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NATIONAL REPORTS OF THE NATIONAL COMMITTEES FOR THE IHP (2004 – 2006)

SUMMARY

The following National Reports of the National Committees for the IHP cover the activities for the intersessional period between the 16th and the 17th sessions of the Intergovernmental Council of the IHP (September 2004 - June 2006).

Pursuant to a decision by the 14th session of the IHP Council, the Reports are herewith reproduced in electronic format only.

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NATIONAL REPORT ON IHP RELATED ACTIVITIES
AUSTRALIA

1. ACTIVITIES UNDERTAKEN IN THE PERIOD OCTOBER 2004 – JUNE 2006

At the 33rd session of the UNESCO General Conference, Australia was elected to the IHP Intergovernmental Council.

1.1 Meetings of the IHP National Committee

IHP activities in Australia are carried out under the guidance of the national UNESCO Science and Technology Network. In order to facilitate the implementation of UNESCO activities in Australia and the region, a national IHP Australian Network was established in 1995 and this network acts as the IHP National Committee for Australia. There are no formal meetings of the IHP Australian Network. Activities are conducted largely between the members by telecommunications (e-mail). The activities of the IHP network are reported on at meetings of the national UNESCO Science and Technology Network. Australia has appointed a new Australian National Commission (NATCOM) for UNESCO. The new NATCOM has 12 members, two parliamentary representatives and four honorary members. The new NATCOM met for the first time in Melbourne on Wednesday 24 August 2005 and again in Canberra from 16-17 March 2006. Mr Bruce Stewart and Professor Ian White represented the IHP National Network at these meetings.

1.1.1 Decisions regarding the composition of the IHP National Committee

The IHP Australian Network includes the following members. Summary details of all current members are listed below.

Name	Expertise	Organization
Bruce Stewart	Water Resources Assessment	Bureau of Meteorology
Tony Falkland	Island Hydrology	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	Monash University
Ian Cordery	Flood/Drought Hydrology	University of New South Wales
Peter Dillon	Groundwater	Centre for Groundwater Studies
Anne Jensen	Ecotones	Wetlands Care Australia
Shahbaz Kahn	Sustainable irrigation systems	CSIRO 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 eWater Cooperative Research Centre (CRC) and other centres for research undertake activities which are closely aligned to the themes of IHP-VI. A description is provided below of some activities pertinent to IHP-VI.

- *Theme 1 - Global Changes and Water Resources*

A subset of the hydrological data collected by the State and Territory water agencies and the Bureau of Meteorology is regularly contributed to international data centres for use in global and regional studies. The eWater Cooperative Research Centre (http://www.ewatercrc.com.au/) is embarking on a research program that includes modelling hydroclimatic variability and impact on

water resources and aquatic ecosystems and rare events and resilience in hydrological and ecological risk assessment. The Indian Ocean Climate Initiative (IOCI) (http://www.ioci.org.au), a partnership of research organisations, is researching the impact of climate variability and climate change on the water resources of the southwest region of Australia. CSIRO (http://www.csiro.au/), Australia's national research organisation, has research programs addressing global and regional climate change, climate change impacts on natural resources including water and climate change adaptation strategies. Australian National University (ANU) together with Ecowise Environmental have been researching vulnerability and adaptation to global change in small island countries and have contributed to AusAID's Pacific vulnerability and adaptation project. The ANU, Ecowise Environmental and the University of Adelaide have been investigating the vulnerability of water supply catchments in the Australian Capital Territory to global change.

- *Theme 2 – Integrated Watershed and Aquifer Dynamics*

The Centre for Groundwater Studies (http://www.groundwater.com.au) has an extensive research program including research on groundwater/surface water interaction and is investigating how better to manage groundwater resources especially using aquifer storage and recovery. The ANU is researching artesian groundwater processes and modelling of groundwater changes in the lower Great Artesian Basin and in south eastern Australia. ANU, with Ecowise Environmental, are investigating shallow groundwater recharge, socio-cultural aspects of groundwater management and impacts of climate variability in low coral islands as a follow up to of an UNESCO-IHP initiated project. As a result of a National Water Initiative (NWI) agreed by Australian federal and state governments all Australian water agencies are required to develop comprehensive water management plans. The plans are being developed through a process of extensive stakeholder consultation and watershed modelling. The process being employed and the resultant plans provide a valuable resource for similar projects elsewhere in the world.

- *Theme 3 - Land Habitat Hydrology*

The ANU and Ecowise Environmental have ongoing projects in conjunction with UNESCO-IHP investigating shallow groundwater recharge, water quality, impacts of land-use and extraction and socio-cultural aspects of groundwater management and impacts of drought in low coral islands. The ANU together with NSW Department of Primary Industry has been investigating estuary policy and management strategies to improve the health of estuaries. Research into hydrological process in and the sustainable management of wetlands is being undertaken in a number of universities and 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 continues to receive a lot of attention in Australia and is a potential resource for similar projects in other countries. The ANU, the French agency CIRAD and Ecowise Environmental have been undertaking research on the use of multi agent systems and companion modelling to support negotations and reduce conflict over groundwater use in low atolls.

- *Theme 5 Water Education and Training*

Each of the Cooperative Research Centres (CRC) (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:
eWater CRC (http://www.ewatercrc.com.au/)

CRC for Coastal Zone, Estuary and Waterway Management (http://www.coastal.crc.org.au/)
CRC for Tropical Rainforest Ecology and Management (http://www.rainforest-crc.jcu.edu.au/)
CRC for Water Quality and Treatment (http://www.waterquality.crc.org.au/)

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

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.

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

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

- *Crosscutting Program Components – FRIEND and HELP*

Collaboration in the Asian Pacific FRIEND project by provision of data, hosting a node of the Internet based Water Archive, and assisting in research activities. The CSIRO Griffith and Charles Sturt University Wagga Wagga is a Regional Coordinating Unit for HELP and the Lower Murrumbidgee Catchment has been 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 also proposed as an Operational Help Basin.

1.1.3 Decisions regarding contribution to/participation in IHP-VII

Peter Dillon (CSIRO) attended a meeting to review the draft IHP-VII in Paris from 5-6 June. It is our continuing concern that UNESCO is trying to do too much across a wide range of activities and must focus on where it can best add value and undertake activities which are achievable. It must focus on its mandated areas, establishing key partnerships where necessary. In some areas we believe it is straying outside its areas of responsibility.

Australia is in a strong position to provide input across the range of Focal Areas identified. The research programs of the CRC's, CSIRO and relevant Australian University groups are closely aligned with the activities proposed within the four major theme areas. Some initial contributions include:

Theme I- Global Change, Watersheds and Aquifers

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

Primary Focal Area:
Focal Area I-1: Large-scale groundwater dependencies related to global change.
- The Great Australian Artesian basin and associated research activities.
- Frameworks for determining sustainable yield of aquifers

Focal Area I-2: Hydrological extremes in sensitive and stressed biomass and hydroclimatic zones e.g. small island developing states.
- Research activities involving the Pacific Island Countries

Focal Area I-3: Global change and feedback mechanisms of hydrological processes in stressed environments.
- The Murray Darling River Basin and GEWEX related research activities

Focal Area I-4: Changing global dynamics in aquatic environments: degrading ecosystems, especially those susceptible to sea level change, coastal sediment balance and pollutant accumulation.
- Research activities involving the Pacific Island Countries
- eWater CRC Research Activities on water quality and catchment processes
- Groundwater dependent ecosystems

Theme II: Governance and Socio-Economics

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

Focal Area II-1: Culture, ethics and legislation for wise stewardship of water.
- Indigenous water knowledge and understanding
- Pacific Island countries culture and water issues

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

Focal Area II-3: Affordability, poverty alleviation and assured financing, for effective IWRM. Include ‘water’ in national PRSP'
- Implementation of IWRM in the Pacific Island Countries (assistance to SOPAC)
- Australian National Water Initiative

Focal Area II-4: Shared Water resources and conflict
- Water markets and water trading approaches
- International exchange of data

Theme III: Ecohydrology and Environmental Sustainability

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

Focal Area III-1: Water as a landscape agent: erosive capacity, mobile solvent, habitat for aquatic biota - interdependencies and regulation in biogeochemical cycling.
- Developing policy and programs to support ecosystem enhancement through ecosystem service production

Focal Area III-2: Complementing engineering solutions with ecological measures resulting in sustainable carrying capacity of ecosystems
- Developing policy and programs to support ecosystem enhancement through ecosystem service production

- National Approach to Biodiversity Decline
- Groundwater dependent ecosystems

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

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

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

- Biodiversity and climate change

Theme IV: Water Quality, Human Health and Food Security

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

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

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

- A major new research project on storing wetland treated stormwater in a brackish aquifer for recovering potable water. This will be an icon project with much on HACCP that will be transferable to developing countries.

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

- major new research project on storing wetland treated stormwater in a brackish aquifer for recovering potable water. This will be an icon project with much on HACCP that will be transferable to developing countries.
- Free exchange of info from Australian Water Conservation Reuse Research Program and UNESCO

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

- Climate variability and change and water resources for agriculture

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

1.2.1 National/local scientific and technical meetings

- 4th Australian Stream Management Conference, 20-22 October 2004, Launceston, Tasmania. The theme of the conference was 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 was “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 – Cites as Catchments, 21-26 Nov 2004, Adelaide, South Australia. The conference explored the relationship between WSUD principles and the sustainability of urban and regional areas.
- 4th National Waterwatch Conference was held at The University of Melbourne, 7-10 February 2005
- 29th Hydrology and Water Resources Symposium, 21-23 February 2005, Canberra, ACT
- 3rd Australian Water Summit 2005 was held in Melbourne 28 February to 2 March 2005.
- Australian Water Summit Sydney 2005 was held in Sydney, 30-31 March 2005 with the theme Building a sustainable water industry.
- Water Reuse and Recycling 2005 was held in Sydney 18-20 April 2005.
- OZWATER 2005, the biennial conference of the Australian Water Association was held in Townsville and Brisbane 5-11 May 2005.

- The 8th International Riversymposium was held in Brisbane 6-9 September 2005. The symposium includes the Thiess International Riverprize.
- 4th Victorian Flood Management Conference, Shepparton, Victoria, 11-14 October 2005
- National Water Week – *Water for Life.* 16-22 October 2005
- OECD Workshop on Agriculture and Water, 14-18 November 2005, Adelaide, 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 National Committee on Water Engineering, Institution of Engineer's has prepared Australian Runoff Quality (ARQ), a design guideline that provides an overview of current best practice in the management of urban stormwater in Australia. It contains: Procedures for the estimation of a range of urban stormwater contaminants; Design guidelines for commonly applied stormwater quantity and quality management practices; Procedures for the estimation of the performance of these practices; and advice with respect to the development/ consideration of integrated urban water cycle management practices. ARQ will be published November/December 2005.
- The Australian Government has undertaken a national land and water resources audit to enable improved decision making in sustainable use of the resources. This audit was completed in early 2002 and a range of publications has resulted. Details of the audit projects and output products are located at www.nlwra.gov.au/archive/archive.html. The results of the audit are available from the web based Australian Natural Resource Atlas at http://audit.ea.gov.au/ANRA/atlas_home.cfm. The National Land and Water Resources Audit has now been established as an ongoing activity with the responsibility of providing data, information and nationwide assessments of Australia's land, water and biological resources to support sustainable development (www.nlwra.gov.au/)

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.

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.

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 Komittee, 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.

White I. and Falkland A. (2004). Effects of Pumping from Infiltration Galleries on Crop Health and Production in Low Coral Islands: Groundwater Impacts. ACIAR Project LWR1/2001/050, Equitable Groundwater Management for the Development of Atolls and Small Islands, prepared for the Australian International Agency for Agricultural Research, November 2004.

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

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

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

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)

A symposium entitled, HELP in Action - Local Solutions to Global Water Problems - Lessons from the South is being planned for 2006. The host country and dates for the symposium have yet to be determined. The proposed symposium themes are:

1. Action on the ground - methods and approaches
2. New integrating science being developed under HELP
3. Connecting environment, economy, social and cultural impacts
4. Institutional and legal lessons for successful HELP implementation
5. Indicators of HELP success
6. Implementing HELP in basins with limited resources and capacity

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

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

1.2.5 Other initiatives

National Water Initiative

Australia has recently embarked on a National Water Initiative. The National Water Initiative (NWI) is a comprehensive strategy driven by the Australian Government to improve water management across the country. Australia's highly variable and often scarce water resources are crucial for our economic, social and environmental wellbeing. We need to continue to improve the productivity and efficiency of our water use, while maintaining healthy river and groundwater systems. The NWI addresses the vital importance of such questions to Australia. It encompasses a wide range of water management issues and encourages the adoption of best-practice approaches to the management of water in Australia.

Reference: http://www.pmc.gov.au/nwi/index.cfm

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 by NZAID and is now in its second year of three years.

1.3.2 Organisation of specific courses

Nil

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

The Australian Bureau of Meteorology produced a document entitled, *Our Future Outlook on Global Water Resources and Water Related Risk Management*, as part of the preparations for the establishment of the International Centre for Water Hazard and Risk management (ICHARM).

1.5 Publications

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).

White I. and Falkland A. (2004). Effects of Pumping from Infiltration Galleries on Crop Health and Production in Low Coral Islands: Groundwater Impacts. ACIAR Project LWR1/2001/050, Equitable Groundwater Management for the Development of Atolls and Small Islands, prepared for the Australian International Agency for Agricultural Research, November 2004.

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

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

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

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

IHP papers presented at the International Conference on Water Sensitive Urban Design 'Cities as Catchments', Adelaide, Australia 22-23 November 2004. Edited by R. James, T. Daniell and K. Takara. IHP-VI Technical Documents in Hydrology No. 3. UNESCO Jakarta Office.

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by Country

The 12th meeting of the UNESCO IHP Regional Steering Committee for Southeast Asia and the Pacific was held in Adelaide 21-24 November in conjunction with the Water Sensitive Urban Design 2004 conference.

See Section 1.2.1 of this report for other international conferences hosted.

1.6.2 Participation in meetings abroad

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.

The "Joint UNESCO/WMO Flood Initiative (JUWFI)" subsequently extended to other UN agencies and renamed "International Flood Initiative" (IFI) was launched during the World Conference on Disasters Reduction in January 2005 by Mr K. Matsura, Director General of UNESCO and Mr M. Jarraud, Secretary-General of WMO. The initiative will promote an integrated approach to flood management to maximize the long-term benefits of floods and minimize the hardship, loss of life and damage to goods and assets that result from floods. It will focus on research, training, information networking, promoting good governance and providing technical assistance. Mr Bruce Stewart was a representative of WMO on the Joint UNESCO/WMO taskforce that drafted the proposal to establish the Initiative.

Trevor Daniell participated in the Asian Pacific FRIEND meeting on *Design rainfall and design flood determination* held in Kuala Lumpur 6-7 June 2005.

Trevor Daniell and Ian White presented papers at the international seminar on *Climatic and Anthropogenic Impacts on the Variability of Water Resources* held in Montpellier, France 22-24 November 2005. There are 8 regional FRIEND programs in the world: West and Central Africa, Southern Africa, the Nile, Asia-Pacific, Indukush-Himalaya, the Carribbean Islands/Central and South America, the Alps and the Mediterranean Sea, Europe of the Northwest. The objective of the meeting was to gather at least two scientists by big sub-continental FRIEND region on the subject of the seminar, to address the multiple issues of this theme according to the regions of the world.

Ian White presented an invited paper at the International Conference on Effective Land-Water Interface Management for Solving Agriculture-Fishery-Aquaculture Conflicts in Coastal Zones 1 – 3 March 2005, Bac Lieu, Vietnam.

Ian White attended the UNESCO IHP Groundwater Resources Assessment Under Pressures of Humanity and Climate Change. 4-6 April 2006-Kyoto Japan (Joint paper with Tony Falkland).

Peter Dillon (CSIRO) attended a meeting to review the draft IHP-VII in Paris from 5-6 June 2006.

Shahbaz Khan organised a strategic HELP Regional Coordinating Unit meeting at CSU Wagga, Australia in May 2006. With the courtesy of Charles Sturt University, a number of delegates from New Zealand, Philippines and Pakistan attended this strategic planning meeting.

Shahbaz Khan attended UNESCO's HELP program meeting at the Fourth World Water Forum (March 2006) to develop a program for HELP in the Southern Hemisphere 2007 Conference in South Africa. UNESCO plans to share experience among HELP basins by running a HELP Southern symposium and training workshop 4-9 November 2007 in Pretoria, South Africa, titled "Local Solutions to Global Water Problems - Lessons from the South".

Shahbaz Khan attended the UNESCO Pacific HELP Symposium organised by Landcare Research, in conjunction with UNESCO Apia, UNESCO-NZ, SOPAC, NIWA, Cawthron Institute, and Tasman District Council ran this symposium in Nelson in November 2005 along with a 2-day workshop and field trip on ICM for regional councils and government agencies. The HELP Symposium was also attended by 10 representatives from 6 Pacific Island Countries (Papua New Guinea, Solomon Islands, Vanuatu, Cook Islands, Samoa, and Fiji) and Japan, as well as by a broad range of stakeholders and scientists working in and around the Motueka Catchment.

Shahbaz Khan was an invited speaker with Mike Bonell (UNESCO, France) on the "Progress in the implementation of UNESCO IHP-HELP" at the International Conference "Integrated Assessment of Water Resources and Global Change: A North-South Analysis", Global Water System Project (GWSP) Bonn, Germany, February 22-25, 2005.

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. The AusAID funded project is developing a climate prediction capacity in participating countries, and in particular, is providing a framework for incorporating climate prediction information into planning across a broad range of agencies and industries. The climate prediction system being provided under the project is based upon the seasonal climate prediction system of the Australian Bureau of Meteorology, which has successfully issued climate predictions for some years.

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 in 2002. Efforts are underway to secure funding through the European Union and the Global Environmental Facility (GEF) mechanisms.

WMO held a workshop on Integrated Water Resources Management in Nadi, Fiji on 20-21 October 2005. The workshop was held in conjunction with the 6th Meeting of the WMO Regional Association V Working Group on Hydrology, 17-19 October 2005. Representatives from 15 PICs and attended the meeting and workshop.

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 2006

- 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, will 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. October 2006
- Greenhouse 2005 Action on Climate Change convened by CSIRO will be held 13-17 November 2005 in Melbourne and has the theme Awareness, Abatement, Adaptation, Action..
- MODSIM2005, 12-15 December 2005, Melbourne, Victoria. The 16th in a series with the theme Advances and Applications for Management and Decision Making.
- 4rd Water Sensitive Urban Design conference and 7th Urban Drainage Modelling Conference, Melbourne, 3-7 April 2006.
- The 2nd National WATER EDUCATION CONFERENCE 'From the Waters Edge to the Red Centre' in Alice Springs in April 2006.
- Enviro 06 A conference and exhibition for showcasing the Australian environment industry. 9-11 May 2006, Melbourne. . The 2006 conference will have the theme Building Sustainable Cities. (www.enviroaust.net/e6)
- 30th Hydrology and Water Resources Symposium, 4-7 December 2006 Launceston, Tasmania
- 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 2007-2008

- 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

Chinese National Committee

1. ACTIVITIES UNDERTAKEN IN THE PERIOD September 2004 — June 2006

1.1 Meetings of the Chinese National Committee for IHP

1.1.1 Decision regarding the composition of the Chinese National Committee

Chairperson Ms. Liu Yaming was shifted to another position in year 2005, Mr. Deng Jian, Director-General of Bureau of Hydrology now will take the chairmanship according to the regulation of Chinese National Committee for IHP. The approval procedure is going on.

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.

International Hydrological Methodology Symposium was held on 31 October-2 Novemver 2005 in Nanjing. About 200 participants from China, USA, UK, France, Japan, Germany, Australia, Poland, Korea, Thailand, Nepal and Hong Kong SAR attended the symposium. The symposium exchanged the newest achievements on hydrological research, especially digital hydrological methodology, and look forward hydrology Science. 180 papers were received and will be published by UK IAHS press. China-IHP was one of sponsors and Vice-Chairperson of China-IHP also attended the activities.

National Hydrological Regime Workshop was held from 14-15 April 2005 in Hangzhou. 100 participants from each province and related ministries attended the workshop. Mr. E Jingping, Vice minister of Ministry of Water Resources in charge of flood control delivered his congratulation letter. In his letter, national hydrological service function and capacity were proud, some examples related to big floods of Huai River in 2003, some local floods and droughts in 200. Hydrologists played very important roles. The workshop was focused on experiences summary of flood forecasting and hydrological modernization. The technical promotion and progress for enhancing hydrological forecasting in next two year was also highlighted.

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

2nd China Water Issues Forum was held from 18-19 December 2005 in Beijing. The forum was organized by IAHS Chinese National Committee and IHP National Committee. About 110 participants from universities, institutions and hydrological organizations attended the forum. The forum focused on research and progress of water problem complexity and uncertainty. IAHS PUBs

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1. This report is submitted to the 17th IGC meeting for the IHP at UNESCO Headquarter 2-7 July, 2006.

for International hydrological Decade was discussed as well. Some common understandings were listed: (1) water problems complexity and uncertainty need hydrological experiments and new technology application; (2) New technology and methodology research are key to solve the problems; (3) enhancement of PUB should be related with China water problems. Chinese National Committees of IAHS and IHP co-organized the forum.

Symposium on Water Environment Protection of Yangtze River was held from 18-19 October 2005 in Hefei. 210 participants from 14 provinces and cities in Yangtze River basin participated the symposium. The symposium is a kind of senior officials and experts forum for Yangtze river water protection. Water quality and water pollution control are main themes. Along with economic development, population increasing, water environment has been aggravated. Therefore, to keep a healthy river is common reorganization by the riparian provinces and cities from upper stream and down stream. A proposal of legislation for Yangtze River water Protection to the State Council was approved by Provincial Political Consultancy Committees. China-IHP was invited to present IHP themes and activities.

International workshop of ecosystem rehabilitation and recovery was held from 14-17 November, 2005 in Nanjing, by the state key laboratory of Hydrology, Water Resources and Water Engineering**.** Some international experts, Prof. Smits and Prof. Hans from the Netherlands, Prof. Anderson from Canada and Dr. Sonja Jähnig from Germany, were invited to present new concepts and technologies on urban water pollution control, healthy ecosystem and recovery, as well as bio-rehabilitation technology for water body etc. The Laboratory is one of Chinese National Committee partners for basic hydrological research.

Healthy Yangtze Expert Workshop was held from 14-15 January 2005 in Wuhan. 30 famous experts jointed the workshop. Coordination between economic development and ecological protection is main issue. With 1.8 million square kilo meters in basin, to maintain a healthy Yangtze is not only related to Yangtze River itself, but also concerned of national social-economic sustainable development. The river basin authority should be a representative of the river. Under the principles of “development in protection and protection in development”, flood control, integrated water resources development and water environment protection; water resources management system must be accelerated. Four objectives for four stages are clarified as keeping safety in flood, reasonable water development, maintenance of good eco-system and stability of river state including stable bed. Some measures for healthy Yangtze were proposed. Member of China-IHP attended the workshop.

International workshop on hydrological research methodology was held in Nanjing from 30 Oct – 1 Nov. 2005. There are about 180 papers and 200 participants from 12 countries, including Australia, France, Germany, Japan, Korea, UK and USA etc. Dr. Pierre Hubert, Secretary- General of IAHS, Prof. Vijay P. Singh delivered keynote speeches during the opening ceremony. Some of the papers will be printed in IAHS journal. China National Committee for IHP was one of sponsors. Dr. Liu Heng, Vice Chairperson of the National Committee was invited to attend the workshop.

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

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 2004 and guarantees to work closely with regional national committees for regional cooperation, especially for IHP-VII.

Secretariat members met in Beijing on 12 March 2006 for draft activities arrangement of IHP National Committee. The proposed activities have been discussed and revised. The activities included several workshops, participation of 17th IGC meeting and bilateral cooperation with other countries.

1.2 ACTIVITIES AT NATIONAL LEVEL IN THE FRAMEWORK OF THE IHP

1.2.1 National/local scientific and technical meetings

National Flood Control and Drought Mitigation Meeting was held from 1-2 January 2005 in Nanning. It is an annual meeting organized by National Headquarter for Flood Control and Drought Mitigation. Since flood control and drought mitigation must be based on coordination of each related organizations and agencies at different level, Ministry of Water Resources, Ministry of Land Resources, China Meteorology Agency and provincial flood control and drought mitigation organizations and agencies sent their high and senior officials for the meeting. About 200 participants joint the meeting.

Some members of China-IHP were invited to attend the workshop.

National Meeting of Hydrological Agency Leaders was held from 31 March to 2 April in Kunming. Mr. E Jingpping, Vice Minister and Other high level Officials from related ministries, as well as 100 leaders from provincial level hydrological agencies attended the meeting. The meeting is a two-year regular meeting for summary of hydrological activities and arrangement of action plan for next two years. Some excellent hydrologists and outstanding hydrological organizations, including hydrological stations, were awarded. Chairperson of China-IHP was chairing the meeting.

National Hydrology Symposium was held from 6-8 December, 2004 in Nanjing. About 250 participants attended the symposium. The main theme of symposium is how provide hydrological information service for water resources development, allocation, saving and protection. Four topics were emphasized, including hydrological prediction and forecasting methodologies flood control and management, flood disaster and mitigation, information technology application.

China-IHP was co-organizer and main sponsor for the symposium. Some members of China-IHP presented their achievements.

National technical Standard system workshop was held on 27 April 2006 in Beijing. The system includes some hydrological measurement and monitoring standards which will be issued as the state standard or ministerial standard in the country. Some experts from different ministries joined the discussion on behalf of their ministries.

2nd Young Scientist Forum of China Hydraulic Engineering Society (CHES) was held from 1-3 November 2005 in Xi'an. The forum was organized by Young Scientist Working Committee of CHES and about 300 participants joined the forum. The forum gave a wide field for young scientists and engineers, which included water resources and environment, flood and flood disaster, hydraulic

engineering, agricultural water saving, hydro-informatics, rock and soil technology and other water related issues. Some discussions on water-saving orientation society, maintenance of healthy river, and key technologies for important engineering projects were exchanged. A proceeding including 114 papers were distributed in the occasion of the forum.

China-IHP was co-organizer and Vice-Chairperson of China-IHP chaired the opening ceremony.

National Hydro-Informatics Workshop was held from 8-9 November 2005 in Zhengzhou. 120 participants attended the workshop. Mr. Suo Lisheng, Vice Minister of Ministry of Water Resources delivered speech in the opening ceremony. Modernization of water information use and management has been emphasized in past years. It was included in the 11th five-year National Hydro-informatics Management Modernization Planning. Ministry of Water Resource issued a Recommendation for Promoting Hydro-Informatics Modernization. It has been recognized as baseline for advanced technology allocation in hydrology and water resources fields. China-IHP sent members to attend the workshop.

National Symposium on River Ecosystem Rehabilitation Technology was held from 24-25 October 2005 in Hangzhou. Vice Minister of Ministry of Water Resources participated and gave a lecture on Dam and Ecology. Some experiences for river ecosystem rehabilitation were also presented their achievements. TO promote harmony of people and water is one of highlight in Ministry of Water Resources. The rehabilitation of river eco-system pays high attention on natural rehabilitation capacity. Some technologies, standards and criteria from experiences of foreign countries were reviewed and introduced to China since year 2002. 200 participants from river commissions and local organizations attended the symposium. Participants also spend a half day to visit sites at Haining city and Jiashan county in Zhejiang province.

China-IHP briefs the IHP-VII on eco-hydrology and ecosystem rehabilitation in the world.

Workshop of water ecosystem protection and rehabilitation was held on 24 May 2006 in Beijing. Since the Ministry of water resources highlighted ecosystem protection as one of water resources management and protection, the workshop focused on technology standard of ecosystem related to water. It is quite new concept for water experts to deal with integration of society, economy, environment and ecosystem. In the next years, the ecosystem related to water will be put on one of top priorities in this ministry. China National Committee will be involved in some key activities for introducing international development on ecohydrology and related ecosystem protection progressing.

1.2.2 Participation IHP Steering Committees/Working Groups

Dr. Liu Heng, Dr. Chen Yuanfang, Dr. Li Zhijia, Dr. Liang Zhongming and Dr. Xu Zongxue participated in The 12th Regional Steering Committee Meeting for Southeast Asia and the Pacific and The International Conference on Water Sensitive Urban Design – Cities as Catchments from 21 - 26 November 2004 in Adelaide, Australia. 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. They also presented scientific papers during the symposium.

The 13th Regional Steering Committee Meeting for Southeast Asia and the Pacific and International Symposium on Ecohydrology was held in Bali, Indonesia from 21-26 November 2005. Dr. Liu Heng, on behalf of Chinese National Committee and also as vice Chairperson of Intergovernmental Council Bureau presented country report and 38th IHP bureau meeting achievements. There are about 200 participants, including 3 others from China (Dr. Chen Yuanfang from Hohai University, Dr. Xu Zongxue from Beijing Normal University and Dr. Yu Xiubo from China Science Academy)

As requested by National Committee, Dr. Chen Yuanfang, as a member of FRIEND working group, participated in APFRIEND phase II meeting on the design rainfall and design Flood determination in Kuala Lumpur, Malaysia from the 6th to 7th June 2005. The main activities of the meeting contains : (1) Country reports giving a statement of the techniques that are used in the country, data availability for IFD (intensity—frequency—duration), proposals for the AP FRIEND phase II; (2) Workshop on IFD and Frequency determinations; (3) Discuss on the improvement for RIVER CATALOGUE; (4) A technical visit in the Humid Tropics Hydrology and Water Resources Research Centre of Malaysia.

1.2.3 Research/applied projects supported or sponsored

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

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

China's delegation including members of IHP national committee members attended 4th World Water Forum in Mexico from 17-22 March, 2006. The participation activities included China, Japan and Korea joint workshop, and also Asian day ceremony, as well as many sessions, especially UNESCO-IHP and WWAP posters. China sends a delegation including 56 experts.

Participation of 33rd General Conference from 9-13 October 2005 in Headquarter of UNESCO. Dr. Liu Heng represented Chinese National Committee participated 3rd committee meeting for Natural Sciences, in where water has been debated and supported by most of member countries.

Participation of The Round Table on Concept and Financial Strategy of UNESCO-IHE on 9 March, 2006 in Headquarter of UNESCO. Sixty delegations from country members attended the meeting, hosted by the Director General, Mr Koïchiro Matsuura. Dr. Liu Heng, Vice Chairman of Chinese National Committee and alumni of UNESCO-IHE was invited to give a short presentation. he stated that his life changed after studying at IHE, personally and professionally. "I discover my personal potential, my view of things expanded and I got more international oriented", expressed Dr Liu Heng. "I am only an example. Many Chinese professionals playing an important role in Chinese water resources have lived the IHE's experience".

Sino-Norway Integrated Water Resources Workshop was held from 11-12 January 2005 in Beijing. Norway Minister of Ministry of Oil and Energy lead a delegation attended the workshop. China Vice Minister of Ministry of Water Resources also attended. Three themes are focused in two may meeting, i.e., Integrated Water Resources Management, Small Hydropower as alternative of

firewood for environment protection, Yellow river estuary protection and river mouth stability. Norway experts paid a visit to 9th water plant.

Sino-European Union River Basin Management Seminar was held from 13-14 October 2005 in Beijing. The seminar is a preliminary for starting a Sino-European Union project on river basin management and enhancing cooperation of Sino-European in water resources field. Participants from China Ministry of Water Resources, Ministry of Commerce and State Environment Protection Agency and River Basin Commissions and universities joined the seminar. European Union sent a delegation especially for the seminar. The main topics for two days discussion are water policy development of European Union, EU Water Framework Directive and its implementation, EU integrated river basin management, cases study (Danube river, Spanish water resources management), public participation, ecosystem issues and China River basin management.

Sino-UK water sector cooperation workshop was held on 23 November 2005 in Beijing. UK water sector association organized this workshop with supporting of China Ministry of Water Resources, UK Embassy in Beijing and UK trade association. About 100 participants from water sectors in Beijing attended the workshop. Some high official related to water from two countries delivered their speeches during the ceremony. UK experiences on water sustainable service were introduced by an expert from UK Ministry of Environment, Food and Rural Affairs. Some companies and institutes from UK, including Wallingford, Parsons Brinkerhoff, Costain, ABB, Halcrow, Simon Hartley etc. also bring their management for Chinese counterparts.

Sino-Dutch Project Seminar on Ecological System and Integrated Water Resources Management of Lancang River Basin was held from 22-23 November 2004 in Kunming. More than 100 participants from China, the Netherlands, USA, Finland and some NGOs participated in the seminar. The project is a pilot project for exploring integrated wetland and water resources management for small river basin. UNESCO-IHE took a leadership and invited many international and domestic organizations to join the research team. The project started from August 2003 and completed in June 2005. Main actions and activities included investigation and researches, such as ecological function, water resources, soil erosion, landslide, river basin management and planning.

The 20th Sino-Japan Bilateral Water Resources Meeting was held in 25 October 2005 in Beijing. A delegation from Japanese Ministry of Civil and Transportation and a delegation from Chinese Ministry of Water Resources exchanged opinions on water resources development, management and utilization. Chinese delegation introduced maintenance of healthy Yangtze River, water-saving orientation society, wetland protection. Japanese delegation presented dam construction issues. The meeting is a routine bilateral activity which has been executed for 20 years.

Sino-Australian Water Resources Workshop was held from 31 January to 1 February 2005 in Canberra, Australia. Vice Minister of Australian Ministry of Agriculture, Fishing and Forestry and Chief Engineer of Chinese Ministry of Water Resources participated the workshop. The workshop focused on water right mechanism, integrated water resources management and pasture water conservancy. The workshop is a part of Sino-Australian cooperation on water resources. Each two year, there is a workshop to be held in China or Australia, respectively.

Workshop on online flood simulation and disaster information distribution system was held on 19 April, 2006 in Beijing. Wallingford software company was invited to presented their new products, including remote control platform and online flood forecasting system based on web

technology. It includes information collection system, distributed models. About 50 hydrologists from different level hydrology bureaus attended the workshop. Currently the state flood control system has been developing. Some international famous companies related to water will be invited to introduce their new products.

19th ICID Congress and 56th International Executive Council was held from 15 to 18 September 2005 in Beijing. Mr. Hui Liangyu, Vice Premier of the State Council, attended the opening ceremony. ICID president, Dr. Abudula Keizeru and many minister level officials attended the congress. Vice Minister, Mr. Ze Haohui from Ministry of Water Resources chaired the opning ceremony.

The Congress combined academic activities with topic of food security and environment sustainability. About 1000 participants from 60 countries joined 4 days seminars, field visiting and executive meetings. There are two themes, i.e., one is improvement of water and land management for increasing irrigation efficiency, another is living harmony with floods. Totally 12 sub-themes are parallel organized.

2nd Workshop on Project Sponsored by ADB: China Flood Management Strategy was held on 25 and 26 April 2005 in Beijing. A framework of flood management and action plan for China was proposed and debated. Some experts from the Netherlands, Japan and USA also joined the workshop and presented their newest achievement. Some representatives from ministries related to flood control and provincial participants joined the workshop as well. The project was started-up in October 2004 and will be completed in one year.

Workshop of ADB TA China Flood Management Strategy Project was held on 5 December 2005 in Beijing. The project was launched in October 2004 and also supported by China's several ministries. The final report will be updated and used by relative authorities for changing from flood control to flood management. Some of IHP Chinese National Committee members were invited as consultants during the implementation of the project.

Integrated transboundary water resource management workshop was held on 14 February, 2006 in Beijing. The workshop is sponsored by Sweden International Development Agency (SIDA). Through the workshop and followed training activities in South Africa and Sweden, the participants understood operational principles, coordination experiences and capacity building for transboundary water management. One participant from IHP National Committee Secretariat was trained.

Community-Based Approaches to Flood Management was held from 3-5 April 2006 in Dakar Bangladesh. About 40 international participants, including one participant from China's Bureau of Hydrology, attended the workshop.

China- Germany joint workshop of hydraulic engineering impact on environment and ecology was held from 1-6 March 2006 in Hubei province. 50 domestic experts from 18 institutions and 17 German experts from 9 German research institutes participated in the workshop. 4 experts from Japan, Italy and USA was also invited to present their newest research outcomes.

The workshop was focusing on large scale hydraulic engineering, especially such as Three-Gorges Project(TGP), impact on environment, ecosystem and social-economy etc. A team including China-Germany experts will continue their research in TGP area. The recent investigation and research will include the field of contribution of rainfall on sedimentation, nutrition and developing some models. Scholar exchange and training plan were also proposed. China National Committee

will trace the joint activities, and one of CNC-member from Yangtze River Commission will be involved in the investigation.

Symposium of Water and soil conservancy and sustainable development in small river basins was held from 20-21 November 2005 in Beijing. The symposium focused on sustainable development in small river basins, and covered several themes including technology, concepts, experiences, effects and development progress. Some innovation development ideas and countermeasure were proposed to central authorities. Representatives from Ministry of Water Resources, China Science Academy, World Bank, UK DfID and other 150 participants attended the symposium. CNC representative also participated in the first day discussion, because CNC would like to enhance hydrology roles in small river development, especially in the western part of the country.

International workshop on China water right system initiation was held on 6 December 2005 in Beijing. The workshop was co-organized by China Ministry of Water Resources and Japan International Cooperation Agency (JICA). The main purposes of the workshop are to learn international experiences of water right, water market, to exchange achievements of recent researches in China and to prepare a proposal for authorities to initiate a China water right system. The final results were examined and proved during 8-9 June 2006 in Beijing. The cooperation between China's Ministry of Water Resources and JICA has been sustaining about 20 years since early 1980s. The water right system will be initiated and established in China.

China-Dutch water resources management innovation workshop was held from 18-19 May 2006 in Shanghai. China's Ministry of Water Resources, The Netherlands' Ministry of Transportation Infrastructure and Water Management co-organized the workshop. There are about 210 participants including 90 from Netherlands. The workshop was focused on river training and river basin management. It is one of activities under the framework of China-Dutch cooperation. Some bilateral agreements were signed during the workshop. Several IHP Chinese National Committee members were invited to present their achievements.

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. Vice-Chair Person of China-IHP had a lecture on Integrated Water Resources Management on 16 September, 2005.

UNIDO Hangzhou Regional Center (HRC) for small hydropower, also named as rural small hydropower research institute, enhanced their activities under IHP framework. Two training courses for developing countries are organized in Hangzhou, China annually.

1.3.2 Organization of specific courses

Training course for leaders of hydrological stations was organized from 9-16 November in

Nanjing. The course provided advanced technologies for hydrological observation. It is also refreshed for those leaders who working in hydrological stations. China-IHP gave technical support, especially new development of international hydrological programme.

1.3.3 Participation in IHP courses

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

1.4 PUBLICATION

1.5 PARTICIPATION IN INTERNATIONAL SCIENTIFIC MEETINGS

1.5.1 Meeting hosted by the country

2nd Yellow River Forum was held from 18 to 21 October 2005 in Zhengzhou. About 800 participants including 300 international participants from 50 countries attended the forum. The His royal highness orange prince William Alexander also attended the forum. 6 themes and 12 sessions were arranged for specific topics. The themes included maintenance of healthy river, hydraulics and non-structure measures, water environment and ecology protection, trans-basin water transfer and water allocation, water right/price and water market as well as specific sessions, such as UNESCO-IHE alumni session. The forum became a well-known action and will take place each two years in cities along Yellow River.

UNESCO-IHE session was chaired by Vice-Chairperson of China-IHP.

Workshop on Dam Safety Monitoring and Management was held from 1-3 November 2005 in Xi'an. The workshop was organized by Ministry of Water Resources with support of World Bank. Mr. Liu Ning, Chief Engineer of Ministry of Water Resources attended the workshop and delivered a speech. About 150 participants, including 20 international participants, participated in the workshop. Participants shared experiences on dam safety monitoring and management in their countries and organizations, as well as discussed dam management technology, legislation and institution, sedimentation management etc. ice Chairperson of China-IHP attended the workshop.

1.5.2 Participation in meetings abroad

Ms Liu Jingnan from Nanjing Hydraulic Research Institute participated in the "International Training Course on Hydrological Droughts and Low Flows" was organized in Regional Humid Tropics Hydrology and Water Resources Centre (HTC), Kuala Lumpur, Malaysia, 26-30 September 2005.

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 2007

The National Committee will continue and pay high attention for regional cooperation under IHP framework. WWAP and WWDR are key issues at present, it s supposed that some of China basins will be included in the next versions of WWDR.

2.2 ACTIVITIES FORESEEN FOR 2008-2009

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. Meanwhile, some initiatives for IHP-VII themes will be encouraged and arranged by the National Committee. Cooperation among the Southeast Asia and the Pacific will be top priority.

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 fro regional cooperation. In the phase IHP-VII, some working groups will be established for more cooperation activities.

RESUMEN DEL INFORME NACIONAL SOBRE ACTIVIDADES

COMITÉ NACIONAL DE HIDROLOGÍA Y METEOROLOGÍA DE COSTA RICA

Elaborado por: Sadí Laporte M.

Introducción:

Antecedentes del Comité Nacional de Hidrología y Meteorología

La Comisión de Hidrología y Meteorología, creada por decreto No. 115 del 6 de mayo de 1966 y el Comité Costarricense para el Decenio Hidrológico Internacional, creado por decreto No.77 del 12 de agosto de 1965, modificado por el No.113 del 6 de mayo de 1966, se refunden en un solo organismo que se denominará "Comité Nacional de Hidrología y Meteorología ", según decreto No.5503-P del 19 de diciembre de 1975.

Sus principales objetivos son:

- Coordinar a nivel nacional, los programas para la obtención de datos hidrometeorológicos.
- Recomendar programas a los diferentes organismos sobre planes de ayuda en el campo de la hidrometeorología.
- Promover la investigación de problemas hidrometeorológicos concretos, cuya urgencia y naturaleza especial requieren un considerable esfuerzo nacional, regional e internacional.
- Representar al país ante los organismos de carácter internacional, cuyos fines sean los mismos, y propiciar financiamiento a proyectos relacionados con la hidrometeorología.
- Coordinar actividades del Programa Hidrológico Internacional y de otros programas internacionales a nivel nacional, regional e internacional.
- Fomentar la enseñanza y formación profesional en hidrología y meteorología.
- Promover la publicación de datos e informes de interés, y el intercambio sistemático de datos con otras instituciones.

El Comité Nacional de Hidrología y Meteorología está formado por las siguientes instituciones y sus representantes respectivos.

Instituto Costarricense de Electricidad	Lic. Sadí Laporte
Instituto Meteorológico Nacional	Msc. Paulo Manso
Instituto Costarricense de Acueductos y Alcantarillados	Ing. Walter Ramírez
Servicio Nacional de Aguas Subterráneas, Riego y Avenamiento	Ing. German Matamoros
Dirección de Aguas, Ministerio Ambiente y Energía	Ing. José Miguel Zeledón

1. Actividades realizadas en el período setiembre 2004-junio 2006.

1.1 Reuniones del Comité Nacional del PHI

1.1.1 Decisiones concernientes a la composición del Comité Nacional de PHI

El Comité Nacional de Hidrología y Meteorología de Costa Rica, se compone de cinco instituciones relacionadas con los recursos hídricos, según decreto No.5503-P del 19 de diciembre de 1975.

El Ing. Walter Ramírez sustituyó a la Licda. Claudia Solera, representante del Instituto Costarricense de Acueductos y Alcantarillados.

1.1.2 Estado de las actividades del PHI - VI

El Programa Hidrológico Internacional (PHI), es un programa de cooperación científica de la UNESCO, relativo a los recursos hídricos, mediante el cual se mejora el conocimiento del ciclo hídrico e incrementa la capacidad de administrar y explotar mejor sus recursos hídricos, además, mejora la base científica y tecnológica, incluyendo la protección al medio ambiente.

Dentro de la VI fase del PHI, las principales líneas de acción son:

- Los cambios mundiales y los recursos hídricos.
- La dinámica integrada de las cuencas y los acuíferos.
- La hidrología de los hábitats terrestres.
- El agua y la sociedad.
- La educación y la formación en los recursos hídricos.

Dentro de los temas transversales relacionados con VI fase el Comité Nacional de PHI de Costa Rica ha participado en los siguientes programas:

- **Programa Regímenes de Flujo determinados a partir de serie de Datos Internacionales Experimentales de Redes (FRIEND)**

Costa Rica continúa participando en el Proyecto Regímenes de Flujo Determinados a partir de Series de Datos Experimentales Internacionales y de Red (FRIEND).

En agosto del 2005 Costa Rica participó en el Taller de Actividades y Lineamientos para el Desarrollo del Proyecto FRIEND para Latinoamérica y El Caribe, realizado en Foz de Iguazú, Brasil.

Dentro de los temas científicos discutidos están: Base de datos (pág. Web), Extremos Hidrológicos, Variabilidad y Cambio Climático, Regionalización Hidrológica, Vulnerabilidad Hidrológica y Adaptación y Creación de Capacidades. Además, se coordinaron algunas acciones con el Proyecto HELP.

Para el próximo año Costa Rica en coordinación con Cuba elaborará un proyecto sobre ”Eventos Climáticos e Hidrológicos en Centroamérica y el Caribe: Inundaciones y Sequías.

Con respecto al tema de “Regionalización Hidrológica”, Costa Rica ha propuesto a FRIEND-LAC presentar un proyecto sobre la “Estimación de Valores Máximos de Precipitación y

Caudal para Propósitos de Diseño", este estudio se realizó en Costa Rica y el objetivo sería implementarlo en la región Centroamericana y del Caribe a través de un proyecto con FRIEND/PHI-LAC /UNESCO.

- **PROGRAMA ECOHIDROLOGIA**

Dentro del Programa Ecohidrología para América Latina, Costa Rica ha seguido participando activamente en este programa.

En diciembre del 2005 se realizó un "Taller sobre Caudales Ambientales: Experiencias y Desafíos Regionales".

Se efectúo en San José, Costa Rica, con la participación de los países centroamericanos, siendo auspiciado por PHI-LAC Programa Hidrológico Internacional para América Latina (PHI-LAC), Comité Nacional de Hidrología y Meteorología y Comité Regional de Recursos Hidráulicos.

En este taller participaron dos delegados de cada país de la región centroamericana; así como otras organizaciones como: la Dirección General de Aguas Chile, Unión Mundial para la Naturaleza (UICN), Global Water Partnership -Centroamérica (GWP), Comisión Nacional de UNESCO, Oficina para Centroamérica para UNESCO, Universidades e instituciones relacionadas con el recurso hídrico en Costa Rica.

Se aprovechó en este evento hacer un homenaje al Comité Nacional de Hidrología y Meteorología de Costa Rica por sus cuarenta años de existencia.

En este taller cada país de la región presentó el nivel de investigación que ha desarrollado en caudales ambientales, posteriormente se analizó la experiencia en este tema de Chile y Costa Rica.

En este evento el Dr. Marcelo Gaviño de Argentina presentó el proyecto Regional Agua y Educación (WERP), la Licda. Nydia Rodríguez expuso el Proyecto WET- Costa Rica sobre Educación del Agua y la Dra. Jenny Reynolds se refirió a la calidad del agua en Costa Rica.

Como conclusión de este taller fue solicitar apoyo a PHI- LAC/ UNESCO para implementar en Proyecto Regional de "Caudales Ambientales" donde se puede realizar un diagnóstico de la situación actual de los países y establecer un programa de capacitación en este tema, mediante cursos itinerantes, otro aspecto es impulsar a nivel de la reunión estudios sobre sedimentación y erosión, dentro del Proyecto Iniciativa Internacional sobre Sedimentos (ISI) de UNESCO.

Además se decidió apoyar al Proyecto Regional Agua y Educación (WERP) PHI-LAC/UNESCO y para el 2007 se planea realizar un Taller sobre Gestión Integrada del Recursos Hídricos en algún país de la región Centroamericana.

- **Congresos donde Costa Rica ha participado con apoyo de PHI-LAC / UNESCO**

  - ✓ **Taller sobre Balance Hídrico y el Proyecto para la Elaboración del Mapa de Zonas Áridas, Semiáridas y Subhúmedas Secas de América Latina y el Caribe.**

Este taller se efectúo en Cuernavaca, México del 7 al 9 de abril 2005, el participante fue el Lic. Rafael Chacón Mora.

El objetivo de este taller fue fortalecer el desarrollo técnico, social y educacional de la Región sobre la base de un aprovechamiento y una gestión mejorada de los recursos hídricos en las zonas áridas y semiáridas de América Latina y el Caribe, además, aumentar el rol de las comunidades en el desarrollo de una cultura del agua por medio del establecimiento de un centro regional. Además se definió la metodología y el avance de las actividades para el balance hídrico superficial para el período 1970-2002.

Capacitación de la metodología para elaborar mapas regionales de zonas áridas y semiáridas. En este punto Costa Rica envió la información solicitada por Centro del Agua Latina y el Caribe (CAZALAC) para Zonas Aridas y Semiáridas de América.

  - ✓ **VI Reunión sobre Actividades y Lineamientos para el Desarrollo del Proyecto FRIEND para Latinoamérica y el Caribe.**

Esta reunión se efectuó en Foz de Iguazú, Brasil del 10 al 12 de agosto del 2005, la participante fue la Licda. Alexia Pacheco Hernández.
El objetivo fue promover sinergias y optimizar las capacidades involucradas en los programas HELP y FRIEND del PHI –LAC.

En el marco de Proyecto FRIEND se acordó en continuar trabajando con bases de datos y página WEB, extremos hidrológicos, variabilidad y cambio climático, regionalización hidrológica, vulnerabilidad hidrológica y creación de capacidades.

Los principales proyectos en que se trabajará son: compartir metodologías en hidrología, desarrollar la página WEB e implementar la base de datos, diagnóstico de sequías, capacitación y publicación de artículos y preparación de la Conferencia Mundial de FRIEND que se realizará en el 2006.

  - ✓ **V Diálogo Interamericano sobre Administración de Aguas y VI Reunión de Comités Nacionales y Puntos Focales del Programa Hidrológico Internacional (PHI) de UNESCO para América Latina y el Caribe.**

Del 10 al 12 se participó en el V Diálogo Interamericano sobre Administración de Aguas, en Montego Bay, Jamaica, para este evento el Lic. Sadí Laporte Molina presentó una conferencia sobre “Determinación de una Metodología para Estimar el caudal de Compensación en los Ríos de Costa Rica”.

Posteriormente el 13 al 14 de octubre del 2005 con la participación del Lic. Sadí Laporte Molina, Presidente del Comité Nacional de PHI-Costa Rica expuso las actividades del Comité Nacional con el PHI-LAC/UNESCO para el 2004-2005.

El objetivo principal de esta última reunión fue informar a los participantes de los proyectos realizados y futuros del PHI – LAC para Latinoamérica, por parte de la Hidróloga Regional Dra. María Donoso.

Dentro de las principales conclusiones están:

- Continuar con los esfuerzos para finalizar el Balance Hídrico, se espera que en Costa Rica se concluya en julio de 2006. La publicación de este estudio va a ser financiado por PHI – LAC/UNESCO.
- Costa Rica enfatizó su apoyo a las acciones emprendidas para la Hidróloga Regional para Latinoamérica (UNESCO), de ampliar la relación laboral con la Organización Meteorológica Mundial (OMM).
- Apoyar para que las reuniones con PHI sean cada dos años.
- Apoyo a los mecanismos para mejorar la comunicación e intercambios de datos e información entre los miembros del PHI – LAC.
- Apoyo para que PHI – LAC actúe como Secretaría Técnica de la Red Interamericana del Recursos Hídricos (RIRH)

✓ **Participación de Costa Rica en el Taller de Trabajo del Proyecto Cultura del Agua América Latina**

Este taller se realizó en Tegucigalpa, Honduras, del 14 al 16 de setiembre del 2005 con la participación del Dr. Felipe Montoya, de la Escuela de Historia de la Universidad de Costa Rica, este proyecto lo coordina la Oficina Nacional de UNESCO.

El objetivo es realizar un Atlas de la Cultura del Agua de América Latina y el Caribe, para el caso de Costa Rica ya se concluyó el estudio, falta la compilación de todos los estudios nacionales de la región.

✓ **Participación de Costa Rica en el Taller de Evaluación de Recursos Hídricos - Manual para la Estimación de las Capacidades Nacionales.**

Este taller se efectúo del 14 al 16 de febrero de 2006 en Bogotá, Colombia, siendo patrocinado por PHI-LAC UNESCO y la OMM. El Lic. Rafael Enrique Chacón Mora participó en este evento.

El objetivo fue revisar y discutir la metodología del "Manual para la Estimación de las Capacidades Nacionales" OMM – UNESCO, tomando en cuenta índices de capacidades nacionales, enseñanza, formación de personal, investigación desarrollo técnico e intercambio tecnológico, posterior a la revisión se nombró un grupo de trabajo que se encargará de promover una propuesta de las modificaciones y posteriormente se les hará llegar a los participantes de la reunión.

✓ **Participación de Costa Rica en el Taller sobre Presentación de Resultados de los Balances Hídricos a Nivel Centroamericano.**

Este taller se realizó el 11 y 12 de mayo de 2006 en San Salvador, Salvador, participando el Lic. Rafael Enrique Chacón Mora responsable del Proyecto Balance Hídrico en Costa Rica.

El evento fue auspiciado por el Comité Regional de Recursos Hídricos, con el apoyo de PHI-LAC.

El objetivo fue revisar las metodologías de balance hídrico, que se están utilizando en los países de la región, donde se expusieron las diversas técnicas utilizadas para el análisis de la calidad de la información, extensión y relleno de series hidrometeorológicas.

- ✓ **Participación del Comité Nacional PHI en el Cuarto Foro Mundial del Agua.**

Se realizó en México del 16 al 22 de marzo del 2006, participando el Lic. Sadí Laporte Molina.

El foro es una iniciativa del Consejo Mundial del Agua cuyo objetivo es despertar la conciencia sobre los asuntos del agua en todo el mundo.

- ✓ **Participación de Costa Rica en el Curso Piloto del Conflicto Potencial a la Cooperación Potencial (PllP).**

Este curso se efectúo en Guayaquil, Ecuador del 15 al 21 de enero de 2006, el participante por Costa Rica fue el Lic. Rolando Madrigal del Ministerio de Relaciones Exteriores.

El objetivo fue capacitar a los participantes con el fin de incrementar las capacidades en lo que se refiere a la prevención y resolución de conflictos relacionados con el agua.

- ✓ **Participación Futura de Costa Rica en la Conferencia Mundial de FRIEND**

Del 27 de noviembre al 1º. diciembre de 2006 se efectuará en La Habana, Cuba la "Conferencia Mundial de FRIEND", donde el tema es Vulnerabilidad de los Recursos Hídricos Procesos, Análisis e Impactos. En esta conferencia Costa Rica participará con las siguientes ponencias ya aprobadas por el Comité Director de la reunión, cuyos títulos son:
"Estimation of extreme precipitation and floods for design purposes: software tools", "Regionalization of low flow and dry spells in Costa Rica" y "Estimation of minimum acceptable flow for the rivers of Costa Rica".

1.1.3 Decisiones Concernientes a la Contribución y Participación en el PHI-VII

- En el Tema I: Cambio Mundial Vertientes y Acuíferos

El Comité Nacional de Costa Rica puede apoyar en este tema a la región con el proyecto que desarrolló Costa Rica sobre Eventos Extremos en Hidrología.

Cabe mencionar que el Instituto Meteorológico Nacional está participando en el Proyecto "Fomento de Capacidades para la Etapa II Adaptación al Cambio Climático en Centroamérica, México y Cuba", proyecto auspiciado por el Programa de Desarrollo Naciones Unidas.

- En el tema II: Buen Gobierno y Asuntos Económicos y Sociales.

Costa Rica tiene interés en participar en cultura, ética y legislación para una administración acertada de los recursos hídricos, sobre todo ahora que se está discutiendo en el Congreso el Proyecto de Ley de Recurso Hídrico.

En este tema para el país es de gran interés la capacitación del recurso humano en el tema de recursos hídricos y resolución de conflictos, así como resolución de la autonomía: agua y energía mediante gestión acertada.

- En el Tema III: Ecohidrología y Sostenibilidad Ambiental

Costa Rica en diciembre de 2005 realizó un taller sobre "Caudales Ambientales en Centroamérica", auspiciado por PHI-LAC/CRRH. En este evento se decidió por parte de los participantes iniciar un proyecto regional sobre este tema a nivel de la región basada en la metodología de estudio que esta elaborando el Instituto Costarricense de Electricidad en este tema; por lo tanto, es importante pedir la colaboración a PHI-LAC al respecto.

Otro subtema de gran interés para el país es el impacto de las presiones causadas por la urbanización en ciudades, y las amenazas del cambio climático en los ecosistemas.

- En el Tema IV: Calidad del Agua Salud y Seguridad Alimentaria

Se tiene gran interés en implementar un proyecto sobre la Calidad del Agua a nivel nacional, con la participación del Instituto Costarricense de Acueductos y Alcantarillados, esta institución en un futuro construirá un laboratorio de 1500 m^2 con un costo de 4 millones de dólares, donde se podrán contar con los últimos adelantos en esta materia, por lo tanto, Costa Rica podría tener un papel importante a nivel de la región ofreciendo servicios en este tema. Es de gran necesidad solicitar capacitación en calidad del agua

1.2 Actividades a Nivel Nacional Dentro del Marco del PHI

Costa Rica a través del Comité Nacional de PHI, colabora con otros organismos como: la Organización de Estados Americanos (OEA) en la Red Interamericana del Recursos Hídricos y en el Proyecto del Deltamérica.

Con la Organización Meteorológica Mundial en el tema de la gestión integrada de los recursos hídricos y el uso de modelos hidrológicos para previsión.

El Comité Regional de Recursos Hidráulicos de Centroamérica, pertenece al Sistema de Integración Centroamericana (SICA), existe una estrecha colaboración en el tema de los recursos hídricos, en especial con el nuevo proyecto Regional de Reducción de Vulnerabilidad y Degradación Ambiental, financiado por la Comunidad Europea.

El Comité Nacional del PHI-CR elaboró un Atlas con la Red de Estaciones Hidrológicas y Meteorológicas de Costa Rica.

1.3 Cursos Académicos o de Adiestramiento.

Las instituciones que integran el Comité Nacional de PHI, tienen programas de capacitación en variados temas relacionados con los recursos hídricos, en este campo existe un gran apoyo de las universidades estatales.

1.4 Cooperación con el Instituto UNESCO-IHE para la Educación Relativa al Agua.

Por ser el tema de los recursos hídricos de gran relevancia para el país, en un futuro se estará pidiendo la colaboración de la UNESCO y el IHE para capacitar profesionales en el campo del agua.

1.5 Publicaciones

Las instituciones miembros del Comité Nacional de PHI de Costa Rica ha publicado numerosos estudios que se pueden consultar muchos de ellos en la página WEB de éstas.

1.6 Participación de Certámenes Científicos Internacionales

1.6.1 **Certámenes realizados en el país**.

- El Instituto Costarricense de Acueductos y Alcantarillados tiene el "Programa de Bandera Azul", cuyo objetivo es implementar la limpieza de las playas y evitar la contaminación de las aguas en las playas del país.

  También hay programas de limpieza de los ríos y protección de las nacientes de agua.

1.7 Otras Actividades a Nivel Regional

-Proyecto de Balance Hídrico de Costa Rica, se espera concluirlo en el mes de julio 2006.

