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NATIONAL REPORTS OF THE NATIONAL COMMITTEES FOR THE IHP (2008 – 2010)

SUMMARY

The following National Reports of the National Committees for the IHP cover the activities for the intersessional period between the 18th and the 19th sessions of the Intergovernmental Council of the IHP (June 2008 - May 2010).

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 July 2008 – May 2010

For the 19th Session of the Intergovernmental Council for the International Hydrology Programme, Australia is not a member of the Council, but will attend as an Observer.

1.1 Meetings of the IHP National Committee

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

1.1.1 Decisions regarding the composition of the IHP National Committee

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

Name	Expertise	Organization
Bruce Stewart	Water Resources Assessment	Bureau of Meteorology
Tony Falkland	Island Hydrology	
Trevor Daniell	Urban, Low and High Flow Hydrology	University of Adelaide
Ross James	Hydrological Data & Networks	Bureau of Meteorology
Peter Martin	Public Relations	CRC for Weed Management
Ian White	Hydrology/Water Quality	Australian National University
Jeff Camkin	Ecohydrology / Water Policy / HELP Coordination	University of Western Australia Centre for Excellence for Ecohydrology/ CRC for Irrigation Futures
Ian Cordery	Flood/Drought Hydrology	University of New South Wales
Peter Dillon	Groundwater	Centre for Groundwater Studies
Anne Jensen	Ecotones	Wetlands Care Australia
Shahbaz Kahn	Sustainable irrigation systems	CSIRO now UNESCO (from April 2008)
Ray Volker	Groundwater	University of Queensland

1.1.2 Status of IHP-VII activities

The IHP Australian Network brings together many of the key hydrological research groups within Australia. As such, Australia is able to contribute towards IHP activities through the research programs currently existing in Australia. For example, the eWater Cooperative Research Centre (CRC) and other centres for research undertake activities which are closely aligned to the themes of IHP-VII. A description is provided below of some activities pertinent to IHP-VII. The Australian Bureau of Meteorology and CSIRO have also established a Water Information Research and Development Alliance (WIRADA) which undertakes research of direct relevance to the activities of the IHP. Australia faces major challenges in ensuring sustainable water supply in the face of drying climate and rising demand for water. In response, the Australian Government's initiative, *Water for the Future*, provides national leadership in water reform for all Australians. *Water for the Future* (http://www.environment.gov.au/water/australia/index.html) is built on four key priorities:

- Taking action on climate change

- Using water wisely
- Securing water supplies
- Supporting healthy rivers

Theme 1 - Adapting to the Impacts of Global Changes on River Basins and Aquifer Systems
A subset of the hydrological data collected by the State and Territory water agencies and the Bureau of Meteorology is contributed to international data centres for use in global and regional studies. The eWater Cooperative Research Centre (http://www.ewatercrc.com.au/) is continuing its research program that includes modelling hydroclimatic variability and impact on water resources and aquatic ecosystems and rare events and resilience in hydrological and ecological risk assessment. The Indian Ocean Climate Initiative (IOCI) (http://www.ioci.org.au), a partnership of research organisations, is researching the impact of climate variability and climate change on the water resources of the southwest region of Australia. CSIRO (http://www.csiro.au/), Australia's national research organisation, has research programs addressing global and regional climate change, climate change impacts on natural resources including water and climate change adaptation strategies. Australian National University (ANU) together with Ecowise Environmental have been researching vulnerability and adaptation to global change in small island countries and have contributed to AusAID's Pacific vulnerability and adaptation project. The ANU, Ecowise Environmental and the University of Adelaide have been investigating the vulnerability of water supply catchments in the Australian Capital Territory to global change. The Water Information Research and Development Alliance (WIRADA) brings together CSIRO's research and development expertise in water and information sciences and the Bureau of Meteorology's operational role in hydrological analysis and prediction. The Water data transfer standards project is defining and developing transfer standards and procedures for supply of specified data from water information providers. A Hydrologists workbench project will develop tools to automate common workflow processes to access and use hydrological data and models. A Precipitation and actual evapotranspiration products project is developing new methods and tools to produce data products to underpin hydrologic assessment and forecasting.

Theme 2 - Strengthening Water Governance for Sustainability
The National Land and Water Resources Audit (http://www.nlwra.gov.au/) and http://audit.ea.gov.au/ANRA/atlas_home.cfm) and the Water and the Economy study have produced a considerable body of data and information about the value, use, distribution and quality of water within Australia. Research on property rights of water and the structure, operations and social and economic impacts of water trading markets continues to receive a lot of attention in Australia and is a potential resource for similar projects in other countries. The ANU, the French agency CIRAD and Ecowise Environmental has undertaken research on the use of multi agent systems and companion modelling to support negotations and reduce conflict over groundwater use in low atolls. The WIRADA water resources assessment and water use accounting project is developing methods and technologies, to enable the Australian Bureau of Meteorology to provide integrated surface and groundwater resource assessments, water accounts and water resource outlooks.

Theme 3 - Ecohydrology for Sustainability
The ANU and Ecowise Environmental have ongoing projects in conjunction with UNESCO-IHP investigating shallow groundwater recharge, water quality, impacts of land-use and extraction and socio-cultural aspects of groundwater management and impacts of drought in low coral islands. The ANU together with NSW Department of Primary Industry has been investigating estuary policy and management strategies to improve the health of estuaries. Research into hydrological process in and the sustainable management of wetlands is being undertaken in a number of universities and eWater Cooperative Research Centre and the ANU in conjunction with UNSW and the NSW Sugar Industry has been investigating the use of constructed wetlands to treat drainage from farm lands. The urban environment and water sensitive urban design are also areas of current research.

Theme 4 - Water and Life Support Systems

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

Theme 5 - Water Education for Sustainable Development

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

eWater CRC (http://www.ewatercrc.com.au/)
CRC for Water Quality and Treatment (http://www.waterquality.crc.org.au/)
CRC for Irrigation Futures (www.irrigationfutures.org.au/)

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

Centre for Groundwater Studies (http://www.groundwater.com.au)
The purpose of the centre is to provide research, education and specialist services for Australian and International land and water industries with the objective of improving the management of resources affected by groundwater processes.

Centre for Environmental Applied Hydrology (http://www.civag.unimelb.edu.au/ceah)
The Centre for Environmental Applied Hydrology is a research centre within the Departments of Civil and Environmental Engineering and Geography and Environmental Science at the University of Melbourne. Specific expertise covers all aspects of surface and groundwater hydrology, hydraulics and geomorphology.

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

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

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

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

A new National Centre for Groundwater Research and Training has been established to accelerate the assessment of Australia's groundwater resources and to harmonise definitional issues, governance and management. The Centre is based at Flinders University, South Australia, and aims at developing a new generation of skilled groundwater scientists and policy makers/managers who will develop the underpinning knowledge and practices so vital to the ongoing sustainable management of our groundwater resources. Key functions of the Centre will be to train postgraduate and postdoctoral scientists in advanced hydrogeological and related technologies as well as improving knowledge of groundwater connectivity and policy and management issues confronting water managers.

- *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. There are now five Australian HELP basins. The Ord (Western Australia, coordinator), Tully (Queensland) and Murray Darling Basin were accepted as new HELP basins in the 2009 call for proposals and the Lower Burdekin (Queensland) and Fitzroy (Queensland) were accepted as continuing basins. Jeff Camkin and Justin Story play a coordination role for the HELP program in Australia.

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

1.2.1 National/local scientific and technical meetings

- 32nd Hydrology and Water Resources Symposium, December 2009 Newcastle, New South Wales.
- 9th National Conference on Hydraulics in Water Engineering, 23 - 26 September 2008 at Darwin Convention Centre. Within this overall theme the conference sub-themes are: Climate Change, Methods in Hydraulics, Applied Hydraulics, Geophysical Hydraulics and Coastal Hydraulics.
- 10th Australasian Environmental Isotope Conference and 3rd Australasian Hydrogeology Research Conference with the theme of *applications of stable and radiogenic isotopes*, 1-3 December 2009, Perth.
- The biennial convention of the Australian Water Association (AWA) (www.awa.asn.au) is the Australian water industry's largest and most prestigious event. It is an internationally recognised and well attended occasion, attracting delegates from across Australia and around the globe. The Ozwater 2010 Convention & Exhibition, was held 8-10 March 2010 in Brisbane.
- 12th International Riversymposium, Brisbane, 21-24 September 2009. The symposium includes the Thiess International Riverprize.
- National Water Week18-24 October 2009 (www.nationalwaterweek.org.au)
- Greenhouse 2009 convened by CSIRO held 23-26 March 2009 in Perth had the theme Climate Change and Resources.
- MODSIM2009, 13-17 July 2009, Cairns, Queensland. International Congress on Modelling and Simulation.
- 3rd NATIONAL WATER EDUCATION CONFERENCE, WATER EFFICIENCY 2008 and WICD 2008. All three conferences were held 30 March - 2 April 2008 on Queensland's Gold Coast. Education website (Website 1), Efficiency website (Website 2), WICD website (website 3).
- ENVIRO08 A conference and exhibition for showcasing the Australian environment industry. Will be held 5-7 May 2008, Melbourne (www.enviroconvention.com.au/).
- A number of meetings of the National Committee on Water Engineering, Institution of Engineer's have been held during this period. Some of the key purposes of these meetings are to coordinate and organise hydrology and water resources symposia and conferences, to coordinate the ongoing revision to the national hydrological design guidelines Australian Rainfall and Runoff, prepare Position Papers on key hydrological issues and to manage the publication of Australian Journal of Water Resources. Position Papers are now all available on the Institution of Engineers, Australia web site: (http://www.eng.newcastle.edu.au/~ncwe/ncwePosPaper/ppHome.htm).

1.2.2 Participation in IHP Steering Committees/Working Groups

Prof Shahbaz Khan was Chair of the International Steering Committee of the Hydrology for the Environment, Life and Policy (HELP) Program and the Regional Coordinator for the Australasian region. Since April he has been in UNESCO Paris as Chief, Sustainable Water Resources Development and Management Section, Division of Water Sciences. Mr Jeff Camkin, University of Western Australia, now plays a coordination role for HELP in Australia (Jeff.Camkin@gmail.com).

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

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

Prof Trevor Daniell was elected Chairman of the Friend Inter-Group Coordinating Committee at it meeting in Havana, Cuba in December 2006. The 7th FIGCC Meeting was held in Adelaide on April 9th, 2008.

As president of the WMO Commission for Hydrology, Mr Bruce Stewart attended a Joint WMO/UNESCO Liaison Committee meeting in January 2010 and also chaired a meeting of the IFI Coordination Group held by e-mail and SKYPE in December 2009/January 2010.

1.2.3 Research/applied projects supported or sponsored

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

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

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

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

White I., Falkland A., Metutera, T., Metai E., Perez P., Dray A. and Overmars M. (2005). Climatic and Human Influences on Water Resources in Low Atolls. In Proceedings of the International

Seminar On: Climatic And Anthropogenic Impacts on the Variability Of Water Resources Umr Hydrosciences Montpellier / UNESCO / OMM Maison des Sciences de L'eau de Montpellier, 22 - 24 November 2005.

1.2.4 Hydrology for Environment, Life and Policy (HELP)

Australia continues to contribute to the projects established under the HELP banner. Current HELP Basins are: Murray Darling Basin (coordinated by Awadesh Prasad, Murray Darling Basin Authority), Tully Basin (coordinated by Jim Williams, CSIRO), Lower Burdekin Basin (Coordinated by Keith Bristow, CSIRO), Fitzroy Basin (coordinated by Chris Carroll, QLD Department of Environment, Resources and Mines) and the Ord River (coordinated by Jeff Camkin, University of Western Australia and Dick Pasfield).

A HELP Forum "River Basin Planning", coordinated by Australia and sponsored by UNESCO, was held in Brisbane on 24 July 2009. The forum brought together experts from Australia, NZ, Asia, Europe and the US to share HELP basin and other experiences in river basin planning. A selection of these experiences will form a chapter in a forthcoming UNESCO HELP program book on IWRM. A meeting of HELP Australia and New Zealand coordinators, and an open forum on HELP in Australia, are planned for Perth in October 2010, coinciding with RiverSymposium.

Ord River HELP Basin activities include: nomination of the Ord River as a UNESCO Ecohydrology Program Demonstration Site (pending) in May 2010; a HELP workshop with Ord stakeholders in July 2010 to develop a HELP workplan; and joint papers and presentations with a comparable basin in Portugal (Guadiana).

Fitzroy HELP Basin activities include: visit from Dr Mike Bonnell from the UNESCO HELP Centre for Water Law, Policy and Science, University of Dundee, in March 2010; a series of 'Catchment Champion' workshops held by the Fitzroy Basin Association and Dept of Environment and Resource Management to identify environmental values and water quality objectives for the basin; and using catchment modelling an economic assessment was conducted to assess prioritisation of onground investment in grazing to reduce sediment and nutrient loads to the reef lagoon.

Lower Burdekin HELP Basin activities include: a UNESCO HELP water forum with a keynote address by Professor Shahbaz Khan, Global HELP Coordinator in 2010; international visits by Dr Ken Knox (University of Denver) in 2008 and Dr Mark Dent (University of KwaZulu-Natal) in 2008; establishment of the Burdekin Water Futures group to guide HELP and other whole of catchment activities; creation of a groundwater science plan and modelling proposal for the Burdekin.

Murray Darling HELP Basin activities include: The Murray- Darling Basin Authority (MDBA www.mdba.gov.au) is currently undertaking the biggest ever water reform in the Murray-Darling Basin by way of preparing the first statutory Basin Plan. The Plan will be a strategic 10 year plan for the integrated and sustainable management of water resources in the Murray–Darling Basin. A central element of the Basin Plan is setting of environmentally diversion limits (SDLs)on the amount of water that can be taken from the Basin's water resources. As precursors to the Basin Plan (to be released in July 2010), several investigations and activities have been completed. The key activities completed during 2009-10 include:

- A Basin Plan Concept Statement (http://www.mdba.gov.au/files/publications/basin-plan-concept-statement.pdf) was released in end June 2009. The concept statement introduces and explains in general terms, the purpose of the Basin Plan, what it will contain, and when and how it is being developed and the key approach being taken by the Murray-Darling Basin Authority (MDBA)in developing the Basin Plan.
- An issue paper (http://www.mdba.gov.au/files/publications/sustainable-diversion-limits-issues-paper-12-11-09.pdf) on SDL was released for public consultation in November 2009. The paper explores issues around developing SDLs for the Murray-Darling Basin and

describes the relationship between SDLs and the other elements of the proposed Basin Plan.

- A comprehensive socioeconomic baseline report, Socio-Economic Context for the Murray–Darling Basin (http://www.mdba.gov.au/files/publications/Socio-economic-context-report-b2.pdf) was prepared and released for public information in September 2009.
- Environmental water needs for the Basin was assessed by identifying key environmental assets, including water-dependent ecosystems and ecosystem services. The report, Assessing environmental water needs of the Basin (http://www.mdba.gov.au/files/publications/Assessing-environmental-water-needs-of-the-Basin-April-2010.pdf) was released in April 2010.
- Compressive hydrological modelling of groundwater and surface water systems were undertaken to investigate various physical (eg climate)and policy scenarios for determining SDLs.
- A comprehensive program of stakeholder engagement (http://www.mdba.gov.au/programs/engagement) has been established through which various stakeholders including the community are informed of the development of the Basin Plan and their inputs are taken. Community meetings and forums for industry peak bodies are being regularly held.

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

As President of the WMO Commission for Hydrology and also Chair of the Australian IHP Network, Mr Bruce Stewart provides a link between the UNESCO IHP and WMO's Hydrology and Water Resources Programme and the International Flood Initiative. Tony Falkland and Ian White are members of the Water Working Group of the Science, Technology and Resources Network of the South Pacific Applied Geoscience Commission. Ian White is a member of the Asian Pacific Association of Hydrology and Water Resources. The Centre of Excellence for Ecohydrology (University of Western Australia) is establishing a Memorandum of Understanding with the UNESCO-IHP International Centre for Coastal Ecohydrology.

1.2.6 Other initiatives

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

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

1.3.2 Organisation of specific courses

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

1.3.3 Participation in IHP courses

1.3.4 Other

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

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

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

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

1.4 Publications

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

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

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

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

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

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

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

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

1.5 Participation in international scientific meetings

1.5.1 Meetings hosted by Country

See Section 1.2.1 of this report for international conferences hosted.

1.5.2 Participation in meetings abroad

Trevor Daniell participated in the Coordination Committee of the GRDC in Koblenz, 19 to 21 September 2007

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

Chris Carroll (presented), Keith Bristow (presented), John Blackwell and Jeff Camkin participated in the HELP in the Southern Hemisphere Symposium, South Africa 2007.

Keith Bristow and Jeff Camkin both presented at the UNESCO-HELP Symposium on Water Governance, Portugal, in 2009 and Jeff Camkin was a member of the Coordinating Committee for the Symposium.

Jim Williams (Tully Basin Coordinator), Justin Story (co-coordinator for HELP in Australia) and Jeff Camkin (coordinator for HELP in Australia and Coordinator for HELP in Australia) met with the Global HELP Coordinator in Paris in 2009.

Jeff Camkin participated in the HELP Symposium in Douro, Portugal in 2010.

1.6 Other activities at a regional level

A project titled: Enhanced Application of Climate Predictions in Pacific Island Countries is currently in progress to meet the general goals of improving weather and climate services and products. The AusAID funded project is developing a climate prediction capacity in participating countries, and in particular, is providing a framework for incorporating climate prediction information into planning across a broad range of agencies and industries. The climate prediction system being provided under the project is based upon the seasonal climate prediction system of the Australian Bureau of Meteorology, which has successfully issued climate predictions for some years. (www.bom.gov.au/climate/pi-cpp/)

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

1.6.1 Institutional relations/co-operation

The Centre of Excellence for Ecohydrology (University of Western Australia) is entering into a Memorandum of Understanding with the UNESCO International Centre for Coastal Ecohydrology, Portugal, to support collaboration on coastal ecohydrology.

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 2010

- 13th INTERNATIONAL RIVERSYMPOSIUM, Perth, 11-14 October 2010.
- National Water Week, October 2010
- 34th IAHR Biennial Congress, 33rd Hydrology and Water Resources Symposium and 10th Conference on Hydraulics in Water Engineering, Brisbane, 26 June to 1 July 2011
- IUGG 2011 Earth on the Edge, Melbourne, 27 June to 8 July 2011
- HELP Australia public forum, October 2010 in Perth
- HELP Australia Coordinators meeting, October 2010 in Perth
- Ord River Basin HELP Workshop, July 2010 in Kununurra
- Monthly meetings of the Burdekin Water Futures group

2.2 Activities Planned for 2010-2011

- Continuation of assistance to Pacific Island Projects.
- Continuation of involvement in Asian Pacific FRIEND.
- Continuation of involvement in HELP
- Participation in the FRIEND Symposium 2010, Fes, Morocco, 25-29th October.
- Participation in the Global HELP Symposium planned for South America, 2011
- Increasing involvement in UNESCO Ecohydrology Program through proposed demonstration sites, if successful

2.3 Activities envisaged in the long term

No information available at this time.

National Report of the Azerbaijan to the IHP Secretariat

The following has been accomplished about the related topics under the reporting period (July 2008 - May 2010)

Theme 1: Global Change, Watershed and Aquifers	The seminar "Recent Climate Changes and Azerbaijan" held in Baku (14 November 2009) was supported by the UNESCO Moscow bureau on Azerbaijan, Armenia, Moldova, Russia and National Comission of UNESCO in Azerbaijan and taken into consideration by the mass media. The main goal of the seminar was to give the press officers a wide knowledge regarding Global Climate Changes and their local manifestations in Azerbaijan. At the same time, wide information about impacts on climatic changes and possible adaptation measures will be given. For this reason, the lectures about the climate changes that took place between Azerbaijani scientists and specialists will be delivered.
Theme 2: Governance and Socio-Economics	The river basin of Ganigh (Alazani) IWRM planning of the Ganigh (Alazani) river basin (April 2010) was finished according to the recomendations of the European Union's Water Framework Directive. Transboundary Ganigh river enters the area of Azerbaijan from Georgia. Coordination of the IWRM river basin plans in both countries is assumed. This is a pilot project for Azerbaijan because right now water resources management takes place by administrative method.
Theme 3: Ecohydrology and Environmental Sustainability	"Water resources of Azerbaijan and their intergrational management" monography was prepared for publishing. One chapter of the book was completely dealt with the types of methods of the environmental flows.
Theme 4: Water Quality, Human healthy and Food Security	In October of 2008 in comemoration of the 70^{th} anniversary of Magbet Mammadov the head of the IHP Azerbaijan National Committee there was a conference held and some of his work has been published. The conference materials consisted mostly of Water Quality and Human Health topics.

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INFORME NACIONAL DEL ESTADO PLURINACIONAL DE BOLIVIA

1. ACTIVIDADES REALIZADAS EN EL PERÍODO JULIO 2008 - MAYO 2010.

1.1. Reuniones del Comité Nacional del PHI.

1.1.1. Decisiones concernientes a la composición del Comité Nacional del PHI.

En reunión realizada el 8 de junio de 2010, con la asistencia de representantes del directorio del CONAPHI Bolivia, se definió que el nuevo directorio para la gestión 2010 – 2012 está conformado de la siguiente manera:

- Presidente : Dr. Ing. Miguel Angel Ontiveros Mollinedo **(a.i.)**

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- Vicepresidente : Ing. Carlos Herbas Camacho

Director, Instituto de Hidráulica e Hidrología
Universidad Mayor de San Andrés
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- Secretario Técnico : CN. DAEN. Jorge E. Espinosa Hurtado

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- Vocal : Lic. Jorge Quintanilla

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El CONAPHI-Bolivia está formado actualmente por 15 miembros, que representan a 13 instituciones universitarias, gubernamentales y privadas.

En la próxima reunion se definiran nuevos representantes que puedan complementar las actividades de los programas y grupos de trabajo del PHI

1.1.2 Estado de actividades del PHI-VII

Participaciónen el taller de máxima hidrológicas, precipitación pluvial y caudales

Objetivo
Generar bases de datos de caudales y lluvias máximas
Fecha: 17/5//2010 al 20/5/2010
Lugar: Lima - Perú

1.2. Actividades a nivel Nacional dentro del marco del PHI.

1.2.1. Certámenes científicos y técnicos nacionales/locales

a. Actividad: Primer curso internacional de capacitación sobre aplicación de sensores remotos para monitoreo de glaciares.

Objetivos:

- Capacitar a técnicos de los Servicios Meteorológicos, Operadores de gestión de Agua, Operadores de generación de energía eléctrica y responsables de los programas glaciológicos de: Colombia, Ecuador, Perú y Bolivia; en la utilización de sensores remotos para monitoreo glaciar.
- Capacitar a los participantes en la utilización de las imágenes del satélite japonés ALOS. Utilizando los captores: PRISM, AVNIR-2 y PALSAR.
- Capacitar a los participantes en la utilización de Sistemas de Posicionamiento Global Doble Frecuencia (DGPS), para la adquisición de puntos de control (GCP) para la calibración de imágenes satelitales

Fecha: 01/11/07 al 03/12/07
Lugar: La Paz – Bolivia

b. Actividad: Taller intensivo sobre agrometeorología y técnicas científicas relacionadas, "Agroclim 2009"

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Objetivo: Capacitación dirigida a profesionales relacionados con la aplicaciones de meteorología agrícola

Fecha: 09/11/09 al 14/11/09
Lugar: La Paz – Bolivia

1.2.2. Participaciones en comités de dirección/Grupos de Trabajo del PHI

a. Actividad: Reunión del "Grupo Consultivo de la UNESCO en Latino América y el Caribe para la formulación de políticas y proyectos de reducción del riesgo de desastres"

Objetivos:

- Contribuir al fortalecimiento de un marco conceptual integral y holístico en estos temas, que permita avanzar en la gestión de riesgo de desastres, promoviendo un enfoque integrado de lo físico y lo social en el análisis y la acción.
- Promover un proceso permanente de debate conceptual y teórico, a la luz de los avances alcanzados en los últimos años.
- Proponer líneas de acción compatibles con la misión y visión de la UNESCO, para avanzar en la gestión eficiente del riesgo de desastres en América Latina y el Caribe, generando líneas de trabajo para ayudar a los países de la región a minimizar los impactos negativos de los desastres.
- Capitalizar los diferentes esfuerzos realizados hasta el momento en el tema y en la región.
- Proponer y ayudar en la transversalización del tema de riesgo en los procesos y programas de desarrollo sostenible en la región.
- Promover un enfoque multidisciplinario para proveer herramientas a los países, tendientes a minimizar los impactos a través de la implementación de políticas públicas adecuadas

Fecha: 4-6 Marzo 2008
Lugar: Montevideo - Uruguay

1.2.3. Proyectos de Investigación o de aplicación apoyados o patrocinados

1.2.4. Colaboración con otras organizaciones o programas nacionales e internacionales

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1.2.5. Otras iniciativas

1.3. Cursos académicos o de adiestramiento

1.3.1 Contribución a cursos del PHI

1.3.2 Organización de cursos específicos

1.3.3 Participación en cursos del PHI

1.4. Cooperación con el Instituto UNESCO-IE para la educación Relativa al agua, y otros centros internacionales/regionales relacionados con los recursos hídricos, bajo los auspicios de la UNESCO

1.5. Publicaciones

Instituto de Hidraulica e Hidrologia – IHH. 2009. Revista especializada en ciencias del Agua, Recursos Hidricos. Editores: Jose Luis Montaño V., Jorge Molina Carpio.

1.6. Participación certámenes científicos internacionales

1.6.1. Certámenes realizados en el país

1.6.2. Participación en certámenes en el extranjero

a. Actividad: Entrevista en el programa Al Natural (Panamá); Fundación Albatros
Objetivos:

- Dar relevancia a la actividad de investigación de los equipos de investigación miembros del GTNH-PHI-LAC-UNESCO.
- Presentar la problemática del impacto de los cambios climáticos sobre el derretimiento de los glaciares y su posible implicancia sobre la disponibilidad de recursos hídricos en Latinoamérica.

Fecha: 30/06/2008
Lugar: Panamá

b. Actividad: VII Encuentro Internacional de Investigadores de Grupo de Trabajo de Nieves y Hielo para América Latina y el Caribe (Manizales – Colombia, Agosto 2008)

Objetivos:

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- Evaluar resultados de las investigaciones glaciológicas en los países miembros realizadas durante el periodo 2007-2008.
- Redactar un documento que exprese el punto de vista científico en América Latina sobre las preocupaciones relacionadas a Glaciares, Cambio Climático y Recursos Hídricos**.**
- Planificar actividades conjuntas interinstitucionales orientadas a diseñar proyectos regionales

Fecha: 26- 30 de Agosto 2008
Lugar: Manizales – Colombia

c. Actividad: Conferencia Agua y Cambio Global

Objetivo:

- Presentar las actividades y principales resultados del Grupo de Trabajo en el Contexto regional sobre la temática de Cambio Global y Recursos hídricos
- Presentación oral de las actividades del GTNH.

Fecha: 8 – 10 septiembre 2008
Lugar: Montevideo – Uruguay

d. Actividad: Foro de Sudamérica preparatorio para el V Foro Mundial del Agua.

Objetivo:

- Presentación y difusión de la "Declaración de Manizales sobre Cambio Climático y glaciares" para su consideración ante los representantes participantes del Foro.

e. Actividad: Reunión de Coordinación del PHI-LAC
Objetivo:

- Presentación de las actividades y principales resultados de GTNH a los coordinadores de los programas y grupos de trabajo del PHI-LAC.

Fecha: 12 – 13 Septiembre 2008
Lugar: Montevideo – Uruguay

f. Actividad: Primera Reunión de Coordinación del proyecto PROSUL: Programa Sudamericano de apoyo a las actividades de Cooperación en Ciencia y Tecnología del Brasil; Iniciativa C-BERS 2B (Brasil, Bolivia, Colombia, Ecuador, Perú).

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Objetivo:

- Establecer sitios de interés para el monitoreo de glaciares a través de la utilización del satélite Chino-Brasilero CBERS-2B.
- Definir actividades en cada uno de los países participantes
- Establecer el estado del arte de las investigaciones glaciológicas en la región Andino – Amazónica.

Fecha: Octubre 2008
Lugar: Porto Alegre - Brasil

g. Actividad: Participación del GTNH a la 4th EGU Alexander von Humboldt International Conference -The Andes: Challenge for Geosciences

Objetivo:

- Presentación de un Poster para dar a conocer las actividades del GTNH.
- Dar a conocer la redacción de la Declaración de Manizales sobre Cambio Climático y Glaciares.

Fecha: Nov 2008
Lugar: Santiago - Chile

h. Actividad: Participación del GTNH al Simposio - Taller internacional "Evaluación integral de impactos, vulnerabilidad y medidas de adaptación a los cambios globales en ecosistemas prioritarios de Iberoamérica": Iniciativa Red CYTED

Objetivo:

- Participación de miembros del GTNH en las discusiones y coordinaciones con la red CYTED.
- Establecimiento de lazos de colaboración con otras redes de investigación regionales.

Fecha: 15-17 junio 2009
Lugar: Venezuela

i. Actividad: Reunión de Coordinación de Programas, Proyectos y Grupos de Trabajo del PHI-LAC

Objetivo:

- Presentación de informe de actividades de los diferentes Programas de PHI y de grupos de trabajo del GTNH durante la gestión 2007-2008.
- Establecimiento de nuevas propuestas de colaboración entre grupos de trabajo PHI e interacciones regionales.

Fecha: 29/06/2009
Lugar: Asunción – Paraguay

j. Actividad: VIII Reunión de Comités Nacionales y Puntos Focales del Programa Hidrológico Internacional (PHI).

Fecha: 30 de Junio, 01 Julio 2009
Lugar: Asunción – Paraguay

k. Actividad: Presencia en: IAMAS-IAPSO-IACS Joint Assembly (MOCA – 2009)
www.moca-09.org

Fecha: 19-29 Julio 2009
Lugar: Montreal – Canadá

l. Actividad: Reunión de Coordinación proyecto PROSUL: "Técnicas de Percepción Remota aplicadas al Monitoreo Hidrológico y de cambios Climáticos en la Región Amazónica. Países: Brasil, Bolivia, Colombia, Perú

Fecha: 13-15 de julio de 2009
Lugar: Manaus – Brasil

1.7. Otras Actividades a nivel regional

1.7.1. Relaciones/cooperación institucionales

El nuevo directorio del CONAPHI se fijó como objetivo principal fortalecer las relaciones y la cooperación entre sus instituciones miembros, así como las relaciones externas. Para cumplir este objetivo se planificó llevar a cabo las siguientes actividades:

- Informar por diversos medios y a diferentes organismos gubernamentales, universitarios, privados y científicos en general, sobre la reconstitución del CONAPHI y la elección del nuevo Directorio.
- Editar y publicar el Boletín del CONAPHI y distribuirlo en forma extensa.

- Llevar a cabo proyectos en el marco del CONAPHI que involucren al mayor número posible de instituciones miembros, como es el caso de la conclusión del Balance Hídrico Microregional de Bolivia

.

1.7.2. Proyectos científicos concluidos y en marcha

a. Curvas IDF para diferentes categorías de análisis de eventos extremos para cinco ciudades de Bolivia La Paz, El Alto, Cochabamba, Santa Cruz y Trinidad

Evaluar los Eventos Extremos de precipitación en Bolivia y categorizar la construcción de las nuevas relaciones Intensidad Duración y Periodo de Retorno (IDF) mediante un análisis probabilístico de los valores extremos de precipitación en cinco ciudades principales de Bolivia La Paz, El Alto, Santa Cruz Cochabamba, Trinidad

b. Balance Hídrico Microregional de Bolivia

En la actualidad y a nivel global, el recurso agua se ha convertido en un factor primordial para el desarrollo de un país; en este sentido la cuantificación del potencial hídrico con que se cuenta y su distribución en el espacio y en el tiempo, constituye una información básica para emprender cualquier proyecto de desarrollo. En consecuencia se hace imperativo actualizar el Balance Hídrico Superficial de Bolivia que permitirá obtener información sobre la oferta hídrica y su comportamiento espacial y temporal.

El Balance Hídrico Superficial de Bolivia (Roche et al, 1992) es el único documento de alcance nacional que, en base a valores medios anuales, brinda información sobre la oferta de agua superficial por cuencas, basado en el análisis de los tres términos principales del balance: precipitación, evapotranspiración y escorrentía superficial. Este proyecto fue el primer balance hídrico que abarcó todo el territorio boliviano. Se consideraron ocho grandes cuencas hidrográficas y datos del periodo 1968-82.

El Balance Hídrico de 1992 es un documento de referencia importante cuando se desean considerar variables hidrológicas a nivel de macrocuencas, por lo que ha sido y es utilizado en estudios relacionados a la planificación de los recursos hídricos del país. Sin embargo es insuficiente para la gestión, aprovechamiento y asignación de derechos de agua, que exigen un mayor conocimiento de la variación temporal y espacial de la oferta. Para estos fines, se requiere un análisis de las variables hidrológicas a nivel mensual como mínimo, una discretización

espacial en subcuencas de menor extensión y en lo posible, series de datos más largos.

Solamente una cuenca está concluida, la del río Pilcomayo. Tres cuencas fueron concluidas de forma preliminar, son las siguientes:

- Cuenca Ichilo – Mamoré
- Cuenca de río Beni, parte andina
- Cuenca del Lago Titicaca

Estos balances hídricos preliminares carecen de los siguientes aspectos:

- Base de datos en formato HYDRACCESS
- Revisión de datos hidrológicos y cartográficos
- Informe final

c. Estudio de las tendencias de las series de precipitación pluvial y temperatura para Bolivia.

Esta en elaboracion la información contenida en estaciones ubicadas en las ciudades de La Paz, El Alto, Sucre y Potosi

2. ACTIVIDADES FUTURAS

2.1. Actividades planificadas hasta diciembre 2010.

a. Estudio de las tendencias de las series de precipitación pluvial y temperatura para Bolivia.

Información contenida en estaciones ubicadas en las ciudades de Santa Cruz, Trinidad Cobija, Tarija, Cochabamba, Oruro

2.2. Actividades previstas para 2011 – 2012.

a. Curvas IDF para diferentes categorías de análisis de eventos extremos

Hasta el año 2012 se concluirán las curvas IDF de las nueve capitales de departamento y de las estaciones que dispongan de pluviogramas

Se determinarán funciones adimensionales para discretizar o desagregar valores máximos de precipitación pluvial en 24 horas de estaciones de control de lluvia diaria

2.3. Actividades vislumbradas a largo plazo

a. Conservación de testigos de hielo (Patrimonio histórico climático), Casquete de hielo del nevado Illimani, La Paz, Bolivia

Durante la VIII Reunión de Comités Nacionales y Puntos Focales del PHI –LAC llevada a cabo en Asunción, Paraguay del 30 de Junio al 1 de Julio de 2009, la resolución PHI/LAC VIII-01 reitera el compromiso de sus miembros de buscar que las proposiciones resultantes de las reuniones sean elevadas a instancias superiores en nombre de la región.

En la misma reunión de Asunción, en la resolución PHI/LAC VIII-02 los Comités Nacionales y Puntos Focales del PHI-LAC reconocieron los esfuerzos realizados por el GTNH para el estudio de la glaciología y manifestaron su preocupación frente a la pérdida progresiva del PATRIMONIO HISTORICO CLIMATICO representado por los testigos de hielo como consecuencia de los impactos del cambio global y hacen un llamado a UNESCO para buscar los mecanismos adecuados para preservar los testigos de hielo patrimonio para estudios climáticos en el futuro.

El reporte anterior nos indica que es urgente la obtención de los testigos de hielo para su estudio ya que en los próximos años estaríamos viendo su completa desaparición.

b. Balance Hídrico Nacional.

Se concluirá el Balance Hídrico Nacional bajo la metodología empleada en la cuenca del río Pilcomayo. Como periodo común para el desarrollo de Balance hídrico micro-regional, se tomará el periodo 1970 – 2000, tomando en la cuenca que el Balance de la cuenca del río Pilcomayo tomó ese periodo, además los otros balances preliminares se desarrollaron en el mismo periodo; sin embargo se deja abierta la posibilidad de actualizar el Balance Hídrico Nacional en forma permanente.

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c. Curvas IDF para diferentes categorías de análisis de eventos extremos, análisis espacial de eventos extremos.

Una vez que se determinen las curvas IDF de las estaciones que disponen de pluviogramas y de las estaciones pluviométricas de control diario, estas últimas a través de la discretización de valores máximos de lluvia en 24 horas, se realizará el análisis espacial para diferentes duraciones y periodos de retorno

d. Estudio de las tendencias de las series de precipitación pluvial y temperatura para Bolivia

Información contenida en estaciones ubicadas en las ciudades de Santa Cruz, Trinidad , Cobija, Tarija, Cochabamba, Oruro

e. Elaboración del mapa de zonas áridas, semiaridas, y subhumeda secas de America Latina

Objetivo.- Implementar la metología al territorio nacional, utilizando el sistema CIRH

Dr. Miguel Angel Ontiveros Mollinedo
DIRECTOR GENERAL
SERVICIO NACIONAL DE METEOROLOGIA E HIDROLOGIA

RESUMEN DEL INFORME NACIONAL SOBRE ACTIVIDADES COMITÉ NACIONAL DE HIDROLOGIA Y METEOROLOGIA 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, este comité representa actualmente el Comité Nacional del Programa Hidrológico Internacional de la UNESCO (CONAPHI – COSTA RICA).

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	: Sr. Sadí Laporte M.
Instituto Meteorológico Nacional	: Sr. Juan Carlos Fallas
Instituto Costarricense de Acueductos y Alcantarillados	: Sr. Carlos Vargas
Servicio Nacional de Aguas Subterráneas y Avenamiento	: Sr. Carlos Romero
Departamento de Aguas, Ministerio Ambiente y Energía	: Sr. José Miguel Zeledón

1. Actividades realizadas en el período julio 2008 a mayo 2010.

1.1 Reuniones del Comité Nacional del PHI

1.1.1 Decisiones concernientes a la composición del Comité Nacional del Programa Hidrológico Internacional (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.

Actualmente se mantienen los miembros de este comité, a través de los representantes arriba mencionados y las reuniones se realizan de acuerdo al reglamento.

1.1.2 Estado de las actividades del PHI - VII

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.

El principal hilo conductor en la sétimo fase son: interdependencia de los sistemas, sometidos a estrés y respuesta sociales.

Dentro de la Sétima Fase del PHI en el marco conceptual de proponen los siguientes temas: a) Adaptación a los efectos de los cambios mundiales de las cuencas fluviales y los sistemas de acuíferos b) Mejorar las gestión de los recursos hídricos para la sostenibilidad de sustento de la vida. e) La educación relativa al agua para el desarrollo sostenible.

- **PROGRAMAS TRANSVERSALES**

Dentro de los programas de FRIEND Y HELP relacionados con la sétima fase, el CONAPHI de Costa Rica, ha participado en los siguientes:

- **PROGRAMA FRIEND: (REGÍMENES DE FLUJO DETERMINADOS A PARTIR DE SERIE DE DATOS INTERNACIONALES EXPERIMENTALES Y DE REDES)**

Este programa ayuda a establecer redes regionales para el análisis de datos hidrológicos mediante el aprovechamiento compartido de datos, conocimientos y técnicos en el plano regional.

El Programa FRIEND AMIGO LAC actualmente aborda los siguientes temas de trabajo:

- Mejorar la comprensión de la variabilidad espacial y temporal del régimen hidrológico a escala regional.

- Compartir datos provenientes de redes de observación seleccionadas y en cuencas experimentales.
- Compartir y mejorar las herramientas para el análisis hidrológico
- Detectar tendencias debidas a la variabilidad y al cambio climático

En años anteriores Costa Rica ha participado activamente en el Programa FRIEND donde ha presentado los siguientes temas:

" 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.

Del 17 al 20 de mayo del 2010 se efectúo una Reunión de Expertos FRIEND – IFI, en Lima, Perú donde se definieron las metodologías a seguir para definir proyecto de Máximos Hidrológicos y el de Base de Datos del PHI–LAC.

En esta reunión de definió el cronograma de actividades para el 2010 y 2011, donde Costa Rica se comprometió a participar en dicho proyecto, con los fichas técnicos de eventos extremos de inundaciones y aplicar las metodologías para la envolvente de precipitaciones máximas nacionales.

PROGRAMA HELP: (PROGRAMA HIDROLOGÍA AL SERVICIO DEL MEDIO AMBIENTE, LA VIDA Y LAS POLÍTICAS).

