee for Southeast Asia and the Pacific has set down that a review of the Catalogue of Rivers for Southeast Asia and the Pacific should be conducted after five years. This review is to critically examine the uses, advantages and disadvantages and costs of continuing production of the Catalogue of Rivers for Southeast Asia and the Pacific and factors inhibiting the entry of accompanying data into the hydrological Water Archive database.

1. Identify and assess the advantages and disadvantages of continuing production of the catalogue, including identification of the uses and range of users of the catalogue.
2. Identify factors inhibiting the entry of accompanying hydrologic data into the database.
3. Identify any format and/or data improvements that would increase the usefulness to research of the data in the catalogue and Water Archive and enhance their use.
4. Provide recommendations to the RSC concerning the continued publication of the catalogue, including, if appropriate, possible improvements to the format and contents the catalogue, data transfer arrangements and funding options.

ANNEX 8

REVIEW OF PROPOSALS FROM THE RSC SEAP, 2004-2005

**Review of
PROPOSALS from THE IHP REGIONAL STEERING COMMITTEE FOR
SOUTHEAST ASIA AND THE PACIFIC
(Based on discussions at the 11th Session of RSC-SEAP,
Sigatoka, Fiji, 30-31 October 2003)**

Adelaide, Australia, 25-26 November 2004

Proposals for 2004-2005

1. Common Projects

(1) RSC Meetings and related small meetings

- Annual RSC Meetings inviting two delegates from the member countries
- Preparation/Coordination Meetings for various RSC matters such as new membership, budgets and publications
- Costs for publications (such as a number of Volumes of IHP-VI Technical Documents in Hydrology, UNESCO Jakarta 2004-2005)

REVIEW: UNESCO Jakarta Office and Australia and Japan NatComs collaborated well.

(2) IHP Training Courses

- 14th (2004) and 15th (2005) Courses (14th may be implemented in KL)

REVIEW: UNESCO Jakarta Office and Malaysia and Japan NatComs collaborated well. The 14th TC was successfully held in KL in October 2004.

(3) Asian Pacific FRIEND Phase 2 (2002-2007)

- Third Asian Pacific FRIEND Workshop (in the first half of 2004)
Note: 1st: March 1998 (Malaysia, Indonesia)
2nd: March 1999 (Vietnam)
- Technical Subcommittee (TSC) meetings (at least once every year)

REVIEW: TSC was held on 23 November 2004. The 3rd Workshop will be held in early part of 2005. UNESCO Jakarta Office has some budget for it.

(4) Catalogue of Rivers, Vol. 6 (to be published early part of 2006)

- Funding for preparation of manuscripts to countries of need such as Laos, PNG, North Korea, and other new comers (Pacific island countries, Myanmar, Mongolia, etc.)
- Editorial Meeting (in the first half of 2005)
- Publication in book and CD forms (in the second half of 2005)

REVIEW: No actions for Vol. 6 as of November 2004. Vol. 5 was published and distributed in Paris (September 2004) and Adelaide (November 2004).

2. Recommended Proposals

(1) Setting experimental (demo) sites for ecohydrology

- Towards establishment of Ecohydrology Center in Indonesia
- Strong collaboration with UNESCO-MAB and with local stakeholders

REVIEW: A resolution for ecohydrology center in Indonesia was adopted in Paris September 2004.

(2) Flood hazard and risk management

- Towards establishment of UNESCO Center in Tsukuba, Japan
- Flood forecasting and warning systems for the humid tropics region
- Strong collaboration with flood-prone areas under FA 2.1 and FA 4.4

REVIEW: A resolution for flood hazard and risk management center in Tsukuba, Japan was adopted in Paris September 2004. HTC will report the situation about flood forecasting and warning systems for the humid tropics region.

(3) Water for human need – water conflict solution

- A Participation Programme through National Committees (Commissions) in the region

REVIEW: No information.

(4) Groundwater and Water Resources in River basins and Small Islands

- Contribution to IHP-VI Theme 4: Water and Society

REVIEW: No information.

(5) HELP Projects

- Contribution to CCPC: HELP

REVIEW: Japan has proposed a HELP basin: the Yasu River, which is included in the Catalogue of Rivers, Vol. 5. No notification so far if the Yasu River is adopted as a HELP basin.

(6) Comparative Study of the Water Law and Policy in Southeast Asian Countries

REVIEW: No information.