-Proyecto de Caudales de Compensación (ambientales), se espera concluirlo en abril del 2007.

-Proyecto del Mapa de Zonas Áridas de América Latina y del Caribe con el Centro del Agua para Zonas Áridas y Semiáridas de América Latina y el Caribe. (Ver //www.cazalac.org)

2. Actividades Futuras

- Conclusión de proyecto de Balance Hídrico de Costa Rica
- Conclusión del Proyecto de Caudales de Compensación en abril del 2007, se hará un taller de presentación del estudio, donde participarán los países centroamericanos.
- Participación en la conferencia mundial de FRIEND en la Habana, Cuba en diciembre, 2006.
- Edición de la publicación de "Hidrología Estocástica" financiado por el PHI-LAC-UNESCO.
- Continuar con el apoyo a los proyectos de ISARM, WHYMAP y FRIEND.
- Continuar con el apoyo a la Estrategia para la Gestión Integrada de Recursos Hídricos en Costa Rica – Proyecto BID/MINAE.
- Fortalecimiento del Comité Nacional del PHI.
- Continuar con el estudio de caudales ambientales para todas las cuencas de Costa Rica.
- Apoyar La Política Hídrica Nacional en las Orientaciones de Gobierno y Desarrollo, Marco Jurídico, Agua y Economía, Agua y Ambiente, Institucionalidad, Instrumentos de Gestión e Implementación.
- Iniciar el Proyecto de Calidad del Agua a Nivel Nacional de Costa Rica.
- Continuar apoyando el Programa Mundial de Evaluación de los Recursos Hídricos (WWAP).
- Apoyo al Decenio Internacional para la acción "El Agua, Fuente de Vida".

- Apoyo al Centro Internacional de Formación e Investigación sobre Erosión y Sedimentación (IRTCES) en China, en especial a Costa Rica le interesa la gestión de las cuencas para controlar la sedimentación en los embalses.
- Apoyo a "La iniciativa de la UNESCO/OMM sobre inundaciones"
  Iniciar un proyecto de "Cultura del Agua" para escuelas y colegios en conjunto con WEB Costa Rica / Proyecto Regional Agua y Educación (WERP)/PHI-LAC/UNESCO y Comité Nacional de Costa Rica, la idea es tener una guía universal.
- Iniciar un proyecto de sedimentos para Costa Rica con el Proyecto Iniciativa Internacional de Sedimentos (ISI) de PHI-LAC/UNESCO.
- Reforzar la capacitación a nivel nacional en el tema de los recursos hídricos.
- Proyecto para establecer la relación entre los recursos hídricos superficiales y subterráneos.
- Continuar con el apoyo a la Red Interamericana de Recursos Hídricos de la OEA.
- Participación en el Proyecto Ecohidrología para América Latina y el Caribe.
- Realizar un taller para intercambiar experiencias sobre validación de los indicadores relacionados con el agua.
- Solicitar apoyo de candidato nacional para Advisory Board of the International Centre for Water Hazard and Risk Management (ICHARM) in Tsukuba, Japan
- Solicitar apoyo de candidato nacional para Advisory Board of the International Research and Training Centre for Erosion and Sedimentation (IRTCES) in Beijing, China.

Para esta reunión Costa Rica debe apoyar:

- Fortalecimiento de los Comités Nacionales.
- Recomendar al Consejo Internacional Gubernamental que se establezcan mecanismos para estructurar al PHI, sobre la base de los consejos regionales.
- Continuar con el apoyo de PHI-LAC/UNESCO para que las reuniones de los Comités Nacionales y Puntos Focales sean realizadas cada dos años, así mismo tener el apoyo para que los presidentes de los Comités Nacionales participen en las reuniones del Consejo Intergubernamental.
- Solicitar que los fondos asignados conforme al Programa Principal sean descentralizados a las oficinas regionales, clusters y oficinas nacionales para ser utilizados en las actividades relacionadas con el PHI de acuerdo a los programas y proyectos aprobados.
- Solicitar apoyo para Costa Rica en la Estrategia Nacional para la Gestión Integrada de Recursos Hídricos.

LISTA DE DOCUMENTOS EN EL ANEXO

- Estrategia para la Gestión Integrada de Recursos Hídricos en Costa Rica.

    1. Resumen ejecutivo GIRH
    2. Estrategia GIRH
    3. Política Hídrica Nacional

- Plan General de Trabajo del Área de Aguas Subterráneas 2004-2005.

- Proyecto fomento de capacidades para la Etapa II adaptación al cambio climático en Centroamérica, México y Cuba.
- Mapa de Recarga Potencial para Costa Rica.
- Red Hidrometeorológica de Costa Rica.
- Balance Hídrico de Costa Rica
- Taller caudales ambientales / diciembre 2005.
- Informe de actividades y proyecciones del proyecto FRIEND AMIGO para Latinoamérica y el Caribe.
- Acceptation conference Alexia Pacheco and Sadí Laporte
- Poster Conference Sadí Laporte
- Proyecto Ley del Recurso Hídrico
- Conferencia presentada en reunión de Comités Nacionales de PHI en Montego Bay, Jamaica. Conferencia de CONAPHI / COSTA RICA

NATIONAL REPORT OF THE CZECH REPUBLIC ON IHP RELATED ACTIVITIES for the period 2004 – 2006

1.1 Activities undertaken in the period 2004 - 2006

1.1.1 Decisions regarding the composition of the IHP National Committee

The Secretariat of IHP Czech National Committee (CNC) works administratively at the Czech Hydrometeorological Institute. The Institution lies within the competence of the Ministry of Environment and employs relatively the most of hydrologists in the country. However CNC activities are guided generally so that they could serve to everybody engaging in the development of hydrology and its application to water management, namely to involved institutes of the Czech Academy of Sciences, research institutes, departments of universities, projection and operation enterprises. That corresponds to the CNC composition. The CNC chairman of is appointed by the Minister of Foreign Affairs as a member of the Czech Committee for cooperation with UNESCO. In the last few years there was quite a number of changes in the competences of responsibility for water resources in CR in comparison with conditions under those the original status of CNC was formulated. For that reason the CNC IHP prepares formulation of a new status, which would better meet the present requirements especially taking account of the accession of the Czech Republic (CR) to the European Union.

1.1.2 Status of IHP VI activities

Czech specialists are working mainly in frame of two FRIEND groups during IHP-VI:

- The activities in the Low Flow group in the preceding period were focused on finalisation of ASTHyDA Textbook and preparation of a new research project, on which Czech hydrologists collaborated.
  The textbook, whose title is “HYDROLOGICAL DROUGHT - Processes and Estimation Methods for Streamflow and Groundwater”, was published by Elsevier Science B.V. in the Netherlands in 2004 within their series Developments in Water Sciences.
  Future activities will be focused on co-operation in the new project “Water and global change” (WATCH), which is an integrated project that will be carried out within the framework of the Sixth Framework Programme EU on Global change and ecosystems. The project will bring together the hydrological, water resources and climate communities to analyse, quantify and predict the components of the current and future global water cycles and related water resources states, evaluate their uncertainties and clarify the overall vulnerability of global water resources related to the main societal and economic sectors.

- In the Flood Group the main achievements were the testing of the snow distribution model and the updating algorithms implemented in the Nordic HBV model on 10 Norwegian catchments, investigating the sensitivity of flood inundation modelling within the uncertainty framework on two rivers in the Czech Republic and creating a new frequency version of TOPMODEL with snow accumulation and melt and storms moving across the catchment.
  The group is going to continue the modelling work in the direction of the “Manifesto for the Equifinality Thesis” (Beven, 2005). The intention is to rely more on prior evaluations of model acceptability relative to observations and less on likelihood measures based on model residuals after a model has been run.

Models are going to be applied within a learning framework following Prof. Beven's idea of models of everywhere (Beven, 2006).

1.1.3 Decisions regarding participation in IHP-VII

The CNC called on the public involved to a discussion and formulation of participation in the IHP-VII phase on the occasion of a regular conference of Czech and Slovak hydrologists during the so-called „Hydrological Days" which took part in September 2005 in Bratislava (SR). The next revised version of the IHP-VII phase was sent to all potentially interested partners in CR in the second quarter of 2006. It follows from the existing information and discussions that Czech experts would like to participate in research of extreme runoff phases (within FRIEND projects), continuation of the GWES (Groundwater for Emergency Situations) project, regional collaboration in hydrology (especially with neighbouring countries) and postgraduate training of experts from developing countries.

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

- The "22nd Conference of the Danubian Countries on Hydrological Forecasts and Hydrological Bases of Water Management" which was held in August 2004 in Brno (CR). 200 experts of 14 European Countries took part in it. The exact wording of the contributions is at disposal on CD ROM in English and German languages.
- The periodical conference "Hydrological Days 2005" was devoted to the theme "Hydrology for Integrated Management of Water Resources". The Conference in Bratislava (SR) was attended by 150 Czech and Slovak hydrologists and water management workers. The exact wording is at disposal on CD ROM in Czech and Slovak languages.
- The national "Workshop on the occasion of the 130th anniversary of hydrology on the territory of CR and the 100th anniversary of the activity of the hydrological workplace in Moravia" took part in Brno (CR). A publication from the seminar was published in Czech language.
- Cooperation with the Institute for Hydrodynamics of the Czech Academy of Sciences and the Czech Scientific and Technological Watermanagement Society in organizing the national workshop „Hydrology of Small Basins". Number of participants was about 100 experts. Papers are in proceedings from the seminar in Czech language.

1.2.2 Participation in IHP Working Group

Dr. J. Vrba coordinated an international project "Groundwater in Emergency Situations". Prof. J. Šilar worked in the same working group as an expert leader. The project results were select to represent UNESCO in the section of science at the World Conference on Water in Mexico City in 2006.

1.2.3 Research project supported

In addition to research projects supported from the IHP UNESCO budget also an extensive comprehensive exhibition „Water and Life" prepared by the National Museum in cooperation with CNC IHP and other partners was covered by the Government of CR. It was one of the largest exhibitions of that type in central Europe. It started in 2003 an the occasion of International year of Water and continued even

in 2004. It was attended by tens of thousands of visitors from our country and from abroad and also by many students of Czech schools.
Another important event there was evaluation of results of the Czech expeditions focused on geographical specification of the Amazon river springs. The research was leaded by Prof. Asist. B. Janský, a member of CNC IHP. The costs connected with evaluation of the research, preparations and translation of the book summarizing results of all expeditions were covered by various national and foreign sponsors. The CNC IHP recommended that the book was published in the edition series of UNESCO.

1.2.4 Collaboration with other national and international organizations

The most frequent foreign contacts of Czech hydrologists are with partners of the neighbouring countries. They are engaged in problems of boundary waters and other common hydrological problems. A long-lasting successful collaboration included into IHP-VI is called as “Regional Collaboration of the Danubian Countries in Hydrology”..
There is also running collaboration with many other committees (NC) operating in the Czech Republic and focused on water issues, such as NC for International Strategy for Disaster Reduction, NC for the Czech National Climate Programme, NC for Geophysics and Geodesy, NC for activities of the International Commission for Irrigation and Drainage and NC for activities of the International Oceanographic Commissions of UNESCO.

1.2.5 Other initiatives

The Czech Republic contributes to the ICARE (Inventory of the Catchments for Research in Europe) database, which contains meta-data about 142 basins and several sets of validation data measured in a short time interval. The database is maintained by CEMAGREF in Lyon, France.
The Northern European FRIEND Project 5 “Catchment hydrological and biogeochemical processes in changing environment” including Czech collaboration is focused on gaining a better understanding and a synthesis of the processes and mechanisms responsible for streamflow generation, variation in flow components and cycling of the main nutrients in different physiographic and climatic conditions.

1.3 Educational and Training courses

1.3.1 Contribution to IHP courses

In view of a new conception of postgradual hydrological education within UNESCO the Czech Agricultural University (CAU) in Prague finished in agreement with CNC IHP an international hydrological course “Hydrological Data for Water Resources Planning”. Instead of it a two week international seminar called “Disaster Prevention and Reduction with Emphasis on Floods and Droughts” was introduced. Top foreign and national experts are invited to lecture and explain select actual problems. Number of foreign participants is about 30 specialists. The running costs connected with organizing the seminar are covered with support of CAU, Ministry of Education of CR and foreign sponsors.

1.3.2 Organization of specific courses

Czech NC Man and Biosphere together with CNC IHP prepare and present within the framework of the UNESCO Participation Programme a proposal for organizing an international course called “International Course on Ecohydrological Approaches for Wise Use, Restoration, Management and Conservation of Fresh Water Wetlands”.

1.3.3 Participation in IHP Courses

The Czech experts used to take part in an international postgradual course in Bed Dagan, Israel. In the last two years CNC mostly registers their participation in the international postgraduate short course arranged by CAU (see 1.3.1)

1.4 Cooperation with the UNESCO-IHE for water Education

The contact of the Czech hydrological teachers with IHE Delft is running at university level. Occasionally it comes to personal contacts (e.g. Prof. M. Abbott invited to ČR).

1.5 Publications

Members of CNC assisted in preparing a comprehensive educational publication "Water in the Czech Republic". In the present time they assist in its English version. Another publication activity (see in item 1.2.1)

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

The "22nd Conference of the Danubian Countries on Hydrological Forecasts and Hydrological Bases of Water Management" in Brno (CR) was the most important event.

1.6.2 Participation in meetings abroad

Relatively the largest participation of Czech experts was recorded within the FRIEND project:

- April 2004 Nice during EGU,
- July 2004 London during the conference "Hydrology Science and Practice for the 21st century",
- October 2005 Tromso during "International Conference for ACTIF, FLOODMAN and FLOODRELIEF projects",
- April 2006 Vienna during EGU.

Within ERB the Czech experts took part in international conferences in Turin and in Sofia. The Czech also took an active part in an international conference called „Mountain Hydrology" in Berchtesgaden. Regularly every year a CNC representative and experts participate in fulfilling of the tasks arising for CR from „Regional Cooperation of the Danubian Countries in Hydrology".

1.7 Other activities at regional level

1.7.1 Institutional relationship

CNC assisted in joining the Czech Republic in IOC UNESCO activities (otherwise see in item 1.2.4).

1.7.2 Completed and ongoing scientific projects

A plan for continuation of GWES focused on conflict situations is developed. The formulation of CR participation in the VII. phase is running.

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2007

- Collaboration at organizing an international conference „Biohydrology“ in Prague 2006.
- Collaboration at organizing an international conference „Groundwater Modelling“ in Karlovy Vary in 2006.
- Discussions about a new status of CNC IHP in 2007.
- Fulfilment of the role of a respondent of hydrological data users sphere in the EU project „New water“.

2.2 Activities foreseen for 2008-2009

Participation of the Czech institutions in investigating research projects of the IHP-VII phase.

2.3 Activities envisaged in the long term

Top priority hydrological problems and needs in Czech Republic include:

- Mitigating damages caused by natural disasters particularly floods and droughts,
- Application of the sustainable development principles in practice,
- Revitalisation of the hydro component of the landscape,
- Application of the EU Framework Directive on Water.

DENMARK

NATIONAL REPORT ON IHP RELATED ACTIVITIES

1. ACTIVITIES UNDERTAKEN IN THE PERIOD SEPTEMBER 2004 – JUNE 2006

1.1 Meetings of the IHP National Committee

The Danish National IHP Committee was transferred to the Danish Water Forum, DWF, in 2003 as a consequence of closing the Danish Water Resource Committee. The daily contact is the DWF, whereas the national committee contacts to the IHP programme is done through a representative from the Technical University of Denmark, Institute of Environment & Resources

1.1.1 Decisions regarding the composition of the IHP National Committee

No changes have been done since 2003.

1.1.2 Status of IHP-VI activities

The national committee has not done any actions directly towards IHP-VI, but water-related aspects have been included in a number of workshops, seminars and meetings organised directly by DWF or in cooperation with other Danish Research networks.

1.1.3 Decisions regarding contribution to/participation in IHP-VII

The Institute of Environment & Resources, Technical University of Denmark, is coordinating Project Component 4. Integrated Urban Water Systems Interactions of IHP VI Theme 3. Land Habitat and Hydrology, Focal Area Urban and Rural Settlements.

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

Since last reporting the National Committee has been involved through DWF in three technical meetings in Denmark:

- EU water initiative, April 2005
- Future ways to handle wastewater
- Resource base meeting with the Danish aid organization Danida: Peri-urban water problems.
- Water and Health: Ways to development.

1.2.2 Participation in IHP Steering Committees/Working Groups

1.2.3 Research/applied projects supported or sponsored

None, besides providing travel grants for students, wanting to include a stay in a developing country as part of their study (8 students in 2004-2006)

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

DWF has been involved heavily in the European initiative in the "**Water Supply and Sanitation Technology Platform",** a large EU based research programme, where DWF has taken part and has put its fingerprint on the agenda.

DWF has also been involved in the development of knowledge network for coordination and information exchange on the EU water initiative called **ERA-NET EUWI.**

1.7 Other activities at regional level

1.7.1 Institutional relations/cooperation

Dan Rosbjerg, Institute of Environment & Resources, Technical University of Denmark and Jens Jørgen Gaardhøje, Niels Bohr Institute, University of Copenhagen, have attended "Seminar on UNESCO Science Programs in the Nordic Countries", 28-29 March in Stockholm.

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2007

For the coming period DWF intend to organise other workshops and seminars where water is a key issue. The next events are planned:

"***Urban Environmental Management in Developing Countries - Environmental Health, Planning and Capacity Development"***
23 August 2006, Institute of Geography, University of Copenhagen, Denmark
This conference is organized by ReNED, jointly with Danish Water Forum-Research.

"***Water Reform and Access to Water for the Rural Poor***", 19th of September 2006. Jointly arranged by DWF, DIIS and Danida. Programme and announcement are now available on the DWF homepage at www.danishwaterforum.dk .

17th Sahel Workshop: "***Environment, Agriculture, Water and Governance in West Africa"***, 6-7 November 2006.
This workshop is organized by Research Network for Environment and Development (ReNED), Danish Network for Agricultural Research for Development (NETARD), Research Network for Governance, Economic Policy and Public Administration (GEPPA) and Danish Water Forum-Research, jointly with Danida.

Egyptian National Committee of the International Hydrological Program (IHP)
National Report for the period September 2004 to June 2006
To be presented at 17th Session of the IHP Intergovernmental Council

1. Activities Undertaken in the period September 2004-June 2006

1.1 Meetings of the IHP National committee

1.1.1 Decisions regarding the composition of the IHP National Committee

Formation for the Egyptian National Committee of the international hydrological programs (ENCIHP) was issued by the Ministerial Decree No. 48 dated 9/2/1998. The formation consists of twenty members. They are carefully selected from different disciplines and form a very specialized team.
The members of the committee are as follows:

1. Dr. M. B. A. Saad Vice President, Senior Under Secretary, Head of Irrigation Department, Ministry of Water Resources and Irrigation (MWRI).
2. Prof. Abel Wahab Amer Member, Professor, Hydraulic and Irrigation Department, Faculty of Engineering, Cairo University.
3. Dr. Mohamed El Moattassem Member, Nile Research Institute, National Water Research Center (NWRC).
4. Dr. Ahmed Rashad Khater Member, Director of the Research Institute for Groundwater, (NWRC).
5. Dr. Mouhamed Abd Elmoutaleb Member, Director of the Water Resources Research Institute, (NWRC).
6. Prof. Emad Hussny Hamdy Member, Professor, Head of Hydraulic and Irrigation Department, Faculty of Engineering, Cairo University.
7. Prof. Moustafa Solieman Member, Professor, Hydraulic and Irrigation Department, Faculty of Engineering, Ain Shams University.
8. Dr. Mohamed Ibrahim Member, consultant at Egyptian Environmental Affairs Agency (EEAA).
9. Dr. Abel Fataah Motawa Member, Head of Nile Water Sector, MWRI.
10. Eng. Refky el Bendary Member, Head, Irrigation Sector, MWRI.
11. Eng. Fawzy Al Mohammady Member, Chairman, Nile Controls Inspectorate, MWRI.
12. Eng. Helmi Mahmoud Member, Consultant
13. Eng. Ali Abu El Suaod Member, General Secretary of ENC for Hydrology, Irrigation and Drainage, and Maping
14. Dr. Mouhamed Dawood Member, the Meteorological Department of Egypt.
15. Dr. Karima Attia Member, Researcher, Nile Research Institute, National Water Research Center (NWRC).
16. Mr. Mouhamed Safwat Salem Member, Secretary General of

National Commission of UNESCO, Ministry of Higher Education.

17. Eng. Nahed khalil — Member, Head of Groundwater Sector MWRI
18. Dr. Alli Islam. — Member, Chairman of Atomic Energy Authority
19. Dr. Madiha Moustafa — Rapporteur, Researcher, Research Institute for Groundwater, NWRC.

The committee was honored by the attendance of:
Representative of UNESCO Cairo office Dr. Radwan el Weshah the regional hydrologist

The Committee usually organizes a periodical meeting every month, unless there are urgent subjects that need to be discussed. The main activities of the committee are: to discuss research results related to hydrology, cooperate technically with other national and international organizations sharing similar interests, disseminate information and studies related to committee activities, translate interesting books and magazines into Arabic, compose books related to hydrology to be used by the researchers, attend conferences and seminars related to committee activities, and transfer of knowledge through organizing training courses and seminars. The committee has a major role in implementing projects of, IHP-VI and proposes new themes and project to IHP-VII.

Activities of the committee through the mentioned period are summarized bellow: -

- The Committee established a hydrological library, which is provided with IHP publications, and other textbooks related to hydrology as well as other subjects related to freshwater.

- Establishing a web site for the groundwater protection network.

- Organizing an International Course on Environmental hydrology, which is a yearly course with duration of six weeks and held at the Hydraulics Research Institute campus at Delta Barrage of Egypt.

- Contributing to the formulation of the seventh phase of the International Hydrological Program of (IHP VII) (2008-2012). Comments on proposed themes and suggested area of interest for the Arab region.

- The Committee prepared the annual work plan for its activities of the year 2006/2007.

- Participation in preparation of book entitled “Management of Water Resources at cities in arid and semi arid region”.

- Participation in the governmental and intergovernmental council meetings.

- The Committee discussed the flood features of the Nile River in Egypt during

year 2005-2006 and made comparison with the previous flood feature to determine the lessons to be learned.

- The committee gives a great contribution and attention to the project "Controlling the Evaporation Losses at Lake Nasser" sponsored by Egyptian National Academy of Science and conducted by the Nile Research Institute (NRI). The project includes as well importance of protecting the lake from different sources of pollution.

- Continues support for the regional networks, which related to Wadi Hydrology and Groundwater Protection.

- Participation at related internal or external conferences and workshops.

- Participation at the Project entitled National Water Quality and Availability Management (NAWQM) which is carried by the NWRC.

- Dissemination of training courses and fellowships to other partners and provide recommendations to participants.

- Contributing to the study of groundwater potential in Siwa Oases and the MWRI plan for the development and the management of the existing water resources.

- Study, translates and summarizes reports to the which have been delivered to the Egyptian national committee for IHP such as World Water for Development, Urban Ground water Pollution, Groundwater Pollution, and new World Water Advancing Technology to secure supply and sub grade the environment.

- Discussing the proposed regional initiatives.

- Present and discuss the activity done by other Egyptian committees

- Discussing method and techniques used for flood forecasting of the River Nile.

- Identify the gaps and give recommendations to IHP VI

- Discussing the training needs for developing of African countries and determining the role of Egypt

- Discussing the different projects proposed under the umbrella of the Nile Basin Initiatives and identifying the role of Egypt

- Discussing, contributing, and observing evaporation control and the sedimentation process at rivers and at storage lakes with focusing on Lake Nasser.

- Study the cooperation between different Egyptian committees of UNESCO Programs and some projects related to Ecohydrology.

- Preparation and contribute to World Water Day Calibration. The celebration of this year was titled Water & Culture which organized and held in the MWRI building's.

- Discussion on "constraints for the development of Lake Nasser"

- Discuss and present the application of isotopes in hydrology (evaporation from lake Nasser, groundwater seepage, recharge to groundwater from adjacent aquifer, sedimentation at lakes)

- Discussion and presentation of the water annual report for the period (2000-2003) which prepared by central directorate for Nile control, Nile Water Sector, Ministry of Water Resources and Irrigation.

- Presentation and discussion with committee staff on the application and the use of isotopes at the water resources and sedimentation assessment.

- Discussion and comments at the proposal of UNESCO plan for year 2006-2007 which contains projects and budget.

- Presentation on application of the isotope to estimate evaporation losses from Nasser Lake.

- Discussion and presentation of proposals prepared considering minimizing decrease evaporation rate at Nasser Lake and irrigation networks.

- Proposals for several seminars and workshops to be organized by the committee. Many participants are usually invited including other committees members, researchers from the NWRC and MWRI in addition to universities staff.

- Revision and comments on IHP VII themes (2008-2014).

- Dr Bahaa presented article "Integrated Urban Water Management" at workshop "Integrated Water Management in Arid and semi Arid regions" 8-14/5/2004.

- <u>Books received by EIHP</u>

1. fresh water sustainability within uncertainty.

2. submarine groundwater discharge-management implications, measurement and effects.
3. water resources in the OOS countries-evaluation use and management

a- friend 2000-2003
b- friend phase # 2000-2003
c- groundwater contamination
d- groundwater resources of the world
e- groundwater studies
f- integrated watershed management

1.1.2 Status of IHP-VI (2002-2007) activities

1.1.3a Decisions regarding contribution to/participation in IHP-VI

The Egyptian national committee evaluated the IHP VI Projects under Different Themes by using some indicators to measure the program themes from different points: - relevance, effectiveness, efficiency, and sustainability.

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

Comments on proposed themes and suggested area of interested for the Arab region

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

1.2.1 National/local scientific and technical meetings

Water Resources Protection Workshop was organized within the celebration of Suez Canal University by the water world day. The event took place at Ismailia, Egypt, on 22 March 2005. More than 50 Egyptian participants attended this workshop. Technical papers on the application of new technologies for water resources management in Wadi Systems and Groundwater Protection were presented and discussed. The application of new techniques of Integrated Water Resources Management in Wadi Hydrology was highly recommended.

The celebration of the world water day which was titled "Water and Disaster"

The Celebration was held at the MWRI conferences room at year 2005. About 200 researchers and engineers from the MWRI and the NWRC attended the seminar. Preparation and contribution to annual World Water Day Calibration titled Water & Culture which held in the MWRI on 18th June 2006.

1.2.2 Participation in IHP Steering Committees/ Working Groups

One day seminar was held at Nile Water Sector of MWRI on the 10th of May 2006. It was entitled "Evaporation from Surface Water Body". About 50 participants attended from

the committee, other Egyptian committees and the NWRC& MWRI. Four presentations where made, the first on 'Water Policy of Egypt for the Coming 50 Years", the second presentation was on "Evaluation of Different Alternatives for Controlling Evaporation Rater from Nasser Lake, Irrigation Networks, and River and its branches", the third was on "Application of Isotope Hydrology in Measuring Evaporation from Nasser Lake", and the fourth was on "Construction of a New Dam at Lake Nasser in Egypt Boundary and the Impact on the Evaporation Rater from Nasser Lake and the Groundwater Aquifer".
It was clearly that one day for the seminar was not enough to discuss such important issue. The discussion and the recommendations on the Water Policy of Egypt for the Coming 50 Years are taken into considerations.
Accordingly, a second seminar is proposed and will be held in August 2006. It will be entitled "Different methods for Prediction of Nile river flow", and coved of rest of presentation of the first seminar.

1.2.3 Research/applied projects supported or sponsored

The following list presents the projects and topics performed and participated by the Egyptian National Committee:

- Monitoring and evaluation of the sedimentation in Nasser Lake upstream of High Aswan Dam.
- Studying the fluvial characteristics and hydraulics of the River Nile.
- Development of technologies for river bank protection and river front improvement for rural, urban and tourist areas.
- Monitoring of water quality in the channel and influent drains for chemical, physical and biological characteristics.
- Monitoring of groundwater quality.
- Groundwater assessment and development.
- Hydraulic studies on the river Nile and its structures.
- Reuse of drainage water with considering environmental concerns.
- Integrated water management.
- Pollution Control.
- Wadi Hydrology.
- Weed control and waterways maintenance.
- Assessment of environmental impact of the national projects
- Scour around bridges piers.
- Groundwater protection.
- Hydrological code and formula for Wadi Feiran, Sinai, Egypt- case study.
- Legend and framework to construct a hydrological map for Egypt.

1.2.4 Collaboration with other national and international organization/programs

The Egyptian IHP committee being composed of several Government Officials,

University staff, and Research Institution members are taken part in joint work with many international organizations and programs. Among those are the following:

NWRC (Egypt)- Agriculture Research Center (ARC) (Egypt)- National Academy of Science (Egypt)- CEDARS- LTNDP-WMO- TECCONILE- CIDA- DANEDA- ICID- IWRA- IAHR and many others.

1.2.5 Other initiatives

- Reviewing the UNESCO program and budget for years 2006-2007.
- The Regional Center for Water Studies and Training at 6th October City of MWRI and the Universities of Egypt are willing to train researchers and technicians of the third World Countries.
- Egypt is supporting and contributing the joint activities between IHP and MAB programs.
- Egypt is willing to have one of the pilot projects that can be applied at coastal zone within the frame of the Ocean Monitoring (GOOS). Proposed topics for a training program to be organized at the training center of MWRI at 6th of October city.

- Training program is being executed with the cooperation between Hydraulics Research Institute and IHE of Netherlands.

Future activities:

* Careful plan for the activities and outputs of the focal area at themes of IHP-VII is being considered.
* Updating the Selby's of the specific courses which organize by the committee.
* Strengthen the cooperation with other national committee.
* Increase participation of new disciplines to the committee.

1.3 Educational and Training courses

1.3.1 Contribution to IHP courses (courses supervised by the regional training center)

No.	Program	Partners	No of Participants	Foreign Share US$	Year
1	Workshop: Syrian-Egyptian Meeting for Cooperation	MWRI + RCTWS + UNESCO	8	8000	2004
2	Course: Reuse of Treated Drainage Water in Irrigation Syrian participants	RCTWS + UNESCO	14	15000	2004
3	Course: Geographic Information System" GIS " Kuwait	RCTWS + UNESCO	5	7000	2004
4	UNESCO Workshop for Cooperation	RCTWS + UNESCO	7	6000	2004
5	Course: Geographic Information System" GIS " -Kuwait	RCTWS + UNESCO	10	6000	2004
6	Syrian-Egyptian Workshop to Sign Agreements to Apply The Syrian-Egyptian High Committee Decisions & Discuss The Future Cooperation	MWRI + RCTWS + UNESCO	8	2000	2004
7	Iraqi-Egyptian Workshop for Cooperation	MWRI + RCTWS	5	2,500	2004
8	Workshop: "Crops' Water Requirements & Water Strategies" (ICID)	ICID+INCID+RCTWS	12	15,000	2004
9	Course: " On Farm Water Management Drainage for Agriculture Lands" (Nile Basin Countries)	JICA+EFTECA+UNESCO+RCTWS	19	24,000	2004
10	Workshop: Knowledge Mapping	ESCWA+ UNESCO+ RCTWS	17	3,000	2004

No.	Program	Partners	No of Participants	Foreign Share US$	Year
11	First African Regional Conference for Drainage (ARCOD) (African& Other Countries)	ICID+INCID+RCTWS	400	10,000	2004
12	Workshop:" Reuse of Treated Water in Irrigation Purposes" (Bari Institute, Italy)	Bari Institute+ RCTWS	42	25,000	2004
13	Workshop: " Non-Conventional Water Use" (Bari Institute, Italy)	Bari Institute+ RCTWS	30	22.000	2004
14	Workshop: " Applied Training Project" (Nile Basin Countries)	NBI/ATP + RCTWS	10	2000	2005
15	Course: " Numerical 3D Groundwater Solute Transport Modeling "(Iraq)	UNESCO+RCTWS	16	5100	2005
16	Course: " Procurement Training" (East Nile Countries)	NBI/ATP+RCTWS	19	6000	2005
17	National Workshop: NBI/ATP Awareness & Training Needs Assessment for Egypt	NBI/ATP+ RCTWS	45	4500	2005
18	Workshop: International Water's Negotiation & Dispute Resolution.	RCTWS + RCWE	47	6000	2005

No.	Program	Partners	No of Participants	Foreign Share US$	Year
19	Workshop on: "Urban Water Modeling in Specific Climates". (Regional Countries)	RCTWS+UNESCO	11	15000	2005
20	Evaluation Workshop: "Sustainable Water and Wastewater Management Project". (Regional Countries)	RCTWS+InWEnt	22	15000	2005
21	Course: " On Farm Water Management " Irrigation & Drainage (Nile Basin Countries(	JICA+EFTECA+UNESCO+RCTWS	21	35000	2005
22	Course: Groundwater Protection. (Regional Countries)	RCTWS+ UNESCO	21	5000	2005

1.3.2 Organization of specific courses

Training workshop on "Integrated Groundwater Resources Management in Arid Region" was jointly organized with WMO. The training workshop aimed at improving governance and groundwater management within the context of IWRM in arid and semi-arid countries; thus enhancing the utilization of such a resource and strengthen the capacity of professionals in this field. The workshop was held in Cairo, Egypt 4-7 April 2005. More than 70 participants attended in these training activities and they were from most of the Arab countries, Africa and Europe. There were case studies presented to improve capacity building and increase knowledge dissemination on the integrated groundwater resources management in the Arab region.

25th International Post Graduate Training Course on "Environmental Hydrology for Arid and Semi-Arid Regions" aimed at training the participants on the principle of environmental Hydrology and to provide sufficient competences in the collection, analysis and use of metrological and hydrological data for IWR planning, focusing on water and ecosystems. The event was held in Cairo, Egypt, May- June 2005. More than 20 participants were involved in this training course from the Arab and Nile basin countries. The course enhanced capacity building on environmental hydrology methodologies. The recommendations stated that applying more studies on environmental hydrology is needed.

26th International Post Graduate Training Course on "Environmental Hydrology for Arid and Semi-Arid Regions" (on-going) aimed at training the participants on the principle of environmental Hydrology and to provide sufficient competences in the collection, analysis and use of metrological and hydrological data for IWR planning, focusing on water and ecosystems. The event was held in Cairo, Egypt, May- June 2006. More than 20 participants were involved in this training course from the Arab and Nile basin countries. The course enhanced capacity building on environmental hydrology methodologies.

The 8th Regional Training Course on Groundwater Protection (GWP) and the 8th Steering Committee Meeting have a long term objective which is to contribute to rational development and management of Ground Water resources leading ultimately to sustainable socio-economic development and to promote national, sub-regional and regional cooperation in Ground Water studies and Capacity Building with ALECSO and ISESCO. The venue and date for these meetings were in Cairo, Egypt, 25th November – 2nd December 2005 with the participation of 29 Participants from most of the Arab Countries, ISESCO, GWPN and ALECSO. The meeting resulted in the enhancement of methodologies of groundwater management and development of training material on Groundwater management in the Arab region. At the end of the meeting, it was recommended to conduct annual training on GWP and priorities on regional Groundwater issues were identified

- Training Workshop on Groundwater Modeling, Cairo, Egypt; 14-24 December 2004.

- Training Course on Groundwater Solute and Transport Modeling, Cairo, Egypt 23-31 March 2005.

- Training Course on Rainfall-Runoff Analysis Modeling Using the Watershed Modeling System Package, Cairo, Egypt; 9-16 April 2005.

- FRIEND/Nile Technical Tour, Cairo, Egypt 12-19 May 2005.

The 7th Regional Training Course on Groundwater Protection, Cairo, Egypt 17-24 December 2004. UNESCO Cairo Office organized this meeting jointly with the Research Institute for Groundwater (RIGW), IHP – Network on Groundwater Protection in the Arab region. The main aim of the training course was to bring together professionals to discuss and understand issues facing the region with respect to groundwater sustainability and to assist in strengthening and coordinating research activities in related areas within the Arab region.

1.3.3 Participation in IHP courses

8th International Training Workshop on Wadi Hydrology: Application Using Decision Support System (DSS) had a clear objective which is to receive an excellent training on DSS application on Wadi Hydrology with hands-on case studies. This activity was jointly with ALECSO and ISESCO in Amman, Jordan, 17 – 26 Jun. 2005. 20 participants from 11 Arab States attended this training workshop. The workshop improved capacity building and methodologies of Decision Support System tools within the application of integrated water resources management approach in the Arab Region. In the recommendations, it was mentioned that the 9th International Training workshop will be held in Jordan in July 2006 jointly with ALECSO, ISESCO and ACSAD.

1.4 Cooperation with the UNESCO &IHE institute for water education and/or international/ regional water centers under the auspices of UNESCO

A. There is a unique cooperation with IHE which already existed long time ago. The IHE helps on promoting the profession career of the Egyptian Engineers. Many engineers attended the courses organized by IHE and many engineers obtained M.Sc and Ph.D with under supervision of IHE. This cooperation is being continued and will be continue in the future.
B. There is a strong cooperation among the IHE and Hydraulics Research Institute, Regional Center for Water Studies and Training.
C. There is a remarkable cooperation between the regional Center for Water Studies and Training with other Training Centers under the Auspice of UNESCO such as the training Centers in Iran and China…..

1.5 Publications

-Proceedings of the UNESCO - NWRC - ACSAD workshops on (Wadi hydrology) and (Groundwater protection).
-Impact of the proposed Naga Hamadi Barrage on groundwater and possible remedial

measures.
-Policy and strategies for the management of carbonates in Egypt
-Development of Siwa oasis
-Potentiality of aquifer in Saddat City for drinking water supply
-Hydrological condition on El Saff canal area
-Development of Groundwater protection criteria"
-IHP-Regional Network on Groundwater Protection in the Arab Region in co-operation with the Dutch Government: General Report on the Round Table Workshop on Groundwater Protection and Meeting of the Network (Cairo.6-10 September 1998). IHP-V, TDH, No4.

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

The 9th International Water Technology Conference aimed at the identification of environmental problems and development of technologies to be used for their solution. The conference was held in Sharm El-Sheikh, Egypt, 16-20 Mar. 2005, with the presentation of more than 50 technical papers and about 100 key water experts in the field of water technology participated from most of Arab Countries in this conference to discuss and solve the environmental legislations. Research results and practical experience in the field of Water Technology was shared and exchanged among the participants. It was recommended to promote issues related to water resources quality and quantities in Integrated Water Resources Management.

The Workshop of Applicability of Climate Research and Information for Water Resource Management in the Semi-Arid and Arid Regions (G-Wadi) aimed at organizing a forum in which researchers of WRM in Arid Regions and climate observation and modeling can discuss together the various aspects of operational hydrology and water resources management in the semi-arid regions. The workshop took place in Cairo, Egypt from 18-22 April 2005. Thirty researchers attended in this workshop from most of the Arab Countries. The recommendations included the application of climate changes studies in the Arab Region.

4th International Symposium on River Engineering aimed at showing that civil Engineering is a global profession with a focus on economics and natural resources preservation and utilization. The Symposium took place in Cairo, Egypt, 7-9 Jun. 2005. More than 25 trainees attended this symposium from most of the Arab Countries. There was a clear impact that showed the enhanced methodologies for better Arab water resources assessment and management in addition to promoted hydrological techniques for research and development in the Arab region.

International Sedimentation Initiative (ISI): 4th Steering Committee and Workshop aimed to study the sedimentation problems in different basins all over the world and to discuss the issues of sediment, transport training and education, data collection, utilization and analysis. It was held in Sharm El-Sheikh, 9–11 November 2005. About 18 participants representing the Steering Committee members, UNESCO representatives,

Water experts and policy makers from the Egyptian Ministry of Water Resources and Irrigation of .Austria, Yugoslavia, Canada, China, England, France, Italy, Japan, Russia, Sudan, Swiss, USA and Egypt were involved. The issues of sediment transport training and education, data collection, utilization and analysis were thoroughly discussed. It was recommended to follow up on the implementation of the Steering Committee recommendations by the SC members. The Fifth Steering Committee Meeting will be held in Khartoum in November 2006 as a side activity of the International Sediment Conference.

An international conference for the FRIEND/Nile Project was organized during the period 12-14 November 2005 in Sharm El Shiekh, Egypt to present the obtained results and the implemented research activities of the project. Twenty-seven joint technical papers were prepared and presented by the research team of the project reflecting the remarkable achieved technical regional cooperation. About 120 participants from than 12 countries, comprising international and regional key-water experts, policy makers from the Nile countries, FRIEND/Nile researchers, Flemish counterparts, stakeholders and representatives of the ongoing Nile initiatives, attended and contributed to the deliberations of the conference. The recommendations included the extension of the project for another phase as a result of the achievements from the first phase and the promotion of the cooperative networking approach among the Nile countries.

The Fifth Project Management and Ninth Steering Committee Meetings of the FRIEND/Nile wanted to review the implementation of the overall project activities during year 2005. The meetings were in Sharm El Sheikh, 14-15 Nov. 2005. The participants of the meeting from Egypt, Sudan, Tanzania, Kenya, Ethiopia and Belgium reviewed and evaluated the implementation of the project activities during the last 4 years and expressed their satisfaction with the obtained results. The application of proposals presented to the European Union (EU) within the International Research Co-operation, 7th Research Framework Programme (FP 7) was highly stressed. In the recommendations, the participants stressed on the importance of the linkage of the project with Nile Basin Initiative (NBI) as a dissemination forum for the FRIEND/Nile research outputs

1.6.2 Participation in meetings abroad

Regional Seminar on Artificial Groundwater Recharge: A Step towards Water Security aimed at presenting and discussing activities pertaining to awareness increase on the advantages of artificial groundwater recharge with special reference to desalinated water in the GCC and the arid environments. The event was held in Kuwait, 14-17 Feb 2005, with the participation of 70 participants from most of the Arab Countries who discussed future regional activities related to Groundwater recharge activities. The activity enhanced institutional capacity building in the field of groundwater assessment and management with special focus on artificial groundwater recharge in the Arab region.

Therefore, the recommendations included that capacity building in artificial recharge using desalinated water needs to be increased.

Groundwater and Soil Resources Protection Workshop (ACSAD) aimed at promoting integrated groundwater management in the Arab Region and to focus on the integrated land-water management in the Arab Region. The workshop was held in Amman, Jordan, 27-30 June 2005. 30 trainees from most of the Arab Countries attended this training course. The workshop developed Groundwater Protection approach for integrated water resources management strategy. In the recommendations, both UNESCO Office in Cairo and ACSAD agreed to focus on the integrated land-water management in the Arab region.

The 11th Regional Meeting of the Arab IHP National Committees Meeting aimed at the establishment of an effective, sustained mechanism for IHP Governance and regional cooperation and capacity building in Hydrological Sciences and WRM in Arab Region. The meeting was in Damascus, Syria, 25-28 September 2005. 11th Regional Meeting of the Arab IHP National Committees and the Expert Group Meeting for the Arab Mapping Project were implemented successfully with 72 participants from 17 Arab States. The meeting led to the improvement of water resources policy and management techniques in the Arab Region. The recommendations included that the delegates authorized UNESCO take necessary actions to arrange the 12th IHP in UAE in October 2007 and that the UNESCO Office in Cairo will follow up on IHP priorities and recommendations.

The 3rd Wadi Hydrology Conference aimed at enhancing the state of knowledge for Arab experts, scientists, policy makers and planners in the area of IWR-Wadi Hydrology in the Arab region. The conference took place in Sana'a, Yemen, 12-14 December 2005. More than 100 key water resources experts and researchers and more than 60 technical papers focusing on the hydrological and water resources development and management aspects in arid and semi-arid regions were presented in the conference and more than 12 countries have participated in this conference. Enhanced methodologies and promoted relevant techniques for research and development in Wadi systems were stressed upon, in addition to fostered networking and exchange among Arab scientists and with their international counterpart on one hand and with policy makers on the other. The recommendations included the promotion of IWRM in arid region with more tours on Wadi Hydrology and the promotion of the concept of Echo-Hydrology in the arid and Semi-arid region was highly recommended with special focus on means of protection of echo systems through sustainable ecological management of Wadi systems.

FRIEND Nile Project management and Steering Committee aimed at reviewing the implementation of the project activities and to approve the future activities in addition to reviewing and endorsing the project document of the proposed second phase of the FRIEND/Nile project. The event was held in Addis Ababa, Dar Eslam 21-25 Feb. 2005, with the participation of 18 experts from Egypt, Sudan, Tanzania, Kenya, Ethiopia who reviewed the implementation of the project activities. They also approved the year 2005 work plan and allocated budget. The impact of the activity was very clear as the Steering Committee reviewed and fully endorsed the project document of the proposed second

stage of the FRIEND/Nile FUST project. The Steering Committee also approved the structure of the second stage of the FRIEND/Nile. Therefore, it was recommended that the Steering Committee stress on the importance of preparing quality technical papers as one of the important outputs of the project and it was agreed to support the organization of FRIEND/Nile international conference.

Four Concurrent FRIEND/Nile Workshops were held to review, discuss and finalize the FRIEND/Nile joint research activities and papers of the components of the projects. They were held in Khartoum, Sudan, 25-30 Jul. 2005. About twenty five key experts participated in these workshops representing the research teams of the FRIEND/Nile Project and showing the improvement in the preparation of the technical papers of the project that was recognized by all countries. Countries involved were Kenya, Tanzania, Sudan, Ethiopia and Egypt. The results of the workshops were the improvement of capacity building of the water institutions in the participating countries, and the fostered networking among the FRIEND/Nile themes researchers and the achieved mutual trust and confidence. The recommendations lay under finalizing the preparation of 27 joint technical papers as the research output of the project and continuing the fruitful cooperation and sustainable coordination among the FRIEND/Nile partners.

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1.7 Other activities at a regional level

1.7.1 Institutional relation/co-operation

1.7.2 Completed and ongoing scientific projects

Completion of friend program
Completion of groundwater protection project

2)Future activities

2.1 Activities foreseen until December 2006: -

a) Organizing the annual conference for the National Water Research Center of the Ministry of Water Resources and Irrigation.

b) Dissemination of publications, posters, and all water awareness prepared by Water Awareness Unit of the Ministry of Water Resources and Irrigation of Egypt.

c) Establishing a web site for Groundwater Protection Network in the Arab Region.

d) Participation in the different themes of IHP-VI and publishing all technical reports among the other regional committees of IHP.

e) Organizing yearly competitions among all water scientists on the following subjects:
- Best research on river hydraulic engineering and hydraulic structure.
- Best design of an irrigation project.
- Water resources planning.
- Water quality management.

- Water conservation projects.
- Best PhD theses from Egyptian Universities.
- Water control structures.
- Environment protection.
- Improve efficiency of water conveyance and distribution.
- Best engineer in water management.
- Best M.Sc or PhD theses on water economics.
- Best engineer in the field of irrigation improvement.
- Development of conventional and unconventional water resources.
- Best project of Horizontal Extension.
- Best research on integrated management of water resources.
- Best research on the field of survey engineering.
- Best student's project, final year, Hydraulic and Irrigation Departments at Faculty of Engineering, Egyptian Universities.

f- Completion of Wadi hydrology activity and protection of groundwater.
g- Execution of regular meeting of the Egyptian committee
h- Preparation of one day seminar or workshop to present the committee activity and technical issue to other committees

2.2 Activities foreseen for 2006-2007:-

Water Resources Assessment in Arid and Semi Arid Regions.
Groundwater Development.
Control of groundwater pollution.
Reservoir sediment.
Technology transfer.

2.3 Activities envisaged in the long term

Optimum use of limited water resources.
Updating the policy of water resources utilization.

- **Integrated water resource management at West Delta region and related problems**

Like any other development project, land reclamation projects have both positive and negative environmental impacts. For example land reclamation could provide better habitats for disease vectors and could contribute to consequent increase in diseases. Overuse of water, and/or improper drainage system could contribute to the water-logging and soil Stalinization problems. Irrigation of lands at higher levels could contribute to water-logging

The objectives of this report are identification of prevailing problems that affect the sustainability of the aquifer at West Delta region and testing possible remedial measures.

Recommendations

Continues monitoring for the aquifer from the quality and quantity aspect, results should be evaluated technically and economically, taking into consideration the simplicity and applicability of the solutions. This will finally lead to the selection of most suitable

solutions. Updating the potentiality maps through a regular well inventory, and well licensing system is recommended.
Integrated water resources management is highly recommended

- **Integration of Geographic Information System and Remote Sensing Technology for Studying the Land Reclamation Expansion At West Nile Delta Region**

The major issues concerning water development and management include water conservation and the efficiency of water use, cost recovery, social and environmental factors.
Ministry of Water Resources and Irrigation and the National Water Research Center are given more attention to the preparation of information bases such as hydrogeological, potential, land use, vulnerability and pollution risk maps.
Geographic information system (GIS) and remote sensing (RS) techniques are considered powerful, accurate and time saving in this respect. These techniques are widely used for illustrating and analyzing different phenomena, such as the new development in the desert (land reclamation), residential development (new communities), urbanization, industrial zones, disposal zones, etc….
Western Nile delta region is characterized by rapid development based on surface and groundwater. The increasing in groundwater extraction is accompanied by continuous lowering of water table, and that leads to depletion of the aquifers, increasing the groundwater salinity and also increasing of pumping costs.
In this project two land use maps for study area at two different dates (2/7/1987&30/6/1998) by using remote sensing technique. Also producing change detection map which reflect the changes in reclamation lands during the period from 1987 to 1998 for the selected area that depend on the groundwater by using different GIS analysis for the satellite images. Finally compare the result is compare with the increasing in the extraction rates and the salinity at the study area.

Recommendations

Applying different kinds of change detection technique on the study area and compare between results, continue the monitoring of the development by using satellite image is highly recommended also well, licensing system is recommended in order to avoid ground-water deterioration due to excessive pumping.

- **Environmental Impact Assessment for Drinking Water in Rural Areas: Assessment of Drinking Water Using Hand Pump System**

Project Objectives

The overall objective of the project is to develop means for the protection of shallow groundwater used by hand-pumps for drinking purposes in the rural areas.
The specific objectives of the project are:

- Investigation and identification of problems related to bad sanitary conditions around hand-pump used for domestic water supply in rural areas.
- Determination of the extent of shallow groundwater pollution and possible remediation and protection measures.

- Constructing the recommended hand-pump system on the selected sites.
- Design and implementing have related public awareness campaigns.
- Preparation of hand-pumps construction guidelines.

Specific conclusion and recommendation

- The project activities implemented achieved substantial progress towards the project specific objectives.
- Local authorities, representatives of inhabitants and community participation have been successfully involved in the project implementation.
- The selected site of Arab El Aiaida village at Qaliub district in the Qalubiya governorate and Meshrif village in Gharbiya have been proved to be successful for the implementation of the project activities as a full-scale demonstration

- **Environmental management of groundwater (south el their –west delta)**

Groundwater constitutes an important source of fresh water that represents 20% of the available fresh water resources of Egypt. However many worries are increasingly being voiced on the dangers that surround the groundwater.

The main elements of these worries are related to depletion as a result of over extraction activities and quality deterioration brought by many modes of pollution. Therefore, actions must be taken to protect groundwater from degradation; this calls for a simulation of groundwater flow and quality.

The area concerned in this report occupies South El Tahrir area, which is a part of West Tanta region. The study area is West Tanta. The northern boundary of the study area is Alexandria Governorate and the western south boundary is Wadi El Natrun. The study area covers an area of about 2600 Km^2. Rosetta Branch is passing through the area.

The project aims at simulating the present situation of the study area to enable forecasting future trends in the groundwater heads and quality in relation to over extraction activities. The groundwater suitability for drinking depends on the standards and limits of WHO guidelines of the various elements in groundwater. The study area suffers from increasing of Total Dissolved Solid (TDS), Iron (Fe) and Manganese (Mn) concentrations in the groundwater due to doubled extraction activities.

This work is done within the framework of the protocol done between RIGW (Research Institute for Groundwater) and Behera Drinking Water Company and Drainage (BWAD).

The conclusions that can be obtained from this work are:

- The maximum drawdown will be 20m and a decline of the aquifer storage will occur after 20 years.
- The present concentration of TDS, Fe and Mn are larger than the WHO limitations at some locations.
- The change in the concentration of TDS and Mn due to double extraction policy is smaller than the WHO limitations and there is no any change in Fe concentration.

In accordance with the above conclusion, and looking forward for the extended future research dealing with the subject matter, it is recommended to:

- Add local studies in the proposed sites for drilling well fields.
- study the environmental impact of all activities that involve changes of the groundwater's flow and quality.

GERMAN NATIONAL REPORT ON IHP-RELATED ACTIVITIES

1 ACTIVITIES UNDERTAKEN IN THE PERIOD SEPTEMBER 2004 - JUNE 2006

1.1 Meetings of the IHP National Committee

1.1.1 Decisions regarding the composition of the IHP National Committee

No changes

1.1.2 Status of IHP-VI activities

All projects have been accomplished according to plan.

1.1.3 Decisions regarding contribution to/participation in IHP-VII

University representatives involved in hydrological issues were invited to Koblenz for consultation. During this one-day meeting the workshop participants discussed which main fields of research of the individual universities could be integrated into which IHP and HWRP projects. This would produce synergies, foster institutional cooperation and promote interdisciplinary research and studies. With the establishment of a national network the following activities are to be carried out:

- register of existing research activities
- foundation of a working group on e-learning
- input of the proposals from the network into the preparation of Phase VII of the IHP
- set-up of an e-mailing list for information exchange
- list of Master and PhD study courses in Germany, conducted in English

In particular it was discussed which research topics were to be considered relevant for Phase VII of the IHP (2008-13). Topic proposals were: water and food; water and megacities; water and health; data issues; knowledge development, management and transfer. The suggestions agreed upon for Phase VII of the IHP were passed on to the UNESCO IHP Secretariat.

A working group consisting of university representatives has been established to identify the research themes that Germany could contribute to the IHP programme.

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

National workshop with university representatives
11 February 2004, Koblenz, Germany

One of the functions of the IHP/HWRP Secretariat is to make national contributions to the two worldwide hydrology programmes IHP and HWRP. For this purpose the collaboration already well established between the German IHP/HWRP and the German universities has been strengthened and expanded.

National workshop with representatives of water-related ministries and federal scientific institutions
9 December 2004, Koblenz, Germany

Germany's commitment to support the two significant water programmes IHP and HWRP of the UN specialised agencies UNESCO and WMO with national contributions leads to a great need for information on current and planned national research programmes. In order to meet these requirements the IHP/HWRP Secretariat needs to have knowledge about the existing resources in the field of hydrological research in Germany. Possible approaches to a transparent flow of information were discussed at a national workshop held in Koblenz with representatives of water-related ministries and federal scientific institutions. The establishment of a research information platform (FIP = **F**orschungs-**I**nformations-**P**lattform) was considered a suitable instrument. Such a research information platform will prove to be extremely useful not only for the IHP/HWRP Secretariat but also for all the institutions involved in FIP. The objectives of FIP are:

- utilisation of national programmes and projects for the IHP and HWRP
- enhancement of information exchange between partners
- transparency and synergy effects for national programmes and projects.

National workshop with university representatives
12 July 2005, Koblenz, Germany

IHP Phase VII
For the further planning of IHP Phase VII a national working group was commissioned to consider the hitherto proposed themes and, if necessary, to draft complementary proposals. The working group then identified focal points of the themes that could be developed jointly by a group of German universities.

As a further development a research concept for a selected focal point will be worked out, which it is hoped will be funded by national institutions. The concept is based on the cooperation of a consortium of universities with the aim of incorporating the research results into the IHP and HWRP.

Education and training
E-learning modules for Bachelor and Master study courses are offered on the Internet by various German universities. There also exists an exchange service for e-learning modules. This is of particular interest to those from IHP member countries.

The proposal was made to establish a theme pool for training courses abroad at the IHP/HWRP Secretariat, allowing those interested to select themes from the pool. The setting-up of a summer school in Germany or at one of the international UNESCO centres concentrating on a certain subject area was also suggested and is now in preparation.

The IHP/HWRP Secretariat distributed a list of international Bachelor (BSc), Master (MSc) and Doctorate (PhD) programmes for water and water-related subjects in Germany to all IHP National Committees. The Ministry of Foreign Affairs distributed it further to all its diplomatic missions.

1.2.2 Participation in IHP Steering Committees/Working Groups

Cooperation in international steering committees and expert panels

Various German scientists were nominated to the expert panels of IHP and HWRP with the result that contributions were made on behalf of Germany to FRIEND, WWAP[1] and the Guide to Hydrological Practices of WMO. The concept of a WMO Manual on the Estimation of Design Floods will also be implemented under the guidance of German university representatives.

At the 16th Session of the Intergovernmental Council (IC) the Director of the IHP/HWRP Secretariat was elected to be one of the four vice-chairmen of the IC and is thus a member of the IHP Bureau. The Bureau supports the IHP Secretariat in Paris, assists the International Task Force and prepares the biennial IC sessions. In this way German suggestions can be brought up directly in the steering committees of IHP. The IHP Bureau has asked Mr Demuth to represent the IHP in the steering committee of the International Flood Initiative (WMO/UNESCO).

The HWRP is the responsibility of the Commission for Hydrology (CHy), which meets every four years. In the inter-sessional periods the content of the programme is controlled by an Advisory Working Group (AWG). The Director of the IHP/HWRP Secretariat was voted member of this group and coordinates the subject area Disaster Mitigation – Floods and Droughts. The tasks include coordination for the preparation of a manual on the estimation of design floods and a manual on the estimation and prediction of low flows.

1.2.3 Research/applied projects supported or sponsored

See 1.5 Publications

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

Asian Institute of Technology, Bangkok, Thailand; Humid Tropics Centre, Kuala Lumpur, Malaysia; IHP-Danube Regional Cooperation Danube; International Commission for the Hydrology of the Rhine Basin; IHP National Committees of the Netherlands, Norway and UK.

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

International study course Hydrogeology in Arid Catchment Areas
27 September 2004 to 8 October 2004, La Serena, Chile

The study course Hydrogeology in Arid Catchment Areas was organised by the UNESCO Centre of Water in the Arid and Semi-arid Zones of South America and the

[1] World Water Assessment Programme

Caribbean CAZALAC (Centro del Agua para Zonas Áridas y Semiáridas de América Latina y El Caribe), by the Ruhr University of Bochum and the University of La Serena. The German IHP/HWRP Secretariat financially supported the course as part of its programme for education and training. Altogether 32 participants from Argentina, Bolivia, Chile, Germany, Paraguay and Peru completed the training course.

The thematic content of the course was intended for students shortly before completion of their studies (major field of study: hydrogeology, applied geology, water resources management) and for professionals working for institutions and organisations dealing with water resources management in Latin-American countries. The objective of the course was to impart basic knowledge for the study of groundwater resources. Particular importance was attached to the practical application of fieldwork methods and the evaluation of their results, with the help of which problems concerning the quality and quantity of water can be clarified.

International Training Course on Hydrological Droughts and Low Flows
26 – 30 September 2005, Kuala Lumpur, Malaysia

The rapid growth of population in the last 100 years has had a massive impact on all natural resources and on water in particular. There is no doubt that the continuing population growth will have a huge impact on the use and distribution of water as a resource. The impact will be greatest when the quantity of water is reduced, that is during periods of low flow and drought. The sustainable management of water resources is vital. Drought is a natural phenomenon with serious consequences. About 280,000 people died and damage amounting to several tens of millions of dollars occurred between 1991 and 2000 as a result of drought. For the sustainable management of water resources, especially during periods of low flow, it is necessary to estimate the spatial and temporal variability of drought. This requires an understanding of the hydrological processes and the application of appropriate assessment methods. These include frequency analysis, time series analysis, simulation, modelling and procedures for ungauged catchment areas.