Este programa tiene un nuevo planteamiento de la gestión integrada de cuencas, mediante el establecimiento de un marco de trabajo en el tema de legislación y políticas relativas a los recursos hídricos, los gestores y los científicos para trabajar de manera conjunta en los problemas relacionados con los recursos hídricos.

A finales del año 2008, Costa Rica presentó al PHI-LAC, la cuenca de Río Reventazón, como cuenca HELP, siendo un honor para el país esta designación, el Ing. Guillermo Flores, Director Ejecutivo de la Comisión Ordenamiento y Manejo de Cuenca Alta del Río Reventazón (COMCURE), es el representante de HELP en Costa Rica.

En mayo de 2009, participó en una reunión de coordinación en Guayaquil, Ecuador, donde se elaboró el cronograma de actividades para los próximos años y se dictó el "Taller HELP de Indicadores de Manejo Integrada de Cuencas Hidrográficas".

Para un futuro en este proyecto se estudiarán los indicadores biológicos de calidad del agua en la cuenca del Reventazón.

Dentro de este programa se participó en un curso en línea sobre "Cosecha de Agua", donde participaron varias instituciones nacionales y que fue coordinado por la Universidad de Guayaquil y el Programa HELP.

En julio de 2009, se realizó en Costa Rica el Taller Índice de Sostenibilidad Cuenca de Río Reventazón, impartido por el Dr. Henrique Chaves del Programa HELP, en él participaron varias instituciones nacionales relacionadas en el manejo de cuenca.

Al respecto Costa Rica concluyó el estudio de Índice de Sostenibilidad de la cuenca del Río Reventazón, actualmente el documento está en las Oficinas Regionales del PHI-LAC para su revisión y publicación.

PROGRAMAS ASOCIADOS

PROGRAMA ISARM: (INICIATIVA SOBRE LA GESTIÓN DE RECURSOS DE ACUÍFEROS TRANSNACIONALES)

Consiste en establecer una red de especialistas para llevar a cabo un inventario de los acuíferos transfronterizos y prácticas idóneas e instrumentos en materia de gestión de recursos de aguas subterráneas compartidas.

En la actualidad Costa Rica ha venido participando desde el 2003 en este programa.

Del 1 al 3 de diciembre del 2008 se realizó en República Dominicana el VI Taller de Coordinación, en el se finiquitaron detalles sobre la tercera etapa del proyecto que consistió en la revisión de la tercera publicación sobre Aspectos Socioeconómicos y Ambientales de los Acuíferos Transfronterizos de las América.

En el periodo comprendido entre los días del 15 al 17 de Setiembre del 2009 se realizó en Quito, Ecuador el VII taller de coordinación del Proyecto. En esta reunión se coordinaron aspectos sobre la tercera publicación y se procedió a la revisión final de éste. Además se inició la cuarta etapa que consiste en definir una Estrategia Regional para La Gestión Integrada de Manejo de los Sistemas Acuíferos Trasfronterizos en el Continente Americano.

Del 4 al 7 de mayo se realizó en Costa Rica, un taller Organizado por la OEA en el cual participan los coordinadores del Proyecto ISARM para Centroamérica. El principal objetivo del taller consintió en la formulación de una nueva propuesta del proyecto para el "Estudio Técnico de los Acuíferos Transfronterizos de Mesoamérica".
El Coordinador por Costa Rica, para este proyecto es el Sr. Rodrigo Calvo Porras, funcionario del Instituto Costarricense de Electricidad.

- **PROYECTO IFI: (IINICIATIVA INTERNACIONAL SOBRE INUNDACIONES)**

Esta promueve el planteamiento integrado de la gestión de las inundaciones que saca provecho de los beneficios de éstas o el uso de llanuras inundables; reduciendo al mismo tiempo los riesgos sociales, ambientales y económicos.

En el Taller Nacional para Latinoamérica y el Caribe sobre Crecida y Gestión de Riesgos de Inundaciones, realizado en México en 2007, se presentó la idea de formar un grupo de trabajo IFI-PHI-LAC, en este tema. La coordinación de este proyecto estará a cargo de CONAPHI de México y FRIEND.

En la reunión de mayo 2010 en Lima, Perú, se comentó la metodología y el cronograma de actividades 2010-2011. Es este evento Costa Rica presentó una ponencia sobre las inundaciones en nuestro país, a cargo del Sr. Sadí Laporte M.

Costa Rica participará en este proyecto en coordinación con el Programa FRIEND/AMIGO, CONAPHI-Costa Rica y IFI-PHI-LAC donde tendrá a cargo realizar un inventario a nivel nacional de lluvias máximas con el fin de elaborar un Curva Envolvente Regional de Lluvias Máximas para la región de América Central.

- **PROGRAMA ISI: (INICIATIVA INTERNACIONAL SOBRE SEDIMENTACIÓN)**

Se evalúa la erosión y el transporte de sedimentos a diferentes ambientes, donde se hace un planteamiento holístico para la recuperación y conservación de las aguas superficiales vinculadas con la ciencia, política y gestión.

El CONAPHI de Costa Rica participa en el proyecto ISI/GEST, sobre sedimentos en especial el análisis de éstos en los embalses de las plantas hidroeléctricas, también el análisis de metodologías para la estimación de la erosión hídrica y su distribución geo-espacial.

En agosto 2008 en Panamá, Costa Rica participó en la Reunión de Coordinación ISI-LAC y en el Taller de Sedimentos, con el representante de este programa Ing. José Zúñiga M.

Además Costa Rica representó el coordinador del Programa ISI-LAC en la Reunión del Comité Director del IRTCES, realizado en noviembre de 2008, en Beijing, China.

Se sigue participando en el Plan de Trabajo ISI-LAC, de acuerdo a los compromisos adquiridos para lograr los objetivos de ISI en le región LAC.

La participación en estos eventos ha sido de gran importancia para el país y para el Instituto Costarricense de Electricidad en la toma de sedimentos en embalses y control de la erosión.

- **PARTICIPACIÓN EN OTROS PROGRAMAS:**

- **PROGRAMA ECOHIDROLOGÍA**

Dentro del Programa Ecohidrología para América Latina, Costa Rica ha venido participando activamente en éste.

En años anteriores se han realizado talleres internacionales sobre Estimación de Caudales de Compensación (ambientales), en sistemas regulados por proyectos hidroeléctricos, organizado el Comité Nacional de PHI de Costa Rica, con el apoyo del Comité Regional y PHI – LAC UNESCO.

En noviembre del 2008 se realizó en San José, Costa Rica el curso Regional Itinerante en Gestión Integrada de los Recursos Hídricos con el auspicio de PHI – LAC / UNESCO, es éste hubo participación de varias instituciones relacionadas con el recurso hídrico, siendo el instructor el Dr. Marcelo Gaviño.

Dentro del tema de Caudales Ambientales, Costa Rica participarán en París, Francia el 2-3 de julio en el "10th Kovacs Colloquium 2010 Hydrocomplexity: New Tools for Salving Wicked Water Problems. La señora Anny Chaves Quirós tendrá el honor de participar con una conferencia sobre "Caudales de Compensación en Costa Rica".

- **PROYECTO DE BALANCE HÍDRICO**

Se concluyó el balance hídrico superficial de Costa Rica a nivel anual para las 34 cuencas del país, considerando las variables de precipitación, escorrentía superficial y evapotranspiración para el período 1970-2002

Este proyecto fue elaborado por el Instituto Costarricense de Electricidad y el Instituto Meteorológico Nacional, con el apoyo de las demás instituciones del CONAPHI de Costa Rica, además se contó con la asesoría de UNESCO – PHI-LAC y el CRRH.

La publicación del Balance Hídrico, Documento Técnico N^{a} 1, fue financiado por la UNESCO/PHI-LAC.

En la página web de PHI-LAC se puede ver dicho estudio http://www.unesco.org.uy/phi

Posteriormente la Dirección de Aguas del MINAET con el apoyo del CONAPHI-CR concluyó otro balance a nivel mensual para las 15 principales cuencas de Costa Rica.

- **PROGRAMA DE AGUA Y EDUCACIÓN PARA LAS AMÉRICAS Y EL CARIBE**

El programa de PHI-UNESCO firmó un convenio con la Fundación del Proyecto WET para desarrollar el Programa de Agua y Educación, dirigido a educadores de niveles preescolar a preparatoria.

Costa Rica tuvo gran participación en la formulación de la propuesta educativa, presentando un ejercicio sobre el cambio climático, este fue acogido para que formara parte del programa.

En la actualidad se concluyó la "Guía de Agua y Educación para Costa Rica", coordinado por el CONAPHI-Costa Rica y la Fundación Terra Nostra.

Una vez revisada esta guía por PHI-LAC se espera organizar talleres para formación de facilitadores de éste programa y posteriormente impartirlo a educadores. Para esto es necesario hacer un convenio con el PHI-LAC/UNESCO.

En junio 2009, se realizó en taller en Guatemala sobre Agua y Educación donde Costa Rica participó a través del Comité Regional de Recursos Hídricos (CRRH).

Para los próximos meses Costa Rica participará en el Proyecto GRAPHIC que está relacionado con el efecto del cambio climático en los acuíferos, también el Proyecto "Agua y Género".

En los años anteriores se participó en “Agua y Cultura” para América Central” , en el Mapa de Zonas Áridas y Semi-áridas con CAZALAC, en el Programa Mundial de Evacuación y Cartografía Hidrogeológica, (WHYMAP) y en el Programa del Conflicto Potencial a la Cooperación Potencial. (PCCP).

1.2 ACTIVIDADES A NIVEL NACIONAL DENTRO DEL MARCO DEL PHI

- **PARTICIPACIÓN DEL CONAPHI-COSTA RICA EN REUNIONES ESTATUARIA DE COMITÉS NACIONALES Y PUNTOS FOCALES DE PHI DE AMÉRICA LATINA Y EL CARIBE**

En el período de julio 2008 a mayo 2010, nuestro país a través del Presidente del CONAPHI-Costa Rica, señor Sadí Laporte M. a participó en la Reunión Estuatoria de los Comités Nacionales y Puntos Focales del Programa Hidrológico Internacional de América Latina y el Caribe, en Asunción, Paraguay, del 30 de junio al 3 de julio de 2009, en esta reunión Costa Rica presentó un informe sobre los avances de las actividades del PHI-LAC.

En este último evento la Hidróloga Regional Dra. María Donoso, felicitó al CONAPHI- Costa Rica por su participación activa en los programas del PHI-LAC-UNESCO.

Además Costa Rica presentó en el programa de Ecohidrología el tema de Caudales Ambientales en dos cuencas del país, donde se mereció una felicitación por el trabajo realizado por parte del señor Shahbaz Khan.

1.2.1 Certámenes Científicos y Técnicos Nacionales / Locales

Dentro de las actividades del CONAPHI-CR se han realizado varios certámenes en coordinación con otras instituciones reaccionadas con el recurso hídrico.

1.2.2 Participación en Comités de Dirección / Grupos de Trabajo

El CONAPHI de Costa Rica a través de sus miembros ha participado en las siguientes actividades:

- Participación en la Reunión de Puntos Focales de la Red Interamericana de Recursos Hídricos de América Latina y el Caribe, OEA/PHI-LAC.
- En la Estrategia Nacional del Plan de Manejo Integral del Recurso Hídrico.
- Iniciativa de Paz con la Naturaleza en el tema del cambio climático.
- Reglamento para la evaluación y clasificación de la Calidad de Cuerpos de Agua Superficiales. Decreto No.33903-MINAET.
- Reunión sobre National Economic, Environment and Development Study for Climate Change, en INCAE, San José, Costa Rica.
- Participación en la elaboración del “Día Mundial del Agua” y del “Día Mundial del Ambiente”, con diferentes instituciones nacionales.
- Participación en las presentaciones del “Diagnóstico Biofísico para Costa Rica” del Proyecto de Mejoramiento de Capacidades Nacionales para la Evaluación de

la Vulnerabilidad y la Adaptación del Sistema Hídrico el Cambio Climático en Costa Rica.
- Participación en encuesta sobre "Proyecto Hídrico del PHI-LAC"
- Participación en el Comité Asesor Técnico de Hidrometeorología y ríos de la Comisión Nacional de Emergencia.
- Participación en la Reunión de Seguimiento de 5to. Foro Mundial del Agua, realizado en San José, Costa Rica en noviembre 2009.
- Apoyo por parte del CONAPHI-Costa Rica a los proyectos sobre recursos hídricos que coordina el Comité Regional de Recursos Hídricos, organismo de SICA.

1.2.3 Proyectos de investigación o de aplicación apoyados o patrocinados

El CONAPHI-CR a través de los programas transversales y asociados participa en varios proyectos que se menciona en el apartado 1.1.2

1.2.4 Colaboración con otras organizaciones o programas nacionales e internacionales

El CONAPHI Costa Rica tiene colaboración con varias instituciones mundiales en el ámbito de los recursos hídricos.

1.3 Cursos académicos o de adestramiento

En el apartado 1.1.2 se detallan algunos cursos o talleres que se han realizado en el Programa de PHI-LAC, así como los talleres nacionales organizados por el CONAPHI –Costa Rica con el auspicio del PHI-LAC.

1.4 Cooperación con el Instituto UNESCO – IHE para la Educación Relativa el Agua y centros internacionales regionales relacionados con los recursos hídricos bajo los auspicios de la UNESCO.

En el año 2008 el Ing. José Alberto Zúñiga Mora, quien representa a Costa Rica en el Programa ISI-LAC, participó en una reunión sobre Sedimentos en Beijing, China.

A nivel del CONAPHI Costa Rica de hacen gestiones para promover la capacitación de profesionales en el tema de recursos hídricos, buscando el apoyo del Instituto UNESCO – IHE, además tenemos colaboración con otros centros como CAZALAC y el Water Assessment & Advisory Global Network. Zaragoza, España.

1.5 Publicaciones:

Las instituciones que forman el CONAPHI-Costa Rica han publicado numerosos estudios que se encuentran en la página WEB de éstas.

-La última publicación con el PHI-LAC, fue el "El Balance Hídrico".
- La "Guía de Agua y Educación" para Costa Rica está en revisión y publicación por parte del PHI-LAC.
-El Índice de Sostenibilidad de la Cuenca del Río Reventazón esta en iguales condiciones que la anterior.

1.6 Participación certámenes científicos internacionales.

El CONAPHI – Costa Rica a través de sus instituciones miembros, ha participado en varios eventos científicos a nivel nacional e internacional.

1.7 Otras actividades a nivel regional

1.7.1 Relaciones / cooperación institucionales

A través de las reuniones se van establecer cooperaciones con otras instituciones y universidades latinoamericanas.

1.8 Otras actividades sobre recurso hídrico donde participa el CONAPHI-CR con el Ministerio de Ambiente, Energía y Telecomunicaciones.

(Informe suministrado por el Sr. José Miguel Zeledón, Director de la Dirección de Aguas del MINAET)

-Política Hídrica Nacional

El lunes 30 de noviembre de 2009 en acto público masivo se oficializó por parte del Ministro del MINAET la Política Hídrica Nacional,

"Esta Política de Estado, es el marco de acción del sector hídrico para permitirnos atender y solventar a largo plazo los problemas en la gestión del agua, desde la perspectiva de agua como recurso y como servicio, en apego a la efectiva implementación del Plan Nacional de Gestión Integrada de los Recursos Hídricos, instrumento fundamental en la búsqueda del desarrollo que los costarricenses anhelamos.

Los lineamientos establecidos integran aspectos técnicos, sociales, económicos, legales, institucionales y ambientales del agua, en una gestión apegada a la realidad del país, con proyección a futuro, cuyos ejes estratégicos giran en torno a aspectos de gobernabilidad del sector hídrico, competitividad, sostenibilidad, desarrollo del conocimiento, creación de una cultura del agua, vulnerabilidad y adaptación frente al cambio climático; la participación social y la formación de alianzas estratégicas" *(presentación del documento de Política Hídrica Nacional por parte del Sr. Ministro de Ambiente, Energía y Telecomunicaciones Ing. Jorge Rodríguez ´página 7. Noviembre 2009)*

La política contempla los principios rectores que permitan avanzar en la gestión integrada de los recursos hídricos, y que se citan a continuación:

Derecho humano fundamental de acceso al agua potable y saneamiento básico.
Debe reservase el agua requerida para asegurar que todas las personas tengan acceso universal y solidario al agua, en condiciones adecuadas de calidad, cantidad y continuidad como un derecho humano fundamental; para garantizar y sostener la vida, la salud, el desarrollo y el medio ambiente. En estos mismos términos, todos tienen derecho al saneamiento básico como derecho humano.

Bien de dominio público.
El agua es un bien de dominio público, su conservación y uso sostenible son de interés social. (Ley Orgánica del Ambiente No. 7554 del 4 de octubre de 1995, en su artículo 50).

Enfoque ecosistémico e integral del manejo del agua.
La gestión eficaz de los recursos hídricos requiere un enfoque integrado que concilie el desarrollo económico, social y la protección de los ecosistemas naturales. El manejo del recurso hídrico se realizará valorando y respetando su relación con los ciclos naturales de los ecosistemas de soporte conectados con las cuencas hidrológicas, para asegurar su disponibilidad y calidad.

Prioridad del uso del agua para consumo humano.
En caso de reducción de la cantidad, calidad, continuidad o conflictos entre los diversos usos, debe prevalecer el uso del agua para consumo humano sobre los otros aprovechamientos, como elemento de protección de la salud pública.

Unidad territorial de planificación y gestión.
Se reconoce la cuenca hidrológica como unidad básica territorial de planificación y gestión.

Valor del agua social, ambiental y económico, en sus múltiples usos.
Los beneficiarios del sistema de gestión integrada del agua deben contribuir a los diferentes costos de su establecimiento, mantenimiento y distribución sobre una base equitativa y solidaria, para fomentar conductas de ahorro y protección, bajo criterios de uso múltiple

Aprovechamiento sostenible del agua.
El recurso hídrico debe ser desarrollado, asignado y gestionado equitativamente en todos los sectores y usuarios, conservando la cantidad, calidad, continuidad y seguridad deseada del agua en forma sostenible.

Participación de los actores sociales en la gestión del recurso hídrico.
La gestión del recurso hídrico debe inspirarse en un planteamiento basado en la participación de los usuarios y los diferentes actores sociales en los diferentes niveles de gestión.

Contaminador pagador
El Estado deberá garantizar la internalización de los costos ambientales y sociales de la contaminación de manera que dichos costos los asuma quien los provoca.

Bajo la gestión de estos principios, la Política Hídrica Nacional enmarca la gestión del agua en 8 lineamientos estratégicos que determinan la dirección de la política, estos son:

i. Gobernabilidad del Sector Hídrico
ii. Garantizar el Derecho Humano Fundamental al acceso a agua potable
iii. Competitividad en el sector hídrico
iv. Sostenibilidad del recurso hídrico
v. Desarrollo del conocimiento
vi. Creación de una cultura del agua
vii. Vulnerabilidad y adaptación al cambio climático
viii. Participación social y formación de alianzas estratégicas

-Plan Nacional de Gestión Integrada de los Recursos Hídricos (PNGIRH)

En forma conjunta con la Política Hídrica Nacional, el lunes 30 de noviembre de 2009 en acto público masivo se oficializó el PNGIRH por parte del Ministro del MINAET, primero que Costa Rica alcanza realizar y cuarto en Latinoamérica después de Brasil, Argentina y México.

> ***"Cambiar el modelo de gestión del agua en nuestro país no es una tarea sencilla. Al contrario, es un desafío social y financiero. La elaboración de este Plan es el primer paso hacia un mejor futuro. Para que las metas de este documento salgan del papel a la realidad, todos los sectores, instituciones y ciudadanos de nuestro país, tendrán que juntar fuerzas: desde el Gobierno Central hasta los Gobiernos Locales, desde la Asamblea Legislativa hasta las asociaciones comunales y de desarrollo".*** (Sr. Presidente de la República Dr. Oscar Arias Sanchez, Prologo del Plan)

El PNGIRH es el documento orientador e indicativo que integra del conjunto de iniciativas de acciones y proyectos prioritarios que en su conjunto permiten alcanzar los objetivos establecidos en términos de metas de corto, mediano y largo plazos, con base en el cual deben desarrollarse los planes hídricos regionales, planes sectoriales e institucionales, así como proyectos específicos en su definición detallada en términos de costos y beneficios, su programación en el tiempo, los responsables de ejecutarlos, los requerimientos financieros e institucionales, y las acciones complementarias.
Estable asimismo, los lineamientos necesarios para iniciar su implementación, así como los indicadores de impacto para darle seguimiento, evaluar su cumplimiento y hacer los ajustes necesarios.

La generación de iniciativas incorporadas dentro del PNGIRH tienen su origen en dos ámbitos, primero, la visión de país y segundo la visión local a fin de incorporar las aspiraciones y visiones de autoridades, usuarios y grupos sociales de cada cuenca o región, a través de talleres participativos diseñados con este propósito.
Las distintas iniciativas, se sometieron a un proceso de evaluación que determina finalmente su incorporación dentro del PNGIRH y su ubicación dentro del horizonte de planificación (corto, mediano y largo plazos).

Objetivos del PNGIRH:

- Garantizar el abastecimiento de agua en el país
- Alcanzar la racionalidad y sustentabilidad en la gestión del agua (optimizar uso y protección)

Este primer Plan Nacional de Gestión Integrada de los Recursos Hídricos (PNGIRH), era una acción estratégica dentro Plan Nacional de Desarrollo 2006-2010 y por tanto forma parte de las acciones del sector ambiente, energía y telecomunicaciones dispuestas en el Contrato con la Ciudadanía que firman el Sr. Presidente de la República y el Ministro de Ambiente y Energía[1].

[1] De los compromisos anotados en el Plan Nacional de Desarrollo del Gobierno de la República, se tomaron las acciones estratégicas de cada
sector y se elaboró un documento que suscribieron públicamente en compromiso de cumplimiento el Presidente de la República y el Ministro rector del sector correspondiente, a lo que se llamo "*CONTRATO CON LA CIUDADANIA*", además en el caso del MINAE, el Sr. Ministro suscribe con sus Viceministros un compromiso de cumplimiento de las acciones estratégicas del sector medio ambiente energía y telecomunicaciones.

Para facilitar la construcción e implementación del Plan Nacional para la Gestión del Recurso Hídrico, el Gobierno de Costa Rica a través de la Dirección de Aguas del Ministerio de Ambiente, Energía y Telecomunicaciones, miembro del Comité Nacional de Hidrología y Meteorología, con apoyo del Programa de las Naciones Unidas para el Medio Ambiente (PNUMA), desarrollo un proceso de capacitación en torno a la Gestión Integrada del Recurso Hídrico a nivel local y nacional por medio de cinco talleres regionales y uno nacional, donde participaron funcionarios de las instituciones del sector hídrico y miembros del Comité Nacional de Hidrología y Meteorología.
A través de memoria permitió el desarrollo de capacidades locales a nivel nacional en la GIRH y Planes Nacionales en mas de 400 personas, que de una u otra forma, directa o indirectamente son parte de la gestión local de este valioso recurso; lo cual permite contar con una base sólida para facilitar la construcción del Plan Nacional y posterior implementación.
Se realizaron cinco talleres regionales en seis diferentes zonas del país a saber: San Isidro de Pérez Zeledón el 05 de Diciembre del 2006, Santa Cruz Guanacaste el 08 de Diciembre del 2006, San José el 13 de Diciembre del 2006, Guápiles, Pococí el 17 de Enero del 2007 y Muelle de San Carlos el 19 de Enero del 2007.
Se logro capacitar al menos 400 personas provenientes de múltiples y variadas instituciones públicas así como de la academia y representación de la comunidad indígena, miembros de Asociaciones Administradoras de Acueductos y Alcantarillados Comunales, personal de múltiples empresas privadas, Organizaciones no Gubernamentales y publico en general.
Luego con el apoyo financiero y de experto en la gestión integrada de recurso hídrico de la Asociación Mundial para el Agua (GWP por sus siglas en ingles) y en el marco de un proyecto regional de ***Iniciativas de Diálogos Nacionales Avanzando Hacia un Cambio de Cultura y Gobernabilidad en la Gestión del Agua***, con el fin de contribuir y promover el proceso de construcción del PNGIRH, ejecutó cuatro talleres locales.
Se tomó la misma base de actores capacitados en los cinco talleres anteriores de desarrollo de capacidades en la gestión Integrada de los recursos hídricos.

Cartera de las principales iniciativas del PNGIRH

La Cartera de Iniciativas esta integrada por programas, proyectos y acciones de carácter estructural (infraestructura hidráulica para los diversos sectores de uso) y no estructural (planes, programas de gestión por cuenca, constitución de organizaciones de usuarios, normas de distinto tipo, incentivos económicos y otros). Estas iniciativas se encuentran en distintos niveles de definición (idea, estudio, gran visión, prefactibilidad, factibilidad, proyecto ejecutivo, obra en proceso. Idealmente, el PNGIRH contribuirá a dar seguimiento a la evolución de cada iniciativa para determinar la posible fecha de ejecución y puesta en marcha en el marco de las prioridades establecidas.

Elementos habilitadores del Plan

Si bien las inversiones directas en acciones y proyectos de aprovechamiento hídrico correspondientes a las iniciativas puntuales de las instituciones del sector hídrico, son importantes y forman la columna vertebral del PNGIRH, se necesita una serie de elementos medulares que la harán funcionar de manera efectiva y eficiente para lograr los objetivos y metas propuestos. Así mismo, para un efectivo aprovechamiento del agua es necesario tomar una serie de medidas que permitan poner en práctica la gestión integrada del recurso.
Estas elementos habilitadores que hacen posible la implementación del Plan, se refieren a las acciones en materia legal, institucional y de asignación de las inversiones públicas y de facilitación de las inversiones privadas, así como las acciones de socialización y de promoción de una mayor participación de la sociedad civil y sector privado.

-Balance Hídrico

Actualmente el Gobierno cuenta con el primer Balance Hídrico Oferta-Demanda realizado para las principales 15 cuencas hidrológicas del país. Se trata de la determinación de la disponibilidad promedio de agua **por mes** y por **cuenca** para efectos de Planificación de la Gestión de Agua. Este instrumento se encuentra en digital en el Sistema de Información Geográfica de la Dirección de Aguas.

El Balance Hídrico fue elaborado por el Instituto Mexicano de Tecnología del Agua (IMTA), que contempla la oferta de agua y los requerimientos bajo diferentes escenarios de desarrollo, así como una recopilación de las iniciativas de inversión en el sector programadas por las instituciones principales. Se compararon también estas iniciativas con la demanda esperada, para identificar aquellos vacíos esperados, a nivel de 16 cuencas.

Se efectuó un cálculo del balance hídrico oferta-demanda y la disponibilidad de agua anual y mensual en las 16 cuencas definidas como prioritarias por el Comité Nacional de Hidrología y Meteorología de Costa Rica. La metodología utilizada en los balances hídricos es la que se presenta en UNESCO (2006)[2] y para estimar la disponibilidad de agua se utilizó la metodología presentada en SEMARNAT (2002)[3]

El balance hídrico a nivel nacional sugiere que el país como un todo, no afronta problemas de escasez de agua y las diversas proyecciones que se han realizado bajo diversos escenarios, revelan que la disponibilidad del recurso debería dar abasto para los requerimientos de los diversos usuarios en el mediano y largo plazos. Como se deduce de las proyecciones de demanda a nivel país, las demandas de agua para usos consuntivos no llegarán a representar, para cualquier escenario, más del 10% de la disponibilidad total de recursos hídricos.

Sin embargo, debido a que el análisis se realizó a nivel de cuencas, este estimado no refleja problemas asociados a la concentración espacial de la población, a la actividad económica, a la temporalidad en la ocurrencia del agua y a la degradación de su calidad. Esta última es consecuencia de los vertidos que se realizan a los cauces sin tratamiento previo o que se infiltran indiscriminadamente al subsuelo y tiene un impacto directo sobre la disponibilidad efectiva de agua.

- Registro Nacional de Concesiones de Aprovechamiento de Aguas

Para que el sector hídrico contribuya al bienestar de los habitantes del país, mediante una gestión integrada y sostenible del recurso hídrico, que garantice su disponibilidad en cantidad y calidad apropiadas para las necesidades de crecimiento que el país tiene en un ambiente sano y ecológicamente equilibrado, de existir un manejo oportuno de la información relativa al aprovechamiento del agua por los diferentes sectores se constituye en uno de los pilares para el control del Balance Hídrico, de ahí la importancia del haber sistematizado y digitalizado el Registro Nacional de Concesiones de Aprovechamiento de Agua que ha sido colocado al servicio de la sociedad mediante un sistema interactivo en Internet.

El sistema automatizado actual es único a nivel de la región centroamericana, operativiza el ***Registro Nacional de concesiones de Aprovechamiento de Aguas,*** con capacidad para

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[2] UNESCO (Organización de las Naciones Unidas, para la Educación, la Ciencia y la Cultura). 2006. *Evaluación de los recursos hídricos. Elaboración del balance hídrico integrado por cuencas hidrográficas.* Programa Hidrológico Internacional de la UNESCO para América Latina y el Caribe. Documento Técnico No.4.

[3] SEMARNAT (Secretaria de Medio Ambiente y Recursos Naturales), 2002. Norma Oficial Mexicana NOM-011-CNA-2000. Conservación del Recurso Agua. Que Establece las Especificaciones y el Método para Determinar la Disponibilidad Media anual de las Aguas Nacionales. Diario Oficial, México

sistematizar todos los aprovechamientos de aguas tanto superficiales como subterráneas, ya sea los autorizados a través de la concesión, como los aprovechamientos inscritos a nombre de instituciones del Estado, y la inscripción de caudal a las Asociaciones Administradoras de Acueductos y Alcantarillados (ASADAS) rurales de todo el país.

Se constituye en una herramienta tecnológica que asegura un manejo eficiente de la información referida al aprovechamiento de agua en nuestro país y que se constituye en una fuente oficial de consulta nacional e internacional, para lo cual se dispone de multicriterios de búsqueda tales como distrito, cantón, cuenca, río, cliente, expediente; que dan flexibilidad para acceder a diferentes productos o reportes en la materia.

Otra de las bondades del sistema es que permite en forma particular que cada uno de los clientes (concesionarios), conozcan en tiempo real acerca de su trámite, así como dar seguimiento a su expediente en aspectos tales como vigencia de su derecho, entre otros y tener control personalizado de cambios de su perfil de cliente y de su pago del canon por aprovechamiento de agua.

Este Registro Nacional de Concesiones de Aprovechamiento de Aguas, se constituye en un sistema modelo a nivel en la región centroamericana, como herramienta tecnológica interactiva que complementará la toma de decisiones y facilite la gestión de agua en materia de asignaciones futuras y el desarrollo de actividades del sector productivo.

Está al servicio de toda la comunidad nacional e internacional en la pagina Web: www.drh.go.cr

2. Actividades futuras:

2.1 Actividades planificadas hasta diciembre 2010

- Efectuar una reunión con el nuevo especialista del sector de Ciencias Naturales de UNESCO-Costa Rica, señor Jonathan Baker, con el fin de coordinar proyectos con la Oficina Regional UNESCO-Costa Rica.
- Realizar dos reuniones con los miembros del CONAPHI-Costa Rica.
- Proyecto de fortalecimiento del CONAPHI-Costa Rica
- Participación en la Reunión del Programa ISARM a realizarse en México.

2.2 Actividades previstas para 2011-2012

- Editar la guía para Costa Rica de Agua y Educación.
- Lograr formalizar un convenio entre el Ministerio de Educación (MEP) y el PHI-LAC, UNESCO, con el fin de que el MEP utilice esta guía en forme oficial.
- Publicación de la “Revista Técnica en Hidrología LAC” sobre Caudales Ambientales en Costa Rica.
- Publicación del Estudio de Índice de Sostenibilidad de la Cuenca del Río Reventazón.
- Mayor participación en los proyectos de la Sétima Fase en los programas transversales, asociados y regionales.

- Participación en el subtema de repercusiones del cambio climático en el ciclo hidrológico y los consiguientes efectos de los recursos hídricos.
- Participación en la resolución entre el nexo entre agua o energía a nivel de cuenca.
- Participación en los riesgos hidrológicos, fenómenos hidrológicos extremos y desastres relacionados con el agua.

2.3 Actividades vislumbradas a largo plazo

- Gestión y contabilidad ambiental basada en riesgos.
- Protección de la calidad del agua para propiciar medios de vida sostenibles y reducción de la pobreza.
- Educación vinculada al agua en las escuelas.
- Incrementar el número de los especialistas en ciencias del agua en Costa Rica.
- Elaborar el “Plan Hidrológico Nacional”

Propuestas de Costa Rica para esta reunión:

- Recomendar al Consejo Internacional Gubernamental que se establezcan mecanismos para estructura al PHI, sobre la base de consejos Regionales, esto facilitaría la mayor participación de los países miembros.
- Solicitar apoyo para Costa Rica en la Estrategia Nacional de Cambio Climático.
- Mayor apoyo a los CONAPHI-Costa Rica para que puedan participar en las reuniones del Consejo Intergubernamental de PHI.

COMITÉ NACIONAL CUBANO
PHI – UNESCO

Informe sobre actividades realizadas por el Comité Nacional Cubano

Introducción

El Comité cubano del PHI-UNESCO fue uno de los primeros CONAPHI creados en América Latina y Caribe (1975), como continuador de las actividades del Decenio Hidrológico Internacional (1965 – 1975).

Desde esa fecha, ha mantenido su desempeño, no siempre de forma sistemática, pero con presencia en la Región. En todo este período se han desarrollado numerosas actividades y proyectos de cooperación e investigación en el campo de las Ciencias del Agua. Su última reestructuración ocurrió a principios de de 2008.

Las formas básicas actuales que caracterizan el trabajo del Comité, son las siguientes:

- El Comité celebra tres reuniones anuales, alternando sedes.
- Decide y ejecuta auspicios a eventos, talleres, congresos y equivalentes.
- Se aprueba un plan de actividades y de temas anual, que en cada reunión del Comité admite su revisión y ampliación.
- En su seno se coordinan actividades y programas, talleres y otras.
- Se analizan temáticas de interés para los recursos hídricos mediante la celebración de talleres y seminarios (Por ejemplo: sedimentación y erosión, lluvias y series, gestión del agua en cuencas y otros).
- Facilita la concreción de apoyos de la Oficina Regional.
- Se adoptan acuerdos y recomendaciones, que se circulan a sus miembros.
- Disemina información científico-técnica.
- Existe una red virtual de intercambio de informaciones y noticias entre su Presidencia y miembros.

El Comité cubano está insertado actualmente en los siguientes Programas y proyectos PHI-LAC:

- Programas Globales: FRIEND (base de datos, fenómenos hidro máx y mín); HELP (Cuenca Cuyaguateje, aprobada recientemente); Ecohidrología (Participación en talleres y conferencias); ISI (Evaluación sedimentación en embalses y participación en talleres); Agua Subterránea (GRAPHIC, Proyecto SIDS).
- Programas Regionales: Agua y Educación
- Grupos de Trabajo: Técnicas para aumentar las disponibilidades de agua.

Periodo julio 2008 - mayo 2010

1.1 Reuniones del Comité Nacional del PHI

En el período, el CONAPHI – CUBA efectuó todas las reuniones programadas en su Plan de Actividades anual, aprobado éste en sus últimas reuniones respectivas de noviembre 2008 y noviembre 2009.

El total de reuniones efectuada fue de seis (6), contando con una adecuada asistencia media de sus miembros, lo que permitió adoptar acuerdos y evaluar su cumplimiento. Se adoptaron 54 acuerdos para la acción, estando en la actualidad pendientes 2 de ellos.

Como tendencia, éstas se realizaron en la institución sede del Presidente del Comité (Instituto Nacional de Recursos Hidráulicos - INRH), aunque por decisión del CONAPHI, se celebraron también en la sede de la Comisión Cubana de la UNESCO. Este periodo de trabajo permite afirmar que se consolidó definitivamente su accionar, luego de que el Comité a finales de 2007 e inicio de 2008 experimentó un proceso de reestructuración y fortalecimiento de su mesa directiva y de sus miembros. La estabilidad en su funcionamiento y resultados así lo indican.

Sus actuales miembros aparecen en una relación adjunta. Se creció en 3 miembros respecto al período julio 06 – mayo 08. En total el Comité lo conforman 18 personas, de ellas, 11 Doctores en Ciencias.

Se desarrollan las actividades relacionadas con el PHI –VII, siendo el Comité un nicho donde éstas se evalúan y se promueven.

En la 35va. Conferencia General de la UNESCO de 2009, Cuba fue electa miembro del Consejo Intergubernamental del PHI-UNESCO hasta la 37ma. Conferencia y junto a Brazil, Chile, Paraguay y México, representará a la América Latina y el Caribe.

1.2 Actividades a nivel nacional dentro del marco del PHI

1.2.1 Certámenes científicos y técnicos

El Comité Nacional Cubano del PHI, ha apoyado y generado en el período un numeroso grupo de eventos y talleres científico-técnicos en el campo de la hidrología y la gestión de los recursos hídricos en el país, como apoyo a la actividad nacional y en el contexto de la fase VII del PHI. Entre ellos, se citan :

- Semana del Agua, en marzo, culminando con la celebración del Día Mundial del Agua (22 marzo);
- Día Interamericano del Agua (primer domingo de octubre);
- Concurso “Trazaguas” (Educación para el uso sostenible del agua entre niños y jóvenes) y Programa de Ahorro y Uso Racional del Agua (PAURA). INRH.;
- Día Mundial del Medio Ambiente (5 de junio).
- XII y XIII Curso Internacional de Agua Subterránea y Medio Ambiente (CIASMA), junio 2009 y 2010.

- IV Congreso Internacional de Riego y Drenaje (2 a 5 junio). IIRD-MINAG
- IX Congreso Internacional Ingeniería Hidráulica (28 sept-3 oct). SIH-UNAICC
- IX Foro Panamericano de Cuencas Hidrográficas, SIH-UNAICC, 2010.
- 1er. Seminario-Taller sobre Aguas Subterráneas y Transporte de Contaminantes, 22 a 26 marzo 2010, CIH-CUJAE, INRH, España
- Varios talleres en colaboración con la Sociedad de Ingeniería Hidráulica SIH – UNAICC sobre manejo de Cuencas Hidrográficas y de los Recursos Hídricos, así como sobre el funcionamiento de las Redes de Observación del Ciclo Hidrológico, dentro del contexto de las temáticas de la VII fase del PHI.

El Comité cubano ha organizado 2 talleres nacionales (I y II Taller de Erosión y Sedimentación), con la participación de numerosos profesionales, orientados a evaluar y compartir las experiencias obtenidas en los estudios de sedimentación en embalses del país, así como en la evaluación de las descargas de sedimentos en corrientes superficiales ante fenómenos de intensas lluvias. Se han celebrado en el contexto de la Semana Nacional por el Día Mundial del Agua

1.2.2 Proyectos de investigación o de aplicación apoyados o patrocinados

- Programa Ramal Científico-Técnico Gestión Integrada del Agua, así como coauspicio y apoyo de un grupo de Programas Ramales y Nacionales de Ciencia y Técnica (PRCT y PNCT) encaminados fundamentalmente a solucionar o mitigar los problemas de la creciente demanda de agua y el deterioro de su calidad.
- Defensas de Tesis de Maestría y Diplomados en diferentes Facultades (Geografía, Hidráulica) de Universidades del país, en temas relacionados con la gestión del agua, los que han contando con la participación de miembros del Comité Cubano PHI.
- Apoyo a los trabajos del Comité Panamericano de Cuencas Hidrográficas de la Sociedad de Ingeniero Hidráulicos de Cuba (SIH-UNAICC).
- Preparación de estudios y proyectos nacionales y regionales relativos al Manejo de Riesgos y Sostenibilidad de Acuíferos Costeros en las Islas del Caribe, así como la participación en estudios de peligros, vulnerabilidad y riesgos.

1.2.3 Colaboración con otras organizaciones o programas nacionales e internacionales de UNESCO.

CONAPHI - Cuba ha establecido relaciones y vínculos con:

- CAZALAC (Centro del Agua para Zonas Áridas de América Latina y el Caribe CATHALAC),
- Centro para la Gestión Sostenible de los Recursos Hídricos en los estados insulares del Caribe (CEHICA), centro tipo 2 UNESCO, de República Dominicana. Cuba fue electa, a través del Presidente de su CONAPHI, para ocupar la Vicepresidencia de su Consejo de Administración.

Estos han beneficiado el desempeño del Comité.

Representantes del CONAPHI – CUBA participaron como miembros de la Delegación cubana en el V Foro Mundial del Agua celebrado en Istanbul, Turquía, de 16 a 22 marzo de 2009.

1.2.4 Publicaciones

Diferentes miembros del Comité Cubano PHI han publicado artículos en revistas científico-técnicas cubanas y extranjeras en este período de tiempo. Por parte del CONAPHI - Cuba se está en disposición de contribuir con estas producciones a nutrir revistas especializadas, que ya están siendo editadas o de nueva creación en la región.