(7) International Sediment (and Landslide) Initiatives

- Strong collaboration with the International Consortium on Landslides (ICL) handling International Programme on Landslides (IPL), which is supported by UNESCO
- UNESCO/KU/ICL UNITWIN Network programme “Landslide Risk Management for the Society and the Environment” (KU: Kyoto Univ.)
- Chinese ITRCES is encouraged to keep contacting with ICL, IPL, RCL etc., for promoting the initiative

REVIEW: The International Sediment Initiative (ISI) is now implemented in the framework of UNESCO IHP. No information about regional activities on this. Kyoto University and ICL (International Consortium on Landslides) will host a thematic session at the 2nd UN World Conference on Disaster Reduction (WCDR) in Kobe, Japan on 18-22 January 2005 with strong collaboration with IHP Headquarters.

3. Centre Activities:

- (1) Regional Humid Tropics Hydrology and Water Resources Centre for Southeast Asia and the Pacific (HTC), KL, Malaysia
- 5 Collaborative Actions by ad-hoc team – from mapping to action, 2004-2005
 - 2nd phase AP FRIEND Workshop/Water Archive Training

REVIEW: The 8th Coordination Committee was held in Adelaide on 22 November 2004.

- (2) International Training and Research Centre for Hydrology, Water Resources and Environment (ITRCHWE), Nanjing, China
- 12-month M.Sc. level training course on water resources sustainable development will be continued in the future including 2004-2005.

REVIEW: China will report on this.

- (3) UNESCO Centre for Water Hazard and Risk Management (Provisional name)
- Preparation and consensus building for its establishment and focal areas

REVIEW: Japan will report on this.

- (4) Regional centre for ecohydrology
- Preparation and consensus building for its establishment

REVIEW: Indonesia will report on this.

4. Others

REVIEW: Members and Observers may report on this.

ANNEX 9

**MINUTES OF THE MEETING OF THE 8th COORDINATION COMMITTEE OF THE
REGIONAL HUMID TROPICS HYDROLOGY AND WATER RESOURCES CENTRE
FOR SOUTHEAST ASIA AND THE PACIFIC (HTC)**

**8th CO-ORDINATION COMMITTEE MEETING OF THE REGIONAL HUMID
TROPICS HYDROLOGY AND WATER RESOURCES CENTRE FOR SOUTHEAST
ASIA AND THE PACIFIC**

**Hilton Hotel
Adelaide, 22 November 2004**

Minutes

Participants

FAMILY NAME	GIVEN NAME	COUNTRY	E-MAIL
MOHAMED DESA	Mohamed Nor (Chairman)	Malaysia	phtc@did.moa.my
JAMES	Ross	Australia	r.james@bom.gov.au
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AEKARAJ	Sukontha (Ms)	Thailand	sukontha_a@monre.go.th
ARDUINO	Giuseppe	UNESCO	g.arduino@unesco.org

1. Opening by the Chairperson

Mr Mohamed Nor, Director of the HTC, welcomed the participants and apologised for the absence of the Chairman, Mr Keizrul Abdullah, who was unable to attend due to the weather conditions and flood situation in Malaysia. With the meetings agreement, Mr Nor accepted the role of Chairman and opened the meeting at 5:40pm.

2. Election of Rapporteur

Mr James was elected as Rapporteur for the meeting.

3. Report of the 6th Coordination Committee meeting

The Chairman referred the meeting to the booklet that was distributed and which included the Minutes of the 7th Co-ordination Committee Meeting held in Fiji. The Chairman expressed his thanks to Ross James for the preparation of the Minutes.

Mr Daniell inquired whether any proposals for projects from member countries had been received. The Chairman responded that one joint proposal was proposed and discussed in Fiji. He also referred to a one month study that was carried out to field test integrated water resources assessment procedures. The project received funding from Cap-Net.

The status of action items in the minutes is as follows:

1. *Fix the dates of the workshop to assess the Nagoya series of courses*
Mr Arduino briefly described the workshop that was held in Kuala Lumpur, 11-15 October 2004. A summary of the course is included as Appendix 4 of the meeting booklet and a more complete description of the course will be presented at the RSC meeting later in the week.
2. *Provide a more detailed and descriptive financial summary*
The Chairman informed the meeting that an effort had been made to expand the financial summary included in the meeting booklet. The financial information was presented under Agenda Item 4.

Mr Daniell proposed that the minutes of the 7th CC Meeting be accepted, this was seconded by Mr White.

4. Report by the Director of HTC

Mr Nor advised that his Director's Report was included as Section 4 in the meeting booklet and inquired if there were any comments or questions.

Mr Arduino informed the meeting that a training course on low flows, funded by the German IHP/OHP and UNESCO Jakarta, will be held in the HTC, during September 2005. The Chairman added that there will only be limited places (10-12 participants) but that it will provide hands on computer training and case studies. This course can also be related to the AP FRIEND Phase 2 activities.