Against this background the international training course on Hydrological Droughts and Low Flows was held at the Regional Humid Tropics Hydrology and Water Resources Centre (HTC), Kuala Lumpur, Malaysia from 26 to 30 September 2005. The objective of the course was to teach techniques for the analysis of hydrological droughts. The participants came from hydrological services and universities of Thailand, Malaysia, the Philippines, China, Laos, Vietnam, Sri Lanka, India, Indonesia and New Zealand.

The qualitative, conceptual understanding of the characteristics and processes of drought, the detailed presentation of assessment methods and tools, and practical examples formed the focal point of the course. The assessment methods and tools were demonstrated by means of sample datasets and made available on a CD. The CD includes a global, a regional and a local dataset, and the methods are presented as self-guided tours. The phenomenon drought and its worldwide diversity was shown by means of a global dataset of discharge series, whereby regional and local aspects were explained by the combination of hydrological time series and information on the individual catchment areas. The anthropogenic impact on drought, ecological issues and examples of procedures for the design and implementation of water resources management plans were discussed. Not only were established procedures and methods

presented but also the latest results of research on drought. Some course participants presented case studies on low flow and drought from their own countries. The combination of theory and practical examples stimulated a lively exchange of opinion and knowledge which was reflected in the positive comments made by all the participants in their final evaluation of the course.

The main topics of the course were drought and hydro-climatology, spatial and temporal variability, origin of drought, characteristics of drought, frequency analysis, regionalisation and anthropogenic impacts. Using regional datasets from Malaysia one group of participants concentrated on the practical application of frequency analysis and another on model simulation of anthropogenic impacts on the processes.

Each participant was given the textbook Hydrological Drought, Processes and Estimation Methods for Groundwater and Streamflow. With the help of this textbook, the accompanying CD and the exercises carried out during the course, it will be possible for the participants to introduce the new procedures into the operational work of their national hydrological services.

The course material was based on the results of the long intensive international cooperation of the Northern European FRIEND Low Flow group, that elaborated teaching modules on the analysis of hydrological drought. The lecturers, who all have many years' experience in the field of drought research and teaching, came from the United Kingdom, Norway, the Netherlands and Germany.

The international training course Hydrological Droughts and Low Flows was jointly organised by the German IHP/HWRP National Committee, UNESCO Jakarta Regional Science Bureau for Asia and the Pacific, WMO and UNESCO and the Regional Humid Tropics Hydrology and Water Resources Centre (HTC), Kuala Lumpur, Malaysia.

1.3.3 Participation in IHP courses

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

1.5 Publications

The papers presented and the highlights of the discussions at the international workshop Value of Water – Different Approaches in Transboundary Water Management have been published as Heft 3 of the IHP/HWRP-Berichte series. A case study titled Runoff from Nepalese Headwater Catchments – Measurements and Modelling has been published as Heft 4 of the IHP/HWRP-Berichte series.

Information on the latest events from international programmes and projects is regularly posted on the website of the IHP/HWRP Secretariat. The webpage 'Did you know?' has been extended further. It gives information based on the World Water Assessment Report on worldwide water supply, water scarcity, the competitive demand on water, extreme events, ecosystems and important water resources of the earth.

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

International conference Hydrology of Mountain Environments
27 September to 1 October 2004, Berchtesgaden, Germany

The aim of the conference was to point out the ecohydrological needs of mountainous environments, to assist in revealing deficits and defining future requirements for regional study concepts for the mountains of the world with respect to regional infrastructure and existing scientific potential.

The conference was divided into three main thematic sessions. The first was concerned on the one hand with instrumentation, data collection and processing, networks, methods and modelling, and on the other hand with regional aspects of mountain hydrology. The papers ranged on a spatial scale from the hydrology of mountain slopes to studies of the whole Himalayan region. As regards content a bow was drawn from the estimation of precipitation to tracer hydrology procedures and comprehensive modelling of a catchment area. Numerous case studies, especially on the impacts of climate change, completed this session.

The second session dealt with atmospheric, hydrological and ecohydrological interactions, the role of snow and ice, and the hazards of water-induced geomorphic processes. A wide spectrum of papers covered, amongst others, the impact of beaver colonies on runoff conditions, studies of glacier retreat on various continents and reports on extreme slides of mud and scree in Japan and Nepal.

The last session was concerned with integrated model-based studies including those of socio-economic issues and their implementation in biosphere reserves. Although several interesting approaches concerning hydrology, ecology, and land use and environmental changes were presented, the attempt to integrate social economy was rare.

A volume with selected papers was published in 2005.

Value of Water – Different Approaches in Transboundary Water Management
10 – 11 March 2005, Koblenz, Germany

The international workshop Value of Water – Different Approaches in Transboundary Water Management was held in Koblenz from 10 to 11 March 2005. The aim of the workshop was to identify the various assessments, perceptions and management approaches to transboundary water management in different culture groups.

The value of water encompasses the complex interactions between human beings and water as a natural resource. The value of water has different meanings for people with different societal, cultural and religious backgrounds. The varying approaches to valuing water are particularly apparent in conflict prevention and transboundary water management cooperation. As a result of overexploitation, pollution and mismanagement, water is becoming scarcer in many regions of the world. Its various uses, such as irrigation, process water, water for industrial and domestic uses, and drinking water, compete with each other and this can often be the cause of conflict.

Value of water in different societies
The modern western approach to water resources management often clashes, when transferred to less developed regions and societies, with the traditional concepts of the value of water held in these communities. Whereas a technocratic, utilitarian and market-oriented approach is adopted in modern states, traditional societies consider the value of water holistically, not only in a social context but also from a cultural and spiritual perspective. For them the economic value of water is of less importance.

Water figures prominently in all the major religions of the world. It is considered a sacred gift of god and the religious rules greatly influence endeavours for a rational water resources management. The religious dimension of the value of water in many societies is often underestimated.

Amongst the stakeholders in a transboundary catchment, there are, apart from the local and regional parties involved, often stakeholders from international non-governmental organisations. Their knowledge and also their funds can curb or promote developments. Their activities focus on ecological and environmental aspects for a sustainable development.

Value of water in transboundary basins in different regions
Two case studies, one of Lake Constance in Europe and one of the Okavango basin in central southern Africa, describe the procedures and endeavours made for the joint management of the transboundary water resources. Based on the historical development in both regions, access, use and various stakeholders were analysed. The development of joint decision-making bodies and the implementation of decisions from conviction lead to conflict-free cooperation and hence to sustainable management.

In many places groundwater is available as a significant natural resource. Many aquifers extend across several states and the coordination of transboundary management is necessary to avoid irreparable damage such as overexploitation, salinisation and contamination. Especially in arid zones the boundaries of groundwater catchment areas differ considerably to those of surface watersheds.

Value of water under stress conditions
Stress situations can have either quantitative reasons, e.g. flood or drought, or qualitative reasons such as salinisation, nutrient input, rise of temperature, etc.. The value of water is shown by how far qualitative pollution in form of, for example, nutrient inputs is minimised or completely prevented. For the assessment and analysis of interests of the different kinds of water use both the physical and socio-economic conditions in the catchment area have to be adequately recorded and taken into account. Risk assessment and risk prevention such as quantitative stress conditions are part of management strategies and serve to optimise the system. Based on a case study in the Netherlands an attempt was made to quantify the economic, ecological and social consequences.

The political process, which can be considerably facilitated by economic analysis, reciprocal compensation and indication of win-win situations, is decisive for transboundary cooperation. Emphasis is on cost analysis for the joint use of the water and on service improvement for all those involved. Case studies in Africa show that

environmental and social aspects are rarely considered and most approaches are sector-oriented. Shared use and mutual benefits make an optimal water use possible.

Cooperation despite differing perceptions of the value of water
Case studies from different regions, river basins in Namibia, the Danube in Europe and the Mekong in South-east Asia, illustrated the approaches to cooperation both within a state and between states. Problems between local communities and central governments have an impact on international relations; and international agreements have an impact on the local level. A variety of users from industry, agriculture and the environment have to be involved and they in turn are active internationally, bilaterally and intra-nationally. Conflict resolution depends on reliable datasets, the transparent flow of information and the involvement of the general public in the decision-making process. Interest in the joint use of one and the same resource is always maintained when all parties are able to participate in its evaluation.

The workshop was jointly organised by the IHP/HWRP National Committees of Germany and the Netherlands, together with the Bonn International Center for Conversion (BICC), UNESCO and WMO.

International conference on Integrated assessment of water resources and global change: A north-south analysis
23 – 25 February 2005, Bonn, Germany

The main objective of the conference Integrated assessment of water resources and global change: A north-south analysis was to analyse the challenges that are encountered in the integrated assessment and management of water resources in large river basins in the context of global change. Scientists and managers from north and south were given the opportunity to discuss international research efforts concerning water-related issues and their translation into more practical methods and coherent approaches.

Professor Malin Falkenmark from the Stockholm International Water Institute opened the conference with a keynote address. She pointed out the necessity for a shift in thinking to solve the ever-increasing problem of hunger in the 21st century. In this context she called for the focus of water resources management to be moved from "blue" to "green" water. Blue water comprises the 30-year-old mission to secure adequate water supply and sanitation. Green water serves to ensure the production of food. 70 times more water is needed to produce food for one person than for domestic consumption.

The main themes of the conference were: water science and policy interactions, international water programmes, stakeholder perspectives, water resources data, scaling, and integration.

Water science and policy interactions
Managers of large international water programmes, lawyers, social scientists and water resources managers showed how science influences policy at regional, national and global levels. It was revealed how relevant scientific information in appropriate form can be accessed by decision-makers.

International water programmes
Representatives of nine international programmes for which water plays a significant role presented their views on the approaches of integrated water resources management in river basins. Even though the various programme objectives such as agricultural irrigation, drinking water and health, or sanitation are different, it was evident that there is a certain amount of overlapping as far as databases and programme implementation are concerned. The main outcome of this session was therefore the demand for better cooperation between the programme coordinators.

Stakeholder perspectives
Case studies from Europe, North America and Africa were presented, showing very different procedures to involve stakeholders in the decision-making process. A general request was made that the results of pilot projects be transferred to other and larger schemes. The requirements for this were considered to be the creation of learning partnerships and the monitoring of projects by persons who accept to become mentors over a long period.

Water resources data
Apart from a few case studies, which presented examples for the possibilities of applying hydrological water resources data in models and data information systems, the more general papers pointed out the necessity of strengthening input in databases as a basis for all future water resources projects. The importance for solving global problems of storing data in global data centres was stressed. Here reference was made to the WMO resolutions for the free exchange of hydrological and climatological data. Finally, greater efforts in collecting socio-scientific and economic information in future were called for.

Scaling
Various model approaches for spatial and temporal upscaling and downscaling of hydrological model parameters were presented. The first approaches of upscaling in socio-economic models were also shown.

Integration
Case studies from the northern and southern hemispheres showed very different approaches to the integration of social and physical components in models of water resources management, due to great differences in bio-geographical regions and societies. The introduction of indicators was propagated by economic scientists as a possible solution for simplifying complex relationships. A linking of socio-economic models with scientific models was also proposed. However, it was pointed out that it would be a long time before this kind of model could be used to help decision-makers.

In the ensuing discussion it was agreed that balancing the demands made on water by both humans and nature is a major challenge. A new approach in the form of water resources management will not suffice alone to mask the lack of interdisciplinary cooperation in the past. A paradigm shift between the groups always needs to be created in order to bridge the gap between social and natural scientists.

Also the lack of knowledge transfer between the northern and southern hemispheres is still considerable and especially the ability to apply science and its results is often inadequate. Well-qualified scientists returning to their home country frequently find themselves in an unreceptive political environment.

Generally, scientists should play the role of moderator, presenting scientific results to keep local decision-makers informed, not to enforce political decisions. This would improve the dialogue between scientists and politicians. Conveying uncertainties in the results is particularly difficult.

The conference was organised by the Global Water System Project (GWSP), the secretariat of which is located in Bonn, Germany. The German IHP/HWRP National Committee was involved, as regards funding, content and personnel, in the planning and carrying out of the conference, as were also several other national and international institutions.

The results of the conference will be published by Springer in their Water Resources Management series.

1.6.2 Participation in meetings abroad

Water as a good and a service: decision-making methods and tools for regional water management with respect to uncertainties
International workshop, 28 and 29 January 2005, Wageningen, Netherlands

The value of water encompasses the complex interactions between human beings and water as a natural resource. Water itself, even drinking water, is not a product in the real sense, also not a normal article of trade, but a heritage and an element of the water cycle. The European Water Framework Directive (WFD) views the introduction of the recovery of costs for water services as an important factor for the sustainable use of water. There is ample scope in the proposals for the realisation of these aims. It is, however, important that the price of water should be based on comprehensive economic analyses. This means the inclusion of costs for the conservation of the environment, for the economy and for the resource itself.

Water as a good
Different standards of water quality lead to varying costs and benefits. The political setting of definite threshold values is extremely important. For example, water from the river Rhine is used through bank filtration as drinking water by approx. 12 million people and by varied branches of industry as process water. Despite the effective treatment of used water in sewage plants, additional substances such as endocrine substances (pharmaceuticals, etc.) or biologically non-degradable substances (viruses, bacteria) are fed into the river water. The aim of the WFD is not only to preserve the usability of the water and the functional characteristics associated with this, but also to improve the ecological quality of water.

Uncertainties
For the quantitative assessment of the components of the hydrological cycle and the calculation of the available water, uncertainties have to be assumed, be it for epistemic, scientific or technical reasons. Uncertainties also arise from projections of population growth, water demand and climate variability. To this are added factors of a subjective nature, such as psychological and hypothetical considerations or plausible reasons. A sound prediction is complicated by such boundary conditions.

Planning aspects
Requirements for the use of water for recreation differ from those for industrial or agricultural purposes. The supplier of drinking water makes again quite other demands

on the quality and quantity of water. There is no absolute value for water; the various uses compete with each other. Water is a means of existence just as much for flora and fauna, a requirement that needs to be respected by humans, but it can be monetarised or subjected to a cost-benefit analysis only under certain conditions. Land-use planning with respect to water has to be based on the interactions between the water and regional demands made on it.

The supply of water as a service?
Does the price of water cover all economic costs and all costs incurred for the protection of water as a resource? Water cannot only be considered as a public good, but has also to be regarded as a natural resource that is traded regionally and nationally and thus has its price. The challenge is to recognise and record the socio-economic, physical-geographical and ecological interactions. Furthermore, it is necessary to constantly reflect on the measures taken during the management of water as a resource.

The workshop was organised jointly by the IHP/HWRP National Committees of the Netherlands and Germany.

1.7 Other activities at regional level

1.7.1 Institutional relations/cooperation

1.7.2 Completed and ongoing scientific projects

See 1.5 Publications.
Report on forest hydrology in cooperation with the Valdai Branch of the State Hydrological Institute of Russia
Report on irrigation control: towards a new solution of an old problem.

2 FUTURE ACTIVITIES

2.1 Activities planned until December 2007

International workshop on value of water
International workshop on megacities

2.2 Activities foreseen for 2008-2009

2.3 Activities envisaged in the long term

In the process of planning.

NATIONAL REPORT OF THE REPUBLIC OF INDIA
April 2004 – March 2006
(IHP NATIONAL COMMITTEE OF INDIA)

FOR THE 17th SESSION OF INTER GOVERNMENTAL COUNCIL OF IHP-UNESCO, 3-7 JULY 2006, PARIS

PREAMBLE

The hydrology of Indian sub-continent, comprising an area of 329 million ha, varies from season to season and region to region due to unpredictable changes in climatic conditions. Variability of rainfall every year is a major constraint for utilizing the available water in the rivers. The quantum of water available per capita in India is low compared to the many developed countries. Thus, increasing demand of water for domestic, agricultural, industrial and other purposes along with natural climatic changes is a major concern for the hydrologists and water resources planners in the country.

Ministry of Water Resources (MoWR), Government of India is responsible for the development and regulations of country's water resources. Besides, every State also has a separate Ministry to develop and regulate the water resources. The central organisations under MoWR responsible for different activities are Central Water Commission (CWC), Central Ground Water Board (CGWB), National Institute of Hydrology (NIH), Central Soil and Material Research Station (CSMRS) and Central Water and Power Research Station (CWPRS).

The National Institute of Hydrology is the nodal organisation for coordinating the water related science and technology activities in India and provides Secretariat to the IHP National Committee of India, which is known as Indian National Committee on Hydrology (INCOH). In order to carry out specific activities in various fields of hydrology and water resources development, the IHP National Committee consists of a main body and three sub-committees. The Committeeand its members drawn from central and state government agencies as well as experts from academic and research organizations (as given in Appendix I). The Ministry of Water Resources (MoWR) provides financial support to IHP National Committee to carry out the following activities:

- To advice central and state governments and agencies on matters related to hydrology.
- To appoint special task force/expert panels to consider special problems to advice the IHP National Committee.
- To prepare and periodically update the state of art in the country on different branches of hydrology by collating relevant information from the national and international organizations and disseminating the same.

- To undertake studies on historical appreciation of development of hydrology and to introduce perspective planning for research in the field.
- To disseminate information related to hydrology through publication of journals, research news/digests, etc.
- To recommend recognition of centers of excellence on different branches of hydrology and to recommend central funding thereof.
- To recommend funding for the infrastructure development of hydrological research institutions.
- To maintain effective co-ordination so as to avoid overlaps in the research programs of different institutions.
- To promote programs for human resources development leading to the specialization of research staff and recommend encouragement for the outstanding research personnel.
- To identify areas in the field of hydrology which need immediate attention or in which new methods are to be introduced for bringing the level of research activities in the country to the international standards.
- To prepare, co-ordinate and recommend funding of research programmes to be taken up by the institutions in the country on basic and applied research, action strategic research, and other areas related to research in hydrology.
- To encourage the national institutions to take research studies and development activities in the fields, which have been identified by the Committee, as thrust/priority areas; where necessary, the Committee may itself nominate the institution for undertaking research/development in a specified subject.
- To encourage voluntary professional bodies, non-commercial Non Governmental Organizations (NGOs) to take up R & D activities, dissemination of knowledge, participation in mass awareness programme, etc. in hydrology.
- To maintain effective cooperation with other National Committees/Boards, related GOI/state ministries, CSIR laboratories, IIT's engineering colleges and polytechnics, universities and other academic institutions.
- To encourage indigenous industry through loans to take up technological developments in hydrology.
- To monitor the progress made by executing institutions on research schemes in the field of hydrology.
- To promote and coordinate effective participation of India in the international programmes related to hydrology and to act as national committee for such international bodies, where required.
- To promote education, training and manpower development programmes in the field of hydrology.
- To arrange and conduct seminars/conferences/workshops, to support mass awareness programs, and to arrange R & D review sessions on hydrology.

IMPORTANT MEETINGS HELD DURING APRIL2004-MARCH 2006

(I) Meetings of IHP National Committee

The members of IHP National Committee meet twice in a Calendar Year to review the following activities:

(i) Funding for research projects on IHP related activities to various agencies under R&D programme of Ministry of Water Resources. At present there are 32 ongoing research projects of about Rs. 5,00,00,000 (US $ 10,00,000) being funded by the IHP National Committee of India.

(ii) Sponsoring Seminar/Symposium/short-term courses by various agencies including National Symposium on Hydrology organized by IHP National Committee. During the period April 2004- March 2006, Twenty such events involving an expenditure of about Rs. 7,00,000 (US $ 15,000) were sponsored by IHP National Committee.

(iii) Publication of Hydrology Review Journal- "JVS" every year.

(iv) Publication of "State-of-art" report on various Themes of Hydrology.

(v) Organization of IHP-UNESCO sponsored activities in India (GWADI, International Workshops, etc.).

The 27th meeting was held on 30th April, 2004.
The 28th meeting was held on 1st December, 2004.
The 29th meeting was held on 15th June 2005.
The 30th meeting of INCOH was held on 14th December 2005.

(II) Steering Committee Meetings

The 21st, 22nd and 23rd Steering Committee (a sub-committee of IHP National Committee) meetings were held on 24 August 2004, 3rd June 2005 and 3rd August 2005 respectively to consider financial support from IHP National Committee for organizing Conferences/seminars/symposia/short-term courses etc.

(III) Research Committee Meetings

The 6th and 7th meeting of Research Committee, Ground Water (a sub-committee of IHP National Committee) were held on 7th December 2004 and 21st February, 2005, respectively, in which new research projects related to ground water hydrology submitted for funding were discussed.

The 12th and 13th meeting of Research Committee, Surface Water (a sub-committee of IHP National Committee) were held on 5th January 2005 and 9th September 2005, respectively, in which new research projects related to surface water hydrology submitted for funding were discussed.

IMPORTANT EVENTS HELD DURING THE YEAR 2005-06

(I) Organization of International G-WADI Modeling Workshop and Asian G-WADI Regional Meeting

The first International G- WADI modelling workshop was held during 28th February to 4th March at NIH, Roorkee India. The meeting was attended by 45 scientists from eighteen countries including representatives from the Asian region, South America, North Africa, Southern Africa, the Middle East, Europe, North America and Australia. Presentations on various aspects of modeling and data resources and technological advances in observations and data systems were made and a series of hands-on computer workshops were held. Modeling software and tools were provided to the participants.

The workshop included detailed discussion of priority needs in the areas of data, models and calibration and uncertainty methods. The workshop demonstrated that there was a lack of awareness of the capability of current methods for automatic optimization and the analysis of uncertainty, but great interest in the applicability of such methods, particularly in the context of model application to the un-gauged catchments.


G-WADI ASIA
Regional Meeting
DFID


G-WADI ASIA
International G-WADI Modelling Workshop a
Regional Meeting
(28th February-4th March, 2005)
Sponsored by
DFID

The key recommendations of the workshop are as follows:

- G- WADI, through its website, should provide access to models and supporting global data sets together with links to useful websites
- There is a need for guidance on model suitability and assessment of the worth of models
- There is a need for guidance and tutorials on methods of model calibration and uncertainty analysis.
- A number of arid/semi-arid catchments should be nominated and data made available for model testing and inter-comparison.
- On modeling methods, links should be established with relevant international Problems of ungauged catchments and the need for guidance from programmes such as PUBS, GEWEX.
- It would be useful to post information on model use and experience in different countries on the web site and to provide chat room facilities for arid zone modelers.
- The development of tutorial material and supporting software, including examples from developing countries be made available via the G- WADI web-site.
- The development of a web-site guidance note for model users on appropriate methods of optimization and uncertainty analysis for the different categories of model, including GIS-based semi-distributed and distributed models be made available. The guidance note should include advice on strategies for model regionalization.

(II) Brain Storming Session for IHP activities in India

To look up for the possibility of India's role in thrust areas of IHP-VII (2008-2013) activities of UNESCO, one day brain storming session was organized by INCOH on Friday 20th May, 2005. The Department of Civil Engineering, Indian Institute of Science, Bangalore hosted the brain storming session and provided all logistic support. Four technical sessions were held on each proposed Theme.

Further, the concerns and reservations of the Indian National Committee, MoWR, Government of India for IHP VI-Theme IV- Focal area 4.3: Water Conflicts- Prevention and Resolution and for IHP VII- Theme II- Governance and Socio-economics were duly shared with the Members.

(III) UNESCO sponsored International Workshop

An International Workshop on "Impacts of Reforestation of Degraded Land on Landscape Hydrology in the Asian Region" was organised at the National Institute of Hydrology, Roorkee during 06 – 10 March 2006. The Workshop was primarily intended to review the on-going research work in the Asian region concerning the hydrological impacts of forestation of degraded land with particular reference to high and low stream flows and groundwater recharge. The other objectives include setting up of a regional

network of research basins to investigate the impacts of reforestation. The workshop primarily addressed the following three areas:

1. Land cover changes and associated soil and eco-system degradation
2. Changes in water flows linked with land cover change
3. Water quality, erosion and sedimentation vs. land cover change

The workshop was sponsored and supported by the UNESCO-IHP Programme. The five days event was co-sponsored by ICAR, NIH, INCOH,CSIR and DST. Dr K D Sharma, Director NIH, Dr Mike Bonell from UNESCO Paris and Dr Bhanu Neupane from UNESCO Office, New Delhi coordinated the workshop.

28 invited delegates from Sri Lanka, Malaysia, Pakistan, Nepal, China, Iran, Indonesia, Australia, New Zealand, Bangladesh, UK, France, Thailand and India participated in the workshop.

The following recommendations were emerged from the Symposium:

- ✓ Establishment a network of experimental basins in the South-East Asia for undertaking forest hydrology studies.
- ✓ Urge governmental and civil societies to initiate and prioritize forest management research programmes.
- ✓ Request UNESCO – Inter-Governmental Council to consider Roorkee declaration as a resolution and provide sufficient funds for promoting forest hydrologic research

(IV) Organization of Research and Development (R&D) Sessions

The 2nd R&D Session of IHP National Committee was held at Mahatma Gandhi State Institute of Public Administration, Water Resources & Environment Directorate, Government of Punjab, Chandigarh during 30th Sept. to 1st Oct. 2004. It was inaugurated by Sri K.R. Lakhanpal, Principal Secretary, Irrigation & Finance, Govt. of Punjab. Sri R. Jeyaseelan, Chairman, IHP National Committee & Chairman, Central Water Commission, New Delhi presided over the inaugural session.

The 3rd R&D Session of IHP National Committee was held at National Geophysical Research Institute (NGRI), Hyderabad during 26-27 September 2005 to review the progress of on-going research projects funded by the Ministry of Water Resources, Government of India. It was inaugurated by Dr. S.K.Sikka, Principal Scientific Advisor, Government of India. Dr. V.P.Dimri, Director, NGRI, Hyderabad was the Guest of Honour for the inaugural session.

In the R&D sessions all ongoing research projects were presented by the Principal Investigators for which funds have been provided by the Ministry of Water Resources and a critical review of each project was done by the experts.

(V) Organisation of 11th National Symposium on Hydrology

The 11th National Symposium on Hydrology with a focal theme on "Water Quality" was organised during November 22-23, 2004 at National Institute of Hydrology, Roorkee. Shri R. Jeyaseelan, Chairman INCOH and Chairman Central Water Commission, New Delhi inaugurated the Symposium and Prof. Prem Vrat, Director, Indian Institute of Technology, Roorkee was the Chief guest for the Valedictory function.

The following recommendations were emerged from the Symposium:

1. Increasing pollution threat to the rivers/streams, exceeding permissible limits prescribed by Bureau of Indian Standard for different uses of water, requires special attention towards adoption of cleaner technology for safeguarding the health of the rivers including ecosystem maintaining by the rivers.
2. For assessment of minimum flow in a stream or a river, which could be either determination of flow for the given pollution load or the permissible pollution load for the given flow, suitability of alternatives should be examined before accepting or rejecting any scheme.
3. Methodology may be developed for prediction of sediment yield considering the various land uses and developmental activities in the river basins.
4. Use of the advanced optimization techniques such as Differential Evolution and Simulated Annealing should be encouraged for multi-objective planning and operation of the water resources systems for optimum utilization of water resources.
5. Judicious artificial groundwater recharge measures should be taken up for groundwater management in over-exploited areas.

6. Using hydrological software packages, optimal pumping strategies should be derived in order to contain the contaminants in aquifer system.
7. Numerical models should be used to study the mechanisms of contaminant transport in groundwater system.
8. Preventive measures should be taken up to control the intrusion of saltwater in coastal aquifer systems.
9. Combination of surface and bore well geophysical data should be encouraged to delineate the saline and fresh water aquifers.
10. Mass awareness program must be conducted by different central and states govt. agencies, teaching institutes and other organisations in a big way to solve water quality problems of rivers in India.
11. Biological parameters must be given due importance for assessing the fresh water quality of Rivers in India.
12. Studies on Lakes and wetland should be strengthened and outcome information should be shared among stake holders for its implementation.
13. Pesticides monitoring in water bodies is an important area of research.
14. Pollutants shall be studied along with the direction of flow. Further, the studies should come up with remediation measures.
15. In keeping with area specific severe groundwater pollution and apprehension of sub-terrainian discharge of highly polluted effluent, investigations to establish such practices is needed so that appropriate measures to control such practices could be evolved.
16. In the field of water quality modeling, there is a need of advanced techniques such as ANN, Expert System, and DSS.
17. Various water quality models need to be validated on micro to macro scale and these models shall be coupled with ground water model for management of water resources.
18. Development of suitable innovative technologies in water treatment is the most important agenda for water engineers.
19. Physical, chemical treatment technology is to be replaced by physico-chemical and bioremediation technology system.
20. Research carried out in lab.scale/pilot scale should be extended on field scale for commercial exploitation of the research in the field of water quality management. Techno-economics of the new technology should also be compared while presenting them.

SUPPORT TO RESEARCH PROJECTS

The ministry of Water Resources has research grants for studies to be conducted in the area of hydrology. In order to rationalize the process of funding of various research projects in hydrology, the IHP National Committee has been identified as the nodal agency. After thorough scrutiny of the projects and based on the recommendations of the Research Committee (surface water and ground water), ten projects were approved by the MoWR during the year 2004-05 and 2005-06. A list of research projects funded by IHP National Committee is given in Appendix I.

The funds for research projects are given to academic institutes, research and development organisations, central and state government agencies and non-governmental organizations distributed all over the country. Following diagram shows the distribution of ongoing (ONG) and completed (CP) projects.

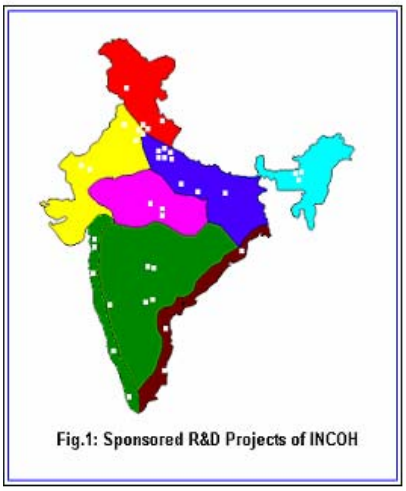

Fig.1: Sponsored R&D Projects of INCOH

	OGP	CP		OGP	CP
Andaman and Nicobar	0	0	Kerela	1	1
Andra Pardesh	6	0	Lakshdweep	0	0
Arunachal Pardesh	0	0	Maharashtra	1	1
Assam	0	0	Manipur	1	0
Bihar	0	1	Meghalaya	0	0
Chandigarh	0	1	Mizoram	0	0
Chattisgarh	1	0	Nagaland	0	0
Daman and Diu	0	0	Orissa	1	1
Delhi	3	0	Podicherry	2	1
Goa	0	0	Punjab	0	0
Gujarat	1	1	Rajasthan	4	0
Haryana	0	1	Sikkim	0	4
Himachal Pardesh	0	0	Tamil Nadu	3	0
Jammu & Kashmir	0	0	Tripura	0	0
Jharkhand	0	0	Uttar Pardesh	1	4
Karnataka	3	1	Uttranchal	4	1
			West Bengal	2	1

INDIA'S PARTICIPATION IN IHP-UNESCO

IHP National Committee of India is participating in the activities of International Hydrological Programme (IHP) of the UNESCO by organizing regional courses and workshops. The Committee has been actively contributing to the VIth phase (2002-2007) of IHP of UNESCO through its National Committee. India decided to take initiatives on specific focal areas under various themes on priority basis. The focal areas of each theme in which activities were taken up by the INCOH are given in Appendix II.

The themes / focal areas and the activities to be taken up by the Indian National Committee on Hydrology (INCOH) during the VII Phase of the International Hydrological Programme (IHP) (2008-20013) of UNESCO have been approved by the Ministry of Water Resources, Government of India and are given in Appendix III.

SUPPORTS TO SEMINARS/SYMPOSIA/TRAINING COURSES/ WORKSHOPS

As a part of its objectives, IHP National Committee provides sponsorship to various organisations in the country for organising national and international events in hydrology

and water resources. The Committee has been actively providing support to various organisations in the country for holding different activities. The details of various activities held during the year 2004, 2005 and 2006, for which technical assistance and funds were provided by the IHP National Committee, are given in Appendix IV.

PUBLICATIONS

(I) Hydrology Review Journal

The Indian National Committee has been bringing out an annual Hydrology Review Journal entitled "Jal Vigyan Sameeksha" whose each issue is devoted to a specific theme. This activity has been taken up to disseminate information and thereby promoting improvement in the standards of hydrological research in the country. The papers specific themes are invited from the experts in India. These publications are widely circulated to all organisations and agencies dealing in water sector. The focal themes of various issues so far brought out by the Secretariat and the topics of future issues are given in Appendix V.

(II) State of Art Reports

In pursuance of its objectives to prepare and periodically update the state of art in different branches of hydrology and disseminating the same, the Committee had taken up a programme of inviting experts to prepare state of art reports on various facets of hydrology. The topics and experts are identified and recommended by the Committee. These reports are being circulated to state and central government agencies including academic and research organisations. A list of titles with authors of the report is given in Appendix VI.

(III) Special Publications

The following publications of Ministry of Water Resources were printed by the Committee as special publications for wider circulation to all organisations and agencies dealing in water sector.

- Theme Papers by Ministry of Water Resources, Government of India for National Conference on “Water Quality Issues –2004” organised at Kolkota during 14-15 October 2004
- Country Paper for International G-WADI Modelling Workshop and Regional Meeting organized at National Institute of Hydrology, Roorkee during 28th February-4th March 2005 (jointly with UNESCO).

Appendix-I

LIST OF ONGOING RESEARCH PROJECTS UNDER IHP NATIONAL COMMITTEE

SNo	Project name	P.I. name & address
1	Study of hydrological Behaviour of Micro watershed and development of integrated watershed management Model	Dr.A.P Mukherjee IGAU, Raipur, Chattisgarh
2	Behaviour of monsoon rainfall in Rajasthan	Director DSO & Hydrology I ID&R Irrigation Unit, J L N Marg Jaipur
3	Hydrological & Ecological Studies on the Oustery Lake ecosystem	Prof.S.A.Abbasi, Pondicherry University Pondicheery
4	Integrated Hydrological Studies in Kondaveeti Vagu Watershed.	Dr. P.Sankara Pitchaiah, ANU, Nagarjuna Nagar, A P
5	Reservoir performance analysis using stochastic stream flow models	Dr.K.Srinivasan, IIT Madras, Chennai, Tamil Nadu
6	Ground water studies using satellite data. Helium and Geophysical techniques-A pilot study project	Dr.S.K.Gupta PRL, Ahmedabad, Gujarat
7	Feasibility of artificial recharge study through mathematical modelling in Kongal river basin, hard rock region, Nalgonda, A.P.	Dr.V.S.Singh NGRI, Hyderabad, A P
8	Ascertaining arsenic mobilisation in soilwater-plant systems and exploring the possible remedial measure, West Bengal	Dr. S. K. Sanyal, BCKV, Mohanpur, WB
9	Geohydrological studies for augmentation of spring discharge in Western Himalaya	Dr.G.C.S.Negi GBPIHED, Almora, Uttranchal
10	Study of fluvial geomorphology and tectonics of Khari-Mashi drainage basin, Rajasthan for data preparation and groundwater recharge capability assessment	Dr. S. Sinha Roy, Birla Inst. of Scientific Research, Jaipur, Rajasthan
11	Groundwater behaviour in connate water areas and hard rocks terrains of Orissa with respect to different schedules of pumping and varied draw down conditions	Er. J. Patnaik, C.Er. & Dir., DGWS&I, Bhubaneswar, Orissa

12	R&D cum action and awareness project on rainwater harvesting, groundwater recharge and waste water reuse	Dr.S.A.Abbassi Pondicherry Univ., Pondicherry
13	Studies on salt water intrusion in coastal D.K.District, Karnataka	Dr. A.Mehesha, NIT, Suratkal, Karnataka
14	To assess the Impact of presence of Water harvesting and Water Conservation in Imphal Manipur	Dr. L. Dinachandra Singh, MSTC, Imphal, Manipur
15	To assess the Impact of presence of septic tanks on ground water and spread of water borne diseases, and to identify means to solve the problems created by the waste water in Balrampur dist. In U.P.	Dr. Gauhar Mahmood Jamia Millia Islamia, New Delhi
16	Ground water flow modeling and aquifer vulnerability assessment studies in Yamuna-Krishni sub-basin, Muzaffarnagar District	Dr. Rashid Umar AMU, Aligarh, U P
17	Study on Ground Water Contamination through Municipal Land Fills in the NCT of Delhi	Dr. A. L. Ramanathan JNU, New Delhi
18	Development of defluoridation Media for contaminated ground water and its Lab to field Application	Dr. Uday Chand Ghosh Presidency College, Kolkata , W B
19	Ground Water Research Studies in Thar Terrain of Rajasthan through surplus water	Sri K.C. Kothari Addl. CE, SWRPD, Jaipur, Rajasthan
20	Institutional Framework for Regulating use of ground water in India	Prof. Kamta Prasad IRMED Karkardooma, Delhi
21	Impact of Urban, Industrial & Agricultural Pollution in Surface and Ground Water in and around Hyderabad & Secunderabad - A.P.	Prof. M. N. Reddy Osmania University, Hyderabad , A P
22	Hydrofluorosis in Halia River, Environs; Nalgonda district, A.P. A case study of Intensity and Source	Dr. M. Muralidhar Osmania University Hyderabad, A P
23	Study of Trace Metal in Surface & Sub-surface water in and around Tirupati	Prof. K.L.Narasimha Rao Sri Venkateswara Univ. Tirupati, A P

24	Identification of sites for artificial ground water recharge in upper ganga plain, using remote sensing – GIS	Dr. R. P. Gupta IIT, Roorkee Roorkee,Uttranchal	
25	Study on hydrology of small watersheds of highland Kerala	Smt.Celine George CWRDM, Kerala	
26	Flood Estimation in mixed/Urban/Rural catchments of South India	Dr. S. Ramaseshan Anna University, Chennai	
27	Artificial Neural networks for Water resources planning: An innovative approach	Dr.K.Srinivasa Raju, Birla Institute of Technology & Science, Pilani	
28	Fuzzy – Stochastic Modeling for Stream Water Quality Management	Dr.P.P. Mujumdar I.I.Sc. Bangalore Karnataka	
29	Assessment of water resources under climate change	Prof. P.P.Majumdar, IISc, Banglore	
30	Hydrological investigation of lake Picholla Udaipur (Rajasthan) for its rejuvenation	Dr. C.S.P. Ojha IIT Roorkee, Roorkee	
31	Development of drought vulnerable indices of preparedness and mitigation	Dr. R Nagarajan IIT Bombay Mumbai	Sri R.P. Pandey NIH Roorkee
32	Integration of Fuzy Logic and GIS for Delineating Groundwater Source Areas in Bazada land of Solani River Basin	Shri O.P Dubey IRI Roorkee Roorkee	

Appendix-II

ACTIVITIES TAKEN UP UNDER IHP-VI (2002-07) BY THE IHP NATIONAL COMMITTEE OF INDIA

India has implemented a detailed programme according to IHP-VI Themes towards preparation of reports, conducting research studies, organisation of seminars/symposia, etc. at national and regional level and promotion of hydrological education in the country. Under each theme of IHP-VI program, one Focal area was considered on priority basis as shown in the Table below and activities were undertaken.

Theme	Focal area	Activities undertaken/proposed
Theme 1: Global Changes and Water Resources	Focal Area 1.3: Integrated assessment of water resources in the context of global land based activities and climate change	(a) Publication of Hydrology Review Journal on Theme "Water and Environment" 2002 (b) Publication of Hydrology Review Journal on Theme "Snow hydrology" 2003 (c) Research projects entitled "Assessment of water resources under climate change" IISc Bangalore.
Theme 2: Integrated Watershed and Aquifer Dynamics	Focal Area 2.1: Extreme events in land and water resources	(a) UNESCO Regional Training Workshop on "Groundwater Dynamics In Hard Rock Aquifers" -Including Sustainable Management and Optimal Monitoring Network Design June 17-21, 2004, NGRI, Hyderabad, India. (b) 11th National Symposium on Hydrology with Focus on "Water Quality" November 22-23, 2004 NIH, Roorkee (c) Involvement in UNESCO's JIIHP program on isotope hydrology. (d) 2nd Research and Development Session 30th September- 1st October, 2004 at Water Resources Department, Chandigarh, Punjab. (e) Publication of State-of-art report on "Regionalisation of hydrological parameters" –by Prof. N.K.Goel, IIT, Roorkee 2002 (f) Publication of State-of-art report on "Water quality indices" by Dr. S.A. Abbassi, Pondicherry University– 2002 (g) 3rd Research and Development Session September 26-27, 2005 at NGRI, Hyderabad. (h) 12th National Symposium on Hydrology

		with Focus on "Hydrological Groundwater Governance Ownership of Groundwater and its Pricing", 14-15 November, 2006 at Central Ground Water Board, New Delhi
Theme 3: Land Habitat Hydrology	Focal Area 3.1: Dry lands	(a) Indian National Committee has been involved with UNESCO in the projects and collaboration on "Forest Hydrology" (b) International G-WADI modelling workshop and Regional meeting. 28th February-4th March, 2005, National Institute of Hydrology, Roorkee, India (c) One day Brain Storming Session for IHP-VII related activities. 20th May 2005
Theme 4: Water and Society	Focal Area 4.5: Public awareness raising on water interactions	(a) Freshwater year 2003 – Freshwater conservation campaign, initiation of new programs and organisation of various events by Ministry of Water Resources, Government of India. (b) Organised a three-day international workshop on "Afforestation-reforestation of degraded land and impacts on landscape hydrology in Asia-Australia" during 6-10 March 2006.
Theme 5: Water Education and Training	Focal Area 5.2: Continuing education and training for selected target groups	(a) Hydrology Project Phase I- Training was provided by NWA and NIH for hydrological data processing and analysis. (b) Two international Post Graduate Diploma and Master's courses are being organized by India (i) IIT Roorkee and (ii) Anna University, Chennai

Appendix-III

PROPOSED ACTIVITIES FOR IHP-VII (2008-13) TO BE TAKEN UP BY THE IHP NATIONAL COMMITTEE OF INDIA

THEME	**PRIMARY FOCAL AREAS**	**ACTIVITIES TO BE TAKEN UP BY INCOH**
Theme I: Global Change, Watersheds and Aquifers	Focal area I-1: Large-scale groundwater dependencies related to global change.	Artificial recharge of water and groundwater assessment
	Focal area I-2: Hydrological extremes in sensitive and stressed biomass and hydro climatic zones e.g. small island developing states.	Water resources management under drought situation
	Focal area I-3: Global change and feedback mechanism of hydrological processes in stressed environments.	Assessment of water resources under climate change
	Focal area I-4: Changing global dynamics in aquatic environments: degrading ecosystems, especially those susceptible to sea level change, coastal sediment balance and pollutant accumulation.	
Theme II: Governance and Socio-Economics	FOCAL AERA II-I: Culture, ethics and legislation for wise stewardship of water	
	FOCAL AREA II-2: Good Governance, capacity development and stakeholder participation, Empowerment of human resources.	
	FOCAL AREA II-3: Affordability, poverty alleviation and assured financing, for effective IWRM; 'water' in national Poverty Reduction Strategy Papers (PRSPs).	
	FOCAL AREA II-4: Shared Water resources and conflict resolution/co-operative solutions, true valuation of common pool water resources.	
	FOCAL AREA II-5: Resolving the water and energy nexus through sound governance.	
Theme III: Ecohydrology and	FOCAL AREA III-1: Water as a landscape agent: erosive capacity, mobile solvent, habitat for aquatic biota – interdependencies and regulation in biogeochemical cycling.	

Environmental Sustainability	FOCAL AREA III-2: Complementing engineering solutions with ecological measures resulting in sustainable carrying capacity of ecosystems.	
	FOCAL AREA III-3: Urbanization pressures, sustainable cities, towns and villages; water and sanitation for mega cities	
	FOCAL AREA III-4: Risk based environmental management (under uncertainty), especially climate change threats to ecosystem functions.	1. Real time flood forecasting 2. Flood inundation zoning for different return periods
Theme IV: Water Quality, Human Health and Food Security	FOCAL AREA IV-1: Methodologies for safeguards against water borne biotic and abiotic pollutants	
	FOCAL AREA IV-2: Access to safe water, human health and integrated water resource management.	International conference on water, environment, energy and society (WEES)
	FOCAL AREA IV-3: Non-conventional water resources: brackish water use and waste water re-use.	
	FOCAL AREA IV-4: Access to water for food security in environmentally stressed zones.	
	FOCAL AREA IV-5: Consumptive and in-stream requirements of water (terrestrial and aquatic eco system), food and people.	
	FOCAL AREA IV:6: The role of water consumption versus virtual water trade in assuring food security and environmental sustainability	
Theme V: Water Education and Training	Transfer of Technology through various training programmes and capacity building	

Appendix-IV

SEMINAR/SYMPOSIA/TRAINING COURSES/ WORKSHOPS SPONSORED DURING YEAR 2004 -2006

S. No	Name of Activity and organisation	Date when held	Venue	Amount of funding provided by INCOH
1.	One day Brain storming Seminar on Ground Water Rising Problem of Jodhpur City"	8th April, 2004	JNVU, Jodhpur	25,000
2.	Interactive Workshop on Water Conservation	13-14th April, 2004	NIH Roorkee	25,000
3.	19th Water Resources Day	27th May, 2004	Inst. Of Engeers, Guwahati	10,000
4.	Seminar on "Assessment and Management of Water Resources (AMWR-2004)	26th July, 2004	IISC, Bangalore	25,000
5.	Seminar on "Forest Water & People (FORWAP - 2004)	29-30th July, 2004	Belgaum	25,000
6.	National Workshop on "Role of R&D in Water Sector"	9-10th Sept. 2004	NWA, Pune	25,000
7.	International Conference on Hydraulic Engg. Research & Practice ICON-HERP-2004	26-28th Oct. 2004	IIT, Roorkee	25,000
8.	Symposium on "Prediction in Un-gauged Basins for Sustainable Water Resources Planning & Management (PUBSWRPM-2004)	30th Oct. 2004	BITS, Pilani	25,000
9.	National Symposium on Water Quality	22-23rd Nov., 2004.	NIH, Roorkee	3.00 lakhs
10	National Conference on "Resource Conserving Technologies for Social Up-liftment"	7-9th Dec. 2004	New Delhi	50,000
11.	National Symposium on "Water Resource Management in Mine Areas (WRMMA-2004)	16-17 Dec. 2004)	Bhubneswar	10,000
12	International Conference on Hydrological Perspectives for Sustainable Development	23-25th Feb. 2005	IIT, Roorkee	1.5 lacs (by MoWR)

	(HYPESD-2005)			
13.	20th Water Resource Day – 2005 on the theme "Economical Development of Perennially FloodProne Areas"	31st May 2005	I.E.(India), Assam State Centre, Guwahati	10,000
14.	International Conf. On "Crisis Management in Water & Environment – 2005" (ICCMWE2005)	15th – 16th July 2005	Science City, Kolkata	50,000
15.	National Workshop on "Geoinformatics in Water Sector"	22-23rd Sept. 2005	NWA, Pune	25,000
16.	Seminar on "Rejuvenation of Urban Lakes" HARUL – 2005	20-21 Oct.2005	M.P.	15,000
17.	Organisation of One Day Workshop on Rain Water Harvesting	15th Dec. 2005	Institution of Engineers (India) Roorkee	10,000
18.	Organisation of XXIV AHI National Seminar on "Hydrology" with special reference to "Urban Ground water Pollution"	27-28 December 2005	Karnatak University, Dharwad	15,000
19.	International Conference on "Ground Water Resource Management"	1st – 4th Feb, 2006	SES, JNU, New Delhi	30,000
20.	International Conference on Reforestation of Degraded land on landscape hydrology in the Asian Region	6-10 March, 2006	NIH,Roorkee	25,000
21.	Workshop on "Water Conservation with special emphasis on Recycle and Reuse"	March 25,2006	Civil engineering Department, IIT, BHU, Varanasi	20,000

Appendix-V

DETAILS OF VARIOUS PUBLISHED ISSUES OF HYDROLOGY REVIEW JOURNAL "JAL VIGYAN SAMEEKSHA (JVS)"

Volume	Year	Area
Published		
VOLUME I NO.1	1986	Drought
VOLUME I NO.2	1986	Hydrological Forecasting
VOLUME II NO.1	1987	Ground Water Management
VOLUME II NO.2	1987	Hydrological Network Design
VOLUME III NO.1	1988	Water Quality
VOLUME III NO.2	1988	Drainage
VOLUME IV NO.1	1989	Remote Sensing
VOLUME IV NO.2	1989	PC Applications in Hydrology
VOLUME V NO.1&2	1990	Soil Moisture
VOLUME VI NO.1&2	1991	Soil Erosion & Sedimentation
VOLUME VII NO.1	1992	Flood Hydrology
VOLUME VII NO.2	1992	Water Conservation
VOLUME VIII NO.1	1993	Reservoir Operation
VOLUME VIII NO.2	1993	Education and Training
VOLUME IX NO.1&2	1994	Conjunctive use of surface and ground water
VOLUME X NO.1&2	1995	Watershed Management
VOLUME XI NO.1	1996	National Activities
VOLUME XI NO.2	1996	National Activities
VOLUME XII NO.1	1997	Data Storage and Retrieval System
VOLUME XII NO.2	1997	Hydrological Aspects of Agricultural Areas
VOLUME XIII NO.1 & 2	1998	Advances in Remote Sensing and GIS
VOLUME XIV NO.1 & 2	1999	Water related Disasters
VOLUME XV NO.1 & 2	2000	Urban Hydrology
VOLUME XVI NO.1 & 2	2001	Emerging Techniques in Water Resources
VOLUME XVII NO.1 & 2	2002	Water and Environment
VOLUME XVIII NO.1 & 2	2003	Snow Hydrology
VOLUME XIX NO.1 & 2	2004	Hydrological Aspects of Large Scale Water Transfer
VOLUME XX	2005	Fresh and Sea Water Interaction in Coastal Regions
VOLUME XXI	2006	Water management under extreme events: Droughts and Floods
VOLUME XXII	2007	Impact of climate change on water resources

Appendix-VI

STATUS OF PUBLISHED STATE OF ART REPORTS

Title of Report	Prepared By	Status
Long Term Baseflow Studies	Sh.T.S.Raju, Dr.G.C.Mishra and Dr.A.G.Chachadi	Printed
How To Conduct River Surveys	Dr.V.P.Thergaonkar&Sh. A.M.Deshkar	Printed
Current Status and Prospects of Rain Water Harvesting	Dr. H.N.Verma and Dr. K.N.Tiwari	Printed
Surface Drainage Aspects of Agricultural Areas	Sh.G.P.Malhotra	Printed
Research in Soil and Water Conservation in India with Special Emphasis on Watershed Management	Dr. V.V. Dhruva Narayana	Printed
Reservoir Sedimentation	Prof. R.J.Garde	Printed
Natural Ground Water Recharge Estimation Methodologies in India	Sh. B.P.C.Sinha and Sh. S.K. Sharma	Printed
Water Supply for Industrial and Domestic Use	Sh.Paritosh C.Tyagi	Printed
Real Time Reservoir Operation	Dr. D.K. Srivastava	Printed
Wastewater Treatment with Aquatic Plants	Prof. S. A. Abbasi	Printed
Prevention and Control of Soil Erosion	Sh. V.N. Sharda	Printed
Ground Water Pollution Studies in India	Sh. B.P.C. Sinha, Santosh Kumar Sharma,O.P. Pal	Printed
Infiltration and its Simulation	Sh. V.N. Sharda & Sh. Sita Ram Singh	Printed
Surface Water Quality Modelling	Dr. Vijay Joshi	Printed
Integrated Planning of River Basin System and Management	Prof. Hari Krishna	Printed
Impact of Siltation on the useful life of large reservoirs 11/97	Dr. R.S. Varshney	Printed
Existing Methods of collection of Sediment Data in Indian Streams/Rivers.	Sh. M.L. Baweja,Dr. Roop Narayan	Printed
Frontier Areas of Research in Hydrometeorology	Prof.A.R.Subramaniam	Printed

Water Quality in Irrigation Agriculture	Dr. N.V. Pundarikenthan,Dr. S. Ravi Chandra,Dr. N.K. Ambujam	Printed
Water Management Practices in Command Areas	Dr. B.M. Sahni	Printed
Finite Element Methods in Water Resources	Dr. B.V. Rao	Printed
Application of Expert System in Water Resources	Dr. H. Raman	Printed
Conjunctive Use of Surface and Ground Water	Shri R.S. Saksena	Printed
Computation of Seepage	Dr. G.C. Mishra and Dr. D.N. Bhargava	Under revision
Regionalisation of Hydrological Parameters	Dr. Subash Chander & Dr. N.K. Goel	Printed
Water Quality Indices	Dr.S.A. Abbasi	Printed
Climate Change and its Impacts	Dr. K. S. Ramasastri	Printed
Manual for Roof Top Rainwater Harvesting using Cisterns or Storage Tanks for Individual Households, Community and Institutions	Sri S. K. Sharma	Printed

REPORT OF THE
INDONESIAN IHP NATIONAL COMMITTEE
JUNE 2006

1. ACTIVITIES UNDERTAKEN IN THE PERIOD SEPTEMBER 2004 – JUNE 2006

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 15 members from universities and multisectoral-departments. 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	: Eddy Djajadiredja
Secretary I	: Gadis Sri Haryani
Secretary II	: Nenny Sintawardani

Members:

1. P.E. Hehanussa	Indonesian Institute of Sciences
2. M. Rahman Djuwansyah	Indonesian Institute of Sciences
3. Hadikusumah	Indonesian Institute of Sciences
4. Sudaryati Cahyaningsih	Indonesian Institute of Sciences
5. Bogie Soedjatmiko	Indonesian Institute of Sciences
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 & 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
Cibinong sciences Center , jl. Raya Bogor Km.46
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.

National Workshop on the Preparation of The Formulation of Indonesia's IWRM and Water Efficiency Plan was held in February 2005: It is a contribution for IHP VI Theme 2: Integrated Watershed and Aquifer Dynamics

A contribution for IHP VI Theme 5 *Water Education and Training*: Under the flagship of Indonesia Water Partnership, the water stakeholders have been making use of the World Water Day since year 2000 until now. Its main objective is to conduct campaign through training, educating and dialogues and seminars program to augment public participation. The annual themes were changed according to the prevailing local needs. Three strategic target groups have been chosen, namely the school children and teachers, the decision makers cum academics, as well as the farmers.

1.1.1 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 information related to IHP activities to and between members of the committee.
- In mid October 2004 the national committee meeting has decided the personnel 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 held in January 2005 in Jakarta, the meeting was intended to better facilitate overlapping and closely related activities between planned and ongoing activities under framework of the four UNESCO bodies.
- On 29 November 2005, RIWR arranged a colloquium on hydrological researches and a technology exhibition on hydrological equipments which were attended by representatives of other governmental institutions, universities, private sectors and students.

1.1.2 Participation in IHP Steering Committees/Working Groups:

- Jan Sopaheluwakan participated the 33rd General Conference of UNESCO in Commission III on Basic Science October , 12, 2005. During the debate on the Establishment of the European Regional Centre for Ecohydrology in Lodz, Poland, and the International Centre for Water Hazard and Risk Management (ICHARM) in Tsukuba, Japan, under the auspices of UNESCO, Indonesia strongly endorsed the establishment of the said centre. Indonesia also reported the on-going efforts furthering the Resolution XVI-3 of 16th session of the Intergovernmental Council IHP-UNESCO, 2004, concerning the Establishment of Regional Center for Ecohydrology in Cibinong Indonesia under the auspices of UNESCO.
- Chairman and committee members attended UNESCO IHP 12th Regional Steering Committee Meeting for Southeast Asia & the Pacific, Adelaide, Australia, 21 – 26 November 2004

1.2.3 Research/applied projects supported or sponsored:

- Saguling Reservoir demo site as an Ecohydrology research activity sponsored by IHP-UNESCO.

  Ecohydrology activities:

  Saguling demos site:

  The Asia Pacific Center for Ecohydrology started its activities in the Saguling Reservoir, West Jawa since 2004. The objectives in this demo site are twofold i.e. to reduce

sedimentation rate and water quality control into the reservoir. The upper catchment area of the Citarum River (2000 km2) that flows into the reservoir are monitored by various government institutions. A small sub-catchment area has been selected to construct hydrological observations. This area is bounded by steep mountains which are relative unaltered. Comparison between the two catchments will provide a comparison between anthropogenic effects on the catchment and those that is less altered.

Exploratory visits to East Kalimantan.

Coal mining in East Kalimantan has developed extensively during the last two decades in the middle catchment of the Mahakam River. Mining sites are located closely to the Mahakam River for easy and cheap way of transportation of the coal. A number of underground mining was developed but the main practice is open pit mining. Weathering of the exposed sedimentary beds leads to acid mine water production in the area. Increasing suspended sediments are the byproducts of these activities.

The two problem areas were explored in 2005. The Saguling Reservoir demo site is more ready for future developments while East Kalimantan is still in exploratory stage.

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

- 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.
- In field activities, with PT Indonesia Power Electric Power Co. in problems related to management of water quality and reducing sedimentation in the Saguling Reservoir

1.2.5 Other activities:

- Policy paper presentation on the Water World Day on March 22, 2005 at the Department of Public Works, Indonesia
- Several events related to the World Water Day 2006:
    - in Bogor by organizing an International Symposium on The Ecology and Limnology of the Malili Lakes, 20-22 March 2006.
    - In Jakarta The Multistakeholders Dialogues on Water and Disaster; Water and Food; Water Availability and its mechanism of provisioning.
    - In Cibinong, organized by Drinking Water Company in District of Bogor: water education for children, exhibitions, etc.

1.3 Educational and training courses

1.3.1 Contribution to IHP courses:

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1.3.2 Organization of specific courses:

- The 3rd Ecohydrology Training Workshop was held in November 2005, attended by 35 participants from Asia Pacific nations

1.3.3 Participation in IHP courses:

- The 14th IHP Nagoya Training Course: Hydrology in Asia Kuala Lumpur, Malaysia, 11-15 October 2004
  1. Asep Sofyan (INDONESIA) - Toshihiro Kitada Laboratory, Dept. of Ecological Eng., Toyohashi University of Technology

- UNESCO – AP FRIEND Meeting: Drought Frequency Duration and Flood Frequencies, Kuala Lumpur, 6-7 June 2005
  1. Agung Bagiawan (INDONESIA) - Experimental Station for Hydrology Research Institute for Water Resources
- International Training Course on Hydrological Droughts and Low Flows, HTC Kuala Lumpur, 26 – 30 September 2005
  1 Mr. Askari Muhammad (INDONESIA) – Bogor Agricultural University, Laboratory of Hydrometeorology, Department of Geophysics and Meteorology, FMIPA IPB
  2 Ms. Eleonora Runtunuwu (INDONESIA) - Indonesian Agroclimate and Hydrology Research Institute (IAHRI)

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

1.5 Publications

- Proceedings of the 3rd Training Workshop on Ecohydrology, 313 pp.