1.3 Participación certámenes científicos internacionales bajo el auspicio del PHI UNESCO

1.3.1 Participación en certámenes en el extranjero

Adjunto aparece un resumen del apoyo del PHI – UNESCO a través de su Oficina Regional de Uruguay, a la participación de especialistas cubanos en talleres y seminarios celebrados en otros países (jul 08 a may 10):

No	Nombre	Fecha	Financista	País	Objetivo
1	Aymée Aguirre - INRH (miembro Comité)	Noviembre 2008	PHI	Brasil. Foz de Iguazú	Reunión Regional Américas. V FMA
2	Lídice Mora Ramos - INRH (no miembro Comité) y Norberto Marrero CIH-CUJAE (miembro)	Diciembre 2008	PHI	Asunción. Paraguay	Congreso Agua y Educación
3	Orlando Laíz EIPI – INRH (miembro)	Agosto 2008	PHI	Panamá	Programa ISI. Sedimentación
4	Jorge Mario García - INRH (Presidente Comité)	Diciembre 2008	PHI	República Dominicana	Taller Centro tipo 2 Gestión Agua en el Caribe
5	Zeida Romero Palmero - INRH (No miembro Comité)	Mayo 2009	PHI	Ecuador	Programa HELP. Cuenca Cuyaguateje.
6	Rigoberto Morales Palacios INRH (Vicepresidente Comité)	Junio-Julio 2009	PHI	Asunción. Paraguay	Reunión CONAPHIs; Conf. Ecohidrología; Taller HELP-LAC

7	Jorge Mario García – INRH (Presidente Comité)	Agosto-septiembre 2009	PHI	República Dominicana	Consejo Administración CEHICA

No se identifican las actividades y participaciones del miembro del CONAPHI – CUBA, Dr. Eduardo Planos como Coordinador del Programa FRIEND en América Latina y el Caribe.

2. Actividades futuras

Dentro de sus perspectivas está el de consolidar su participación activa en los Programas Globales en que actualmente está insertado y evaluar su inserción en otros, ampliando su participación en los Programas Regionales, especialmente en Agua y Cultura, así como en el Grupo de Trabajo relacionado con las Técnicas para aumentar las disponibilidades de agua.

En el mismo sentido, continuará perfeccionando su trabajo nacional, incrementando sus actividades y haciendo más efectivos sus acuerdos y resultados. Es su interés, elevar de forma sistemática el número de sus miembros y la representatividad profesional, institucional y geográfica, diseminando con mayor extensión y efectividad sus mensajes.
Trabajará también por promover con mayor eficacia los eventos organizados en el país y elevar la participación en ellos de profesionales y científicos de las Ciencias del Agua de América Latina y el Caribe.

Miembros CONAPHI – CUBA

No.	Nombre y Apellidos	Cargo CONAPHI	Institución	Cargo Institución	Localización
1	**Dr.** Jorge Mario García Fernández	Presidente	Instituto Nacional de Recursos Hidráulicos INRH	Director Cuencas Hidrográficas	Humboldt 106. Plaza. Vedado. La Habana. jorgem@hidro.cu 836 - 3449
2	Ing. Luis E. Cantero Corrales	Vicepresidente	Instituto Nacional de Recursos Hidráulicos INRH	Jefe Despacho Presidente	Humboldt 106. Plaza. Vedado. La Habana. luis@hidro.cu 836 - 5332
3	Ing. Rigoberto Morales Palacios	Vicepresidente	Instituto Nacional de Recursos Hidráulicos INRH	Director Obras Hidráulicas	Humboldt 106. Plaza. Vedado. La Habana. rigoberto@hidro.cu 836 - 6702
4	Lic. Miguel Alberto Méndez Córdova	Secretario	Comisión Nacional Cubana CNC UNESCO	Funcionario	Ave Hohly 51 esp. 32. Plaza. Vedado. mendez@cncu.minrex.gov.cu 881 - 0088
5	**Dr.** Rafael Pardo Gómez	Miembro	Centro de Investigaciones Hidráulicas CIH - CUJAE	Director	114 No. 11901 CUJAE. Marianao. rpardo@cih.cujae.edu.cu 262 - 7495
6	**Dr.** Armando O. Hernández Valdés	Miembro	Centro de Investigaciones Hidráulicas CIH - CUJAE	Profesor	114 No. 11901 CUJAE. Marianao. ahernandez@cih.cujae.edu.cu 260 - 1416
7	**Dr.** Ivan González	Miembro	Facultad Geografia- UH	Profesor	L No. 353 6 piso. Vedado. Plaza igp@geo.uh.cu 832 - 6290
8	Ing. Aymée Aguirre Hernández	Miembro	Instituto Nacional de Recursos Hidráulicos INRH	VicePresidenta	Humboldt 106. Plaza. Vedado. La Habana. aimee@hidro.cu 836 - 6783
9	**Dr.** Cristóbal Díaz Morejón	Miembro	DMA-MinistérioMédio Ambiente CITMA	Funcionario	Capitolio Nacional. Prado y San José.Habana Vieja. cristobal@citma.cu 867 - 0598

10	Ing. Margarita Fontova de los Reyes	Miembro	Sociedad Ingeniería Hidráulica Cuba-UNAICC	Presidente	Humboldt 104 esp. Infanta. Vedado. Plaza.
11	**Dr.** Braulio P. Lapinel Pedroso	Miembro	Instituto de Meteorologia - CITMA	Investigador	Loma de Casablanca. Regla. La Habana. braulio.lapinel@insmet.cu 861 – 8375; 868 – 6270
12	Ing. Gisel Pérez Wong	Miembro	Instituto Nacional de Recursos Hidráulicos INRH	Directora Ciencia y Técnica	Humboldt 106. Plaza. Vedado. La Habana. gisel@hidro.cu 834 – 6567
13	**Dr.** María Elena Ruíz Pérez	Miembro	Universidad Agraria Habana UNAH	Jefe Grupo Investigaciones Agrofísicas	Autopista Nacional km 23,5 mruiz@isch.edu.cu udnaranj@infomed.sld.cu 047 – 863013 ext. 235
14	**Dr**. Orestes Valdés Valdés	Miembro	Ministerio de Educación MINED	Asesor Educación Ambiental	3ra. Y 16. Miramar. Playa. La Habana. ovaldes@rimed.cu; educamb@dct.rimed.cu 202 – 2259
15	**Dr.** Angel R. Rey García	Miembro	Instituto Investigaciones Riego y Drenaje MINAG	Director	Ave. Camilo Cienfuegos y calle 27. Arroyo Naranjo. La Habana. rey@iird.cu iird@iird.cu 644 1633
16	**Dr.** Eduardo Planos Gutiérrez	Miembro	INSMET	Especialista Centro Cilima. INSMET	868 6672 eduardo.planos@inset.cu Instituto de Meteorología CITMA
17	**Msc**. Orlando Laíz	Miembro	EIPI-INRH	Especialista	Virtudes y Belascoaín. Centro Habana. 864 2208
18	**Dr**. Norberto MArrero	Miembro	CIH - CUJAE	Profesor CIH	Teléfono: 2601416 marrero@tesla.cujae.edu.cu

NATIONAL REPORT ON IHP RELATED ACTIVITES

DPRK NATIONAL COMMITTEE

1. ACTIVITIES UNDERTAKEN IN THE PERIOD JULY 2008 – MAY 2010

1.1 Meetings of the IHP National Committee

1.1.1 Decisions regarding the composition of the IHP National Committee

According to the regulation of DPRK National committee for IHP (DNC-IHP), Mr. RYU Pong Chol, deputy-Administrator of the State Hydrometeorological Administration (SHMA) now took the chairmanship. The present composition of DNC-IHP consists as follows:

President:	Mr. RYU Pong Chol, Deputy-Administrator of the SHMA
Vice President:	Prof. Jo Myong Bong, Earth sciences faculty, **KIM IL Sung** University
Secretary-General:	Mr. KIM Chol, Director of the Department of Hydrological and Oceanographic Science and Technology

Members: Representatives from concerning agencies as follows

1. Hydrological Research Institute, State Hydro meteorological Administration
2. Geographical Research Institute, State Academy of Science
3. Hydraulic Engineering Research Institute, State Academy of Science

The mailing addresses are as follows:

DPRK National Committee for the IHP
State Hydro meteorological Administration
OeSong-Dong, Central District, Pyongyang City, DPRK
Tel: 850-2-321-4539 Fax: 850-2-381-4410/4416/4427
Email: shma@co.chesin.com

During this period, DNC-IHP held several meetings to revise and review all activities to implement the appropriate National policies and plans on hydrology.

1.1.2 State of activities of IHP-VII stage

a) Continuing development of the Water Resources Management Support System in the Taedong River Basin, DPRK
b) Organization of the Training and workshop on Integrated Water Resources Management to the stakeholders and local communities in the river basins
c) Raising public awareness on Integrated Water Resources Management
d) Continuing hydrological service for major hydro electric power plants to meet energy demand of the country
e) Constructed MiRuPol Waterway for irrigation in the upper district of the Ryesong River

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

- National Workshop on Climate Change and Natural Disasters, on 16 September 2008, Pyongyang, DPRK
- National Workshop on Estimation of Design Flood at the Hui Chon Hydro electric power plant, on 14 October 2008, Pyongyang, DPRK
- National Workshop on Flood Hazard Assessment in combination of terrain data, on 17 November 2009, Pyongyang, DPRK

1.2.2 Participation in IHP Steering Committees/Working Groups

DPRK has participated in the meetings of the regional steering committee in the Asia Pacific Region held in Mongolia (2008) and China (2009)

1.2.3 Research/applied projects supported or sponsored

- Research on Flood Forecasting Method based on a Hydraulic model in the lower of Taedong River in 2008

- Research on Estimation of Flood Inundation area in RungRa-Do, YangKak-Do and DuRu islet of the Taedong River during the Flood Period in 2008
- Research on Assessment of Balance of Water Demand and Supply and of Water Value from 2008 to 2009
- Research on Development of Groundwater and its Rational Use in populated area of the lower of the Taedong River Basin in 2009
- Research on Reservoir Operation in the Multi-Reservoir System to Reduce Flood Peak During the Rainy Season in 2009
- Research on Hydrological Design Calculation Method and Updating of Design Standards in 2009. The Objective is to reevaluate the design standards required for the engineering works.

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

- Project on Flood hazard Assessment from 2008 to 2009. This objective was to produce a Flood hazard map being a base of flood preventive planning in collaboration of the stakeholders including SHMA, **KIM Il Sung** University and Land & Environment Protection Research Institute.
- Project on Environmental Assessment of the Taedong River Basin from 2008 to 2009. The objective of this project was to assess hydrometeorological, water quality and ecological state of Taedong River. Many agencies including SHMA, **KIM Il Sung** University, Land and Environment Protection Research Institute and Biological Research institute and individuals were participated in this project. One of major results of this project was a book entitling “Weather of Taedong River”, Volume Ⅱ published in 2010.
- Project on Assessment of Climate Change Impacts on River Runoff in Taedong River Basin in 2010. The Objectives was to provide the Land Planning Research Institute responsible for the long-term water use strategy with future runoff change and variability of Taedong River Basin.

1.3 Educational and training courses

Training course on Observation Method, Information Processing and Flood Forecasting Technique was organized on May of every year, Pyongyang, DPRK. The course, which was attended by the leaders of provincial meteorological stations, is a regular course for improving their knowledge.

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

- Hydrological and Meteorological Year Book
- Weather of the Taedong River, Volume Ⅱ
- Guide to Hydrological Design Calculation

1.6 Participation in international scientific meetings

- The 16th Regional Steering Committee Meeting for the IHP , Ulanbator, Mongolia
- The 17th Regional Steering Committee Meeting for the IHP , wufan, China,

1.7 Other activities at regional level

1.7.1 Institutional relations/cooperation

DNC-IHP has close coordination and contact with the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), World Meteorological Organization (WMO), UNESCO Jakarta Office and UNESCO Beijing Office, as well as Ministry of Water Resources, China as a bilateral relation.

- Research on Flood Forecasting Method Based on a Hydraulic Model in the lower of Taedong River
- Research on Estimation of Flood Inundation area in RungRa-Do, YangKak-Do and DuRu islet of the Taedong River during the Flood Period
- Research on Assessment of Balance of Water Demand and Supply and of Water Value
- Research on Development of Groundwater and its Rational Use in Populated Area of the Lower of the Taedong River Basin

- Research on Reservoir Operation in the Multi-Reservoir System to Reduce Flood Peak During the Rainy Season
- Research on Hydrological Design Calculation Method and Updating of Design Standards
- Project on Flood hazard Assessment throughout the country
- Project on Environmental Assessment of the Taedong River Basin
- Project on Assessment of Climate Change Impacts on River Runoff in Taedong River Basin

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2010

The National Committee will pay special attention to solve practical issues on hydrology according to a National Development Strategic under IHP framework. The construction of Huichon Hydroelectric power plant which is planning to be finished until 2012, is the highest priority in DPRK. The National Committee will be contribute to its completion with design of hydraulic structure in cost-effective manner, development of flood forecasting system and rational operation system.
The research project on Assessment of Climate Change Impacts on River Runoff in Taedong River Basin will be finished in 2010.

2.2 Activities foreseen for 2011-2012

Some national projects related to IHP-Ⅶ themes will be implement by the SHMA through DNC-IHP. DNC-IHP will continue to train the qualified experts, organize scientific and technical workshops, disseminate knowledge and experiences related to environmental protection and thus, promote the public participation to Integrated Water Resources.

The activities taken for 2011-2012 will include the following:
Based on water resources scenarios developed in the national level according to climate change scenarios, the Long-Term Water Use Strategy will be developed.
The Drought Early Warning System will developed throughout the country in close cooperation of concerning agencies including the SHMA, **KIM Il Sung** University and Ministry of Agriculture.
The seasonal hydrological forecasts method for rational reservoir operation to meet water demand in the lower of the river basin throughtout the year will be developed.

The team to solve hydrological issues required for construction of the HuiChon Hydroelectric power plant will be organized and serve on the spot.
The seminars and workshops of different themes on environmental protection and natural disaster prevention will be oranized by the DNC-IHP periodically in spring and autumn of every year.
The project for Integrated Water Resources Management in the demonstration site will be implemented.

2.3 Activities envisaged in the long term

The DNC-IHP will make more active participation to IHP activities and contribute to achieve UN MDGs and National Development Strategy especially, Expansion of integrated Water Resources Management throughout the country, continuation of raising public awareness and education in environment protection and climate change adaptation.

NATIONAL REPORT OF FINLAND

IHP-related activities undertaken in the period July 2008 – May 2010

As a member of the Intergovernmental Council of IHP, Finland participated in the 18th session of the Council in Paris in June 2008. Finland was also represented at the IHP Group 1 meeting in Washington DC in September 2009.

At the national level, a process of restructuring the IHP activities has been launched. The guiding principle is that the realisation of and the participation in the program activities are coordinated by hydrological experts, while the administrative and political dimensions are examined in close cooperation with relevant ministries.

According to these principles, the Finnish Environment Institute (SYKE) ***http://www.ymparisto.fi/default.asp?node=5297&lan=en*** **is** responsible for the coordination of IHP activities. The Water Centre of SYKE supports water protection and water resources management by multidisciplinary research, by collecting information and by developing assessment tools and sustainable solutions to issues of water supply, wastewater treatment especially in scarcely populated areas, hydraulic construction, and utilization of water resources.

SYKE carries out the monitoring and assessment of all variables of the hydrological cycle, the status of surface and ground water bodies and various biological variables. Changes in the status of waters are examined from a holistic perspective.

The results of SYKE's research are used in socioeconomic evaluations of water-related issues and in making decisions concerning these issues. Among the most frequently used information services of SYKE are the nation-wide hydrological reports and forecasts which are based on extensive database material and on hydrological models.

Some of SYKE's hydrological activities are closely tied to international IHP programs. As an example, SYKE maintains a network of 37 small hydrological basins, observing e.g. discharge with measuring weirs, precipitation, snow water equivalent and soil frost. Fourteen of these basins belong to the FRIEND monitoring network, they are also part of the ERB (Euromediterranean Network of Experimental and Representative Basins) and the Eurowaternet. The automatisation of the network is gradually proceeding.

The Water Engineering Group of the Aalto University ***http://www.aalto.fi/en/*** provides undergraduate and graduate level education in water resources management, hydrology, hydraulic engineering, and sanitary engineering. The research topics include global change and water resources, environmental river engineering, hydrological modeling and runoff generation processes, erosion and contaminant transport, water and nitrogen cycles in agricultural areas, and urban hydrology.

The Water Resources and Environmental Engineering Laboratory of the Oulu University ***http://www.oulu.fi/poves/*** has research programs in applied hydrology; present topics include river hydraulics and restoration, erosion and sediment transport, hydrology of constructed wetlands, hydrology of peatlands, hydrology of eskers, climate change impacts on esker water balance, tracer

hydrology and modeling, surface-groundwater interaction, retention of contaminants in soils, transport properties of forest soils, lake restoration, and development of hydraulic barriers and similar techniques for landfill protection. The northern dimension is keenly in the focus of the studies, because the university is one of the northernmost sites of higher education in the world.

At the Tampere University of Technology, the Laboratory of Environmental Engineering and Biotechnology ***http://www.tut.fi/public/index.cfm?siteid=32*** focuses on water, wastewater and solid waste management as well as remediation of contaminated environments. The Laboratory has been involved in IHP-HELP work since 2004, with the aim of e.g. improving participative IWRM methods.

As to the themes of IHP VII, the research of SYKE concentrates in theme 1, particularly in climate change impacts on the hydrological cycle and consequent impacts on water resources. Ecohydrological studies related to theme 3 are also performed. The Aalto University carries out research e.g. on subthemes 1.1 (global changes and feedback mechanisms of hydrological processes in stressed systems) and 2.4 (managing water as a shared responsibility across geographical and social boundaries).

International Strategy for Finland's Water Sector was adopted in September 2009. The aim of this strategy is to increase international cooperation and the impact of Finnish actors in the water sector by identifying broad themes under which the water sector in particular could operate. The priorities of the strategy include

- An integrated approach to water resource management
- Developing water institutions
- The impact of climate change on water systems and climate change adaptation
- The protection and restoration of river systems, including issues relating to water quality
- Security issues relating to water.

The strategy also highlights the importance of the participation of Finnish water professionals in key international processes, including World Water Forums and the activities of UNESCO's International Hydrological Program, and stresses the need to allocate sufficient resources for such activities.

As to the restructuring of IHP activities, the Ministry of Education and Culture (MEC) will establish a National Coordination Group, consisting of:

- the coordinators of all UNESCO's science programs, which Finland participates
- representatives from the Ministry of the Environment and the Ministry for Foreign Affairs
- representatives from the International Relations and the Division for Higher Education and Science of the MEC
- representatives from the Academy of Finland and the Finnish National Commission for UNESCO.

The secretariat of this group will be within the Federation of Finnish Learned Societies.

The Academy of Finland ***http://www.aka.fi/en-gb/A/*** funds problem-oriented and multidisciplinary development research (research on developing countries) together with the Ministry for Foreign Affairs. In development research, the problems to be studied may derive from the local as well as the global level, or from the search and analysis of the connections between development phenomena at different levels. The Development Research has funded projects related to IHP activities.

The Research Councils at the Academy of Finland support the high quality scientific research in the country. Water-related research belongs mainly to the fields of Research Council for Biosciences and Environment and Research Council for Natural Sciences and Engineering. All research funding instruments are used; researcher posts, research projects etc.

The Research Council for Natural Sciences and Engineering arranged in 2009 a special call for water technology projects and funded them by 1.8 M€. The main goal was to support the Finnish national water program together with another Finnish research funding organization, Tekes.

The Academy will launch another water-related research program in 2012. It is planned to be multidisciplinary and have cooperation with the research fields of natural, social, health and technical sciences.

Deutsches IHP/HWRP-Nationalkomitee

Deutsche Beiträge zum IHP der UNESCO und zum HWRP der WMO
German Contributions to the IHP of UNESCO and the HWRP of WMO

2008 – 2009

Arbeitsbereiche 2008 – 2009 | Fields of Activity 2008 – 2009

UNESCO Category II Centre Water Resources and Global Change

Veranstaltungen | Scientific Events

Projekte | Projects

Kompetenzvermittlung | Capacity Development

Regionale Zusammenarbeit | Regional Cooperation

Netzwerke | Networks

Flow Regimes from International Experimental and Network Data

Publikationen | Publications

Veröffentlichungen | List of Publications

Öffentlichkeitsarbeit | Public Relations

UNESCO Category II Centre Water Resources and Global Change

Die UNESCO strebt eine verstärkte Zusammenarbeit mit regionalen Fachzentren an, sogenannte UNESCO Category II Centres, verteilt über alle Kontinente, die zu IHP-Themen schwerpunktmäßig Beiträge erarbeiten.
Das Angebot Deutschlands, ein UNESCO Category II Centre on Water Resources and Global Change einzurichten, wurde von der UNESCO General Conference im Oktober 2009 angenommen.
Aufgabe dieses UNESCO Category II Centre wird sein, die Ergebnisse nationaler Forschung zu transportieren und durch eigene Forschung und Untersuchungen (z. B. Master- und PhD-Arbeiten, Postdocs) zu den UN-Entwicklungszielen beizutragen.

UNESCO aims at intensifying its cooperation with regional hydrological centres, so-called UNESCO Category II Centres, that are spread across all continents and work out contributions concentrating on IHP issues.
The German offer to establish a UNESCO Category II Centre on Water Resources and Global Change was accepted by the UNESCO General Conference in October 2009.
The national UNESCO Category II Centre's functions will include transporting national research results and contributing own research and scientific work (e.g. Master and PhD theses, postdoctoral work) to reach the UN Millennium Development Goals.

Veranstaltungen | Scientific Events

Internationaler Workshop
Stand und Perspektiven hydrologischer Forschung in kleinen Einzugsgebieten

Vom 30. März bis 2. April 2009 fand in Goslar-Hahnenklee der internationale Workshop „Status and Perspectives of Hydrology in Small Basins“ statt. Der Workshop in Hahnenklee wurde gemeinsam von der Abteilung Hydrologie und Landschaftsökologie an der Technischen Universität Carolo-Wilhelmina zu Braunschweig (TUBS) und dem deutschen IHP/HWRP-Sekretariat ausgerichtet. Die 70 Teilnehmer kamen aus 24 Ländern.

Themen des Workshops waren:

- Aktuell betriebene kleine hydrologische Versuchsgebiete
- Grundlegende hydrologische Erkenntnisse durch Forschung in kleinen Einzugsgebieten
- Hydrologisches Prozessverständnis abgeleitet aus Untersuchungen in kleinen Einzugsgebieten
- Bedeutung hydrologischer Daten und Forschungsergebnisse aus kleinen Einzugsgebieten für die hydrologische Modellierung

International Workshop
Status and Perspectives of Hydrology in Small Basins

From 30 March to 2 April 2009 the Workshop “Status and Perspectives of Hydrology in Small Basins” was held at Goslar-Hahnenklee. The workshop was jointly hosted by the Department of Hydrology and Landscape Ecology at the Technische Universität Carolo-Wilhelmina zu Braunschweig (TUBS) and the German IHP/HWRP Secretariat. 70 researchers from 24 countries attended the workshop.

The workshop focused on the following topics:

- Presently operated small hydrological research basins
- Fundamental hydrological results from research in small basins
- Hydrological process knowledge derived from studies in small basins
- Importance of hydrological data and research results from small basins for hydrological modelling

Internationaler Workshop
Wasser und Gesundheit – Eine europäische Perspektive

Am 8. und 9.12. 2009 fand in Koblenz an der Bundesanstalt für Gewässerkunde unter Federführung des deutschen IHP/HWRP-Sekretariates der internationale Workshop „Water and Health – A European Perspective“ statt. Insgesamt 43 Teilnehmer, darunter Vertreter aus Politik, Wissenschaft und Wirtschaft sowie von Nichtregierungsorganisationen kamen zusammen, um über den aktuellen Stand und Fortschritte bei der Behandlung gesundheitsrelevanter Probleme auf dem Gebiet der Trinkwasserversorgung und anderer Wassernutzungen zu informieren und zu diskutieren. Das Programm umfasste 18 Vorträge zu den Themenbereichen Management von Wassersystemen, Fallbeispiele sowie Zukünftige Herausforderungen.

International Workshop
Water and Health – A European Perspective

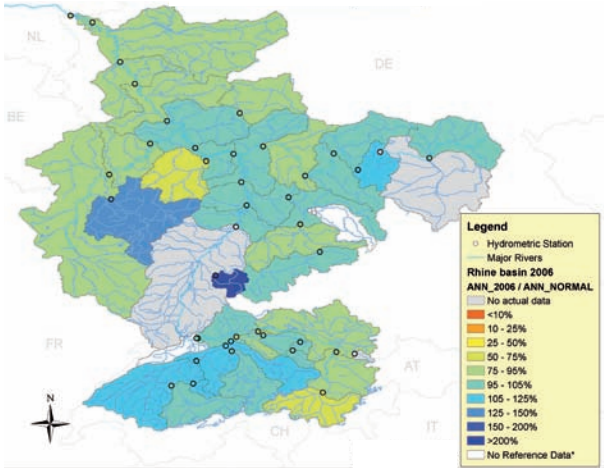
Under the aegis of the German IHP/HWRP Secretariat, the international workshop “Water and Health in Europe” was held in Koblenz at the Federal Institute of Hydrology on 8 – 9 December 2009. 43 participants from the realms of politics, science and economy, as well as nongovernmental organisations, convened to inform and discuss about the current status and progress made in dealing with health-relevant problems in the field of drinking water supply and other water uses. The programme included 18 lectures relating to water system management, case studies as well as future challenges.

Projekte | Projects

Hydrological Normals

In dem Projekt werden, im Zusammenarbeit mit der TU Dresden, Algorithmen entwickelt und programmiert, um analog zu den gängigen klimatologischen Normalwerten hydrologische Normalwerte, also Aussagen zur räumlichen und zeitlichen Verteilung des Abflusses, berechnen zu können. Diese dienen als Unterstützung für das Wasserressourcen-management von Flussgebieten und können wesentlich dazu beitragen, wasserwirtschaftliche und landwirtschaftliche Prozesse zu optimieren.

In weiteren Schritten werden Niedrigwasserkenn-werte in die Berechung mit einbezogen. Somit ist der Grundstein gelegt, zukünftig mit meteorologischen Langfristvorhersagen die Entwicklung der erwarteten verfügbaren Wasserressourcen zu bewerten und dies als zusätzliche Information für Planungen in der Landwirt-schaft, Energiewirtschaft und Wasserwirtschaft verfügbar zu machen.

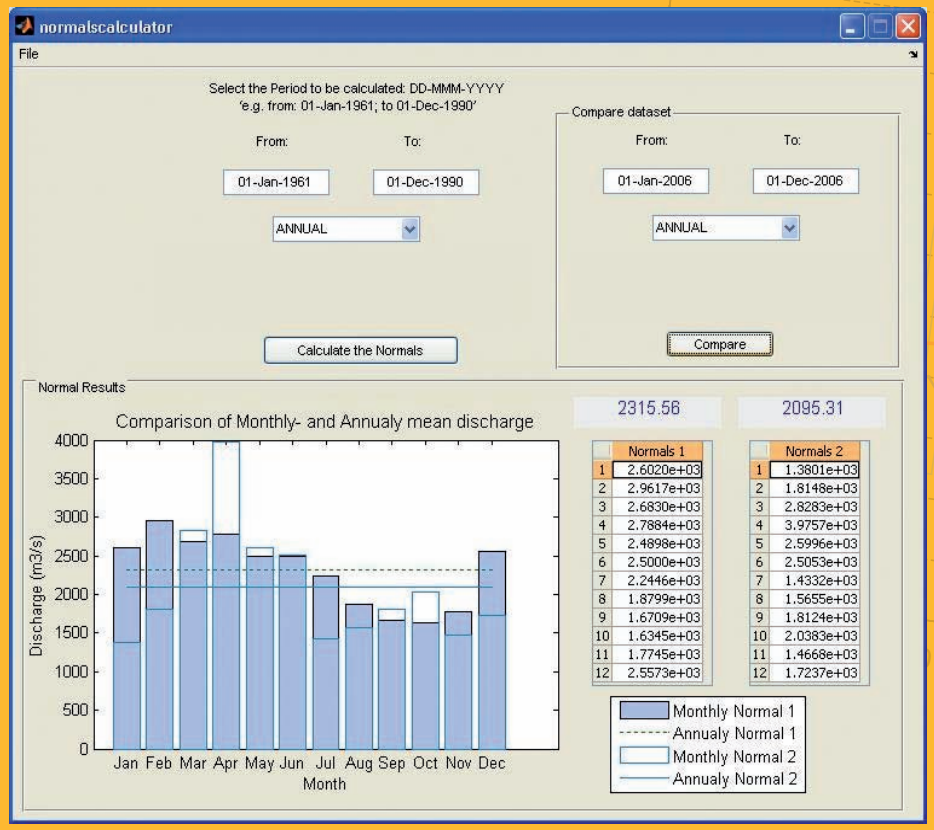


Comparison of the river flow in 2006 with the Rhine Basin Discharge Normals (1961–1990)

Hydrological Normals

In cooperation with the Technische Universität Dresden, algorithms have been developed to allow calculating hydrological normals, i.e. statements on the spatial and temporal distribution of runoff analogously to the usual climatological normals. Hydrological normals are used to support water resources management of rivers and play a vital role in optimising agricultural and water management processes.

In further steps, low-flow parameters are incorporated into the calculation. This lays the foundation for evaluating the development of the anticipated availability of water resources in future by means of meteorological long-term forecasts, and for making these data available for planning in agriculture, energy industry and water management.



Beispiel:
Vergleich des Jahres 2006 mit dem hydrologischen Normalverhalten 1961 – 1990

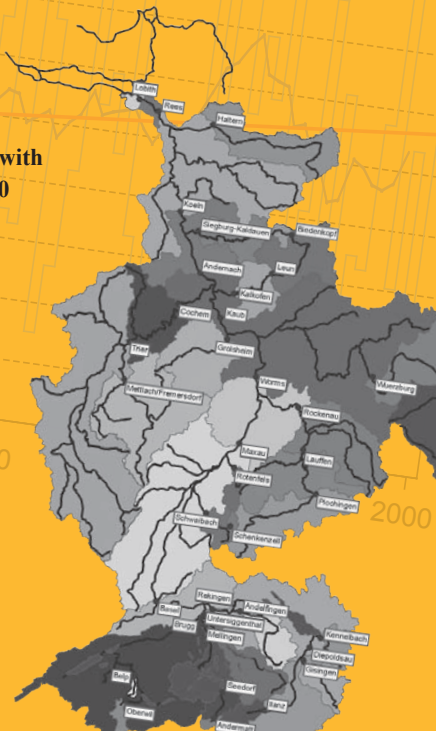
Pilotgebiet: Rhein

Generell weltweit anwendbar

Sample:
Comparison of 2006 values with reference period 1961 – 1990

Rhine basin

Can be applied worldwide



Kompetenzvermittlung | Capacity Development

Der UN World Water Development Report weist in vielfältiger Weise darauf hin, dass in zahlreichen Gebieten der Erde zukünftig sowohl mit hydrologisch basierter als auch ökonomisch induzierter Wasserknappheit gerechnet werden muss. In Asien hat jeder sechste Mensch keinen Zugang zu sicherer Wasserver- und -entsorgung, in Afrika leidet jeder dritte Mensch unter solchen Verhältnissen.
Die hydrologischen Ressourcen einzelner Regionen sind begrenzt. Durch Kompetenzvermittlung und Wissenstransfer kann jedoch ein langfristig tragbarer Umgang mit der Ressource Wasser erreicht werden.

Hydrologische Summer Schools in Deutschland

In Deutschland wurden drei, von IHP/UNESCO und dem Deutschen IHP/HWRP-Nationalkomitee unterstützte, internationale Summer Schools angeboten:

- International German Summer School of Hydrology (IGSH), Ruhr-Universität Bochum
- Field methods and eco-hydrological models for integrated water management in rural areas (RWM), Universität Kiel
- Transboundary Water Management (TWM), Fachhochschule Köln

The UN World Water Development Report points out that both hydrologically based as well as economically induced water scarcity will have to be expected in many regions of the world. One out of six persons in Asia lacks access to safe water supply and sanitation. In Africa, one out of three persons suffers from such conditions.

The hydrological resources of individual regions are limited. However, sustainable water management can be achieved by means of competence and knowledge transfer.

Hydrological Summer Schools in Germany

With the assistance of IHP/UNESCO and the German IHP/HWRP National Committee, three international Summer Schools were offered in Germany:

- International German Summer School of Hydrology (IGSH), Ruhr-Universität Bochum
- Field methods and eco-hydrological models for integrated water management in rural areas (RWM), Universität Kiel
- Transboundary Water Management (TWM), Fachhochschule Köln

In den Summer Schools wurden Aspekte der Hydrologie und Wasserbewirtschaftung für einen internationalen Teilnehmerkreis praxisorientiert behandelt. Forschungsorientierte Workshops vermittelten neue Perspektiven der Hydrologie.

E-Learning

Zur Ergänzung des klassischen Lernangebots wurde ein Internet basiertes E-Learning Modul zum Thema Water Balance in Zusammenarbeit mit der Universität Tübingen entwickelt. Hauptthemen sind:

- General terms of the water balance
- Water balances of urban areas
- Water balances of forests
- Water balances in warm climates
- Water balances of coastal areas

The summer schools dealt with practical aspects of hydrology and water resources management addressed to an international audience. New perspectives of hydrology were presented in research-oriented workshops.

E-Learning

To complement classical learning options, an internet-based E-learning module dealing with Water Balance has been developed in cooperation with the Universität Tübingen, centring on the following main issues:

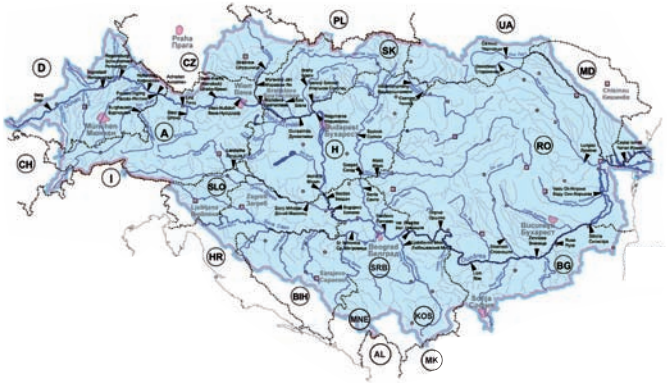
- General terms of the water balance
- Water balances of urban areas
- Water balances of forests
- Water balances in warm climates
- Water balances of coastal areas

Regionale Zusammenarbeit | Regional Cooperation

Die Zusammenarbeit am Rhein erfolgt durch Mitarbeit in der internationalen Kommission für die Hydrologie des Rheingebietes (KHR). Die KHR arbeitet im Rahmen des IHP der UNESCO und des HWRP der WMO. Sie versteht sich als Instrument hydrologisch-wasserwirtschaftlicher Institutionen der Rheinanliegerstaaten und unterstützt länderübergreifende hydrologische Untersuchungen.

Abgeschlossen wurde die Fallstudie Rhein – Erosion, Transport und Sedimentdeposition (KHR Report II–20).

Die Zusammenarbeit der Donauländer im Rahmen des IHP der UNESCO basiert zum einen auf Projektarbeiten und zum anderen auf regelmäßigen Konferenzen. Laufende Projekte sind:



- Charakterisierung des Abflussregimes im Einzugsgebiet der Donau
- Modellierung der Erosions-, Transport- und Sedimentationsprozesse der Donau und ihrer wichtigsten Nebenflüsse
- Niedrigwasser und hydrologische Dürre im Donaueinzugsgebiet

Cooperation on the Rhine results from collaborative work in the International Commission on the Hydrology of the Rhine Basin (CHR). The CHR works within the scope of the IHP of UNESCO and the HWRP of WMO. It is an instrument of the hydrological and water resources institutions of the Rhine riparian states and supports transboundary hydrological studies.

The case study Rhine – Erosion, Transport and Deposition of Sediments (CHR Report II–20) has been completed.

The cooperation of the Danube countries within the scope of the IHP of UNESCO is based on the one hand on project work and on the other hand on regular conferences. Current projects are:

- Characterisation of the runoff regime in the Danube basin
- Modelling of erosion, transport and sedimentation processes of the Danube and its major tributaries
- Low-flow and hydrological drought in the Danube basin

Netzwerke | Networks

Netzwerke nationaler und internationaler Experten dienen dem Wissenstransfer und fördern Wissenschaft und operationelle Anwendungen. Nationale Kompetenz kann in internationale Gremien eingebracht werden.

Fachlicher Austausch erfolgte mit:

- Korea Institute of Construction Technology, Südkorea
- Afrikanischen UNESCO Kommissionen
- dem State Hydrological Institute (SHI) in Russland zum Thema „Anwendung des russischen Modells Hydrograph auf Einzugsgebiete des Rheins“
- der Universität Stuttgart zum Projekt „Erarbeitung von Grundlagen zur Bewertung der Auswirkungen des globalen Wandels auf den Wasserhaushalt“.

Networks of national and international experts enhance the transfer of knowledge and promote science as well as operational applications. They allow introducing national competence into international committees.

A professional exchange took place with:

- Korea Institute of Construction Technology, South Korea
- African UNESCO commissions
- State Hydrological Institute (SHI) in Russia on the subject of “Application of the Russian Model Hydrograph to Rhine Catchments”
- Universität Stuttgart on the project “Development of principles for the evaluation of impacts of global change on the water balance”.

Participation in International Expert Meetings

- **36th Session of the UNESCO General Conference,** *12.10. – 16.10.2009, Paris*
- **Regional Meeting IHP National Committees of the UNESCO Electoral Group I,** *24. – 25.9.2009, Washington, USA*
- **61st Session of WMO Executive Council,** *3. – 12.6.2009, Genf*
- **43rd Meeting of the IHP Bureau,** *3. – 5.6.2009, Paris*
- **Session of the Commisson for Hydrology of WMO,** *4. – 12.11. 2008, WMO, Geneva*
- **22nd Expert Meeting on the Hydrology of the Danube,** *1.6.2008, Bled, Slovenia*
- **Working meeting of EURO-FRIEND coordinators,** *30.5.2008, Koblenz*

Flow Regimes from International Experimental and Network Data

Vom 28. – 30. Mai 2008 fand mit Unterstützung des deutschen IHP/HWRP-Nationalkomitees in Koblenz der Workshop der **EURO-FRIEND** Datenbankgruppe statt. 16 Experten aus 9 europäischen Ländern nahmen teil. Es wurde über die Fortschritte des letzten Jahres berichtet und die weitere Vorgehensweise zur Aktualisierung der EWA Datenbank besprochen.

Das neu strukturierte EWA wurde vorgestellt. Das Einpflegen neuer Daten und Verteilen der Datenbestände wurden neu organisiert. Hohe Priorität hat jetzt die Aktualisierung der Datenbestände, damit das EWA wieder an Attraktivität gewinnt und vermehrt von der Wissenschaft genutzt werden kann. Eine mehr liberale Datenpolitik war von einigen Workshopteilnehmern vorgeschlagen worden. Letztendlich wurde aber die bestehende Datenpolitik beibehalten, da die Abflussdaten einiger Länder speziell nur für die EURO-FRIEND Gemeinschaft zur Verfügung gestellt worden sind.

Die skandinavischen und mitteleuropäischen Länder stellten dem GRDC neue Datensätze zur Aufnahme in das EWA zur Verfügung.

Wegen der Umstrukturierung von NE-FRIEND in EURO-FRIEND, müssen für die Balkan- und Schwarzmeerstaaten zusätzliche regionale FRIEND Datenzentren identifiziert werden.

With the support of the German IHP/HWRP National Committee, the **EURO-FRIEND** database group held a workshop in Koblenz from 28 – 30 May 2008 attended by 16 experts from 9 European countries.
Reports were given on the progress made in the last year and further procedures to update the EWA database were discussed.

The newly structured EWA was presented. The entry of new data and distribution of databases was reorganised. High priority is now given to updating the databases to make EWA regain attractiveness and increase its usage by scientists. The concept of EWA data exclusivity for members of FRIEND was discussed. Some attendants of the workshop suggested a more liberal data policy. Eventually, the existing data policy was maintained, as the runoff data of some countries have been solely made available for use by the EURO-FRIEND community.

The Scandinavian and Central European countries supplied new data sets to the GRDC for inclusion into EWA.