The Chairman highlighted another activity planned for 2005, namely the assessment of flood forecasting and warning studies involving Malaysia, Vietnam and Indonesia. The proposal includes a desk study, site visits and workshops and has received funding from UNESCO Jakarta. A copy of the project proposal was included in the meeting booklet at Appendix 1. Additional countries may be able to be included if funds are available.

The financial details included in the Directors Report were presented with the Chairman providing some brief points of clarification. The Chairman expressed the hope that some other countries would be able to make a financial contribution to the operation of the HTC.

The HTC staff structure was included as Appendix 6 however the Chairman emphasised that there were now 4 staff vacancies. The engineer responsible for maintaining the AP FRIEND Water Archive has now left. This will have an impact of the office and a new person will need to be trained.

In response to a question from Mr Arduino about the status of the Water Archive, the Chairman advised that no changes have been made since the Fiji meeting. Data for river basins included in Catalogue of Rivers Volume 5 have not been received but hopefully will be added to the archive.

5. Future direction of HTC Kuala Lumpur

Section 3 in the Director's Report details some future programme activities. There was no further discussion as the Chairman informed the meeting that these activities will be referred to during the RSC meeting later in the week.

6. Other matters

The Chairman requested that countries try to identify activities that could be undertaken by the HTC or undertaken in collaboration with the HTC and to submit proposals. Based on the papers presented on the first day of the WSUD2004 conference he suggested there were opportunities to broaden the scope of activities undertaken by the HTC.

7. Closure of the meeting

The Chairman thanked the meeting participants for their input and for keeping the discussion focused. The meeting was closed at 6:10 pm.

8. Action Items

Action	By whom
1. Nil	

ANNEX 10

ESTABLISHMENT OF LAO PDR IHP NATIONAL COMMITTEE

RESOLUTION RSCXII-1

Lao PDR IHP National Committee

Recommendation on the establishment of Lao PDR IHP National Committee

The IHP RSC for South East Asia and the Pacific

Taking into account

The active functions of the RSC for the IHP in South East Asia and the Pacific since it was established more than ten years ago;

Recognising

The importance of regional activities amongst the IHP member countries in South East Asia and the Pacific in that the RSC meets every year;

Acknowledging

That there have been many discussions and resolutions which have encouraged the establishment of IHP National Committees;

Convinced

That an early decision to establish a national committee for IHP in Lao PDR would greatly assist the status of IHP activities;

Urges

The Lao PDR's UNESCO National Commission to establish a IHP National Committee as soon as possible.

Requests

The UNESCO IHP Secretariat to assist in the establishment of the IHP National Committee in Lao PDR.

ANNEX 11

RSC SEAP VIEW ON IHP GOVERNANCE

RESOLUTION RSCXII-2

IHP Governance

Recommendation on a RSC SEAP view on IHP Governance

The IHP RSC for South East Asia and the Pacific

Recalling

The discussion on IHP Governance at the 11th IHP RSC for SEAP, in Sigatoka, Fiji, October 2003;

Noting

That the 16th Session of the IHP Intergovernmental Council, through its resolution 16/7 has decided to reconsider the governance structure at its 17th Session when further documentation will be available;

Requests

The IHP Bureau to seriously consider the attached statement on governance (Attachment A) at its next meeting, in particular in relation to the development of supporting documentation for the establishment of Regional Intergovernmental Councils.

ATTACHMENT A

Statement:

The IHP RSC for SEAP is concerned that the proposed Regional Intergovernmental Council structure for the IHP will significantly impact its role, function and activities.

While a Regional Intergovernmental Council structure may have some benefits for regions with comparable hydrological characteristics and where travel distances are not large, the Asia Pacific Region is a vast Region and also a region of varying hydrological situations from small islands nations to large areas of desert.

The current IHP RSC for SEAP is able to operate with a large degree of flexibility and has established procedures to enable wide participation of members and representation from combined countries. Currently, we are not convinced that the proposed Regional Intergovernmental Council structure will allow such flexibility.

We are further concerned that the details of reporting and responsibility mechanisms have not been fully or adequately described and are unsure of the net impact of the proposed Regional Intergovernmental Council structure on the role and function of the IHP RSC for SEAP. Indeed, we are concerned that the proposed Regional Intergovernmental Council structure may at worst lead to the abolition of the IHP RSC for SEAP (and potential loss of a voice from parts of this vast Region) or at best make the activities of the IHP RSC for SEAP appear redundant and remove its decision making functions.

Under these circumstances, the RSC for SEAP has no desire to give up its role and function and intends to continue to operate in its current form.

A further issue is the amount of control the proposed Regional Intergovernmental Council structure may have over finances and financial decisions regarding UNESCO Head Office funds.

We strongly recommend that the documentation presented to the 17th Session of the IC addresses these issues, so that we can make a more informed decision.