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country:

- International Symposium on Ecohydrology, Bali, 21 – 22 November 2005
- The 13th Regional Steering Committee for Southeast Asia and the Pacific UNESCO meeting in Bali, 24-25 November 2005
- The 3rd Training Workshop on Ecohydrology, Bali, 24 -25 November 2005
- Scientific Advisory Committee for Ecohydrology Meeting, Bali, 26 November 2005.

1.6.2 Participation in meetings abroad:

- An inaugural speech related to the establishment of IHES regional organization, on the principles of ecohydrology, was presented by Peter Hehanussa, in Daegu, Korea, October 2004.
- Jan Sopaheluwakan and Peter Hehanussa represented Indonesia in the 16th IGC Meeting in Paris, 20-24 September in Paris, during

which Indonesian Proposal on the establishment of Category 2 water related center (Asia Pacific Center for Ecohydrology) was presented.

- 11th World Lake Conference, Nairobi 31 October – 4 November 2005
- Mr. Joesron Loebis attended the "6th Session of Regional Association V (RA V) Working Group on Hydrology (WGH) of World Meteorological Organization (WMO)" in Nadi, Fiji from 17 to 25 October 2005. In the meeting, Indonesia gained support for the establishment of Regional Hydrological Training Center (RHTC) for South-West Pacific in Indonesia. The plan was then endorsed in "The 14th Session of RA V (South-West Pacific) Meeting" held in Adelaide, Australia from 9 to 16 May 2006. At this moment, RIWR is arranging next steps in preparing the developing role of Indonesian Hydrological Training Center to become the RHTC for South-West Pacific under the auspices of WMO.
- T. Firdaus Larosa, MT attended "Flood Hazard Mapping" course in Japan from 27 October to 3 December 2005.
- Mr. Hehanussa attended Scientific Advisory Committee (SAC) on Ecohydrology meeting, in Poland, 17-19th November 2005
- Mr. Hehanussa attended the Opening Ceremony of the European Regional Centre for Ecohydrology, under the auspices of UNESCO, 8th March 2006.

1.7 Other activities at regional level

1.7.1 Institutional relations/co-operation

Indonesia (Research Institute for Water Resources RIWR) has participated in producing River Catalogue Volume I (1995) to V (2004) and is continuing its contribution for Volume VI of River Catalogue.

1.7.2 Completed and ongoing scientific projects:

International Symposium on Ecohydrology in conjunction with the 13th Asia Pacific RSC meeting was held in 21-25 November 2005 in Bali Island attended by 126 participants from 21 countries (Argentina, Australia, Bangladesh, Cambodia, Canada, China, Egypt, Fiji, France, India, Indonesia, Iran, Japan, Korea (PDR), Korea (Rep. of), Lao PDR, Malaysia, Micronesia (Fed. St. of), Mongolia, Myanmar, Nepal, New Zealand, Papua new Guinea, Philippines, Poland, Portugal, Samoa, South Africa, Srilanka, Sudan, Thailand, Vietnam). SAC-EH meeting and two other meetings was adjoined during the period November 2005 are the 3rd International Training Workshop on Ecohydrology and Annual Scientific Advisory Committee on Ecohidrology meeting.

The opening remarks of the International Symposium and Training Workshop were given by Dr. Ir. Jan Sopaheluwakan, M. Sc., APU

(representative of the Chairman of LIPI), Dr. Han Qunli (Representative of UNESCO Jakarta Office), Professor Arif Rahman (Executive Chairman of Indonesian National Commision for UNESCO), and Dr. Eddy Djajadiredja (representative of Indonesian IHP Chairman). The closing remark was given by Dr. Ir. Gadis Sri Haryani (chairperson of Organizing Committee).

The International Symposium presented and discussed 44 papers that covered wide spectrum of ecohydrology and hydrology. Two keynote speeches were given by Prof. Maciej Zalewski from Poland Academic of Sciences, and Dr. Basuki Hadimulyono from Department of Public Works.

The Training Workshop were given by:

1. Prof. Maciej Zalewski: Ecohydrology – System Approach for Sustainable water Ecosystem and Society.
2. Prof. P.E. Hehanussa: Background Information (related to setting up the new) on the Indonesian Water Resources Law
3. Prof. Hidayat Pawitan: The Needs of Criteria and Indicators in the Development and Management of Water Resources.

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2007

- The Asia Pacific Center for Ecohydrology (APCE) under the Indonesian Institute of Sciences is going to be operational and host activities in the region
- Attend the 4th World Water Forum in Mexico City, March 2006
- Participate in 17th session of IHP Intergovernmental Council UNESCO, 3-7 July 2006
- The 14th IHP-RSC meeting is planned to be held in Bangkok, Thailand, 16-17 October 2006
- 3rd APHW Conference on 'Wise Water Resources Management towards Sustainable Growth and Poverty Reduction' planned to be held in Bangkok, Thailand 19-20 October 2006
- The 15th IHP-RSC meeting is planned to be held Philippines, 2007
- 12th World Lake Conference, India November 2007

1. Research Institute for Water Resources has a plan to increase its human resources capacity through participation in short term courses or joint research which will be held by UNESCO-IHP in the field of:
    - Flood
    - Sediment and erosion
    - Ecohydrology
    - Water management
    - Real-time forecasting
    - Modeling
    - Urban hydrology
2. The Research Institute of Water Resources has been organizing a national hydrological training program every year. To optimize the program, RIWR is

planning to strengthen its national training program by setting up a proposal. The scope of activities in the proposed project includes:

a. Inventorying all of the materials and facilities needed to train local and regional personnel
b. Preparing detail design of the building facilities such as training building, dormitory, laboratories and other supporting installation
c. Constructing the buildings and other facilities
d. Procuring needed appurtenances
e. Preparing facilities for outdoor training and instrumental calibration
f. Preparing data processing facilities (software and hardware)
g. Arranging training programs as well as potential trainers
h. Preparing training's modules

The running national training program is divided into three programs which are:

- Training on Operational Hydrology, to be held in April of each year
- Training on Applied Hydrology, to be held in August of each year
- Training on Advanced Hydrology, to be held in November of each year

Until now, some training methods, such as indoor and outdoor training, have been applied. Every trainee has to follow the completely arranged field training step by step according to the structured materials and modules. A range of tests for the trainee will be held at the end of the training program. Those who successfully pass the tests are deserved for a certificate.

The RIWR welcomes the members of UNESCO-IHP to make use of the Indonesian Hydrological Training Program as a Regional Hydrological Training Program for Southeast Asia and The Pacific region.

2.2 Activities foreseen for 2008-2009

- Activities related to implementation of the APCE (Asia Pacific Center for ecohydrology) office for the region .

2.3 Activities envisaged in the long term

- Indonesian National committee for IHP will be used to coordinate participations at national level to augment people's awareness through education and training on the oncoming hazards caused by global warming, as well as hazards caused by the geological and volcanological earth movements, in which Indonesia is one of the most prone of. These include sea level rise, flood hazard, volcanic debris control, draught, earth quakes, tsunamis, water and food security, and access to save water. Areas of priority are mega cities, and coastal areas. Considering that Indonesia is an archipelago (more than 7650 islands), inhabited by more than 220 million people, this is a large task. The objectives are to prompt people's preparedness, the communities as well as the governments institutions, in facing the oncoming hazards. The mechanism of evacuations, health and basic needs preparations, as well as for the oncoming assistance have to be readily
- Organized APCE (Asia Pacific Center for ecohydrology) in Cibinong and The Saguling demo-site related to APCE office in Cibinong will have routine activities related to the training of recervoir, lakes and river basin management for participants of the country and for regional participants.

International Hydrological Programme of UNESCO

NATIONAL REPORT of the IRISH NATIONAL COMMITTEE
June 2006

1. ROLE OF THE IRISH IHP NATIONAL COMMITTEE

The Irish National Committee is the focal point in Ireland for internal and international cooperation in hydrology. It also has the role as national committee of the International Commission on Irrigation and Drainage (ICID – a non-governmental organisation). During 1989, the role of the National Committee (IHP) was defined as a focus in Ireland for IHP activities and in particular:

(i) to stimulate and facilitate co-operation and exchange of information between various organisations involved with hydrology in Ireland.
(ii) to send / receive communications to / from UNESCO.
(iii) to make suggestions about the draft plans for the successive programme phases.
(iv) to recommend or supply names of persons suitable for acting as rapporteurs or working group members for IHP projects.
(v) to supply Irish data for IHP projects.
(vi) to encourage the undertaking by Irish organisations of hydrological projects pertinent to the current phase of IHP and stimulate such with financial contributions towards equipment.
(vii) to facilitate and encourage Irish participation in international hydrological projects.
(viii) to encourage participation by Irish hydrologists at relevant international conferences.
(ix) to disseminate information about IHP to Irish organisations and individuals.
(x) to form a library holding of UNESCO documents relating to or emanating from IHP phases - these include technical documents.
(xi) to hold regular committee meetings.
(xii) to hold or to assist in the holding of hydrologically relevant conferences,
(xiii) to comment, as appropriate, on hydrological issues

2. ACTIVITIES OF THE IRISH IHP NATIONAL COMMITTEE

The Irish National Committee organises and convenes the Irish National Hydrology Seminar, held in November each year. The theme of these seminars deals with topical issues relating to water resources - at both global and river basin levels - and features papers, presentations and poster sessions from local authorities, universities and the private sector. International contributions are always welcome. The theme of this year's seminar is: **"Water Resources in Ireland and Climate Change"**, which has links with Theme I of the proposed IHPVII.

In 2003, the National Committee established the "Hydrology Ireland" website and maintains and updates this on an on-going basis (see: http://www.opw.ie/hydrology). This website gives details of recent publications, up-coming seminars, conferences, courses and other events relating to water resources, both nationally and internationally.

The committee comments on topical issues from time to time. In the last two years, the committee contributed to the development of government policy and activities in two areas:

- National Flood Policy Review – highlighting the need for involvement of society through flood hazard mapping, catchment-based flood risk planning, public awareness campaigns, research and development and application of improved modelling techniques. The policy was adopted by Government in 2004, and
- River Basin Management – in development of stakeholder involvement and integration of hydrology and water quality issues, particularly in relation to providing hydrological advice and guidance to the Water Framework Directive working groups in the areas of flow duration curves, sampling issues and flood related matters.

3. RESEARCH

The committee promotes focussed research by universities, government agencies and private interests, often funded by national and EU RTD programmes. The Environmental Protection Agency has funded specific programmes of research that are coordinated with the work of National and EU working groups involved in development of methods for the EU Water Framework. The Office of Public Works coordinates its own research programme in flood management. The Committee has been pleased to be associated with this work. Further research needs relate primarily to climate change, information and communication technology and wetland eco-hydrology.

Potential bottlenecks relate to limited management and support facilities for research and development. However, increased recognition of the role of local authorities in water management in its broadest sense has begun to provide some additional sources of funds.

4. CO-OPERATION WITH OTHER NATIONAL COMMITTEES AND INSTITUTIONS IN OTHER COUNTRIES

The Irish IHP National Committee has contributed in the past to the IHP FRIEND project and has funded attendance of experts at IHP and ICID technical conferences. Through EU and World Bank funded programmes, contributions have been made to international cooperation in water management. The Committee is keen to see continued cooperation in the future, and is actively seeking out opportunities to work, and share experience with, other National Committees.

The main benefit of Regional Meetings is seen as the promotion of such cooperation leading to best practice in water resources management applicable at sub-region and national scale.

5. CONTACT DETAILS

The contact details of the Secretary of the IHP Irish National Committee are given below:

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STATE OF ISRAEL

NATIONAL REPORT ON IHP RELATED ACTIVITIES

July 2006

General

Activities of the Israel National Committee for Hydrology are sponsored by the Ministry of Education, Culture and Sport and the Ministry of Science and Technology. The present Chairperson of Israel IHP is Prof. Daniel Ronen from the Israel Water Commission and the Ben Gurion University of the Negev. The Israel IHP Committee is a statutory committee of the Israel National Commission for UNESCO.

The members of the Bureau of the Israel National Committee for Hydrology are: Mr. Daniel Bar-Eli, Coordinator (Israel National Commission for UNESCO); Prof. Eilon Adar (Ben Gurion University of the Negev); Prof. Gedeon Dagan (Tel Aviv University); Dr. Joseph Guttman (Mekorot-Israel National Water Co.); Ing. Shalom Goldberger (Ministry of Health); Prof. Joel Gat (Weizmann Institute of Science); Dr. Gabriel Weinberger (Israel Hydrological Service); Mr. Yacob Keidar (Ministry of Foreign Affairs); Prof. Ronit Nativ (The Hebrew University of Jerusalem); Dr. Ehud Simon (TAHAL); Dr. Alon Rimmer (The Kinneret Limnological Laboratory); Prof. Raphael Semiat (GWRI, Technion – Israel Institute of Technology); Prof. Avner Adin (The Hebrew University of Jerusalem); Dr. Arie Pistiner (Ministry of Environmental Quality); Mr. Avner Furshpan (Director, Climatology and Agro-Meteorology, Israel Meteorological Service); Prof. Hillel Rubin (Technion – Israel Institute of Technology); Prof. David Sharon (The Hebrew University of Jerusalem); Dr. Husam Masalha (Ministry of Science and Technology); Dr. Avner Vengosh (Ben Gurion University of the Negev); Prof.Haim Gvirsman (The Hebrew University of Jerusalem); Dr. Abraham Melloul

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(Israel Hydrological Service).

Activities undertaken in the period August 2004 – June 2006

1. Israel IHP Committee, the Israel National Commission for UNESCO and the Division of Science Teaching of the Weizmann Institute of Science (Prof. Abraham Arcavi, Head) presented to UNESCO (June 26, 2003) and through UNESCO to all countries of the world, a syllabus for the study of water related issues at the junior-high school level entitled "*The Blue Planet – The Water Cycle in the Earth's Eco-Systems*" (hereafter referred to as *"The Blue Planet").* *The Blue Planet* is an innovative curriculum reflecting recent research findings on water issues.

   Israel hopes that this contribution will help improve people's understanding and awareness of the importance of water to our planet as a limited, necessary and long-lasting commodity for mankind. Israel also hopes that the syllabus will help in bridging differences and misunderstandings between people by demonstrating that our needs are alike and that only together can we work to preserve this indispensable common resource and a better world.

   The syllabus was prepared by the Division of Science Teaching of the Weizmann Institute of Science as a joint venture with the Curriculum Development Center of Israel Ministry of Education. The syllabus was the Ph.D. thesis of Dr. Orit Ben Zvi – Assaraf, conducted under the supervision of Professors Nir Orion and Daniel Ronen.

   The Blue Planet is presently being translated into Spanish for implementation in Latin America countries.

   The Israeli chapter of the IHP established contacts with CAZALAC, UNESCO's Center for Arid and Semi-arid Areas of Latin America, in Chile,

and UNESCO's secretariat, in Uruguay, for the organization of seminars and workshops with the participation of Israeli experts and teachers from Latin America. During this events the Blue Planet curriculum will be transferred to our colleagues in Latin America. UNESCO's support is required for acquisition of chemical laboratory kits necessary for applying the curriculum.

2. The Israeli chapter of the IHP contacted CAZALAC and the Embassy of Chile for the establishment of cooperation programs related to water in arid zones and eLearning.

   The following topics were suggested:

   - Reutilización de aguas negras municipales para usos agrícolas
   - Desarrollo y adaptación de mini- plantas de tratamiento de aguas negras para pequeñas poblaciones
   - Modelación y gerenciamiento de recursos hídricos
   - Penetración de cuña marina en acuíferos costeros
   - Desalinización
   - Gerenciamiento de recursos hídricos en zonas áridas
   - Desarrollo de sistemas de monitoreo de calidad de aguas de superficie y subterráneas
   - Interrelación de aguas de superficie y aguas subterráneas en zonas áridas
   - Desarrollo de agricultura con plantas tolerantes a aguas de alta salinidad
   - Análisis costo-beneficio relacionado a la utilización de aguas con contaminantes naturales (por ejemplo, metales pesados, arsénico)
   - Adiestramiento y enseñanza a distancia

3. The Israeli chapter of the IHP and the Israel National Commission for

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UNESCO proposed Prof. Arie Shimshon Issar as a nominee for the UNESCO Great Man-Made River International Water Prize for Water Resources in Arid and Semi-Arid Areas (2005). Prof. Issar's outstanding work and interdisciplinary approach was dictated by the special conditions of scarcity of data and resources in arid and semi arid regions.

4. The Israeli chapter of the IHP and the Israel National Commission for UNESCO cooperated with the Zukerberg Institute for Water Research of the Ben Gurion Univeristy of the Negev (Directed by Prof. Eilon Adar) and the Stephen & Nancy Grand Water Research Institute of the Technion, Israel Institute of Technology (Directed by Prof. Raphael Semiat) in the organization of the Workshop "Microorganisms – Water and Aquifers". The Workshop was held at the Sde Boker Campus of the Ben Gurion University of the Negev (September 20 and 21, 2005) with the participation of colleagues from Egypt, Jordan and the Palestinian Authority.

5. No progress was made in relation to the proposal presented to UNESCO (July 23, 2003) by the Israeli chapter of the IHP and the Israel Water Commission on the creation of "The Water Museum of the Middle East". Israel is still waiting for an answer to her request for UNESCO's sponsorship and guidance.

6. Following the proposal of the Delft-based International Institute for Infrastructural, Hydraulic and Environmental Engineering (IHE) to establish the UNESCO-IHE Institute for Water Education, the Israel National Committee for the IHP of UNESCO submitted a proposal (October 10, 2001) for cooperation between the UNESCO-IHE Institute for Water Education and the Institute for Water Sciences and Technology (IWST) of the Ben Gurion University of the Negev. No progress was made in this area. A list of Israeli

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experts willing to cooperate with IHE activities is being prepared and will be submitted to UNESCO.

7. The unknown status of the above mentioned activities proposed by the IHP of Israel (items 5 and 6) to UNESCO were discussed during UNESCO's DDG Mission to Israel and the Palestinian Territories (June 5, 2004) – Strategy for Reconstruction and Reconciliation in the Middle – East.

8. Prof. Daniel Ronen participated as Chairperson of the Israel IHP Committee in the regional meeting of Europe IHP National Committees of Electoral Groups I and II of UNESCO held in Wallingford, UK, (July 5 and 6, 2005).

9. To celebrate the International Water Day, the Israeli chapter of the IHP and the Israel National Commission for UNESCO cooperated with the Zukerberg Institute for Water Research (Ben Gurion Univeristy of the Negev) in the organization of the Workshop "Water Technologies". The Workshop was held at the Sde Boker Campus of the Ben Gurion University of the Negev (March 22, 2006).

10. The Israeli chapter of the IHP of UNESCO proposed (April 24, 2006) Prof. Jonathan B. Laronne of the Department of Geography & Environmental Development of the Ben Gurion University of the Negev as a candidate for the Advisory Board of the International Research and Training Centre for Erosion and Sedimentation (IRTCES) in Beijing, China and the International Centre for Water Hazard and Risk Management (ICHARM),Tsukuba, Japan.

11. The Israeli chapter of the IHP suggested that Integrative and Quantitative Management of Water Resources on National and International Scales is a

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subject of outmost importance to all countries of the world and especially to those suffering from water shortage. Therefore, Israel's IHP recommended including this topic in IHP-VII. It was also recommended that Israeli scientists be involved in all facets of IHP-VII.

12. The Israeli chapter of the IHP and the Israel National Commission for UNESCO co-sponsored the IIIrd Symposium of the Israel Water Association held at the Ben Gurion Univerity of the Negev (May 25, 2006).

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NATIONAL REPORT ON IHP RELATED ACTIVITIES
JAPAN

Various activities of UNESCO have been implemented under the support of the Japanese National Commission for UNESCO with financial contribution in the form of Fund-in-Trust (JFIT) for the Promotion of Science for the Sustainable Development. The following summary includes the activities of Japanese National Committee for the International Hydrological Programme (IHP) of UNESCO undertaken during September 2004 to June 2006.

1. ACTIVITIES UNDERTAKEN IN THE PERIOD SEPTEMBER 2004 – JUNE 2006

1.1 Meetings of the IHP National Committee

1.1.1 Decisions regarding the composition of the IHP National Committee

New members of the IHP National Committee have just been appointed in June 2006 as follows.

Chairman: TAKEUCHI Kuniyoshi, Prof., Univ. of Yamanashi
NAKANISHI Hisae, Prof., Nagoya Univ.
KOIKE Toshio, Prof., Univ. of Tokyo
UEDA Hiroshi, Prof., HyARC, Nagoya Univ.
SHIMIZU Yoshihisa, Assoc. Prof., Kyoto Univ.
JINNO Kenji, Prof., Kyushu Univ.
TAKARA Kaoru, Prof., DPRI, Kyoto Univ.
TAKEMON Yasuhiro, Assoc. Prof., DPRI, Kyoto Univ.
TANAKA Tadashi, Prof., Univ. of Tsukuba
NAKAYAMA Mikiyasu, Prof., Univ. of Tokyo
WATANABE Tsugihiro, Prof., Research Institute for Humanity and Nature (RIHN)
TERAKAWA Akira, Mr., ICHARM, Public Works Research Institute (PWRI)
KURAJI Koichiro, Dr., Univ. of Tokyo

1.1.2 Status of IHP-VI activities

(1) Catalogue of Rivers: The Catalogue of Rivers for Southeast Asia and the Pacific, Vols. 1 and 2, published in book form in 1995 and 1997 respectively, were compiled in a CD-ROM with the aid of Special Coordination Funds for Promoting Science and Technology (Prof. Takara, DPRI, Kyoto University). The CD-ROMs for Vols. 1 and 2 were distributed at the Asian-Pacific FRIEND (Flow Regimes from International Experimental Network Datasets) Workshop and Kuala Lumpur on 6-7 June 2005, as well as at the 13th Session of IHP Regional Steering Committee (RSC) for Southeast Asia and the Pacific (SEAP) in Kuta, Bali, Indonesia on 24-25 November 2005.

(2) Asian Pacific FRIEND: Prof. Takara attended the Asian Pacific FRIEND Workshop, Kuala Lumpur on 6-7 June 2005 and reported the current status of IDF analysis and practice in Japan. Based on an action item decided at the Workshop, he collected rainfall data at five rain gauges in

Aichi Prefecture and distributed them to AP FRIEND members. He also analyzed the rainfall data provided by the members and reported the preliminary results at the APF Technical Sub-Committee (TSC) on 21 November 2005 at the occasion of the 13th Session of RSC in Bali, Indonesia.

(3) Hydrology for Environment, Life and Policy (HELP): Dr Tachikawa submitted the second report of the Yasu River basin, a HELP candidate basin in Japan, to HELP Secretariat for their review.

1.1.3 Decisions regarding contribution to/participation in IHP-VII

Dr. Kuraji has joined in preparation of the IHP-VII as an expert from Japan. The Japanese National Committee for IHP sent comments on IHP-VII Draft Plan to the UNESCO-IHP Secretariat, taking into account the importance and necessity of prevention of water-related disaster.

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

(1) IHP Training Course Working Group Meeting was held at Shin-Kokusai Building, Tokyo on 24 May 2005. The courses for FY 2005 and 2006 were decided to name as “Water and Carbon Cycles in Terrestrial Ecosystems” and “Oceanography Basics”. The composition of Training Course Working Group was determined as well. Prof. Ueda, HyARC, Nagoya University is the head of the Working Group since 2005.

(2) An IHP-VII proposal was presented by a group of Univ. of Tsukuba on the basis of discussions on IHP-VII at the IHP National Committee meeting on 3 August 2004. The proposal title was “Capacity Building and Education for Observers for Continuous Monitoring of Terrestrial Environments in Asia: An Integrated program of Flux Observation, Tracer Analysis and Numerical Modeling”, which is appeared in Newsletter “IHP” No. 18 (June 2005).

(3) ICHARM Inauguration Symposium: “Towards Global Water Disaster Reduction - Cooperating through ICHARM (International Centre for Water Hazard and Risk Management) -” was held on 10 May 2006 at the United Nations University (UNU), Tokyo, Japan.

(4) IHP Training Course Working Group Meeting was held at the MEXT, Tokyo on 24 May 2006. The courses for FY 2006 were discussed.

1.2.2 Participation in IHP Steering Committees/Working Groups

The Japanese National Commission for UNESCO provides UNESCO with financial contribution in the form of Fund-in-Trust (JFIT) for the Promotion of Science for the Sustainable Development. Using JFIT, the UNESCO Jakarta Office organizes the UNESCO-IHP Regional Steering Committee (RSC) for Southeast Asia and the Pacific and IHP Training Courses in collaboration with the Ministry of Education, Culture, Sports, Science and Technology of Japan (MEXT), Japanese Universities and Research Institutes.

(1) Regional Steering Committee (RSC)

a) The 12th RSC was held in November 2004 in Adelaide, Australia. The cost for participants from Asia and Pacific (Cambodia, Indonesia, Rep. of Korea, Lao PDR, Myanmar, NZ, Niue Island, the Philippines, Thailand and Vietnam) was financially supported by JFIT. The Review of the Catalogue of Rivers and maintenance of the current system of RSC were decided in the RSC. Prof. Takara was re-elected as the Secretary of RSC.

b) The 13th RSC was held in November 2005 in Kuta, Bali, Indonesia. Prof. Tanaka (Univ. of Tsukuba), Prof. Takara and others participated in the meeting. The policy of IHP governance in the region was discussed and confirmed. The RSC adopted a resolution for encouraging Lao PDR, Myanmar and Mongolia to officially participate in the RSC in the near future.

1.2.3 Research/applied projects supported or sponsored

The MEXT bestowed Prof. Takara, Kyoto University on a Grant-in-Aid for Scientific Research for FY 2004-2006 in order to promote a climate- and disaster-related international cooperative research in East Asia. For FY 2002-2004, 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. These funds are used in part for meetings related to UNESCO-IHP such as RSC meetings.

The MEXT Grant-in-Aid for Scientific Research was awarded to “Downscaling of Global Earth Observation Products to Locally Useful Information” led by Prof. Kuniyoshi Takeuchi, University of Yamanashi for FY2004-2006 to promote the research on PUB, Predictions in Ungauged Basins, an IHAS-initiated science program supported by IHP IGC Resolution XV-7.

The MEXT Special Coordination Funds for Promoting Science and Technology (Leadership for international scientific cooperation) was awarded to “Leadership on the Hydrological Science for Mitigating World Water Issues” led by Assoc. Prof. Taikan Oki,University of Tokyo for FY2004-2006. The fund was used to promote international activities including PUB and other IHP-related initiatives.

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

The Japanese IHP National Committee has been closely collaborating 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.

Recognized by Science Council of Japan, (1) and (2) will be reformed in 2006. The GEWEX Asian Monsoon Experiments (GAME) was reformed into Monsoon Asian Hydro-Atmosphere Scientific Research and Prediction Initiative (MAHASI) last year led by Prof. Matsumoto, University of Tokyo, and so as in SCJ.

(3) The national government and its branches relating to hydrology and water resources

administration.

(4) Nagoya University for IHP Training Courses and graduate school.
Other universities and research institutes.

(5) The Japan Water Forum (JWF).

(6) World Meteorological Organization (WMO).

(7) International NGOs/NPOs such as the International Association of Hydrological Sciences (IAHS), the International Water Resources Association (IWRA) and the International Consortium on Landslides (ICL).

1.2.5 Other initiatives

N/A

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

(2) IHP Training Courses:

The Hydroshperic Atmospheric Research Center (HyARC) of Nagoya University offers IHP Training Courses for both foreign students of Graduate School of Science, Nagoya University and trainees chosen by UNESCO Regional Science Bureau for Asia and the Pacific in Jakarta. The training courses are financed by the Japanese Fund-in-Trust (JFIT) for IHP.

a) The 14th IHP Training Course on “Hydrology in Asia” was carried out in Kuala Lumpur, Malaysia in October 2004, gathering many participants (11 lecturers from Japan and 29 trainees from 14 countries in Asia and Pacific regions including 16 trainees from Malaysia). The Humid Tropics Centre, Kuala Lumpur (HTC KL) kindly hosted the training course. This was the first attempt for Japan to organize the IHP Training Course in abroad. The past 13 courses were reviewed at this occasion. The cost of participants from Indonesia, PNG, Philippines, Thailand, Vietnam, China, India, Lao PDR, Sri Lanka and NZ was financially supported by JFIT. Prof. Nakamura (HyARC, Nagoya Univ.), Prof. Takara and others participated in the course.

b) The 15th Training Course was organized in Nagoya and Chiba in February-March 2006 under the theme of “Water and Carbon Cycles on Terrestrial Ecosystems“. JFIT financially supported 7 participants.

1.3.2 Organization of specific courses

In cooperation with the Mongolian National Committee for UNESCO-IHP and the UNESCO Beijing Office, the Japanese National Committee for UNESCO-IHP co-organized the Mongolian National Training Workshop “Groundwater Hydrology and Management” in Mongolia on 14 and 15 June 2006. Five Japanese experts participated in the Training Workshop at their own expense as lecturers. The Japanese experts are: Prof. Dr. Kaihotsu (Hiroshima Univ.), Prof. Dr. Takara (Kyoto Univ.), Prof. Dr. Jinno (Kyushu Univ.), Dr. Tsujimura (Univ. of Tsukuba) and Dr. Hamaguchi (Kyoto Univ.). The Mongolian National Committee for IHP, the organizer of the workshop, supported staying expenses for the lecturers.

1.3.3 Participation in IHP courses

N/A

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

ICHARM: **I**nternational **C**entre for Water **Ha**zard and **R**isk **M**anagement under the auspices of UNESCO was established in Tsukuba, Japan in March 2006, after getting accreditation by the member states of UNESCO at the 33rd General Conference of UNESCO. Dr. Kuniyoshi Takeuchi, the chairman of the Japanese National Committee for UNESCO-IHP, was assigned as the founding Director of ICHARM. ICHARM was established as the core of research, training, and information networking activities on water-related disasters at global levels. The activities are expected to contribute in the prevention and reduction of water-related disasters, such as floods. It is important to cooperate with existing UNESCO Centers such as IHE in the Netherlands, IRTCES in China, CATHALAC in Panama and HTC in Malaysia, etc. The outline of ICHARM is as follows.

1) Objectives: The objective of the Centre is to be the world centre of excellence to provide and assist implementation of best practicable strategies to localities, nations, regions and the globe to manage the risk of water related disasters including flood, drought, landslide, debris flow, storm surge, tsunami and water contamination. The Centre conducts research, capacity building and information networking activities in an integrated manner for preventing and mitigating the impacts of water related disasters and thus to achieve sustainable and integrated river basin management.
2) Functions:
   (i) to promote scientific research and to undertake effective capacity-building activities at the institutional and professional levels;
   (ii) to create and reinforce networks for the exchange of scientific, technical and policy information among institutions and individuals;
   (iii) to develop and coordinate cooperative research activities, taking advantage particularly of the installed scientific and professional capacity of the IHP networks, WWAP, the IFI/P and relevant

programmes of non-governmental organizations, international institutions and networks;

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

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

3) Structure: The center is established as a part of the Public Works Research Institute (PWRI) and be operated under the responsibility of its Chief Executive, with the advice from the Advisory Board.

1.5 Publications

1. « IHP Papers presented at the International Conference on Water Sensitive Urban Design 'Cities as Catchment' », IHP-VI Technical Documents in Hydrology No. 3, UNESCO Jakarta Office, (Eds.) R. James, T. Daniell and K. Takara, November 2004.
2. « MPMD-2005: Monitoring, Prediction and Mitigation of Water-Related Disasters », Proceedings of International Conference on Monitoring, Prediction and Mitigation of Water-Related Disasters, (Eds.) K. Takara, K. Tachikawa and NMNS B. Nawarathna, January 2005.
3. Catalogue of Rivers for Southeast Asia and the Pacific Vol. 1 (1995) and Vol. 2 (1997) CD-ROM version (March 2005).
4. « IHP », Newsletter on IHP activities of Japan, No.18, June 2005 (in Japanese).
5. The booklet of the Portfolio of Water Actions (PWA) was published in March 2005 to show the current progress of the PWA created by Japanese Government. 98 plans of action or commitments are listed in the PWA. The booklet was used for facilitating efforts to initiate concrete actions, and bring desirable results.
6. T. Oki, C. Valeo and K. Heal (Eds.), Hydrology 2020: An Integrating Science to Meet World Water Challenges, IAHS Publication 300, 190 +xxxii pp, 2006.

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

(1) MPMD-2005 (Kyoto Univ., 12-15 Jan. 2005): The International Conference on Monitoring, Prediction and Mitigation of Water-Related Disasters, Kyoto University, Kyoto, Japan, 12-15 January 2005, was co-organized by UNESCO-IHP with a sponsorship by a three-year (2002-2004) research programme "Contribution to International Cooperation for Monitoring, Prediction and Mitigation of Water-Related Disasters" (PI: Prof. Takara, DPRI, Kyoto University) under the framework of the Special Coordination Funds for Promotion of Science and Technology, MEXT. The discussion outcomes at this conference were brought to the World Conference on Disaster Reduction (WCDR), Kobe, Japan, 18-21 January 2005.

(2) WCDR Session (Kobe, 19 Jan. 2005): A proposed session "New International Initiatives for Research and Risk Mitigation of Floods (IFI/P) and Landslides (IPL)" was held. Numerous scientists and representatives of NGOs, GO and the UN grouped around the "International Consortium of

Landslides" (ICL) and the "Joint UNESCO/WMO Flood Initiative" (JUWFI) propose, in order to overcome years of under-investment in and poor coordination of the scientific and technical infrastructure activities needed to reduce the vulnerability notably of developing countries to natural hazards, to sign a joint 'Memorandum of Understanding' (MoU) between major stakeholders concerning "Strengthening Cooperation in Research for Earth System Risk Analysis and Sustainable Disaster Management within the Framework of the UN-ISDR". Based on existing networks and institutional, national and international expertise the new MoU shall contribute to the overall strategy of disaster reduction of the UN, including the objectives of the UN-WCDR, and is intended to provide a better and formal platform to promote research and preventive activities for an integrated Earth system risk analysis and sustainable development targeting landslides, floods, and other disasters like earthquakes, tsunamis, or volcanic eruptions. The session shall be completed by presenting a 'letter of intent' to finalize in due course the above-mentioned MoU to be signed by the representatives of UNESCO, WMO, FAO, UN/ISDR, UNU and ICSU

(3) Asian Water Cycle Symposium (Univ. of Tokyo, 2-4 Nov. 2005) was held for Asian GEOSS kick off convened by Prof. Toshio Koike. Dr. Andras Szollosi-Nagy (UNESCO) and a number of Asian national representatives came including from non-signed members of GEOSS (Global Earth Observation System of Systems). It was stressed that Asian FRIEND especially Catalogue of Rivers and its Water Archive can contribute GEOSS. It is an agenda how APF can contribute GEOSS and what kind of resources we need to do so. It is suggested by Szollosi-Nagy that we consider the submission of GEOSS support resolution to the next Council. What kind of resolution do we submitted.

(4) Asian PUB is developing quite well under Dr. Yasuto Tachikawa's initiative. Quite a few national representatives came to Nanjing and had Asian PUB national working group meeting (Hohai Univ., 31 Oct.-2 Nov. 2005). The attended were Korea, Nepal, Thai, China and Japan. Sri Lanka PUB did not attend. Strong national interests were demonstrated towards hydrological sciences for improving prediction.

(5) Post-GAME MAHASRI led by Dr. Jun Matsumoto (Univ. of Tokyo) is now official with many participants from Asian countries. A meeting was held in Univ. of Tokyo on 1 Nov. They requested the collaboration with IHP FRIEND as well as with PUB.

(6) Round Table Discussion: Strengthening Research and Learning on Earth System Risk Analysis and Sustainable Disaster Management within UN-ISDR as Regards "Landslides" : Towards a dynamic global network of International Programme on Landslides (IPL), Elizabeth Rose Hall, United Nations university, Tokyo, Japan, 18-20 January 2006, organized by International Consortium on Landslides (ICL), UNESCO, WMO, FAO, UN-ISDR, UNEP, UNU and Kyoto University.

(7) International Workshop on Flood Risk Management, Tsukuba International Congress Center EPOCHAL TSUKUBA on 24-26 January 2006, organized by the Public Works Research Institute (PWRI), UNESCO and WMO.

(8) UK-Japan Flooding and Coastal Defense Workshop, British Embassy, Tokyo, Japan, 31 January to 4 February 2006. From UK, Prof. Ian Cluckie, Prof. Brian Golding and six others and from Japan, Prof. Takeuchi, Prof. Takara, Mr. Terakawa and others attended.

(9) UNESCO-GRAPHIC (Groundwater Resources Assessment under the Pressures of Humanity and Climate Changes) International Symposium was held at the new facility of the Research Institute for Humanity and Nature (RIHN), Kamigamo, Kyoto, Japan, 4-6 April 2006 with supports by GWSP (Global Water System Project), IAH (International Association of Hydro geologist), IGRAC (International Groundwater Resources Assessment Center), etc. Dr. Makoto Taniguchi (RIHN) organized this symposium.

1.6.2 Participation in meetings abroad

Japan has played important role in the IHP Intergovernmental Council as a member. In particular, Prof. TAKEUCHI had been the Chairperson of the Council and Bureau of IHP from 1998 to 2000. Japan participated in the establishment of the Regional Steering Committee (RSC) for Southeast Asia and the Pacific in 1993. The first RSC chairperson was Prof. Yutaka Takahashi (Univ. of Tokyo). 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) and the Chairman of the Technical Sub-Committee (TSC) for Asian Pacific FRIEND (APF) Phase 1 (1997-2001) in the framework of the RSC, while Prof. Takara is playing a role of the RSC Secretary (1999-2006) and a member of TSC-APF Phases I and II (2002-2007).

(1) The 7th IHP/IAHS George Kovacs Colloquium, Paris, 17-18 September 2004 (Prof. Takeuchi and Prof. Takara)

(2) The 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), Dr Tadahiko Sakamoto (PWRI), Mr. Akira Terakawa (PWRI), Mr. Daisuke Kuribayashi (PWRI), Mr. Shigenobu Tazou (PWRI), Mr. Kenji Suzuki (MLIT) and Mr Seiji Ito (MLIT)).

(3) The 2nd GRAPHIC meeting (Univ. of East Anglia, UEA, 3 April 2005): Dr Makoto Taniguchi (RIHN) attended and had discussions on database management system for GRAPHIC (Groundwater Resources Assessment under the Pressure of Humanity and Climate Change) project and review of the past research themes. The 3rd meeting was held at the Research Institute for Humanity and Nature (RIHN) in Kyoto, Japan in April 2006.

(4) The 4th World Water Forum (Mexico City, Mexico, 16-23 March 2006): Water-related ministries or agencies, various sectors, and stakeholders participated in the Forum. (ICHARM, Prof. Takeuchi, Prof. Watanabe, Prof. Takara and others).

1.7 Other activities at regional level

1.7.1 Institutional relations/cooperation

Japanese National Committee supported the proposals for the UNESCO Participation Programme 2006-2007 for the "Regional Conference on Regional Conference on Hydrology and Water Recourses Management for Hazard Reduction and Sustainable Development," based on a request from the Philippines National Committee for IHP.

1.7.2 Completed and ongoing scientific projects

N/A

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2007

1) The 14th Session of the IHP Regional Steering Committee (RSC) for Southeast Asia and the Pacific will be held in Bangkok, Thailand, in conjunction with the 3rd Asia Pacific Association of Hydrology and Water Resources Conference (APHW2006), in October 2006.
2) The 16th IHP Training Course with the theme "Oceanography Basics" will be held in Nagoya, Japan, in December 2006.

2.2 Activities foreseen for 2008-2009

(1) Participation in RSC activities including Asian Pacific FRIEND and the Catalogue of Rivers.
(2) Nagoya University IHP Training Courses in 2008 and 2009.
(3) Implementation of projects related to IHP-VII.
(4) Activities related to the International Center for Water-related Hazards and Risk Management (ICHARM).
(5) Research on HELP basins.
(6) Collaboration with UNESCO-MAB activities.

2.3 Activities envisaged in the long term

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

NATIONAL REPORT ON IHP RELATED ACTIVITIES, JORDAN

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1. ACTIVITIES UNDERTAKEN IN THE PERIOD 2004 – 2006

1.1 Meetings of the IHP National Committee

There are seven meetings each year, about one meeting every two months.

1.1.1 Decisions regarding the composition of the IHP National Committee

* The committee is headed by H.E the Minister of Water and Irrigation, Jordan where the Vice Chair Person is Prof. Dr. Muhammad Shatanawi, the UNESCO Chair in Wadi Hydrology at the Univercity of Jordan.

The IHP National Committee composed with the following Institutions and Universities:

- Ministry of Water and Irrigation (MWI)
- Ministry of Education-National Commission for Education, Science and Culture
- University of Jordan, Amman – UNESCO Chair in Wadi Hydrology
- University of Science and Technology, Irbid
- Yarmouk University, Irbid
- Muta University, Karak
- Hashemite University, Zarqa
- Al Albayt University, Mafraq
- Balqa University, Salt
- Metorological Departement
- Natural Resources Authority (NRA)
- The Higher Council for Science and Technology (HCST)

In regard of re-composition of the National IHP Committee, a request has been sent to two universities and two institutions. One member of the committee has been replaced by another that has more time to contribute in the IHP activities.

The decisions of the Committee within the third quarter of April 2006 are nominations of the following Scientists and Specialists to the Category Centers as follows:

* Nomination of Prof Dr. Muhammad Shatanawi , the UNESCO Chair in Wadi Hydrology at the University of Jordan for the "Governing Board of the UNESCO-IHE Institute for Water Education" .

* Nomination of Prof Dr. Anwar Jiries , from Muta University for the "Advisory Board of the International Centre of Water Hazard and Risk Management (ICHARM) in Tsukuba, Japan " .

* Nomination of Prof Dr. Abdallah Malkawi, from the Science and Technology University, Jordan for the "Advisory Board of the International Research and Training Centre for Erosion and Sedimentation (IRTCES) in Beijing, China..

1.1.2 Status of IHP-VI activities

1.1.3 Decisions regarding contribution to/participation in IHP-VII

The Jordan National IHP Committee Contributed on the preparation and commenting on the draft plan for participation in IHP-VII.

Concentration on the National Priorities as follows:

* Surface water and Groundwater Resources Protection.
* Public Awareness and Stakeholders Participation.
* Watershed and Aquifers / Climatic Changes Impacts.
* Hydrology / Ecohydrology.
* Others

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

* Two Workshops have been conducted in 2004 by the Jordan National IHP Committee. The first workshop conducted at the Ministry of Water and Irrigation, Jordan where the second workshop conducted in the Hashemite University on the topic "Groundwater Resources Protection"

* Two Workshops have been conducted in 2005 by the Jordan National IHP Committee. The first workshop on "Groudwater Resources Management " conducted at the Ministry of Water and Irrigation, Jordan in March 2005 followed the celebration in the International water day, where the second workshop conducted in the Hashemite University on the topic "Groundwater Vulnerability and Risk "

* A Workshops and a Seminar have been conducted in 2006 by the Jordan National IHP Committee. The first workshop on "Water and Culture" conducted at the Ministry of Water and Irrigation, Jordan in March 2006 followed the celebration in the international water day, where the second event conducted in 30,th May 2006 at the University of Jordan on the topic " Aquifer dynamics- Water and Culture ". This Seminar organized in Cooperation between The Jordan National IHP Committee, the UNESCO Chair in Wadi Hydrology at the University of Jordan and UNESCO Amman Office.

The main topics of the seminar as follows:

* The Water in the Arabian Culture.
* Effects of Droughts on the Social, Cultural and Economic Activities.
* Resolution of Conflicts.
* The Conventional and Traditional Methods in Water Resources Management in Jordan.
* The Role of Municipal Activities on Characteristics and Watershed Management.
* Panel Discussion and Recommendations.

1.2.2 Participation in IHP Steering Committees/Working Groups

* A member of the IHP Committee Participated in one of the Ecohydrology working groups.

1.2.3 Research/applied projects supported or sponsored

* Applying for a study and research project in an artificial recharge of the flash floods at southern Jordan valley-south of the Dead Sea.

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

* UNESCO Chair in Wadi Hydrology at the Univercity of Jordan, Amman.

* UNESCO Chair in Desertification Protection at the Yarmouk University, Irbid

* Higher Committee of Climate change at the Ministry of Environment.

* Higher Committee of Desertification Protection at the Ministry of Planning-Ministry of Environment.

* UNESCO, Amman Office and UNESCO Cairo Office.

* ALECSO, ROSTAS and ACSAD.

* Non Governmental Organizations and Associations in Jordan

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1.2.5 Other initiatives

* Proposal for a land use study and research project of three wadis having different environment in Jordan. The finance of this proposal is going to be submitted through the extra budgetary resources at UNESCO.

* Celebration in the international water day in 2004, 2005 and 2006. The celebration in 2006 concentrated on the Theme "Water and Culture" with presence of students, institutions and non governmental organizations having a role in pubic awareness of water and culture. Prizes were distributed through that event.

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

Contribution to the annual Wadi Hydrology training course in Amman, Jordan. This Course is conducted by UNESCO Cairo Office, UNESCO Chair in Wadi Hydrology at the University of Jordan. In 2005 this course conducted at Balqa University, Jordan.

1.3.2 Organization of specific courses

1.3.3 Participation in IHP courses

* One participant trained in IHP course in a training center in Cairo.
* Trainees participation in the annual Wadi Hydrology Course, Amman.

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

1.5 Publications

* Publication of the scientific papers of the workshop in "Groundwater Protection" held at Hashimiyya University in 2004 through a CD.

* Publication of the scientific papers of the workshop held at Hashimiyya University in September 2005 through a CD.

* The papers presented in the seminar "Water and Culture" held at the University of Jordan in 30 of May 2006 will be published through a CD.

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

* Annual Wadi Hydrology Course in the University of Jordan in 2004.
* Annual Wadi Hydrology Course at Balqa University, Jordan in 2005.

1.6.2 Participation in meetings abroad

* Participation in the 11th Arab National IHP Committees Meeting in Damascus, Syria in September, 2005. The National Country report about the water sector has been submitted to the meeting. Actually this meeting is conducted each two years through UNESCO Cairo Office, ALECSO and other Organizations.

* Participation in the 3,rd International Conference in Wadi Hydrology in Sanaa, Yemen in December, 2005. Three Scientific papers have been submitted to the Conference.

* Participation in the meeting of the Steering Committee of Wadi Hydrology conducted parallel with the 3,rd International Conference in Wadi Hydrology.

* Participation in two Scientific meetings abroad.

* Intergovernmental Council meeting held in UNESCO headquarter in paris in September 2004.

* 38th session of the IHP Bureau meeting from 4-6 June 2005 in Paris where the general secretary of Jordan National IHP Committee is a member of the IHP Bureau, represents the Arab Region.

* 39th session of the IHP Bureau meeting from 3-5 May 2006 in IHE-Delft.

1.7 Other activities at regional level

1.7.1 Institutional relations/cooperation

* Cooperation with several governmental and Non-Governmental Organizations and Associations at the regional level.

* Cooperation with Wadi Hydrology Network, UNESCO Cairo Office, UNESCO Chair in Wadi Hydrology.

* Cooperation with Groundwater Protection Network, UNESCO Cairo Office, Acsad.

* Cooperation with the Yemeni National IHP Committee, where two specialists and officials from the Yemeni National IHP Committee visited Jordan National IHP Committee from 28 May to 3 June 2006. The trip covered a visit to the Ministry of Water and Irrigation (MWI), Jordan National Committee for Education, Science and Culture. UNESCO Amman office, and four Universities. The mission includes a field trip to potential water projects at the Jordan valley, also attending a seminar held in the University of Jordan.

1.7.2 Completed and ongoing scientific projects

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2007

There are three foreseen activities planned as follows:

* Celebration in the international water day in March 2007 at the Ministry of Water and Irrigation (MWI) headquarter, Amman in cooperation with the Non governmental organizations, UNESCO Chair in Wadi Hydrology and UNESCO Amman office.

* A scientific workshop in March 2007 about "Water Resources and Land Use".

* A scientific Seminar followed by a panel discussion within the third quarter 2007 in one of the Jordan Universities outside the capital city of Amman. The topic will be selected to coincide with one of the themes mentioned in the sixth mid term plan of IHP- VI from (2002-2007) and with the national priorities in the water sector in an arid environment.

2.2 Activities foreseen for 2008-2009

* Celebration in the international water day in March 2008.

* A Workshop at the first quarter 2008.

* A Scientific Seminar Probably in the second or third quarter 2008.

* Celebration in the international water day in March 2009.

* A Workshop at the first quarter 2009.

* A Scientific Seminar Probably in the second or third quarter 2009.

2.3 Activities envisaged in the long term

Informational report
on the activities of the National Committee of the Republic of Kazakhstan under UNESCO International Hydrological Programme in 2004-2005

During the period under consideration the National IHP RK Committee did the following works:

• In the framework of the UNESCO programme "Participation Programme" the National Committee completed researches on the project 00KZ 11105 "***Estimation of snow-ice resources of the Ili river basin and renewable aqueous resources of the Chinese part of this basin".***

As a result of investigations the characteristics of territorial distribution of snow resources in the above basin were determined and renewable water resources of the Chinese part of the Ili river were first estimated. The results of investigations may be used to solve the problems of interstate usage of water resources of transboundary basin of the Ili river and to improve the system of water resources management.

• Researches in the framework of the programme **"Global international waters assessment"-GIWA– Subregion -24 Aral Sea basin"** were completed**.** Researches in the framework of this programme were carried out for three years; their objective was to use a standard method to evaluate contemporary and forecasted situation in 65 transboundary world basins and to develop recommendations on water resources management and development of ecological situation in transboundary areas. The researches in the framework of GIWA programme in Central Asia were carried out on the territory of the Aral sea basin. The works were done under the auspice of the National IHP Committee RK on the base of the Institute of Geography. The researches on the GIWA programme included evaluation of the situation development in different spheres – from estimation of the natural resources potential of the region to estimation of the consequences of man-induced activities on the environment, tendencies and perspectives of development of socio-economic situation in the countries of the region.

According to the estimations of GIWA experts the most important problem in the Central Asian region is the problem of water. Even now resources of surface waters of the Amudarya and Syrdarya are used as much as 150 and 110%, respectively, and the countries manage to avoid dramatic crisis in the water sector only due to repeated usage of return and discharge waters. On a whole, in spite of the efforts of the governments of the regional countries and international community the situation in the region, largely in the field of water resources usage, remains complicated, it has clearly pronounced tendencies to aggravation and bears a threat of not only crises in economic-social sphere but also threat to regional security.

The situation is complicated by unfavorable prognoses according to which due to global warming water resources of the main watershed basins of Central Asia may reduce by 20-40% as early as in the near future.

One of the main reasons for this situation is insufficient attraction of scientific potential of the regional countries to the solution of all complex of regional and national problems and insufficient attention to scientific researches, primarily estimations of the conditions in the runoff formation zone, tendencies and perspectives of climatically-driven changes in water resources and improvement of water resources management at all levels – from local to regional. Final report on the GIWA programme was published in November 2005*(UNEP, 2005. Severskiy I.V., Chervanyov I.,Ponomarenko Y., Novikova N.M., Miagkov S.V., Rautalahti E. and D. Daler. Aral Sea, GIWA Regional assessment 24. University of Kalmar, Kalmar, Sweden. 2005. 87 p.).*

In the framework of the fundamental research programme the Institute of Geography, MES RK, carried out researches on three themes directly corresponding to the targets of the UNESCO Hydrological Programme. They included:

1. Development of geographical base for integrated water resources management in natural-economic systems of transboundary drainless basins on the principles of sustainable development. The results of investigations:

- development of principally new integral criteria of estimation of hydroecological disturbances and risk in natural-anthropogenic systems. These criteria were used to estimate current hydroecological state of 8 basin natural-anthropogenic systems in Kazakhstan;
- estimation of the efficiency of deep counter-regulation of the runoff in the Aral-Syrdarya natural-anthropogenic system in terms of reduction of winter and summer risks in hydrological regime in Kazakhstani part of the basin.

2. Studying of dynamics of surface water resources taking into account man-induced and climatic factors as the base of hydroecological safety of the Republic of Kazakhstan. Creation of hydrological base of river water resources management in Central and Eastern Kazakhstan. In the process of investigations the scientists:

• estimated water resources of the rivers: the upstream flow of the Irtysh (on the territory of Kazakhstan), the upstream flow of the Esil river, the Nura, Sarysu and Torgay, estimated tendencies of minimal and maximal flow of the major rivers of Eastern and Central Kazakhstan;
• compiled databank for types of elementary circulation processes and estimated the role of atmosphere circulation in the dynamics of climate variations in Central Asia taking into account elementary circulation processes.

3. Studying of contemporary and prognosis dynamics of glaciosphere of Southeastern Kazakhstan mountains as the base for probable climatically-driven changes in renewable water resources in the foreseeable future.

It was established that:

• in spite of year-to-year variations norms of annual and seasonal sums of precipitations and maximal snow reserves in the runoff formation area remained unchanged over the last 50 years;
• in spite of considerable shrinking of glacier areas the river flow characteristics including flow distribution within a year and renewable water resources on the territory of Southeastern Kazakhstan did not change considerably over the last 50 years.

The results that we have obtained enable us to state that:

- widely spread opinion that the rates of contemporary and forecasted climate warming are very high is exaggerated. The main source of erroneous estimates is insufficient account of the influence of anthropogenically-changed landscapes and urbanized areas on the formation of the fields of climate characteristics;
- glaciation of Southeastern Kazakhstan mountains and adjacent mountain areas of Central Asia during the second half of the XX-th century decreased at the rate of 0.8% per year for the glaciation area and about 1.0% for the ice volume. The degradation was especially intensive in the mid-1970s – the rate of reduction of the glaciation area on the northern slope of the Zailiyskiy Alatau in the period from 1975 to 1979, on the average, was 1.27% per year. However, later, in the period from 1979 to 1990, it reduced to 0.94% per year and then reached 0.89% during the next decade. The field data show that during the last 20 years the rates of reduction of glaciers area in the Gissaro-Altai basins decreased two times as compared to the rates typical of the previous 20-year period. This glaciations dynamics is likely to be characteristic of all Central Asian region;
- on the contrary to the expectations the process of glacier flow reduction caused by the reduction of the glaciers area prevailed over the process its increase caused by more intensive

melting due to climate warming. As a result the percentage of glacier flow in the total annual flow was continuously reducing during the last decades;

- the results of investigations make it possible to assume that even in the conditions of continuing degradation of glaciation, the renewable water resources of the main watershed basins of Central Asia will not change dramatically during the next decades and will remain more or less stable. This conclusion is important from practical point of view, because in perspective planning of water sector development it enables to base on the current water resources not being afraid of their considerable reduction (by 20-40% according to the forecasts) due to global climate warming.

• According to the results of the first regional meeting EDUCARAL the Institute of Hydrology and Hydrophysics, MES RK, developed the main priorities of IHP activities for 2004.

According to this plan the content and the structure of the monograph on the results of studying of ground water resources of the Aral sea region, its preparation for publishing and publishing were discussed. The monograph (V.V. Veselov, V.Yu. Panichkin. “Geoinformational mathematical modeling of hydrogeological conditions of Eastern Aral region”, Almaty, p. 428) was published in June, 2004.

Methodological aids on usage of modern information technologies in hydrogeological investigations (by the results of modeling of the aRal sea basin ground waters) were developed and presented in the INTERNET on UNESCO server http://www.aralmodel.unesco.kz .

At the beginning of 2005 the monograph “Hydrogeology of Kazakhstan” by V.V. Veselov and Zh.S. Sydykov, Almaty, p. 484 was published in Kazakh, Russian and English languages. The monograph considers physical-geographical and geological conditions of ground water formation and distribution, gives substantiation of natural and explored reserves and their usage, presents results of geoinformational and mathematical modeling of all large hydrogeological regions, industrial areas, irrigated areas and mineral deposits.

In the framework of Participation Programme works to support and improve national information network on water problems of the Aral sea region and other regions with tense water balance in Kazakhstan were fulfilled.

The scientists of the institute prepared and published in the INTERNET (address: http://www.water.unesco.kz) information about ground waters of Eastern part of the Aral sea region, Kazakhstani part of the Caspian sea coast and Ili-Balkhash region (the main water problems, the state, usage and protection of ground waters from overusage and contamination) and methodological materials on the usage of modern computer technologies for solution of water problems in Kazakhstan.

In the frames of the Republican programme of fundamental research “Fundamental principles of balanced usage of surface and ground waters and sustainable functioning of natural-anthropogenic systems of the Republic of Kazakhstan” the Institute of Hydrogeology and Hydrophysics, MES RK, completed works under the project “Development of theoretical base and experimental justification of uniting of mathematical models and geoinformation systems”.

Professor I.V. Severskiy

Chairman of the RK IHP National Committee

KYRGYZ NATIONAL REPORT ON IHP RELATED ACTIVITIES

1. ACTIVITIES UNDERTAKEN IN THE PERIOD SEPTEMBER 2004 – JUNE 2006

1.1 Meetings of the IHP National Committee

1.1.1 Decisions regarding the composition of the IHP National Committee

№	Name	Scientific degree	Place of work and position	Contact information
1	Mamatkanov Dushen Mamatkanovich (chairman)	Academician, doctor of technical sciences	Director, IWP&HP NAS KR	21-06-74 w
2	Matychenkov Vladimir Egorovich (deputy chairman)	Doctor of geological-mineralogical sciences, professor	Head of laboratory of hydropower, IWP&HP NAS KR	21-74-67 w
3	Tuzova Tamara Vasilevna (responsible secretary)	Candidate of physical-mathematical sciences, senior lecturer	Chief research officer of laboratory of long term regulation methods ofand forecasting of river drain, IWP&HP NAS KR	21-45-64 w
4	Alamanov Salamat Kulenbekovich	Candidate of geological sciences	Head of department of regional problem in Government of KR	21-18-73 w
5	Bazhanova Larisa Vasilevna		Senior research officer of laboratory of water and water-power resources, IWP&HP NAS KR	21-45-64 w
6	Erokhin Sergei Aleksandrovich		Head of engineer-geological detachment of Agency on geology and mineral resources by Government of KR	22-38-62 w
7	Mahdychev Alexandr Nikolaevich	Candidate of geological and mineralogical sciences	Head of laboratory of underground water ecology, IWP&HP NAS KR	21-45-63 w
8	Romanovskii Vladimir Vladimirovich		Head of laboratory of water and water power resources of IWP&HP NAS KR	21-45-73 w
9	Tolstikhin Gennadii Mikhailovich	Candidate of geological-mineralogical sciences	Chief geologist of Agency on geology and mineral resources by Government of KR	66-39-06 w
10	Usupaev Sheishenaly Eshmanbetovich	Doctor of geological-mineralogical sciences, professor	Head of Department of Ministry of emergency situation KR	21-95-26 w

11	Choduraev Temirbek Makeshovich	Candidate of geological sciences	Pro-rector of Bishkek University by I.Arabaev	
12	Shalpykova Gulnara	Master of Arts in International Relations	Head of Sector for External Relations, IWP&HP NAS KR	21-45-63 w
13	Ergeshov Abzapar Abdrazzakovich	Doctor geological sciences, professor	Pro-rector of Bishkek State University on scientific work	54-14-25 w
14	Erdman Olga Dmitrievna		Academic secretary, IWP&HP NAS KR	21-45-74 w
15	Yakimov Viktor Mikhailovich	Candidate of geological and mineralogical sciences	Head of laboratory of economy and ecology of water economy, IWP&HP NAS KR	21-45-73 w

1.1.2 Status of IHP-VI activities

Members of the Committee are currently involved in the Project implementation "Water and Ecological situation in the Issyk-Kul basin in the context of global climate change: scientific evaluation, forecast and mitigation."