Owing to NE-FRIEND's restructuring into EURO-FRIEND, additional regional FRIEND data centres have to be identified for the Balkans and the Black Sea states.

Digitales Inventar kleiner hydrologischer Untersuchungsgebiete

Hydrologische Untersuchungsgebiete mit klar definierten Eigenschaften und Systemgrenzen sind sehr gut geeignet zur Untersuchung der komplexen Prozesse im Naturraum – sowohl der natürlichen oder auch der anthropogen geprägten Prozesse. Diese Untersuchungsgebiete leisten einen wertvollen Beitrag zum Verständnis und zur Überwachung von Prozessen des Energie- und Wasserhaushaltes sowie der daran gebundenen Stoffkreisläufe. Hydrologische Untersuchungsgebiete mit langen Messreihen dienen auch als Referenzgebiete für unterschiedliche zeitvariante Messgrößen und erlauben die Erfassung von Veränderungen infolge von Belastungsquellen.

Um einen Überblick über die derzeit betriebenen hydrologischen Untersuchungsgebiete und ihre Zielstellungen zu erhalten wurde auf der Basis einheitlicher Vorgaben ein digitales Inventar der European Representative Basins (ERB-Gebiete) erarbeitet. Es ist geplant, dieses Inventar zu erweitern und regelmäßig zu aktualisieren, um so den Austausch von Information zwischen den Betreibern der Gebiete und Wissenschaftlern zu fördern.

Das digitale Inventar kleiner hydrologischer Untersuchungsgebiet kann eingesehen werden unter: *www.euro-friend.de*

Digital inventory of small hydrological research basins

Hydrological research basins with clearly defined system properties and basin characteristics are very suitable for investigating complex processes, both natural or anthropogenically superimposed, within the natural space. These research basins make a valuable contribution towards understanding and monitoring hydrological and energy balance processes as well as the inherent materials cycles. Hydrological research basins featuring long-term measurement series also serve as reference basins for diverse time-variant measurement parameters and allow the acquisition of changes due to pollution sources.

To gain an overview of currently operating hydrological research basins and their objectives, a digital inventory of the European Representative Basins (ERB basins) has been established on the basis of uniform standards.

It is planned to extend and regularly update this inventory in order to promote the exchange of information between basin operators and scientists.

The digital inventory of small hydrological basins can be viewed at: *www.euro-friend.de*

Publikationen | Publications

IHP/HWRP-Berichte Heft 9
Managing Extreme Flood Events
Als deutscher Beitrag zur VII. Phase des International Hydrological Programme (IHP) der UNESCO, Schwerpunkt Hydro-hazards, hydrological extremes and water-related disasters, wurde in Kooperation mit dem RIMAX Koordinationsbüro eine zusammenfassende Darstellung der RIMAX-Projekte (Risikomanagement extremer Hochwasser-ereignisse) in Heft 9 der IHP/HWRP-Berichte veröffentlicht.

IHP/HWRP-Berichte Heft 8
Assessment of Snow, Glacier and Water Resources in Asia
Wasserverfügbarkeit und die möglichen Auswirkungen des Klimawandels auf die Wasserressourcen ist eine Thematik von eminenter Bedeutung für die Länder Zentralasiens. In den vergangenen Dekaden zeigte sich, dass die Sicherheit der Wasserversorgung für diese Länder eine der größten Herausforderungen ist. Die Wasserversorgung, bisher gewährleistet durch Schnee und Gletscher, ist zunehmend durch klimatische Änderungen bedroht. Ein tieferes Verständnis und eine Einschätzung über den Zustand der Gletscher in Zentralasien fehlte bislang. Heft 8 der IHP/HWRP-Berichte enthält, basierend auf den Vorträgen des internationalen Workshops „Snow, glacier and water resources in Asia“ in Almaty, Kasachstan, Informationen über die Schnee und Gletscherressoureen Zentralasiens.

IHP/HWRP-Berichte Heft 9
Managing Extreme Flood Events
The German contribution to phase VII of the International Hydrological Programme (IHP) of UNESCO, focussing on hydro-hazards, hydrological extremes and water-related disasters involved the publication of a summary of the RIMAX projects (risk management of extreme flood events) in Heft 9 of the IHP/HWRP Berichte.

IHP/HWRP-Berichte Heft 8
Assessment of Snow, Glacier and Water Resources in Asia
The availability of water and the potential impacts of climate change on water resources is a key issue for the Central Asian countries. Recent decades have shown that water supply safety is one of the major challenges in these countries. Water supply, as yet ensured by snow and glaciers, is increasingly being threatened by climate change. A deeper understanding as well as an assessment of the conditions of Central Asian glaciers has been lacking so far. Based on the lectures given at the international workshop on “Snow, glaciers and water resources in Asia” in Almaty, Kazakhstan, Heft 8 of the IHP/HWRP-Berichte contains information on the Central Asian snow and glacier resources.

IHP/HWRP-Berichte Heft 7
GLOWA – Globaler Wandel des Wasserkreislaufs
Das GLOWA-Programm des BMBF hat sich mit Themen globaler Bedeutung wie Wasserknappheit, Klima, Landnutzung und sozioökonomischem Wandel auseinandergesetzt. Dabei besteht der besondere Ansatz von GLOWA in der Bildung multidisziplinärer Forschungsgruppen, die mit ortsansässigen Interessengruppen zusammenarbeiten, um Probleme von lokaler, regionaler und internationaler Tragweite anzugehen.

Die einzugsgebietsorientierte Abschätzung von Wasserressourcen, die gegenwärtig als der geeignete Ansatz zur Auseinandersetzung mit der Thematik Wasserressourcen betrachtet wird, liegt diesem Programm zugrunde. Grundvoraussetzung für alle GLOWA Studien ist, die Kernaspekte des hydrologischen Kreislaufs zu verstehen und zu modellieren. Eines der Hauptziele des GLOWA-Programms war die Reduzierung der Unsicherheit bei der Abschätzung der Folgen von Klima- und Landnutzungswandel sowie der ökologischen und sozioökonomischen Folgen. Das langfristige Ziel war, die Lebensgrundlage der vom Wandel betroffenen Menschen zu verbessern. Die Publikation IHP/HWRP-Berichte Heft 7 stellt die Projekte von GLOWA vor, die Regionen, in denen diese Projekte durchgeführt wurden (Elbe, Donau, Jordan, Volta, Oueme und Draa), die angewandten Methoden sowie Erfahrungen zur nachhaltigen Entwicklung.

IHP/HWRP-Berichte Heft 7
GLOWA – Global Change and the Hydrological Cycle
The GLOWA programme of the Federal Ministry of Education and Research has dealt with issues of global importance such as water scarcity, climate, land use and socioeconomic change. GLOWA's special approach consists in forming multidisciplinary research groups cooperating with local stakeholders to tackle problems on a local, regional and international level.

This programme is based on the catchment-orientated assessment of water resources that is currently considered to be the most suitable approach of dealing with the subject area of water resources. All GLOWA studies are founded on the basic prerequisite of understanding and modelling the key aspects of the hydrological cycle. One of the primary objectives of the GLOWA programme focussed on reducing uncertainty in assessing the impacts of climate change and land use change as well as the ecological and socioeconomic consequences. The long-term goal was to improve the livelihood of the people concerned by the impacts of change. The publication "IHP/HWRP-Berichte Heft 7" presents GLOWA projects, the regions in which these projects were realised (Elbe, Danube, Jordan, Volta, Ouemé and Draa), the methods applied and the experience made in the field of sustainable development.

Veröffentlichungen | List of Publications

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Geiger, W., (2009): UNESCO Lehrstuhl Sustainable Water Management. Hydrologie und Wasserbewirtschaftung 53, H. 1

Lanen van, H.A.J., (2009): Forschung zu Niedrigwasser und Dürre in Europa: Ergebnisse und Ziele. Hydrologie und Wasserbewirtschaftung 53, H. 1

Gerbens-Leenes, P.W., A.Y. Hoekstra and Th.H. Van der Meer (2008): The water footprint of bioenergy: Global water use for bio-ethanol, bio-diesel, heat and electricity. Value of Water Research Report Series 34. Übersetzung des englischsprachigen Summary: IHP/HWRP-Sekretariat Koblenz (2009). Hydrologie und Wasserbewirtschaftung 53, H. 1

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Strigel, G., (2009): UN Resolution zu grenzüberschreitenden Grundwasservorkommen. Hydrologie und Wasserbewirtschaftung 53, H. 2

UNEP (2009): Freshwater under Threat: South Asia. Deutsche Übersetzung der Zusammenfassung: IHP/HWRP-Sekretariat Koblenz. Hydrologie und Wasserbewirtschaftung 53, H. 2

UNESCO (2009): UN World Water Development Report 3. Deutsche Übersetzung der UNESCO Pressemitteilung Nr. 2009-21: IHP/HWRP-Sekretariat Koblenz. Hydrologie und Wasserbewirtschaftung 53, H. 3

WMO (2009): WMO statement on the status of the global climate in 2008. Deutsche Übersetzung: IHP/HWRP-Sekretariat Koblenz. Hydrologie und Wasserbewirtschaftung 53, H. 3

Hoff, H., (2009): Verbessertes Wassermanagement kann Ernährungskrisen eindämmen. Hydrologie und Wasserbewirtschaftung 53, H. 4

Herrmann, A., S. Schumann, U. Schröder (2009): Internationaler Workshop Stand und Perspektiven hydrologischer Forschung in kleinen Einzugsgebieten. Hydrologie und Wasserbewirtschaftung 53, H. 4

WMO (2008): Manual on low-flow estimation and prediction. Deutsche Übersetzung der Zusammenfassung: IHP/HWRP-Sekretariat Koblenz (2009). Hydrologie und Wasserbewirtschaftung 53, H. 4

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UNESCO (2009): Virtual water trade, UN World Water Development Report 3, p. 35. Deutsche Übersetzung: IHP/HWRP-Sekretariat Koblenz. Hydrologie und Wasserbewirtschaftung 53, H. 5

Cullmann, J., (2009): 3. Weltklimakonferenz der WMO. Hydrologie und Wasserbewirtschaftung 53, H. 6

Strigel, G., (2009): Erosion, Transport und Sedimentdeposition – Fallstudie Rhein. Kurzbericht. Hydrologie und Wasserbewirtschaftung 53, H. 6

WMO (2009): HelpDesk for Integrated Flood Management of WMO. Deutsche Übersetzung: IHP/HWRP-Sekretariat Koblenz. Hydrologie und Wasserbewirtschaftung 53, H. 6

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Cullmann, J., Krauße, T. and Philipp, A., (2008): Enhancing flood forecasting with the help of process based calibration Physics and Chemistry of the Earth 33, pp. 1111–1116

Schmitz, G. H. and Cullmann, J., (2008): PAI-OFF: A new way to online flood forecasting in flash flood prone catchments, Journal of Hydrology 360, pp. 1–14

Cullmann, J., Krauße, T. and Philipp, A., (2008): Communicating flood forecast uncertainty under operational circumstances, Proceedings 4th International Symposium on Flood Defence: Toronto,Canada, May 6–8

Öffentlichkeitsarbeit | Public Relations

Fachzeitschrift
Kurzberichte zur Rubrik UN-Wasserforum in der Zeitschrift Hydrologie und Wasserbewirtschaftung (HyWa)

Nationale IHP/HWRP-Webseite
Aktuelle Information zu nationalen und internationalen Arbeiten und allgemein verständliche Wissensvermittlung zum Thema Wasser • *http://ihp.bafg.de*

NE-FRIEND
Information zum UNESCO Projekt Flow Regimes from International Experimental and Network Data – Northern Europe
Digitales Inventar kleiner hydrologischer Untersuchungsgebiete
www.euro-friend.de

HydroForum
Wasserportal zur Aus- und Fortbildung in Hydrologie und Wasserwirtschaft in Deutschland
Information zu internationalen Organisationen mit Bezug zum Wasser • *www.hydroforum.de*

Deutsche IAHS Webseite
Information zum Deutschen IAHS-Nationalkomitee
http://iahs-deutschland.bafg.de

Hydrological journal
Short reports under the heading UN Water Forum in the scientific journal “Hydrologie und Wasserbewirtschaftung (HyWa)”

National IHP/HWRP Website
Topical information on national and international activities and transfer of knowledge on the subject of water in a generally intelligible manner • *http://ihp.bafg.de*

NE-FRIEND
Information on the UNESCO Project Flow Regimes from International Experimental and Network Data – Northern Europe
Digital inventory of small hydrological research basins
www.euro-friend.de

HydroForum
Water portal for capacity development in the fields of hydrology and water resources management in Germany
Information on international organisations with regard to water • *www.hydroforum.de*

German IAHS Website
Information on the German IAHS National Committee
http://iahs-deutschland.bafg.de

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GHANA NATIONAL REPORT ON IHP RELATED ACTIVITIES

1. ACTIVITIES UNDERTAKEN IN THE PERIOD JULY 2008 – MAY 2010

1.1 Meetings of the IHP National Committee

1.1.1 Decisions regarding the composition of the IHP National Committee
Inclusion of Women Groups and more NGOs

1.1.2 Status of IHP-VII activities
The National focus is on climate change and variability and feasible adaptation measures

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings
Biannial

1.2.2 Participation in IHP Steering Committees/Working Groups
Member: Inter-Governmental Council of IHP

1.2.3 Research/applied projects supported or sponsored

- ***Climate change effects on water resources and adaptation measures in Ghana***
- ***Preliminary Survey of Water Users' Associations in Ghana***
- ***Characterising Lowflows of Rivers in Ghana***
- ***Sediment Studies on Ghanaian Rivers***

1.2.4 Collaboration with other national and international organizations and/or programmes
Challenge Program for Water and Food / International Water Management Institute

1.2.5 Other initiatives

1.3 Educational and training courses

1.3.1 Contribution to IHP courses – ***Nil***

1.3.2 Organization of specific courses – ***Nil***

1.3.3 Participation in IHP courses - ***Nil***

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

1.5 Publications

***Technical Report*: Climate change effects on water resources and adaptation measures in Ghana, CSIR water Research Institute, Accra, Sponsored by the UNESCO Participation Programme (through the Ghana National Commission for UNESCO, Accra)**

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

Regional Workshop on the Contribution of Big Water Infrastructures to the Sustainable Development of Countries for Journalists in West Africa, Global Water Partnership-West Africa/Country Water Partnership-Ghana, 17th – 21st May 2010, Paloma Hotel, Accra.

1.6.2 Participation in meetings abroad

- ***WEAP Training for Key Partners of Riparian States of the Volta Basin Authority, 28th February – 4th March 2010, VBA/PAGEV/IUCN, Bamako, Mali.***

- ***Joint Africa IHP/UNESCO IOC-GOOS-UNEP/ARSSE/GEO Pan-African Workshop on Climate Change, Water Resources and Coastal Zones Management in Africa: 3rd Meeting of Sub-Sahara IHP National Committees and 2nd Regional Workshop of the GEO Coastal of Community of Practice (CZCP), 15 – 17 February 2010, Cotonou, Benin***

- ***Kick-off Workshop for Principal Investigators, ITC/European Space Agency TIGER Capacity Building Facility 2 Project, 8th – 11th December 2009, ITC, Enschede, The Netherlands.***

- ***Global Water Partnership-West Africa Technical Advisory Committee Extended Meeting, 23rd - 24th October, 2009, Royalton Hotel, Abuja, Nigeria***

- ***Regional Workshop for the Establishment of UNESCO-IHP Category II Centre for Integrated River Basin Management in National Water Resources Institute, Kaduna-Nigeria, 17th -18th September 2009, NWRI, Rockview Hotel, Abuja, Nigeria.***

- ***Workshop on Water Issues in Africa-IAP Water Programme, ASSAf/Water Research Commission/Brazil Academy of Sciences, 27th March - 1st April 2009, CSIR Centre, Pretoria, South Africa.***

- ***International Forum on Water for Food-2, November 2008, CPWF/IWMI, Addis Ababa, Ethiopia.***

1.7 Other activities at regional level

1.7.1 Institutional relations/cooperation

- ***Collaboration with the Volta Basin Authority(Ouagadougou, Burkina Faso) on Integrated Water Resources Management***

- ***Collaboration with the Global Water Partnership-West Africa (GWP-WA) and the Country Water Partnership (CWP-Ghana) on Integrated Water Resources Management***

1.7.2 Completed and ongoing scientific projects

On-going: **Project Nr. 17 - Earth Observation for Regional Water Balance Estimation and Surface Energy Balance Assessment in the Volta Basin, West Africa *Volta-Web (Volta Water and Energy Balance)* (Water Assessment in Africa under Global Climate Variability – Turning Science into Operations), ESA TIGER-2 / ITC, The Netherlands**

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2010

Research/applied projects supported or sponsored:

- ***Inventory of Local Population Adaptation Strategies to Climate Change and Experience and Best Practices Sharing among Local Representatives from Various Regions in Ghana – Sponsored by theGlobal Water Partnership-West Africa***

2.2 Activities foreseen for 2011-2012

- ***Climate Change and Variability and Adaptation Measures in Ghana and West Africa***

2.3 Activities envisaged in the long term

- ***Climate Change and Variability and Integrated Water Resources Management in Ghana and West Africa***

- ***Characterising Low Flows of Rivers in Ghana***

- ***Sediment Studies of Rivers in Ghana***

- ***Collaboration with the Volta Basin Authority(Ouagadougou, Burkina Faso) on Integrated Water Resources Management***

- ***Collaboration with the Global Water Partnership-West Africa (GWP-WA) and the Country Water Partnership (CWP-Ghana) on Integrated Water Resources Management***

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NATIONAL REPORT ON IHP RELATED ACTIVITIES

Iran

1. ACTIVITIES UNDERTAKEN IN THE PERIOD JULY 2006 – MAY 2008

1.1 Meetings of the IHP National Committee

1.1.1 Decisions regarding the composition of the IHP National Committee

The Iranian National Committee of IHP composed of 17 members representing various organizations such as Ministry of Energy, Water Resource Management Co, Department of Environment, Meteorological Organization, two category II Centers, regional center on urban water management, International Center on Qanats and Historic Hydraulic Structures, 4 universities, Ministry of Agriculture, Geological Survey.
The committee convened approximately once a month discussing various issues of our contribution to the international programmes.
The secretariat of IHP National Committee sends IHP News Water Portal News to all members and also informs them about awards and bursaries and also national and international workshops, seminars and conferences. Members also represent their report in the Committee Meetings.

The Iranian national Committee of IHP consists of the following members:

- H.E. Mr. Mohammadreza Attarzadeh
- Mr. Ahmad Abrishamchi
- Mr. Alireza Almaswandi
- Mr. Abdulkarim Behnia
- Mr. Alireza Daemi
- Mr. Ahmad Dehghan
- Mr. Rahimzadeh
- Mr. Aliasghar Semsaryazdi
- Mr. Hamid Shamloo
- Mr. Forood Sharifi
- Mr. Naser Talebbeidokhti
- Mr. Ebrahim Fattahi
- Mr. Jawad Farhoudi
- Mrs. Mahin Gazani
- Mr. Homayoun Motiee
- Mr. Abolghasem Mozafari
- Mr. Reza Maknoon
- Mr. Aliasghar Montazer
- Mr. Alimohammad Noorian

1.1.2 Status of IHP-VI activities

1.1.3 Decisions regarding contribution to/participation in IHP-VII

After going through the details of the various themes and keeping in view the interest of the country, The National Committee decided to participate in the following themes/focal areas.
Theme 1: Focal Area 1.2, Focal Area 1.5
Theme 2: Focal Area 2.2, Focal Area 2.3, Focal Area 2.4
Theme 3: Focal Area 3.2
Theme 4: Focal Area 4.1, Focal Area 4.3, Focal Area 4.4
Theme 5: Focal Area 5.4

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

Iranian National Committee on Hydrology has been active in disseminating and promoting hydrological knowledge in the country by providing sponsorship to various organizations in the country for organizing national/regional and international events in the hydrology.

- Climate change impacts on water resources management in the MENA region
- Empowerment of women's role in water management issues
- ToT on Integrated Urban Water Management
- Water and sanitation
- Action Plan on Flood Management
- National IHP Meeting held in the Ministry of Energy, Iran by the Regional Centre on Urban Water Management-Tehran during 2009.
- National Water and Wastewater Workshop held in Tehran, 2009

1.2.2 Participation in IHP Steering Committees/Working Groups

- G-WADI Steering Committee

1.2.3 Research/applied projects supported or sponsored

- Privatization in the water and wastewater sector
- Urban water management in drought periods
- Watershed management and its relation with urban water management
- Utilization of brackish water for providing potable water
- Groundwater monitoring methods in urban areas
- Water tariffs flexibility in urban areas
- Application of reuse water resources from sewage systems in irrigation as a new water resource
- Promoting manpower capacities in the water and wastewater sector through training and capacity building assessment
- Inventory of the countries utilizing the qanat technology: this project is aimed to prepare an international document which determines the dimensions of this technology usage in each country. Number of qanats, volume of supplied water, and ratio of supplied water to total water demand and the present situation of the qanats in the country will be analyzed.
- Preparation of the Atlas of Qanats in the Central Plateau of Iran as a pilot project: in case this project would be successfully finished, we can make use of its methodology in extending the work to a larger area in order to prepare the world atlas of qanats.
- A survey on the negative impacts of the developmental projects on qanats and the ways to prevent the further destructions. This project can be done with the support of the Iranian ministry of energy (WRMO).
- Introduction of modern technology to operation and maintenance of qanats: this project examines how to apply the modern technologies in the construction and maintenance of the qanats.
- Groundwater Management in the Arid Regions; Some Lessons from Indigenous Knowledge. This project has been put forward to UNESCO. It is hoped that the proposal would meet with UNESCO's approval. This project is to examine the situation of groundwater management in the arid regions of Iran as well as the ways through which we can incorporate some traditional methods into our modern groundwater management.
- Survey on The law of Trans boundary aquifers
- Pilot projects on G-WADI in Khorasan and Taleghan
- Methods for estimating Probable Maximum Precipitation
- Research and Design Flood Warning System for different Basins in Iran
- Investigating and forecasting Large-Scale Climatic Signals Discharge

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

- The International Water Academy
- The International Water Association
- UNESCO-IHE
- UN-Water Decade Program on Capacity Development (UNW-DPC)

- WMO, FAO

1.2.5 Other initiatives

- A proposal on International Drought Initiative (IDI) by I. R. Iran.
- Close cooperation with the International Flood Initiative (IFI) for organizing an international Workshop on Flash Floods, May 2009.

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

- Expert Group Meeting on "Municipal Wastewater Use for Irrigation", Sana'a, Yemen, 4th – 7th Nov. 2006.
- Participating in the 4th International Water Exhibition, Tehran, Iran, 22nd – 25th Nov. 2006.
- International Conference on "Water Resources Management in the Islamic Countries", Tehran, Iran, 19th – 20th Feb. 2007.
- International Symposium on "New Directions in Urban Water Management", Paris, France, 12th– 14th Sep. 2007.
- Co-organizing 70 short courses in the field of wastewater with cooperation of faculty of water Shahid Abbaspour University and UNESCO-IHE institute in 2008 and 2009.
- Training Workshop on ”Integrated Flood Management”, 2009
- Training Workshop on ”Risk Assessment & Flash Flood Mitigation Strategies”, 2009
- Training Workshop on “ Reservoir Dam Sedimentation Control” , 2009
- Training Workshop on “ Challenges of Sustainable Water Use in Arid and Semi-arid Regions under the condition of climate change”, 2009
- Training Workshop on “Development of Hydropower plants”, 2009
- Advanced Training Course for Iraqi Experts, 2009
- Training Workshop on “Qanat Engineering”, 2009
- Meeting on “Consultation of Ministry of Energy and Ministry of Jihad e Agriculture”,2009
- Training course on qanat technology for Islamic countries expert, 2010
- International course on “Hydraulic Historic Structures”, 2010
- Training of Trainers course, 2010
- Investigating the destructive impacts of development plans on Qanats, 2010
- National Workshop on “Capacity Development for Farm Management Strategies to improve Crop Water productivity using Aquacrop”,2010
- Training Workshop on Impacts of Oceanic Climate Change on Water Resources Management, Tehran 2009
- National Seminar on Experiences of Flood Management across the Country, Tehran, 2009
- Technical Workshop on Climate Change, Dams and floods & Drought Challenges, 2008
- National Seminar on Flood Warning System, 2007
- First National Seminar on Geotechnical Issues, Irrigation and Drainage Networks: Challenges and Strategies, 2008
- Second Seminar on Improving and Rehabilitation of Surface Irrigation Systems, 2008
- Second National Seminar on Sustainable Development of Modern Irrigation methods, 2009
- Training Workshop on Drought Impacts, 2008
- Training Course on Irrigation Systems and Management for Afghani Experts, 2008

1.3.2 Organization of specific courses (N/A)

- Training of Trainers Workshop on "Application of Models and New Technologies in Groundwater Management in Arid and Semi-arid Regions", Karaj, Iran, 29th July – 1st Aug. 2006.
- International Workshop on "Flash Floods in Urban Areas and Risk Management", Muscat, Oman, 4th – 6th Sep. 2006.
- International Workshop on "Groundwater for Emergency Situations", Tehran, Iran, 29th – 31st Oct. 2006.
- Training of Trainers Workshop on "Integrated Urban Water Management (IUWM)", Lahore, Pakistan, 2nd – 5th May 2007.
- International Workshop on "Water Demand Management in Urban Areas in Light of Tourism", Muscat, Oman, 27th – 28th Aug. 2007.
- International Workshop on "Capacity Development for Water Journalists", Tehran, Iran, 26th – 28th Nov. 2007.
- Organizing the International Training Course on Qanats "A Multidisciplinary Approach to Integrating Traditional Knowledge with Modern Development"1 ~ 4 July 2007, Yazd – Iran

1.3.3 Participation in IHP courses (N/A)

- Training workshop on Reservoir sedimentation management (China,10-16 October 2007),
- International workshop on Groundwater Modeling for Arid and Semi arid areas (China, 11 -17 June 2007)
- Workshop on Water resource management practices and strategies in arid and semi arid zones of Asia (Turkmenistan, 10-14 March 2008)

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

- Co organizing 70 short courses in the field of wastewater with cooperation of faculty of water Shahid Abbaspour University and UNESCO-IHE institute in 2008 and 2009.
- UNESCO – IHE

And also cooperation with following centers:

- Regional Centre for Training and Water Studies (RCTWS-Cairo)
- UNESCO Tehran Cluster Office
- UNESCO New Delhi Office
- UNESCO Cairo Office
- UNESCO Beijing Office
- Iranian National Commission for UNESCO
- Turkmenistan National Commission for UNESCO
- Pakistan National Commission for UNESCO
- Cooperating with Dundee UNESCO Centre for Water Laws, Policy and Science,
- Cooperating with the Humid Tropic Centre in Kuala Lumpur, Malaysia
- Cooperating with ICHARM –Japan in carrying out joint training courses

1.5 Publications

- Newsletters
- Proceedings of the International Workshop on "Groundwater for Emergency Situations", IHP-VI, Series on Groundwater, No.16
- Preparing the proceeding, presentations and all documents of all events on the CD and DVD
- Preparing the country report of qanats of Afghanistan, Iran and Pakistan
- Groundwater for Emergency Situations
- New Technologies in Water and Wastewater
- Investigating the destructive impacts of development plans on Qanats

- Practices and experiences of water and wastewater technology
- Veins of desert
- Situation of qanat in the world
- Qanat engineering
- Manual on Training of Trainers on Integrated Urban Water Management

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

- Technical Workshop on "Wastewater Reclamation and Water Reuse", Tehran, Iran, 5th May 2008.
- Technical Workshop on "Decentralized and Small Wastewater Treatment Systems", Tehran, Iran, 6th May 2008.
- 2nd Asia Pacific Ministerial Conference on Housing and Urban Development, Tehran, Iran, 12th – 15th May 2008.
- The Governing Board meeting of the Regional Centre on Urban Water Management-Tehran, May 2010, Tehran
- The Governing Board Meeting of the International Centre on Historic Hydraulic Structures, Yazd 2009

1.6.2 Participation in meetings abroad

- 17th session of IHP Intergovernmental Council, UNESCO HQ, Paris, July 2006
- Meeting of the Directors of UNESCO's Water Related Institute and Centers, UNESCO-IHE, Delft, June 2007
- Implementation Planning Workshop on "IHP-VII Urban Water Management Program activities", Paris, Jan. 2008
- SWITCH Workshop, Indonesia, 2009
- Organization of the Islamic Conference (OIC), Working Group on Water, Emirates, 2009
- 5th World Water Forum, (WWF5), Istanbul, 2009

1.7 Other activities at regional level

1.7.1 Institutional relations/cooperation

- Cooperating with the Economic Cooperation Organization (ECO) for establishing the ECO regional Centre on Water

1.7.2 Completed and ongoing scientific projects

- Reconstruction of Hydro-meteorological Network of Afghanistan
- Establishment of Water Research Center in Kabul, Afghanistan
- A project between Iran, Syria, Iraq and Turkey on Climate Change impacts on dam construction on Tigris and Euphrates rivers
- A research project for future studying SWITCH-in-Asia in close Cooperation with the Iranian Water Resource Management company
- Preparing a Manual on Training of Trainers on Integrated Urban Water Management
- Preparing qanats Atlas by using GIS

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2010

- Impacts of Climate Change on Water Resources in MENA Region (emphasizing on supplying drinking water)
- Carrying out a research project during 2008 - 2009
- Holding a training workshop in Syria, RCTWS – Cairo, Late 2008
- Holding an Int. Seminar in Oman, Late 2008
- Arsenic Removal Technology
- Carrying out a research project in 2008 – 09
- Empowerment of Women's Role in Water Issues
- Preparatory phase will be launched in 2008
- Executive phase will start in 2009
- Training of Trainers on Urban Water Management Issues
- Holding a workshop in 2009
- Revising the manual in 2009
- International Conference on Water Resources Management (Middle East,
- CIS and MENA Countries)
- Coordinating for the 2nd Conference to be held in 2010 (venue to be
- determined)
- Health and Safety in Municipal Water Reuse for Irrigation
- Organizing an international workshop in 2008 / 2009
- Organizing a technical training course on qanat for Iraqi experts

2.2 Activities foreseen for 2010-2011

- Impacts of Climate Change on Water Resources in MENA Region (emphasizing on supplying drinking water)
- Arsenic Removal Technology from Potable Water
- Empowerment of Women's Role in Water Issues
- Training of Trainers on Urban Water Management Issues
- International Conference on Water Resources Management (Middle East,CIS and MENA Countries)
- Organizing the 3rd Conference to be held in 2013
- Second National Seminar on Geotechnical Issues, Irrigation and Drainage Networks, 2010
- Training Course on Irrigation Management, 2010
- Training Workshop on Applications of AquaCrop Software, 2010
- The Role of Value Engineering in Drainage and Irrigation Networks, 2010
- Training Workshop on "Water and Sanitation in Disaster Situations"
- Registration of important qanats in UNESCO
- Education of qanat and Hydraulic Historic Structure in schools
- Technical visit on Iran's achievements in the field of Water industry for the Iraqi General Managers

2.3 Activities envisaged in the long term

- A Memorandum of Understanding (MoU) has been signed and exchanged with International Centre for Water Hazard and Risk Management (ICHARM) and short-term, mid-term and long-term activities have been included to be carried out in the framework of UNESCO-IHP phase VII.

- A MoU with Dundee UNESCO Centre on Centre for Water Law, Policy & Science
- MoU with the international agricultural research and training Centre (IARTC), Turkey
- A research project for future studying SWITCH-in-Asia in close Cooperation with the Iranian Water Resource Management Company

INTERNATIONAL HYDROLOGICAL PROGRAM

- ISRAEL -

NATIONAL REPORT ON IHP RELATED ACTIVITIES

1. General

Activities of the Israel National Committee for Hydrology are sponsored by the Ministry of Education, and the Ministry of Science and Technology. The present Chairperson of Israel IHP is Prof. Daniel Ronen from the Israel Water Authority and the Ben Gurion University of the Negev. The Israel IHP Committee operates under the aegis 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); 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); Prof.Haim Gvirsman (The Hebrew University of Jerusalem); Dr. Abraham Melloul (Israel Hydrological Service).

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2. Activities undertaken in the period July 2008 – May 2010

2.1 The Chinese version of "The Blue Planet - The Water Cycle in Earth Systems" has been published under the sponsorship of UNESCO – Paris and UNESCO – Israel (Fig.1). This is the culmination of the first step in the globalization program of a novel teaching methodology for the junior-high school level. The methodology was developed at the Science Teaching Department of the Weizmann Institute of Science in Israel by Dr. Orit-Ben Zvi Assaraf under the educational and scientific leadership of Prof. Nir Orion and Prof. Daniel Ronen.

This venture was triggered by the translation, in 2007, of "The Blue Planet" from Hebrew to Spanish under the sponsorship of the late Eng. Pedro Dondisch, President of the Mexican Association of Friends of the Ben Gurion University of the Negev, Israel.

The Chinese translation was possible, in Israel, thanks to the support of Prof. Uri Shani, Director General of the Israel Water Authority and, in China, by (a) the devoted work and leadership of Ms. Liu Yunhua, General Director of the Shangri La Institute for Sustainable Communities and the sponsorship of the Swarovski Waterschool and (b) Mr. Liu Ke and Mr. Jayakumar Ramasamy of UNESCO's Office in Beijing who promoted the cooperation between Israel and China.

This is a first step in the accomplishment of a dream for a better future and a better world for the coming generations on this planet.

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Fig. 1. Cover page of the Chinese version of "The Blue Planet - The Water Cycle in Earth Systems" .

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2.2 A Workshop for the transfer of "The Blue Planet" methodology was planned to be held in Santiago, Chile in March 2010. The Workshop was organized by the Ministerio de Obras Públicas, Iniciativa Nacional de Eficiencia Hídrica and the Universidad de Chile and was sponsored by the Faculty of Physics and Mathematics of Chile, CAZALAC (Centro para Zonas Áridas y Semiáridas en América Latina y el Caribe), UNESCO-PHI/Proyecto WET Agua y Programa Educativo, and UNESCO – Israel. For unexpected reasons, the workshop has been postponed and will be held in 2010 – 2011.

2.3 Dr. Orit Ben-Zvi –Assaraf, of the Science Teaching Department of the Ben Gurion University of the Negev, Israel, participated in the expert- meeting organized by UNESCO-IHE in Delft, The Netherlands on "Water and Education, towards stratgies with impact" (February 2009). In this ocasion she presented a paper entitled: UNESCO – IHP as a Framework for the Transfer of the Blue Planet Earth Systems Approach (BEPESA), by Orit Ben-Zvi -Assaraf, Nir Orion and Daniel Ronen.

2.4 Dr. Yosi Yechieli, of the Geological Survey of Israel, represented UNESCO – Israel at the meeting held in Paris (April 2009) entitled "The relationship bewteen climate change and groundwater".

2.5 Prof. Shaul Sorek and Prof. Daniel Ronen presented a position paper entitled "Aspects of Water Resources Management" in the Rotary Symposium – Water Quality in the Service of Welfare (May 2009).

2.6 UNESCO and IHP - Israel partially sponsored the Stockholm Junior Water Prize organized by Prof. Gideon Dagan of the Faculty of Engineering of the Tel Aviv University (May 2009).

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2.7 IHP – Israel entusiatically supported CAZALACs Third Phase financing request presented to the Financing Fund of the Government of Flanders.

3. Future activities

3.1 Workshops for knowledge transfer of the "The Blue Planet" methodology will be organized in Argentina, Chile, Mexico and China.

3.2 Cooperation between the UNESCO-IHE Institute for Water Education in Delft and Israeli Universities is envisaged in areas related to arid zone hydrogeology. The following avenues of cooperation will be explored: (a) Establishment of cooperative agreements that will lead to joint education programs; (b) Establishment of common short course program(s) on different water related topics; (c) Exchange of students and faculty members for different time periods; (d) Making use of UNESCO's fellowships for research students of developing countries. A meeting will be held with the new Rector of UNESCO-IHE, Prof. Andras Szöllösi-Nagy.

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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 June 2008 to June 2010.

Professor Kuniyoshi Takeuchi was awarded by the Japan Society of Civil Engineers (JSCE) for his outstanding contributions to international activities for a long time including his services and leadership for UNESCO-IHP, ICHARM and IAHS. Dr. Andras Szollosi-Nagy, the former Director and Deputy ADG, Division of Water Science, UNESCO was also awarded at the same time.

1. ACTIVITIES UNDERTAKEN IN THE PERIOD JUNE 2008 – JUNE 2010

1.1 Meetings of the IHP National Committee

1.1.1 Decisions regarding the composition of the IHP National Committee

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

Members of the IHP National Committee as of June 2010.

	Name	Position	E-mail
Chair *	TAKARA Kaoru	Prof., DPRI, Kyoto Univ.	takara.kaoru.7v@kyoto-u.ac.jp
*	NAKANISHI Hisae	Prof., Doshisha Univ.	hinakani@mail.doshisha.ac.jp
*	YAMAGATA Toshio	Prof., Univ. of Tokyo	yamagata@eps.s.u-tokyo.ac.jp
	UYEDA Hiroshi	Prof., HyARC, Nagoya Univ.	uyeda@rain.hyarc.nagoya-u.ac.jp
	OKI Taikan	Prof., IIS, Univ. of Tokyo	taikan@iis.u-tokyo.ac.jp
	KAWAMURA Akira	Prof., Tokyo Metropolitan Univ.	kawamura@c.metro-u.ac.jp
	KOIKE Toshio	Prof., Univ. of Tokyo	tkoike@hydra.t.u-tokyo.ac.jp
	SHIMIZU Yoshihisa	Prof., Kyoto Univ.	shimizu@biwa.eqc.kyoto-u.ac.jp
	TACHIKAWA Yasuto	Assoc. Prof., Kyoto Univ.	tachikawa@hywr.kuciv.kyoto-u.ac.jp
	TANAKA Shigenobu	Deputy Director, ICHARM	s_tanaka@pwri.go.jp
	TANAKA Tadashi	Prof. Emeritus, Univ. of Tsukuba	tadashi@geoenv.tsukuba.ac.jp
	TANIGUCHI Makoto	Prof., RIHN	makoto@chikyu.ac.jp
	NAKAYAMA Mikiyasu	Prof., Univ. of Tokyo	nakayama@k.u-tokyo.ac.jp
	HORI Tomoharu	Prof., WRRC, DPRI, Kyoto Univ.	hori.tomoharu.3w@kyoto-u.ac.jp
	WATANABE Tsugihiro	Prof., RIHN	nabe@chikyu.ac.jp

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

Secretariat of the Japanese National Committee for IHP, UNESCO:
c/o Mr. MINAMI Tetsuhito
Japanese National Commission for UNESCO,
Ministry of Education, Culture, Sports, Science and Technology (MEXT)
3-2-2 Kasumigaseki, Chiyoda-ku, Tokyo 100-8959, Japan
E-mail: "Natcom Japan" <jpNatcom@mext.go.jp>
TEL: +81-(0)3-6734-2585 / FAX: +81-(0)3-6734-3679
http://flood.dpri.kyoto-u.ac.jp/ihp_japan/index.htm

1.1.2 Status of IHP-VII activities

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

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

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

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

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

- Climate change research focusing on impacts on water-related disaster risk using "Earth Simulator": MEXT Kakushin Project (2007-2011).
- Global Earth Observation System of Systems (GEOSS) and Asian Water Cycle Initiative (AWCI) 3rd GEOSS Asia-Pacific Symposium, Kyoto, Japan, 2-4 February 2009: http://www2.restec.or.jp/geoss_090415/index.html
- GWSP-Asia: HydroChange2008 Conference, Kyoto, Japan, 1-3 October 2008: http://www.gwsp.org/gwsp_asia.html
- Groundwater research such as GRAPHIC.
- GWES (Groundwater in Emergency Situations).
- Collaboration with Mongolian UNESCO Chair on Groundwater.
- Second Phase of PUB project in cooperation with IAHS [Kyoto Univ.].

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

- A Global Center of Excellence (GCOE) Program at Kyoto University "Sustainability/Survivability Science for a Resilient Society Adaptable to Extreme Weather Conditions" adopted for 2009-2014
- A new task force on frequency analysis for non-stationary hydrological time series in ICHARM initiated since 2009
- Improving the predictability of hydrological extremes in ungaged or poorly gaged basins using new measurement technology and promoting the local use of satellite information for improved river basin management in partnership with GEOSS
- Case studies on human security and water-related disasters
- Best practices on water risk management
- Provide ICHARM coordination as focal point for possible networking activities
- Flood forecasting and management [MEXT Kakushin Program, ICHARM, PWRI, IFNet]

FA 1.4 – Managing groundwater systems' response to global changes

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

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

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

THEME 2: Strengthening Water Governance for Sustainability

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

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

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

- Research on "virtual water"
- Collaboration with IHP-LAC for Rio de La Plata Basin Workshops
- Relative impact evaluation in water resources dynamics and social system with large development in river basins [Kyoto Univ.]