1.1.3 Decisions regarding contribution to/participation in IHP-VII

The IHP Kyrgyz Committee supports the IHP's three important directions that have been mentioned in the letter dated 21 October 2003. These directions have always been priorities for the Kyrgyz Republic. For many years the country has been engaged in planned and regular research in the field of hydrology, water resources management, specialists' training and institutional capacity building. However, with the disintegration of the Soviet Union a decade ago, the situation with the water related research has drastically changed.

Priorities Justification. With respect to the hydrological research, the network of hydrological measurement stations in the country was reduced by 80%. The current hydrological research can be characterized as incidental due to a shortage of budgetary funds and professional manpower drain.

The water resources management issue also demands a high degree of attention because of its latent conflict potential. Indeed, co-riparians of the Aral Sea basin have diametrically opposite views on how to manage the trans-boundary water resources of the basin. Such clash of opinions leads to conflict situations and tense relations within the riparian community.

The essence of the problem lies in the fact that the water allocation scheme of the Soviet period still remains in force. As a result, upstream states (Kyrgyzstan and Tajikistan) of a mountain zone, where the main flow is formed, have small water quotas. Such situation with water allocations in turn causes the lowest indicator of water resources and difficult living conditions of people of the upper riparian states. This looks quite paradoxical, especially given considerable land resources availability fit for irrigation.

A number of resolutions and declarations on the necessity to develop a new water allocation strategy, adopted by the heads of the Central Asian states during the period of 1993-1996, has remained on paper and has never been put into practice in full measure. Market mechanisms on interstate use of the trans-

boundary water resources are lacking. The upstream states, therefore, have to provide funds from their budgets to maintain water facilities, which serve mainly the needs of downstream users.

Long-term Priorities Setting. The circumstances mentioned above have considerable influence on setting long-term priorities of Kyrgyzstan with regard to 'three essential lines of action.' The IHP Kyrgyz Committee does believe that the following topics will be the most priority and salient issues for the next several decades.

1. Hydrological Research
   - assessment of the current/ future state of water resources in the context of climate change.

2. Water Resources Management
   - preparation of a new water allocation strategy for the trans-boundary water resources of the Aral Sea basin, which would be able to provide for a balance of upstream-downstream state interests;
   - elaboration/ introduction of economic mechanisms to manage the water resources;
   - development of water disputes resolution techniques with due attention to unique peculiarities of the water issue of the basin.

3. Education and Institutional Capacity Building
   - preparation of different training programmes for water professionals;
   - improvement of the Internet access to facilitate working partnerships, to promote compilation/ exchange of information and technology transfer;
   - strengthening the Committee's role at the national, regional and international levels.

Conclusion. The IHP Kyrgyz Committee would appreciate it, if the proposed priority issues are reflected in the plan for the IHP-VII. Study and solution of these issues would exert direct and positive influence on interstate relations with respect to the trans-boundary water resources; thus promoting cooperation among Kyrgyzstan and its neighbours. Besides, mainstreaming the issues into the IHP-VII would brisk up the hydrological research and help to improve professional development and institutional capacities. Having skilled professionals as well as well-functioning institutions and being aware of the current/ future state of the water resources through the hydrological research, the country would be able to follow the principle of sustainable development. Finally, but not less important, if the problem of water allocations in the basin is solved with due and fair attention to the upper riparians needs, there will be an opportunity to increase a specific area of irrigated land in these countries. This in turn will improve the situation with food supplies and contribute to eradication of poverty. In that way the country will move towards fulfilling the UN Millennium Goals related to water.

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

The IHP Kyrgyz Committee conducted a number of meetings. For more details, please visit the website: www.caresd.net/iwp

1.2.2 Participation in IHP Steering Committees/Working Groups
none

1.2.3 Research/applied projects supported or sponsored

The project «The water-ecological situation of the Issyk-Kul basin in the conditions of global climate getting warmer: scientific estimation, development forecast, measures on a mitigation of negative consequences » was implemented in 2004-2005. The implementation of the project " Creation of the information system block of the Issyk-Kul area for water-ground and hydropower resources management with the purpose of region steady development" is started in 2006.

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

INTAS. The perspectives of development of natural-economic resources in Kazakh Priaralye.
Coordinator: Dr. Mikael Motelica Heino, Geological service of France, Orlean, France
Executor: V.Yakimov
2002-2004
The grant sum is 150 thousand euro
Including IWP and HP- 24 thousand euro
Was received by IWP and HP in 2003 -1,0
2004 .-2,2
2005 -1,793

ISTC
KR-330.2
Study of Quaternary climate changes in Tyan-Shan: freezing and fluctuation of the level of inflow lakes of Issyk-Kul, Chatyr-Kul (Kyrgyzstan)
Collaborators: prof., Tomas Jonson, doctor Rihard D.Riketts, Observatory of Great lakes, University Minnesota, USA
Prof. Kennet Rasmussen, Smith Institute, Washington, USA
The manager V.M. Yakimov
Period of implementation: 2004-2006.

ISTC
KR-330.3
Study of water balance and hydrodynamics of the Issyk-Kul lake by isotope methods
Collaborators: Y.Klerks, The Chairman of the international bureau of environmental study (IBES), Belgium
S.Lombardi, professor of « La Sapienta» University, Rome, Italy
The manager V.E.Matychenkov
Period of implementation: 2002-2005.

1.2.5 Other initiatives

EC, FP6
Estimation of risk to environment from tails of deposits working out of radioactive raw material
Coordinator: Y.Klerks, The Chairman of the international bureau of environmental study (IBES), Belgium
Period of implementation: 2004-2006.

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

none

1.3.2 Organization of specific courses

none

1.3.3 Participation in IHP courses

General: From September 14, 2005 through September 20, 2005, Ms. Gulnara Shalpykova, representing the Institute of Water Problems and Hydropower of the National Academy of Sciences of the Kyrgyz Republic, visited the International Research and Training Center on Erosion and Sedimentation ("IRTCES").

All participants were set the following tasks:

- to attend a series of lectures on basic theories on mechanics of sediment transport, fluvial process, watershed eco-environmental management and water resources management;
- to participate in discussions and field trips; and
- to share information and to prepare presentations on the basic situation of water resource management in home countries.

Activities: From September 14, 2005 through September 20, 2005, Ms. Gulnara Shalpykova was taking part in the International Training Workshop on Watershed Eco-environment and Water Resources Management (the "Workshop"). The even was held at IRTCES and was sponsored by IHP-UNESCO Paris, UNESCO cluster offices and the Ministry of Water Resources of China.

The Workshop was devoted to:

- basic theories on mechanics of sediment transport;
- fluvial process;
- watershed eco-environmental management; and
- water resources management.

On September 15, 2005, Ms. Gulnara Shalpykova attended lectures on water resources management, strategic planning, integrated approaches to river basin planning, development and management.

On the next day there was a lecture on remote sensing and its application in water resources management in China. On the same day Ms. Gulnara Shalpykova visited Water Resources Department of the Institute of Water Resources and Hydropower Research.

During the whole day of September 17, 2005, Ms. Gulnara Shalpykova had been in the Beijing suburb visiting a small watershed management demonstration place.

The last day was aimed at discussing water relevant topics and/or presenting general issues in the field of water resources management in home countries. Ms. Gulnara Shalpykova made a brief introduction to the Institute of Water Problems and Hydropower of the Kyrgyz Republic. In addition, she presented the

main research activities of the Institute with key focus on preliminary studies related to transboundary water resources of the Tarim river basin, which is shared by Kyrgyzstan and China. Finally, Ms. Gulnara Shalpykova answered questions on transboundary water resources issues of Central Asia.

Results: In the course of the Workshop, Ms. Gulnara Shalpykova shared her knowledge in the field of transboundary water resources management and established a number of useful contacts with international experts interested in scientific partnership with research institutions of Central Asia. Several lecture materials and presentations were obtained and distributed subsequently among interested scientists of the Institute of Water Problems and Hydropower.

In addition, Ms. Gulnara Shalpykova successfully presented her report, obtained valuable and positive comments from international colleagues representing 9 countries of the world and answered several interesting questions on the most pressing water-related issues of Central Asia.

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

The IHP Kyrgyz Committee keeps trying to establish partnership relations with the UNESCO-IHE Institute for Water Education. Such partnership could contribute to further development of young water professionals. All attempts, however, are still unsuccessful since candidates from the Kyrgyz Republic are not eligible to apply for NFP fellowships to attend courses offered by the UNESCO-IHE.

1.5 Publications

2005

1. D.M.Mamatkanov Preliminary Results and Perspectives of USE of Space Imagery in Solving Water Problems of Highlands. Proceedings of the 7th international symposium on High mountain remote sensing cartography (Bishkek, Kyrgyzstan, 2002) Institut for Cartography Dresden University of Technology Germany, Dresden, 2004 p.179.

2. A.N.Mandychev Process of Transfer of the Weighted Material in Lake Issyk-Kul on Hand-Held Space Photos. Proceedings of the 7th international symposium on High mountain remote sensing cartography (Bishkek, Kyrgyzstan, 2002) Institute for Cartography Dresden University of Technology Germany, Dresden, 2004 p.181.

3.Mandychev A.N.., Prilepskaya S.V., « The estimation of renewed resources of underground waters of Quaternary water-bearing complex of the Issyk-Kul basin». 5p., 2005 (http: // www.geohydro.narod.ru).

4.Mandychev A.N. « The estimation of renewed resources of underground waters Sharpyldak water-bearing complex of the Issyk-Kul basin». 6p., 2005 (http: // www.geohydro.narod.ru).

5.D.M.Mamatkanov., L.V.Bazanova. Water balance of the Issyk-Kul lake at the present stage (2001-2003). « Study of hydrodynamics of the Issyk-Kul lake with the use of isotope methods » .Part 1, Bishkek, ILIM 2005.p.8-16 (RUSS)., p. II, 2006, 148 p(Engl).

6. V.V.Romanovskii, V.A.Kuzmichenok, D.M. Mamatkanov, A.O. Podrezov. All about Issyk-Kul.. The encyclopaedic information directory on a nature and ecology of the lake and the basin. Bishkek, 2005. p-406.

7.V.V.Romanovskii, V.A.Kuzmichenok. «Ursache und Auswirkungen der Seespiegelschwankungen des Issyk-Kul in jungerer Zeit». Gissen university by Ustusa Libiga, Germany, 2005. 90p.

8. r. Hanbilvardi, A.Gitelson, S.Stanichnii, A.Mandychev, V.Kushnir, V.Hasin, B.Shteinman. Remote monitoring of water dynamics and estimation of chlorophyll concentration. Works of the ninth biennale of ASCE (American society of the civil engineers). Space branch of the international conference on development, construction and actions in problem environments. The Earth and space, 2004, Lig-city- Texas.p. 263-268.

9. Sh.A.Ilyasov, V.M.Yakimov etc. A national structure of the Kyrgyz Republic for the estimation of a national infrastructure on management of stable organic contaminators. Bishkek, 2005. 240 p.

10. Shabunin A.G. « Geoinformation system of the Issyk-Kul area(The Kyrgyz Republic) » Urgent problems of modern science: The 1st International forum (:of the International conference) of young scientists and students). Natural sciences. p.18:Informatics and management information system / scientific editing by A.S. Trunin, A.V. Chuvakov, Samara, SSTUA. 2005, p.135.

11.Bazanova L.V., Change of liquid water content of the rivers on a background of global climate getting warmer // Water and market. St.-Petersburg. At Polytechnical university. 2005.250 p.

12. Luterbacher U., Kuzmichenok V. and Shalpykova Gulnara. *Mountain Glaciers and Society International and Interdisciplinary Workshop*. "Glaciers and Water Use in Central Asia." (submitted to Kluwer Academic Publishers in January 2005)

2004

1. Shabunin A.G., Shabunin G.D.. Results of the spectral analysis of seiches fluctuations of the Issyk-Kul lake level. News NAS KR, № 2, 2004, p.92-96.

2. Shabunin A.G.. Transformation of coordinates. The collection of materials of the international conference « GIS use and simulative models for research and acceptance of the decisions in Central Asia river basins " » of Tashkent, 2004, p.68-70.

3. T.V. Tuzova, Dj Kachkynbaeva. " Use Even Uranium Isotopes Correlation as a Natural Radioactive Mark for Studying Water Resources Formation Condition in Mountain Areas ". Materials of the international conference " Monitoring of migration and accumulation of radionucleids in natural ecosystems components", Dushanbe, 2004, p.17.

4. T. V. Tuzova " Peculiarities of Even Uranium Isotopes Migration in Waters of the Gunt and Pjandj River Basins (Eastern Pamirs) ". Materials of the international conference " Monitoring of migration and accumulation radionucleids in components of natural ecosystems ", Dushanbe, 2004, p.15-16.

5. Dj. Kachkynbaeva "Mechanism of Disequilibrium Uranium Formation in Natural Objects". Materials of the international conference " Monitoring of migration and accumulation radionucleids in components of natural ecosystems ", Dushanbe, 2004, p.25-28.

6. Mamatkanov D.M., Bazanova L.V., Romanovskii V.V., Dikih A.N., Modern changes of a climate and reaction on them of various kinds of water resources of Kyrgyzstan. J. " Water resources of Central Asia ", № 2, Dushanbe, 2004, p.12-17.

7. D.M.Mamatkanov The threat of conflicts about the interstate use of transboundary resources in Central Asia. Cooperation and Conflict Management in Central Asia/ Peter Lang, Europaischer Verlag der Wissenschaften. Gissen, 2004. p.155-160.

8. Shalpykova G., "Upstream-Downstream Relations in the Syr Darya River Basin." In *International Conference on Security Challenges in Central Asia*, edited by Halim Nezihoglu, Iskender Ormon Uulu, Murat Bakir, 191-196. Bishkek: International Ataturk-Alatoo University, 2004.

9. D.M.Mamatkanov Preliminary Results and Perspectives of USE of Space Imagery in Solving Water Problems of Highlands. Proceedings of the 7th international symposium on High mountain remote sensing cartography (Bishkek, Kyrgyzstan, 2002) Institute for Cartography Dresden University of Technology Germany, Dresden, 2004 p.179.

10. A.N.Mandychev Process of Transfer of the Weighted Material in Lake Issyk-Kul on Hand-Held Space Photos. Proceedings of the 7th international symposium on High mountain remote sensing cartography (Bishkek, Kyrgyzstan, 2002) Institute for Cartography Dresden University of Technology Germany, Dresden, 2004 p.181.

1.6 Participation in international scientific meetings

1.6.2 Participation in meetings abroad

General: From February 26, 2005 through March 05, 2005, a mission team (the "Mission") composed of Prof. Dushen Mamatkanov and Ms. Gulnara Shalpykova both representing the Institute of Water Problems and Hydropower of the National Academy of Sciences of the Kyrgyz Republic visited the Indian National Institute of Hydrology in Roorkee ("NIH").

The principal tasks of the Mission were to:

- present the Country Paper on Water in Arid and Semi-arid Regions of the Kyrgyz Republic;
- discuss the process of establishing a regional network (the "Asian G-WADI");
- become familiar with new developments in environmental modelling; and
- get modelling support in the form of access to appropriate software tools and web-based training materials.

Activities: From February 28, 2005 through March 04, 2005, the Mission was taking part in the International G-WADI Modelling Workshop (the "Workshop"). The even was held at NIH and was sponsored by IHP-UNESCO Paris, UNESCO cluster offices, DFID, G-WADI network, the Indian National Committee on Hydrology and the Indian Institute of Technology.

Among others, the goals of the Workshop included:

- discussion of the country papers for G-WADI;
- establishment of a regional network, the Asian G-WADI; and
- provision of modelling support to facilitate the sustainable development of water resources and the integrated management of river basins, to forecast and manage flood phenomena, and to monitor water quality in arid and semi-arid areas.

During the first several days (from February 28 through March 03, 2005), the Mission attended all presentations and software demonstrations arranged by invited guests in order to become familiar with new developments in the field of environmental simulation for arid and semi-arid zones and to share experiences.

The next few days were aimed at presenting and discussing country papers on water resources management in arid and semi-arid regions. The Mission made a presentation of "the Country Paper on Water in Arid and Semi-arid Regions of the Kyrgyz Republic" prepared by scientists of the Institute of Water Problems and Hydropower of the Kyrgyz Republic.

On last day of the Workshop, participants discussed provisions of a declaration on the establishment of a regional network within the framework of G-WADI. The Mission participated actively in all discussions and initiated some amendments to this document.

Results: In the course of the Workshop, the Mission shared experiences in the area of hydrological modelling and established a number of useful contacts with international experts interested in scientific partnership with research institutions of Central Asia. Several software demo packages were obtained and distributed subsequently among interested scientists of the Institute of Water Problems and Hydropower.

In addition, the Mission successfully presented the Country Paper, obtained valuable and positive comments from international colleagues and answered several interesting questions on the most pressing water-related issues of Central Asia.

Lastly, but not of less importance, during discussions of the declaration provisions, the Mission supported the proposed initiative to establish the Asian G-WADI and put forward an idea to determine a fixed period for rotation of the network coordinating body.

Outcomes: The idea related to a fixed period for rotation was met with approval and support from participants of the Workshop. As a result, it was decided that the coordinating body of the Asian G-WADI would rotate in a three-year cycle among members of the network.

Afghanistan, China, India, Iran, Kyrgyz Republic, Mongolia, Pakistan, Tajikistan and Uzbekistan signed the declaration and became members of the newly created network. The network membership would be open to all.

According to provisions of the signed declaration, during the first three-year period, the Asian G-WADI will be coordinated by NIH.

The presented country papers as well as other proceedings of the Workshop are expected to be revised, published and open for public use through the G-WADI website.

1.7 Other activities at regional level

1.7.1 Institutional relations/cooperation

The Kyrgyz IHP Committee actively cooperates with a number of regional institutions of Central Asia. For more information, please visit our website: www.caresd.net/iwp.

1.7.2 Completed and ongoing scientific projects

Members of the Kyrgyz IHP Committee implemented and have been continuing to carry out the following locally financed studies and international joint projects:

INTERNATIONAL JOINT PROJECTS

2004-2006
Study of Quaternary Climatic Fluctuations in Tien-Shan: Glaciation and Level's Fluctuations in Inland Lakes, Issyk-Kul and Chatyr-Kul (Kyrgyzstan)
collaborators: Large Lake Observatory and Smithsonian Institution, USA
grant sources: ISTC

2004-2006
Assessment of Environmental Risk of Radioactively Contaminated Industrial Tailings
collaborator: International Bureau for Environmental Studies, Belgium
grant sources: EC FP6

2004
Central Asian Lakes Monitoring: Issyk-Kul, Aral Sea
collaborator: Laboratoire d'Etudes en Geophysique et Oceanographie Spatiales, Centre National d'Etudes Spatiales, France
grant sources: NATO

2003-2005
Effect of Changes in Climate, Snow Pack, Glaciers and Permafrost on River Runoff in Tien Shan, Central Asia
coordinator: University of Idaho, USA
grant sources: National Science Foundation, USA

2002-2005
Study of Water Balance and Hydrodynamic Model of the Issyk-Kul lake with the Use of Isotope Methods
collaborators: International Bureau for Environmental Studies, Belgium and University La Sapienta, Italy
grant sources: ISTC

2002-2004
Prospect for the development of natural-economic resources in the Kazakh Priaralie
collaborator: French Geological Survey
grant sources: INTAS

2000-2004
Assessment and Prognosis of Environmental Changes in the Issyk-Kul Lake
coordinator: International Bureau for Environmental Studies, Belgium

grant sources: EC/ Copernicus II
brief project description

2000-2003
Water Use, Property Rights and Transboundary Conflicts in Central Asia: Exploring Problems and Solutions
collaborator: Institut universitaire Kurt Bosch, Switzerland
grant sources: SNSF

1998
Late Quaternary Paleoclimatic Archives of the Issyk-Kul Lake
collaborator: Large Lake Observatory and Smithsonian Institution, USA
grant sources: National Scientific Foundation, USA

1996-1997
Management and Control System of the Syr Darya River Basin to Support Decision Making
grant sources: USAID

1995-1996
Water Pricing in the Central Asian Countries
grant sources: USAID

STUDIES FINANCED FROM THE STATE BUDGET

2004-present
"Research, development and application of technical regulations into practical work of scientific organizations."

2003-2005
"Water and ecological situation in the Issyk-Kul lake basin in the context of global warming: scientific assessment, further event forecast and measures to mitigate negative consequences."

2000-2002
"Development of scientific foundations for integrated use of water and hydropower resources of the Issyk-Kul oblast in order to achieve sustainable development and to put into practice ideas of the Great Silk Way."

1997-1999
"Development of scientific foundations to optimize use of the country's water and hydropower potentials in order to achieve sustainable development."

1996
"Development of scientific foundations to optimize use and protection of water and hydropower resources of the Kyrgyz Republic in the context of market economy."

1992-1995
"Development of scientific foundations to evaluate water resources in mountainous areas and to assess efficiency of their use with due attention to environmental protection."

OFF-BUDGET RESEARCH

2000
Underground Waters, Landslide and Mudflow Phenomena in Kyrgyzstan: Assessment and Forecast.

1999
Dangerous Phenomena Caused by Surface and Underground Waters in the Osh and Jalal-Abad oblasts of Kyrgyzstan: Regime and Forecast.

1998
Integrated Hydrological and Hydrogeological Research in the Western Chui Valley (between Bishkek and Kara-Balty cities) to Assess Underflooding and Flood Risks. Development of Recommendations to Eliminate or Mitigate these Risks.

1997
Integrated Hydrological and Hydrogeological Research in the Eastern Chui Valley (between Chu, Tokmok and Kant cities) to Assess Underflooding and Flood Risks. Development of Recommendations to Eliminate or Mitigate these Risks.

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2007

Further implementation of the current projects.

2.2 Activities foreseen for 2008-2009

Development of a strategy for transboundary water resources management in Central Asia.

2.3 Activities envisaged in the long term

Glaciers monitoring of the Northern Tien-Shan range in the context of the global climate change.

17th SESSION INTERGOVERNMENTAL COUNCIL
UNESCO PARIS

(3 JULY 2006 - 7 JULY 2006)

COUNTRY REPORT

OF

MALAYSIAN NATIONAL COMMITTEE FOR IHP

(SEPTEMBER 2004 – JUNE 2006)

BY

DATUK IR. HAJI KEIZRUL BIN ABDULLAH

CHAIRMAN

MALAYSIAN NATIONAL COMMITTEE FOR IHP

COUNTRY REPORT 2006 OF
MALAYSIAN NATIONAL COMMITTEE FOR IHP

CONTENTS

1. ACTIVITIES UNDERTAKEN IN THE PERIOD SEPTEMBER 2004 – JUNE 2006

The Malaysian National Committee for IHP was formed in 1975, and comprises 29 governmental agencies and institutions of Higher Learning as listed in Appendix A.

1.1 Meetings of the IHP National Committee

a) The EXCO meetings were held as follows:-

Year 2005 in Kota Bharu 17 January 2005
in Kuala Lumpur 9 May 2005
in Kuala Lumpur 11 November 2005

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

Year 2005 35th AGM on 15 July 2005
Prime City Hotel, Kluang, Johor

1.1.1 Decisions regarding the composition of the IHP National Committee

The National Committee of IHP Malaysia (MIHP) 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 Datuk Ir. Keizrul Abdullah, the Director General of Drainage and Irrigation Department (DID) Malaysia. The Secretary of the National Committee is Mr. Lee Bea Leang (from January 2006) who succeeds Ir. Abdul Rahim Kaparawi (from January 2004 to March 2005), is the Director of Hydrology and Water Resources Division of DID, the Secretariat for IHP Malysia.

The EXCO members elected during the 35th AGM were as follows:-

1. The University 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 they are carried out by the three standing committees and their working groups. The three standing committees comprise:

(a) Committee on Research (JKP) under the chairmanship of the Director of Humid Tropics Centre, Kuala Lumpur (HTC KL).
(b) Committee on Education, Training and Public Information (JKPLPA), headed by the University of Technology Malaysia (UTM).

(c) Committee on Standardization of Hydrological Practices (JKPAH), headed by the Department of Irrigation and Drainage (DID) Malaysia.

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

1.1.2 Status of IHP-V and IHP-VI activities

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

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

1.1.3 Decisions regarding contribution to/participation in IHP-VI

MIHP is co-organising the National Conference on Water for Sustainable Development, which will be held on 13 – 14 July 2006 at Port Dickson of the Negeri Sembilan state.

1.2 Activities at national level in the framework of IHP

1.2.1 National/local scientific and technical meetings

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

1.2.2 Participation in Regional IHP Steering Committee

MIHP participated in the 12th RSC Meeting for IHP UNESCO for South East Asia and the Pacific at Adelaide, Australia from 20 October – 26 October 2004 which was represented by Dr. Mohd Nor Desa, the Director of HTC KL.

The 13th RSC Meeting for IHP UNESCO for South East Asia and the Pacific at Bali, Indonesia from 21 November – 25 November 2005 was attended by Datuk Ir. Keizrul bin Abdullah, the Chairman of MIHP and Dr. Mohd Nor Desa, the Director of HTC KL.

1.2.3 Research projects sponsored

See Table 2 and Table 3.

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 (JIIHP).

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 in Malaysia to be executed successfully.

1.2.5 Other initiatives

MIHP has been organising several activities such as workshops, seminars, basic courses in Hydrology etc. at National Level through out the year.

The MIHP has successfully organised The 2006 World Water Day Celebration in collaboration with government agencies, NGOs and private sectors. The celebration was launched by His Royal Highness the Acting Raja (Ruler) of Perlis at 9.30 pm on 23 April 2006 at the Esplanade Sungai Perlis, Kangar. Guests of honour include the wife of His Royal Highness the Acting Raja (Ruler) of Perlis, Chief Minister of Perlis, Minister of Natural Resources and Environment, Deputy Minister of Arts, Culture and Heritage, Parliamentary Secretary to The Ministry of Natural Resources and Environment, Chief Secretary to the Ministry of Natural Resources and Environment, State Secretary of Perlis, Director General of DID, Federal and State officials.

The activities carried out include the national seminar, the national exhibition, drawing and colouring contest, articles and feature writings in the electronic and mass media (see Table 4).

1.3 Educational and training courses

In the year 2005, talks on hydrology and environment to secondary schools were organised with participation of over 1,000 students.

Several other educational programmes were organized for student as follows:

a) **National River Expedition 2005** – was successfully organised from 15 – 19 July 2005 at the National Park Endau – Rompin and Tebrau River in Johor. 75 secondary school students and 25 teachers from all over Malaysia (including East Malaysia) participated in the Expedition. This program was one of the activities organized under the JKPLPA of MIHP lead by Dr. Zulkifli Yusop in collaboration with UTM. The project was sponsored by the Malaysian National Commission for UNESCO (MNCU) and local agencies.

b) **Sustainable Water Resources Management Seminar –** was jointly organised by JKPLPA and Ministry of Education in conjunction with 2005 World Water Day Celebration on 17 March 2005 in Pengkalan Chepa, Kelantan. The seminar, which includes a workshop, was attended by 100 secondary students and 25 teachers from all over the state of Kelantan.

c) **Sustainable Water Resources Management Seminar and Camp –** was jointly organised by JKPLPA and Ministry of Education in conjunction with 2006 World Water Day Celebration from 22 – 23 April 2006 in Kangar, Perlis. The program of the Camp comprises of practical activities in hydrology on the first day and seminar on the second day. 100 secondary students and 25 teachers from the state of Perlis participated in this program.

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 was held in Kuala Lumpur Malaysia from 11 October – 15 October 2004. It 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 FRIM
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

1.4 Publications

Publications contributed by MIHP are as follows:

1. The Report on Sungai Pahang for River Catalogue Vol. 5.

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

3. The Proceedings of The International Symposium on Comparative Regional Hydrology Mission for IHP - VI of UNESCO edited by Dr. Mohd. Nor Desa and became IHP – VI Technical Document in Hydrology No. 1 UNESCO Jakarta Office, 2002.

4. Standardization of Practices and Techniques of Water Quality Sampling in Malaysia (manual) by JKPAH.

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 Datuk Ir. Keizrul bin Abdullah attended the International World Water Day Celebration in Mexico City from 16 – 22 March 2006 accompanying The Honorable Minister of Natural Resources and Environment who delivered a keynote speech.

1.6 Other activities at a regional level

Application for a participation programme grant 2006-2007 to carry out a project on "River Eco–Expedition" for S.E.A. regional student exchange programme on Hydrological and Environmental Expedition has been re-submitted to the Malaysian National Commission for UNESCO for consideration.

1.6.1 Institutional relations/co-operation

The MIHP was represented by Ir. Hj Hosni Bardan, the Deputy Director-General (II) of The Department of Irrigation And Drainage Malaysia and Dr. Mohd Nor Desa at the 16th IGC Meeting in UNESCO Paris from 16 – 24 September 2004.

1.6.2 Completed and on-going scientific projects

Refer to Table 2.

2. FUTURE ACTIVITIES

2.1 Activities planned for 2007 and beyond

The implementation of the proposed project on "River Eco-Hydrology Expedition for S.E.A. Regional Student Exchange Programme" to be held at the end of 2006 is very much dependent on the availability of financial sponsorship from UNESCO.

The second "National River Expedition" is planned to be held in 2007 under the sponsorship of MNCU and that other local agencies who are members of the standing committee (JKPLPA) will be participating in this event.

Other proposed activities are listed in Table 5.

2.2 Activities envisaged in the long term

Being planned.

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

Theme / Focal Area	Title	Status	Agencies Involved	Impl. period	Funding Agency Project Cost
Theme 2	**Integrated Watershed Dynamics**				
Focal Area 2.2	a) Development of Runoff Generation and Catchment responses in Forest and Agricultural sites	Literature review - Phase I completed. Purchasing of equipment and installation.	UTM,MINT,USM,FRIM, JMG	2004 - 2007	IRPA RM 298,000
Theme 3	**Regional Perspective**				
Focal Area 3.1	a) Development of Temporal Pattern for Urban Areas and PMP Derivation for Peninsular Malaysia	Preparation of max. persisting Dew Point is 90% completed. Analysis of Temporal Characteristics of short term rainfall in Kerayong River now completed.	HTC,MMS	2004 - 2006	IRPA RM 166,000
Focal Area 3.5	a) Detailed Hydrological Balance Study of Paya Indah Wetlands, Selangor	Literature review - Phase I partially completed. Phase II – Study of historical data on rainfall, geological, hydrological, meteorological and topographic maps and flow path between the lakes in the Wetlands is on-going.	HTC,DID,UTM,FRIM, MINT,MMS,JMG	2004 - 2007	IRPA RM 277,00
Focal Area 3.7	a). Development of runoff characteristics to validate Manual Saliran Mesra Alam (MASMA)	Literature review completed. i) Checking data reliability for Kerayong River. ii)Separation of rainfall volume and runoff volume. iii) Determination of hydrograph separation.	USM,DID,MINT KUiTTHO,HTC	2004 - 2007	IRPA RM 241,000
	b) Development of Urban Stormwater Management Model (SWMM) and GIS for Decision Support System	i) Development of USM SWMM Main Engine. ii) Redevelopment of USM tools.	USM,JPS	2004 - 2007	IRPA RM 163,000

Table 2: Malaysian IHP Research Activities Under IHP Phase VI

No .*	Title	Status	Agencies Involved	Completion Date	Funding Agency
1. (6.1/6.2)	Effects of Logging on the Muda/Pedu Reservoirs.	Late start of logging activity of modified logging compartment. Continue with hydrological data collection including sediment transport for post-logging assesment.	DID/UPM/UTM/JPSM/MINT/MADA/ FRIM/LESTARI/UKM/JPNK/DOA	Dec. 2006	DID and MADA

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

Table 3: Asian Pacific FRIEND research project

No .	Title	Status	Agencies Involved	Completion Date	Funding Agency
1.	Water Archive	On going	DID	2006	M'sian Govt.
2.	Catalogue of Rivers for South East Asia & the Pacific.	Volume VI . Planning in progress	DID	2007	M'sian Govt.
3.	AP FRIEND – IDF Project and Design Flood Project	Preliminary analyses of rainfall data from countries	DID / NAHRIM / UNITEN / HTC / UTM	2007	M'sian Govt. .

Table 4. Activities Carried Out by Malaysian IHP for 2004/2006
(from September 2004 - June 2006)

Item	Activity	Period and Venue	Lead Agency
1.	**World Water Day 2005**		
i.	Launching by Hon. Parliamentary Secretary of the Ministry of Natural Resources and Environment, Malysia	19 March 2005 KB Mall,Kota Bharu	MIHP
ii.	National Exhibition	18 – 19 March 2005 KB Mall,Kota Bharu	DID Kelantan
iii.	Drawing and Colouring Contest	19 March 2005 KB Mall,Kota Bharu	MOE
iv.	Publicity	During the World Water Day Celebration	Radio & TV Malaysia, local newspapers and bulletin
v.	Open Day of Water Treatment Plant	19 March – 16 April 2005 Through out Malaysia	JBA
vi.	Seminar and Workshop on "Sustainable Water Resources Management"	17 March 2005	MIHP
vii.	National Seminar	20 - 21 March 2005 Kota Bharu, Kelantan	MANCID - YPF
2.	**World Water Day 2006**		
i.	Launching by His Royal Highness The Acting Raja (Ruler) of Perlis	23 April 2006 Kangar, Perlis	MIHP
ii.	National Exhibition	22 – 23 April 2006 Kangar, Perlis	DID Perlis
iii	Drawing and Colouring Contest	23 April 2003 Kangar, Perlis	MOE
iv	Publicity	During the World Water Day Celebration	Radio & TV Malaysia, local newspapers and bulletin
v	Open Day of Water Treatment Plant	21 March – 12 April 2006	JBA
vi	National Seminar	2 - 3 April 2006 Bukit Merah Resort	DID
vii.	Sustainable Water Resources Management Camp	22 - 23 April 2006 Kangar Perlis	JKPLPA
3.	**Courses**		
i.	Water Resources Assessment Course	7 – 10 December 2004 UTM Kuala Lumpur	JKPLPA
4.	**Talks to Secondary school students on Hydrology and Environment Issues.**	Through out the year 2005 and 2006	MIHP Members

Table 5: Future Activities by Malaysian IHP for 2006 - 2008

A) Research

Item	Activity	Proposed Agency Involved	Lead Agency	Funding Agency
1.	Effects of Logging on the Muda/ Pedu Reservoirs Phase II.	DID/UPM/UTM/JPSM/MINT/MADA/FRIM/LESTARI/UKM/JPNK/DOA	DID	Government of M'sia
2.	Establishment of Landside Hazard Assessment Map for North-South Expressway and Cameron Highlands	UiTM,MINT,KUiTTHO,DID JMG	UiTM	Government of M'sia
3.	Determination of Event Mean Concentration (EMC) Values of Suspended Sediments and Nutrients in Urban Discharge Monitoring at Stations of Sg. Kerayong and Taman Mayang WP. Kuala Lumpur	UiTM, MINT,KUiTTHO,DID, MMS,UPM	UiTM	Government of M'sia
4.	Establishment of a Rainfall Erosivity Profile along North-South Expressway	UiTM,MINT,KUiTTHO,DID, MMS,UPM	UiTM	Government of M'sia
5.	Heat Island Effects in Urban Areas and Correlation with Rainfall Runoff Pattern	MINT,USM,UiTM	MINT	Government of M'sia
6.	Performance Indicator of Stormwater Gross Pollutant Trap for Urban Drainage System	DID,USM,UTM,HTC	DID	Government of M'sia
7.	Modelling of Convective rains for Predicting Flash Floods	UTM	UTM	Government of M'sia

B) Meeting / Seminar / Conference / Workshop / Talks

Item	Activity	Period and Venue	Lead Agency	Funding Agency
1.	Water Resources Management	2006UTM Skudai	JKPLPA	Government of M'sia
2.	World Water Day 2007.	March 2007	MIHP	Government of M'sia
3.	World Water Day 2008.	March 2008	MIHP	Government of M'sia
4.	Talks on Hydrology to Schools.	2006 - 2008	JKPLPA	Government of M'sia
5.	Seminars and Workshops on MIHP research projects.	2006 - 2008 K. Lumpur	HTC/DID	Government of M'sia
6.	River Expedition for Selangor Secondary School Students	2006 DID Gombak	JKPLPA	Government of M'sia
7.	Talks on Environment to Schools	2006 - 2008	JKPLPA	Government of M'sia
8.	Environmental Camp (Mangrove Eco System)	2007 Tg. Piai, Johor	JKPLPA	MNCU
9.	Meeting and Technical Visit	2006 Perak	JKPLPA	Government of M'sia
10.	River Eco – Hydrology Expedition for S. E. A. Regional Students Exchange	2007 Johor	JKPLPA	UNESCO
11.	Workshop on Wetland Hydrology	2008 K. Lumpur	JKPAH	Government of M'sia
12.	IRPA Seminar on Urban Hydrological Characteristics of Sg. Kerayong	2008 K. Lumpur	JKPAH	Government of M'sia

Appendix A

CURRENT MEMBERS OF THE MIHP

1.	DID *[1]	-	Department of Irrigation and Drainage (Secretariat)
2.	DOA	-	Department of Agriculture
3.	DOE *[2]	-	Department of Environment
4.	DOF	-	Department of Forestry
5.	EPU	-	Economic Planning Unit
6.	FELDA	-	Federal Land Development Authority
7.	FRIM *[2]	-	Forest Research Institute of Malaysia
8.	DMG *[1]	-	Department of Minerals and Geosciences
9.	MACRES	-	Malaysian Center for Remote Sensing
10.	MMS *[1]	-	Malaysian Meteorological Service
11.	MNCU *[1]	-	Malaysian National Commission for UNESCO
12.	MOA	-	Ministry of Agriculture
13.	MOE	-	Ministry of Education
14.	MOF	-	Ministry of Finance
15.	MOH	-	Ministry of Health
16.	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 Technologi Tun Hussein Onn
25.	UiTM	-	University of Technology MARA
26.	NAHRIM	-	National Hydraulics Research Institute of Malaysia
27.	HTC	-	The Regional Humid Tropics Hydrology and Water Resources Center for Southeast Asia and the Pacific
28.	MHLG	-	Ministry of Housing and Local Government
29.	JBA	-	Department of Water supply , Ministry of Energy, Water and Communication

Note: *[1] - Permanent EXCO Member

*[2] - Elected EXCO Member

ACTIVIDADES DEL COMITÉ MEXICANO DEL PHI 2004-2006

Año 2004

Se continúa, desde 2001, colaborando en el Programa Friend/Amigo para Latinoamérica y El Caribe del PHI de la UNESCO, siendo México responsable de la Hoja de Internet de este programa, contando con el apoyo del Instituto Mexicano de Tecnología del Agua (IMTA).

En general, el día Mundial del Agua, 22 de marzo, se participa, en conjunto con la CONAGUA, SEMARNAT, SEP, etc., promoviendo actividades como conferencias, exposiciones o eventos específicos, relacionadas con el tema del agua.

Se participó con comentarios, enviados directamente al Grupo de Trabajo, para la formación del Programa de la Fase VII del PHI tanto en el año 2004 como en el 2005.

Se participó en la 16a. Sesión del Consejo Intergubernamental del PHI en septiembre de 2004.

Se apoyaron las actividades de preparación del IV Foro Mundial del Agua en México durante 2006.

Año 2005

En el día Mundial del Agua, 22 de marzo, se participa, en conjunto con la CONAGUA, SEMARNAT, SEP, etc., promoviendo actividades como conferencias, exposiciones o eventos específicos relacionadas con el tema del agua.

En abril se realizó en México la II Reunión Ampliada del PHI-LAC para la Evaluación de los Recursos Hídricos.

También en abril en México se participó en el Taller para la creación del Mapa de Zonas Áridas del PHI-LAC, colaborando en la diseminación de resultados en fechas posteriores con los participantes de Cuba y asistiendo a reuniones posteriores en Buenos Aires, Argentina.

En mayo se apoyó la realización del Taller Friend/Amigo para analizar la arquitectura de las bases de datos que se pueden emplear en este proyecto para LAC.

En agosto de 2005 se participó en la "Reunión conjunta de los proyecto PHI LAC" en Brasil, para promover y optimizar las actividades de los programas del PHI-LAC.

Se continúa colaborando en el Programa Friend/Amigo para Latinoamérica y El Caribe del PHI de la UNESCO, siendo México responsable de la Hoja de Internet de este programa, contando con el apoyo del Instituto Mexicano de Tecnología del Agua (IMTA)

En general, el día Mundial del Agua, 22 de marzo, se participa, en conjunto con la CONAGUA, SEMARNAT, SEP, etc., promoviendo actividades como conferencias, exposiciones o eventos específicos, relacionadas con el tema del agua.

Se apoyó la realización de Talleres Nacionales y Regionales en México para la realización del IV Foro Mundial del Agua en México durante 2006.

En diciembre se colaboró para promover un grupo de trabajo en LAC que participe en la Iniciativa Internacional de Sedimentos y se contribuyó a integrar un grupo para México. Se publicó un libro sobre los Sedimentos en México.

Javier Aparicio, vicepresidente del Comité Mexicano para el PHI, participó como miembro de la junta de gobernadores del IHE en su sesión de diciembre. Además de colaborar con la revisión del plan de trabajo 2006, puntualizó que es necesario que el IHE equilibre su atención en las diversas regiones del mundo.

Año 2006

Se enfocaron las actividades a apoyar el IV Foro Mundial del Agua en México, incluyendo la celebración del Día Mundial del Agua, que coincidió con este evento.

Se continuó este año con el apoyo de difusión a la metodología del Mapa de Zonas Áridas, asistiendo a varios eventos, entre ellos a una presentación en Argentina.

Se terminó y entregó a la Coordinación del proyecto el Mapa de Zonas Áridas de México.

Se terminó la preparación del Manual de Balance Hídrico para su difusión en los países de Latinoamérica. Se espera que este manual se publique este mismo año.

NIGERIAN NATIONAL COMMITTEE FOR INTERNATIONAL HYDROLOGICAL PROGRAMME

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REPORT OF THE COOPERATIVE ACTIVITIES OF THE NIGERIAN NATIONAL COMMITTEE FOR UNESCO-IHP IN THE FRAMEWORK OF THE PROGRAMME FOR THE PERIOD 2004 – 2006.[1]

Introduction

Since the IHP depends strongly on national efforts we have in place a Nigerian National Committee for UNESCO- IHP (NNC-IHP), with the Department of Hydrology and Hydrogeology of the Nigeria's Federal Ministry of Water Resources providing the Secretariat.

The National Committee was inaugurated since 1988 and was constituted to be representatives of the Hydrological Community in Nigeria, who are to actively participate in the implementation of the IHP Projects in Nigeria and is therefore a multidisciplinary body comprising professionals nominated to serve by the various Water departments/agencies along with renowned experts in the private sector of the Water industry.

Briefly the Committee among others has the following functions:

- Draw up Nigeria's programme of participation in the UNESCO-IHP
- Serve as Steering Committee for planning and promoting hydrological activities under IHP
- Promotion of training in Hydrology and Water Resources management
- Coordinates the fellowships programme of UNESCO
- Participates at regional and international meetings of UNESCO
- Organises workshop and symposium to promote hydrological awareness programme

The structure of the National Committee at the time of inauguration and till recently comprised of a 20-member representatives of the Federal Ministry of Water Resources, Meteorological Services Agency; National Inland Waterways Authority; National Commission for UNESCO; River Basin Development Authorities; States Water Boards; Universities/ Research Institutions, professional Associations of Hydrologists and Private Consultants in Water programmes.

2. Meetings of the Nigerian National Committee for IHP

The Nigerian National Committee for IHP was quite inactive in previous times, until this last biennial 2004 – 2006, during which period the Committee received tremendous financial support from its Secretariat's Ministry which has enabled it to hold and host its meetings, with the reactivation of the Committee.

[1] Report submitted on behalf of the Nigerian National Committee for UNESCO-IHP at the 17th Session of the Intergovernmental Council for IHP of UNESCO, Paris, France, July, 2006.

2.1. Meeting of the Nigerian National Committee for IHP, 10-12, May 2005, Abuja.

The meeting of the Nigerian National Committee for UNESCO-IHP was held at Sharon Ultimate Hotels, Abuja from 10th to 12th May 2005. The primary aim of the meeting was to rekindle the inactivity of the Committee and address matters, among others on the 32 C/5 Programme and Budget (2004-2005) of UNESCO; IHP-VI National Projects Implementation; Co-operation with UNESCO-IHP Secretariat, Paris; Preparation of Programme and Budget for 2006-2007 of UNESCO; Draft Concept Paper for the Seventh Phase of IHP (2008 - 2014); resuscitating the National Hydrology Symposium and the establishment of Technical Working Groups to carry out the Committee's work.

Election was conducted at the meeting and the three candidates were elected as follows:

- J.A. Hanidu - President
- Prof. H.I. Ezeigbo - 1st Vice Chairman
- Engr Nosa Ukponmwan - 2nd Vice Chairman

The Secretariat remains coordinated by:

- Engr. M.H. Ibrahim - Secretary
- Mr. Olufemi Odumosu - Assistant Secretary

A total of 15Nos. documents and papers were presented during the technical sessions at the meeting and there was reconstitution and constitution of sub-committees as well as ad-hoc committees to implement adopted programmes of the Nigerian National Committee for UNESCO-IHP as follows:

- ***Technical Sub-Committee*** is to serve as a ***Working Group on Nigerian Water Resources Assessment.***
- ***Communication and Information Sub-Committee***
- ***Working Group or Technical Sub-Committee on Joint Hydrology Symposium / Conference with*** the Nigerian Association of Hydrological Science (NAHS)
- ***Ad-hoc Sub-Committee for the Fourth World Water Forum***
- ***An Ad-hoc Sub-Committee on UNESCO Education for Sustainable Development on Water Resources***
- ***Working Group on Data Collection/Water Resources Assessment***

In concluding the meeting, a number of recommendations were put forward towards sustaining and improvement of the activities of the Nigerian National Committee for UNESCO-IHP.

2.2. Meeting of the Nigerian National Committee for IHP, 15th – 17th November, 2005, Lokoja, Kogi State, Nigeria.

The meeting of the Nigerian National Committee for UNESCO-IHP was held at the Confluence Beach Hotel, Lokoja, Kogi State, from 15th – 17th November 2005. The main highlights of the meeting were as follows:

- Minutes of the last meeting of the Nigerian National Committee for UNESCO-IHP, 10th – 12th May, 2005, at Sharon Ultimate Hotels, Abuja.
- Brief on the 38th Session of IHP Bureau meeting.
- Report on the 33rd Session of UNESCO General Conference.
- Preparation of Programme and Budget for 2006- 2007 of UNESCO.
- Draft Paper for the Seventh Phase of IHP (2008-2014).
- Reports from Ad-hoc/Technical Sub-Committees established during the UNESCO-IHP meeting held in May 2005, in Abuja.

- Report on Nigeria's hosting of the International Conference on ***"Water Security and Hydrological Extremes: Towards Sustainable Development in Africa" and the "1st African Regional Consultative Meeting of the National Committees for UNESCO-IHP" Abuja, Nigeria 27th February – 2nd March, 2006***.

The Committee deliberated extensively on the recommendation of the National Water Resources Institute, Kaduna to be designated as UNESCO Centre for Water Resources and therefore recommended that for the Institute to become UNESCO regional Centre for water resources, it must reform and must be well funded adequately by the Federal Ministry of Water Resources.

In considering the report on Nigeria's hosting of the International Conference on "***Water Security And Hydrological Extremes: Towards Sustainable Development in Africa,*** and the ***"1st African Regional Consultative Meeting of the National Committees for UNESCO-IHP",*** 27th February-2nd March, 2006, Abuja, as presented, the Committee is of the view that the Nigerian National Committee for IHP should be at the forefront of the organization of the Conference; and therefore set up a Technical Sub-Committee which examined and reviewed the entire Draft Document for the International Conference as prepared by the UNESCO-IHP Secretariat, Paris, France.

The reports from Ad-hoc/Technical Sub-committees established during the last meeting of the National Committee for UNESCO-IHP were also considered and reviewed.

2.3. Meeting of the Nigerian National Committee for IHP, 23rd – 25th February, 2006, Abuja, FCT, Nigeria.

The meeting of the Nigerian National Committee for UNESCO-IHP was held in Abuja at the Sharon Hotel from 24th – 25th February, 2006. This was an extraordinary meeting of the National Committee for UNESCO-IHP, the purpose of which was to enable the Committee in conjunction with the National Organising Committee for the International Scientific Conference and Regional Meeting assessed and review the preparatory programmes for Nigeria's successful hosting of the International Conference on ***"Water Security and Hydrological Extremes: Towards Sustainable Development in Africa" and the "1st African Regional Consultative Meeting of the National Committees for UNESCO-IHP" Abuja, Nigeria 27th February – 2nd March, 2006***.

The main highlights of the meeting were as follows:

- Minutes of the last meeting of the Nigerian National Committee for UNESCO-IHP, 15th-17th November 2005 at Confluence Beach hotel, Lokoja, Kogi State.
- Report on Nigeria's hosting of the International Conference on ***"Water Security and Hydrological Extremes: Towards Sustainable Development in Africa"*** and the ***"1st African Regional Consultative Meeting of the National Committees for UNESCO-IHP",*** 27th February-2nd March, 2006
- Final Draft Programme of the Conference and the Regional Meeting.
- Preparation of a draft Recommendation to the Conference
- Report of the National Committee for UNESCO-IHP for 2004-2006
- Draft Paper for Seventh Phase of IHP (IHP-VII, 2008-2013)
- Preparation for the National Hydrology Symposium being jointly organised with the Nigerian Association of Hydrological Sciences(NAHS)
- Update from the Ad-Hoc/Technical Sub-Committees of the NNC-IHP

Various reports on the level of preparedness to host the events were presented by the Secretariat. The reports gave a run-down of the local and international inputs towards hosting the events. The need to prepare a draft recommendation to the Conference stating Nigerian's stand on various issues was highlighted. The Secretariat stated that it has not prepared the Report of the National Committee for UNESCO-IHP for 2004-2006 as members were expected to make submissions/contributions for a more comprehensive report that the whole house would consider. The meeting adopted September 2007 as new date for the joint Symposium. The LOC was mandated to work out the exact date and programme of event.

The Working Group on Data Collection reported that a meeting was held with the Director of Hydrology and Water Resources of WMO during participation at the UNESCO General Conference in Paris in October 2005. It was reported that Consultants have been appointed for the two projects, namely Hydrological Data Rescue Project and the Nigerian National Hydrological Assessment Programme. No report was received from the other ad-hoc Committees owing to the absence of their Chairmen. The Communication and Information Committee informed the house of their inability to convene a meeting.

3. Restructuring of the composition of the Nigerian National Committee

The Nigerian National Committee for UNESCO-IHP has been restructured to include representatives from all the professional Departments of the Ministry including the representatives from each of the 12Nos. River Basin Development Authorities, and the National Water Resources Institute, as well as other Hydrological and Water Resources agencies nationwide including Universities and Private Consultants, in order to enhance Nigeria's beneficial participation in UNESCO's water programmes in collaboration with the Department of Hydrology/Hydrogeology, of the Ministry.

To this end, requests were made for invitation of resource/focal persons in Hydrology and Water resources programmes of the IHP from these bodies, who will be able to make meaningful contribution from their respective perspective to the UNESCO-IHP's three essential lines of action:

- Hydrological programmes
- Water Resources Management
- Water Education and Capacity Building

The representatives of the organizations will also contribute to the key role of sustainable water management efforts of the UNESCO-IHP in a follow-up to the World Summit on Sustainable Development (WSSD - Johannesburg, 2002) Plans of Implementation and the UN Millennium Development Goals (MDGs) as well as the relevance to our on-going Presidential Water Initiative, ***"Water for People, Water for Life".***

This invitation was extended for nominations into the memberships of the Committee from the following:

- Fed Min of Water Resources – 5Nos. Technical Departments of Irrigation and Drainage; Water Supply; Planning, Research and Statistics; Dams & Reservoir Operations
- Nigerian Meteorological Agency
- National Inland Waterways Authority (NIWA)
- National Electric Power Authority (NEPA)
- Geological Survey of Nigeria Agency
- Federal Ministry of Environment.

- Federal Ministry of Science and Technology
- National Commission for UNESCO
- National Water Resources Institute, Kaduna.
- 12Nos. River Basin Development Authorities.
- 36Nos States Water Boards and FCT Water Board
- Nigerian Association of Hydrological Sciences
- Nigerian Association of Hydrogeologists
- 9Nos. Universities
- Private Consultants in Water Programmes

4. Status of IHP-VI activities

As earlier reported, the Nigerian National Committee for IHP had been quite inactive in recent times, and this had invariably affected our preparedness to participate and implement the relevant projects at the commencement of the IHP-VI activities.

However the Department of Hydrology and Hydrogeology of the Federal Ministry of Water Resources which provides the Secretariat of the Committee had continuously been involved in the implementation of the various national and regional IHP programmes as part of our various hydrological activities in the Ministry. Some of these projects therefore falls within the implementation of IHP-VI Activities, and therefore kept our role alive in the International Hydrological Programme.

5. Contribution to/participation in IHP-VII Plan.

We had twice acknowledged with respective contributions to the Consultation on the Planning process for the proposed content of the Seventh phase of IHP (2008-2014), which is of relevance to Nigeria's long-term priorities with regard to the UNESCO International Hydrological Programme. This includes:

- Water to remain the principal priority of UNESCO, so as to ensure further benefit of substantial and increasing budgetary reinforcement in years ahead, as a decline will greatly reverse the gains achieved in the IHP in the previous years, thereby ensuring that IHP in particular and UNESCO in general, will have a basis for continuing to serve Member States in the field of water sciences and sustainable development.
- UNESCO's responsibility in Water Education and Capacity Building should not be left alone in the hand of the UNESCO-IHE Institute of Water Education, but rather the UNESCO-IHP should continue to pursue Education and Training programmes as well as Capacity Building and furthermore foster future collaboration for research-oriented work in hydrology and water resources as was done in previous years as part of the IHP-VII activities.
- In a consideration of the future development of the World Water Assessment Programme (WWAP) and its World Water Development Report, we will urge UNESCO, as part of the action plans that could form part of the IHP-VII, to support the initiation of the National Water Assessment Programme at country level in its member-states, so as to provide the mechanism for each country to prepare a National Water Development Report as respective contribution to the WWAP and its series of World Water Development Reports.
- With regards to the proposed concept and structure of IHP-VII, we also stressed on the need to incorporate, in the overall framework for the IHP-VII, relevant aspects of the

International Decade on "Water for Life" 2005-2014, as part of UNESCO's long term priorities in global water resources management.

- We have further suggested the proposals for the four major "Themes" of IHP VII as presented by the Task Force could be further enriched explicitly as follows:

    - Theme I: Impacts of Global Changes on Watersheds and Aquifers Management
    - Theme II: Governance and Socio-Economics for Sustainable Water Management Policies for Human Development
    - Theme III: Sustainable Water Resources and Environmental Management for water security
    - Theme IV: Water Quality, Human Health and Food Security

Nigeria had hosted the ***1st African Regional Consultative Meeting of the National Committees for UNESCO-International Hydrological Programme*** from March 1-2, 2006 in Abuja, and one of the items on the agenda was the review of the IHP-VII Plan. The meeting went into sub-regional groupings to further review the themes of the IHP-VII as relevant to their programmes

Nigeria was therefore part of the West Africa sub-regional group whose contributions to this meeting included:

- Full endorsement of the IHPVII Draft Plan.
- The sub-region indicates that groundwater resources related issues are priorities for the region.
- Theme 1 is a priority and within theme 1 the priority is given to Focal area 1.4: large-scale groundwater dependencies related to global changes and quality deterioration.
- Within Theme 2 the priority is given to Focal area 2.2. Good governance, capacity development and stakeholder participation.
- Within Theme3 the priority is given to Focal Area 3.5: Groundwater dependent ecosystems identification, inventory and assessment.
- Within Theme 4 the priority is given to Focal Area 4.2 :Access to safe surface water and groundwater for human health and for food security.

As the planning process for the Seventh phase of IHP is still continuous, the Nigerian National Committee for UNESCO-IHP at its February 2006 meeting also constituted a 6-man sub-committee to study the Draft Paper so as to forward further review of the Draft Concept paper and make recommendation based on appropriate comments from the members and resource persons to reflect the needs and priorities of Nigeria as a UNESCO member-state.

6. Meeting of Experts of the Nigerian National Commission for UNESCO on Nigeria's participation in the 33rd General Conference of UNESCO (Document 33 C/5), 8th - 9th August, 2005, Abuja.

The Nigerian National Commission for UNESCO had hosted a meeting of Experts to consider the relevant documents towards Nigeria's participation in the 33rd UNESCO General Conference, from 8th – 9th August, 2005, in Abuja.

We had participated at this meeting in the Sub-Committee that deliberated on Science and Technology programmes in a Panel of Experts which examined UNESCO Draft Programme and Budget for 2006-2007 (33C/5) in order to determine the extent to which Nigerian's interest, and indeed Africa and developed countries, generally, have been taken into consideration with

respect to Nigeria's response to UNESCO Director-General's consultation document on the preparation of Doc. 33C/5.

The work of the Panel was on the Major Programme II, Natural Sciences. Since our own focus is on Water Resources, our presentation were made on the issue of **Managing Water Interactions: *Systems at Risks and Social Challenges***, and after exhaustive discussion on this the panel, resolved based on recommendations made in the presentation that; The National Water Resource Institute Kaduna, Nigeria, be upgraded to sub- regional Water Centre. UNESCO to strengthen Regional cooperation of IHP National Committees in Africa, UNESCO to support capacity building in water education, UNESCO to explore compiling data bank of scientists in water resources in Africa. On this note, the panel recommended 2Nos. Draft Resolutions for adoption by the meeting, which is related to the Water Resources programmes.

7. Collaboration with other national and international organizations and/or programmes

The Department of Hydrology/Hydrogeology that has provided the Secretariat of the IHP National Committee, has always been in collaboration with other national and international organisation in the implementation of programmes in hydrology and water resources that is of mutual benefit and relevance. The Department along with the Nigerian Meteorological Agency has been in active collaboration in the implementation of various national and regional programmes of the World Meteorological Organisation (WMO).

The Department also collaborates with the International Atomic Energy Agency (IAEA) in the use of Isotope Hydrology Techniques in water resources assessment, along with a national agency, the Energy Commission of Nigeria.

The National Committee for IHP is also encouraging a scientific collaboration with the Nigerian Association of Hydrological Sciences in the joint hosting for resuscitating the National Hydrology Symposium.

8. Educational and Training programmes

The IHP National Committee as a result of being previously inactive was not able to make appropriate contribution to IHP courses or involved in the organization of specific courses.

However, we had participated in the UNESCO-IHP sponsored course in Groundwater Management in the Framework of Integrated Water Resources Management (IWRM) in May 2006, in Egypt and supported by the Italian Ministry for the Environment and Territory (IMET) within the framework of the UNESCO-IMET "Water Programme for Africa" (WPA)

9. Cooperation with the UNESCO-IHE Institute for Water Education and/or International regional water centres under the auspices of UNESCO.

At the inception of the establishment of the National Water Resources Institute (NWRI) in Kaduna, Nigeria, UNESCO had played a leading role in giving the desired support towards the curricula development and provision of teaching and educational materials. The NWRI runs a certificate course in Water Resources Engineering and professional Post Graduate course in Water Resources engineering.

The NWRI whose main responsibility is to train all categories of lower and middle cadre manpower that will execute and operate various water resources projects in Nigeria, and where possible in other African countries, should be encouraged to build on a collaborative cooperation and institutional networking with the UNESCO- IHE Institute for Water Education and other UNESCO associated centres in human capacity-building in the various aspects of integrated water resources management as well as in the preparation for the United Nations Decade on Education for Sustainable Development (2005- 2014).

10. Publications

We have published eighth editions of our electronic Newsletter, which is being released quarterly for circulation for the purpose of our mutual collaboration in the implementation of the national programmes of the IHP and to provide a wide forum for inputs and on line-consultation with the Secretariat of the Nigerian National Committee for UNESCO-IHP (NNC-IHP).
The first edition in the Newsletter series, which came out in 2004, was an introductory note on the IHP Programme and the National Committee and the subsequent editions highlighted the various events and programmes within the UNESCO-IHP's as relevant to Nigeria as at the time of publication.

We also use each edition of the Newsletter to provide access to the ***"Water news, events and Links"*** from UNESCO water portals, and the ***"Currents"*** from the World Water Assessment Programme and useful and relevant information to meet the scientific needs and programmes of our hydrological community in Nigeria.

The e-mail address of the Newsletter is ihpncng@yahoo.com, through which the Secretariat of the Nigerian National Committee for IHP also communicates.

11. Participation in International Scientific meetings

11.1. Nigeria's successful hosting of the International Conference on "Water Security and Hydrological Extremes: Towards Sustainable Development in Africa" and the "1st African Regional Consultative Meeting of the National Committees for UNESCO-International Hydrological Programme", 27th February - 2nd March, 2006, in Abuja.

The International Conference on Water Security and Hydrological Extremes: Towards Sustainable Development in Africa and the 1st African Regional Consultative Meeting of the National Committees for UNESCO-International Hydrological Programme, were held from 27th February – 2nd March, 2006 in Abuja, Nigeria. These two events were convened under the auspices of UNESCO– International Hydrological Programme (IHP) Secretariat, Paris, France and the Nigeria's Federal Ministry of Water Resources. Thirty-two (32) African countries were represented at the two events: Algeria, Angola, Benin, Botswana, Burkina Faso, Congo-Brazzaville, Cote d`Ivoire, Democ.Rep.Congo, Ethiopia, Ghana, Guinea Equatorial, Kenya, Lesotho, Madagascar, Malawi, Mali, Niger, Nigeria, Senegal, South Africa, Sudan, Swaziland, Tanzania, Tchad, The Gambia, Togo, Tunisia, Uganda, Zambia and Zimbabwe

The President, Commander in-Chief of the Armed Forces of the Federal Republic of Nigeria, His Excellency, Chief Olusegun Obasanjo, *GCFR***,** graciously attended and presented the Keynote Address and declared open the Scientific Conference and the African Regional Consultative Meeting.

The Conference and the Regional Consultative Meeting brought together African experts and stakeholders associated with UNESCO Water Programmes to mainly discuss and address the common water issues in Sub-Saharan Africa. There were over 300 participants that attended the International Conference, including experts, donors, non-governmental organisations, United Nations agencies and diplomatic delegates

The Scientific Conference was organized as parallel two-day sessions on 27th – 28th February, 2006. This was followed by a Panel meeting on 1st March, 2006, with the participation of AMCOW-NEPAD-IHP National Committees and Donors/ Development Partners for the purpose of identifying regional proposals and projects. The Regional Meeting of IHP National Committees in Africa commenced in the afternoon of same day, 1st March, 2006 till 2nd March 2006.

In concluding the Scientific Conference and Regional Meeting, the recommendations of the Conference on "Water Security and Hydrological Extremes: Towards Sustainable Development in Africa" and the "Declaration Statement of the IHP National Committees" were adopted. These recommendations of the Conference and the Statement were presented at the Fourth World Water Forum (4WWF), Mexico City, Mexico, March 2006, to intimate the global community on water issues that are of great concern to the African region. These include amongst others a clearer articulation of African plans and actions within the UNESCO-IHP in order to contribute towards achieving the United Nations MDG targets for water in Africa, through partnership with AMCOW and the Development Partners.

It was also agreed that the Consultative meetings of the IHP National Committees in Africa will be organized every two years in order to ensure the sustainability of regional cooperation.

11.2. 16th Session of the Intergovernmental Council of the UNESCO-IHP, 20-25 September 2004, and the 7th UNESCO/IAHS Kovacs Colloquium on Scales in Hydrology and Water Management, 17 - 18 September, 2004, Paris, France.

The Sixteenth session of the Intergovernmental Council of the International Hydrological Programme (IHP) of UNESCO was held at the UNESCO Headquarters in Paris, France, 20th – 25th September 2004. The Council Session was preceded by the 7th UNESCO/IAHS Kovacs Colloquium on Scales in Hydrology and Water Management, 17-18 September, 2004.

Our delegation to the Council meeting was led by Engr. Bashr Ishola Awotorebo, Honourable Minister of State of Water Resources and included Engr. M. H. Ibrahim, Director of Hydrology/Hydrogeology, Dr. Abdulmumin, Director, National Water Resources Institute, Kaduna; Mr. Olufemi Odumosu, Deputy Director (Operational Hydrology); and Mr. Olurotimi Omodunbi, Personal Assistant to Honourable Minister of State. Engr. Aliyu M. Adnan, Director/Chief Executive, Hydraulic Equipment Development Institute, Kano along with Dr. Lijadu and Mr. Nwafor of the Permanent Delegation of Nigeria to UNESCO in Paris.

Mr. Ognjen Bonacci of Croatia was elected as Chairperson of the IHP Bureau while four Vice-Chairpersons were also elected: Mr. S. Demuth (Germany) for the Western Europe and North America-Region I; Mr. L.Heng (China) for Asia-Region IV; Mr. M.H.Ibrahim (Nigeria) representing the sub-Saharan African group-Region Va; Mr. E.A.E.Qunqar (Jordan) for the Arab and Middle East-Region Vb; Mr. Victor Pochat, the Outgoing Chairperson, for the Latin America Caribbean- Region III.

The Council adopted its provisional agenda presented by the Secretariat and deliberated on the items as presented in the adopted agenda and discussed the many aspects of the successful implementation of IHP's sixth phase, notably IHP's active involvement in internationally relevant events, the 2002 World Summit on Sustainable Development, the Third World Water Forum and the International Year of Freshwater 2003 and first World Water Development Report (WWDR) with World Water Assessment Programme, its incorporation of new initiatives such as the International Flood Initiative and the establishment of new water centres under the auspices of UNESCO and its establishment of professional posts (in India, Ghana and Kazakhstan). There was an acceptance for consideration of UNESCO's support for our National Water Resources Institute in Kaduna, Nigeria.

In the course of the deliberations of the above adopted agenda, our active participation at the 16th Session of the IHP Council, which was led at a high political level by Engr. Bashr Ishola Awotorebo, Honourable Minister of State of Water Resources was elaborated by his presentation of five major Ministerial Intervention at the Council, and a number of various comments as contributions to this meeting which had positively affected the outcome of the meeting. These Ministerial Interventions therefore facilitated Nigeria's visibility and respect in our lead role in speaking for and raising voice of the African group at this meeting, which otherwise would have been marginalized by the non-attendance and non-participation of the other African countries that are members of the IHP Council.

11.3. Nigeria's participation at the 38th session of the IHP Bureau, 6-8 June, 2005, Paris, France.

The 38th session of the Bureau of the Intergovernmental Council of the International Hydrological Programme (IHP) was held at UNESCO Headquarters in Paris from 6 to 8 June 2005. The entire six members of the IHP Bureau attended the meeting.

Nigeria's delegation to the Bureau meeting was led by Engr. M. H. Ibrahim, Director of Hydrology/Hydrogeology and includes Mr. Olufemi Odumosu, Deputy Director (Operational Hydrology).
Mr. Bonacci, Chairman of the Bureau, opened the meeting while Dr. A. Szöllösi-Nagy, Deputy Assistant Director-General for Natural Sciences and Secretary of IHP, presented the agenda, timetable as well as the background documentation for the meeting's ensuing deliberations.

It was noted that Africa would proceed to organize a regional technical and management conference of IHP National Committees in Nigeria, to be held before March 2006. The Bureau has encouraged the African National Committees to act as scientific advisory committees to the African Ministerial Council on Water (AMCOW) and therefore agreed as suggested by Nigeria that IHP and AMCOW sign a memorandum of understanding on the subject.
The Nigeria's delegation had drawn the attention of the Bureau members that no category II Centres existed in Sub-Saharan Africa, and in response to Nigeria's concern of African countries not being able to meet the financial requirements to upgrade to such UNESCO Water Centres, the Secretariat suggested that countries within that region might want to submit a request to the African Development Bank for financial assistance to upgrade. It was also proposed, following attention to the omission drawn by the Nigerian delegation, that the Niger River might later be additional case study for the International Sediment Initiative Project.

11.4. Participation of Nigeria's Water Resources Ministerial delegation at the 33rd Session of the UNESCO General Conference, 3rd – 21st October, 2005, Paris, France.

The 33rd session of the UNESCO General Conference, which takes place every two years, was held from 3rd – 21st October, 2005 at UNESCO Headquarters in Paris, France. The Conference brought together more than 2,000 participants, including a large number of Ministers and several Heads of State and Government from 191 of the Member States of UNESCO. The representatives of governmental and non-governmental organisations and representatives of UN organisations also participated.

The examination and adoption of the Programme and Budget for 2006-2007 and the preparation of the Draft Programme and Budget for 2008-2009 were the focus of the sessions of the Conference.

The Honourable Minister of Education, Mrs Chinwe Nora Obaji, led the Nigeria's delegation to the Thirty-Third session of the UNESCO General Conference. The Water Resources delegation to the Conference was led by the Honourable Minister of State for Water Resources, Engr. Bashr Ishola Awotorebo and included Engr. M. H. Ibrahim, Director (Hydrology & Hydrogeology), Mr. Olufemi O. Odumosu, Deputy Director (Operational Hydrology).

The Conference, was declared open by the president of the 32nd session of the General Conference, Prof. Michael Abiola Omolewa, Ambassador and Permanent Delegate of Nigeria to UNESCO, Paris. The plenary sessions thereafter commenced with the adoption of the agenda and a presentation of the Organisation of the work of the session. The 33rd UNESCO General Conference session coincided with UNESCO's 60th anniversary, which was marked by a special ceremony on 5 October, 2005, was dedicated to human dignity.

The Technical Commission III, in which the Water Resources delegation participated in, considered issues of Part II.A: Major Programme III (Social and Human Sciences), and Major Programme II (Natural Sciences) of the Draft Programme and Budget for 2006-2007 (33 C/5), as well as the Draft Programme and Budget for 2008-2009 (34 C/5), and the preparation of the Medium-Term Strategy for 2008-2013 (34 C/4) in the areas of Natural Sciences and Social and Human Sciences. The Honourable Minister of State for Water Resources, Engr. Bashr Ishola Awotorebo, presented Nigeria's Ministerial Interventions at the Technical Commission III's session while the Nigeria's Honourable Minister of Science and Technology of also gave a number of Ministerial interventions for Nigeria.

11.5. Participation of Nigeria's Water Resources Ministerial delegation at the Fourth World Water Forum, 16th - 22nd March, 2006, Mexico city, Mexico.

The Fourth World Water Forum was held at the Centro de Convenciones de Banamex in Mexico City from 16th – 22nd March 2006, under the overarching theme of ***"Local Actions for a Global Challenge"***. It focused on analysis of experiences and knowledge sharing and was attended by more than 13,000 participants and representatives from more than 120 nations. The representatives of governmental and non-governmental organisations and representatives of UN organisations also participated.

The Water Resources delegation to the Forum was led by the Permanent Secretary, Engr. E.O. Okeke and included

- Senator Tunde Ogbeha, Chairman, Senate Committee on Water Resources

- Hon. Baba Shehu Agaie, Member, House of Representative Committee on Water Resources
- Alhaji M.N. Gusau Hassan, Hon. Commissioner for Water Resources, Zamfara State
- Engr. M. N. Gundiri, Director (Dams & Reservoir Operations)
- Mr. Olufemi O. Odumosu, Deputy Director (Operational Hydrology)
- Engr. Tolu Fadahunsi, Managing Director, Ogun-Oshun River Basin Development Authority
- Dr. J. Sadeeq, Special Assistant to the HMWR and Executive Secretary of AMCOW
- Ms. Laide Sodeko, Assistant Director, Water Supply

The President of Mexico, Vicente Fox Quesada, declared the Forum opened calling for a new culture based on shared responsibility, equity and solidarity, in light of the water crisis that the world is experiencing, and called for international cooperation and coordination to face the vast global challenge of reaching agreements for the rational and fair use of the water resources.

The Thematic Component of the 4th World Water Forum was centered on five framework themes, which included some of the world's most important and challenging problems relating to water, as well as five cross-cutting perspectives representing some of the processes and factors affecting the development of local actions around the world.

The Regional Document on Africa, ***"Water Resources Development in Africa: Challenges Response and Prospective"*** which was presented indicated that the African continent has thus far developed only 3.8% of its water resources for supply, irrigation and electrical power. The three primary water challenges that the African continent faces are: water security, water governance, and the transboundary management of water, given that on this continent there are 80 rivers and 38 groundwater aquifers that are shared by various nations. It must therefore be emphasized that Africa's message to the world is infrastructure projects must be developed, the global partnership must be strengthened so that this continent might attain the Millennium Development Goals, the principles of Integrated Water Resource Management must be developed .

At a session organised by the UNESCO-IHP on 21st March on ***"Groundwater and Risk Management: Coping with Climate Change, Water Scarcity and Emergency Situations"***, Engr. E. O. Okeke, Permanent Secretary and Head of Nigerian Delegation to the 4th World Water Forum, along with the Koïchiro Matsuura, Director-General of UNESCO and the Jabu Sindane, Director-General, National Dept. of Water Affairs and Forestry of South Africa had given respective opening statements at this session.

The World Water Day 2006 celebrated on 22nd March of every year was marked as one of the events of the 4WWF and was dedicated to the topic of Water and Culture. Water is a source of culture and there is no civilization whose origins were not in water. Representatives of the 24 water-related UN agencies, including UNU, ESCAP, UNEP, WHO, FAO, UN-ISDR, UNDP, presented the second edition of the World Water Development Report, "***a shared responsibility"***.

For the first time, a Nigerian, Mr. Michael Ale was elected into the Governing Board of the World Water Council as one of the Governors. He is also the youngest of all the Governors.

11.6. Nigeria's participation at the 39th session of the IHP Bureau, 3-5 May, 2006, Delft, Netherlands.

The 39th session of the Bureau of the Intergovernmental Council of the International Hydrological Programme (IHP) was held at the UNESCO-IHE Institute for Water Education in Delft, The Netherlands, from 3 to 5 May 2006.

All the six members of the IHP Bureau were represented by their respective delegations; including Nigeria at the meeting. Nigeria's delegation to the Bureau meeting was led by Engr. M. H. Ibrahim, Director of Hydrology/Hydrogeology and Secretary IHP National Committee, who is the Vice-Chairman representing the African group in the Bureau, and included Mr. Olufemi Odumosu, Deputy Director (Operational Hydrology) and Assistant Secretary, IHP National Committee.

The Bureau noted that "Water and associated ecosystems" remained a principal priority for the 2006-2007 biennium and the establishment of five new water-related category II centres and need to emphasize the close relationship between water and all the Millennium Development Goals (MDGs) and on the role of the UNESCO-IHE Institute for Water Education in relation to the International Hydrological Programme, and its delivery of post-graduate water education globally. The Bureau also adopted a proposal for the establishment of RICs.

It also acknowledged the progress made in developing the IHP-VII Draft Plan and endorsed its structure and recommended the preparation of an updated version of the draft plan to the 17th session of the Council in July 2006 for discussion and formal adoption. It also requested that the Task Force be complemented by experts from Africa at its 6-7 June 2006 meeting.

The document as submitted by the Nigerian delegation, on the Information Report of Nigeria's successful hosting of the International Conference on ***"Water Security And Hydrological Extremes: Towards Sustainable Development In Africa"*** and the ***"1st African Regional Consultative Meeting of the National Committees for UNESCO - IHP"*** held at Transcorp Hilton Hotel, Abuja, Nigeria, 27th February – 2nd March, 2006, was circulated to the meeting and the Bureau was requested to review this report, endorse the *"Recommendations of the Conference"* and the *"Declaration Statement of the IHP National Committees"* for its submission to the 17th Session of the IHP Intergovernmental Council.

The Bureau also reviewed the Progress Report on new IHP Initiatives, the International Sediment Initiative (ISI); International Flood Initiative (IFI); Ecohydrology Programme and the proposed thematic programme on water education within the UN Decade on Education for Sustainable Development (DESD, 2005-2014). On relations with United Nations and Non-Governmental Organizations, the Bureau noted the co-operation between IHP and the UN World Water Assessment Programme (WWAP) and the upcoming transfer of the WWAP Secretariat to Perugia, Italy and noted the many joint activities that WMO is conducting with UNESCO and between UNESCO and IAHS and the Report on IHP's participation in the 4th World Water Forum and the visibility and recognition of UNESCO's leading position within the UN system in the field of freshwater. The preparations for the 17th Session of the IHP Intergovernmental Council, Paris, 3-7 July 2006 was also reviewed by the Bureau and it decided to carry out the Council in the same format as the 16th session.

12. Ongoing Scientific Projects at Regional level

12.1. UNESCO-IHP sponsored Transboundary regional aquifer study for the management of the Ilullemeden basin shared between Nigeria, Niger and Mali.

This is a project in which the Department is actively participating in the regional shared aquifer study for the management of the Ilullemeden basin shared between Nigeria, Niger and Mali.

A regional workshop held in Niamey, Niger Republic from June 29th – July 1st, 2005 on the establishment of Tripartite Consultation mechanism for the Management of the Iullemeden Aquifer System (IAS).

A National workshop on Transboundary Diagnostic Analysis (TDA) and Consultation mechanism on the project: ""Managing Hydrogeological Risks in the Iullemeden Aquifer System (IAS)" was held from 6th – 8th February, 2006 to discuss and rationalize issues on-

- Transboundary Diagnostic Analysis (TDA) and Consultation mechanism for the Iullemeden Aquifer System.
- Establishment of legal/Institutional framework for he management of the Iullemeden Aquifer System.

The 1st meeting of the Regional Steering Committee of the GEF/UNDP assisted project comprising Nigeria, Niger and Mali was also held in Nigeria from 25th – 26th February, 2006 with all the development partners in attendance.

Two members of the Project team also attended group training on Groundwater Modelling for the Management of the Water Resources of the Iullemeden Aquifer System (IAS) at the OSS (Observatory of the Sahel and the Saharan) headquarters in Tunis, Tunisia from April 17th – 29th, 2006.

Nigeria through the Federal Ministry of Water Resources has just concluded a field data verification exercise in the Nigerian segment of the Iullemeden Aquifer System (IAS) this June, 2006.

12.2. Regional UNESCO-IHP project for the Joint Management of Shared West African Coastal Aquifer Resources.

This is a Saline Water Intrusion Studies regional project which involves the countries of Benin, Nigeria, Ghana, Cote d'Ivoire and Togo. The goal of the project is to create a control mechanism for a sustainable management of West African coastal aquifers.

This phenomenon of saline (Salt) water intrusion is rampant in the Nigerian coastal areas, specifically in the Dahomey (Benin) and Niger Delta Basins. It occurs in recent sediments and aquifers in the Dahomey (Benin) Basin around Lagos metropolis. It also occurs in both confined and unconfined aquifers in the Niger Delta Basin.

Usually the phenomenon occurs mostly due to overdevelopment of coastal aquifers and in recent times due to either flooding of groundwater recharge areas by seawater, reclamation of seawater filled channels or saturation of evaporate deposits in the case of inland areas.

Since most of the urban and communities along the Nigerian coast covering an estimated area of 143,000 km2 depend on groundwater for their water supplies it has become imperative to study the phenomenon and come up management measures to address the problem.

The objectives of the study is to map in three dimensional basis the extent of the saline water intrusion in the coastal areas to determine both the depth to the salt/fresh water interface and the areal boundaries of the zones (aquifers affected).

At the end of the studies output will include the design of groundwater level and water quality monitoring network and recommendations of measures to check the incidence of saline water intrusion, and ensure the provision of adequate water supplies for Nigerian communities where the incidence occurs.

A preliminary data collection for the project has been carried out for detailed geological, hydrogeological and geotechnical data as well available water quality data. A desktop and a laptop computer were procured for data management.

12.3. Application of Isotope Hydrology Techniques in contemporary water resources assessment, development and management in Nigeria, under the auspices of the International Atomic Energy Agency (IAEA) and the UNESCO-IHP as part of the establishment of the Joint International Isotopes in Hydrology Programme (JIIHP) between UNESCO and IAEA

Application of Isotope Hydrology Techniques was first successfully used in Nigeria between 1997-2000, with the study of recharge, general flow pattern and determination of sources of pollution in the Wurno Irrigation Scheme in the Sokoto Hydrological basin.

Thereafter, the technique was employed in the study of the aquifer characteristics, recharge age determination and general aquifer disposition of the multilayered aquifer systems of the Chad basin in order to solve the problems of water demand in the basin.

The technique is presently being employed in the study of the sources of artesian flows in the Middle and parts of the Eastern Nigeria, as well as the study Hydrochemistry and Isotope Geochemistry of the Middle Benue Trough.

As a result of the success made in the implementation of the previous projects, the IAEA has procured (through the cost sharing agreement) and shipped a Mass Spectrometer (MS) to Nigeria for installation at the newly constructed Isotope Hydrology Laboratory at Center for Energy Research and Training (CERT) Ahmadu Bello University, Zaria, Nigeria. The availability of the MS will allow the study of other hydrogeological provinces in the country as well as earn revenue to the government from other West African countries through analysis of their samples.

13. Future Activities and Programmes of the IHP National Committee

It will be recalled that Nigeria hosted the International Conference on ***"Water Security and Hydrological Extremes: Towards Sustainable Development in Africa"*** and *the* ***"1st African Regional Consultative Meeting of the National Committees for UNESCO-International Hydrological Programme"***, which was successfully held from 27th February - 2nd March, 2006, in Abuja and produced a "Conference Recommendations and a "Declaration Statement of the IHP National Committees" which were presented at the Fourth World Water Forum (4WWF), Mexico City, Mexico, March 2006, to intimate the global community on water issues that are of

great concern to the African region. These include amongst others a clearer articulation of African plans and actions within the UNESCO-IHP in order to contribute towards achieving the United Nations MDG targets for water in Africa, through partnership with AMCOW and the Development Partners.

One of the aims of the International Scientific Conference and the 1st African Regional Consultative IHP Meeting is also to strengthen and create an enabling environment to rekindle the inactive African IHP National Committees, including that of Nigeria.

This will therefore enable us to facilitate our continuity and commitments in the implementation of UNESCO's water programmes by making preparations for effective participation at the forthcoming 17th Session of the IHP Intergovernmental Council, 3rd - 7th July, 2006 in Paris through a Ministerial delegation which is now being led by the Honourable Minister who is to vie for Nigeria's candidacy into the Presidency of the IHP Council, a position which we have been canvassing for support at different water Conferences and events in the last one year.

Nigeria will thereafter be able to obtain first hand information and contribute in influencing the course of the UNESCO-International Hydrology Programmes in the position of the Chairman of the IHP Bureau of the Intergovernmental Council, and will represent and lead not only the African group's interest but the global initiatives of the UNESCO's water programmes in the next 2-year intersessional period 2006- 2008.

The discussions that will emerge from the 17th Session of the IHP Intergovernmental Council, 3rd - 7th July, 2006, Paris and the arising Resolutions that will be adopted at the meeting which will be subject to a review by the Nigerian National Committee for IHP at its next meeting especially as related to the Draft Strategic Plan for the Seventh Phase of IHP (2008 - 2013) will obviously determine the Activities envisaged in the long term.

The National Secretariat,
Nigerian National Committee for UNESCO-IHP,
June 2006.

NATIONAL REPORT ON IHP RELATED ACTIVITIES OF THE REPUBLIC OF POLAND

1. ACTIVITIES UNDERTAKEN IN THE PERIOD SEPTEMBER 2004 – JUNE 2006

1.1 Meetings of the IHP National Committee

1.1.1 Decisions regarding the composition of the IHP National Committee

The Polish Academy of Sciences has established the Committee for International Hydrological Programmes. It is presently composed of nine members representing various international water related programmes and organizations:
Prof. Dr Zdzislaw Kaczmarek – **Chairman**, Institute of Geophysics PAS, Warsaw;
Prof. Dr. Piotr Kowalik – **V-Chairman**, Water Building Eng. and Environmental Eng., Gdansk Technical University;
Dr Artur Magnuszewski –**Secretary**, Dep. Geography and Regional Studies, Warsaw University;
Members:
Dr. Kazimierz Banasik, Chair of Water Building Eng., Main Agricultural School, Warsaw;
Prof. Dr. Zbigniew Kundzewicz, Dep. of Agricultural and Forest Environments Research, PAS, Poznan;
Dr Eng. Mieczyslaw Ostojski, Director of Institute of Meteorology and Water Management (IMWM), Warsaw;
Dr. Pawel Rowinski, Deputy Director, Institute of Geophysics PAS, Warsaw;
Prof. Dr. Witold G. Strupczewski, Institute of Geophysics PAS, Warsaw;
Prof. Dr. Maciej Zalewski, Director of European Regional Centre for Ecohydrology PAS under the Auspices of UNESCO, Lodz.

There is neither the UNESCO IHP National Committee nor the separate budget to cover operational costs of the IHP or other international programmes in the country. Professor Dr Z. Kaczmarek is the Chairman of the Committee while Professor Dr W.G. Strupczewski is responsible for contacts with the UNESCO IHP. The Committee convened approximately once a year discussing various issues of our contribution to the international programmes, while informal meetings and other forms of contacts are very frequent. During its meeting on 15 January 2004, the Committee established the Sub-committee for IHP/UNESCO for the period 2004-2006 consisting of three persons:

Prof. Dr Witold G. Strupczewski – chairman (e-mail: wgs@igf.edu.pl)
Dr Artur Magnuszewski - (email:amagnusz@wgsr.uw.edu.pl)
Prof. Dr Maciej Zalewski - member (email:mzal@biol.uni.lodz.pl)

1.1.2 Status of IHP-VI activities

In order to carry out a research project financial means are indispensable. They usually comes from the Committee of Scientific Research, which is the Governmental Body, from EU, from the budget of research institutes, and several International Projects. Because of that the IHP can be considered as an unifying umbrella for dealing with water issue. Hence our activities falling under the themes of the sixth phase of IHP are much wider than reported here.

IHP-VI Ecohydrology Activity. Department of Applied Ecology, University of Lodz in cooperation with ten national research organizations headed by Prof. M.Zalewski and Dr I. Wagner.

Northern European FRIEND

Project 2. "Low Flows". The team headed by Prof. E. Kupczyk (Faculty of Geography and Regional

Studies, Warsaw University) participates in execution of this project. The members of the team: Adynkiewicz-Piragas M., Dubicki A. (IMWM – Wroclaw), Jakubowski W. (Agricultural Academy – Wroclaw), Kasprzyk A., Mordalska H., Pokojski W., Suligowski R. and Tokarczyk T.

Project 5. "Catchment hydrological and biogeochemical processes in changing environment". Department of Hydrology, Faculty of Geography and Regional Studies, Warsaw University actively participates in the Project execution. Prof. M. Gutry-Korycka acts as the coordinator of the team consisting of seven persons: Dr Artur Magnuszewski, Dr Urszula Somorowska, Dr Barbara Nowicka, Dr Maciej Lenartowicz, Dr Dariusz Woronko, Dr Jarosław Suchożebrski and Dr Aneta Afelt. Their work is closely related to the activity in **European Network of Experimental and Research Basins (ERB) –** the team of Jagiellonian University, Krakow headed by National Correspondent of ERB Prof. W. Chelmicki.

Team 2, Focal Area 2.1. "Extreme events in land and water resources management" – Flood Frequency Modelling – the team of Institute of Geophysics PAS, Krakow Technical University and Louisiana State University headed by Prof. W.G. Strupczewski

1.1.3 Decisions regarding contribution to/participation in IHP-VII

Prof. Maciej Zalewski - Representative of UNESCO IHP to Scientific Committee on Water Research (ICSU, SCOWAR).

Prof. Maciej Zalewski - Chairman of the Steering Committee of UNESCO IHP Programme "Ecohydrology", Project 2.3/2.4.

Dr Iwona Wagner – Scientific Secretary of Ecohydrology in IHP-VI.

Dr Iwona Wagner – Member of Task Force for preparation of 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. **Prof. Maciej Zalewski** – Chairman of the Scientific Advisory Committee of the UNESCO IHP-VI Ecohydrology Activity.
2. **Dr Iwona Wagner-Lotkowska** – Scientific Secretary of the UNESCO IHP-VI Ecohydrology Activity.
3. **Professor Dr Z.W. Kundzewicz** is TAB member.
4. **Professor Dr Z. Kaczmarek** was Member of Governing Board of UNESCO/IHE – Institute for Water Education till 2005.
5. **Dr I. Wagner-Lotkowska** - Member of Special IHP-VII Task Force Group, UNESCO IHP-VII.
6. **Dr Iwona Wagner-Lotkowska.** UNEP IETC Fellowship/co-operation with UNESCO IHP: Pursuing the MOU between UNEP-IETC and UNESCO IHP, as well as UNEP-IETC and the European Regional Centre for Ecohydroloy PAS and the join activities of these two institutions with UNESCO IHP on Phytotechnologies and Ecohydrology.
7. **Prof. Dr W. Chelmicki** was a member of organising and the Scientific Committee of the IHP/UNESCO Conference on *Hydrology of Mountain Environments* in Berchtesgaden (Germany, 27 September -1 October 2004.
8. **Dr hab. Artur Magnuszewski** participated in Working Group and Steering Committee Meetings of Northern European FRIEND Low Flow, Vienna, Austria, 22-24 April 2005 at University of

Agricultural Sciences (BOKU), Institute of Applied Statistics and Computing (IASC), Peter Jordan-Str. 82, A-1190 Wien.

1.2.3 Research/applied projects supported or sponsored

2005-2010- SWITCH - Sustainable Water Management Improves Tomorrow's Cities' Health.
Project Officer for the project partner - University of Lodz
Project Coordinator: UNESCO-IHE;

EU FP6 IP Project;

UNESCO IHP Demonstration Site "Application of Ecohydrology and Phytotechnologies for Water Resources Management and Sustainable Development"; Project Coordinator –Dr Iwona Wagner

1.2.4 Collaboration with other national and international organizations and/ programmes

UNESCO IHP – Demonstration Projects on Ecohydrology – Coordination on behalf of UNESCO;

FRIEND project , II. LOW FLOWS group activities:

Cooperation of Czech Rep., Poland and Slovakia aimed at the improvements of the methods of disastrous droughts evaluation, using appropriate indicators, adjusted to climatic and physiographical conditions of our region. Identification of drought – prone area and homogenous regions with respect to frequency distribution of the selected drought characteristics, were carried out on the basis of extended data sets and using improved software NIZOWKA.

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

Department of Hydrology, Faculty of Geography and Regional Studies, Warsaw University cooperates with European Regional Centre for Ecohydrology under the Auspices of UNESCO, Lodz, Poland.

ERB:
Prof. Dr Wojciech Chelmicki (Jagiellonian University, Kraków) - National correspondent for Poland at The European Network of Experimental and Research Basins (ERB) attended ERB Steering Committee meeting (Turin,12 Oct. 2004), where Poland declared organization of 12th ERB conference in 2008 in Kraków. Steering Committee invited him into the Scientific Committee of 11th ERB International Conference in Luxembourg (2006).

Prof. W. Chelmicki was member of the Scientific Committee of 10th ERB Conference in Turin (Italy): *Progress in surface and subsurface water studies at the plot and small basin scale*, October 13th – 17th 2004**.**

Prof. W. Chelmicki attended ERB Steering Committee meeting (4 Oct. 2005, Yundola, Bulgaria) where details of programme of the 11th ERB Conference were discussed. The Committee decided to organize the 12th conference in 2008 in Krakow (Poland).

1.5 Publications

Ecohydrology

Zalewski M & Wagner-Lotkowska I. (eds). 2004 Integrated Watershed Management – Ecohydrology and Phytotechnology-Manual. UNESCO IHP, UNEP IETC. 246pp.

Zalewski M., Harper D., Robarts R., 2004. Ecohydrology&Hydrobiology. No. 4

Zalewski M., Harper D., Robarts R., 2005. Ecohydrology&Hydrobiology. No. 1-4

Zalewski M., Harper D., Robarts R., 2006. Ecohydrology&Hydrobiology. No.1.

Northern European FRIEND

2. Low Flows:

Kupczyk, E. Kasprzyk, A., Pokojski, W., 2004. Contribution to chapter 3. Flow generating processes and chapter 9. Human influences. In: *Hydrological drought. Processes and estimation methods for streamflow and groundwater.* Ed. L.M. Tallaksen, H. A. J. Van Lanen, Elsevier.
Participation in developing the final version of the textbook and relevant to this book software: W. Jakubowski – elaboration NIZOWKA software, attached to the book on CD.

Dubicki, A., Tokarczyk, T., Kupczyk, E., Suligowski R., 2005. Assessment of drought potential risk for Upper and Middle Odra Watershed, Abstract, *EGU*, Vienna, Austria 24-29 April 2005, *www.copernicus.org/EGU*.

Jakubowski, W., 2005. Zastosowanie uogólnionego rozkładu Pareto do wyznaczania rozkłądów maksymalnych charakterystyk niżówek (*An application of Generalized Pareto Distribution for maximum of the low flow indices distribution determination*), *Zesz. Nauk. Akad. Roln.* 520; p. 29-41.

Jakubowski, W., 2005. Rozkłady prawdopodobieństwa niżówek maksymalnych. (*Distributions of low flow maximums*); *Prz. Geof*., nr. 3-4.

Jakubowski W., 2006; An application of the Bivariate Generalized Pareto Distribution for the probabilities of low flow extremes estimation, Hydrol. Earth. Syst. Sci. Discuss. 3, 1-35.

Kasprzyk, A., 2005. Rola czynników fizycznogeograficznych w kształtowaniu susz hydrologicznych w Europie Środkowej. (*The role of physico- geographical factors in hydrological droughts creation in the Middle Europe.* **In**: *Extreme hydrological and meteorological phenomena*. pp. 277-286. *Wyd. IMGW*, Warszawa.

Tokarczyk, T., Adynkiewicz-Piragas, M., Mordalska, H., 2004. Problemy w planowaniu i zarządzaniu zasobami wodnymi w przypadku niedoborów wody (*Problems in planning of water resources management in case of water shortage*), XIII Ogólnopolska Szkoła Naukowa Gospodarki Wodnej, Jachranka 2003. *Wyd. IMGW*.

Northern European FRIEND

5. Catchment hydrological and biogeochemical processes in a changing environment:

Pokojska P., 2004, Application of a Water Balance Model with distributed parameters (on the example of Reda river basin), *Miscellanea Geographica*, Vol. 11, pp. 139-150.

Somorowska U., 2004, Water storage in the vadose zone evaluated from TDR soil moisture Measurement. *Acta Agrophysica*, 110, Vol. 4(1), pp.169-176.

Somorowska U., 2004, Inferring changes in dynamic groundwater storage from recession curve analysis of discharge data. *Miscellanea Geographica*, Vol. 11, pp. 155-162.

Suchożebrski J., 2004, The size of the basic unit geographic analysis, *Miscellanea Geographica*, Vol. 11, pp. 151-160

Afelt A., 2005, An influence of soil water sampler substance on chemical composition of porous moisture. *Acta Universitatis Carolinae*, T. 38, No 1., pp. 5-10.

Gutry-Korycka M., 2005, Urbanization in the global change development syndrome. *Papers on Global Change. IGBP*, No 12., pp.7-21.

Suchożebrski J., 2005, Impact of water and sewage management in rural areas on the quality of groundwater in lowland agricultural basin. *Acta Universitatis Carolinae*, V. 38, No 1., 2003, pp. 421-430.

Magnuszewski A., Suchożebrski J., Szydłowski M., Gutry-Korycka M., 2005, Flood Zones – a risk for the Urban areas. [In:] Gutry-Korycka M. (Ed.) *Urban Sprawl. Warsaw agglomeration case study.* University of Warsaw Press, Warsaw, pp.253-264.

Gutry-Korycka M., Zegar T., Ostrowski W., 2005, The conversion of rural land-use to urban sprawl. [In:] Gutry-Korycka M. (Ed.) *Urban Sprawl. Warsaw agglomeration case study.* University of Warsaw Press, Warsaw, pp. 53-82.

Magnuszewski A., Kiedrzyńska E., Wagner-Łotkowska I., Zalewski M., 2005, Immobilizing of sediments in a lowland river floodplain. [In:] Altinakar M.S., Czernuszenko W., Rowiński P., Wang S.Y. (Ed.) *Publs. Inst. Geophys. Pol. Acad. Sc*. E-5 (387), pp. 239-260.

Nowicka B., Lenartowicz M., 2005, Variability of the process of lake feeding by groundwater (case study of small basin in South Pomeranian Lake District). [In:] Tropeano D., Arattano M., Maraga F., Pelissero C. (Ed.) *Progress in surface and subsurface water studies at the plot and small basin scale. UNESCO Technical Documents in Hydrology*, Paris.

Somorowska U., 2005, Temporal patterns of the subsurface water storage inferred from the soil moisture TDR measurements. [In:], Maraga F., Arattano M. (Ed.) *Progress in surface and subsurface water studies*

at the plot and small basin scale: Proceedings of the 10th ERB Conference, Turin, Italy, 13-17 October 2004. *Technical Documents in Hydrology, No.77, UNESCO,* Paris, pp. 27-33.

Suchożebrski J., 2005, - Quantity and quality of surface water and groundwater resources. [In:] Gutry-Korycka M. (Ed.) *Urban Sprawl. Warsaw agglomeration case study. University of Warsaw Press,* Warsaw, pp.242-253.

Euromediterranean Network of Experimental and Representative Basins (ERB):

Progress in Surface and Subsurface Water Studies at Plot and Small Basin Scale, Eds F. Maraga and M. Arattano, *Proceedings of the 10th ERB Conference* (Turin, Italy, 13-17 October 2004), Paris 2005:

Nowicka B., Lenartowicz M., Variability in the process of lake feeding by groundwater (case study of small basin in South Pomeranian Lake District), pp. 15-20.

Somorowska U., Temporal patterns of the subsurface water storage inferred from the soil moisture TDR measurements, pp. 27-34.

Raczak J., Żelazny M., Diurnal fluctuations in stream-water chemical composition in small catchments of the Carpathian Foothills (Southern Poland), pp. 101-108.

International Conference on Hydrology of Mountain Environments, Berchtesgaden, 27 September-1 October 2004, *Landschaftsekologie und Umweltforschung*

Extended Abstracts, , Heft. 47, 2004:

Absalon D., Changes of runoff and water quality in the Żylica catchment (The West Carpathians), pp. 1-6.

Kaczka R., J., The role of coarse woody debris in mountain stream channel modeling, Central Europe (Germany, Poland), pp. 169-174.

Matysik M., Hydrological and hydrochemical profile of springs in the mountainous part of the upper Oder River Basin , pp. 243-248.

Mietelski J., Siwek J., The application of digital elevation model for calculating the potential direct solar radiation in the Carpathian Foothills, pp. 251-252.

Tomaszewski E., Application of the ET algorithm to estimation of groundwater flow dynamics in mountain rivers, pp. 389-394.

Tomaszewski J., The character of outflow from quasi natural basins of middle mountains on the example of two mountainous basins in the Eastern Karkonosze Mountains, pp. 395-396.

Proceedings, Heft. 48, 2005:

Matysik M., Hydrological and hydrochemical profile of springs in the mountainous part of the upper Oder River Basin , pp. 99-108.

Tomaszewski E., Application of the ET algorithm to estimation of groundwater flow dynamics in mountain rivers, pp. 109-120.

Kaczka R., J., The role of coarse woody debris in mountain stream channel modeling, Central Europe (Germany, Poland), pp. 189-198.

Absalon D., Changes of runoff and water quality in the Żylica catchment (The West Carpathians), pp. 263-272.

Team 2, Focal Area 2.1. "Extreme events in land and water resources management" – Flood Frequency Modeling:

Weglarczyk, S., Strupczewski, W.G. and Singh, V.P. (2005), Three-parameter discontinuous distributions for hydrological samples with zero values, *Hydrologic Processes,* **19,** 2899-2914.

Strupczewski, W.G., Mitosek, H.T., Kochanek, K., Singh, V.P., Weglarczyk, S., (2005a). Probability of correct selection from Lognormal and Convective Diffusion models based on the likelihood ratio. *SERRA* 10.1007/s00477-004-0210-8, pp.11.

Strupczewski, W.G., Kochanek, Weglarczyk, S., Singh, V.P.(2005b) On robustness of large quantile estimates of log-Gumbel and log-logistic distributions to largest element of observation series: Monte Carlo vs. first order approximation. *SERRA* 10.1007/s00477-005-0232-x.

Strupczewski, W.G., Kochanek, Singh, V.P., Weglarczyk, S. (2005c) Are parsimonious FF models more reliable than true ones? I. Accuracy of quantiles and moments estimation (AQME) – Method of assessment. *Acta Geoph. Pol.,* **53**(4) , 419-436.

Kochanek K., Strupczewski, W.G, Singh, V.P., Weglarczyk, S. (2005) Are parsimonious FF models more reliable than true ones? II.Comparative assessment of the performance of simple models versus the parent distributions. *Acta Geoph. Pol.,* **53**(4), 437-457.

Weglarczyk, S., Strupczewski, W.G. and Singh, V.P. (2005), Three-parameter discontinuous distributions for hydrological samples with zero values, *Hydrologic Processes,* 19, 2899-2914.

Strupczewski, W.G., Kochanek, K., Weglarczyk, S., Singh, V.P.(2006) On robustness of large quantile estimates to largest element of the observation series. *Hydrol Process.* (in press).

Mitosek, H.T., Strupczewski, W.G. and Singh, V.P. (2006) Three procedures for selection of annual flood peak distribution. *J. Hydrol.* 323, 57-73.

Markiewicz, I., Strupczewski, W.G., Kochanek, K., Singh, V.P. (2006a) Relationships between three dispersion measures used in flood frequency analysis. *SERRA* DOI 10.1007/s0047-006-0033-x.

Markiewicz, I., Strupczewski, W.G., Kochanek, K., Singh, V.P. (2006b) Relationships between three dispersion measures used in flood frequency analysis. EGU, Vienna, Abstract. I
n: www.copernicus.org/EGU.

Strupczewski, W.G., Kochanek, K., (2006) On thermal inversion observed in Liberian lagoons during dry season. Proceedings of 25th Anniversary Meeting & International Conference "Challenges in Coastal Hydrology and Water Quality", A.I.H. Ch.3, 1-8., May 21-24, 2006, Baton Rouge, Louisiana.

Markiewicz, I., Strupczewski, W.G., Kochanek, K., Singh, V.P. (2006) Discussion on „Non-stationary pooled flood frequency analysis" by J.M. Cunderlik and D.H. Burns [J.Hydrol. 276 (2003) 210-223], *J.Hydrol.* (in press)

Strupczewski, W.G., Singh, V.P., Weglarczyk, S., Kochanek, K., Mitosek, H.T. (2006) Complementary aspects of linear flood routing modelling and flood frequency analysis. *Hydrol. Processes*, (in press).

Strupczewski, W.G., Singh, V.P., Kochanek, K (2006) Selected problems of at-site flood frequency analysis. International Symposium on Methodology in Hydrology. Nanjing, China (Oct.30–Nov.1, 2005), *IAHS Red Books* (in press).

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

Opening symposium of European Regional Centre for Ecohydrology under the auspices of UNESCO in Lodz. 30-31 May 2006, Lodz, Poland

The First Meeting UNESCO IHP Demonstration Project on Ecohydrology, 17-19 November 2005, Lodz, Poland

"Aquatic Habitats in Integrated Urban Water Management" - International UNESCO Workshop, UNESCO/IHP, UNESCO/MAB, European Regional Centre for Ecohydrology PAS , Lodz, 18 - 20 Sept. 2005. Presentation: I. Wagner-Łotkowska, J. Bocian, M. Zalewski "Sustainable Water Management Improves Tomorrow's Cities' Health". Presentation of the EU project and advancement of research and co-operation with the City of Lodz.

International UNESCO IHP and UNESCO MAB Workshop "Urban Waters" 19- 21. 09.2005, Lodz.

1.6.2 Participation in meetings abroad

Ecohydrology

2006 4 World Water Forum, 18-22 March 2006, Mexico City, Mexico

2005 International Workshop "Water and Ecosystems: Water Resources Management in Diverse Ecosystems and Providing for Human Needs" 14-16 June 2005, Hamilton, Canada (key-note lecture)

2005 Symposium "Future of Life and the Future of Our Civilization (predictions and modelling)", 2-6 May 2005, Frankfurt, Germany

2005 Brazilian Remote Sensing Symposium, 16-21 April 2005, Goiania, Brazil (key-note speaker at the workshop "Ecohydrology fractals and remote sensing"

2005 International Symposium on ECOHYDROLOGY, Vienna, 23-25th October, 2005.

2005 3rd Asia Pacific Training Workshop on Ecohydrology, 21-26 November 2005, Denpasar, Bali, Indonesia.

2004 16th Session of the Intergovernmental Council of UNESCO IHP, Paris, 20 – 24 September 2004. Oral Presentation: IHP VII –Plan and Strategy.

2004 Course on Phytotechnology and Wetland Management. UNEP-IETC Project: Support for Environmental Management of the Iraqi Marshlands. December 6th - 16th 2004, Cairo, Egypt.

2005 The First Meeting of the Leaders of "Demonstration Projects on Ecohydrology", UNESCO IHP-VI & ICE PAS. Łódź 17 – 19 XI 2005. Presentation: Wagner-Lotkowska, I. "Improving water resource management ecohydrological coupling of a river and a reservoir; Pilica River, Poland".

2005 FRIEND, LOW FLOW group meeting, Vienna, 22-24 April 2005;

2005 EGU Conference, Vienna, 25 – 29 April 2005. Participants:
Wojciech Jakubowski, Department of Mathematics, Agriculture University, Wroclaw;
Elżbieta Kupczyk , Institute of Geography, Jan Kochanowski, University, Kielce;
Artur Magnuszewski, Faculty of Geography and Regional Studies, Warsaw University;
Tamara Tokarczyk, Institute of Meteorology and Water Management, Wroclaw Branch.

Polish participation in IHP sponsored Conferences

2004 International Conference on Hydrology of Mountain Environments (27 Sep.-1 Oct. 2004), Berchtesgaden, Germany**.** Ten Polish hydrologists participated: D. Absalon, R.J. Kaczka, M. Matysik, J. Mietelski, J. Siwek, W. Chelmicki, E. Tomaszewski, J. Tomaszewski, D. Woronko, E. Żmudzka and presented 6 oral and poster presentations (see 1.5). W. Chelmicki was a member of the Scientific Committee.

2005 International Symposium on Methodology in Hydrology (Oct. 30 – Nov. 1, 2005), Hohai University, Nanjing, China. Prof. W.G. Strupczewski (key-note speaker). Lecture untitled "Selected problems of at-site flood frequency analysis".

2004 10th ERB Conference in Turin (Italy): *Progress in surface and subsurface water studies at the plot and small basin scale.*(Oct. 13 – 17, 2004)**.** Fourteen Polish hydrologists attended the Conference (B. Nowicka, M. Lenartowicz, M. Gutry-Korycka, U. Somorowska, W. Chelmicki, J. Raczak, M. Żelazny, J. Chormanski, S. Ignar, P. Cabanski , R. T. Walczak, C. Slawinski, D. Swiatek and T. Okruszko) giving three oral presentations and four posters.

1.7 Other activities at regional level

Joanna Raczak (Doctoral student at the Jagiellonian University) was stipendiary at Centre de Recherche Public - Gabriel Lippmann (Luxembourg) – Hydrology Unit – organizer of the 11th ERB Conference in Luxembourg in September 2006.

1.7.1 Institutional relations/cooperation
1.7.2 Completed and ongoing scientific projects

UNESCO IHP Demonstration Site "Application of Ecohydrology and Phytotechnologies for Water Resources Management and Sustainable Development". Project Coordinator – Dr Iwona Wagner.

2005-2010 - SWITCH - Sustainable Water management Improves Tomorrow's Cities' Health. Project Officer for the project partner - University of Lodz, Project coordinator: UNESCO-IHE.

EU FP6 IP Project.

Improvement of methods and techniques of statistical modeling of flood phenomena. Project of Polish Committee of Scientific Research. Principal investigator: Prof. Dr W.G. Strupczewski, Institute of Geophysics PAS (2005-2008).

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2007

Organizing Special Session on Ecohydrology, SIL Congress, 12-18 August 2007, Montreal, Canada.

ILTER Coordinating Committee Meeting, August 2006, Namibia – Freshwater Research session: Ecohydrological perspectives of development of long-term freshwater research.

Continuation of the ongoing projects.

Participation in the 5th WORLD FRIEND Conference - Water Resource Variability: Processes, Analyses and Impacts, Nov. 27-Dec.01, 2006, Havana, Cuba with five presentations:

Altinakar M., Biedrzyńska E., Magnuszewski A., 2006, Modeling of inundation patterns at Pilica river floodplain, Poland. IAHS Red book (in press).

Gutry-Korycka M., Magnuszewski A., Suchożeberski J., Jaworski W., Marcinkowski M., Szydłowski M., 2006, Numerical estimation of flood zones in the valley of Vistula river in Warsaw. IAHS Red book (in press).

Somorowska U.,2006, Physical insight into soil water storage interacting in the soil-plant atmosphere system. IAHS Red book (in press).

Tokarczyk, T., Jakubowski , W. , Temporal and spatial changeability of drought in mountain catchments of the Nysa Klodzka basin.

Jakubowski, W., Bivariate Generalized Pareto distribution – an application to the low flows extremes – Computer Programme.

11th ERB Conference. Luxembourg (Sept. 20-22). W.Jakubowski will present the paper “An influence of threshold level values on the distribution of low flow indices extremes”.

2.2 Activities foreseen for 2008-2009

12th ERB conference in Krakow (September 2008). Preliminary theme: Extreme hydrological events in a small basin scale.

2.3 Activities envisaged in the long term

NATIONAL REPORT ON IHP RELATED ACTIVITIES
IN
REPUBLIC OF KOREA

June, 2006

Korean National Committee
for
The International Hydrological Programme
Republic of Korea

1. ACTIVITIES UNDERTAKEN IN THE PERIOD SEPTEMBER 2004-JUNE 2006

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 and this year(2006), 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. 2004 IHP Representative Basin Studies	· Distribution of hydrological data by electronic publication(Ⅲ) · Study on flash flood forecasting and management for mountainous region(Ⅱ) · 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
2. 2005 IHP Representative Basin Studies	· Comprehensive analyses on climate change and its effect on water resources · Evaluation of drought and its measures · Distribution of hydrological data by electronic publication(IV) · Study of urbanization effect on river water and sewage quality(II) · Water conflict factors and solution in Korean river basins(II) · Development of image education system for water resources education and training(II) · Collection and fundamental analysis of hydrological data of the Representative basins · Preparations of River Catalogue-Vol.12	Theme 1, 2, 4 and 5	Korean rivers	MOCT	Major Gov. input	Report and Papers
3. 2006 IHP Representative Basin Studies	· Water demand management planning and its studies · Runoff characteristics change and runoff reduction studies according to large-scale housing area development · Runoff analyses by future landuse and climate change · Int'l river management examples investigation and development of management strategy of South-North Korean co-boundary river basins · River basin management manual for Integrated River Basin management(IRBM) · Optimal water resources use and its management technique development in island and coastal region · Groundwater variation characteristics in urban areas · River and culture/civilization studies in river basin · Selection and design of new Representative basins for hydrological data collection · Review of study results and future direction of present Representative basins	Theme 1, 2, 4 and 5	Korean rivers	MOCT	Major Gov. input	Report and Papers
4. Asian/Pacific FRIEND Studies	· Basic hydrologic analyses in AP FRIEND river basins · Comparative regional analyses of hydrology and water resources in AP FRIEND regions	Theme 1 Area 1.1	Korean rivers	MOCT		Report and Papers
5. Special program on the low-flow management	· 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	· Extreme flood and drought modeling · 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 hydrology	· FRIEND basin studies · HELP studies · PUB studies			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	· 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	· 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	· 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	· 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	· Developing strategies of international river basin management							
Focal Area 2.3	Endorheic Basins								
Focal Area 2.4	Methodologies for integrated river basin management	· 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	· 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	· 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	· 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	· Studies of relationship of water with culture and civilization in Korean river basins - - - characteristics of water culture							
Focal Area 4.2	Value of water	· Assessment of water price for effective consumption · Studies of water consumptive habit in the society							
Focal Area 4.3	Water conflicts – prevention and resolution	· Evaluation of water conflict problems in Korean river 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 hydrogists 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-Ⅶ

Upon having received the progress report on the seventh phase of the international hydrological programme(IHP-Ⅶ, 2008-2013), the Korean National Committee for the IHP decided to prepare the potential contribution and research programme of IHP-Ⅶ during the IHP-Ⅵ period(2002-2007) based on the proposed concept and structure of IHP-Ⅶ as the followings ;

Water Dependencies : Systems under Stress and Societal Responses

Theme Ⅰ: Global Changes, Watersheds and Aquifers

Theme Ⅱ: Governance and Socio-Economics

Theme Ⅲ: Ecohydrology and Environmental Sustainability

Theme Ⅳ: Water Quality, Human Health and Flood Security

Cross Cutting Programmes : HELP and FRIEND

Education and Capacity Building

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

1.2.1 National / local scientific and technical meetings

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

1.2.2 Participation in IHP Steering Committees / Working Groups

Republic of Korea was one of most active member countries in IHP Regional Steering Committee's activities for Southeast Asia and the Pacific. Republic of Korean delegates actively participated in the IHP Regional Steering Committee and Working Group meetings held in the period of 2004~2006.

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 2004~2006 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).

· Basic hydrologic analyses and data collection

· Comparative regional flow regimes analyses

  - Rainfall models and design storm
  - Flood models and design flood

· FRIEND river basin review and selection

· HELP river basin selection and studies

1.2.4 Collaboration with other national and international organizations / or programmes

The Korean National Committee for the IHP is functioning in the execution of IHP activities in collaboration with the following national and international organizations/or programmes; Korea Water Resources Corporation; 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 Federation of

Water Science and Engineering Societies; 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 above mentioned organizations in 1.2.4. In these specific courses, special topics are dealt with practical application in river basins.

1.3.3 Participation in IHP courses

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

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

The Korean National Committee for the IHP had particularly close cooperation with International Center for Water Hazard and Risk Management(ICHARM) under the auspices of UNESCO in its preparatory activities for the establishment during last two years through the participation in workshops and strong support at the UNESCO Council and regional meetings.

1.5 Publications

The Korean National Committee for the IHP is publishing IHP Annual Research Report and the Catalogue of Rivers in Korea every year in the form of Government Publication since 1975. These reports are distributed to all water-related organizations and IHP-KNC members and research results are published on the journals of academic societies or organizations.

Some other technical reports, proceedings of scientific meetings and specific course's materials are also published by the IHP-KNC.

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

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

· 2004 International Symposium on Hydrological Environment
· 2005 International Symposium on Hydrological Environment

These meetings were held at the Yeungnam University and Inter-Burgo Hotel, Taegu, Republic of Korea in 2004 and 2005.

1.6.2 Participation in meetings abroad

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

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2007, foreseen for 2008-2009 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-Ⅶ by the end of IHP-Ⅵ period(2007) and organize some international and regional activities within this period.

The following international symposium and workshop will be organized until December 2007 as the IHP-Ⅵ activities of IHP-KNC.

· 2006 International Symposium on Hydrological Environment
· 2007 International Symposium on Hydrological Environment
· Korean Workshops of FRIEND, HELP and PUB

Romanian National Committee for IHP UNESCO

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NATIONAL REPORT ON IHP RELATED ACTIVITIES

1. ACTIVITIES UNDERTAKEN IN THE PERIOD SEPTEMBER 2004 - JUNE 2006

1.1. Meetings of the IHP National Committee

1.1.1. Decisions regarding the structure of the IHP National Committee

During the annual meeting of the IHP - UNESCO Romanian National Committee, which took place on 18.11.2005, the following board was elected:

1. PRESIDENT – Lucia Ana VARGA, Secretary of State, Ministry of Environment and Water Management
2. VICEPRESIDENT – Dr. Eng. Petru SERBAN, National Administration "Romanian Water"
3. VICEPRESIDENT – Prof. Dr. Eng. Radu DROBOT, Civil Engineering University - Bucharest
4. VICEPRESIDENT – Prof. Dr. Eng. Gheorghe CRETU, Politechnic University - Timisoara
5. SECRETARY – Dr. Petre STANCIU, National Institute of Hydrology and Water Management

1.1.2. Status of IHP-VI activities

- Implementation of the Orders and Decisions regarding the Water Management passed by the IHP Intergovernmental Council
- Participation in/realization of the themes and projects included in IHP-UNESCO or in regional programmes.
- Providing the data and information regarding the activities of Romanian National Committee for the International Hydrological Program of UNESCO
- Partnership with UNESCO National Commission for Romania and participation to specific programmes of this organization.
- Organization of workshops, scientific sessions etc.

1.1.3. Decisions regarding contribution to/participation in IHP VII

The Plan project IHP-VII, received from the IHP-UNESCO Secretariat was distributed to the RNC-IHP members, in order to formulate observations and

suggestions concerning the proposed structure and to transmit them to the Secretariat of the International Hydrological Program – Natural Sciences Division.

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

1.2.1. National/local scientific and technical meetings

- Participation in the JRC Information Day and S&T Workshops organized by the European Commission's Joint Research Center and the Romanian Ministry of Education and Research. The objective was to make presentations of the 7th Framework Programme and COST, and also the signature of the Memorandum of Understanding regarding the application of the European Flood Alert System – EFAS in Romania, between Joint Research Center and the National Institute of Hydrology and Water Management.

1.2.2. Participation in IHP Steering Committees/Working Groups

- Participation in the meeting regarding the initiation of Phase II of a Pilot Project in the Centre and East of Europe "Forward Integration of Flood Warning in Areas Prone to Flash Floods".

1.2.3. Research/applied projects supported or sponsored

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

- Participation in the International Conference Regarding Sustainable Development and Conservation of Biodiversity in the Danube Delta, Odessa, Ukraine 27 February 2006. It was collaboration between the Ukrainian, Romanian and Moldavian Governments, under the auspices of UNESCO Paris, UNESCO International Commissions from Ukraine, Romania and Moldova, ICPDR and WWF.

1.2.5. Other initiatives

1.3. Educational and training courses

1.3.1. Contribution to IHP courses

There are not yet contributions to IHP courses.