THEME 3: Ecohydrology for Sustainability

FA 3.1 – Ecological measures to protect and remediate catchments process

- Participation in ecohydrology research development
- Effect of forest devastation on water resources and environmental issues [Univ. of Tsukuba, Kyoto Univ., Kyushu Univ., Univ. of Tokyo, Tokyo Univ. of Agriculture and Technology]
- Ecohydrology symposia and sessions at AOGS meetings

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

- Frontier of sustainable groundwater management systems based on groundwater flow process in arid/semi-arid region in cooperation with China and Mongolia [Univ. of Tsukuba, Hiroshima Univ., Kumamoto Univ.]

THEME 4: Water and Life Support Systems

FA 4.3 – Achieving sustainable urban water management

- Hydrogeological and sociological survey on development processes of East-Asian cities co-existing with floods [Kyoto Univ.]
- Vulnerability assessment of urban groundwater resources in Asia and Oceania [Geological Survey of Japan]
- New CREST (Core Research for Evolutional Science and Technology) research projects supported by the JST (Japanese Science and Technology Agency) since 2009
- A special UNESCO session at the Rainwater Harvesting Conference was held in Tokyo, Japan, 9 September 2009.

FA 4.4 – Achieving sustainable rural water management*

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

THEME 5: Water Education for Sustainable Development

FA 5.1 – Tertiary water education and professional development

FA 5.2 – Vocational education and training of water technicians

FA 5.3 – Water education in schools

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

- Nagoya University Training Courses and a Doctor degree course in Graduate School of Science in cooperation with a number of Japanese universities
- ICHARM Training Programmes and a one-year Master Degree Program on water-related risk management in cooperation with the National Graduate Institute for Policy Studies (GRIPS) supported by JICA.
- Capacity building and education for observation experts for continuous monitoring of terrestrial environments in Asia [Univ. of Tsukuba]

Other regional and cross-cutting themes activities include:

(1) Catalogue of Rivers: The format of the Catalogue of Rivers for Southeast Asia and the Pacific, Vol. 6 was announced at the 15th Session of IHP Regional Steering Committee (RSC) for Southeast Asia and the Pacific (SEAP) in Manila, the Philippines, on 22-23 November 2007. No remarkable progress so far. The information of previous five volumes locates at: http://flood.dpri.kyoto-u.ac.jp/ihp_rsc/riverCatalogue/index.html

(2) Asian Pacific FRIEND: Prof. Takara and Dr. Kobayashi attended the Asian Pacific FRIEND Workshop, Ho Chi Minh City on 5-6 March 2009.

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

(4) Prediction in Ungauged Basins (PUB) by IAHS: Prof. Takeuchi (ICHARM), Dr. Tachikawa (Kyoto Univ.) and others in PUB-Japan attended a PUB meeting held in Chéngdū, China on 7-9 November 2008.

(5) International Flood Initiative (IFI), International Sediment Initiative (ISI) and International Programme on Landslides (IPL): ICHARM is playing a role of the Secretariat of IFI. IFI was launched at a Session organized by UN agencies, ICSU, WFEO and the International Consortium on Landslides (ICL) at the World Conference on Disaster Reduction (WCDR) in Kobe, Japan in January 2005. Since then both IFI and IPL are promoted continuously and actively. IPL also have a linkage with the International Sedimentation Initiative (ISI). Prof. Takara attended ISI Workshop held in Beijing, China on 5-6 November 2008. His colleague attended a Workshop on Sediment Problems and Sediment Management in Asian River Basins co-convened by ICCE, ISI and WASER at IAHS General assembly in September 2009.

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

(1) The JFIT Annual Review and Evaluation Meeting on the Proposed Science Sector Activities of UNESCO Office Jakarta for the period 2009-2011 was held in the UNESCO Jakarta Office in May 2009. Two MEXT officers (Ms. Watanabe and Ms. Iwashita) attended. The status and progress of the UNESCO science programmes in the region were reported and evaluated. Jakarta Office explained the IHP-WINGA ASPAC (Water Interoperability Networks for Global Change

Adaptation in Asia and Pacific Region) project, which includes four components: RSC activities, IHP Training Course, Flood Prevention and Mitigation Measures in ASPAC region, and Sustainable Water to Improve Tomorrow's Cities Health – Integrated Programme for Asia (SWITCH – IPA). Flood Prevention and Mitigation Measures in ASPAC region includes AP-FRIEND, Flood Forecasting and Warning System and Disaster Reduction Hyperbase (DRH) managed by Prof. Kameda, National Research Institute for Earth Science and Disaster Prevention (NIED).

(2) IHP Training Course task forth meetings were held twice in Uji (Prof. Uyeda, Prof. Takara, Prof. Kojiri and Dr. Takemon) and in Kyoto (Prof. Uyeda, Prof. Takara) to discuss the organization the 19th Course in Kyoto from 29 November to 11 December 2009, as well as the future plan of the course.

(3) IHP Training Course task forth meetings were held twice in Kyoto to discuss the organization the 20th Course in Nogoya on 6-20 November 2010, as well as the 20th Anniversary events at Mielparque Kyoto on 14 November and at RIHN on 15-16 November. [Taniguchi, Watanabe, Uyeda, Takara, Hori]

(4) The 27th IHP National Committee meeting was held at MEXT to discuss various issues relating to the 19th Session of IHP Intergovernmental Council (July 2010) and IHP-VIII (2014-2019) on 24 June 2010.

1.2.2 Participation in IHP Steering Committees/Working Groups

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

(1) The 16th RSC was held in Ulan Bator, Mongolia in conjunction with the International Conference "Uncertainties in Water Resource Management: causes, technologies and consequences /WRM-Mon2008" on 29 September to 2 October 2008. The RSC adopted two resolutions for honoring achievements in the region, and inviting new countries: Singapore, Brunei Darussalam and Timor Leste. The RSC Secretariat Prof. Takara was re-elected for 2008-2010.

(2) Prof. Takara and Dr. Kobayashi attended the Asian Pacific FRIEND Workshop, Ho Chi Minh City on 5-6 March 2009.

(3) The 17th RSC was held in Wuhan, China in conjunction with the International Conference "Hydrology and Disaster Management" (H&DM 2009) on 2 to 6 November 2009. The RSC adopted a resolution "Archiving hydrological disaster management/reduction technologies". Dr. Heng Liu (China) was elected as the RSC Chairperson. [Takara, Tanaka]

(4) IHP Eighth Phase (IHP-VIII) Task Force meeting at UNESCO Headquarters on 20-21 May 2010. [Oki]

1.2.3 Research/applied projects supported or sponsored

N/A

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

The Japanese IHP National Committee has been closely collaborating with:

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

1.2.5 Other initiatives

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 former chairman of the Japanese National Committee for UNESCO-IHP, was assigned as the founding Director of ICHARM. In its inception, ICHARM has been playing core roles in research, training, and information networking activities on water-related disasters at global levels. The activities are expected to contribute in the prevention and reduction of water-related disasters, focusing on flood related disasters at the initial stage. It is important to cooperate with existing UNESCO water Centers such as IHE in the Netherlands, IRTCES in China, HTC in Malaysia and RCUWM in Iran, etc. The outline of ICHARM is as follows.

1) Objectives: The objective of the Centre is to function as the world centre of excellence to provide and assist implementation of best practicable strategies to localities, nations, regions and the globe to manage the risk of water related disasters including flood, drought, landslide, debris flow, storm surge, tsunami and water contamination. The Centre conducts research, capacity building and information networking activities in an integrated manner for preventing and mitigating the impacts of water related disasters and thus to achieve sustainable and integrated river basin management.
2) Functions:
   (i) to promote scientific research and to undertake effective capacity-building activities at the institutional and professional levels;
   (ii) to create and reinforce networks for the exchange of scientific, technical and policy information among institutions and individuals;
   (iii) to develop and coordinate cooperative research activities, taking advantage particularly of the installed scientific and professional capacity of the IHP networks, WWAP, the IFI/P and relevant programmes of non-governmental organizations, international institutions and networks;
   (iv) to conduct international training courses for practitioners and researchers on the global level; and
   (v) to organize knowledge and information transfer activities including international symposia or workshops, and to engage in appropriate awareness-raising activities;
3) Structure: The center is established as a part of the Public Works Research Institute (PWRI) and operated under the responsibility of its Chief Executive, with the advice from the Advisory Board. See other information at: http://www.icharm.pwri.go.jp/html/about/index.html

The events related to the ICHARM are summarized as below.

(1) The International Symposium on Flood Defense was held in Toronto, Canada, on 6-8 May 2008.
(2) The UN/ISDR Comprehensive Tsunami Disaster Prevention Training Course was held at Tsukuba from 2 June to 11 July 2008.
(3) MoUs were signed with UNESCO-IHE and RCUMW on 9 June 2008 in Paris.
(4) The International Symposium, "Local Practices of Integrated Flood Risk Management under Changing Natural and Social Conditions" was held in Tokyo, Japan, on 30 September 2008.
(5) The 2nd International Advisory Board meeting was held in Tsukuba on 1 October 2008.
(6) The Third International Flood Initiative (IFI) Advisory and Steering Committees meeting in Tsukuba, Japan, on 2 October 2008.
(7) A seminar on the Integrated Flood Analysis System (IFAS) was held at ICHARM on 3-8 October 2008.
(8) The 5th Flood Hazard Mapping training course (a JICA training program) was held at ICHARM from 28 October to 28 November 2008.
(9) The 3rd Follow-up Seminar of the Flood Hazard Mapping training course was held in Manila, Philippines, on 17-19 February 2009.
(10) ICHARM served as the topic coordinator for the "Managing Disasters" session at the 5th World Water Forum on 16-22 March 2009 in Istanbul,Turkey.
(11) A research collaboration agreement was signed with Yamanashi University on 27 March 2009.
(12) An open house of ICHARM was held on 14 April 2009 at ICHARM.
(13) A seminar entitled "Testing and Demonstrating a Technology to Cope with Debris Flows in Mountainous Regions" was held in Manila, Philippines, on 12 June 2009.
(14) IFAS training workshops were held in Tsukuba, Japan, on 3-7 August 2009 and in Kathmandu, Nepal, on 27-28 August 2009.
(15) A "Training Workshop on Risk Assessment and Flood Mitigation Strategies" was held in Kuala Lumpur, Malaysia, on 10-13 August 2009.

(16) ICHARM Director participated in the 3rd World Climate Conference in Geneva, Switzerland on 31 August 2009.
(17) The "Local Disaster Management Plan with Flood Hazard Map" training course (a JICA training program) was held at ICHARM on 9-27 November 2009.
(18) An agreement on a joint regional technical assistance project was signed with ADB on 13 November 2009. As a part of this project, a local workshop was held in Indonesia on 2-4 March 2010 to implement IFAS in the Solo River basin.
(19) ICHARM has conducted a one-year master's program, "Water-related Disaster Management Course of Disaster Management Policy Program," since 2007 in collaboration with JICA and GRIPS. Seven students in the class of 2008 graduated on 16 September 2009 with a master's degree in disaster management. The class of 2009 started the program on 6 October 2009 with 13 students.
(20) An MoU was signed with the International Research and Training Center on Erosion and Sedimentation (IRTCES) on 17 September 2009 at ICHARM.
(21) The new doctoral program in disaster management started its admission process in December 2009 in collaboration with GRIPS.
(22) The ICHARM Quick Reports on Floods 2009 was held at ICHARM on 10 December 2009.
(23) An academic research agreement was signed on 25 January 2010 with the Disaster Prevention Research Institute (DPRI) of Kyoto University at DPRI.
(24) An international workshop on sustainable tsunami countermeasures was held in Banda Aceh, Indonesia, on 9-11 March 2010.
(25) The first announcement of the 5th International Conference on Flood Management scheduled to be held on 27-29 September 2011was made on 7 May 2010.
(26) The IRDR (Integrated Research on Disaster Risk) subcommittee has been established in the Science Council of Japan as a domestic committee of Japan and ICHARM Director Takeuchi has been elected as the subcommittee chair. The 2nd subcommittee meeting was held on 24 May 2010.
(27) A preliminary MoU was signed with the HidroEx newly set up in Brazil on 25 May 2010 at ICHARM.

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

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

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

(2) IHP Training Courses:
The Hydroshperic Atmospheric Research Center (HyARC) of Nagoya University offers IHP Training Courses for both foreign students of Graduate School of Science, Nagoya University and trainees chosen by UNESCO Regional Science Bureau for Asia and the Pacific in Jakarta. The training courses are financed by the Japanese Fund-in-Trust (JFIT) for IHP. The 18th IHP Training Course with the theme "Satellite Remote Sensing of Atmospheric Constituents" was held in Nagoya on 3-15 November 2008. The training course offered introductory lectures on the basics of meteorological satellite observations and the physical principles of retrieval algorithms, as well as a practical training to establish basic skill to analyze satellite data. Next year UNESCO Office, Jakarta in collaboration with Nagoya University and Kyoto University has successfully organized the 19th

IHP Training Course with the theme “Water Resources and Water-Related Disasters under Climate Change -Prediction, Impact Asessment and Adaptation-“. The course consists of a series of lectures, practical sessions and technical visits which will be held mainly at the Disaster Prevention Research Institute (DPRI), Kyoto University from 29 November to 12 December 2009.

1.3.2 Organization of specific courses

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

ICHARM also has been conducting a one-year master’s program, “Water-related Disaster Management Course of Disaster Management Policy Program,” since 2007 in collaboration with JICA and the National Graduate Research Institute for Policy Studies (GRIPS). Seven students in the class of 2008 graduated on 16 September 2009 with a master’s degree in disaster management. The class of 2009 started the program on 6 October 2009 with 13 students. The new doctoral program in disaster management started its admission process in December 2009 in collaboration with GRIPS.

1.3.3 Participation in IHP courses

N/A

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

(1) Prof. Takara visited UNESCO-IHE on 2 June 2009, giving a lecture "Water-Related Disasters in Asia and Pacific Regions" at Lunch Seminar.

(2) International Symposium “Water, Cultural Diversity and Global Environmental Change: Emerging Trends, Sustainable Futures?” was held at the Research Institute for Humanity and Nature (RIHN), Kyoto on 1-3 October 2009, co-organized by RIHN, UNESCO-IHP and UNU-IAS. Open Symposium for the general public was held at Kyoto International Conference Hall on 2 October 2009. The former UNESCO-IHE Rector Dr. Richard Meganck attended this international symposium as Keynote Speaker and Panelist. This symposium is also liked with UNESCO-MAB. [Watanabe, Takara, Nakayama]

(3) Former UNESCO-IHE Rector Richard Meganck visited Kyoto University President Hiroshi Matsumoto on 2 October 2009 to discuss future cooperation between UNESCO-IHE and Kyoto University. [Takara]

1.5 Publications

1. «For the Sustainable Groundwater Resources Management: Through the UNESCO Chair in Mongolia» -2007 University Student Exchange Programme-, Published by Prof. Tadashi Tanaka, Terrestrial Environmental Research Center (TERC), the University of Tsukuba, March 2008.
2. «For the Sustainable Groundwater Resources Management: Through the Japanese Activities on Countermeasures for the Remediation of Public Hazards» -2008 University Student Exchange Programme-, (Eds.) Maki Tsujimura and Tadashi Tanaka, Terrestrial Environmental Research Center (TERC), the University of Tsukuba, October 2008.
3. «UNESCO Chair Workshop on Sustainable Groundwater Management in Arid and Semi-arid Regions» Proceedings, Institute of Geo-ecology, MAS, Ulaanbaatar, Mongolia, 1 October 2008, (Eds.) Tadashi Tanaka, Ramasamy Jayakumar and Badamgarav Erdenechimeg, IHP VII Technical Document in Hydrology, No. 1, UNESCO Office Beijing, 64 pp., 2009.
4. «Satellite Remote Sensing of Atmospheric Constituents» -The Textbook for 18th IHP Training Course in 2008-, Hydrospheric Atmospheric Research Center, Nagoya University and United Nations Educational Scientific, November 2008.
5. «IWRM Guidelines at River Basin Level» Part 1: Principles, UNESCO-IHP, WWAP and NARBO, 24 pp., ISBN: 978-92-3-104100-6.

6. «IWRM Guidelines at River Basin Level» Part 2-1: The Guidelines for IWRM Coordination, UNESCO-IHP, WWAP and NARBO, 173 pp., ISBN: 978-92-3-104101-3.
7. «IWRM Guidelines at River Basin Level» Part 2-2: The Guidelines for Flood Management, UNESCO-IHP, WWAP and NARBO, 76 pp., ISBN: 978-92-3-104102-0.
8. «IWRM Guidelines at River Basin Level» Part 2-3: Invitation to IWRM for Irrigation Practitioners, UNESCO-IHP, WWAP and NARBO.

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

(1) HydroChange 2008 "Hydrological Changes and Managements from Headwater to the Ocean" was held in Kyoto, 1-3 October 2008 [Dr. Taniguchi (RIHN)].
(2) IAH (International Association of Hydrogeologists) meeting in Toyama, Japan in October 2008 including GRAPHIC discussion [Dr. Taniguchi (RIHN)].
(3) The 1st World Landslide Forum was held at UNU, Tokyo on 18-21 November 2008. ICHARM and other UNESCO-related organizations (ICHARM, Ritsumeikan Univ. and UNU) attended it as well as a pre-event on 17 November 2008. [H. Ooe (MOFA), J. Watanabe (MEXT), Takeuchi, Takara]
(4) Japan is managing PUB (Prediction in Ungaged Basins) activities of IAHS. Asian PUB is developing quite well under Dr. Yasuto Tachikawa's initiative. Domestic PUB meetings were held in March 2009.
(5) A Post-GAME project, MAHASRI led by Dr. Jun Matsumoto (Univ. of Tokyo) is now activated with many participants from Asian countries. They are collaborating with IHP FRIEND as well as with PUB.
(6) Asian Water Cycle Symposium. See further at http://monsoon.t.u-tokyo.ac.jp/AWCI/.
(7) GWSP-Asia (Global Water System Project) Working Group activities includes discussion on data collection and future research direction [http://www.chikyu.ac.jp/USE/GWSP/GWSPasia.htm; Dr. Makoto Taniguchi (RIHN)].
(8) International Symposium "Water, Cultural Diversity and Global Environmental Change: Emerging Trends, Sustainable Futures?" was held at the Research Institute for Humanity and Nature (RIHN), Kyoto on 1-3 October 2009, co-organized by RIHN, UNESCO-IHP and UNU-IAS. [Watanabe, Takara, Nakayama]
(9) UNESCO Chair Workshop on International Strategy for Sustainable Groundwater Management: Transboundary Aquifers and Integrated Watershed Management was held at the University of Tsukuba, Japan on 6 October 2009. The representatives of UNESCO Chair in Mongolia and Mr. Chusei Yamada, Special Assistant to the Ministry of Foreign Affairs (Former Special Rapporteur on Shared Natural Resources of the U International Law Commission) attended. [Tadashi Tanaka, Takeuchi, Takara]
(10) The 9th IIASA-DPRI Forum on Integrated Disaster Risk Management in Kyoto, 12-16 October 2009. During this conference, there was DRH Consortium Symposium on 12 and 15 October 2009. Collaboration between DRH and IHP is discussed and approved. [Takara]
(11) The IWRA (International Water Resources Association) International Symposium and Experts Meeting on Integrated River Basin Management in Monsoon Asia was held at the University of Tokyo on 14 and 15 December 2009, with a financial support by the River Fund. This meeting was jointly organized with the GEOSS-AWCI; other co-organizers were UNESCO-IHP, JSCE, IAHR and IAHS. [Takahasi, Takeuchi, Musiake, Koike, Takara, Nakayama, Oki]

1.6.2 Participation in meetings abroad

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

Japan participated in the establishment of the Regional Steering Committee (RSC) for Southeast Asia and the Pacific in 1993. The first RSC chairperson was Prof. Yutaka Takahasi (Univ. of Tokyo), who used to be the Vice Chairperson of the IGC (1990-1991) elected from the Group IV, Asia and the

pacific. Since the establishment of RSC, at least a couple of Japanese National IHP Committee members have attended and participated actively in all of the annual meetings of the RSC. Prof. Takeuchi had served as the RSC Secretary (1993-1999) and the Chairman of the Technical Sub-Committee (TSC) for Asian Pacific FRIEND (APF) Phase I (1997-2001) in the framework of the RSC, while Prof. Takara is playing a role of the RSC Secretary (1999-), and a member of TSC-APF Phases I (1997-2001) and II (2002-).

(1) The 4th International Conference of Asia Pacific Association of Hydrology and Water Resources (APHW2008) was held in Beijing on 3-5 November 2008. A PUB Session was also convened.
(2) The Fifth World Water Forum in Istanbul, Turkey, 16-22 March 2009. [ICHARM, Takara and others]
(3) The 43rd IHP Bureau meeting at UNESCO Headquarters on 3-5 June 2009. [Takara]
(4) The Second Session of the Global Platform for Disaster Risk Reduction, Centre Internationale de Conferences (CICG), Geneva, Switzerland, 16-19 June 2009. ICHARM organized a special event "Charting Global Agenda for water-related Disaster Risk Reduction" on 19 June. [Takeuchi, Takara]
(5) IHP National Committee's Meeting held at RCUWM in Tehran, Iran on 27-28 July 2009. Prof. Takara reported the activities of RSC in Southeast Asia, of Japanese IHP National Committee, and of ICHARM. The Meeting decided to initiate some action for launching International Drought Initiative (IDI).
(6) Final Conference COST Action C22 Paris 2009 "Road Map Towards A Flood Resilient Urban Environment" at UNESCO Headquarters, 25-27 November 2009. Prof. Takara was invited to give a keynote speech "Flood Resilience in the Mega Cities in Asia" on 27 November.
(7) The 44th IHP Bureau meeting at UNESCO-IHE, Delft, The Netherlands on 3-5 June 2009. [Takara]
(8) FRIEND Database Harmonization Workshop at UNESCO Headquarters, 7-8 June 2010. Dr. Hidetaka Chikamori (Okayama Univ.) attended as the representative of AP-FRIEND.
(9) The 10th IHP-IAHS George Kovac Colloquium "Hydrocomplexity: New Tools for Solving Wicked Water Problems"at UNESCO Headquarters, 2-3 July 2010. [Nakajo]
(10) The 19th Session of the IHP Intergovernmental Council at UNESCO Headquarters, 5-9 July 2010. [Takara, Takeuchi and others]

1.7 Other activities at regional level

1.7.1 Institutional relations/cooperation

N/A

1.7.2 Completed and ongoing scientific projects

N/A

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2010

(1) The 18th Session of the IHP Regional Steering Committee (RSC) for Southeast Asia and the Pacific will be held in Hanoi, Viet Nam on 8-12 November 2010.
(2) The 5th International Conference of Asia Pacific Association of Hydrology and Water Resources (APHW2010). This meeting will be in conjunction with the 18th Session of RSC-SEAP in Vietnam.
(3) The 20th IHP Training Course with the theme "Groundwater as a key for adaptation to changing climate and society" will be held on 7 to 20 November 2010. The 20th anniversary Special lectures and meetings will be organized during the 20th IHP Training Course.
(4) The 3rd ICHARM Advisory Board will be held on 29 September 2010 in Tsukuba.
(5) ICHARM will launch Ph.D. course in Disaster Management on 4 October 2010.
(6) UNESCO Chair in Mongolia 2010-2011

(7) The 5th International Symposium on Flood Defense: Tsukuba, Japan on 27-29 September 2011.

2.2 Activities foreseen for 2011 - 2012

(1) The 19th Session of the IHP Regional Steering Committee (RSC) for Southeast Asia and the Pacific will be held in Kyoto, Japan in October 2011.
(2) Participation in RSC-SEAP activities including Asian Pacific FRIEND, the Catalogue of Rivers, IHP-DRH activities.
(3) The 21st IHP Training Course in Kyoto: "Ecohydrology for sustainability" (to be confirmed).
(4) Implementation of projects related to IHP-VII.
(5) The 2nd Asia Pacific Water Summit, dates and place T.B.D.
(6) Research on HELP basins.
(7) Collaboration with UNESCO-MAB and UNESCO-IOC activities.
(8) The Third Session of the Global Platform for Disaster Risk Reduction, Centre Internationale de Conferences (CICG), Geneva, Switzerland, 8-13 May 2011.

2.3 Activities envisaged in the long term

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

JORDAN NATIONAL REPORT ON IHP RELATED ACTIVITIES

1. ACTIVITIES UNDERTAKEN IN THE PERIOD 2008 – May 2010

1.1 Meetings of the IHP National Committee

There are twelve meetings existed each year as one meeting every month.

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, the existing Vice Chair Person is the Secretary General of the Ministry of Water and Irrigation Eng. Maysoon Zoubi.

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

- Ministry of Water and Irrigation (MWI) and both Water Authorities
- Water Authority of Jordan (WAJ)
- Jordan Valley Authority (JVA)
- 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 Applied University, Salt
- Metorological Departement
- Natural Resources Authority (NRA)
- The Higher Council for Science and Technology (HCST)

1.1.2 Status of IHP-VII activities

1.1.3 Decisions regarding contribution to/participation in IHP-VII

The Jordan National IHP Committee Contributed and follows the themes and sub-themes of the plan of IHP-VII (2008-2013), especially in preparation and planning of the ongoing and future activities related to the International Hydrological Program.

Concentration on the National Priorities as follows:

* Surface water and Groundwater Resources Protection
* Artificial Groundwater Recharge and Surface Water Harvesting.
* Adaptation to Climate Change.
* Sanitation and Wastewater Resources Management>
* Shared Water Resources and Transboundary Water.
* Watershed and Aquifers / Climatic Change 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 2009 by the Jordan National IHP Committee. The first workshop on " Shared Water Resources and Transboundary Water " conducted at UNESCO office, Amman in March 2009 followed the celebration in the International water day, where the second workshop conducted at Muta Univercvity, Karak. In May, 2009 in the same topic.

A workshop held in August 2008, at Science and Technology Univercity, Irbid, in a topic, " Sanitation and Reclaimed Water Reuse ".

A workshop in August 2009 at Amman, UNESCO office for evaluation and prioritization a six proposed research projects for the National IHP Committee of " UNESCO part of MDG and Climate Change, Adaptation to Climate Change ", the spanish fund-UN.

Two training programs implemented: The first coarse for water technicians held at Albalqa Univercity for three days at the third quarter 2009 in a topic of, "Hydrological Measurements" where the second training coarse for the technicians held in February, 2010 at the southern Jordan valley.

1.2.2 Participation in IHP Steering Committees/Working Groups

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

1.2.3 Research/applied projects supported or sponsored

* Implementation a research project in a topic " Groundwater Recharge Evaluation in Wadi Feifa, Southern Jordan Valley.

* Research program of " Wastewater Resources Management in Rural Areas in Jordan ", supported by UNESCO (2008-2009).

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 Regional Office in Cairo.
* 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 as Water Protection Association.

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1.2.5 Other initiatives

Celebration in the international water day in march 2009, 2010 at the Ministry of Water and Irrigation headquarter. The celebration consists of public awareness

programs with presence of students, institutions and non governmental organizations having a role in pubic awareness in water and environment protection. Also representatives of a technical cooperation projects and donours attended the celebration. A Prizes and certificates 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.

1.3.2 Organization of specific courses

* Two training courses held at the second half of 2008, the first one held at Balqa university in a topic of, " Wadi Hydrology ". and the second coarse held at UNESCO, Amman office in a topic, " Modelling and Transport Models ".

* Two training programs have been implemented, both training courses related to a topic of " Hydrological Measurements". The participants mainly from the Ministry of Water and Irrigation, where other institutions participated in the first course.

1.3.3 Participation in IHP courses

* participation in the annual Wadi Hydrology Course, Amman.
* Participation in the training workshop in Eygept in April, 2009 in a topic: " Integrated Groundwater Resources Management :.

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

1.5 Publications

* Publication of the scientific papers of the workshop held at the Science and Technology University in August 2008 through a CD.

* The papers presented in the seminar " Shared Water Resources and Transboundary Water " held at Muta University, South of Jordan, Karak May 2009 through a
CD.

* Research Program of " Groundwater Recharge Evaluation in Wadi Feifa, Southern Jordan Valley ". A research program supported by UNESCO and implemented by the Jordan National IHP Committee. Through limited number of paper publication, Also through a CD.

* Research program of " Wastewater Resources Management in Rural Areas in Jordan "., supported by UNESCO (2008-2009). Also implemented by the Jordan National IHP Committee. Through paper publication and CD.

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

* Annual Wadi Hydrology Course at the Jordan University.

1.6.2 Participation in meetings abroad

* Participation in the Arab National IHP Committees Meeting held in Sudan, in September-November, 2009. Two members from the national committee participated in the meeting. A National Country report has been submitted to the meeting. Actually this meeting is conducted each two years through UNESCO Cairo Office, ALECSO and other Organizations.

* Participation of three members of Jordan National IHP in a scientific trip to IHP Committee in Eygept at the first quarter 2009.

* Participation at UNESCO General Conference Held at UNESCO Headquarter in Paris in October, 2009.

* Participation in two Scientific meetings abroad.

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 Regional Office in Cairo, UNESCO Amman Office, UNESCO Chair in Wadi Hydrology.

* Cooperation with Groundwater Protection Network, UNESCO Cairo Office, ACSAD

* Cooperation with the Egyption National IHP Committee.

* Cooperation with Yemeni National IHP Committee.

1.7.2 Completed and ongoing scientific projects

* A project entitled, " Wastewater Resources Management in Rural Areas in Jordan ", that implemented by the Jordan National IHP Committee and supported by UNESCO (2008-2009), also completed in December 2009.

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2010

There are three foreseen activities panned as follows:

* A scientific workshop on a topic, " Wasewater Resources Management in Rural Areas in Jordan".

* A training workshop related on " application two softwares in water resources

management ".

* A scientific workshop on the topic "Climate Change and Biodiverciry, at AL-Albayt Univercity, Jordan, within the fouth quarter of 2010.

Implementation of three research projects related to the " Adaptation to Climate Change ", as follows:

* Evaluation of Climate Change Scenarios iImpacts on Water assets quality of selected basins.

* Evaluation of rainwater variability impacts on soil water contents and groundwater recharge rates.

* Assesment of Surface water harvesting facilities due to variability in intensity and due to climate change.

2.2 Activities foreseen for 2011-2012

* Celebration in the international water day in March 2011.

* A scientific workshop at the first quarter 2011.

* A Scientific Seminar Probably in the second quarter 2011.

* A training coarse in one of the themes mentioned in IHP- VII. within the third quarter 2011.

* Celebration in the international water day in march 2012.

* A scientific workshop at the first quarter 2012.

* A scientific seminar Probably in the second quarter 2012, followed by a panel discussion. The topic will be selected to coincide with the IHP-VII from (2008-2013)..

* A training coarse in one of the themes mentioned in IHP- VII within the third quarter 2012..

2.3 Activities envisaged in the long term

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The 19th Session of the IHP Intergovernmental Council (Paris, 5th -8th July 2010)

LESOTHO COUNTRY REPORT

Introduction

The International Hydrological Programme (IHP) is the United Nations Education, Scientific and Cultural Organization's (UNESCO) inernational scientific cooperative program in water research, water resources management, education and capacity building. Lesotho has not yet legally established the National UNESCO-IHP committee and it is in the process of establishing the committee. However, there are some activities in which the Department of Water Affairs which the focal point for IHP participates in and the Country is also in the process of establishing the National UNESCO-IHP Committee.

Activities

As the focal point for hydrology, the Department has been participating in the meetings and workshops organised by the National UNESCO Commission that involved the participation of the Natural Resources Committee of which we are part of.

In November 2008, Department of Water Affairs participated in UNESCOM Capacity-Building Workshop which was held in Maseru Lesotho. The workshop was aimed at strengthening the capacity of national commissions and eight English-Speaking Commissions in the Region participated.

In February 2010, the Department took part in the meeting organised by National Commission for UNESCO to discuss the Parcipation Programme Proporsals for the biennium (2010-2012) as dicided in the 35th Session of the General Conference of UNESCO held in November 2009.

General Meetings

In February 2010, Department of Water Affairs as a focal point on hydrology participated in a meeting and workshop in Cotonou, Benin. The objectives of the meeting and workshop were the Sub-Saharan Africa IHP committees to discuss ways of reviving research activities of the National Committees of UNESCO – IHP, and to hold a regional workshop on climate change, water resources and coastal zones management in Africa.

Current priority areas / activities on water resource management

- Catchment modeling systems
- Real-time flood forecasting systems
- Wetlands rehabilitation/restoration projects
- Mapping of Lesotho's aquifers
- Development of national Economic Water Use Accounts

Perceived objectives of UNESCO-IHP Lesotho

- Promotion of water research
- Promotion of IWRM activities

Conclusion

Due to high staff mobility, there tends to be discontinuity regarding UNESCO-IHP activities. This problem makes it difficult for Lesotho to establish the National UNESCO-IHP Committee as there is a loss of institutional memory. However, as the National focal point we will learn from other counties expiriences with regard to the establishment of the National IHP Committees. We will also continue to engage all the stakeholders that play a role in water resources management and institutions of higher learning including National University of Lesotho and Lerotholi Politechnic who are already members of the Natural Resources committee to see how best we can establish the National UNESCO- IHP Committee.

Informe de actividades 2008-2010 del Comité Nacional PHI de México

El informe siguiente incluye las actividades del Comité Nacional Mexicano para el Programa Hidrológico Internacional (Conamexphi) de junio de 2008 a mayo de 2010.

Actividad internacional

El Comité Nacional Mexicano del Programa Hidrológico Internacional tuvo presencia en la VII Reunión de Comités Nacionales y Puntos Focales del Programa Hidrológico Internacional (PHI) que se realizó del 30 de junio al 1 de julio del 2009 en la ciudad de Asunción, Paraguay. El M. en C. Alberto Güitrón de los Reyes Vicepresidente del Conamexphi fue quien expuso los avances de los diversos programas que tienen expresión en México. Adicionalmente, asistió a la Conferencia "Ecohidrología para la Sostenibilidad en el contexto del Cambio Global", que formó parte del evento. En Octubre de 2009 México fue elegido como estado miembro del Consejo Intergubernamental del PHI en la 35a. sesión Conferencia General de la UNESCO.

Actividad nacional

- Primer Seminario de Potamología “José Antonio Maza Álvarez”. Del 19 al 21 de noviembre en el Auditorio del IMTA se llevó a cabo el Primer Seminario de Potamología cuyo objetivo fue de estimular las investigaciones y aplicaciones en el área de la mecánica de ríos. El seminario consistió de ponencias magistrales, mesa redonda y presentaciones por diversos expertos en la materia,
- Conferencia “La sostenibilidad de los recursos hídricos: caso río Naranjo. El maestro en ciencias Joram Matias Gil Laroj, responsable de la Cátedra UNESCO “Sostenibilidad de los recursos hídricos”, con sede en la Universidad de San Carlos, en Guatemala, presentó, en el marco de la ceremonia de instalación de la Cátedra UNESCO-IMTA: “El Agua en la Sociedad del Conocimiento”, la conferencia “La sostenibilidad de los recursos hídricos: caso río El Naranjo”, el pasado 22 de octubre en las instalaciones del IMTA.
- Segundo Seminario de Potamología “José Antonio Maza Álvarez” se llevó a cabo del 26 al 29 de agosto de 2009 en la Ciudad de Villahermosa Tabasco. El tema eje del seminario fue “Restauración de ríos para la sustentabilidad ambiental”.
- Creación y mantenimiento de la página web www.imta.gob.mx/conamexphi del conaphi de México.

Cursos académicos o de adiestramiento

- Taller “Water Resources Assessment (Integral Water Balance in Basins)” 17 y 18 de febrero de 2008. “St. John’s, Antigua y Barbuda.
- Taller “Regionalization in hydrology” 19 y 20 de febrero 2008 en St. John’s, Antigua y Barbuda.
- Curso “Prevención de Conflictos y Cooperación en la Gestión de los Recursos Hídricos en América Latina y el Caribe” ”, impartido por Dr. Paúl Herrera Samaniego (Coordinador del PCCP UNESCO para América Latina y El Caribe), Lic. Beatriz Campillo (Alternativas y Capacidades, A.C.), Dr. Sergio

Vargas Velázquez y M.C. Gustavo Ortiz Rendón (IMTA), y Dr. Rodrigo Gutiérrez Rivas (UNAM). Del 1 al 4 de julio de 2008. México DF.

- Curso taller vulnerabilidad y gestión de riesgos por inundaciones. 14 y 15 de agosto 2008. Tuxtla Gutiérrez Chiapas.
- Curso "Trazadores e isotopos en hidrología". 12 al 16 de octubre de 2009. Instalaciones del IMTA.

Publicaciones

- Revisión y validación de la información aportada por México para el Libro II de la serie (aspectos legales e institucionales). Publicado en el 2008 por el Programa Hidrológico Internacional (PHI) de la Oficina Regional de Ciencia para América Latina y el Caribe de la Organización de las Naciones Unidas.
- Agua y Diversidad cultural en México. Publicado en el 2008 por el Programa Hidrológico Internacional (PHI) de la Oficina Regional de Ciencia para América Latina y el Caribe de la Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura (UNESCO).
- Libro Cultura hidráulica y simbolismo mesoamericano del agua en el México prehispánico. IMTA Editorial. Publicado en el 2009.

Actividades en los programas globales y grupos de trabajo basados en el marco de la *VII Fase* del PHI

Tema 1. Adaptación a los efectos de los cambios mundiales en las cuencas fluviales y los sistemas de acuíferos

El programa global HELP dio de alta a la cuenca del lago de Pátzcuaro mediante la ficha correspondiente en donde se describen los resultados del programa de restauración integral en donde se tiene la participación coordinada del Gobierno Federal, Estatal, Municipios, el IMTA, la Fundación Río Arronte y la población civil. Incorporación de nuevos elementos de gestión a las cuencas Lerma-Chapala y Pátzcuaro.

El programa global ISARM revisó y validó la información aportada por México para el libro II de la serie (aspectos legales e institucionales). Estudio de casos: Cuenca del Bolsón del Hueco en la frontera México – EUA. Se continúa participando en la elaboración del libro III de aspectos socioeconómicos.

El IGRAC impartió el Curso "Aumento de oferta hídrica en el Caribe. Se está llevando a cabo el Proyecto Piloto de recarga del Acuífero del Valle de México". Se ha programado impartir el Curso/Taller "Climate Variability and Change: Groundwater Resources". Se dará capacitación a 20 personas del sector agua en México (IMTA, Conagua, CFE, entre otros) en el tema del cambio climático y sus efectos en el agua subterránea.

En el marco del programa global FRIEND se está trabajando en la integración de la información de México a la Base de Datos Regional. Se imparte asistencia técnica en temas especializados de climatología para la formulación del Sistema para la detección de la Variación del Cambio Climático en México. Para el periodo 2010-2011 se impartirá el

Curso – Taller sobre "Establecimiento de un sistema de monitoreo para detectar el cambio climático en el futuro". Se identificará información documentada de temperaturas máximas y mínimas, y precipitación relacionada con el Cambio Climático. Se integrará información de México a la Base de Datos Regional. Se realizará un análisis de la información hidroclimatológica de México para establecer indicadores sobre la variabilidad y el cambio climático.

El programa regional GWADI se trabajó en la obtención del Mapa de zonas áridas, semiáridas y subhúmedas secas de México, de acuerdo con los estándares de FAO, documento que está en su fase de revisión por CAZALAC y será publicado a mediados del 2010. Se elaboran dos documentos temáticos: "Planeación para afrontar las sequias", Monitoreo y "Evaluación de la Sequia en la cuenca del Rio Nazas".

Tema 2. Mejorar la gestión de los recursos hídricos para la sostenibilidad

En el programa global PCCP se realizó el curso "Prevención de Conflictos y Cooperación en la Gestión de los Recursos Hídricos en América Latina y el Caribe", con la colaboración del Coordinador del PCCP-UNESCO para América Latina y El Caribe, de la empresa Alternativas y Capacidades, A.C., el IMTA, y la Universidad Nacional Autónoma de México. Se están documentando conflictos por el agua en la cuenca del río Balsas. Se llevará a cabo el curso sobre manejo de conflictos PCCP en colaboración con instituciones de educación superior e investigación. Se incorporarán a la Guía para la resolución de conflictos con ejemplos de la cuenca del río Balsas.