1.3.2. Organization of specific courses

- Participation in the educational programme of the Civil Engineering University of Bucharest.

1.3.3. Participation in IHP courses:

There has been no participation in IHP courses

1.4. Cooperation with the UNESCO – IHE Institute for Water Education and/or international/regional water canters under the auspices of UNESCO

1.5. Publications

- Within the Regional Hydrological Cooperation of the Danube Countries in the Framework of the International hydrological Programme of UNESCO the following works have been republished:
  - Inventory of the Main Hydraulic Structures in the Danube Basin
  - Regional Analyses of Annual Peak Discharges in the Danube Catchment
- Collaboration in editing "Hydrotechnica Magazine"

1.6. Participation in international scientific meetings

1.6.1. Meetings hosted by the country:

- The NIHWM International Annual Scientific Communication Session, Bucharest, October 2004:
  - Hydrological modeling and forecast models
  - The regional hydrological effects of climatic changes and variability
  - Flows and erosion prediction in ungauged basins (PUB): integrated methods and techniques
  - Water resources management
  - Risk analyses for resources management in extreme situation (flood, drought)
  - Hydrological and hydrogeological regimes
  - Complex and eco-hydrological aquatic systems
  - Modern methods and techniques of hydrometric measurement
- The NIHWM National Annual Scientific Communication Session, Bucharest, October 2005

1.6.2. Participation in meetings abroad

- **Participation in the Session of IHP-NC representatives and in the 22nd Conference of the Danube Countries; Brno - Czech Republic, 27 August – 04 September 2004**.

Within the Conference there have been presented the following scientific papers:

- The 2003 drought on the Danube River.
- The role of the lithological ormations from the Danube Plain on the groundwater level during the large floods.

- Relationships among the hydrological and geomorphologic parameters of a hydrographic basin, based on a case study in Romania.
- The application of social efficiency in designing an automatic warning hydrological network.
- Considerations regarding the overexploitation of groundwater resources.
- CHELIM.
- Methods of the rivers classification regarding the influence of the water storages and dikes on water flow and water balance.
- Relations of maximum flow forecast in correlation with relational factors.

- **Participation in 19th Working Meeting of the experts and representatives of the Regional Hydrological Cooperation of the Danube Countries in the Framework of the International Hydrological Programme of UNESCO - Passau, Germany, June 2nd, 2005**

The Romanian delegation has presented the answers concerning the short Questionnaire to Project no. 12 SEDAN – "Modeling of erosion, transport and sedimentation processes in the Danube River and its major tributaries". Within the above mentioned event it has been established to be organized in October 2005, in Bucharest – Romania the first Steering Committee of SEDAN in order to integrate the Sedan project into International Sedimentation Initiative (ISI).

Within the above mentioned meeting, held in Passau, the following scientific papers have been analyzed too:

- Long-term fluctuations of precipitation in the Danube Basin.
- Flood coincidence of the Danube and its major tributaries.
- Flow regime of River Danube and its Catchment (An update of Chapter II of the Danube Monograph).
- Basin-wide water balance in the Danube River Basin (An update of Chapter III of the Danube Monograph).
- Hydrological water balance related to the Danube Basin.
- The common hydrological meta-database of the countries sharing the Danube Catchment.
- Characterization of the runoff regime and its stability in the Danube Catchment.

- **Participation in the Workshop *„Towards the Integrated Management of the Danube Sediment-Soil-Water-System as Support to the Implementation of the EU Water Framework Directive in the Danube River Basin",* Budapest, Hungary, 23 - 26.03.2006**

The Workshop, initiated and financially supported by UNESCO/ROSTE and involving experts from ICPDR, SEDAN, Aqua Terra and SedNet, has the purpose to continue the efforts to generate from the countries sharing the Danube Catchment further valuable contributions to the International Sediment Initiative (ISI) of UNESCO,

thus simultaneously supporting the implementation of the EU Water Framework Directive (WFD) in the Danube Catchment.

- **Participation in the 33rd UNESCO General Conference, 3 – 21 October 2005, Paris, France**

- **Participation in the 16th Session of the Intergovernmental Council IHP – UNESCO and the 7 th Kovacs Colloquium; Paris - France, 17 – 18 September 2004**

The Romanian delegation has attended:

- The Report of the Council activity during 2002-2004.
- The election of a new President and 4 new Vice-Presidents of the Council for 2004 – 2006.
- The Report of IHP-UNESCO Secretary regarding the Work Program 32 C/5 and the Budget for 2004 – 2005 and the preparation of the new Work Program 33 C/5 and the budget for 2005 – 2006.
- The report regarding the implementation of the adopted recommendations and resolutions, including the UNESCO Educational Centers in the field of water management.
- Reports regarding the foreign evaluation of the IHP Project – Phase V, the implementation of the Phase VI and the preparation activities of the new IHP – Phase VII Project.
- The embracing of the measures regarding the strengthening and intensification of the IHP National Committees activities.
- The analysis of new IHP projects:
    - The International Floods Initiative.
    - The International Sedimentation Initiative.

The Romanian delegation has also participated in:

- The workshops regarding the SEDAN Project;
- The workshops regarding CHARM Project and PWA Project;
- The workshops of the Financial Committee of the IHP Intergovernmental Council;
- The Kovacs Colloquium.

- **Participation in two scientific actions; Turin - Italy, 13- 17 October 2004:**

    - **The 10th ERB Conference (European Network of Experimental and Representative Basins) - Euromediterranean Conference.**
    - **ERB Steering Committee Meeting,**

Within the above mentioned events have been presented two scientific papers:

- Forecast model of flood waves in very small basins.

- Characteristics of minimum flow and depletion phenomenon in small basins in Romania; Forecast relationships of these phenomena.

- **Participation in the "Hydrology and Limnology – Another Boundary in the Danube River Basin" Workshop; Vienna - Austria, 14 – 16 October 2004 for:**

  - The presentation of the development of the SEDAN Project;
  - The discussion of the SEDAN Project withMr. Philip Weller, Executive Secretary of ICPDR and the analysis of the support possibilities;
  - The discussion with Mr. Jurg Bloesch, President of the IAD, in view of the collaboration regarding the SEDAN Project.

- **Thessaloniki – Greece Workshop; 18 – 23 October 2004, where the delegates have attended:**

  - The report on the experience that UNESCO, UNEP UNECE gained in the field of integrated management of transboundary rivers and lakes in the area.
  - The setting up of UNESCO/INWEB databases and the inventorying of surface waters in the South-Eastern and Eastern Europe.
  - The identification of key issues for sustainable transboundary water management from South-Eastern and Eastern Europe and the identification of transboundary areas where conflicts regarding water may appear.

- **Venice - Italy, 25 – 26 November 2004, International Conference SedNet "The Future of the Sedimentation Management in Europe" in order to present:**
  - The Romania's preoccupation for the monitoring of sedimentation processes;
  - The paper: "The Perspectives of Sediment Monitoring Development in Romania"

1.7. Other activities at regional level

1.7.1. Institutional relations/co-operation

There are not put in force. There will be developed bilateral co-operation with Bulgaria, Ukraine, Moldova, Hungary.

1.7.2. Completed and ongoing scientific projects

2. FUTURE ACTIVITIES

2.1. Activities planned until December 2007

- Meetings to analyze the activities of the IHP Romanian National Committee.

2.2. Activities foreseen for 2008-2009

-

2.3. Activities envisaged in the long term

- Proposals for the VIIth faze of the PHI Programme
    - Theme 1: Global Change, Watershed and Aquifers:
        - Water rivers flow evolutions caused by extreme variations of precipitation, water frost or karsts.
        - Methodology of design flood hydrograph calculus under natural and human activities modified conditions.
        - Regional modeling of the maximum discharge, with different durations and mean return periods.
        - Droughts in a global climate change context.
        - Impact of variability and change climate upon monthly water resources using a balance hydrological model.
        - Contribution of the snow cover to runoff in the variability and change climate context.
    - Theme 2: Governance and Socio-economics:
        - Efficient water using and pricing. Management of demands. Water – production function.
    - Theme 3: Water and environmental management:
        - Ecological rehabilitation and reconstruction of water bodies.
        - Food monitoring and forecasting in urban area.

Water resources to assure the water demands for big cities and increasing the water quality down stream.

National Committee of Russia for the International Hydrological Programme of UNESCO

Report of the Russian National Committee for the IHP to the XVIIth Session of the Inter-governmental Council for the IHP of UNESCO (June 2006)

Moscow – St Petersburg
2006

Contents

Introduction

The present report is prepared at the State Hydrological Institute on the basis of materials received from the following agencies and organizations:

- Federal Service for Hydrometeorology and Environmental Monitoring (ROSHYDROMET)
- Russian Agency on Water Resources (RosVodResursy)
- State Hydrological Institute
- Moscow State University
- Institute of Geography of the Russian Academy of Sciences (RAS)
- Russian State Hydrometeorological University
- Institute of Water Problems of the Russian Academy of Sciences (RAS)
- Institute of Water and Ecological Problems of the Siberian Branch of the Russian Academy of Sciences (SB of the RAS)
- Hydroproject "Russian Joint-Stock Company", Energy System of Russia
- State Oceanographic Institute
- Altai State Technical University
- North-Caucasus Administration for Hydrometeorological Service.

The Report is prepared according to the structure, format and volume, developed at the UNESCO IHP Secretariat.

1. ACTIVITIES OF THE RUSSIAN NC FOR THE IHP UNDERTAKEN IN THE PERIOD SEPTEMBER 2004 – JUNE 2006

1.1 Meetings of the IHP National Committee of Russia

1.1.1 Decisions regarding the composition of the IHP NC of Russia

The NC of Russia exists since the time when International Hydrological Programmes of IHD/IHP were launched by UNESCO; the personal composition of the NC, however, was renewed periodically. The present NC composition was nominated by a decision of the Russian Government in 2003; moreover, the governing body of the renewed composition of the NC under the chairmanship of A.V. Frolov Deputy Chief of ROSHYDROMET was adopted. Academician V.M. Kotliakov, Director of the Institute of Geography of the Russian Academy of Sciences (IG of RAS) and Professor I.A. Shiklomanov, Director of the State Hydrological Institute (SHI) were nominated as Vice-Chairmen. Besides, it is assumed that a representative of the Russian Agency on Water Resources (RosVodResursy) would be a Vice-Chairman; at present, this function is performed by S.S. Koskin, Chief of the Administration of RosVodResursy.

The personal composition of the NC is usually proposed by the Chairman and Vice-Chairmen and then it is adopted at the meeting of the NC. At present, it consists of 26 members; scientists and specialists well-known not only in Russia but in the world are among the members of the Committee, as well as representatives of different ministries, agencies and organizations greatly contributing to hydrometeorology, water resources, water management, education and training. O.V. Gorelits, Cand. Geogr. Sci., Senior Scientist from the State Oceanographic Institute (SOI) of ROSHYDROMET was nominated as the Scientific Secretary of the NC.

During the period September 2004 – June 2006 three meetings of the NC were held; current problems and perspective plans within the framework of the VIth and VIIth IHP phases were discussed; results of the most important projects in hydrology and water management were considered; a general strategy of the NC was developed on key problems of the international cooperation in the above fields. New NC members were adopted at the meetings.

1.1.2 Status of IHP-VI activities

Different aspects of the Russian contributions to the IHP-VI projects are always discussed at the NC meetings. A necessity and importance of research to be made within the framework of the IHP-VI projects at the national level are emphasized, which is a specific feature of this programme. The NC members decided to take the account of the main aspects of activities noted in the IHP-VI during a development of the current themes for scientific and technical studies and works of the leading hydrological and water management organizations in Russia as the first-priority problems.

A particular emphasis was focused on a necessity of active participation of Russian scientists and specialists in the implementation of the following very important IHP-VI Themes where it is possible to obtain the results of a great scientific and applied importance not only for the territory of Russia but on the global scale.

Theme 1. “Global Changes and Water Resources”
Theme 2.1. “Extreme Events on Land and Water Resources Control”
Theme 2.2. “International River Basins and Subsurface Water Storage”
Theme 2.3. “Endorheic Basins”
Theme 5. “Education and Training”.

Within Themes 1 and 2.1, it was emphasized, for example, that it was important to work on the assessment of current and future changes in water resources and hydrological regime over the whole territory of Russia, including extreme hydrological events under the conditions of variable climate and socio-economic situation in Russia. A necessity was noted to proceed studies on the global assessment of water resources and water use, on water storage accumulated in ice and snow cover and on the dynamics of glaciers in the world, where Russian scientists have a traditionally great experience and greatly contribute to these problems solution.

Problems on Theme 2.2 on international river basins are also very important for Russia because of the USSR disintegration and formation of many countries along the boundaries of Russia. Much work on this problem is done by the specialists from the Russian Agency on Water Resources and institutions of ROSHYDROMET on the monitoring of the international water bodies and assessment of transboundary water flow and transportation of pollutants.

Studies on Theme 2.3 “Endorheic Basins” are traditionally made in Russia on the problem of the Caspian Sea drainage area, the largest and most densely populated and most economically developed endorheic region in the world. The Caspian Sea is of a great importance not only for Russia but for the five countries along its coast (Russia, Azerbaijan, Iran, Kazakhstan, Turkmenistan). A wide range of water level fluctuations in the sea explained by climate factors and human activities within its drainage area greatly affect economics, ecology and social conditions of the countries situated along the Caspian coast; a comprehensive study of these processes is an extremely important scientific and technical problem in which specialists in hydrometeorology play the first fiddle.

At one of the meetings of the NC of Russia for the IHP a problem was discussed on a necessity of a more active participation of Russian scientists in Theme 5, “Education and Training”. For example, a possibility and expediency of renewal of the UNESCO International Hydrological Courses at the Moscow State University (MSU) as an important link in the system of hydrological education, improvement of qualification and exchange of information within the framework of the main Themes of the current IHP-VI and outlined IHP-VII phases was discussed. It was proposed at the meeting to organize these Courses at the base of the Russian State Hydrometeorological University (RSHMU) in St Petersburg. Prof. L.N. Karlin, Rector of the RSHMU suggested to consult and coordinate this problem with the MSU and Commission of Russia for UNESCO.

During 2004-2005 at the meetings of the Russian NC much emphasis was focused on a preparation, organization and discussion of the results of the VIth All-Russia Hydrological Congress held in St Petersburg during 28 September – 1 October 2004. It was the most important event for all Russian hydrologists which was held in accordance with the decision of the Russian Government. The State Hydrological Institute was responsible for the preparation and organization of the Congress.

The NC members took an active part in the work of the Congress and in the discussions of its results. A special meeting of the NC was held in St Petersburg during the Congress. At the meeting, a great work of the Organizing Committee on the preparation and organization of the Congress was noted. The NC members took an active part in the preparation of the proposals to the draft decisions of the VIth All-Russia Hydrological Congress.

The NC prepared proposals on the participation of Russia in the competition on the UNESCO Programme of Support for 2005. The inquired funds were to be spent for the organization of an “International Round Table on transboundary hydrological problems, including water quality, with a participation of leading scientists from Newly Independent States (NIS) and Baltic countries from the former USSR within the framework of the VIth All-Russia Hydrological Congress”. As a result of the work done by the NC on the UNESCO Programme of Support, a financial support was received for a preparation and translation of a special volume of selected papers presented at the VIth All-Russia Hydrological Congress (in Russian and English). The papers selected in this volume for a publication should demonstrate in full the present level and achievements of the Russian hydrological science. At present, the proceedings of the Congress are being prepared at the SHI, including the volume of Selected papers in English. It is proposed to complete the work by the end of 2006.

The NC members participate in the discussion of current problems on interrelations among different hydrological educational, research, design and water management institutions. For example, at one of the meetings of the NC, a detailed discussion took place on a possible cooperation with other Committees and Commissions of UNESCO within the “Amur Green Belt” Project.

A.V. Frolov, the Chairman of the NC for the IHP, forwarded proposals to the Russian Commission for UNESCO on the draft Programme and budget of the NC of Russia for 2006-2007 on the items related with the International Hydrological Programme.

1.1.3 Decisions regarding contribution to/participation in IHP-VII

The problems of the IHP-VII formation in UNESCO were discussed at the Russian NC meetings repeatedly. In fact, the preparation of the IHP-VII began in advance, in 2003. To this end, the Secretariat organized a special International group on a preparation of the programme. The IHP Secretariat disseminated basic requirements for the programme among IHP National Committees based on the decisions of the UN Conference in Johannesburg in 2002 and requested the NCs to send their considerations about the new programme.

The NC of Russia fully supported the idea that the basic trends in the UNESCO activities within the IHP-VII should primarily stimulate the solutions of those problems which are presented in the “Implementation Plan” adopted at the Summit on the Sustainable Development in Johannesburg in 2002.

Proceeding from a rich experience of the Russian hydrologists in the studies and generalization of water resources data on regional and global scales, the NC of Russia proposed to include the following two problems into the programme of work which directly reflect water aspects in the above Plan:

- To do a complex of works on a reliable assessment of renewable water resources for each country in the world (surface and subsurface water resources, including water suitable for drinking water supply).
- To make a detailed analysis of the efficiency of fresh water use in each sector of economics, primarily in the countries within the regions of water shortage.

In the proposals of the NC of Russia, a necessity was substantiated to solve the above problems and to formulate particular objectives which might be implemented by groups of experienced international experts in a close cooperation with other NCs for the IHP and UNESCO Secretariat.

On the basis of the proposals received from different countries, the International group on the preparation of the programme prepared the first variant of the IHP-VII Concept in which four general directions were suggested as a basis, i.e. ***global change, management and socio-economic problems, ecological control and water quality – health – food safety.***

Four themes have been formulated for the implementation of these directions:
Theme 1 – Global change, watershed divides and aquifers
Theme 2 – Management and socio-economic problems
Theme 3 – Ecohydrology and ecological sustainability
Theme 4 – Water quality, health and food safety.

The Concept contains a generalized strategy and plan for the IHP-VII implementation, in which each Theme is subdivided into 4 key areas considering particular aspects of the Theme.

After a preliminary discussion of the Concept at the session of the Inter-governmental Council in September 2004, it was adopted as a whole; but it was advised to the NCs for the IHP to send their proposals and comments once again to improve the Concept. At present, such proposals of the NC of Russia are being prepared. For example, many NC members, after a careful consideration of the Concept, strategy and IHP-VII plan, are a little anxious about its content.

Moreover, it is noted that all the Themes and key areas of the IHP-VII are of a great socio-economic and ecological importance, but most of them are apart from the proper scientific hydrology.

Out of the four proposed IHP-VII Themes, only one Theme (Theme 1) is purely hydrological, but it concerns only global aspects of hydrology. All the other Themes and key areas refer to socio-economic and ecological aspects of hydrology which are traditionally considered by many other governmental and non-governmental international organizations, e.g., UNEP, FAO, etc. Meanwhile, there are many unsolved problems, which are to be solved, that is why the UNESCO International Hydrological Programme was developed.

If scientific hydrology is not properly reflected in the IHP-VII, an illusion may be produced (under UNESCO authority), that all hydrological events and processes are well studied and the problem is how to apply the available knowledge correctly.

It is highly desirable to avoid this wrong understanding, and the IHP-VII is to involve not only important socio-economic and ecological aspects but current problems of scientific hydrology.

The Concept and the IHP-VII Plan will be discussed repeatedly at different meeting, namely, at the next session of the Inter-governmental Council for the IHP in July 2006, at which main proposals and comments may be considered.

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

The most important event undertaken under the auspices of the NC of Russia for the IHP in the period September 2004 – June 2006 was the organization of the VIth All-Russia Hydrological Congress held during 28 September – 1 October 2004 in St Petersburg.

Traditionally, hydrological congresses in Russia (USSR) are of an extremely great importance for a development of national hydrology and water management.

The 1st Congress was held in 1922, several years after the organization of the SHI (1919), as the leading institute in the country in hydrology of land; the SHI was the initiator of the first congress and of the other congresses, too.

At each Congress the major emphasis was focused on the problems which would meet the most reasonable demands for a development of hydrology and water management, provision of population and developing economics with hydrological information, solution of most important ecological problems.

All Congresses were held in St Petersburg (Leningrad) and were organized by the SHI. The previous Vth Congress was held in 1986, about 20 years ago.

After 1986, very serious changes took place in the territory of Russia; firstly, in the climate system at the global and regional levels, and, secondly, in socio-political and socio-economic spheres. These two circumstances greatly affected the condition of water resources and regimes of water bodies, situation with the hydrological network and hydrological science in the country, water management and fresh water use. The same situation was observed in the countries of the former Soviet Union. All these factors were the main prerequisite to organize the VIth All-Russia Hydrological Congress with invitation of scientists and specialists from NIS. The organization of the Congress was supported by UNESCO, WMO, IAHS and other international organizations associated with water.

According to a decision of the Government of Russia, A.I. Bedritsky, Chief of ROSHYDROMET, was nominated as the Chairman of the Organizing Committee; the Programme Committee was headed by Prof. I.A. Shiklomanov, Director of the SHI, Vice-Chairman of the NC for the IHP.

750 claims for a participation in the Congress were received from scientists and specialists, including 100 claims from NIS. After editing, all the accepted abstracts of papers were published; 670 abstracts of papers in 7 separate issues (abstracts of plenary papers and papers at six sections) were published. All the abstracts were also available on CD and were widely distributed.

545 participants took part in the Congress, out of which 62 specialists from NIS and other countries. About 500 papers were presented at the plenary session, at six sections (oral presentations and posters) and at two round tables.

The main results and conclusions, which were presented and discussed at the Congress, involved the following problems, most of which directly corresponded to the UNESCO IHP purposes and objectives:

- water resources and water management problems of Russia at present and for the future;
- dangerous hydrological events, floods and inundations in particular;
- system of hydrological observations; problems of collection and generalization of information, delivery of information to the users;
- runoff formation and computation, hydrophysical events and processes;
- ecology of water bodies; protection of water bodies against pollution and depletion;
- studies of lakes, reservoirs and river mouths;
- studies and monitoring of channel processes, erosion and sediment yield;
- transboundary hydrological problems;
- education and training in hydrology.

All these problems were discussed at the Plenary sessions, at sections and round tables, where particular decisions were made on a development of strategy, proposals and projects on support and development of the national hydrological science and practice on the basis of the results of the performed investigations and consolidation of the scientific, technical and production potential available in the country. It was decided at the Congress that all the papers presented at the Congress would be published in 7 volumes; besides, by the end of the current year, it is outlined to prepare a volume of selected papers in English and to submit it to the UNESCO Secretariat for publication in the next IHP issues.

Besides the organization of the VIth All-Russia Hydrological Congress, the NC of Russia organized the following national scientific and technical events (during September 2004 – June 2006) in the field of hydrology, water resources and water management:

- Workshop “State-of-the-art and perspectives for a development of the system of hydrological observations and provision of users with information in the light of the decisions of the VIth All-Russia Hydrological Congress” (Valdai Branch of the SHI, Valdai, June, 2005).
- Conference “Fundamental problems of studies and use of water and water resources”, Irkutsk, 20-24 September 2005.
- Conference “Hydropower generation, new problems and technologies”, St Petersburg, December, 2005.
- Workshop “Water conservation zones. Experience in practical use and reasonable development”. Supported by the Federal Agency on Water Resources, 18 April, 2006, Moscow.

1.2.2 Participation in IHP Steering Committees/Working Groups

At the 16th session of the Inter-governmental Council for the IHP (September, 2004) Prof. I.A. Shiklomanov, a representative of the NC of Russia was elected a member of the Governing Board of the UNESCO – IHE Institute for Water Education.

In December 2005, Prof. I.A. Shiklomanov attended a meeting of the Governing Board which was held in Delft (The Netherlands). The Work Plan and Budget of UNESCO – IHE for 2006 as well as the Contents of the Academic Plan and other current problems of the IHE activities were discussed. Several post-graduate students from different countries made brief reports about their research activities for the members of the Board, which stirred up a lively interest in the listeners.

1.2.3 Research/applied projects supported or sponsored by the NC

During the recent years a number of national scientific and technical projects in hydrology and water resources are being developed in Russia, which are supported by the NC of Russia and fully agree with purposes and objectives of the IHP-VI. Among these projects, the following should be noted which are implemented by different agencies and organizations and covering the whole territory of the country or its vast physiographic and economic regions:

- Implementation of the national subprogramme "Water Resources and Water Bodies 2002-2010"; Responsible Agency – Russian Agency for Water Resources. Within the framework of the Subprogramme different projects are to be made to satisfy the demands of economics and population in water, to raise the technical level, to provide safe water management systems and hydraulic structures operation, and to reduce damage of water impact. A great interest taken in this Subprogramme is confirmed by the fact that the State funds transferred to water management and water conservation projects increased in more than two times during the last 5 years. For example, within the framework of this Subprogramme there are projects on a development of schemes for a multipurpose use and conservation of water resources of Russia, aimed at an optimization of planning water projects and higher efficiency of the investments (contribution to Theme 1, IHP-VI).

- Multipurpose projects implemented by the organizations within the RosVodResursy on a development of outlook, principles and practice for a more effective management of water resources and water ecosystems in transboundary river basins. There are 70 large and mid-sized transboundary rivers in Russia (Theme 2.2, IHP-VI). During 2004-2006 much work has been done in the field of cooperation of Russia and the Ukraine, Estonia, Kazakhstan, Finland, Mongolia, Azerbaijan, China, and Russia-Belarus-Latvia on joint use and conservation of water bodies.

- "Expected changes in water resources and hydrological regimes within river basins and Subjects of the Russian Federation for the period before 2010-2015 under the conditions of the global warming and assessment of possible socio-economic results". The project was implemented at the SHI in 2005 and the results were submitted to ROSHYDROMET; the project was considered as a contribution to Themes 1 and 2.1 of IHP-VI. The results of the studies discovered regions in Russia where expected changes in climate and hydrological regimes may be most unfavourable; preliminary proposals and recommendations have been developed on prevention, adaptation and mitigation of negative effects.

- Preparation of the monograph "Water Resources of Russia and Their Use". The Project is under development by the scientists from the SHI and other organizations of ROSHYDROMET and RosVodResursy; it is to be over at the end of 2007. The Project is a contribution to Theme 1. IHP-VI.

- Project on the study of the current dynamics of glaciation, maximum snow storage and principles of glacier runoff formation; it is to be implemented by the IG of RAS within the framework of Theme 1. IHP-VI for the islands of the Russian Arctic region, mountain glaciers in the Urals, Caucasus, Pamir and Tien Shan.

The studies provided important research results on the condition of glaciers in the Russian Arctic region, on the dynamics of glaciers in mountains, on the maximum snow storage variations in Russia at the end of the XXth century obtained from the use of geoinformation methods.

- Within the framework of Theme 4. IHP-VI "Water and Society" an original "Hydromanager" Decision Support System (DSS) has been developed at the Altai State Technical University; the system is aimed at an economic optimization of quality control by means of a complex consideration of the state of the environment, socio-economic and legislative aspects for the conditions of Russia. This system is adapted to the requirements for the account of the environment expressed in the EC Water Directive and economic principles applied in the EC in relation to water resources management.

The applicacy of the system has been tested in the Neme river (Belgium) and in the Ob river (Russia).

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

First of all, practically all the NC members contribute to the WMO activities on the "Hydrology and Water Resources" Programme, as well as to IAHS projects. For example, Prof. I.A. Shiklomanov, Director of the SHI, is the Chairman of the Working Group on Hydrology for Asia (RA-II) and participates in the WMO Executive Committee every year. Prof. I.A. Shiklomanov is also one of the leading authors on the preparation of Chapter "Hydrology and Water Resources" for the 4th IPCC report and he attends the meetings on the preparation of this report every year.

Dr. J.A. Balonishnikova, Scientific Secretary of the SHI, is a WG member on the assessment of water resources of the WMO Commission for Hydrology and she attends the WG meetings. She is also a member of the IAHS/UNESCO young research group on the preparation of monograph "Hydrology 2020".

Prof. V.S. Vuglinsky, Deputy Director of the SHI, is a WG member on Hydrology of Europe (RA-VI) and WG member on "BALTEX" Project; he attends the meetings of these WGs.

Dr. Z.D. Kopaliani, Deputy Director of the SHI, is a member of the Steering Committee on International "GEWEX" Project and he attends the meeting of the Committee every year.

Prof. A.E. Asarin, a NC member, contributes to the work of the Technical Committee "Floods and Dams"/ICOLD (International Commission on Large Dams).

The members of the NC for the IHP greatly contribute to the editorial boards of international scientific journals:

- Prof. A.A. Tskhai is a co-editor of "Hydrological Environment" Journal (ISSN, 1738-8449);
- Prof. R.S. Chalov is a member of the editorial board of "International Journal of Sediment Research"
- Prof. I.A. Shiklomanov is a member of the editorial board of the international journal "Integrated Assessment".

The members of the Russian NC collaborate with many other international organizations, such as:

- International Association for Hydraulic Research (IAHR)
- International Geographic Union
- Association of Academies of Sciences of Asia
- Wetlands International
- NATO Research Programme
- International Commission of Geophysics Union on Water Sustainability.

1.2.5 Other initiatives

Since 2005, the NC of Russia for the IHP takes an active part in the preparation of a new UNEP/GEF project: "Climate change sound water management, water and ice conditions of large Arctic rivers including development of water management facilities adaptation strategy".

It is assumed that this project would be a continuation of the international UNEP project "Dialog on the strategy of climate change account in the water resources management and readiness to floods in the Lena river basin", which was successfully implemented during 2002-2003. The main goal of the project was to study the state of water resources and conditions of dangerous floods formation in the Lena river basin on the background of current and possible changes in climate to develop recommendations for the executive organs of Russia and Yakutia on the control of water resources and mitigation of negative effects caused by floods within the Lena river basin with the account of possible global climate warming.

A newly initiated project was preliminary supported by AMAP and UNEP/GEF; it is intended to expand research to other large river basins within the Arctic Ocean drainage area; the project duration would be three years (2007-2009); it is intended to include such important problems into the research programme as assessment of vulnerability of ecosystems and population in the Arctic zone under the conditions of climate change.

It is assumed that the main contributors to the project would be Russian scientists and specialists representing different agencies and institutions, i.e. ROSHYDROMET (SHI, AARI, MGO, SOI), RAS (IG, Zoological Institute, Institute of System Analysis), RosVodResursy, etc.

Investigations will be performed in close cooperation and participation of the WMO, AMAP, International Polar Year (IPY), International and national programmes on the studies of the Northern territories of Canada, Denmark and Greenland, Iceland, Norway, USA, Germany, etc.

At present, Russian and foreign specialists make their joint efforts to develop detailed proposals and programme of the project. During a preparation of the project, two international meetings were held. The last

meeting was held in 29-30 May 2006 in St Petersburg at the SHI. Ten scientific presentations on different problems of the Arctic region under the conditions of climate change were made and discussed at the meeting; it is intended to include these presentations into the programme of the initiated project. Responsible representatives from all Russian organizations planning to participate in the project attended the meeting; Dr. Lars Otto Reiersen Executive Secretary, AMAP; Dr. Arni Snorrason Chairman, Arctic-Hydra, and Dr Odd Rogne – AMAP, IPY IPO attended the meeting.

During the meeting, the text of the project was prepared in accordance with the requirements of UNEP/GEF; the work plan and a list of the responsible authors were determined.

Implementation of the initiated project, in the opinion of the NC of Russia for the IHP, would be a significant contribution to IHP-VI, to Themes 1 and 4 in particular.

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

At its meeting in 2005, the NC of Russia for the IHP discussed a problem of renewal UNESCO Higher International Courses in Russia, which were organized in Moscow at the Moscow State University during many years. There is a proposal of the Russian State Hydrometeorological University to organize similar courses in St Petersburg, where it is possible to collaborate with the scientists from the SHI and St Petersburg State University. At present, this problem is under consideration (see item 1.1.2 of the present report).

1.3.2 Organization of specific courses

Every year, according to the agreement with ROSHYDROMET, the State Hydrological Institute organizes advanced courses for the specialists in hydrology and water management on different hydrological problems; these courses are attended by hydrologists working in research institutes and at hydrological network of ROSHYDROMET and other agencies, as well as by specialists from universities, design institutions, ministries and companies.

For example, the following courses were arranged during period September 2004 – June 2006:

- Advanced courses for hydrologists “New system of hydrological computations for construction”. Set of Rules – SP 33-101-2003 “Determination of basic design hydrological characteristics” 4-8 November 2005, St Petersburg, SHI.
- Advanced courses for hydrologists “New system of hydrological computations for construction”. Preparation of “Territorial Construction Standards (TCS)” 26.06-07.07.2006, St Petersburg, SHI.

Besides, at the end of 2004, in Barnaul, an international educational workshop “Water Resources Management in Russia and in EC” was held at the Altai State Technical University; professors from Belgium, France and Russia and more than 100 students, post-graduate students and lectures attended the workshop.

1.3.3 Participation in IHP courses

During September 2004 – June 2006, representatives of Russia did not participate in the IHP courses. In fact, there are many opportunities to participate in the national courses and seminars organized in Russia. Many universities and research institutes, as well as technical secondary schools have great experience in training in hydrology (technicians, engineers, and specialists of higher qualifications, i.e. masters of degree and candidates of sciences). Technicians in hydrology are educated in hydrometeorological technical secondary schools and colleges; engineers and scientists in hydrology, as well as specialists of higher qualification get their education at the specialized Russian State Hydrometeorological University, in Moscow and St Petersburg State Universities, and in other universities in many cities of Russia.

For example, the RSHMU has several agreements on the exchange of students, probationers and training of post-graduate students from different countries. For instance, the agreements are carried out with the following universities:

- Dresden and Freiburg Universities; the students from these universities are engaged in practical work in the RSHMU;
- National universities of Cote d’Ivoire for training specialists of higher qualification on prediction of catastrophic hydrological events.

The RSHMU has students and post-graduate students from different countries, namely, from Estonia, Tajikistan, China, Cote d'Ivoire, Ethiopia, Jordan, Colombia. Theses of post-graduate students refer to different branches of hydrology, including those on the IHP-VI Themes (sedimentation, outstanding hydrological events, transboundary water bodies, etc.). Since 1 September 2006, a specialization "Catastrophic hydrometeorological events" will be introduced to curriculums of students for master's degree. For this purpose, detailed syllabi have been developed and a staff of lecturers has been invites.

Training of specialists of higher qualifications in hydrology (candidates and doctors of sciences) is also made in the leading research institutes of ROSHYDROMET and RAS (SHI, Hydrometeorological Centre of Russia, AARI, IWP of RAS, IG of RAS, etc.).

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

Prof. I.A. Shiklomanov, Vice-Chairman of the NC of Russia for the IHP, was elected a member of the Steering Committee of UNESCO – IHE Institute for Water Education (see item 1.2.2 of the present report). During a meeting of the Steering Committee, Prof. I.A. Shiklomanov and the Head of IHE initiated a cooperation between IHE and RSHMU on the exchange of experience and curriculums. At present, negotiations on these problems are in progress.

Prof. I.A. Shiklomanov got an invitation from Prof. K. Takeuchi, Director of the newly organized (in Japan) International centre of UNESCO ("Hydrological Hazards and Risks") to contribute to the work of the Centre as a member of the Consulting Board.

1.5 Publications

Monographs, sets of papers, text books and educational supplies

Monographs:

Buzin V.A. Ice jams and floods on rivers caused by ice jams. – St Petersburg, Gidrometeoizdat, 2004, 203 pp (in Russian).

Lurie P.M., Panov V.D., Tkachenko Yu.Yu. The Kuban river: hydrography and runoff regime. 2005 (in Russian).

Lurie P.M., Panov V.D., Ilyichev Yu.G., Salpagarov A.D. Snow cover and glaciers within the Kuban river basin. 2006 (in Russian).

Mikhailov V.N., Dobrovolsky A.D., Dobroliubov S.A. Hydrology. – Moscow, MSU Press. 2004 (in Russian).

Kumsiashvili G.P. Hydroecological potential of water resources. – Moscow, EBC "Akademkniga". 2005 (in Russian).

Surface and subsurface water resources and their use and quality (annual issue for 2004). – Moscow, 2005, 163 pp (in Russian).

Edelstein K.K. Hydrology of continents. – Moscow, Publishing House "Academia". 2005 (in Russian).

Kovalenko V.V. Partially infinite modeling: basis, examples, paradoxes. - St Petersburg, "Polytekhnik", 2005, 480 pp (in Russian).

Kovalenko V.V. Partially infinite mechanism of natural and social processes turbulization. - St Petersburg, RSHMU Press, 2006, 166 pp (in Russian).

Current problems of water resources assessment and water supply. – Moscow, Nauka, 2005, 318 pp (in Russian).

Bolgov M.V., Krasnozhon G.F., Liubushin A.A. Caspian Sea: extreme hydrological events. – Moscow, Nauka, 2006 (in Russian).

Mishon V.M., Bolgov M.V., Sentsova N.I. The Upper Don basin: hydrology, hydrography and water resources. – Voronezh, 2005 (in Russian).

Assessment of the effect of changes in the regime of land water on land ecosystems. – Ed. By N.M. Novikova. – Moscow, Nauka, 2005 (in Russian).

Mitina N.M. Geoecological studies of landscapes of sea shallow water zones. – Moscow, Nauka, 2005 (in Russian).

Sets of papers

Set of papers on hydrology No. 27. Ed. By V.S. Vuglinsky. - St Petersburg, Gidrometeoizdat, 2004, 163 pp (in Russian).

Materials of the scientific conference "Safety of hydraulic structures and prevention of harmful water effects during snowmelt and rainfall floods" (6-8 December, 2004). Piatigorsk, 2005, 205 pp (in Russian).

Hydroecology: theory and practice. Ed. By N.I. Alexeevsky. Problems of hydrology and hydroecology. Vol. 2. – Moscow, MSU Press, 2004 (in Russian).

Hydrology of the Danube delta. Ed. By V.N. Mikhailov. – Moscow, "GEOS", 2004 (in Russian).

Geography, society and environment. Vol. IV. Dynamics and interaction between atmosphere and hydrosphere. Ed. By N.I. Alexeevsky and S.A. Dobroliubov. – Moscow, "Gorodets" Publishing House, 2004 (in Russian).

Current global changes in the environment (in 2 volumes). Ed. by R.K. Klige. – Moscow, "Nauchny Mir". 2006 (in Russian).

Text books and educational supplies:

Alexeevsky N.I. Hydrophysics. Text book for Higher Educational Institutions. – Moscow, "Academia" Publishing Centre. 2006 (in Russian).

Doganovsky A.M., Malinin V.N. Hydrosphere of the Earth. - St Petersburg, Gidrometeoizdat, 2004, 630 pp (in Russian).

Pavlov A.N. Principles of ecological culture. - St Petersburg, Polytekhnik, 2004, 334 pp (in Russian).

Baryshnikov N.B. Dynamics of channel flows. - St Petersburg, RSHMU Press, 2005, 300 pp (in Russian).

Arseniev G.S. Principles of hydrological processes control: water resources. - St Petersburg, RSHMU Press, 2005, 231 pp (in Russian).

Kovalenko V.V., Viktorova N.V., Gaidukova E.V. Modeling of hydrological processes. - St Petersburg, RSHMU Press, 2006, 580 pp (in Russian).

Pavlov A.N. Hydrophysics (Text book for hydrometeorologists). - St Petersburg, RSHMU Press, 2006, 378 pp (in Russian).

Doganovsky A.M., Orlov V.G. Practical work on hydrology. - St Petersburg, RSHMU Press (in print) (in Russian).

Pavlov A.N. Ecological culture origin. - St Petersburg, RSHMU Press (in print) (in Russian).

Vinogradov Yu.B., Vinogradova T.A. Introduction to hydrology.
(Text book). - St Petersburg, State St Petersburg University Press, 2006 (in print) (in Russian).

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

During September 2004 – June 2006 the following meetings were organized:

- Workshop on INTAS coordination, Barnaul, 2004.
- International conference on water problems within the framework of the 9th international exhibition "Man, ecology, health", Barnaul, 2004.
- Fourth Russian-Iranian conference on agriculture and natural resources. Iran, Shahr-e-Kord, September, 2004.
- International meeting "Conference within the framework of the International Polar Year 2007-2008", St Petersburg, February, 2005.
- International Congress "Large rivers 2005", Section 2 – Major trends in international cooperation in hydrometeorology. – Nizhny Novgorod, 17-20 May, 2005.
- International meeting "Water quality and water resources control", St Petersburg, 16-18 June 2005.
- NATO International symposium "Extreme hydrological events: new concept on safety provision". Novosibirsk, July 2005.
- International workshop on the preparation of UNEP/GEF Project "Climate change sound water management, water and ice conditions of large Arctic rivers including development of water management facilities adaptation strategy", St Petersburg, 29-30 May 2006.
- International Congress "Large rivers, 2006". Nizhny Novgorod, 26-29 May 2006.

1.6.2 Participation in meetings abroad

The members of the Russian NC for the IHP participated in the following meetings abroad:

- British Hydrological Science International Conference. London Imperial College, 2004.
- IX International Symposium on River Sedimentation. October 2004, Yichang, China.
- International meeting "Development of recommendations on the use of satellite images for prediction and assessment of risks of floodplain flooding". Peking, China, March 2005.
- First International Regional Conference on CLiC Project in Asian Region. April 2005, Peking, China.
- 171st session of the Executive Council of UNESCO, Paris, France, 12-28 April 2005.
- Conference of the European Geophysical Union. Vienna, Austria, 24-28 April 2005.
- VIIth Scientific Assembly of IAHS, Foz-de-Iguacu, Brazil, 21-26 April 2005. Within the framework of the Assembly there was a meeting of the IAHS-UNESCO WG "Hydrology 2020" where the results were presented on the preparation of the monograph which is published now.
- International meeting on "Rapid Sea level change: a Caspian Perspective", 2005, Rashd, Iran.
- International Symposium "Ecology 2005", Burgas, Bulgaria, 13-17 June 2005.
- 15th Stockholm Water Symposium. Stockholm, Sweden, August 21-27, 2005.
- International meeting on "Environmental change and rational water use". 20 August – 3 September 2005, Buenos-Aires, Argentina.
- Russia-Taiwan Symposium "Water and Environmental Technology", Taipei, Taiwan, October 2005.
- Meeting of UNESCO on 521 Project "Black Sea – Mediterranean Sea corridor for the last 30 k.a.: water level change and adaptation of mankind". Istanbul, Turkey, 7-16 October 2005.
- Governing Board of the UNESCO-IHE. The Netherlands – Delft, 2 December 2005.
- Meeting on a preparation of the international scientific survey "Assessment of climate change in the Baltic region" within the framework of BALTEX Project. Warsaw, Poland, 8-9 December 2005.

1.7 Other activities at regional level

1.7.1 International relations/cooperation

Implementation of different projects, within the framework of the IHP-VI including, in cooperation with Russian Universities (faculties and chairs) and Universities from other countries is widely developed in Russia.

For instance, the following projects are under implementation with the State Moscow University:

- "Large European river system responses to global change and human activities – the Volga and Rhine rivers" (NOW – RFBR Project N 047. 014. 010). It was implemented by the MSU and Utrecht University, The Netherlands. The Project was implemented in 2005.
- "Changing flood dynamics and their impact on fish recruitment in large rivers (Volga, Russia)" It is under implementation by the MSU, by Wageningen University and Utrecht University. The Netherlands. The Project was initiated in 2005.

During September 2004-June 2006 the Russian State Hydrometeorological University made the following agreements with research institutions and universities:

- Joint studies of river and glacier runoff on Spitsbergen Island with the Arctic and Antarctic Research Institute (AARI) and Nansen Centre (Norway). An agreement with the University of Fairbanks on the hydrology of Arctic rivers (Chair of hydrology of land) is at the stage of being concluded.
- Colombia Hydrometeorological Centre (IDEAM) on the optimization of observation networks, forecasts of water inflow to the reservoirs with hydroelectric power plants. An agreement for a joint project on hydrology with the Ottawa University (Chair of hydrophysics and hydrological forecasts) is at the stage of being concluded.
- Peking Technical University (China) on channel processes and sedimentation (Chair of hydrometry).
- Joint programme with Norwegian Institute of sea studies on the organization of the international portal to provide monitoring in the shelf zones of oil deposits (Chair of hydrogeology and geodesy). Participation in the Russia-Lithuania Commission on the assessment of ecological sustainability of the Baltic Sea on the Kaliningrad shelf. Contribution to the joint monograph "Pure Water" (Chair of hydrogeology and geodesy jointly with the Chair of hydrogeology of the St Petersburg State University and Berkeley University (USA)).
- Negotiations are conducted with French Institute of Environmental Research (Paris). Late in 2005, a French delegation visited the RSHMU to discuss a possibility of joint works, exchange of students and probationers. Mutual interests are: water resources and their use, water quality, hydrological risks.

1.7.2 Completed and ongoing scientific projects

The following international projects should be noted:

- "Comparative analysis of the conditions for channel formation and channel forms display in large rivers of Russia and China (case studies of the Northern Dvina, Vychegda, Lena, Ob, Huang Ho, and Yangtze rivers)" (Grant RFFI-GFEN China, completed in 2005).
- "Conservation of wetlands and fauna species in the south of West Siberia". Grant of the government of The Netherlands. Russian-Dutch Project "PIN-MATRA SE 075". Implemented by the Institute of Water and Ecological Problems (IWEP SB of RAS).
- "The Rehabilitation of the Ecosystem and Bioproductivity of the Aral Sea under Conditions of Water Scarcity". INTAS-01-0511. Implemented by IWEP SB of RAS.
- "Informative facilities to control water quality in river basins based on economic and ecological considerations". INTAS-01-0768 Dsgjkyztncz with BD"G CJHEY/.
- INCO Project "International water resources control: to sustainable future of the Aral Sea basin"; implemented at the support of the European Commission and participation of the Hannover University, 2006-2008.

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2007

The following activities are planned:

- International conference on the problems of hydrometeorological safety (prediction and adaptation of the society to extreme climate changes). 26-29 September 2006, Moscow, ROSHYDROMET.

- International scientific conference “Extreme hydrological events in the Aral-Caspian Region”, to be supported by the International Association of Hydrological Sciences, Moscow, October 2006.
- IVth International conference “Ecological and hydrometeorological problems of large cities and industrial zones”, 25-27 October, 2006, St Petersburg, RSHMU.
- Preparation for the Tenth International Symposium on River Sediments “Impact of river sediments and channel processes on social, economic and ecological safety”, 1-4 August 2007, Moscow, MSU.
- International symposium “Floods. Risk of flood formation and strategy of control in extreme situations”. To be supported by the Federal Agency on Water Resources, Russian Academy of Sciences and ROSHYDROMET, October 2007, St Petersburg.
- Advanced course for hydrologists “Expertise of hydrological computations for construction, including preparation of technical regulations on hydrometeorological safety of structures”, 2007, St Petersburg, SHI.

2.2 Activities foreseen for 2008-2009

These activities will be considered at the meetings of the NC of Russia for the IHP in 2007, at the preparation of programmes on research in hydrology and water management in different agencies and organizations of Russia for 2008-2010.

2.3 Activities envisaged in the long term

It is assumed to organize the next VIIth All-Russia Hydrological Congress in 2010-2012.

Saudi Arabia

Ministry of Water and Electricity National Report for the 17th Session of IHP Intergovernmental Council (Paris 3-7 July 2006) UNESCO.

1.1 Meeting of the IHP National Committee

1.1.1 Decisions regarding the composition of the IHP National Committee.

The Existing formed IHP National Committee does not play its role perfectly. A new Saudi IHP National Committee will be formed shortly. The new Committee will include representatives from Several Governmental institutions, such as: Ministry of Water and Electricity research centers, universities, and Private Sector.

1.1.2 Status of IHP-VI activities.

The Saudi Ministry of Water and Electricity conducted several activities for the achievement of IHP –VI, particularly in the field of non- renewable groundwater management, water quality, sanitation, food security, and water analyses technology.

1.1.3 Decisions regarding contribution to/participation in IHP-VII

Currently, Saudi IHP National Committee does not contribute or participate in IHP–VII phase.

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

1.2.1 National/local scientific and technical meetings

There is no National or local scientific and technical meetings. A consultations and exchange of ideas in the fields related to water and climatic changes is taking place.

1.2.2 Participation in IHP Steering Committees/Working Groups.

Saudi IHP National Committee always participates in IHP steering committee or working groups.

1.2.3 Research/applied projects supported or sponsored.

The Saudi Ministry of Water and Electricity applies many research and supported many projects, especially in the filed of groundwater investigation and non-renewable water resources management.

1.2.4 Collaboration with other National and International Organizations and/or programmes.

A. Saudi Ministry of Water and Electricity and the World Bank have fully collaboration programme in the filed of water strategy integrated Water Resources Management, and action Plan for Water Conservation and rationalization.

B. Ongoing cooperation Programme between Saudi Ministry of Water and Electricity and United Nations Development Programme (UNDP) aiming for:
   - Determination of consumed groundwater quality for Agricultural purpose during last 20 years.
   - Capacity Building, social and environmental factors affected by agricultural income.
   - Establishment of cadastre (Date Base)
   -

C. Saudi Ministry of Water and Electricity is collaborating with World Water Council in the field of Water.

D. A collaboration program for training of trainees to transfer information about integrated water resources management to related Saudi institutions is currently executing between the Saudi Ministry of Water and Electricity and economic and social committee of western Asia (ESCWA)

E. Saudi Ministry of Water and Electricity have fully cooperation programs with National Universities and research centers.

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

1.5 Publications

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

1.6.2 Participation in meetings abroad

The Ministry of Water and Electricity participated in the Arab IHP meeting held in Damascus, Syria in 2005

1.7 Other activities at regional level

1.7.1 Institutional relations/cooperation

1.7.2 Completed and ongoing scientific projects

During last two years (2003 -2005) Saudi Ministry of Water and Electricity curries-out several scientific projects which realizing the objectives of IHP. These projects include but not limited to the following.

- Preparation of integrated water resources management strategy in collaboration with World Bank. Such strategy consist of three phases:

(A) Assessment of current situation of Water Resources (Completed)

(B) Evaluation of different water usages, its Economic and Social effects. Also the administrative and institutional regulations of water facilities assessment

considered one of the vital part of such phase. (Anticipated completion date is last of year 2006).

(C) The Action Plan which will be executed after the completion of phase A and B.

2. Updating of groundwater mathematical models of major aquifers.

3. Detailed water resources studies of non-sedimentary rock which known as (Arabian shield) and to depend on renewable water resources.

4. Study of Water potentials in basaltic and sub-basaltic aquifers

5. Preparation of comprehensive water system and development of needed regulations for its execution.

6. Preparation of studies and designs for treated wastewater reuse in different purposes, (domestic use is excluded)

7. Updating and development of hydrological and observation well network.

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2007

2.2 Activities foreseen for 2008-2009

2.3 Activities envisaged in the long term

NATIONAL REPORT OF THE SLOVAK REPUBLIC

1. Activities undertaken in the period September 2004 - June 2006

1.1 Meetings of the IHP National Committee

The Slovak Committee for Hydrology represents the Slovak NC IHP UNESCO. It was established in 1993 with the support of the Slovak Commission for UNESCO. The committee consists of the Executive Committee and the Plenum. The current business is handled by the secretariat associated with the Institute of Hydrology of the Slovak Academy of Sciences in Bratislava.
The Plenum meets once a year, usually in the first half of the year. The Executive Committee meets at need. There was 1 meeting of the Plenum and 2 meetings of the Executive Committee during the period under consideration.

1.1.1 Decisions regarding the composition of the IHP National Committee

There were few changes in the composition of the IHP National Committee during the period. The Plenum has 28 members and 9 of them form the Executive Committee. All the main research institutes, universities and ministries related to hydrology are represented in the committee.
The present composition of the IHP NC of Slovakia is as follows:

Executive Committee:

Chairman:
MIKLÁNEK Pavol, Institute of Hydrology, Slovak Academy of Sciences, Bratislava
Vice-chairman
SZOLGAY Ján, Slovak University of Technology, Bratislava
Scientific secretary
HALMOVÁ Dana, Institute of Hydrology, Slovak Academy of Sciences, Bratislava
Members
BRTKO Juraj, Water Research Institute, Bratislava
MAJERČÁKOVÁ Oľga, Slovak Hydrometeorological Institute, Bratislava
MATUŠKA Milan, Global Water Partnership, Bratislava
MINÁRIK Boris, Slovak Hydrometeorological Institute, Bratislava
PETROVIČ Pavel, retired
SUPEK Marián, Ministry of Environment of the Slovak Republic, Bratislava
Plenum:
ABAFFY Dušan, retired
BABIAKOVÁ Gabriela, Slovak Hydrometeorological Institute, Bratislava
BODIŠ Dušan, Geological Service of the Slovak Republic, Bratislava
ELIÁŠ Pavol, Slovak Agricultural University, Nitra
FENDEKOVÁ Miriam, Comenius University, Bratislava
HAMBEK Břetislav, retired
HLAVČOVÁ Kamila, Slovak University of Technology, Bratislava
HOLČÍK Vladimír, Water Engineering Construction, Bratislava
HOLKO Ladislav, Institute of Hydrology, Slovak Academy of Sciences, Bratislava
HOLUBOVÁ Katarína, Water Research Institute, Bratislava
LAPIN Milan, Comenius University, Bratislava
LICHNER Ľubomír, Institute of Hydrology, Slovak Academy of Sciences, Bratislava

NOVÁK Viliam, Institute of Hydrology, Slovak Academy of Sciences, Bratislava
PALKO Dušan, retired
PODKONICKÝ Ladislav, retired
RONČÁK Peter, Slovak Hydrometeorological Institute, Bratislava
ŠKULEC Štefan, Slovak Hydrometeorological Institute, Bratislava
ŠOLTÉSZ Andrej, Slovak University of Technology, Bratislava
ŠÚTOR Július, Institute of Hydrology, Slovak Academy of Sciences, Bratislava

1.1.2 Status of IHP-VI activities

The activities of the Slovak institutions were concentrated on the following IHP-VI projects:
CCPC Flow Regimes from International Experimental and Network Data (FRIEND)
2.1 Extreme events in land and water resources management
2.2 International river basins and aquifers
2.4 Methodologies for integrated river basin management
3.3 Land Habitat Hydrology – Mountains.

Pavol Miklánek was elected member of the *Theme Advisory Board* of the IHP UNESCO for Theme II representing the UNESCO Electoral group II.
Slovak representative Dr. Holko is the international coordinator of FRIEND Northern and Western Europe Working group 5 *Hydrological and biogeochemical processes in changing environment* since 1998.
Slovak representative Dr. Petrovič is the international coordinator of Water Balance of the Danube River Basin project of the Regional co-operation of the Danube countries in frame of IHP UNESCO (Focal Area 2.2 International river basins and aquifers).

Two international meetings were organised in 2005 in Slovakia:
Hydrological days 2005 conference (Hydrology for integrated management of water resources), 21–23 September 2005, Bratislava, Slovakia.
10th meeting of experts in snow hydrology 14–16 April 2005 in Liptovský Mikuláš, Slovakia. (Participants from Slovakia, Czech republic and Austria – 12 participants from 3 countries)

The Slovak NC participated in organisation of the following international conferences:
22nd Conference of Danubian countries on the hydrological forecasting and hydrological bases of water management. (National contribution to Focal Area 2.2 International river basins and aquifers.) Brno, Czech Republic, 2004.
International conference on hydrology of mountain environments. (National contribution to Focal Area 3.3 Land Habitat Hydrology - Mountains.) Berchtesgaden, Germany, 2004.
ERB conference 2004, Catchment hydrological and hydrobiogeochemical processes in changing environment, 13.10.2004, Torino, Italy.
23rd Conference of Danubian countries on the Hydrological Forecasting and Hydrological Bases of Water Management. (National contribution to Focal Area 2.2 International river basins and aquifers.) Beograd, Serbia, 2006.
ERB conference 2006, Uncertainties in the "monitoring-conceptualization-modelling" sequence of catchment research, Luxembourg, 2006.

1.1.3 Decisions regarding contribution to/participation in IHP-VII

The IHP National Committee welcomes the possibility to participate in IHP-VII. No specific decision was adopted with regard to IHP-VII till now.

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

1.2.1 National/local scientific and technical meetings

The 16th Conference of Young Slovak and Czech Hydrologists was organised in November 2004 in Bratislava and the conference proceedings were published. Following three papers were awarded:

Langhammer Jakub – Classification of changes of the water quality in Labe watershed.

Orfánus Tomáš, Balkovič Juraj – Generating of regional maps of soil retention properties using soil information system.

Sopková Mariana, Zakovičová Anna, Molnár Ľudovít – The evaluation of groundwater flow direction and quantification of amount of groundwater infiltrated to the Hron River in Sliač locality.

The 17th Conference of Young Slovak and Czech Hydrologists was organised in November 2005 in Bratislava and the conference proceedings were published. Following three papers were awarded:

Jan Kopp – Hydrographic analysis of drainage basin with GIS application.

Petr Máca – Short term runoff prediction in selected small watersheds.

Veronika Mitková – Transformation of the flood waves of the Danube River in Kienstock-Štúrovo reach.

1.2.2 Participation in IHP Steering Committees/Working Groups

Representatives of the NC took part at the 16th Intergovernmental Council of IHP UNESCO in Paris in 2004.

The Slovak NC is member of the Steering Committee of the CCPC FRIEND - Western and Northern Europe and Slovak experts participate in its Working Groups. Dr. Holko is the international coordinator of the WG 5 of the project since 1998.

Representatives of the NC took part at following FRIEND meetings:

NE FRIEND WG 5 meetings in Torino in 2004 and in Yundola in 2005.

FRIEND NWE WG 5 closely collaborates with the European Reference Basins (ERB) project including parallel meetings and common conferences. The Slovak NC participated in the ERB Steering Committee meeting and 10th ERB conference in Torino in 2004 and took part at the ERB Steering Committee meeting in Yundola in 2005.

The delegates of the committee participate regularly at the meetings of the NC representatives of the Danube countries and Slovak experts co-ordinate or actively participate in different projects within this regional co-operation. There were 2 meetings of the representatives and experts of the Danube countries during the period (2004 Brno, Czech Republic, 2005 Passau, Germany). The Slovak experts actively participated at the 22nd Hydrological conference of the Danubian countries in Brno in 2004.

1.2.3 Research/applied projects supported or sponsored

The Slovak IHP NC has no possibility to support or sponsor any research/applied projects, but it is supporting co-operation and participation in IHP UNESCO projects.

1.2.4 Collaboration with other national and international organizations/programmes

The Slovak Committee for Hydrology is a joint IHP/IAHS national committee, in fact. The national representative of IAHS prof. Szolgay is the vice-chairman of the committee and the IAHS national correspondents are members of the committee. The WMO OHP is also represented in the committee. Most of the activities within these three programmes are organised jointly.

The NC is collaborating also with other programmes like IGBP/BAHC, IAH, etc.

The representative of the Slovak NC is the international coordinator of the project 5.3 Update of the Danube water balance of the Regional co-operation of the Danube countries within the IHP. The project is agreed as a common interest project with the International Commission for Protection of the Danube River (ICPDR) in Vienna.

1.2.5 Other initiatives

Except the IHP projects, the IHP National Committee is traditionally organizing three national activities. The NC has its own library of UNESCO and other international publications that is used by the hydrological community; it is organizing the Conferences of Young Hydrologists and publishing series of SVH Publications (Publications of the Slovak Committee for Hydrology).

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

There was no contribution to IHP courses during the period of interest.