Tema 3. Ecohidrología para la sostenibilidad

En el marco del programa global de Ecohidrología se llevó a cabo el Foro Nacional para la Determinación del Uso Ambiental o Caudal Ecológico en México. Se publicó el libro "Requerimientos para implementar el caudal ambiental en México. Se trabaja en la determinación del régimen de caudales ecológicos de diez tramos de río del Estado de Michoacán, aplicando una metodología basada en caudales históricos.se llevo a cabo la simulación del hábitat de un tramo del río Cupatitzio ubicado en el Parque Nacional "Barranca del Cupatitzio", en el Estado de Michoacán, para la determinación del correspondiente régimen de caudales ecológicos.

Tema 4. El agua y los sistemas de sustento de la vida

En el marco del programa global IFI se llevo a cabo el Curso taller vulnerabilidad y gestión de riesgos por inundaciones. Taller "Water Resources Assessment "y el Taller "Regionalization in hydrology" impartidos en St. John's, Antigua y Barbuda. Se llevará a cabo la Reunión nacional IFI-México para discutir las políticas y acciones nacionales referentes a los cuatro ámbitos de la IFI. Se está trabajando en la incorporación de manuales al sitio Web de IFI y en la integración de la Red-IFI.

El programa global JIIHP impartió el Curso "Trazadores e isotopos en hidrología" este se desarrolló en el centro de capacitación del IMTA, del 12 al 16 de octubre de 2009 con la participación de 15 especialistas. El curso permitió a los participantes conocer la utilidad de

los trazadores e isótopos aplicados en hidrología. Presentación de la infraestructura de medición disponible para la aplicación práctica y expedita de los isotopos ambientales en hidrología, se planea llevar a cabo en el 2010 el Curso Internacional: Incorporación de los isotopos en las metodologías utilizadas en el estudio y aprovechamiento sustentable de los recursos hídricos.

En el marco del programa global ISI se impartió el Curso-Taller Regional para Latinoamérica y El Caribe Monitoreo y Gestión de los Sedimentos. El objetivo del Curso Taller fue de llevar a cabo una actualización profesional en materia de monitoreo, evaluación y Gestión de los Sedimentos e impulsar una visión del futuro de la misma, con énfasis en la región de Latinoamérica y El Caribe, mediante una modalidad dinámica e interactiva, a través de la presentación de clases-conferencias, estudios de caso y una visita de campo. Se pretende efectuar dos reuniones en el año con más miembros y una mayor participación a través de presentar sus trabajos a la comunidad de sedimentos a través de presentar sus trabajos a la comunidad de sedimentos. Se planea llevar a cabo durante el 2010 el Estudio de la cuenca El Caracol, proyecto multidisciplinario entre CFE, Conagua, empresas y la academia. Posibilidad de llevar a cabo un seminario internacional sobre erosión en cuencas. Posibilidad de que Conaphi-ISI pueda dar un premio a la mejor tesis de grado en materia de sedimentos o erosión en cuencas.

En el marco del grupo de trabajo Desalación se diseño y desarrollo el laboratorio de membranas, el más grande de Latinoamérica, el cual cuenta con los equipos comerciales de membrana más utilizados a nivel nacional e internacional. Con ellos será posible evaluar la posibilidad de instalar una planta desaladora de agua de mar o salobre en zonas determinadas, así como para remover contaminantes específicos como F, As, entre otros. Los procesos con los que cuenta el Laboratorio son: micro y ultrafiltración, filtración arena como pretratamiento, nanofiltración, OI para agua de mar, OI para agua salobre (procesos de remoción de sales), desinfección con ozono. El laboratorio para autopsia de membranas que está equipado con un microscopio de fluorescencia de RX, así como con equipo para realizar pruebas no destructivas y destructivas de las membranas. En el 2010-2011 se trabajará en un protocolo para la remoción de arsénico en agua.

Tema 5. La educación relativa al agua para el desarrollo sostenible

En el marco del programa regional Agua y Cultura se llevó a cabo la presentación del proyecto Radio Agua Internacional, El IMTA fue invitado para participar en este evento a través de la presidencia del Comité Nacional Mexicano del Programa Hidrológico Internacional. Se llevó a cabo en tres jornadas de trabajo, y contó con la participación de 20 especialistas en comunicación de Argentina, Brasil, Chile, Paraguay, Perú, México, y Uruguay, así como representantes de UNESCO e Itaipú Binacional. Atlas de Culturas Indígenas y su relación con el agua. Se están elaborando los siguientes trabajos: Libro Culturas del agua en México: la cuenca del río Papaloapan (IMTA-Archivo Histórico del Agua). Libro Culturas del agua en México: la ceremonia del Chaac Chac. Video documental Culturas del agua en México: c) Videodocumental Culturas del agua en México: Tabasco. Libro Culturas del agua en México: Los Chultunes, tecnología prehispánica del agua. Proyecto Radio Agua Internacional.

El grupo de trabajo Agua y Género dio seguimiento de la "Agenda Azul de las Mujeres" realizó el Encuentro Nacional sobre Género, Medio Ambiente y Agua y siete talleres sobre género en las políticas hídricas a personal de la Conagua. Ser llevará a cabo el Taller latinoamericano de intercambio de experiencias sobre avances en la incorporación del enfoque de género en las políticas hídricas. Se está trabajando en la formación de formadoras - escuela itinerante: hacia una nueva gobernabilidad del agua con equidad de género.

Cátedra UNESCO-IMTA

- Aprobación de la Cátedra UNESCO-IMTA: El agua en la sociedad del conocimiento en julio de 2008. Instalación de la Cátedra UNESCO-IMTA: El agua en la sociedad del conocimiento, el día 21 de octubre de 2008. Inició de operación del sito "ATL: El Portal del agua desde México" (www.atl.org.mx), que constituye el portal de la cátedra. Conferencia "La sostenibilidad de los recursos hídricos: caso río El Naranjo", impartida por el M.C. Joram Matías Gil Laroj de Guatemala.
- Producción de dos videos: Cátedra UNESCO-IMTA. El agua en la sociedad del conocimiento y Cápsula promocional ATL Portal de la Cátedra UNESCO-IMTA. Seminario "El papel del agua en la sociedad del conocimiento", en noviembre de 2008, en instalaciones del IMTA. Desarrollo de metas para el Plan estratégico de la Cátedra, mediante uso de software colaborativo en noviembre de 2008. Participación en la Reunión Anual de Coordinadores de las Cátedras UNESCO en México, que se llevó a cabo en la Cuidad de Colima, en octubre de 2008. Edición de ocho documentos relacionados con la Cátedra, conteniendo memorias y conceptos de lo descrito. Inicio de la formación de la red de especialistas apoyados en el Portal ATL a partir de mayo 2009.

En el período 2010-2011, conforme los objetivos establecidos en la Cátedra y de acuerdo con el programa de trabajo previsto, se han fijado las siguientes actividades a cubrir:

- Celebrar una Reunión Anual Internacional sobre el tema "El Agua y la sociedad del conocimiento".
- Operar la red de investigadores sobre el agua y la sociedad del conocimiento, en México y con participación de investigadores de varias partes del mundo. Por este medio, contactar y generar la participación de diversas instituciones a nivel internacional en la temática del Cátedra. Se buscará la consolidación del trabajo de varias Cátedras sobre el agua en la región, para la creación de un Centro Internacional.
- Operar y consolidar el Portal Átl de la Cátedra UNESCO-IMTA, como medio de colaboración electrónico y de referencia sobre el tema con al menos 100,000 visitantes anuales.

Estructura del Conamexphi

La composición del Comité nacional mexicano para el PHI es como sigue:

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NIGERIA NATIONAL COMMITTEE FOR INTERNATIONAL HYDROLOGICAL PROGRAMME

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REPORT OF THE NIGERIA NATIONAL COMMITTEE FOR UNESCO-IHP ON IHP RELATED ACTIVITIES FOR THE PERIOD 2008 – 2010.

Introduction

Since the IHP depends strongly on national efforts we have in place a Nigeria National Committee for UNESCO- IHP (NNC-IHP), with the old Department of Hydrology and Hydrogeology of the former Federal Ministry of Water Resources which has now transited into the new Nigeria Hydrological Services Agency, 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 comprises of representatives of the Nigeria Hydrological Services Agency, National Commission for UNESCO, Nigeria Meteorological Agency; National Inland Waterways Authority; River Basin Development Authorities; States Water Boards; Universities/ Research Institutions, professional Associations of Hydrologists and Private Consultants in Water programmes.

This is therefore a statutory report of the 2008- 2010 biennium of the activities of the Nigeria National Committee for UNESCO-IHP as prepared by its Secretariat

2. Meetings of the Nigeria National Committee for IHP

The Nigeria National Committee for IHP only became active since the commencement of the biennial 2008 – 2010, only from September, 2009 after 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.

2.1. ***Meeting of the Nigeria National Committee for IHP, 27th – 30th September, 2009, Enugu, Enugu State, Nigeria.***

This meeting of the Nigeria National Committee for UNESCO-IHP was held at Roban Hotels, Enugu, Enugu State, Nigeria from 27th to 30th September 2009. The primary aim of the meeting was to follow up on the rekindling of the activity of the Committee and address matters, on the need for regular meetings by the National Committee so as to frequently brainstorm and harmonize ideas towards fulfilling its mandate in the implementation of programme and activities of UNESCO in Nigeria.

A total of 8Nos. documents and papers were presented during the technical sessions at the meeting towards implementation of adopted programmes of the Nigeria National Committee for UNESCO-IHP. The papers on the following subject matter were considered:

- Report on Nigeria's hosting of the International Workshop on ***"Improving Understanding of Parliamentarians on Water Management in the ECOWAS Sub-Region"***, Abuja, Nigeria, October, 2007.
- Participation of Nigeria's Water Resources Ministerial delegation at the ***34th Session of the UNESCO General Conference, 16th October – 3rd November, 2007, Paris, France.***
- UNESCO-IHP *Sensitization Workshop* ***on "Improving knowledge of Nigerian Legislators and Managers of Water Resources on Sustainable Water Governance, 26th March, 2009, Abuja, Nigeria.***
- Report of the National and Regional Workshops on the establishment of UNESCO Regional Centre on Integrated River Basin Management, (URC-IRBM) at NWRI, Kaduna.
- National Implementation Plan for the Seventh Phase of IHP; IHP-VII (2008-2013)
- Brief on the transition of the old Department of Hydrology/Hydrogeology to Nigeria Hydrological Services Agency
- Report of the cooperative activities of the Nigerian National Committee for UNESCO-IHP in the framework of the programme for the period 2006 – 2008.
- Update Reports from Ad-hoc/Technical Sub-Committees
    - Standing Technical Sub-Committee
    - Communication and Information Sub-Committee
    - Working Group on Joint Conference with the Nigerian Association of Hydrological Science (NAHS)
    - Ad-hoc Sub-Committee on United Nations Decade on Education for Sustainable Development (2005- 2014) as relevant to Water Resources
    - Working Group on Data Collection/Water Resources Assessment,

In concluding the meeting, a number of comments and observations as well as recommendations were put forward on aspects of hydrological data collection, manpower development, global issues and climate change, towards sustaining and improvement of the activities of the Nigerian National Committee for UNESCO-IHP. The National Committee was tasked to see itself as a Technical Advisory body on hydrological matters that has the responsibility to proffer advice and suggestion to Government on hydrological extremes and global and climatic change.

The meeting also acknowledged the loss of Engr. M.H. Ibrahim, Secretary of IHP National Committee and former Vice Chairman (Africa) of the IHP Intergovernmental Council and the IHP Bureau in 2004-2006.

The meeting also took note of the need to follow up the resolutions of the Legislators Water Workshop and Communiqué with the Parliamentarians with a view to improving their understanding of water resources development and management within the sub-region; and the Secretariat to link-up with the Nigerian and other Parliamentarians in the sub-region so as to facilitate legislation for the sustainable development and management of the water resources of the sub-region.

The reports of the respective Sub-Committees:

- Standing Technical Sub-Committee
- Communication and Information Sub-Committee
- Working Group on Joint Conference with the Nigerian Association of Hydrological Science (NAHS)
- Ad-hoc Sub-Committee on United Nations Decade on Education for Sustainable Development (2005- 2014) as relevant to Water Resources
- Working Group on Data Collection/Water Resources Assessment,

could not be presented as the various Sub-Committees were unable to meet due to the inability of the IHP National Committee to have met in the last two years.

The IHP National Secretariat was therefore advised by the meeting to expedite all arrangement for each of the Sub-Committees to hold their respective meetings that would report to next meeting of the IHP National Committee.

The meeting also set up a ***sub-Committee for the National Implementation Plan for the Seventh Phase of IHP; IHP-VII (2008-2013)***. The meeting resolved that henceforth, IHP National Committee should concentrate on scientific and technical activities such as collaborating to solve hydrological problems. The meeting also directed that the sub-Committee on IHP-VII Plan should be active and come up with implementable programmes that could be keyed in to the action plan.

2.2. *Meeting of the Nigerian National Committee for IHP, 7th – 8th December, 2009, Kaduna, Kaduna State, Nigeria.*

This meeting of the Nigerian National Committee for UNESCO-IHP was held at National Water Resources Institute, Kaduna, Nigeria from 7th to 8th December 2009. The meeting was a follow-up to the Enugu meeting in order to advance our future valuable contribution to the national activities of the International Hydrological Programme in Nigeria.

A total of 6Nos. documents and papers were presented during the technical sessions at the meeting towards implementation of adopted programmes of the Nigerian National Committee for UNESCO-IHP. The papers on the following subject matter were considered:

- Report of participation of Nigeria's Water Resources Ministerial delegation at the ***35th Session of the UNESCO General Conference, 6th - 23rd October, 2009, Paris, France***.
- Nigeria's election into the UNESCO-IHP Intergovernmental Council for the intersessional period 2009-2013.
- Consideration and Endorsement of the Final Report of the ***Proposal on the establishment of UNESCO Regional Centre on Integrated River Basin Management, (URC-IRBM)*** at NWRI, Kaduna.
- Report of the meeting and recommendations of the ***sub-Committee for the National Implementation Plan for the Seventh Phase of IHP; IHP-VII (2008-2013)***
- Proposed 2010 Activities

- Update Reports from Ad-hoc/Technical Sub-Committees

At this last meeting of the National Committee for IHP in Kaduna, 7th – 8th December, 2009, the Committee resolved among others, that a Sub-Committee be set up to restructure the activities of NNC-IHP in view of several lapses that were observed to be inimical to the effectiveness and activities of the Committee.

3. Status of/ and Contribution to/participation in IHP-VII Plan.

As earlier reported, the Nigerian National Committee for IHP had been quite inactive in the key implementation years of the IHP VI, and this had invariably affected our preparedness to participate and implement the relevant projects at the commencement of the IHP-VI activities.

However the old Department of Hydrology and Hydrogeology of the former 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.

It will be recalled that 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 earlier mentioned, the National Committee for IHP had set up a ***sub-Committee for the National Implementation Plan for the Seventh Phase of IHP; IHP-VII (2008-2013)*** and the sub-Committee is putting together a number of proposals received from some Universities and other Water Agencies nationwide in order develop implementable programmes that could be keyed in to the national action plan for the remainder four-year period of the IHP-VII.

4. Collaboration with other National and International organizations and/or programmes.

The old 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.

5. 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 hope to participate in the invitation to nominate candidates to attend UNESCO-PCCP's Training for Trainers from Africa in Water Conflict Management, from 20 to 24 September 2010, Perugia, Italy, under the auspices of the UNESCO-From Potential Conflict to Co-operation Potential programme.

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

Our cooperation programme with the UNESCO-IHE Institute for Water Education has been within the framework of Nigeria's collaborative involvement and participation in different Training programmes for water resources professionals from different Agencies across the country through regular programmes of the UNESCO-IHE Institute.

However, the National Water Resources Institute (NWRI), Kaduna, Nigeria, whose main activities 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 will be most suited to collaborate in the cooperation activities with the UNESCO-IHE for the NIWR to 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 a follow-up to the Resolution XVII-6 of the 17th session of the IHP Intergovernmental Council, July, 2006, endorsing the establishment of the National Water Resources Institute as a regional water centre under the auspices of UNESCO, the IHP National Committee initiated the setting up a steering Committee and set in motion the necessary process and developed the proposal for a UNESCO Regional Water Centre for Integrated River Basin Management (URWC-IRBM) to be located within National Water Resources Institute, Nigeria.

National and Regional Workshops were recently held in September, 2009 to sensitize the Stakeholders on the proposed establishment of this Regional UNESCO Water Centre on Integrated River Basin Management at NWRI, Kaduna. Seventy three (73) participants attended the National workshop while forty five (45) participants attended the Regional workshop from

11 countries of West Africa. At the end of the sessions, the participants unanimously endorsed and agreed on the establishment of the UNESCO Regional Water Centre and its focus on specific key IRBM issues of relevance to the sub-region.

This proposal has now been be submitted to UNESCO and in the foreseen earnest consideration and approval of this proposal will no doubt facilitate the Institute to be designated as a Regional Water Centre under the auspices of UNESCO- category II in order to become the training hub for the West African Sub-region and serve the UNESCO member states better, as well as taking up the role of UNESCO-IHE mirror Institute in the sub-region.

7. Publications

We have been publishing 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).

However this had ceased in recent times due to the inactive of the National Committee which has not been holding meetings upon which its activities could be highlighted on the various events and programmes within the UNESCO-IHP's as relevant to Nigeria as at the time of publication.

The e-mail address of the Newsletter is ihpncng@yahoo.com, through which the Secretariat of the Nigerian National Committee for IHP also communicates.

The Department of Hydrogeoinformatics in the new Nigeria Hydrological Services Agency is also making considerable efforts in the publications of Hydrological Newsletters, Journals and Bulletins which provide scientific information that are also of relevance to the national implementation of the UNESCO water programmes under the IHP in Nigeria.

8. Participation in International Scientific meetings

8.1. UNESCO-IHP *Sensitization Workshop on "Improving knowledge of Nigerian Legislators and Managers of Water Resources on Sustainable Water Governance, 26th March, 2009, Abuja, Nigeria.*

The Workshop on ***"Improving the Knowledge of Nigerian Legislators and Managers of Water Resources on Sustainable Water Governance"*** was organized by the IHP National Committee under the aegis of the Nigeria Hydrological Services Agency, in collaboration with the National Water Resources Institute and the UNESCO Office, Abuja on 26th March, 2009, though earlier scheduled for the end of 2008, but was postponed.

A total of 20 participants from the National and State Houses of Assembly attended the workshop and three well researched papers on relevant topical issues on Integrated Water Resources Management, Water Governance were presented as follows:

- Water Governance and Instruments for Governance by Dr J. Otun
- Concept of Integrated Water Resources Management by Br. D. Bashir
- Water Governance: the Role of Water Law by Prof I J. Goldface-Irokaibe

The problem of lack of access to safe drinking water can be adequately addressed through appropriate legislation by policy makers at State and National levels, through effective water

management policies. This will boost sustainable access to safe drinking water, therefore the need for State and National policy makers to make concerted effort in:

- Promoting best practice in legislation for water resources management at Local, State and National levels.
- Facilitating adequate budget appropriation for the sector in State and National budgeting activities for training and other technical/management issues.
- Developing an inventory of groundwater resources and an enhanced understanding of the ecological consequences of bad policies and management in relation to the ecosystem.
- Promoting awareness and scientific understanding of water management, and developing appropriate training tools for inclusion in educational curriculum.
- Involving Managers of water resources and all other stakeholders in water management decision-making process.
- Development of policies that are sustainable by Nigerian Legislators and Management of same by all stakeholders involved in water resources development.

The workshop therefore enhanced the knowledge base of:

- Nigerian Legislators and Managers of water resources sensitize and update their knowledge on management of water resources for sustainable development.
- Promote education for sustainable livelihood through water conservation, improved and integrated educational curriculum on water management in higher institutions.
- Create awareness on sustainable water governance within the society.

8.2. Report of the Participation of Nigeria's Water Resources Ministerial delegation at the ***35th Session of the UNESCO General Conference, 6th - 23rd October, 2009, Paris, France***.

The Nigeria's Water Resources delegation to the Conference participated in the Science Commission responsible for the UNESCO's programme on Natural Sciences, under which the UNESCO's water programmes of the International Hydrological Programme falls within. The Commission commenced its session on Monday, 12th October, 2009 with RoundTable Scientific discussions on ***"Building stewardship for the Oceans: The contribution of UNESCO to responsible ocean governance"***. The plenary session of the Science Commission began on Wednesday 14th October, 2009 and continued through to 16th October 2009. Its draft report submitted on 20th October 2009 was subsequently adopted by the UNESCO General Conference.

The 6Nos. proposals for Establishment of Category 2 Water Centres under the auspices of UNESCO as presented in Document 35 C/20 Part II, IV, V, VI, XV and XXI were approved:

- Water Centre for Sustainable Development in the Caribbean Island States in Santo Domingo, Dominican Republic
- International Centre on Water Resources and Global Change in Germany
- International Centre on Coastal Ecohydrology in Portugal
- International Centre for Education, Capacity-Building and Applied Research in Water (HIDROEX) in Frutal, Minas Gerais (Federative Republic of Brazil)
- International Centre for Integrated Water Resources Management (ICIWaRM), at the U.S. Army Corps of Engineers - Institute for Water Resources (IWR), United States of America

- Asia-Pacific Centre for Ecohydrology (APCE), hosted by the Indonesian Government and the Indonesian Institute of Science (LIPI) in Indonesia

The Commission noted the reports presented on the activities of the major scientific programmes under the Natural Sciences of IOC, MAB, IGCP, IHP, IBC, IGBC and MOST. The Draft report of the Commission was presented by the Rapporteur of the Commission, which was adopted without any amendments. The adopted report was thereafter submitted to the General Conference on 22nd October 2009.

Two Statements were respectively presented by Water Resources Delegation as Nigeria's Interventions at the Science Commission's session of the 35th UNESCO General Conference from 16th – 20th October 2009, during the course of the session of the Commission.

In the course of participation at the UNESCO General Conference, our Ministerial delegation was able to hold a meeting with the Division of Water Sciences and the IHP Secretariat on the scope of the Illumeden Aquifer Project and the upgrading of the National Water Resources Institute, Kaduna to a UNESCO CategoryII Centre.

The elections of members into the various UNESCO's Councils and Committees whose members are elected by the UNESCO General Conference including the Intergovernmental Council of the International Hydrological Programme was of considerable interest to our Water Resources delegation, in which we vied for election into the Council. Nigeria was re-elected with 110 votes in our African group, to regain our seat into the Intergovernmental Council of the International Hydrological Programme.

9. Ongoing Scientific Projects at Regional level

9.1. 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.

Nigeria through the Federal Ministry of Water Resources has concluded a field data verification exercise in the Nigerian segment of the Iullemeden Aquifer System (IAS) June, 2006.

9.2. 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.

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.

9.3. 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.

10. FUTURE ACTIVITIES

The Nigeria National Committee for UNESCO-IHP holds its meetings statutorily twice a year with the primary aim of implementing all adopted programmes of UNESCO's Water Resources activities. The first meeting for this year 2010 will hold in August 2010 while the second meeting will hold by early December, 2010.

The Nigerian National Commission for UNESCO will host a meeting of Experts to consider the relevant documents towards Nigeria's participation in the 36th UNESCO General Conference, from 12th – 13th July, 2010, in Kaduna, Nigeria. We will therefore participate at this meeting in the Sub-Committee that deliberate on Science and Technology programmes in a Panel of Experts which examine UNESCO Draft Programme and Budget for 2012-2013 in order to determine the extent to which Nigeria's interest have been taken into consideration.

As aforementioned, we hope to have candidates from Nigeria to attend the UNESCO-PCCP's Training for Trainers from Africa in Water Conflict Management, in September 2010, Perugia,

Italy, under the auspices of the UNESCO-From Potential Conflict to Co-operation Potential programme, so as to enable us key into and adopt this laudable programme into the Nigeria' potential water conflict issues in the near future.

Since we have now reached the implementation stage of the IHP-VII, we should be in a position to now key in to the Seventh phase of IHP, with the proposals received from some Universities and other Water Agencies nationwide which will no doubt facilitate the contribution of the Nigerian National Committee for UNESCO-IHP into this IHP-VII plan as part of our future activities foreseen for 2011-2012.

The formulation of the concept note for IHP-VIII (2014-2019) therefore provides an avenue for us to be involved in its planning process towards its final adoption, as part of the future activities of the National Committee envisaged in the long term.

Report prepared by:
THE SECRETARY,
Nigeria National Committee for UNESCO-IHP,
July 2010.

NATIONAL REPORT ON IHP RELATED ACTIVITIES

Norwegian national committee

1. ACTIVITIES UNDERTAKEN IN THE PERIOD JULY 2008 – MAY 2010

1.1 Meetings of the IHP National Committee

1.1.1 Decisions regarding the composition of the IHP National Committee

The Norwegian Hydrological Council is a co-operative body open to all Norwegian institutions, organisations, governmental bodies and corporations working in the field of hydrology. NHR defines the National IHP Committee in Norway and consists of seven representatives from the hydrological community in Norway and one secretary. This group defines the steering committee of NHR and is lead by Torill Engen-Skaugen, Research Scientist at the Norwegian Meteorological Institute. Approximately 6 to 8 meetings are held annually.

1.1.2 Status of IHP-VII activities

The Norwegian IHP National Committee initiate hydrological meetings, symposia, conferences and courses.

The Norwegian IHP National Committee does not have the possibility to fund research within the IHP-VII framework. Hydrological Research in Norway is funded e.g. by the Norwegian Research Council, Nordic Funding Organizations and the European Union framework programmes. These activities are reported directly to the funding organization.

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

"Climate change and infrastructure", Oslo, Norway September 17th 2008

A one day seminar focusing on water related debris avalanches and flood in small Norwegian catchments. The main goal was to establish the need for further knowledge and data.

"WWD 2009"

A one-day national meeting in connected with the World Water Day 2009 with the theme "transboundary water" given by the UN Water group was arranged in Oslo, Norway, March 24th 2009.

"Water – a limited resource", Bergen, Norway, November 23rd 2010
The Norwegian Hydrological Council (NHR) in cooperation with the Nile Basin Research Programme, UNIFOB Global, arranged a seminar concerning transboundary water with an international perspective on water as a limited resource.

"Use of GIS within watershed", Trondheim, January 20th -21st 2010
A seminar concerning communication and knowledge between GIS users related to watershedas. The seminar was arranged by the NHR, SINTEF Energy Research, Geodata and DHI - Water • Environment • Health.

"WWD 2010"
A one-day national meeting in connected with the World Water Day 2010 with the theme "Clean Water
for a Healthy World" given by the UN Water group was arranged in Oslo, Norway, March 22th 2010.

Coordination of Norwegian water related institutions warking internationally, meeting in Oslo, Norway, December 5th, 2009.
NHR initiated a meeting amongst Norwegian institutions working internationally with water issues. The group agreed on cooperation on recruiting students to water related education in Norway.

NHR is reporting annually to their members on Norwegian activities within the IHP and FRIEND.

1.2.2 Participation in IHP Steering Committees/Working Groups

Morten Johnsrud, NHR, participated at the 18th session of the IHP Council. Paris, 9-13 June 2008.

Torill Engen-Skaugen, NHR, participated at IHP-region I meeting September 24th -25th in Washington DC, USA, hosted by the U.S. IHP National Committee.

EURO FRIEND: Norway actively contributes in the IHP Northern European FRIEND groups. River flow data records are continuously updated and provided for the European Water Archive in Koblenz, Germany. Several activities are related to the "Low flow and drought" group and Norwegian participants have attended all group meetings. The last was held in Bratislava in November 2008. Collaboration within this group also takes place through externally funded projects, e.g. the EU 6th FP project WATer and Global Change (WATCH). Norway also has participant collaborating in the "Large-scale variations in hydrological characteristics" and "Techniques for extreme rainfall and flood runoff estimation" groups. For further information see: http://ne-friend.bafg.de/servlet/is/7400/

There are also several contributions from Norway to the next FRIEND conference to take place in Rabat, Morocco, 2010.

In addition, Norway is participating in the "Small hydrological research basins" project. This is a growing inventory of small hydrological research basins including European Representative Basins (ERB) and dates back from an initiative of the National German FRIEND/ERB working group for establishing a growing digital basin archive on the occasion of the Goslar-Hahnenklee Workshop on Status and Perspectives of Hydrology in Small Basins in spring 2009 (http://ne-friend.bafg.de/servlet/is/17796/)

1.2.3 Research/applied projects supported or sponsored

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

1.2.5 Other initiatives

The Norwegian IHP National Committee is working on recruiting young people to apply for science subjects and hydrology in Norway.

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

1.3.2 Organization of specific courses

In collaboration with UNESCO, the Norwegian Water Resources and Energy Directorate and the Department of Energy in Bhutan, is planning to hold a study course on Climate Change, floods and droughts in Thimphu Bhutan later this year.

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

Tallaksen and Hisdal et al., Ch. 11 Changes in the global water cycle and Ch.12 Evolving hazards - and emerging opportunities in: World WaterAssessment Programme. 2009. The United Nations World Water Development Report 3: Water in a Changing World. Paris: UNESCO, and London: Earthscan.

L. Tallaksen and H. Hisdal et al., Ch 5, 6, 7, 8 and 12 in
A. Gustard & S. Demuth (Eds) Manual on Low-flow Estimation and Prediction . Operational Hydrology Report No. 50, WMO-No. 1029, 136p

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

"Hydrology in the Arctic Climate" June 16th – 18th 2008.
International conference with the following topic: The hydrological system of the Arctic is highly vulnerable to climate change. Permafrost conditions, precipitation changes and enhanced snow and ice melt will have an impact on both biotic and abiotic systems. During the International Polar Year, IPY, several projects are studying these impacts. This meeting focused on different parameters of the hydrological system, observed changes and future research needs.

1.6.2 Participation in meetings abroad

Norwegian hydrologists, researchers and the participants of the Norwegian IHP National Committee have, to a large extend, participated to meetings abroad within July 2008 – May 2010. As reported in Section 1.1.2, this activity is reported directly to the respective principal. NHR is therefore not able to report on this activity.

1.7 Other activities at regional level

1.7.1 Institutional relations/cooperation

As reported in Section 1.1.2, this activity is reported directly to the respective principal. NHR is therefore not able to report on this activity.

1.7.2 Completed and ongoing scientific projects

As reported in Section 1.1.2, this activity is reported directly to the respective principal. NHR is therefore not able to report on this activity.

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2010

The Norwegian IHP Natiional Committee will arrange and international conference at Lillehammer, Norway, September 14th – 16th, 2010:

"*Conference on Modelling Hydrology, Climate and Land Surface Processes*"
The integration of hydrology and meteorology is crucial for understanding the future climate and its effects on the infrastructure of society. From recent discussion in Norway we see topics like extreme weather, landslides and new demands for renewable energy which are all strongly linked to the hydro-meteorological system. The Norwegian Hydrological Council recognizes the need to bring together hydrologists and meteorologists to discuss the integration of meteorology and hydrology in climate simulations, and how results from downscaled climate projections can be used in hydrological analysis.
The conference aims on addressing both topics related to modelling the climate system and the interface with the land surface processes and hydrological impacts of changed climate.
Link to more information:

http://www.hydrologiraadet.no/modules/module_109/publisher_view_product.asp?ientityID=23930

2.2 Activities foreseen for 2011-2012

The Norwegian IHP National Committee will continue to work on recruiting young people to apply for science subjects and hydrology in Norway.

The Norwegian IHP National Committee will seek to increase cooperation between the Nordic IHP National Committees.

2.3 Activities envisaged in the long term

The Norwegian IHP National Committee will continue to work on recruiting young people to apply for science subjects and hydrology in Norway.

بسم الله الرحمن الرحيم

The Sultanate of Oman
National Ihp Report

Background

Ihp's Primary Objectives

Ihp's primary objectives are as follows:

- to act as a vehicle through which Member States, cooperating professional and scientific organizations and individual experts can upgrade their knowledge of the water cycle, thereby increasing their capacity to better manage and develop their water resources
- to develop techniques, methodologies and approaches to better define hydrological phenomena
- to improve water management, locally and globally
- to act as a catalyst to stimulate cooperation and dialogue in water science and management
- to assess the sustainable development of vulnerable water resources
- to serve as a platform for increasing awareness of global water issues.

Greater emphasis has been placed on the role of water resources management for sustainable development and with respect to the expected changes in climate and environmental conditions. Progress has also been achieved in methodologies for hydrological studies, training and education in the water sciences. One of Ihp's continuing objectives is to integrate developing countries into research and training efforts, thereby reinforcing regional aspects while maintaining global coordination.

IHP-7: 2008-2013

The strategies and themes of the current phase of IHP (IHP-VII: 2008-2013): "Water Dependencies; Systems under stress and Societal Responses" were first endorsed by the 16th Session of the Ihp Inter Governmental Council. Reviews of the evolving concepts and themes were discussed in the 38th and 39th Sessions of the Bureau. The draft strategy for IHP 7 was submitted to the 17th Inter Governmental Council for adoption. The themes which were chosen in light of the UN Decade of Action, 'Water for Life' were;

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

- Global changes and feedback mechanisms of hydrological processes in stressed Systems
- Climate change impacts on the hydrological cycle and consequent impact on water resources

بسم الله الرحمن الرحيم

- Hydro-hazards, hydrological extremes and water-related disasters
- Managing groundwater systems' response to global changes
- Global change and climate variability in arid and semi-arid regions

Theme 2:
STRENGTHENING WATER GOVERNANCE FOR SUSTAINABILITY

- Cultural, societal and scientific responses to the crises in water governance
- Capacity development for improved governance; enhanced legislation for wise stewardship of water resources
- Governance strategies that enhance affordability and assure financing
- Water as a shared responsibility: managing water across geographical and social boundaries
- Resolving the water and energy nexus

Theme 3:
ECOHYDROLOGY FOR SUSTAINABILITY

- Ecological measures to protect and remediate catchments process
- Improving ecosystem quality and services by combining structural solutions with ecological biotechnologies
- Risk-based environmental management and accounting
- Groundwater-dependent ecosystems identification, inventory and assessment

Theme 4:
WATER AND LIFE SUPPORT SYSTEMS

- Protecting water quality for sustainable livelihoods and poverty alleviation
- Focal area 4.2 - Augmenting scarce water resources
- Focal area 4.3 - Achieving sustainable urban water management
- Focal area 4.4 - Achieving sustainable rural water management

Theme 5:
WATER EDUCATION FOR SUSTAINABLE DEVELOPMENT

Theme 5 will be elaborated by a working group likely to be set up on water education which will provide the Task Force with suggested focal areas for this theme. UN Decade of Education for Sustainable Development.

- Focal area 5.1: Tertiary water education and professional development
- Focal area 5.2: Vocational education and training of water technicians
- Focal area 5.3: Water education in schools
- Focal area 5.4: Water education for communities, stakeholders and mass-media professionals

Activities undertaken by the Ihp Oman National Committee up to the end of 2009

The Committee usually organizes meetings whenever there is subjects that need to be discussed. The main activities of the committee are: to discuss research issues related to hydrology, cooperate technically with other national and international organizations sharing

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وزارة البلديات الإقليمية وموارد المياه

similar interests, 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 previous, Ihp programmes and proposes new themes and projects to Ihp-VII.

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

- Organized International Workshop on "Flash Flood in Urban Areas and Risk Management" during a period from 4th – 6th of September 2006, Muscat – Oman
- Held seminar on coping with water scarcity on the 21st march 2007, Muscat – Oman
- Attending the Seventh Session of the Water Resources Committee in ESCWA Region, 20 – 22 March 2007, Muscat – Oman
- Contributed in the workshop; water demand management in urban areas in the light of tourism development and need for water 2 –4 September 2007
- Contributed in the fourth International Conference on Wadi Hydrology 2-4 December 2007 held in Muscat
- Organize annually celebration of the World Water Day as a part of public awareness campaign
- Contributed in the First International Conference on Water Resources and Climate Change in the MENA Region 2 – 4 November 2008, Muscat – Oman
- Involved in the preparation of International Conference on the Capacity Building in Urban Water management Under Water Scarcity Conditions 13 – 15 December 2009, Muscat - Oman

National Goals up to 2020

- Balance of water use and renewable resources
- Conservation of water resources
- Sustainable development of water resources
- Adopt the integrated water resources policy in a catchment basis
- Private sector participation in water resources
- Increase food security
- Economic diversification
- Employment and increase productivity

The National Committee Water Resources Strategy

- to adopt environmental sustainability principle
- to conduct resources assessment and monitoring
- to conduct water harvesting scheme
- to control water abstraction
- to conduct resources augmentation (dams, aflaj maintenance, desalination, waste water reuse)
- to delineate well field protection zones
- to conduct water resources conservation studies

- to conduct public awareness campaign
- to conduct water resources planning (master planning)

Sultanate of Oman Ihp National Committee
The Role and Function

It is suggested that the national committee reconsider the reformation of its roles and functions in order to be more effective in carrying-out its tasks and achieving its goals:

- to achieve Sultanate of Oman effective participation in the management and implementation of the Ihp defined main thrusts that are relevant to Sultanate of Oman challenges and policy priorities;
- to act as coordinating body working with other related bodies in the country, region and the world to achieve shared objectives concerning freshwater, within the framework of the Ihp.
- to provide advice to Government and private sectors on water-related studies, research, implications for development, education and capacity building with emphasis on a national, regional and global context.
- to promote partnership with other organizations active in the field in particular the professional bodies, non-governmental organizations and various UN agencies.
- to develop and maintain a database of all national stakeholders and projects in the Ihp.
- to hold regular meetings of all stakeholders in the Ihp.
- to represent Sultanate of Oman on all national, regional and global/international meetings and activities.

1. Composition of the Committee

The Committee should be multi-stakeholder in membership to include both scientists and water managers, as well as relevant government bodies, professional associations and civil society. The following is provided as a guideline:

1. Ministry of Regional Municipalities and Water resources (MRMWR).
2. Ministry of Education
3. Ministry of Environment and Climate Affairs
4. Ministry of Agriculture (MA)
5. Public Authority for Water and Electricity
6. Water Research Center (SQU).
7. Universities (academic institutions) representatives.
8. Directorate General of Meteorology and Civil aviation
9. The Research Council
10. Middle East Desalination Research Center.
11. National Committee for Civil Defense (NCCD).
12. Muscat Municipality.
13. Petroleum Development of Oman (PDO)

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2. Research Coordination

Water related research in the country is currently mostly conducted through or by Water Research Center (SQU) or through National research Council. This does not mean that only the WRC conduct water research. Other organisations such as the MRMWR, Ministry of Agriculture, Public Authority of Water and electricity, Petroleum Development of Oman etc also conduct or may conduct research. The IHP committee must ensure that there is research conducted pertaining to the 5 themes identified under the IHP7 priority areas. The Ihp National Committee must;

- Share information widely on the Ihp priority areas to influence national research agendas.
- Ensure collaboration between the research institutions when identifying and resourcing water research related to the priority areas.
- Fully align the research priorities to those of national policy priorities.
- Report on those efforts and
- Facilitate the partnerships and sharing of capacity with other Ihp committees.
- Implementation of research projects in water sciences in collaboration with related institutions and universities.

4. Local, Regional and International partnership

The strength of all Ihp committees lies in their ability to act as virtual networks linking together related interested minds. For this to happen, the Sultanate of Oman practitioners need to learn about the existence and role that the Ihp Oman committee plays.
Within the region, there are other Ihp Committees that probably have similar activities and are striving for excellence in related issues pertaining to the region as in Oman. Such interactions and alignment of activities is governed by the highest level political structures. The Ihp Oman National Committee should support these political structures and other formal government representation. Moreover, the bridging between science and policy happens through the engagement of civil society. Ihp Oman must provide suitable platform for achieving this. Ihp Oman should therefore be in a position to coordinate the participation of Oman in most UNESCO water related activities.

4. Capacity Building

Ihp Oman National Committee participate, contribute and organize but is not responsible in itself to conduct capacity building activities but can monitor the pulse of capacity building in Oman. There doesn't seem to be a local institution which is responsible for the overall monitoring and defining strategic imperatives for building capacity to meet the millennium challenges. However, capacity building is such a broad term which needs to be clearly defined as the building of the capacity of new young scientists and practitioners to ensure that the water sector will continue to function adequately. If this is the agreed on definition, then the role of Ihp Oman is to coordinate the efforts of various institutions and in monitoring the progress and estimating the impact of the various interventions

- Through its extensive partner networks, Ihp Oman committee can enhance these efforts either through mobilization of funds.
- Allowing young professional to participate in the numerous Ihp activities.
- Hosting conferences, symposia and workshops.

6. Advise

In providing advise to Government on water related decisions, implications for development, education and capacity building with emphasis on a regional and global context. Ihp Oman committee must provide suitable platform for achieving this. Ihp Oman committee should therefore be in a position to coordinate the participation of Sultanate of Oman in most UNESCO water related activities.

6. Communication

In this age of information over-flooding, the focus is not so much on knowledge generation or creation of new knowledge but rather is into the dissemination of appropriate knowledge. The purposing and customization of information to reach the target audience is becoming a new science in itself. The desired impact from the coordination of research and the influencing of policy, can only be maximized when communication is effective. The role of Ihp Oman committee can be through the sharing and the creation of platforms for the dissemination of information be it to influence local agenda, regional or international discourse. Ihp Oman committee

- Establish an Ihp Oman committee communication strategy mainly focused on coordination of existing communication platforms.
- Publish regular Ihp Oman committee briefs and/or newsletters of activities to share locally and regionally.
- Establish a web portal with a clearly defined responsibility of regular updating to act as an active and effective communication medium for the benefit of Sultanate of Oman and the region.

8. Activities foreseen for 2010-2011

- Celebration in the Global Water Day in March - 2010.
- A scientific workshops - 2010. A Scientific seminars - 2010.
- A training coarse in one of the themes mentioned in IHP- VII - 2010.
- Celebration in the Global Water Day in March - 2011.
- A scientific workshops - 2011.A scientific seminars - 2011.
- A training coarse in one of the themes mentioned in IHP- VII -2011.
- Organizing yearly competitions among all water practitioners/scientists on the following subjects:
  - Best research on wadis, aflaj hydraulic engineering and hydraulic structure.
  - Best design of an irrigation project.
  - Water resources planning.

- Water quality management.
- Water conservation projects.
- Best dissertation or theses on water related from Oman Universities.
- Water control structures.
- Improve efficiency of water conveyance and distribution.
- Best engineer in water management.
- Best engineer in the field of irrigation improvement.
- Development of conventional and unconventional water resources.
- Best research on integrated management of water resources.

8. Suggested themes

- Water Governance (Sustainable Water Resources)
- Integrated Water Resources Management
- Climate Change (Vulnerability & Adaptation)
- Water Education
- Public Awareness
- Shared Aquifers & Trans boundary
- Water Harvesting & Artificial Recharge
- Floods Risk Assessment and Mitigation Management
- Efficient Use of Wastewater
- Flash Flood Forecasting
- Off-shore freshwater springs (submarine springs)
- Isotopic techniques in groundwater investigations.

Suggested Example for the Theme 5

- Focal area 5.3: Water education in schools
- Focal area 5.4: Water education for communities, stakeholders and mass-media professionals
- Kids Corner
- Children's Groundwater Festival
- Groundwater Guardian
- H2O on the GO
- The Aquifer (A Publication of the Groundwater Foundation).

INFORME

CONAPHI-PANAMÁ
2008-2010

Elaborado por: Ing. Luis C. Escalante H.

8 de junio del 2010

Lic. Patric Fahyl, Administrador General Encargado de la ANAM..

El 17 de diciembre del año en curso, se realizó en el Holiday Inn, Clayton, el taller Regional Local de Iniciativas de Gestión de Recursos Hídricos en Panamá, en conmemoración de los 15 años del Comité Nacional del Programa Hidrológico de Panamá (CONAPHI). El mismo fue inaugurado por el Lic. Patric Fahyl, Administrador General Encargado de la ANAM., lo acompañaron en la mesa principal el Presidente del CONAPHI que recae en la ANAM y lo preside el Ing. Silvano Vergara, la vicepresidencia representada por la ACP representada por el Ing. Gustavo Gleis y la Secretaría Técnica representada por el IDAAN y el designado por dicha institución fue el Lic. Javier Cardoze.

Dicho acto conmemorativo fue honrado con la presencia de la Dra. María Concepción Donoso, Directora Regional de Ciencia para América Latina y el Caribe del Programa Hidrológico Internacional de la UNESCO con sede en Uruguay, así como de las 14 instituciones miembros del CONAPHI y actores vinculados de alguna forma al tema de los recursos hídricos en nuestro país. El Lic. Patrick Fahyl, en su discurso inaugural expuso que los retos de país y para la ANAM es muy importante retomar el tema del CONAPHI, y contribuir de esta forma a fortalecer los niveles de coordinación entre actores en materia de recursos hídricos. Sabemos que el objetivo principal del PHI es mejorar la calidad de vida de los habitantes de la región a través del desarrollo científico y tecnológico de las ciencias del agua, utilizando un enfoque holístico, multiobjetivo y multidimensional, con el fin de desarrollar métodos para la gestión racional de los recursos hídricos, incluyendo la protección del medio ambiente.

El Ing. Silvano Vergara, Presidente del CONAPHI-Panamá.

Hizo un recuento de la gestión de los 15 años, del CONAPHI, donde se han conformado importantes grupos de trabajo que permiten avanzar con Proyectos de Investigación o de aplicación apoyados o patrocinados como:

1 El Balance hídrico superficial de Panamá – periodo 1971-2002, realizado por ETESA y publicado en el 2008, con el apoyo de PHI – UNESCO. 2 Participación en el Programa ISARM de las Américas, concerniente a la investigación de acuíferos transfronterizos. 3 El Programa HELP, implementado en la Cuenca Hidrográfica del Canal de Panamá. 4 Ante la demanda de agua para diversos usos en todo el territorio nacional dentro del marco del desarrollo sostenible,

tenemos como retos de país generar bases de conocimiento científico, socioeconómico, legal, institucional y ambiental de la gestión de los recursos hídricos, en temas tales como:

Evaluación de los impactos de proyectos hidroeléctricos.
Investigación del efecto barrera
Eco-Hidrologia
Hidrogeología
Gestión de Recursos Hídricos
Gestión del riesgo
Balances hídricos y metodologías de caudal ambiental
Tecnología y Producción más limpia
Bioenergía
Tecnología de descontaminación hídrica
Planificación de Recursos Hídricos

La Dra. María Concepción Donoso, Directora Regional del Programa Hidrológico Internacional de la UNESCO, para América Latina y el Caribe, fue la invitada de honor en el seminario taller de Iniciativas para la Gestión de los Recursos Hídricos en Panamá y usos del agua. La misma fue honrada con una placa en su honor por el Presidente de CONAPHI Panamá Ing. Silvano Vergara.

La Dra. María Concepción Donoso, explico que los CONAPHI son instancias multidisciplinarías vinculadas al sector agua (gobierno, academia, ONGs, sector privado, sociedad civil), Planifican y coordinan programas y actividades. Asesoran en temas de gestión integrada de recursos hídricos y ciencias del agua a los tomadores de decisiones.

Expuso los temas del Programa Hidrológico 2008-2013, que se están implementando en la región, tales como:

TEMA 1: Adaptación a los efectos de los cambios mundiales en las cuencas fluviales y los sistemas de acuíferos **TEMA 2:** Mejorar la gestión de los recursos hídricos para la sostenibilidad **TEMA 3**: Eco-hidrología para la sostenibilidad **TEMA 4:** El agua y los sistemas de sustento de la vida **TEMA 5:** La educación relativa al agua para el desarrollo sostenible **TEMAS :** TRANSVERSALES: FRIEND y HELP

PROGRAMAS Y PROYECTOS DEL PHI-LAC Programas Globales: FRIEND, HELP, ISARM Américas, PccP, Eco-hidrología, ISI/GEST, IFI, GRAPHIC Programas Regionales: Agua y Educación, Agua y Cultura, Mapa de Zonas Áridas, Balance Hídrico

Grupos de Trabajo: Hielos y Nieves, Agua y Género, Agua y Energía, Técnicas para Aumentar la Disponibilidad de Agua

Iniciativas de la Gestión de los Recursos Hídricos en Panamá, por parte de la ANAM, la exposición estuvo a cargo del Ing. Luis Escalante.

Panamá, según la Organización Mundial de Meteorología, (OMM), es un país con abundante riqueza hídrica, con un promedio nacional de 2,500mm anuales de precipitación. Aun así, no escapa a la situación de crisis en sectores identificados como el Arco Seco de Azuero. La competitividad de Panamá depende en gran medida de la calidad y abundancia de sus recursos naturales (agua, bosques, recursos marinos, suelo, biodiversidad), favorecida por su posición geográfica y climática. No obstante, estos recursos se ven cada vez más presionados y degradados por procesos desordenados de expansión económica y de los asentamientos humanos.

Al respecto, la Autoridad Nacional del Ambiente (ANAM), ha dado pasos acelerados, en desarrollar instrumentos normativos como son:

• Estrategia Nacional del Ambiente: Gestión Ambiental para el Desarrollo Sostenible 2008-2012.La Estrategia Nacional del Ambiente: Gestión Ambiental para el Desarrollo Sostenible 2008-2012, constituye la política ambiental del país, lo que significa que todos los sectores de la sociedad deben participar en su ejecución. Contiene lineamientos, objetivos y líneas de acción específicas para mejorar la gestión de los recursos hídricos, como lo son la consolidación del marco jurídico y políticas públicas ambientales, el fortalecimiento de los servicios que se prestan, el mejoramiento de la gestión institucional a nivel intra e interinstucional, en el ámbito nacional e internacional; la aplicación de mecanismos para la adaptación y mitigación del cambio climático; el desarrollo y ejecución de los acuerdos y

obligaciones internacionales en materia ambiental; elevar la capacidad técnico-científica de la ANAM y sus asociados; promover instrumentos y estrategias económicas en la gestión ambiental; la conservación y uso sostenible de la biodiversidad y de manera específica, la conservación y restauración de las cuencas hidrográficas desde un enfoque ecosistémico y participativo.

ACTIVIDADES
2008-2010

Eventos

- **Diplomado en Gestión Integrada de los Recursos Hídricos**
  Ubicación: Realizado en Ciudad Panamá, bajo la coordinación y apoyo logístico del ANAM-CIHH-UTP. De octubre de 2008 a agosto de 2009, la Escuela Agrícola Panamericana Zamorano, impartió este diplomado en seis países de Centroamérica, incluyendo Panamá. El mismo se realizó en Panamá con el apoyo del Centro de Investigaciones Hidráulicas e Hidrotécnicas de la Universidad Tecnológica de Panamá, bajo el auspicio del Programa Regional de Reducción de la Vulnerabilidad y la Degradación Ambiental (PREVDA).

  En Panamá, el Diplomado se desarrolló en las instalaciones de la Universidad Tecnológica de Panamá, en la Extensión de Tocùmen y contó con la participación de 21 estudiantes provenientes de las cuencas hidrográficas en donde PREVDA está desarrollando Planes de Manejo Integral, como los ríos indios y Pacora.
  Período del proyecto: Octubre de 2008- Agosto 2009

- Participación en el Seminario Taller “Planificación en la Gestión Integrada de Cuencas Hidrográficas- Cartagena-Colombia- del 5 al 11 septiembre 2009.

- Participación en el Seminario Taller “Aguas en las Comunidades Rurales”, La Antigua-Guatemala, 1-5 de septiembre del 2008.

- Programa Hidrológico Internacional, PHI UNESCO Iniciativa Internacional sobre Inundaciones, IFI Seminario Internacional sobre Desastres por Inundación-Universidad Autónoma de Querétaro, UAQ 21 al 23 de octubre de 2009.

- Taller de Iniciativas de recursos hídricos y usos del agua en Panamá, en conmemoración de los 15 años de CONAPHI-PANAMA. 17 de diciembre del 2009.

- Participación del Seminario Taller “Sistemas de Información Geográfica en Manejo de Cuencas”, Montevideo-Uruguay del 14 al 18 de diciembre del 2009.

- Entrenamiento en modelado numérico de escenarios de cambio del clima ETA/CPTEC”, segunda parte, Centro de Previsión del Tiempo y Estudio Climáticos (CPTEC), ciudad de Cachoera Paulista- Sao Paulo, Brasil. 13 y 18 de julio del 2008.

- Entrenamiento en modelado numérico de escenarios de cambio del clima ETA/CPTEC", segunda parte, Centro de Previsión del Tiempo y Estudio Climáticos (CPTEC), ciudad de Cachoera Paulista- Sao Paulo, Brasil. de 29 de agosto al 5 de septiembre del 2009.

- Intercambio de Experiencia del Funcionamiento de la Sala Temática del Agua y del Centro para la Gestión Sostenible de los Recursos Hídricos en los Estados Insulares del Caribe, en Santo Domingo. Del 28 al 31 de enero del 2010.

- Participación del Primer Foro Mesoamericano de Cuencas 2010 México-Centroamérica: Acuíferos Transfronterizos de Mesoamèrica, celebrado en San José-Costa Rica, 4-7 de mayo, 2010.

- "Curso de Capacitación de SIG y Sensores en Estudios de Fenómenos Hidrológicos y la Evaluación de Riesgo o Desastres Asociados a Inundaciones" Panamá, 1 al 6 de marzo del 2010.Universidad de Panamá.

- Asistencia al Taller sobre el Sistema de Apoyo a las Decisiones Vista DSS, realizado del 19 al 21 de febrero de 2008, en el CCAA.

- Taller del Proyecto de Crecidas Extremas en la Cuenca Hidrográfica del Canal de Panamá, dictado por expertos de la Compañía DHI del 16 al 20 de junio.
- Participación en Taller "Teoría e Implementación del Programa State Space Sacramento-SS-SAC-en la Autoridad del Canal de Panamá" los días 14, 17 y 18 de julio de 2008. 100%
- 7-8 de julio: Curso "Caudales Ambientales", Fundación Natura-ANAM-UICN. Lugar CCAA.
- 27 de agosto de 2008foro "Cambio Climático y los Métodos Actuales para el Ahorro Energético".
- Participación en Foro sobre la gestión del agua en la cuenca, integración regional a los gobiernos locales. Intercambio de Experiencia Francia-Panamá. Expositor: Tema "El Manejo del Recurso Hídrico en la Cuenca del Canal". ETESA, 29 octubre de 2008.

- Ejercicio de Control de Inundaciones, 23 de octubre de 2008. Se efectuó en el Edificio 741 (Centro de Manejo de Incidentes) de Corozal Oeste con la participación de Unidades de la ACP y entes externos relacionados con seguridad y emergencias. Participaron las comunidades ubicadas en las áreas influidas por las operaciones de vertido (Santa Rosa y Guayabalito.

- XXVI Foro del Clima de América Central realizado en la ciudad de Panamá, del 24 al 26 de noviembre de 2008.
- Curso en el Centro de Capacitación Ascanio Arosemena del 11 al 13 de diciembre de 2009 sobre el Sistema de Comando Unificado de Incidentes (ACP y Guardacostas de EE.UU.)

- Marzo de 2009. Publicación del Anuario Hidrológico 2008.
- Desarrollo del Índice sobre Manejo del Recurso Hídrico. Se verificó la metodología y se revisaron las fórmulas de cálculo de los sub-índices correspondientes a los usos almacenamiento y generación de energía. Se adelantó el desarrollo de una presentación en PowerPoint sobre el tema para presentar a la Gerencia y colaboradores de EACR próximamente
- 24-25 de marzo: Ejercicio ECOCANAL 09. Sistema de Comando de Incidentes-Comando Unificado-NRT (Equipo Nacional de Respuesta a Emergencias de EE UU) y OPPD-ACP
- 24-25 de marzo: Ejercicio ECOCANAL 09. Sistema de Comando de Incidentes-Comando Unificado-NRT (Equipo Nacional de Respuesta a Emergencias de EE UU) y OPPD-ACP
- 30 -31 de marzo: Taller sobre Cuentas Ambientales de Panamá, ANAM. Lugar CCAA.
- Curso sobre el programa de apoyo a la toma de decisiones que posee la ACP llamado "Vista". Fue dictado en la ACP por el Sr. Francois Gilbert, de la empresa Synexus Global, de Montreal, Canadá
- Curso sobre Módulo de Meteorología del BNA/Chile - Proyecto *Base de Datos Hidrometeorológicos* (BDH) → Periodo: 01Jun - 12Jun
- Taller "Desarrollo y Validación del Índice de Sostenibilidad de la Cuenca Hidrográfica del Canal de Panamá" , ACP, 22 - 24 de Julio de 2009
- Curso de estimación Divariada de Eventos Hidrológicos Extremos, dictado por el Dr. Aldo Iván Ramírez Orozco, de la Universidad Autónoma de Querétaro, México. Dictado en Panamá, el 24 y el 25 de septiembre de 2009.
- Curso de regionalización hidrológica, dictado por el Dr. Alfonso Gutiérrez López, de la Universidad Autónoma de Querétaro, México. Dictado en Panamá, el 22 y el 23 de septiembre de 2009.
- Presentación en el Primer Congreso Nacional de Presas, en Volcán, Chiriquí, de la charla titulada "Crecidas máximas en el Canal de Panamá
- 1 de octubre: Charla y Ejercicio Anual de Control de Inundaciones, con la participación de instituciones de rescate y seguridad del Estado (SINAPROC, POLICÍA NACIONAL, SPI, SERVICIO AERONAVAL) y personal de la ACP. Centro de Emergencias, Edificio 741 Corozal.
- 2009 II Taller: Herramienta de Predicción Climática del Instituto Internacional de Investigación del clima (CPT/IRI)
- 2009 Aforos, recolección y almacenaje de los datos registrados en las estaciones hidrométricas: en los principales ríos de la Cuenca hidrográfica del Canal de Panamá (CHCP.)
- 2009 Recolección, análisis, demuestras de sedimento suspendido de los principales ríos de la CHCP
- 2009 Cálculo y revisión de los caudales sólidos y concentraciones estaciones, con el fin de obtener resultados para la publicación del Anuario Hidrológico 2009 (promedios diarios, mensuales y anuales).

- 2009 Medición de sedimentos en el canal de desviación del Río Cocolí, presentación de resultados al administrador del Proyecto de Dragados del Pacífico.

Investigaciones y Estudios:

- Balances Hídricos Mensuales Oferta y Demanda, en 10 cuencas prioritarias del país- rep. de Panamá. Documento Técnico- ANAM, 2008.

- Evaluación preliminar de la aplicación y cálculo del Índice de Sostenibilidad de Cuenca, en la Cuenca Hidrográfica del Canal de Panamá, Documento Técnico- PHI-HELP-LAC. UNESCO, 2008.

- Se concluyó el cuestionario socioeconómico del acuífero Transfronterizo de Sixaola, para la publicación del III Libro ISARM- Acuíferos Transfronterizos de las Américas, para ser presentado en el VI Foro Mundial del Agua- Marsella – Francia- 2012.

- Inicio del Estudio de Delimitación de Acuíferos y Establecimientos de Zonas de Recargas, para identificar su vulnerabilidad y el Desarrollo de una Estrategia para su protección y Conservación en el Arco Seco de Azuero- en ejecución a partir del 15 de abril del 2010.

- ***Proyecto:*** Calibración de un Modelo Hidrológico para la Determinación de los Volúmenes de Agua que fluyen en un Bosque Tropical Húmedo: Cuenca del Canal de Panamá, COL06-013
  Ubicación: Cerro Pelado, Gamboa, Provincia de Colón.
  Período del proyecto: 2007-2010.Universidad Tecnológica de Panamá (UTP).

- **Cuantificación del flujo de carbono** a través de un bosque húmedo tropical en la Cuenca del Canal de Panamá, COL07-011
  Ubicación: Cerro Pelado, Gamboa, Provincia de Colón
  Período del proyecto: 2008-2010.

- **Proyecto:** Monitoreo del Efecto que los Eventos Puntuales de lluvia tienen en la calidad del agua de las fuentes de abastecimientos para potabilizadoras en la Ciudad de Panamá, COL07-036.
  Ubicación: Cuenca de los ríos Cabra y Pacora, corregimiento de Tocùmen y Pacora, distrito de Panamá, provincia de Panamá
  Período del proyecto: 2008-2010. **UTP**

- **Proyecto:** El Efecto que la estación lluviosa tiene sobre los volúmenes de aguas subterráneas en la Cuenca del Canal de Panamá, COL08-075
  Ubicación: Cerro Pelado, Observatorio Tropical de Cerro Pelado, Gamboa, provincia de Colón.
  Período del proyecto: 2009-2011.UTP

- UTP-Validación de los Algoritmos de Evapotranspiración en la cuenca del Canal de Panamá con base en Información de Sensores Remotos, COL09-005.Ubicación: Cerro Pelado, Observatorio Tropical de Cerro Pelado, Gamboa, provincia de Colón.
  Período del proyecto: 2010-2012

- **Proyecto UTP-APR06-016.** Clima y Niñez "Medición de Variables Meteorológicas Simples como experiencia motivadora para el aprendizaje de las ciencias en escuelas primarias".
  Ubicación: Escuelas primarias del distrito de Panamá, provincia de Panamá.
  Período del proyecto: 2007-2008

- **Proyecto APR07-014.** Feria Creativa, realizada en el Pabellón de Meteorología ubicado en el Observatorio de Hidrología Tropical de Cerro Pelado, Gamboa, provincia de Colón. Pabellón Móvil del Ciclo Hidrológico.
  Período del proyecto: 2008-2009. (UTP).

- **Proyecto APR08-005.** Medición de Variables Meteorológicas y su Aplicación en la Prevención de Desastres: "Experiencia motivadora para el estudio de las ciencias en escuelas de nivel medio".
  Realizado en las escuelas del distrito de Panamá, sector Este (Tocùmen y Pacora), Cuencas de los ríos Cabra y Pacora, provincia de Panamá.
  Período del proyecto: 2008-2009.

- **Proyecto EST08-045B. Curso de Hidrología y Suelos Tropicales**
  Ubicación: A celebrado en las Instalaciones de Barro Colorado del STRI, Cuenca del Canal de Panamá.
  Período del proyecto: Septiembre de 2008.

- **Proyecto EST08-038C,** Pasantía del Dr. Joseph Shinar: Seminario para la Introducción y Capacitación en el proyecto "Tecnologías de Dispositivos o emisores orgánicos de luz (OLED), sus aplicaciones como sensores de oxígeno disuelto en plantas de tratamiento de aguas residuales".
  Ubicación: A celebrado en el Salón de Capacitación del CIHH-UTP, Extensión Tocùmen, corregimiento de Tocùmen, distrito de Panamá, provincia de Panamá.
  Período del proyecto: Octubre de 2008.

- **Proyecto: EST09-062B: Curso de Hidrología y Suelos Tropicales 2**
  Ubicación: realizado en Cerro Pelado, Observatorio Tropical de Cerro Pelado, Gamboa, provincia de Colón y en el Parque Camino de Cruces. Instalaciones de Smithsonian en Gamboa.
  Período del proyecto: Septiembre de 2009

- Proyecto **"**nuevas tecnologías aplicadas en estudios de ecohidrología: validación de los métodos de sensores remotos usando centillometros"

INFORME NACIONAL SOBRE ACTIVIDADES RELACIONADAS AL PHI



COMITÉ NACIONAL DEL PROGRAMA HIDROLÓGICO INTERNACIONAL

PARAGUAY

MAYO 2010

Avda. Madame Lynch 3500 Telefax: 595 21 615 811 Email: rhidricos@seam.gov.py

Contenido del Informe

1. Actividades realizadas en el periodo julio 2008 - mayo 2010

1.1 Reuniones del Comité nacional del PHI

Dentro de las actividades desarrolladas, se encuentra el fortalecimiento del Comité Nacional del Programa del Programa Hidrológico Internacional, el CoNaPHI-Py ya cuenta actualmente con un logotipo que lo identifica como asociación.

1.1.1 Decisiones concernientes a la composición del Comité Nacional del PHI

Actualmente el CoNaPHI Paraguay ha experimentado cambios teniendo en cuenta el cambio de Gobierno, que por temas de organización y estructuración fueron modificando algunos representantes, no obstante se ha solicitado nuevamente el apoyo de las mismas a través de los técnicos que puedan seguir aportando sus conocimientos en el área del PHI-UNESCO, el llamado para renovar autoridades del Comite sera el 02 de junio de 2010.

1.1.2 Estado de las actividades del PHI-VII

Las actividades contempladas en la VII Fase, y que se han desarrollado durante el periodo 2008-2010, han permitido al CoNaPHI de Paraguay concesuar las acciones encaradas por el PHI-UNESCO asi mismo contribuir al mejoramiento de la Gestión del Agua y entre las cuales tenemos:

Tema 1: Adaptación a los efectos de los cambios mundiales en las cuencas fluviales y los sistemas de acuíferos.

Desde la DGPCRH –SEAM se viene ejecutando el Proyecto Manejo Sustentable y Protección de las Aguas Subterráneas en Paraguay, actualmente están ejecutando trabajo de campo para conocer la situación en que se encuentra tres acuíferos, uno el Acuífero Guaraní en la cuenca el Capiibary, el Acuífero Patiño en la cuenca del Arroyo San Lorenzo y otra en el distrito de Benjamin Aceval, Chaco, para conocer el comportamiento hidrogeológico de las aguas subterráneas del mismo.

Tema 2: Mejorar la gestión de los recursos hídricos con miras a la sostenibilidad.

A fin de mejorar la gestión sustentable de los recursos hídricos en el Paraguay, la SEAM la autoridad del agua y de aplicación de la Ley 3239/07 “De los Recursos Hídricos del Paraguay”, y ha 3 años de aprobación esta desarrollando un software libre con apoyo del PNUD para sistematizar el Inventario Nacional de Recursos Hídricos del Paraguay.

Se ha impulsado con mayor énfasis conciencizacion del agua, tendiendo como premisa que a partir que con territorios sanos abra agua sana. La divulgación se realiza a partir de la participación en varios eventos a nivel nacional e internacionals, donde el interés fundamental es la restauracion y conservación de los ríos, nacientes, humedales, lagos y acuíferos.

Se han conformado 4 Consejos de Agua por Cuencas Hídricas en el marco de la Resolución 170/06, tres de los cuales ya cuentan con el reconocimiento de la SEAM, que son: Consejo de Aguas de la Cuenca del Arroyo San Lorenzo, Consejo de Aguas de la ciudad de Benjamín

Aceval, Consejo de Aguas del Aº Mboi Cae y Quiteria del departamento de Itapúa, Consejo de Aguas de la cuenca del Arroyo Porã de la Ciudad de Sapucai y ya se viene preparando el de la cuenca del Arroyo Pirapo y de la cuenca del Ykua Angua de la ciudad de Guairá. Tambien se esta en etapa de reactivacion el Consejo del Apa, y se esta articulando con representantes del Brasil para en un futuro proximo ser un Consejo de agua Binacional

Realización del 1er Curso Taller de capacitación "**Para los Consejos de Agua en el Paraguay**" en fecha 12, 13 y 14 de agosto de 2009, con el concurso de 2 (dos) expertos de la Secretaria de Recursos Hídricos dependiente del Ministerio del Ambiente de Brasil.

El curso de suma importancia teniendo en cuenta que los Presidentes de los diferentes consejos manifestaron sus experiencias, como el caso de la Cuenca del Arroyo Capiibary, ubicada en el área del Sistema Acuífero Guaraní, y el caso de la Cuenca del Arroyo San Lorenzo, (Acuífero Patiño) estos consejos son un nexo entre las instituciones gubernamentales y la sociedad civil, quienes coadyuvan al proceso de la gestión del agua a través de la concienciación en cada uno de sus municipios y barrios que se encuentran con algún conflicto ambiental.

Foto: 1er Curso Taller de capacitación "**Para los Consejos de Agua en el Paraguay"**

En fecha 21/05/2010: Socialización para la conformación del Consejo de Agua del Ykua Angúa de la ciudad de Villarrica, Departamento de Guairá, lla solicitud fue enviada por el Secretario Ejecutivo Lic.Gustavo Vázquez Martínez de la Oficina Deptal.de Cooperación con la UNESCO-Guairá.

Tema 3: Ecohidrología para la sostenibilidad

Los días 2 y 3 de Julio de 2009, se desarrolló la **Conferencia sobre "Ecohidrología para la Sostenibilidad en el contexto del Cambio Global",** el mismo contó con la presencia del Jefe de Sección de Gestión y Desarrollo Sustentable de Recursos Hídricos, UNESCO, **Shahbaz Khan.**

El Programa de Ecohidrología, y su capítulo regional, tuvieron como objetivo general la promoción de una nueva relación en la gestión del agua basada en una aproximación ecosistémica y el involucramiento activo de los actores sociales en el proceso de toma de decisiones.

Algunos temas tratados fueron: "Desarrollo de la ecohidrología: nuevas direcciones"; "Avances de la ecohidrología en ALAC"; " La ecohidrología en Paraguay", por el Ing. Pedro Domaniczky, presidente de la Asociación Paraguaya de Recursos Hídricos. **"Estudio de las**

sequías e inundaciones en Paraguay" Julián Báez Benítez (Paraguay) **"Restauración hidrológica forestal y clasificación"** Roberto Pizarro (Chile) **"La batimetría como herramienta para el cálculo del caudal ecológico del lago Ypacarai, como parte del cumplimiento de la Ley 3239/07 Ley de los Recursos Hídricos del Paraguay"** Elena Benítez (Paraguay) **"Caracterización, evaluación y diagnóstico de los recursos naturales como base para proponer un plan de manejo de los recursos hídricos en la cuenca del Capiibary"** Eduardo Dose (Paraguay).

Tema 4: El agua y los sistemas de sustento de la vida.

Tema 5: Educación relativa al agua para un desarrollo sostenible.

Entre los días **11 y 12 de diciembre de 2008**, en el Hotel Excelsior, Asunción, Paraguay, fue realizada la Conferencia sobre Agua y Educación, donde representantes de toda la región presentaron e intercambiaron durante 7 sesiones sus experiencias e inquietudes acerca de la educación en materia del agua. Se destacó la participación del Sr. Richard Meganck, Rector del Instituto UNESCO – IHE de Holanda

La Conferencia contó con la participación de estudiantes, académicos, gestores y tomadores de decisiones de América Latina y el Caribe.

La Ceremonia de Inauguración fue realizada el día 11 de diciembre y se contó con la presencia de más de 150 personas, durante esta Ceremonia formaron parte de la Mesa Principal el Sr. Pedro Gómez de la Fuente (Secretario General de la Comisión Nacional UNESCO Paraguay), el Sr. Richard Meganck (Rector del Instituto UNESCO – IHE), el Sr. Alfredo Ledesma (Superintendente de Gestión Ambiental de ITAIPÚ Binacional) y Sra.María Concepción Donoso (Hidróloga Regional del PHI para América Latina y el Caribe) y el (Ministro de la Secretaria del Ambiente).

CONCLUSIONES Y RECOMENDACIONES DE LA CONFERENCIA:

Educación terciaria y desarrollo profesional de científicos del agua, ingenieros, gerentes y tomadores de decisiones:

- Transversalizar el tema agua en el sistema universitario
- Establecer una estrategia en materia de educación terciaria en recursos hídricos
- Actualizar planes de estudio para un marco global en el sistema universitario/terciario, para lo cual se identifica el apoyo del Instituto UNESCO- IHE
- Desarrollar mecanismos para transferir el conocimiento generado en materia de recursos hídricos a las iniciativas educativas formales e informales y a las instancias políticas pertinentes.

Educación comunitaria:

- Intensificar la educación y capacitación comunitaria en temas relativas al agua.
- Definir indicadores confiables para medir la influencia y/o éxito de intervenciones de capacitación o generación de consciencia relativos al agua.
- Valorar y propiciar sinergias con instancias de gobierno, privados, ONGs y/o de transfondo social.

Educación y capacitación de técnicos del agua:

- Reconocer y hacer un llamado a la región en torno a la falta de técnicos del agua debidamente capacitados
- Iniciar un proceso para el establecimiento de un marco normativo para técnicos de agua.
- Intensificar esfuerzos para la reapertura y/o desarrollo de programas dedicados técnicos del agua

Agua y educación en las escuelas:

- Identificar esfuerzos que se están desarrollando en la región para buscar sinergias.
- Dirigir esfuerzos hacia la capacitación de maestros y profesores ("docentes motivados, estudiantes motivados")
- Expandir el ámbito del Programa UNESCO-PHI/Proyecto WET Agua y Educación, incluyendo la expansión de la red regional de esta iniciativa

Educación y los medios de comunicación:

- Intensificar las sinergias entre los medios de comunicación y las instituciones vinculadas con el agua, y en particular con educación del agua
- Desarrollar planes de comunicación y difusión que acompañen las iniciativas de educación relativa al agua a todos los niveles

Recomendaciones finales:

- Recomendar la formulación de políticas estatales a largo plazo en torno a educación relativa al agua.
- Compartir las conclusiones y recomendaciones de esta Conferencia en V Foro Mundial del Agua
- Transmitir los resultados de este evento al proceso que coordina UNESCO en el marco de la ONU relativo a la Década de Educación para el Desarrollo Sostenible
- Solicitar a la UNESCO continuar con el desarrollo de esfuerzos y búsqueda de sinergias para el avance de la educación del agua en América Latina y el Caribe.

Taller de agua y educación para docentes del programa regional PHI en Asunción

9 de septiembre de 2009: En un ambiente de dinamismo, integración y profesionalismo, docentes y educadores de instituciones educativas del área de influencia de la Itaipú Binacional, de los departamentos de Alto Paraná y Canindeyú participaron del Taller para docentes y educadores del Programa de la UNESCO -PHI / Proyecto Wet Agua y Educación para América Latina y el Caribe.

Dicho Proyecto "Wet Educación hídrica para docentes", tiene la misión de contribuir con los países en el desarrollo, la implementación y evaluación de programas educativos en materia de agua.

Durante dos días profesores y educadores fueron capacitados e informados intensamente sobre el recurso vital. En los talleres, los mismos docentes participantes condujeron varias actividades dinámicas, esa forma de trabajo ayudó para que los mismos absorban a fondo todo lo aprendido en la actividad.

La organización y el éxito de este emprendimiento estuvo a cargo de **Rita Vazquez del Mercado** (foto tercera izq.), **especialista del IMTA-México y participante del Comité Nacional Mexicano del PHI (CONAMEXPHI),** coordinadora regional del Programa de la UNESCO -PHI / Proyecto Wet Agua y Educación para América Latina y el Caribe, del Departamento y División de Educación Ambiental de la Dirección de Coordinación de la Itaipú Binacional y demás colaboradores.

Algunos de los temas expuestos y realizados en el taller fueron: "Suma de las partes", reflexión sobre los efectos acumulativos de la contaminación puntual y difusa y cómo reducirlas. "Una gota en la cubeta" análisis de la disponibilidad de agua dulce en el planeta. **"Juegos hídricos panamericanos"** competir para conocer más acerca de las propiedades de adhesión, cohesión y tensión superficial del agua. **"Agua para todos"** reflexión sobre el crecimiento poblacional y su consiguiente incremento en la demanda de agua ¿Hay agua para todos? ¿Por cuánto tiempo? **"La Tormenta",** reproducir el sonido de una tormenta y comprender la importancia de recabar información estadística de la precipitación y de contar con redes de monitoreo.

Por otra parte consideramos importante incluir dentro del informe, que desde la DGPCRH se viene desarrollando actividades para mejorar el conocimiento sobre los recursos hídricos, para lo cual con el apoyo de proyectos de cooperación se ha incluido el componente de educación a jóvenes y niños, se han elaborado materiales conteniendo información sobre el comportamiento del ciclo del agua, su uso y la importancia de su preservación.

Espacio para la realización de pasantías supervisadas en la D.G.P.C.R.H, y proyectos vinculados.

La mayoría de los pasantes tienen la opción de elegir continuar como voluntarias a fin de mejorar sus conocimientos en el área de los recursos hídricos y manejo de los equipos de de medición de calidad y caudal del agua en las tareas de campo que lleva a cabo el proyecto Manejo Sostenible y Protección de las Aguas Subterráneas en Paraguay, de esta manera incentivar a los estudiantes a comprender la importancia del agua y crear más capacidades a nivel de jóvenes, y de esta forma contribuir a cumplir con los objetivos del milenio y de la UNESCO. Hemos tenido una gran experiencia con esta introducción de pasantias ya que la mayoría de los/as pasantes ha continuado sus estudios y realizado tesis de grado y post grado en el área de gestión de los recursos hídricos.

1.1 Actividades a nivel nacional dentro del marco del PHI

1.1.1 Certámenes científicos y técnicos nacionales/locales

7 y 8 de Enero de 2008: Participación del **encuentro de expertos** y consultores – UNESCO-PHI- Proyecto “Agua y Diversidad Cultural”.

7 de febrero de 2008: A través de la Nota VMRREE/DGPM/DOI/ Nº 171/2009, el Ministerio de Relaciones Exteriores, ha informado al Presidente de CoNaPHI-PY, que durante la 34º Conferencia General de la UNESCO, celebrada en Paris del 16 de octubre al 3 de noviembre de 2007, el Paraguay, ha sido **electo para conformar el Consejo Intergubernamental** del Programa Hidrológico Internacional, el cual estará Representado por el Director/a de la Dirección General de Protección y Conservación de los Recursos Hídricos-SEAM.

La elección de Paraguay en este órgano periférico de la UNESCO, es estratégica teniendo en cuenta que la función directiva del Consejo consiste en planificar, definir las prioridades y supervisar la ejecución del PHI. La participación paraguaya en este organismo facilitara el seguimiento y mejor manejo de la información en temas de interés estratégico a escala mundial como ser la de los recursos hídricos, es un instrumento gracias al cual los Estados Miembros pretender mejorar su conocimiento del ciclo hídrico e incrementar su capacidad de administrar y explotar mejor sus recursos hídricos.

En fecha 13 de agosto de 2008: Participación de la Sesión ordinaria de la Comisión Nacional de Cooperación-UNESCO. Asunción- Py.

En Octubre de 2008, el CoNaPHI-Py tuvo varias jornadas de trabajo a fin de realizar el Análisis del Documento Sudamericano y emitir opciones.

En fecha 15 de octubre de 2008: Se ha participado de la Reunión organizada por la Comisión Nacional Paraguaya de Cooperación con la UNESCO.

Entre los días 11 y 12 de diciembre de 2008: en el hotel Excelsior, Asunción, Paraguay, fue realizada la Conferencia sobre Agua y Educación, donde representantes de toda la región presentaron e intercambiaron durante 7 sesiones sus experiencias e inquietudes acerca de la educación en materia del agua.

Entre el 30 de junio y 1° de julio de 2009 en la ciudad de Asunción, Paraguay, se llevó a cabo la VIII Reunión de Comités Nacionales y Puntos Focales del Programa Hidrológico Internacional (PHI), de la Unesco para América Latina y el Caribe (ALAC), que se realizó en el Hotel Excelsior en la ocasión la representación paraguaya presentó ante la UNESCO un informe sobre la reciente gran sequía y su impacto. Nuestro país sufrió las consecuencias del bajo caudal de las aguas nacionales (ríos, arroyos, lagos) debido al problema de la prolongada sequía, desde mediados del año pasado hasta inicio de los tres primeros meses del 2009. Se planteó la necesidad de realizar un estudio técnico y científico que ayude a alertar sobre situaciones similares y adoptar así medidas mitigatorias. Desde la Seam se busca instalar la temática del agua en las agendas institucionales, como una prioridad de gestión.

1.1.2 Participación en Comités de dirección/Grupos de Trabajo del PHI

1.1.3 Proyectos de investigación o de aplicación apoyados o patrocinados

1.1.4 Colaboración con otras organizaciones o programas nacionales e internacionales.

26 de setiembre de 2008: Se ha remitido una **propuesta del CoNaPHI-Py,** a la Comisión Nacional Paraguaya de Cooperación con la UNESCO, teniendo en cuenta la visita del Director de la oficina Regional de UNESCO, Montevideo, así como se ha participado de la Reunión de Trabajo con el Director Regional realizado en el Salón de reuniones del Ministerio de Educación y Cultura.

Participación del Dr. Fernando Larroza, Director de la DGPCRH, en la Conferencia de Directores Iberoamericanos del Agua (STP-CODIA) el X CODIA, fue realizado del 30 de junio y 1 de julio en Madrid y el Seminario "Género y Agua" fue organizado conjuntamente por la Secretaría General Iberoamericana (SEGIB) y la Agencia Española de Cooperación Internacional para el Desarrollo (AECID) el 29 de julio de 2009.

El Dr. Fernando Larroza, Director de la DGPCRH, participo en su carácter de Coordinador Nacional UNESCO-OEA-ISARM Américas en el VIII Taller de Coordinación "Acuíferos Transfronterizos de las Américas" del 15 al 17 de setiembre de 2009 en Quito-Ecuador. La reunión trato sobre la integración del grupo que realizara el "Libro sobre Estrategias sobre los acuíferos Transfronterizos de América", dicho grupo está compuesto por Canadá, Brasil, USA y Paraguay.