1.3.2 Organization of specific courses

The NC organised training seminar concerning GIS application in project “Basin Wide Water Balance of the Danube River Basin” within the Regional co-operation of the Danube countries in hydrology in framework of the IHP UNESCO, Bratislava, 10–11 December 2004, 21 trainees from 10 Danube countries.

1.3.3 Participation in IHP courses

Slovak professors were giving lectures and Slovak participants used to attend the IHP courses in Prague and Budapest. Unfortunately both courses were stopped due to financial reasons.

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

There is no specific cooperation between Slovak NC and UNESCO/IHE.

1.5 Publications

The Slovak NC is supporting publications in three main groups:
– SVH Publications (Publications of the Slovak Committee for Hydrology).
These are monographs summarizing results of the IHP projects. The series started in 1997 and six volumes were published till now. Unfortunately, none of them was published within the period of this report.

– UNESCO and IHP publications, mainly proceedings of international conferences.
Our experts took part in reviewing and preparation of following proceedings and reports:

Maraga, F., Arattano, M. (Eds.): *Progress in surface and subsurface water studies at plot and small basin scale.* Technical Documents in Hydrology 77, UNESCO, 2005. Proceedings of the 10th Conference of the European Network of Experimental and Representative Basins (ERB), Torino, Italy, 2004.

Herrmann, A. (Ed.): International conference on hydrology of mountain environments. Extended abstracts. Landschaftsökologie und Umwaltforschung, Heft 47, Braunschweig, 459 pp., 2004.

– Proceedings of the conferences organised in Slovakia related to IHP:

Hydrological Days 2005, CD Hydrology for integrated management of water resources, 21–23 September 2005, Bratislava, Slovakia.

Special volume of the Journal of Hydrology and Hydromechanics (*on experimental and representative catchments*), No. 2, Vol. 54, 2006, Bratislava, Slovakia, 2006.

Proceedings from 10th meeting of experts in snow hydrology, www.ih.savba.sk

Transport of water, chemicals and energy in the system soil-plant-atmosphere. Proceedings of the XIIth poster day. (IHP-VI project 2.4) CD ROM, UH SAV-GfU SAV, Bratislava, Slovakia, 2004.

Transport of water, chemicals and energy in the system soil-plant-atmosphere. Proceedings of the XIIIth poster day. (IHP-V project 2.4) CD ROM, GfU SAV-UH SAV, Bratislava, Slovakia, 2005.

16th Conference of the Young Hydrologists – Proceedings. CD ROM, SHMI, Bratislava, Slovakia, 2004.

17th Conference of the Young Hydrologists – Proceedings. CD ROM of Hydrological Days conference, SHMI, Bratislava, Slovakia, 2005.

Proceedings of the Jubilee colloquium of Prof. Milan DZUBÁK, prominent Slovak hydrologist. SHMI, Bratislava, Slovakia, May 2006.

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

Hydrological Days 2005 (Hydrology for integrated management of water resources), 21–23 September 2005, Bratislava, Slovakia.

10th meeting of experts in snow hydrology 14–16 April 2005 in Liptovský Mikuláš, Slovakia. (Participants from Slovakia, Czech republic and Austria).

Transport of water, chemicals and energy in the system soil-plant-atmosphere. XIIth poster day. (National contribution to IHP-VI Focal Area project 2.4 Methodologies for integrated river basin management.) Bratislava, Slovakia, 2004.

Transport of water, chemicals and energy in the system soil-plant-atmosphere. XIIIth poster day. (National contribution to IHP-VI Focal Area project 2.4 Methodologies for integrated river basin management.) Bratislava, Slovakia, 2005.

16th Conference of the Young Hydrologists. Bratislava, Slovakia, 2004.

17th Conference of the Young Hydrologists. Bratislava, Slovakia, 2005.

Working group meeting: *Climate variability and land cover change impact on flooding and low flows* within FA 2.1 Extreme events in land and water resources management, Bratislava, Slovakia, 2006.

1.6.2 Participation in meetings abroad

16th Session of the Intergovernmental Council of the IHP UNESCO, Paris, 2004: Miklánek, P., Halmová, D.

ERB (*European Network of Experimental and Representative Basins*) Steering Committee meeting, (Conference: *Catchment hydrological and hydrobiogeochemical processes in changing environment)*, Torino, 2004: Miklánek, P., Holko, L.

Xth ERB Conference and General Assembly, Torino, 2004: 4 papers and 6 participants.

NE FRIEND WG 5 meeting, Torino, 2004: Miklánek, P., Holko, L., Pekárová, P.

18th Working Session of the Danube countries representatives, Brno, 2004: Miklánek, P., Petrovič, P., Halmová, D., Poórová, J., Holubová, K.

22nd Hydrological conference of the Danubian countries, Brno, 2004: 20 papers and 25 participants.

International conference on *Hydrology of Mountain Environments* (FA 3.3 *Land Habitat Hydrology–Mountains*), Berchtesgaden, 2004. Miklánek, P., Holko, L., Kostka, Z.

ICPDR Ministerial conference, Vienna, 2004, Petrovič, P. (as observer on behalf of IHP UNESCO).
ERB (*European Network of Experimental and Representative Basins*) Steering Committee meeting, Yundola, October 2005: Miklánek, P., Holko, L.
NE FRIEND WG 5 meeting, Yundola, 2005: Miklánek, P., Holko, L.
19th Working Session of the Danube countries representatives, Passau, 2005: Miklánek, P., Petrovič, P., Halmová, D., Poórová, J., Holubová, K.
Working group meeting: *Climate variability and land cover change impact on flooding and low flows* within FA 2.1 Extreme events in land and water resources management, Vienna, 2005: Szolgay, J.

1.7 Other activities at a regional level

1.7.1 Institutional relations/co/operation

The Slovak IHP NC does not have institutional relations/co/operation at a regional level except the IHP UNESCO projects.
In capacity of the Chair Working Group of the collaborating Danubian IHP National Committees and the coordinator of the project *Water Balance of the Danube River Basin* the Slovak IHP NC collaborates with the International Commission for Protection of the Danube River (ICPDR) in Vienna.

1.7.2 Completed and ongoing scientific projects

The Slovak IHP NC does not organise or participate in any projects out of IHP UNESCO except the collaboration with ICPDR (see para 1.7.1) on project *Water Balance of the Danube River Basin*.

2. Future Activities

2.1 Activities foreseen until December 2007

The NC intends to continue in all the main ongoing activities mentioned in the report. Activities within the IHP projects and participation at the meetings depend on their working plans, but most of the activities will be oriented on following projects of IHP-VI:
CCPC FRIEND (Flow Regimes from International Experimental and Network Data)
CCPC HELP (Hydrology for the Environment, Life and Policy)
2.1 Extreme events in land and water resources management
2.2 International river basins and aquifers
2.4 Methodologies for integrated river basin management
3.3 Land habitat hydrology - Mountains

The individual activities, which are planned to be organised in the country, are following:
Szolgay, J.: Report to IAHS. In: Slovak National Report to International Union of Geodesy and Geophysics 2003 – 2006. Contributions to Geophysics and Geodesy, Special issue, 2007.
18th Conference of Young Hydrologists (joint activity with Czech NC). Bratislava, November 2006.
19th Conference of Young Hydrologists, (joint activity with Czech NC). Bratislava, November 2007.
Transport of water, chemicals and energy in the system soil-plant-atmosphere. XIVth poster day. (National contribution to IHP-VI Focal Area project 2.4 Methodologies for integrated river basin management.) Bratislava, November, 2006.
Transport of water, chemicals and energy in the system soil-plant-atmosphere. XVth poster day. (National contribution to IHP-VI Focal Area project 2.4 Methodologies for integrated river basin management.) Bratislava, autumn 2007.
Edition of next SVH Publications (1 per year).

2.2 Activities planned for 2008-2009

The continuation in all the main ongoing activities is foreseen (see para 2.1.). Their inclusion into the VII phase of IHP depends on final structure of the VII phase.

- Continuation in Regional co-operation of the Danube countries in hydrology.
- Participation at the regular hydrological Conference of the Danube countries in 2006.

- Continuation in organisation of the Poster days Transport of water, chemicals and energy in the system soil-plant-atmosphere.

- Participation in European Reference Basins project.
- Continuation of activities in mountain hydrology.
- Publication of case studies on hydrology of mountain basins.

CCPC FRIEND (Flow Regimes from International Experimental and Network Data)

- Collaboration and co-ordination of activities with other international programs and projects as European Reference Basins, and others.

CCPC HELP (Hydrology for the Environment, Life and Policy)

- Maintenance and promotion of research in experimental and representative basins.

2.3 Activities envisaged in the long term

Continuation in active participation in the IHP UNESCO. No specific activities planned at the moment.

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Our.ref.: 3/06
Ljubljana
15.06.2006

Report on the work of the Slovenian National Committee for IHP/UNESCO in 2005

The work in 2005 was marked by the regular work on the IHP programme, that is, work on development and maintenance of experimental basins: on the Dragonja River watershed, the Reka River, and urban experimental watersheds of the Gradaščica and Glinščica Rivers. The experimental watersheds took part in the IHP FRIEND program.

Next to the on-going co-operation of IHP countries, Prof. Mikoš and Ms. Šraj participated at the 19th Working Meeting of the Regional Hydrological Co-operation of the Danube Countries in Passau, Germany, 1–5 June 2005. Slovenia also participates in projects SEDAN and Basin-wide water balance of the Danube River Basin.

Some of the results of research on the experimental river basins were represented at the FRIEND-ERB conference "Forest impact on hydrological processes and soil erosion", 05–08 October 2005, Yundola, Bulgaria, and the conference on Urban River Rehabilitation, Dresden, 21–23 September, 2005.

The IHP Committee financially supported the 10th International Symposium on the Interactions Between Sediments and Water organised by IASWS in Bled, **August 28 - September 2, 2005** (www.icjt.org/iasws2005.). The conference was very successful with 183 participants from 35 countries.

RAPPORT NATIONAL SUR LES ACTIVITES DU PHI

1. ACTIVITES ENTREPRISES PENDANT LA PERIODE SEPTEMBRE 2004 - JUIN 2006

Consciente du rôle important du Programme Hydrologique International de l'UNESCO (PHI), la Tunisie a porté durant plus de trois décennies un grand intérêt à toutes les actions menées dans le cadre de ce programme.
Cet intérêt accru au PHI s'est traduit par une participation active d'hydrologues, hydrogéologues et scientifiques tunisiens à diverses manifestations.
Au cours des deux dernières années le Comité National tunisien a organisé et/ou a pris part à plusieurs manifestations scientifiques touchant à plusieurs aspects de l'hydrologie, l'hydrogéologie et de l'éco-hydrologie cadrant avec les différents objectifs, projets et sous-projets du PHI-VI. Nous passons en revue dans ce rapport 1'essentiel de ces activités.

1.1 Réunions du Comité National du PHI

En marge des diverses manifestations scientifiques auxquelles le Comité National tunisien du PHI a contribué, plusieurs réunions ont été tenues au sein de la Direction Générale des ressources en Eau- DGRE, point focal du Comité National pour le PHI,
essentiellement pour définir et mettre sur pied les programmes des diverses interventions ainsi que pour informer et commenter les différentes étapes du projet du PHI VII,

1.1.1 Décision sur la composition du Comité national du PHI

La composition du Comité national a subi des modifications au niveau de certains membres et elle se présente actuellement comme suit :

Nom/Prénom(s)	**Activité au sein du Comité**	**Spécialité**
HAMZA Mekki	Président	Sciences de l'eau
Ghorbel Abdelmajid	Membre, Secrétaire du CN	Hydrologie
Bouzaiane Slaheddine	Membre	Hydrologie
Saâdaoui Mustapha	Membre	Hydrologie
Khanfir Rachid	Membre	Hydrogéologie
Ben Baccar Brahim	Membre	Hydrogéologie
Abdelhedi Taoufik	Membre	Hydraulique
Mme Laâtiri Raqya	Membre	Génie rural
Hamdane Abdelkader	Membre	Génie rural
Djebeli Ali	Membre	Génie rural
Farhat Habib	Membre	Conservation Eaus et Sols
Gaâloul Noureddine	Membre	Siences et Techniques de l'Eau
Zouari Kamel	Membre	Géologie Isotopique
Mme Bargaoui Zoubeida	Membre	Hydrologie
Mme Bouhlila Rachida	Membre	Hydrogéochimie
Maâlel Khalifa	Membre	Hydraulique

1.1.2 Bilan des activités du PHI- VI

Dans le cadre des activités programmées dans la sixième phase du PHI, nous relevons les activités suivantes :

- La participation de Messieurs Gaaloul N et Oueslati M.N respectivement chercheur à l'INRGREF et hydrogéologue au commissariat régional de développement agricole de Nabeul, à un atelier organisé par l'Université de Çukurova – Adana (Turquie) du 31 janvier au 06 février 2005.

- Une attention particulière est portée au thème 3 : Hydrologie de l'habitat terrestre - axe d'étude « zones arides »

Les activités proposées dans cet axe d'étude :

Poursuite de l'étude de l'hydrologie des oueds, notamment la définition de la réalimentation d'origine humaine, l'amélioration de l'analyse des processus hydrologiques et de la modélisation dans les zones sèches, l'élaboration de l'évaluation et de la gestion intégrée des ressources en eau dans des conditions climatiques arides et semi-arides, y compris les ressources non renouvelables,

Etude de la qualité des eaux souterraines et maîtrise des sources de pollution.

Ces activités continuent à recevoir de la part du comité Tunisien du PHI une attention particulière traduite par une participation active à toutes les actions menées par la Direction Générale des Ressources dans le domaine des ressources en eau.

1.1.3 Décisions sur la contribution ou la participation au PHI-VII

Des commentaires et des propositions ont été faites sur le projet d'exposé conceptuel pour la septième phase du PHI. Le comité national tunisien pour le PHI, a exprimé son accord sur le titre du PHI VII et sur le principe que l'hydrologie des zones arides et semi-arides pourrait être conduite par l'un des centres régionaux, ainsi que son attachement particulier aux axes d'études suivants :

Axe d'étude I-1 : Forte dépendance à l'égard des eaux souterraines liée aux changement planétaire,

Axe d'étude II-2 : Bonne gouvernance, renforcement des capacités et participation des acteurs intéressés. Octroi des pouvoirs d'action aux ressources humaines,

Axe d'étude II-4 : Ressources en eau partagées et résolution des conflits en la matière/solution, assises sur la coopération ; évaluation sérieuse des ressources en eau communes,

Axe d'étude IV-3 : Ressources en eau non classiques : utilisation de l'eau saumâtre et recyclage des eaux usées.

1.2 Activités nationales dans le cadre du PHI

1.2.1 Réunions scientifiques et techniques au niveau national et local

A l'échelle nationale les membres du Comité tunisien ont pris part activement aux différentes commissions de suivi de cinq projets pilotes issus de l'Etude du secteur de 1'eau en Tunisie menée par le Gouvernement tunisien dans le cadre des études stratégiques des ressources naturelles du pays. Ces cinq projets pilotes sont: Optimisation des réseaux de suivi des ressources en eau, système d'information national des ressources en eau, outils d'aide à la décision, gestion participative pour la gestion des ressources en eau et recharge artificielle des nappes à partir des ressources en eau conventionnelles et des eaux usées traitées.

- Participation du comité aux différentes réunions relatives au système aquifère du Sahara Septentrionnal (SASS) des spécialistes des pays concernés (Tunisie, A1gérie et Libye) ainsi que des représentants de l'OSS (Observatoire du Sahara et du Sahel)

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- Dans le cadre des activités communes entre la Direction générale des Ressources en eau et l'Institut de Recherches pour le Développement (IRD France) et avec la coopération de plusieurs instituts de recherches et d'écoles d'ingénieurs en Tunisie (ENIT, INAT, ESIER) et l'appui financier du Secrétariat d'Etat à la recherche Scientifique, 1'exécution de la deuxième phase du projet de recherches portant sur la gestion intégrée des ressources en eau en milieu semi-aride a été entamée en 2002. Ce programme multidisciplinaire « Mergusie » est devenu un projet de coopération internationale entre des équipes de recherche tunisiennes et par le biais de l'IRD,des équipes françaises. Le bassin du Merguellil en Tunisie Centrale a été choisi pour mener cette action, il s'agit d'ailleurs du même bassin choisi comme bassin pilote dans le réseau de recherches sur 1'hydrologie des oueds « Wadi Hydrology ».
- Participation active à la célébration de la Journée mondiale de 1'eau au cours des années 2004, 2005 et 2006.
- Participation aux séminaires organisés à l'école supérieure d'ingénieurs de l'équipement rural ESIER en 2004 et 2005 sur la Medjerda
- Participation au Salon Méditerranée de l'Eau « HYDROMED » organisé annuellement à Tunis durant la deuxième semaine du mois de Mars en marge de la Journée Mondiale de l'Eau avec la collaboration de I'IME (institut Méditerranéen de 1'eau).

1.2.2 Participation à des comités directeurs ou groupes de travail du PHI

Organisation d'une réunion du groupe de travail Francophone d'Humidimétrie et des transferts en milieu poreux (GFHN), à l'école nationale des ingénieurs de Tunis (ENIT, novembre 2005) sur les milieux poreux et qualité des eaux.

Présentation de la candidature de Mme Bargaoui Zoubeida, membre du comité national du PHI, en tant que conseiller scientifique du comité sur l'Ecohydrologie (SAC) et acceptation de sa candidature par le Bureau du PHI

1.2.3 Projets de recherche de base ou appliquée, aidés ou patronnés

Le comité tunisien du PHI a participé aux projets de recherches suivants :

- Projet concernant le développement d'outils d'aide à la prévision hydrologique. Ce projet mené en partenariat entre l'Ecole Nationale d'Ingénieurs de Tunis(ENIT), l'Ecole Mohammedia d'Ingénieurs de Rabat (EMI) et l'Institut National de la Recherche Scientifique de Québec (INRS-ETE) a été financé par l'Agence Universitaire de la Francophonie (AUF)

- Projet de recherche avec l'Ecole Polytechnique Fédérale de Zurich (2002-2004) : Ce projet a pour objet de développer des outils de gestion et de modélisation quantitative et qualitative des nappes sahariennes du Sud tunisien.

- Projet de recherche avec le Centre de Recherche et des Techniques de l'Eau en Tunisie (2003-2006) : Ce projet consiste à faire des études géophysiques et géochimiques pour l'identification des nappes profondes des zones côtières du Sahet (Sfax-Sahel-Kairouan)

- Projet de recherche sur la dynamique fluviale de l'oued Medjerda en aval du barrage Sidi Salem: c'est un programme de recherche, entre la Direction Générale des Ressources en Eau et la Région Wallonne en Belgique, sur l'engraissement du lit de l'oued, ayant pour objet d'étudier les causes et les conséquences de ce phénomène et proposer les moyens utilisables pour y remédier afin de réduire l'accroissement des risques de débordement qui en résulte en période de crue.

- Projet *MERGUSIE :* C'est un Projet National lancé par le Secrétariat d'Etat de la Recherche Scientifique et de la Technologie (SERST) et le Ministère de l'Agriculture sur la gestion intégrée de 1'eau en Tunisie Centrale. Plusieurs institutions de recherche et de formation sont groupées pour mener a bien ce projet. Le projet MERGUSIE se propose d'analyser la gestion intégrée de 1'eau sur le bassin versant du Merguellil. Les objectifs du projet sont :

  - Optimisation de 1'affectation de la Ressource en eau

  - Elaboration et analyse des scénarios en cas de modifications intervenant sur le système en place

  - Propositions de recommandations sur les cadres institutionnels de gestion et sur la cohérence des interfaces entre les différents niveaux de décisions.

  - Contribution à l'émergence et à la consolidation d'un groupe de recherche pluridisciplinaire sur les problèmes de gestion de 1'eau ayant une capacité d'expertise reconnue. Le projet favorisera la participation d'étudiants de différentes institutions.

Ce projet est à sa deuxième phase dont la coordination est confiée à l'institut national d'agronomie de Tunisie (INAT). Les grandes actions de cette deuxième phase consistent à : approfondir les connaissances de la zone d'étude et les intégrer dans un système de base de données général assorti d'une représentation

géographique, poursuivre le développement de modèles sectoriels et mettre au point un modèle intégrateur de gestion de l'eau.

1.2.4 Collaboration avec d'autres organismes ou programmes nationaux ou internationaux

- Projet d'utilisation des isotopes dans l'évaluation des ressources en eau du système aquifère du Sahara Septentrionnal : Ce projet qui s'étale sur trois ans (2003-2005), contribue à une connaissance approfondie du système aquifère saharien par l'utilisation des techniques isotopiques en se basant sur les données collectées au cours du projet S.A.S.S. Les objectifs du projet :

  - L'évaluation de la contribution de la recharge actuelle à partir de l'Atlas Saharien,
  - La drainance et l'inter-connexion entre les aquifères du continental intercalaire et du complexe terminal,
  - L'approche de l'étude des exutoires par les études isotopiques.

Ce projet est financé et coordonné par l'Agence Internationale de l'Energie Atomique (AIEA). Il interesse trois pays maghrébins : Algérie, Tunisie et Lybie.

- Projet du système d'information des Ressources en Eau des pays de l'Afrique du Nord. Ce projet financé et coordonné par l'Organisation Africaine de Cartographie et de télédetection (OACT) , interesse les pays du Maghreb et l'Egypte.

- Projet de suivi de la qualité de l'eau de l'oued Medjerda à la station de Ghardimaou (enregistrement en continu des nitrates, nitrites, ammonium, phosphores, ph, température, oxygène dissous). Ce projet qui a été mené en 2000 par le CITET et la commission européenne, a été légué à la Direction Générale des Ressources en Eau pour faire le suivi et l'analyse des données.

1.2.5 Autres initiatives

Participation de deux ingénieurs tunisiens de la Direction Générale des Barrages et Travaux Hydrauliques à l'Atelier Régional, organisé en novembre 2005 à Rabat (MAROC) par l'IME , en collaboration avec EDF (France) sur la Conception et gestion durable des barrages en Méditerranée.

1.3 Cours d'éducation et de formation

Dans le cadre du projet d'investissement dans le secteur de l'eau (PISEAU) financé par la banque mondiale et l'Agence Française pour le développement, des séssions de formation ont été organisées :

- Irrigation avec les eaux non conventionnelles : à l'Institut National Agronomique de Tunisie (INAT)
- Etude d'impact environnemental des ouvrages hydrauliques

1.4 Coopération avec l'Institut UNESCO-IHE pour l'éducation relative à l'eau, et/ou avec d'autres centres internationaux/régionaux liés à l'eau, sous l'égide de l'UNESCO

1.5 Publications

Les documents concernant les différentes manifestations présentées ci-dessus ont été publiés, notamment :

- Dynamique fluviale de la Medjerda
  Analyse de la matière en suspension par différentes méthodes de mesure :
  filtration, jauge nucléaire et turbidité
  calcul du seuil de transport de la Medjerda par différents modèles

- Document sur les actes de la 18ème journée des ressources en eau sur le transport solide des oueds en Tunisie

- CD-ROM contenant les exposés et les postères présentés à l'occasion de la journée mondiale de l'eau de 2005.

1.6 Participation aux réunions scientifiques internationales

1.6.1 Réunions tenues dans le pays

- Colloque international ENIT, du 1 au 03 mars 2005, en cloture au projet de recherche sur les outils d'aide à la prévision hydrologique Le thème de ce colloque est : Variabilité climatique et changements climatiques, Prévision météorologique à courte échéance, Prévision Hydrologique, Gestion et risques associés.
  Les partenaires de ce Projet sont :ENIT, EMI, INRS-ETE et AUF
  Ce colloque a réuni des climatologues, météorologues, hydrologues, hydrauliciens et usagers des pays du Maghreb, d'Afrique de l'Ouest, de France et du Canada.

- Participation du Comité du PHI au séminaire organisé par l'Institut National de la Météorologie dans le cadre de la célébration de la journée mondiale de la météorologie - 23 mars 2006-

- Participation du Comité du PHI au séminaire organisé par la Direction Générale des Ressources en Eau à l'occasion de la célébration de la journée mondiale de l'eau, le 22 mars 2005, Intitulé: l'Eau et le numérique en prélude à la deuxième conférence, tenue en Tunisie du sommet mondial sur les Sciences de l'information (SMSI)
- Célébration de la journée mondiale de l'eau le 22 mars 2006, par un manifeste sur l'eau et la culture
- Participation du Comité du PHI au séminaire organisé par l'Institut National de Recherches en Génie Rural, Eaux et Forêts (INRGREF) dans le cadre de l'évaluation de l'avancement du projet Tunisio-Turque ''Mise en place d'un appui scientifique pour l'amélioration de la gestion des ressources en eau''à Yasmine Hammamet , Tunisie - 9 novembre 2005-

- Ouverture d'une formation d'Ingénieurs en Hydrométéorologie au Département Génie Civil de l'ENIT à partir de septembre 2005

1.6.2 Participation à des réunions à l'étranger

Participation à l'Atelier sur l'élaboration des plans nationaux de l'eau dans les pays du Maghreb à Rabat (Maroc)

Participation à la Conférence des Directeurs de l'eau dans le cadre du SEMIDE- partenariat Euro-Méditerranéen – Rome-

Participation à la troisième Conférence biennale sur les eaux internationales- Brésil-

Participation à la Réunion sur l'utilisation des isotopes dans l'évaluation des ressources en eau du système aquifère du Sahara Septentrionnal -Vienne-

Participation au Projet de l'Unesco ''minibibliothèque – Eau source de vie-'' pour les enfants des pays du Maghreb, Nouakchott (Mauritanie)

Participation à l'atelier sur la gestion des ressources en eau souterraines dans les pays arides et semi-arides, Caire (Egypte), Avril 2005

Participation à la 11ème session des comités nationaux arabes du PHI et à la réunion des groupes d'experts arabes du projet Cartographie, Blonden- Syrie septembre 2005

1.7 Autres activités au niveau régional

1.7.1 Coopération ou relations institutionnelles

Dans le cadre de la coopération bilatérale dans le domaine des échanges éducatifs et culturels entre le Gouvernement de la République Tunisienne et le Gouvernement de la République de Turquie, un projet a été établi entre l'Institut National de Recherches en Génie Rural, Eaux et Forêts (INRGREF) et l'Université de Çukurova – Adana (Turquie).

Ce projet de recherches a pour objet de mettre en place un appui scientifique destiné à l'amélioration de gestion des ressources en eau. Le thème retenu pour ce travail de recherche est : " Modélisation du système aquifère et du biseau salin et aide à la décision pour la gestion durable de l'eau au Cap Bon au Nord de la Tunisie ".

Les partenaires de ce Projet sont : DGRE et CRDA de Nabeul

1.7.2 Projets Scientifiques achevés ou en cours

Projet achevé: Système aquifère du Sahara Septentrionnal (SASS) entre la Lybie, la Tunisie et l'Algérie.

Projet en cours: Etude du Système aquifère de la Djeffara entre la Tunisie et la Lybie.

2 ACTIVITES FUTURES

2.1 Activités planifiées avant décembre 2007

- Elaboration d'un programme de recherche sur les bassins non jaugés par l'ENIT et en collaboration avec le comité national du PHI

- Organisation d'un atelier sur l'optimisation des réseaux de suivi des ressources en eau

2.2 Activités prévues pour la période 2008-2009

- Etude de l'impact des aménagements hydrauliques sur l'hydrologie des bassins situés en aval

- Suivi et analyse de l'engravement du lit de l'oued Medjerda en aval du barrage Sidi Salem

- Organisation d'un séminaire sur les valeurs extrêmes de pluie et débits (ENIT, mars 2008)

2.3 Activités envisagées à long terme

- Impact de la recharge sur les nappes d'eau souterraine (intrusion marine, mobilisation et rétablissement des équilibres des nappes)

- Travaux de recherche sur le Couplage des modèles de circulation générale (GCM) et modèles hydrologiques

- Suivi des changements morphologiques des lits des oueds en aval des barrages

TURKEY - NATIONAL REPORT ON IHP RELATED ACTIVITIES
September 2004 – June 2006

1. ACTIVITIES UNDERTAKEN IN THE PERIOD SEPTEMBER 2004 - JUNE 2006

1.1 Meetings of the IHP National Committee

During the related period, two meetings were organized on the dates of October 4th, 2005, and June 5th, 2006. It was decided that at least two meetings each year, with a 6-month period, should be organized.

1.1.1 Decisions regarding the composition of the IHP National Committee

Being the focal point for the IHP, The Office of International Hydrological Affairs in DSI has been upgraded by institutional status.

The National Committee IAHS-related Turkish National Hydrological Commission (TNHC) has been combined with the missions of Turkish Committee for the International Hydrological Program of UNESCO and the Operational Hydrological Program of WMO. In this respect, the IHP National Committee is consisting of the members who are responsible for the working groups in the IAHS system.

The composition of the Turkish IHP National Committee has been designed with a more nation-wide character through active membership of the other national organizations and NGO's.

1.1.2 Status of IHP-VI activities

The involvement in IHP-VI activities has been rather limited.

1.1.3 Decisions regarding contribution to / participation in IHP-VII

It has been decided that Turkish contribution to the seventh phase of the IHP should be improved. In this context, it is an idea that the preparatory process for the 5th World Water Forum would be included in the process of IHP-VII.

It is also concluded that, the next World Water Forum would better reflect the United Nations Millennium Development Goals and the priorities of the IHP-VII.

1.2 Activities at national level in the framework of the IHP

1.2.1 National / local scientific and technical meetings

The activities that would be considered as a part of the hydrological program carried out by different institutions in Turkey, in the period of 2004-2006, are:

INTERNATIONAL SYMPOSIUM ON "WATER FOR DEVELOPMENT" DSI
7-11 September 2005, Istanbul

A WORLD WATER DAY PANEL ON “THE EFFECT OF CLIMATE CHANGE ON WATER RESOURCES”
Water Foundation
22 Mart 2005

“INTERNATIONAL WORKSHOP ON APPLICATIONS OF WAVELETS TO REAL WORLD PROBLEMS”
17-18 July 2005
Istanbul Commercial University

SEMINAR ENTITLED “WHY CLIMATE CHANGE?”
Turkish Chamber of Engineers

SEMINAR ON “WATERSHED MODEL ON EUPHRATES AND TIGRIS AND ITS APPLICATIONS”

SYMPOSIUM ON “LEGISTRATIVE AND INSTITUTIONAL ASPECTS OF NATIONAL WATER MANAGEMENT”
21 Mart 2005

NATIONAL CONGRESS ON “WATER POLITICS”
21-22 Mart 2006

SECOND NATIONAL SYMPOSIUM ON “WATER ENGINEERING“
21-24.09.2005

SECOND NATIONAL SYMPOSUIM ON ISOTOP TECHNICS IN HYDROLOGY”
20-23.09.2005

SEMINAR ON HYDROMETRY
05-09.09.2005

SEMINAR ON ENGINEERING HYDROLOGY
12-21.09.2005, DSİ, Aydın

3rd INTERNATIONAL ADVANCED COURSE ON “WATER RESOURCES DATA ANALYSIS - Data Processing, Interpreting and Design”
11-20.07.2005

HYDROLOGY SEMINAR,
12-16.09.2005

INTERNATIONAL SYMPOSIUM ON WATER AND LAND MANAGEMENT FOR SUSTAINABLE IRRIGATED AGRICULTURE
4-8.04.2006

SEMINAR ON “WATER INFORMATION SYSTEM”
15.12.2005

1.2.2 Participation in IHP Steering Committees / Working groups

No information

1.2.3 Research/applied projects supported or sponsored

- Turkish National Programme On "Hydrometeorologic Disters"

1.2.4 Collaboration with other national and international organizations/programs

As for the international collaboration, Turkish National Hydrology Committee, over the past two years, has focused on the improvement of good relations between the neighboring countries in the framework various projects which are conducted at the regional level.

- EMWIS Network
- WOISYDES Project

1.2.5 Other initiatives

The celebration of World Day of Water: The celebration of World Day of Water, 22 March, is realized in Turkey with a series of activities carried out to increase public awareness of water in the country. In order to promote extensive public awareness in water use and the role of water for development, the day was a great opportunity to raise the discussion on this matter and make it known as much as possible.

Some brief information giving on the manner in which World Day of Water, 2006, with the theme of "Water and Culture" was celebrated by DSI is given in the following:

For this purpose, General Directorate of State Hydraulic Works (DSI) arranged a number of activities such as competition of composition, picture, Photo and placard, celebration of the day and exhibition display. Competition of picture and composition were arranged in national basis among the 8^{th} grade students of primary schools where as competition of placard was arranged in national basis and open for all. For the photo competition, there was restriction and only DSI staff competed.

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

Except from UNESCO sponsored International Post-Graduate Course on "the sediment technology", in which both the lectures on theory and experiments are given to the participators, there is no any other course organized in Turkey.

1.3.2 Organization of specific courses / seminars

The members of the hydrologic community in Turkey have organised some local cources the subject of operational hydrology. Most of them are related to the various hydrology-related practices including snow measurement, gauging of water level, project hydrology and hydrological evaluation of the major basins.

- COURSE ON DAM PLANNING AND DESIGN
  6-10.03.2006

- SEMINAR ON "DATA PROCESSING AND DESING IN HYDROLOGY"
  3-7.04.2006

- FLOOD ESTIMATION AND PLANNING COURSE
  8-12.05.2006

1.3.3 Participation in IHP courses

No information

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

A good relation has been established between the Turkish National Committee and UNESCO-IHE. With respect to the national contributions to IHE, official letters have been exchanged via the Turkish Ministry of Foreign Relations.

1.4 Publications

As for the official publications related to the observations and assessment of the data, DSI has published the yearbooks of the observed discharge data at the project sites. On the other hand, EIE has published the yearbooks of the observed data for water flows, water levels in the lakes and sedimentation.

- The role of Water Quality in Wetlands : two different wetlands sudy from western part of Turkey: Izmir Bird paradise and Kucuk Menderes River Wetland
- Monitoring of Performance a Hydrological Model to estimate annual water yield in a small watershed in Meric River Basin
- Future of the Integrated Water Supply System of İstanbul
- Benefits Obtained From Renovation of Ömerli Dam
- Reservoir Management Using Artificial Neural Networks

- A Comparison of Three Methods For The Prediction Of Future Stream Flow Data
- Improvement of Operation of Istanbul Water Supply System during 1989-1994 Dry Period
- Comparison of bed load formulae in hydraulic geometry using similarity principle
- Current level of water erosion problem and sediment control measures in Turkey
- The Causes of Floods in the Western Blacksea Region, Turkey
- Turkish Emergency Flood and Eartquake Recovery Project (TEFER)
- Southeastern Anatolia Project (GAP) in Turkey as a water resources management
- Seasonal rainfall Intensity and Frequency in Turkey
- Effects of North Atlantic Oscillation on precipitation and stream flow at Buyuk Menderes Basin
- Producing climate indices and climate change monitoring in the Middle East
- Hydrological Impacts of Thinning in a Deciduous Forest Ecosystem
- Soil Buffering System Against Acid Deposition in Belgrad Forest Ecosystems
- Variations of pH values of stream water in mature Oak-Beech forest ecosystems in Belgrad Forest near Istanbul Turkey
- Groundwater Pollution Originating From Geological Formation And an Example of Konya-Cumra-Karapınar Plain With GIS Application
- Probabilistic Assessment of Overtopping reliability of a dam Analysis of Dry Periods of Coruh River Basin
- Current level of surface and ground water observation network of Turkey
- Synthetic data-based meteorological drought modeling
- The effect of dense maritime traffic on the Bosphorus strait and Marmara sea pollution
- The effect of the Koprubasi mine on the groundwater contamination in Manisa, Turkey
- Analysis mediterranean precipitation associated with the North Atlantic Oscillation (NAO) Index via Hilbert-Huang Transformation
- Polution of the drinking water sources of istanbul City and the preventive measures : Buyuk Cekmece Lake Case Study

1.5 Participation in international scientific meetings

Various international scientific meetings were attended or organized by the related organizations and Universities.

1.5.1 Meetings hosted by the country

- INTERNATIONAL SYMPOSIUM ON “WATER FOR DEVELOPMENT” DSI

  7-11 September 2005, Istanbul

- EMWIS PROMOTION SEMINAR ON “WATER INFORMATION SYSTEM”

  15.12.2005

1.5.2 Participation in meetings abroad

- IHP Meeting of European Group, Wallingford, 5-6.07.2005, UK

1.6 Other activities at a regional level

1.6.1 Institutional relations / co-operation

The members of the Turkish hydrologic community are cooperated with many other institutions listed as following:

- IAEA, International Atomic Energy Agency
- IAH, International Association of Hydro-geologists
- IAHS, International Association of Hydrological Sciences
- TUBITAK, Scientific and Technical Research Council of Turkey
- UNESCO, Division of Water Sciences
- UNESCO, FRIEND

1.6.2 Completed and ongoing scientific projects

2 FUTURE ACTIVITIES

2.1 Activities planned until December 2006

- Improvement of functional capabilities of the Bureau of UNESCO/WMO related issues, established in Investigation and Planning Department of DSI in order to serve as focal point also for various international hydrological activities,
- Establishment of a regional training center (to be affiliated to DSI Research Department in Ankara) on "sediment technology, isotope and erosion", using the existing facilities available in DSI,

2.2 Activities foreseen for 2006-2007

- Organization of 5th National Congress of Hydrology, planned by Civil Engineering Department, METU (Middle East Technical University)
- Development of DSI's Water Information System
- Further involvement in FRIEND activities
- Course on hydrological modeling, by Istanbul Technical University, in collaboration with DSI and EIE,

2.3 Activities envisaged in the long term: In the long term, it is proposed to be more effective in finding a way that the national community, under the leadership of DSI, has a real impact on all hydrologic and water related activities in the country

UNITED KINGDOM
NATIONAL REPORT ON IHP RELATED ACTIVITIES

1. ACTIVITIES UNDERTAKEN IN THE PERIOD SEPTEMBER 2004 – JUNE 2006

1.1 Meetings of the IHP National Committee

1.1.1 Decisions regarding the composition of the IHP National Committee

Two meetings of the UK-IHP Committee were held during the reporting period: on 23 November 2004 and 17 January 2006, respectively.

Membership of the Committee has been revised and now includes UK-based representatives of key IHP programmes (FRIEND, HELP, G-WADI, and ISI). The Chairman of the UK National Commission for UNESCO (Prof Alec Boksenberg) and the UK Ambassador and Permanent Delegate to UNESCO (Timothy Craddock) are observers of the Committee. Membership is reviewed at every UK-IHP Committee meeting. Prof Alan Jenkins, Science Director (Water) at the Centre for Ecology and Hydrology (CEH), Wallingford, remains Chairman of the Committee; Gwyn Rees (CEH) continues as Secretary.

From 2006, the UK-IHP Committee will merge with the national Interdepartmental Committee on Hydrology. A new Terms of Reference for the Committee is being drafted. The next Committee meeting will be held at the end of 2006/start of 2007.

1.1.2 Status of IHP-VI activities

FRIEND

The UK continues to play a leading role in several regional FRIEND projects. In **Northern European FRIEND**, UK scientists have been particularly active in the "Low flows" and "Large-scale variations in hydrological characteristics" sub-projects. UK hydrologists contributed, as editors and co-authors, to several chapters of the new textbook, **"Hydrological Drought – Process and Estimation Methods for Streamflow and Groundwater"**(Eds. Tallaksen, L. & Van Lanen, H., Development in Water Science, 48, Elsevier Science B.V., 579 pp, 2004), with input on operational aspects provided by water resources managers from the Environment Agency of England and Wales. The UK was also instrumental in the establishment of the **European Drought Centre**, a new virtual knowledge centre to coordinate drought-related research in Europe (**www.geo.uio.no/edc**) evolving from the Low Flows group. As coordinator of the "Large-scale variations…" sub-project, Dr. David Hannah (University of Birmingham), has supported, and contributed to, research into such topics regionalisation/ interpolation methods, improving understanding of climate-hydrology links and process interactions, and developing and applying hydrological models at the large (up to global)-scale.

UK support to the **HKH FRIEND** project over the reporting period has been provided through two DFID-funded projects led by CEH: Climate and Sea-level change in the Indian sub-continent (CLASIC, 2003 – date); and Snow and Glacier Aspects of Water Resources management in the Himalayas (SAGARMATHA, 2001 – 2004), to assess potential impacts of climate change on glacier-fed water resources. The UK contribution to **Southern Africa FRIEND**, meanwhile, has primarily been through CEH involvement in defining a IWRM master-plan for the Okavango basin, as part of the EU Twinbasin initiative (**www.twinbasin.org**).

In September 2005, Drs Alan Gustard and Andy Young of CEH lectured at a one-week International Training Course on Hydrological Drought and low Flows at the Humid Tropic Centre, Kuala Lumpur, Malaysia. The course was a contribution to **Asian Pacific FRIEND**. In November 2005, Dr Christel Prudhomme (CEH) and Daniel Kingston (University of Birmingham) attended the FRIEND International Seminar on "Climatic and Anthropogenic Impacts on the Variability of Water Resources", convened by the **AMHY-FRIEND** project in Montpellier, and presented the papers "Low flow and drought studies – the Northern European FRIEND experience" and "Assessing large-scale hydroclimatological variability and linkages across northwest Europe", respectively. The papers are to be published in a UNESCO Technical Document resulting from this meeting.

The **5th International FRIEND Conference**, hosted by the **AMIGO-FREIND** project of Latin America and the Caribbean, will be held in Havana, Cuba, from 27 November - 1 December 2006. UK scientists (Drs Gustard and Prudhomme) are on the International Organizing Committee. A total of 118 papers from 36 countries have been peer-reviewed and accepted for presentation at the conference, 17 of which are by UK scientists. UK scientists have also contributed to the **FRIEND 2006** report, to be published at the Cuba conference, which summarises progress in the eight regional FRIEND projects around the world.

HELP

Funding from the Scottish Higher Education Funding Council (SHEFC) has enabled the **UNESCO Centre of Water Law, Policy and Science** at the University of Dundee to recruit two new chairs - one in water law, the other in water science. A new building for the UNESCO Centre will be ready on 1 July, with three floors allocated to researchers across water law, policy and science. A date for the official opening of the Centre in Dundee is to be confirmed, but will feature an international personality and include a "Water Festival". The European launch of the Centre will be held in Brussels during the week 28 November 2006, in time for St Andrew's Day celebrations there. More information on the Centre can be obtained from Director, Patricia Wouters, (p.k.wouters@dundee.ac.uk) or from the Centre's website, www.dundee.ac.uk/water.

Two basins - Lake Naivasha - River Malewa (Kenya) and River Welland (England), proposed as HELP basins by Dr David M Harper (University of Leicester) and partners, were accepted by the HELP committee in 2004. In early 2006, these two basins, plus a third HELP basin, Pilica in Poland, were accepted as the first "triplets" in the EU Twinbasin initiative, and exchanges begin on 26th June.

G-WADI

Profs Mike Edmunds (University of Oxford) and Howard Wheater (Imperial College, London) continue to serve on the steering committee of G-WADI. This activity has received important financial contribution from UK DFID in the years 2005-2007. To-date, a web site has been established (**www.g-wadi.org**) and is actively maintained, and a series of workshops have been held to start up a number of interest areas, including hydrological models and applications, hydro-climatic forecasting and use of tracers in semi-arid region studies.

A number of activities are planned in the programme of IHP-VII: i) to build further the G-WADI Community through increased involvement of the UNESCO Centres and regional offices and the development of links in new areas (e.g. sub-Saharan Africa); ii) to promote and encourage the participation of the wider scientific community in G-WADI through web contribution and discussion; iii) to develop web-based access to global data sets and modelling tools of specific relevance to arid and semi-arid zones; and, iv) to develop selected workshop activities to kick-start new thematic areas of interest and to provide state of the art information. Planned initiatives include groundwater modelling, water harvesting and aquifer recharge, for example.

ISI

Prof Des Walling (University of Exeter) remains a member of the Steering Committee of the International Sediment Initiative and has attended, and contributed to, several ISI Steering Committee meetings and workshops (see 1.2.2). At the ISI Workshop on Sediment Management in South and Southeast Asia, in Bangkok, Thailand, 24 - 25 April, 2006, he presented a keynote paper on "Changing Sediment Loads in a Changing Environment".

1.1.3 Decisions regarding contribution to/participation in IHP-VII

In its response to the 4th Draft Plan of IHP-VII (19 April 2006), the UK-IHP Committee welcomed the efforts of the Task Force and the IHP Secretariat in producing the Plan and stated its willingness to support, in principle, the outline structure. However it also expressed concerns over how some of the proposed activities had been presented. It understands these concerns are now being addressed by the Task Force.

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

To coincide with the launch of the "International Decade for Action: Water for Life", the Royal Geographical Society, with the support of the UK IHP Committee and CEH, hosted a 1-day conference on World Water Day, 23 March 2005. The conference attracted more than 100 delegates from business, research, policy-making and non-governmental communities. The key note speech was given by the Secretary of State for the Department of International Development, the Rt. Hon. Hilary Benn MP, and the day was chaired by Sir Gordon Conway (DFID) and Prof Alan Jenkins.

For World Water Day 2006, the UK-IHP Committee endorsed the Annual Water Efficiency Conference 2006, convened by Waterwise, at Oxford University.

A Seminar on "The Future of Oxfordshire's Water Resources", also marking World Water Day 2006, was held at the Oxford University Centre for the Environment, Prof Mike Edmunds and Dr John Rodda being the co-convenors.

The British Hydrological Society (BHS) organises many technical meetings and workshops at national and regional level in the UK, which attract contributions from both the academic (universities and research institutes) and operational (i.e. water companies, engineering consultancies and regulatory authorities, such as the Environment Agency and the Scottish Environmental Protection Agency) sectors. Events held over the reporting period included:

- Low Flows: measurement, theory and practice (22 Sep 2004)
- Past Trends and Future Directions in British Hydrology - In Celebration of the BHS 21st Anniversary (10 Nov 2004)
- Flood Estimation - Advances in Data and Methods (19 Jan 2005)
- Water Framework Directive —international links (10 Mar 2005)
- Hydrology of Extremes (11 May 2005)
- LOCAR (lowland catchment research) (21 Sep 2005)
- Low flows and the hydro-illogical cycle (14 Dec 2005)
- Does land management really affect flood risk? (22 Mar 2006)
- Hydrometric data quality and availability (24 Apr 2006)
- UK contributions to the Prediction in Ungauged Basins (PUB) Decade (2003-2012) (14 Jun 2006)

1.2.2 Participation in IHP Steering Committees/Working Groups

Prof Alan Jenkins represents the UK-IHP Committee on the UK National Commission for UNESCO Natural Sciences Committee and is member of two working groups it has set-up: WG1, Input to the UNESCO Natural Sciences Programme; and WG4, Increased Cooperation and Coordination amongst International Science Programme Chairs in the UK.

Ian Gale of the British Geological Survey (BGS) was directly invited by the IHP Secretariat to become a member of the Task Force reviewing the draft IHP-VII document, in light of comments from National Committees. He attended his first Task Force meeting at UNESCO, Paris, on 6-7 June 2006.

Dr Alan Gustard continues to serve on the FRIEND Inter Group Co-ordinating Committee. He is also the UK-IHP Committee representative on the Northern European FRIEND Steering Committee but will be replaced by Gwyn Rees after the next SC meeting in Cuba on 26 November 2006.

Professor Des Walling attended an ad hoc meeting of the ISI Steering Committee, Paris, 23-24 September, 2004; the 3rd SC meeting, Vienna, 28-30 April, 2005; and the 4th SC meeting, Sharm-el-Sheikh, Egypt, 9-13 November, 2005.

Dr David M Harper was elected member of the Ecohydrology Demonstration Sites Task Force, November 2005, and was subsequently elected Chairman, at the 2nd meeting in June 2006.

John Chilton (BGS) is member of Working Group 1 of the IGRAC programme. He is also member of UNECE Working Group on Monitoring and Assessment, contributing to pilot projects under the 1992 Helsinki convention on transboundary waters and to other activities of the Working Group.

In May 2005, the UK-IHP Committee nominated:

- Prof Jim Hall (University o Newcastle) to represent Electoral Group I (Western Europe and North America) on the Advisory Board of ICHARM;
- Prof Des Walling (University of Exeter), to represent Electoral Group I on the Advisory Board of IRTCES;
- Dr David M Harper (University of Leicester) to the Governing Board of the European Regional Centre for Ecohydrology.

1.2.3 Research/applied projects supported or sponsored

UK participation in the IHP has historically been supported by the UK Department for International Development (DFID). Over the reporting period, two applied research projects (CLASIC and SAGARMATHA), contributing to HKH FRIEND, benefited from DFID support, as did the G-WADI initiative (see Section 1.1.2). The UK-IHP Committee is concerned, however, at the recent reduction in funding from DFID for international hydrological research.

The EU is increasingly becoming an important source of funding for UK IHP activity. For example, the EU Accompanying Measure project, “Analysis, Synthesis and Transfer of Knowledge and Tools on Hydrological Drought Assessment” (ASTHyDA) enabled UK scientists to contribute to Northern European FRIEND project, and a newly secured EU-FPVI project called WATCH (Water and Global Change) will help UK scientists to continue their

contribution to the project over the next four years (2007-2010). In Africa, the EU Twinbasin initiative in the Okavango basin facilitated the UK contribution to Southern Africa FRIEND.

Dr Harper's work in the Malewa HELP basin (Kenya) is funded almost entirely by the international environmental charity The Earthwatch Institute (**www.earthwatch.org**), with small grants in 2005 and 2006 from the IHP Ecohydrology Demonstration Sites programme to pump-prime proposals for large-scale restoration at Lake Naivasha and in the basin.

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

Close links are maintained by the UK-IHP Committee and the **WMO**. The UK Commission for Hydrology (**CHy**) representative, Dr Ann Calver (CEH), is a member of the UK-IHP Committee; several Committee members and UK scientists are on the WMO Open Panel of CHy Experts (OPACHE). Dr Gustard is the team leader and, together with a number of UK experts, is collaborating internationally on the production of a new WMO Manual on the Estimation and Prediction of Low Flows. Gwyn Rees is the FRIEND representative on the Steering Committee of the WMO Global Runoff Data Centre (**GRDC**). Dr Gustard attended the Fourth meeting of the WMO Steering Committee of the World Climate Programme – Water (WCP-Water), Wallingford, UK, 13 - 15 June 2005, as the FRIEND representative.

Dr Ian Littlewood (CEH) attended the UK-IHP Committee meeting in January 2006 to report progress with the **IAHS** Prediction in Ungauged Basins (**PUB**) initiative. He reported that the inaugural meeting of the UK National Working Group (UKWG) had been held in Wallingford on 24 November 2005 and that 1-day symposium, "UK contributions to the Prediction in Ungauged Basins (PUB) Decade (2003-2012)", was to be held at the Institution of Civil Engineers, London, on 14 June 2006.

1.2.5 Other initiatives

In October 2005, an UK-led (DFID/CEH) consortium of 13 ministries, funding agencies and national RTD authorities from 10 European countries submitted a proposal to the EU ERA-NET scheme to establish a network "for long term communication, collaboration and coordination of Member State water research programmes in developing countries". The **EUWI-ERA-NET**, as it is called, aims to support the delivery of EU Member States' commitments to strengthen international development in water and assist the delivery of the research commitments of the **EU Water Initiative** (EUWI). Several UN agencies, including the UNESCO Division of Water Sciences, gave backing to the project proposal. Recent communications indicate that the initiative is likely to be funded.

African Water (www.africanwater.net), another EUWI project involving the UK (CEH), aims to raise awareness in Africa and Europe of the opportunities for collaboration in research. Encouraging African involvement in research projects of EU-FPVII will hopefully benefit IHP initiatives, such as Southern African FRIEND.

In November 2004 the **EurAqua** network of leading freshwater research organizations in Europe (**www.euraqua.org**) produced a discussion document, "Towards a European Drought Policy", calling upon senior policy makers and politicians to consider a specific European Drought Policy for long-term sustainable water use in Europe. The document should also help direct future calls of EU-FPVII.

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

As a contribution to Asian Pacific FRIEND, Drs Alan Gustard and Andy Young (CEH) contributed to an International Training Course on "Hydrological Drought and Low Flows" at the Humid Tropic Centre, Kuala Lumpur, Malaysia, in September 2005.

1.3.2 Organization of specific courses

UK hydrologists were due to lecture at a HKH FRIEND Low Flows Training Workshop, to be held in Thimpu, Bhutan, in April 2006. The workshop was cancelled due to lack of funding.

1.3.3 Participation in IHP courses

None reported

1.4 Cooperation with the UNESCO-IHE Institute for Water Education and/or other UNESCO centres

The UNESCO Centre of Water Law, Policy and Science at the University of Dundee is collaborating with IHE Delft to develop first joint degree in Water Governance and Conflict Prevention, with focus on leadership, in line with Dundee's new Water Law, Water Leaders professional Masters degree.

Ian Gale presented a keynote paper to UNESCO-IHE sponsored STAP Workshop on "Managed Artificial Recharge of Groundwater", New Delhi, 18 – 12 September 2005.

1.5 Publications

Several UK hydrologists contributed to the textbook "Hydrological Drought – Process and Estimation Methods for Streamflow and Groundwater" (Eds. Tallaksen, L. & Van Lanen, H., Development in Water Science, 48, Elsevier Science B.V., 579 pp, 2004), a major output of the Low Flows group of the Northern European FRIEND project.

A 7-volume series on the History of Water is being prepared by the IWHA as a contribution to the IHP. Dr Rodda attended a planning meeting for the Series at UNESCO on 22 May 2006. The books will be published jointly by UNESCO and CUP.

John Chilton (BGS) attended an authors' meeting at IGRAC on a guidance document on groundwater monitoring being produced by Working Group 1.

Ian Gale (BGS) contributed to the compilation and editing of "Strategies for Managed Aquifer Recharge (MAR) in semi-arid areas" - a UNESCO–IAH information booklet that was published in 2005.

No list is maintained of UK publications deriving from IHP-related activity. However, a small selection of recently published papers is listed below:

- Bower D., Hannah D.M. and McGregor G.R. (2004), Techniques for assessing the climatic sensitivity of river flow regimes, Hydrological Processes, 18, 2515-2543

- Fowler, H.J. and Archer, D.R. (2005). Hydro-climatological variability in the Upper Indus Basin and implications for water resources. In: Wagener, T. et al. (Eds.) Regional Hydrological Impacts of Climatic Change – Impact Assessment and Decision Making, IAHS Publication 295, 131-138

- Hannah D.M., Kansakar S.R., Gerrard A.J. and Rees G. (2005), Flow regimes of Himalayan rivers of Nepal: Their nature and spatial patterns, Journal of Hydrology, 308, 18-32

- Harper, D.M. and K.M. Mavuti (2004). Lake Naivasha, Kenya: Ecohydrology to guide the management of a tropical protected area. Ecohydrology & Hydrobiology 4; 287-305.

- Rees, H.G., Holmes, M.G.R., Young, A.R. and Kansakar, S.R. (2004). Recession based hydrological models for estimating low flows in ungauged catchments in the Himalayas. Hydrology and Earth System Sciences, 8 (5), 891-902.

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

None reported

1.6.2 Participation in meetings abroad

No list is maintained of international meetings attended by UK scientists. Reported attendance is listed below:

- Dr John Rodda presented a keynote address at the ceremony to celebrate the 30th anniversary of the launch of the IHP at the 4th IWHA Conference, UNESCO, Paris 1-4 December 2005, and he gave a second, invited paper to the Conference in its final session.

- Prof Des Walling attended the ISI Workshop on Sediment Management in South and Southeast Asia, AIT, Bangkok, Thailand, 24-25 April, 2006, and an ISI Workshop and Database Working Group meeting, Sharm-el-Sheikh, Egypt, 9-13 November, 2005.

- Dr David M Harper attended the 11th World Lakes Congress, Nairobi, 2005, where he and colleagues from the Universities of Nairobi and Lodz (Poland) presented three papers including one on "Eco-hydrology - needs and opportunities in Africa. The Lake Naivasha Demonstration Site".

- Dr Christel Prudhomme and Daniel Kingston attended the FRIEND International Seminar on “Climatic and Anthropogenic Impacts on the Variability of Water Resources”, in Montpellier in November 2005.

- Several UK hydrologists presented papers at the European Geosciences Union General Assembly 2006, in Vienna, Austria, 2 – 7 April 2006, and attended meetings of the Low Flows and Large Scale Variations sub-projects of Northern European FRIEND, which coincided with the Assembly.

- The UK was also well represented at the Seventh Scientific Assembly of IAHS, at Foz de Iguacu, Brazil, 4 -9 April 2005, several being convenors or co-convenors of the various symposia and workshops.

- Ian Gale presented a keynote paper at the UNESCO-sponsored Regional Workshop on "Management of Aquifer Recharge and Water Harvesting in Arid and Semi-Arid Regions of Asia", which was held in Yazd, Iran from 27 November - 1 December, 2004. He was also a participant of the 2nd G-WADI Global Workshop held in UNESCO Paris 10-11 November 2005.

1.7 Other activities at regional level

1.7.1 Institutional relations/cooperation

The UK-IHP Committee hosted a **Regional Meeting of Electoral Group I** of the IHP at CEH Wallingford on 5 – 6 July, 2005. The meeting attracted 23 participants from 15 countries. Minutes of the meeting can be obtained from the Secretary of the UK-IHP Committee.

Dr. Fred Wrona, Chairman of the Canadian National Committee for IHP, visited Prof Jenkins at CEH in November 2005 to discuss opportunities for collaboration between Canada and the UK.

1.7.2 Completed and ongoing scientific projects

None in addition to those previously mentioned.

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2007

Some of the activities planned to December 2007 include:

- An international conference on “Riverine Hydroecology: Advances in Research and Applications” at Stirling University, Scotland, 14-18 Aug 2006

- 9th National Hydrology Symposium at Durham University, 10 - 13 September 2006, on “Land management and the protection of the water environment: Understanding the impact of new legislation”.

- 5th FRIEND World Conference, “Water Resource Variability: Processes, Analyses and Impacts” will be held in Havana, Cuba, 27 November - 1 December 2006. UK scientists will attend the Steering Committee meeting of the Northern European FRIEND project, and other sub-projects’ meetings, during the conference.

- UK and European (Brussels) launch of the UNESCO Centre of Water Law, Policy and Science at the University of Dundee

- A symposium of Southern Hemisphere HELP basins is to be held in South Africa, in 2007

- UK scientists will lead several workshops and symposia at the IUGG XXIV General Assembly in Perugia, 2-13 July, 2007.

2.2 Activities foreseen for 2008-2009

UK scientists intend to continue their participation in various IHP initiatives, including FRIEND, HELP, ISI and G-WADI, as resources permit. Dr Harper has proposed to the Ecohydrology Task Force the first African Ecohydrology Training course, to take place in March 2008 in the Serengeti National Park, Tanzania (the other African EH demonstration site).

2.3 Activities envisaged in the long term

Whilst the UK IHP Committee supports, in principle, the draft IHP-VII proposals to improve the linkages between water and other environmental and social systems, it believes the need for good quality hydrological science should remain a high priority. Future UK activity within the IHP, therefore, is likely to conform to the Committee's long-term priorities: the advancement of knowledge and understanding through hydrological research; the development of tools and methods to improve the assessment and management of water resources in gauged and ungauged catchments; and the education and training of young hydrologists, both in developing countries and in the UK.

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