1.1.5 Otras iniciativas

1.2 Cursos academicos o de adiestramiento

1.2.1 Contribución a cursos del PHI
1.2.2 Organización de cursos específicos
1.2.3 Participación en cursos del PHI

1.3 Cooperación con el Instituto UNESCO-IHE para la Educación Relativa al Agua, y otros centros internacionales/regionales relacionados con los recursos hídricos, bajo los auspicios de la UNESCO

En ocasión de la 18º reunión del Consejo Intergubernamental del PHI celebrada del 9 al 13 de junio de 2008 en la Sede de la UNESCO, en París, el Gobierno de Paraguay y Brasil, propusieron al Consejo Ejecutivo, la creación de un Centro Internacional de Hidroinformática en ITAIPU BINACIONAL como Centro de Categoría 2 auspiciado por la UNESCO.

1.4 Publicaciones

La SEAM de manera conjunta con la APRH, ha preparado un total de 100 CDs sobre la situación del sector hídrico en el paraguay, titulado "***NUESTRA AGUA, NUESTRA VIDA, NUESTRO PARAGUAY***", que es una compilación tomando como base los documentos presentados en el IV Foro Mundial del Agua en México 2006.

El CD contiene:

- Introducción
- Los recursos hídricos en el Paraguay
- Política Ambiental y Marco Legal
- Acciones Nacionales para la GIRH
- Compiladores

1.5 Participación certámenes científicos internacionales

1.5.1 Certámenes realizados en el país

- 30/03/09: Seminario "El agua desde la perspectiva social" realizado en la FCA-UNA. Expositores: Ing. Amado Insfrán, Ing José Silvero, Srta. Alice Romero, Pasante de la DGPCRH

En fecha **29 de marzo de 2009:** se ha celebrado el "**Día Mundial del Agua**", evento realizado en la Facultad de Ciencias Agrarias de la Universidad Nacional de Asunción, con la cooperación de la SEAM y el CoNaPHI-PY,

El día 22 de marzo de 2010 fue desarrollado un evento conmemorativo del Día Mundial del Agua y el Día Meteorológico Mundial, en el Gran Hotel del Paraguay, Asunción.

Durante el mencionado evento, se realizó el Lanzamiento del material educativo "Las Aventuras de Ytyky" y un Guión para docentes, que contiene los conceptos del ciclo hidrológico, contaminación y sustentabilidad elaborado dentro del marco Proyecto PAS-PY (SEAM-BGR).

La programación se desarrollo con paneles técnico-científicos, conferencias y presentación de pósters relacionadas a la temática del agua, de manera a que todos los actores puedan conocer la situación, debatir, crear mecanismos y espacios para coordinar acciones en miras a la gestión integrada del agua.

1.5.2 Participación en certámenes en el extranjero

En fecha 9 al 13 de junio de 2008: se realizó la 18ª reunión del Consejo Intergubernamental del PHI celebrada en la Sede de la UNESCO, en París Asistieron a la reunión delegados de 36 Estados Miembros que integran el Consejo. Estuvieron representados en calidad de observadores 40 delegaciones de Estados Miembros que no son miembros del Consejo, 12 organizaciones gubernamentales y no gubernamentales, dos organizaciones del sistema de las Naciones Unidas y nueve centros de categoría 2 de la UNESCO.

Por primera vez Paraguay ha tenido la oportunidad de participar en la mencionada reunión como miembro titular del Consejo con vos y voto.

10 y 11 de setiembre de 2008: En representación del CoNaPHI-Py, se ha participado del Foro Subregional de Consulta, realizado en Montevideo –Uruguay, en el marco del proceso de preparación del V Foro Mundial del Agua.
Se ha elaborado un Informe País.

En fecha **24 y 25 de noviembre de 2008** se ha participado en la **reunión de las Sub regiones,** en la ciudad de Foz de Yguazú, donde se presentó el documento de las Américas para el V Foro Mundial del Agua.

Entre el **16 y 22 de marzo:** Paraguay ha participado del **V Foro Mundial del Agua** realizado en la ciudad de Estambul, en su momento en la persona del Ing. Amado Insfrán quien ocupaba el cargo de Director General de la DGPCRH. La representación paraguaya centró su participación en la Conferencia Ministerial donde ha sentado postura oficial ante la Declaración Ministerial propuesta por la organización del Foro y activo rol en las Declaraciones Anexas, Paraguay junto con aproximadamente 25 estados decidieron reconocer el agua como derecho humano entre los que se hallan, Bolivia, Chile, Cuba, Ecuador, España, Guatemala, Honduras, Panamá, Uruguay y Venezuela. Suiza, en Europa, Benin, Camerún, Chad, Etiopía, Marruecos, Namibia, Niger, Nigeria, Senegal y Sudáfrica, por parte africana, así como Bangladesh, los Emiratos Árabes Unidos y Sri Lanka, de Asia, también suscribieron la declaración.

Conferencia Ministerial

28 de mayo de 2009: se ha participado del SEMINARIO INTERNACIONAL "SEQUÍAS Y GESTIÓN DE RIESGO CLIMÁTICO" realizado en la Serena, Chile, organizado por el Centro del Agua para Zonas Áridas y Semiáridas de América Latina y el Caribe – CAZALAC.

1.6 Otras actividades a nivel regional

1.6.1 Relaciones/cooperación institucionales

1.6.2 Proyectos científicos concluidos y en marcha

2 Actividades futuras

El CoNaPHI-Py, desarrolla trabajos a nivel nacional, conjuntamente con las instituciones que trabajan en la tematica del agua, apunta a una gestión sostenible de los recursos hidricos, asi mismo coadyuva a las actividades delineadas por el PHI –UNESCO, en el compromiso de la Fase VII del PHI cuyo título es: "Dependencia de los recursos hídricos: sistemas sometidos a estrés y respuestas sociales" para lo cual se viene delineando acciones para mejorar el nivel de conciencia de la sociedad paraguaya en el uso y manejo de los recursos hídricos, asi como hacerlos participes de la problemática socioambiental para resolver conflictos de uso del agua a traves de la participación de todos los usuarios, gestores, instituciones.

2.1 Actividades planificadas hasta diciembre 2010

- En fecha 02 de junio se realizara la Asamblea de renovación de autoridaes del Comité Nacional del Programa Hidrologico Internacional de Paraguay.

- Se auspiciara el º Foro de Conocimientos y Saberes de Cuencas a realizarse en dia 02 de junio de 2010, en conmemoración del Día Mundial del Ambiente.

- Instalar la temática de agua en las agendas institucionales e instancias, como prioridad de gestión.

- Participación activa en la Agenda UNESCO Regional

- Apoyar a las Secretarias de la UNESCO en la tematica agua, para lo cual ya se viene trabajando para coordinar acciones y conformar los consejos de agua por cuenca hidricas.

- **Fortalecer el Comité Paraguayo, aprobar el borrador de los estatutos**

2.2 Actividades previstas para 2011-2012

- Consolidar las bases de los conocimientos sobre el manejo del agua, a traves de talleres, seminarios y foros de intercambio de experiencias relacionadas a los recursos hídricos.

- Mejorar la gestión, consolidad estrategias y politicas para recuperar los recursos hidricos de las zonas urbanas.

- Acompañar el proceso de los proyectos desarrollados a nivel nacional.

- Establecer alianzas con los consejos de cuencas existentes en el país.

- Auspiciar y colaborar con las iniciativas desarrolladas a nivel nacional.

2.3 Actividades vislumbradas a largo plazo

- Acompañar el desarrollo el Plan de Recursos Hidricos
- Colaborar con el Balance Hidrico por cuencas
- Colaborar para la implementación del Inventario Nacional de Recursos Hidricos

NATIONAL REPORT ON IHP RELATED ACTIVITIES

PHILIPPINES

OCTOBER 2008

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

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

1.1 Meetings of the IHP National Committee

1.1.1 Decisions regarding the composition of the IHP National Committee

The institutional members of the Philippine National Committee for the UNESCO-IHP are agencies and organizations (public and private) which are mandated with, and are engaged in research, development and management activities in the water sector:

Bureau of Soils and Water Management (BSWM), Department of Agriculture (DA)
Bureau of Research and Standards (BRS), Department of Public Works and Highways (DPWH)
Environmental Management Bureau (EMB), Department of the Environment and Natural Resources (DENR)
Flood Control & Sabo Engineering Center (FCSEC), Department of Public Works and Highways (DPWH)
Laguna Lake Development Authority (LLDA)
Local Water Utilities Administration (LWUA)
LPA & Associates (private sector)
Metropolitan Waterworks and Sewerage System (MWSS)
Mines and Geoscience Bureau (MGB), Department of the Environment and Natural Resources (DENR)
National Economic and Development Authority (NEDA)
National Hydraulic Research Center, University of the Philippines (UP-NHRC)
National Irrigation Administration (NIA)
National Mapping and Resource Information Authority (NAMRIA)
National Power Corporation (NPC)
National Water Resources Board (NWRB)
Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA), Department of Science and Technology (DOST)
Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD), Department of Science and Technology (DOST)
Philippine Council for Aquatic and Marine Research and Development (PCAMRD), Department of Science and Technology (DOST)
Philippine Water Partnership (PWP)
Mapua Institute of Technology, School of Civil Engineering, Manila
University of Santo Tomas (UST), Department of Civil Engineering (UST), Manila
University of the Philippines at Los Baños (UPLB), College of Engineering and Agro-Industrial Technology (UPLB-CEAT), Los Baños, Laguna
Ateneo De Manila University (ADMU) - Manila Observatory, Quezon City
Central Luzon State University (CLSU), Muñoz, Nueva Ecija
De La Salle University (DLSU), Department of Civil Engineering (DLSU), Manila
University of San Carlos (USC), Department of Civil Engineering & Water Resources Research Center (USC), Cebu City

Officers of the Philippine National Committee for UNESCO-IHP:

Chairman: Leonardo Q. Liongson (UP Diliman)
Treasurer: Lino P. Aldovino (LPA & Associates)
Secretariat: NHRC and PWP staff (on secondment)

Agency Lead Representatives:
Ramon B. Alikpala, NWRB & PWP(2007)
Francisco Arellano, MWSI
Virgilio Basa, NAMRIA
Macra A. Cruz, MWSS
Antonio Morano, DPWH-BRS
Resito David, DPWH-FCSEC
Prisco Nilo, PAGASA
Virgilio Rivera, MWCI & PWP(2008)
Lennie Santos-Borja, LLDA

Finance Sub-Committee members:
Leonor Cleofas, MWSS
Dolores Hipolito, DPWH-FCSEC
Ms. Lyn Almario, MWCI
Francisco Arellano, MWSI
Romualdo Beltran, NPC
Lino P. Aldovino, PNC-UNESCO-IHP Treasurer

Technical Sub-Committee members::
Guillermo Q. Tabios III, UP-NHRC & C.E. Dept.
Romualdo Beltran, NPC
Samuel Contreras, BSWM
Emiterio Hernandez, LLDA
Milo Landicho, NIA
Peter Lim, University of Sto. Tomas, C.E. Dept.
Rosa Perez, PAGASA
Roberto Soriano, Mapua I.T.- School of C.E.

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

1.1.2 Status of IHP-VI activities

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

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

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

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

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

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

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

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

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

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

In response to the questionnarie from the UNESCO-IHP Paris office, the following has been indicated as the Philippines Country Priorities for IHP-VII Themes:

Theme 1: ADAPTING TO THE IMPACTS OF GLOBAL CHANGES ON RIVER BASINS AND AQUIFER SYSTEMS (General priority of the Philippines in all focal areas)
Focal area 1.1 - Global changes and feedback mechanisms of hydrological processes in stressed systems
Focal area 1.2 - Climate change impacts on the hydrological cycle and consequent impact on water resources
Focal area 1.3 - Hydro-hazards, hydrological extremes and water-related disasters
Focal area 1.4 - Managing groundwater systems' response to global changes
Focal area 1.5 - Global change and climate variability in arid and semi-arid regions

Theme 2: STRENGTHENING WATER GOVERNANCE FOR SUSTAINABILITY
(General priority of the Philippines in all focal areas)
Focal area 2.1 - Cultural, societal and scientific responses to the crises in water governance
Focal area 2.2 - Capacity development for improved governance; enhanced legislation for wise stewardship of water resources
Focal area 2.3 - Governance strategies that enhance affordability and assure financing
Focal area 2.4 - Managing water as a shared responsibility across geographical & social boundaries
Focal area 2.5 - Addressing the water-energy nexus in basin-wide water resources

Theme 3: ECOHYDROLOGY FOR SUSTAINABILITY (priority of the Philippines for focal area 3.1)
Focal area 3.1 - Ecological measures to protect and remediate catchments process
Focal area 3.2 - Improving ecosystem quality and services by combining structural solutions with ecological biotechnologies
Focal area 3.3 - Risk-based environmental management and accounting
Focal area 3.4 - Groundwater-dependent ecosystems identification, inventory and assessment

Theme 4: WATER AND LIFE SUPPORT SYSTEMS
(General priority of the Philippines in all focal areas)
Focal area 4.1 - Protecting water quality for sustainable livelihoods and poverty alleviation
Focal area 4.2 - Augmenting scarce water resources especially in SIDS
Focal area 4.3 - Achieving sustainable urban water management
Focal area 4.4 - Achieving sustainable rural water management

Theme 5: WATER EDUCATION FOR SUSTAINABLE DEVELOPMENT
(General priority of the Philippines in all focal areas)
Focal area 5.1: Tertiary water education and professional development
Focal area 5.2: Vocational education and training of water technicians
Focal area 5.3: Water education in schools
Focal area 5.4: Water education for communities, stakeholders and mass-media professionals

Cross-cutting programmes: FRIEND (Asia Pacific FRIEND - priority of the Philippines)

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

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

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

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

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

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

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

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

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

1.2.2 Participation in IHP Steering Committees/Working Groups

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

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

1.2.3 Research/applied projects supported or sponsored

National Academy of Science and Technology (NAST)

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

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

National Hydraulic Research Center (NHRC)

Completed Projects (2007-2008):

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

National Research Council of the Philippines (NRCP)

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

National Water Resources Board (NWRB)

Completed Projects (2007):

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

Ongoing Projects (2007-2008):

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

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

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

- Upgrading of *Flood Forecasting Operations.*
- Establishment of *Communication Network Thru SMS Link* Between PAGASA Weather and Flood Forecasting Center (WFFC) Bldg. (Quezon City) and Magat Dam in Isabela.

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

Establishment/Enhancement of *Community-based Early Warning System(CBEWS)* under the READY Project (UNDP), covering the following Provinces: Laguna, Ilocos Sur, Zambales, Cavite, Bohol

Conduct of *flood hazard mapping* (READY Project) in the following provinces: Ilocos Sur, Laguna, Cavite, Pampanga, Iloilo.

Improvement of the *Flood Forecasting and Warning System (FFWS)* of the Pampanga and Agno River Basins, to include the ff. activities:

Construction of the Pampanga River Flood Forecasting Center.

Implementation of JICA project in the Pampanga and Agno river basins

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

Establishment of *Early Warning System for disaster mitigation* in the south (Iloilo) under the Korean Government - project began March 2008.

Philippine Water Partnership (PWP)

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

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

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

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

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

Participated in the *Singapore International Water Week*.

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

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

No additional information is available.

1.2.5 Other Initiatives

Bureau of Soils and Water Management (BSWM), *Drought Mitigation Measures.*

Bureau of Soils and Water Management (BSWM), *Integrated Watershed Management for Sustainable Soil and Water Resources Management of the Inabanga Watershed, Bohol Island, Philippines*.

Bureau of Soils and Water Management (BSWM), *Rainwater Harvesting.*

Bureau of Soils and Water Management (BSWM), *Rehabilitation/Upgrading of Regional and Provincial Soil and Water Analyses.*

Bureau of Soils and Water Management (BSWM), *Small Water Impounding Projects (SWIP).*

Flood Control & Sabo Engineering Center (FCSEC), Department of Public Works and Highways (DPWH), *Project for Enhancement of Capabilities in Flood Control and Sabo Engineering of the DPWH*, JICA.

Laguna Lake Development Authority (LLDA), *Environmental User Fee Program* (as centerpiece of Environmental Management Program).

Laguna Lake Development Authority (LLDA), *River Rehabilitation Program* .

Laguna Lake Development Authority (LLDA), *Lake Fishery Management Program.*

Laguna Lake Development Authority (LLDA), *Laguna de Bay Shoreland Management*.

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

1.3 Educational and training courses

1.3.1 Contribution to IHP Courses

None.

1.3.2 Organization of specific courses

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

1.3.3 Participation in IHP courses

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

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

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

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

1.4 Papers and Publications

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

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

Tabios, G. Q. III (2008), *Implications of Water Resources Developments and the Need for Ecology-based Hydrologic and Engineering Studies for Agusan Marsh, Philippines,* Proceedings of the International conference "Uncertainties in Water Resource Management: causes, technologies and consequences"

/WRM-Mon2008 in conjunction with the 16th Regional Steering Committee (RSC) Meeting for the UNESCO International Hydrological Programme for Southeast Asia and the Pacific (UNESCO-IHP SEAP). Chinggis Khaan Hotel, Ulaanbaatar city, Mongolia, 29 September – 3 October 2008. UNESC-IHP Phase VII Technical Document in Hydrology No. 1.

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

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

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

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

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

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

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

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

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

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

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

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

Stable isotopes as potential tracers for assessing groundwater contamination from the Montalban landfill

by Soledad S. Castañeda, Rosalina V. Almoneda, R.aymond J. Sucgang and Cynthia L. Iblan

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

Philippines Progress on Implementing IWRM Reforms
by Isidra D. Penaranda

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

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

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

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

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

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

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

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

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

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

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

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

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

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

1.5 Participation in international scientific meeting

No complete information is available.

1.5.1 Meetings hosted by the country

International Conference on Hydrology and Water Resources Management For Hazard Reduction and Sustainable Development (HRSD 2007) in conjunction with the 15th RSC Meeting, UNESCO for SEAP, 19-23 November 2007, UNESCO International Hydrology Program, Makati City, Philippines.

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

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

1.5.2 Participation in meetings abroad

No additional information is available.

1.6 Other activities at regional level

1.6.1 Institutional relations /co-operation

No complete information is available.

1.6.2 Completed and ongoing scientific projects

No additional information is available.

2.0 Future Activities

2.1 Activities planned for 2007-2008

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

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

2.2 Activities in the long term

Continued support of, and partcipation in the UNESCO-IHP in general and the RSC in particular, in all present and future: activities: APFRIEND (rainfall IDF and flood frequency studies), Catalogue of Rivers for SEAP, IHP training courses conducted by host countries, and joint hydrologic training courses and researches among member countries.

NATIONAL REPORT ON IHP RELATED ACTIVITIES

PHILIPPINES

NOVEMBER 2009

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

1. ACTIVITIES UNDERTAKEN IN THE PERIOD OCTOBER 2008 – OCTOBER 2009

1.1 Meetings of the IHP National Committee

1.1.1 Decisions regarding the composition of the IHP National Committee

The institutional members of the Philippine National Committee for the UNESCO-IHP are agencies and organizations (public and private) which are mandated with, and are engaged in research, development and management activities in the water sector:

Bureau of Soils and Water Management (BSWM), Department of Agriculture (DA)
Bureau of Research and Standards (BRS), Department of Public Works and Highways (DPWH)
Environmental Management Bureau (EMB), Department of the Environment and Natural Resources (DENR)
Flood Control & Sabo Engineering Center (FCSEC), Department of Public Works and Highways (DPWH)
Laguna Lake Development Authority (LLDA)
Local Water Utilities Administration (LWUA)
LPA & Associates (private sector)
Metropolitan Waterworks and Sewerage System (MWSS)
Mines and Geoscience Bureau (MGB), Department of the Environment and Natural Resources (DENR)
National Economic and Development Authority (NEDA)
National Hydraulic Research Center, University of the Philippines (UP-NHRC)
National Irrigation Administration (NIA)
National Mapping and Resource Information Authority (NAMRIA)
National Power Corporation (NPC)
National Water Resources Board (NWRB)
Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA), Department of Science and Technology (DOST)
Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD), Department of Science and Technology (DOST)
Philippine Council for Aquatic and Marine Research and Development (PCAMRD), Department of Science and Technology (DOST)
Philippine Water Partnership (PWP)
Mapua Institute of Technology, School of Civil Engineering, Manila
University of Santo Tomas (UST), Department of Civil Engineering (UST), Manila
University of the Philippines at Los Baños (UPLB), College of Engineering and Agro-Industrial Technology (UPLB-CEAT), Los Baños, Laguna
Ateneo De Manila University (ADMU) - Manila Observatory, Quezon City
Central Luzon State University (CLSU), Muñoz, Nueva Ecija
De La Salle University (DLSU), Department of Civil Engineering (DLSU), Manila
University of San Carlos (USC), Department of Civil Engineering & Water Resources Research Center (USC), Cebu City

Officers of the Philippine National Committee for UNESCO-IHP:

Chairman: Leonardo Q. Liongson (UP Diliman)
Treasurer: Lino P. Aldovino (LPA & Associates)
Secretariat: NHRC and PWP staff (on secondment)

Agency Lead Representatives:
Ramon B. Alikpala, NWRB & PWP(2007-2008)
Francisco Arellano, MWSI
Virgilio Basa, NAMRIA
Macra A. Cruz, MWSS
Antonio Morano, DPWH-BRS
Resito David, DPWH-FCSEC
Prisco Nilo, PAGASA
Virgilio Rivera, MWCI & PWP(2008-2009)
Lennie Santos-Borja, LLDA

Finance Sub-Committee members:
Leonor Cleofas, MWSS
Dolores Hipolito, DPWH-FCSEC
Ms. Lyn Almario, MWCI
Francisco Arellano, MWSI
Romualdo Beltran, NPC
Lino P. Aldovino, PNC-UNESCO-IHP Treasurer

Technical Sub-Committee members::
Guillermo Q. Tabios III, UP-NHRC & C.E. Dept.
Romualdo Beltran, NPC
Samuel Contreras, BSWM
Emiterio Hernandez, LLDA
Milo Landicho, NIA
Peter Lim, University of Sto. Tomas, C.E. Dept.
Rosa Perez, PAGASA
Roberto Soriano, Mapua I.T.- School of C.E.

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

1.1.2 Status of IHP-VII activities

In response to the questionnarie from the UNESCO-IHP Paris office, the following has been indicated in 2008 as the Philippines Country Priorities for IHP-VII Themes:

Theme 1: ADAPTING TO THE IMPACTS OF GLOBAL CHANGES ON RIVER BASINS AND AQUIFER SYSTEMS (General priority of the Philippines in all focal areas)
Focal area 1.1 - Global changes and feedback mechanisms of hydrological processes in stressed systems
Focal area 1.2 - Climate change impacts on the hydrological cycle and consequent impact on water resources
Focal area 1.3 - Hydro-hazards, hydrological extremes and water-related disasters
Focal area 1.4 - Managing groundwater systems' response to global changes
Focal area 1.5 - Global change and climate variability in arid and semi-arid regions

Theme 2: STRENGTHENING WATER GOVERNANCE FOR SUSTAINABILITY
(General priority of the Philippines in all focal areas)
Focal area 2.1 - Cultural, societal and scientific responses to the crises in water governance
Focal area 2.2 - Capacity development for improved governance; enhanced legislation for wise stewardship of water resources
Focal area 2.3 - Governance strategies that enhance affordability and assure financing
Focal area 2.4 - Managing water as a shared responsibility across geographical & social boundaries
Focal area 2.5 - Addressing the water-energy nexus in basin-wide water resources

Theme 3: ECOHYDROLOGY FOR SUSTAINABILITY (priority of the Philippines for focal area 3.1)
Focal area 3.1 - Ecological measures to protect and remediate catchments process
Focal area 3.2 - Improving ecosystem quality and services by combining structural solutions with ecological biotechnologies
Focal area 3.3 - Risk-based environmental management and accounting
Focal area 3.4 - Groundwater-dependent ecosystems identification, inventory and assessment

Theme 4: WATER AND LIFE SUPPORT SYSTEMS
(General priority of the Philippines in all focal areas)
Focal area 4.1 - Protecting water quality for sustainable livelihoods and poverty alleviation
Focal area 4.2 - Augmenting scarce water resources especially in SIDS
Focal area 4.3 - Achieving sustainable urban water management
Focal area 4.4 - Achieving sustainable rural water management

Theme 5: WATER EDUCATION FOR SUSTAINABLE DEVELOPMENT
(General priority of the Philippines in all focal areas)
Focal area 5.1: Tertiary water education and professional development
Focal area 5.2: Vocational education and training of water technicians
Focal area 5.3: Water education in schools
Focal area 5.4: Water education for communities, stakeholders and mass-media professionals

Cross-cutting programmes: FRIEND (Asia Pacific FRIEND - priority of the Philippines)

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

Consultative Forum on the National Integrated Basic Research Agenda (NIBRA),)
organized by the National Research Council of the Philippines (NRCP).
The water-related research agenda are covered by Cluster II (Mathematical Sciences, Engineering and Industrial Research, Physics, and Earth and Space Sciences) – such as in the earth and environmental sciences, and multi-disciplinary research on environment and climate.
7 November 2008, Traders Hotel, Pasay City, Philippines.

National Consultative Meeting on the Review of the Philippines Water Code (2007-2008),
organized by the National Academy of Science and Technology (NAST) and the National Water Resources Board (NWRB). In a series of four (4) Round Table Meetings and one National Consultative Meeting held in 2008, a Technical Working Group (TWG) and 58 water agencies and stakeholders reviewed, discussed and made comments (by agency) on the proposed amendments of the Philippines Water Code.

2008 National Meeting of the Philippine National Committee for UNESCO-IHP,
4 December 2008, National Hydraulic Research Center, Melchor Hall, College of Engineering, University of the Philippines, Diliman, Quezon City, Philippines.

2nd National Conference of Small Water Service Providers:
"Building Partnerships for Sustainable Water for All",
organized by the Philippine Water Partnership (PWP).
16-17 October 2008, Cebu, Philippines.

PWP Strategic Plan (2009-2013) Planning Workshop,
organized by the Philippine Water Partnership (PWP).
20-21 November 2008, Balaw Kalinaw, University of the Philippines, Diliman,
Quezon City, Philippines.

Facilitators Training on Outcome Mapping Plan for PWP/CWPs back-to-back with Rainwater Harvesting Seminar - Supporting Water Supply and Sanitation (WSS): Government Agencies and Foreign Funding Institutions,
organized by the Philippine Water Partnership (PWP).
Water supply and sanitation (WSS) services are major concerns of the government. Population growth, urban development, economic crisis, poverty, lack of knowledge, global competition are some factors that contribute to problems in water supply and sanitation.
24-25 November 2008, Davao City, Philippines.

Conference on Legislating Water Economic Regulation to Expand Water Access for the Poor,
organized by the Philippine Water Partnership together with the Office of Senator Jinggoy E. Estrada .
10 March 2009, Pecson Room, Senate Building, Pasay City, Philippines.

Conference on Climate Change Adaptation for Urban and Rural Development Planners,
organized by the Philippine Water Partnership together with
Co-convenors: Office of Senator Juan Miguel Zubiri and Office of Representative Ignacio Arroyo.
March 2009, Philippines.

3rd National Conference on Small-scale Water Service Providers
organized by the Philippine Water Partnership.
19-20 August 2009, The Royal Mandaya Hotel, Davao City, Philippines.

"Water is Life" National Photo Contest 2009,
organized by the Philippine Water Partnership together with the National Water Resources Board (NWRB) and German Agency for Technical Cooperation (GTZ) Sanitation Program, recently conducted to raise awareness among Filipino citizens by capturing the various water and sanitation issues facing the country today and move our people into action to address these issues. The theme Water for Life is based on the fundamental truth of water as a core element of life. The contest is open to all amateur and professional photographers who are Philippine residents.
Prizes for this contest are: 1st Prize - P25,000, 2nd Prize - P20,000, 3rd prize - P15,000. There will be special prizes on Water for Food and Agriculture - P10,000, Water for People - P10,000, and Water for Health and Sanitation - P10,000.

Forum on Climate Change and Water Resources:
Understanding the Climate Vulnerability of the Water Resources,
organized y the Philippine Water Partnership and the National Water Resources Board (NWRB), with support by GTZ and the PAGCOR.
25 September 2009, Mandarin Suites, Araneta Center, Cubao, Quezon City, Philippines.

Disaster Mitigation and Preparedness Strategies Project (DMAPS) Forum on Flood Risk Management:
"Learning Lessons, Moving On in the Wake of Storm Ondoy (Ketsana)",
organized by the University of the Philippines, College of Engineering, Institute of Civil Engineering (UP ICE) and Philippine Institute of Civil Engineers (PICE).
13 October 2009, Melchor Hall, College of Engineering, University of the Philippines, Diliman, Quezon City, Philippines.

Learning from the Ondoy Flood: A Dialogue with Experts,
a seminar organized by the Asian Development Bank (ADB),
14 October 2009, khub Main Library, ADB, Pasig City, Philippines.

2nd National Conference on Climate Change Adaptation (Albay+2):
Moving Forward on the 2007 Albay Declaration,
organized by the Center for Initiatives and Research on Climate Change Adaptation (CIRCA) of the Provincial Government of Albay, in partnership with the Department of Environment and Natural Resources (DENR) and the GTZ ACCBio Project.
26-27 October 2009, Diamond Hotel, Roxas Boulevard, Manila, Philippines.

A National Forum on Climate Change and Vulnerability:
Mainstreaming Climate Change Mitigation and Adaptation in Philippine Development Agenda.
Organized by the Task Force on Climate Change (TFCC) of the National Academy of Science and Technology (NAST).
16 November 2009, Manila Hotel, Manila, Philippines.

1.2.2 Participation in IHP Steering Committees/Working Groups

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

Philippines on 22-23 October 2007, attending to chair both the 16th RSC Meeting in 2008 at Ulan Bataar. Mongolia and the 17th RSC Meeting in 2009 at Wuhan, China.

Guillermo Q. Tabios III (UP Diliman), RSC member - has served as co-coordinator with RSC member Prof. Trevor Daniels of Adelaide University in the RSC-assigned task group for APFRIEND (2005-2009) on the development of Rainfall Intensity Duration Frequency (IDF) and Flood Frequency (FF) relations in the SEAP region.

Guillermo Q.Tabios III (UP Diliman), RSC member – has served as Philippine focal person in the Assessment of Flood Forecasting and Warning System (FFWS) for Tropical Regions, organized by the the UNESCO-IHP Humid Tropics Center, Malaysia.

> First Meeting of the "Assessment of Flood Forecasting and Warning System (FFWS) for Tropical Regions" held at Kuala Lumpur, Malaysia, April 20-24, 2009.
>
> Second Meeting of the "Assessment of Flood Forecasting and Warning System (FFWS) for Tropical Regions" held at Bogor, Indonesia, July 15-18, 2009.
>
> Third Meeting of the "Assessment of Flood Forecasting and Warning System (FFWS) for Tropical Regions" held at Danang, Vietnam, October 9-11, 2009.

1.2.3 Research/applied projects supported or sponsored

National Hydraulic Research Center (NHRC)

Enhancement, Incorporation of Optimization Module and Calibration of MWSI Water Distribution Network Model, 2008-2009, UPERDFI-NHRC project for Maynilad Water Services, Inc. (MWSI), University of the Philippines, Diliman, Quezon City, Philippines.

Ambuklao and Binga Rehabilitation Project, Sedimentation and Reservoir Operation Studies, 2009, UPERDFI-NHRC project for NORCONSULT Management Services (Phil.) Inc., University of the Philippines, Diliman, Quezon City, Philippines.

National Academy of Science and Technology (NAST)
NAST Research Fellowship on the Metro-Manila Floods caused by Tropical Storm Ketsana (Ondoy) and other Flood Events of 2009.

National Research Council of the Philippines (NRCP)
Publication/Updating of the Philippine Compendium of Science and Technology
(Chapters on Hydrology, Hydraulics and Water Resources Management)

National Water Resources Board (NWRB)

NWRB-JICA *Study on Integrated Water Resources Management for Poverty Alleviation and Economic Development in Pampanga River Basin,*
Phase I (the phase for the basic study to assess the present conditions of the study area);
Phase II (the phase for formulation of the IWRM Plan).
January 2009 – February 2011.

Other Projects (2007-2008):

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

Department of Environment and Natural Resources (DENR) and National Water Resources Board
ADB-assisted project - Philippines: Master Plan for the Agusan River Basin.

Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA),
Continuing Priority Programs of the Flood Forecasting Branch
- Upgrading of *Flood Forecasting Operations.*
- Establishment of *Communication Network Thru SMS Link* Between PAGASA Weather and Flood Forecasting Center (WFFC) Bldg. (Quezon City) and Magat Dam in Isabela.
- Calibration of the following hydrologic models, to be applied operationally to the various flood forecasting points of the Pampanga, Agno, Bicol and Cagayan River Basins: MLRegression, Storage Function and Sacramento Model.

Establishment/Enhancement of *Community-based Early Warning System(CBEWS)* under the READY Project (UNDP), covering the following Provinces: Laguna, Ilocos Sur, Zambales, Cavite, Bohol

Conduct of *flood hazard mapping* (READY Project) in the following provinces: Ilocos Sur, Laguna, Cavite, Pampanga, Iloilo.

Improvement of the *Flood Forecasting and Warning System (FFWS)* of the Pampanga and Agno River Basins, to include the ff. activities:
Construction of the Pampanga River Flood Forecasting Center.
Implementation of JICA project in the Pampanga and Agno river basins

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

Establishment of *Early Warning System for disaster mitigation* in the south (Iloilo) under the Korean Government - project began March 2008.

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

Philippine Water Partnership (PWP)
15th Global Water Partnership (GWP) - SouthEast Asia Steering Committee Meeting,
The Meeting discussed the GWP-SEA Strategy 2009-2013 during the Planning Session.
17-20 September 2008, Jakarta, Indonesia.

1.2.5 Other Initiatives

Bureau of Soils and Water Management (BSWM), *Drought Mitigation Measures.*

Bureau of Soils and Water Management (BSWM), *Integrated Watershed Management for Sustainable Soil and Water Resources Management of the Inabanga Watershed, Bohol Island, Philippines*.

Bureau of Soils and Water Management (BSWM), *Rainwater Harvesting.*

Bureau of Soils and Water Management (BSWM), *Rehabilitation/Upgrading of Regional and Provincial Soil and Water Analyses.*

Bureau of Soils and Water Management (BSWM), *Small Water Impounding Projects (SWIP).*

Flood Control & Sabo Engineering Center (FCSEC), Department of Public Works and Highways (DPWH), *Project for Enhancement of Capabilities in Flood Control and Sabo Engineering of the DPWH*, JICA.

Laguna Lake Development Authority (LLDA), *Environmental User Fee Program* (as centerpiece of Environmental Management Program).

Laguna Lake Development Authority (LLDA), *River Rehabilitation Program* .

Laguna Lake Development Authority (LLDA), *Lake Fishery Management Program.*

Laguna Lake Development Authority (LLDA), *Laguna de Bay Shoreland Management*.

1.3 Educational and training courses

1.3.1 Contribution to IHP Courses

Tabios, G.Q. III, 2009, Workshop Presentor, UNESCO-IHP Asia Pacific FRIEND Workshop on Design Rainfall and Flood Frequency, Ho Chi Minh City, Vietnam, March 9-10, 2009.

1.3.2 Organization of specific courses

Tabios, G.Q.III, 2008, Lecturer, National Engineering Center, Hydrology and Hydropower Development for First Gen Corporation, August 13-15, 2008.

Tabios, G.Q. III, 2008, Lecturer, Metro Cebu Water District, Groundwater Flow and Solute Transport Modeling with FEMWATER Model, October 27-28, 2008.

1.3.3 Participation in IHP courses

18th IHP Training Course on Satellite Remote Sensing of Atmospheric Constituents, 3-15 November 2008. Nagoya, Japan –
Philippine participant: Rhodora Gonzales, Dept. of Geodetic Engineering and Training Center for Applied Geodesy and Photogrammetry (TCAGP), College of Engineering, UP Diliman.

19th IHP Training Course on Water Resources and Water-Related Disasters under Climate Change: Prediction, Impact Assessment and Adaptation, 9-12 December 2009. Disaster Prevention Research Institute (DPRI), KyotoUniversity – Philippine participant to be nominated in November 2009.

1.4 Papers and Publications

Liongson, L. Q. (2008), *Groundwater Assessment by Distributed Basin and Aquifer Modeling*, Proceedings of the 29th Philippine Association of Water Districts (PAWD) National Convention, 5-9 February 2008, The Pryce Plaza, Cagayan de Oro.

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

September 2008, Manila, ASEAN University Network Southeast Asia Engineering Education Development Network (AUN/SEED-Net).

Liongson, L. Q. (2008), *Horizontal Wells in Heterogeneous Media*, Proceedings of the International Conference on Uncertainties in Water Resources Management: causes, technologies and consequence (WRM-Mon2008) & 16th RSC Meeting for UNESCO-IHP for Southeast Asia and the Pacific, UNESCO-IHP Phase VII Technical Document No. 1, Ulaan Baatar, Mongolia, 29 September to 3 October 2008.

Liongson , L. Q. (2009), *Seepage Rates into Horizontal Wells in Heterogeneous Media*, , Paper presented in the Environment and Infrastructure Track, 2nd Engineering Research and Development for Technology (ERDT) Conference, Diamond Hotel, Manila, Philippines, 20 February 2009.

Liongson, L. Q. (2009), *Data, Models, Designs and Decisions: Meeting the Challenges of Water Resources Management*, Kho Science Awards Lectures, 29th Annual Philippine-American Academy of Science and Engineering (PAASE) Meeting and Symposium (29APAMS), Ateneo de Manila University, Loyola Heights, Quezon City, Philippines, 13-15 July 2009,

Other water-related papers presented in the 29th Annual Philippine-American Academy of Science and Engineering (PAASE) Meeting and Symposium (29APAMS), Ateneo de Manila University, Loyola Heights, Quezon City, Philippines, 13-15 July 2009:

Climate Change: a Philippine Scenario
Daniel McNamara, S.J., Emmanuel Anglo, Gemma Narisma

The Value of Scientific Collaboration in Disaster Risk Reduction: Lessons Learned from Recent Philippine Disasters
Antonia Yulo Loyzaga

Responding to Extreme Events in a Changing Climate in the Philippines
Felino P. Lansigan

Climate Change Signals and Associated Disasters as Observed from Space
Josefino C. Comiso

The Agusan Marsh: The Need For Collaborative, Multidisciplinary Research
J.H. Primavera

Liongson, L. Q. (2009), *Extreme Hydrologic Events in the last 20 Years: Perspective for Water Research and Management*. Special Seminar at the School of Environmental Science and Management (SESAM), University of the Philippines, Los Baños, College, Laguna, Philippines, 7 September 2009.

Liongson, L. Q. (2009), *Limiting Factors in the Design of Horizontal Wells*, Paper presented in the Environment and Infrastructure Track, 3rd Engineering Research and Development for Technology (ERDT) Conference, Manila Hotel, Manila, Philippines, 11 September 2009.

Liongson, L. Q. (2009), *Limitations on Yields of Horizontal Wells with Filter Beds*, Proceedings of the International Conference on Hydrology and Disaster Management (H&DM 2009) & 17th RSC Meeting for UNESCO-IHP Southeast Asia and the Pacific, UNESCO-IHP Phase VII Technical Document No. 2, Wuhan, China, 2-6 November 2009.

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

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

Tabios, G.Q. III (2008), *Two-Dimensional Hydraulic Model with Mobile Bed for Dam-Break Problems*, JourNAL of Hydrologic Environment, IHES, Vol. 4, no.1, December, pp. 17-25.

Tabios, G.Q. III (2008), *Hydrology and Related Ecology-Based Aspects of Managing the Agusan Marsh*, Proceedings of the First Agusan Marsh Scientific Conference, Butuan City, Agusan.

Daniell, T.M. and G.Q. Tabios III (2008), *Rainfall Intensity Duration Frequency (IDF) Analysis for the Asia Pacific Region*, Asian Pacific FRIEND, IHP-VII Technical Documents in Hydrology, No. 2, UNESCO Office, Jakarta, Indonesia, November.

Tabios, G.Q. III (2008), *Recent Water-Related Disaster in the Philippines*, Proceedings of 2008 International Symposium on Hydrological Environment, International Hydrologic Environment Society, Daegu, Korea, December 14-15.

Tabios, G.Q. III, A.A. Oposa Jr., and C.A. Cabrido Jr (2008), *Water-Related Disaster Management in the Philippines: Issues and Policies, Policy*, paper presented at Center for Integrative and Development Studies, University of the Philippines (UP-CIDS) as part of the UP-CIDS lecture offerings for the UP Centennial Celebration, December 12, 2008. [This policy research was supported by Senator Edgardo Angara through the DBM Special Allotment Release Order (SARO), Priority Development Assistance Fund (PDAF), FY 2007 Budget, RA No. 9401 to UP-CIDS.]

Tabios, G.Q. III (2009), *Need for Ecology-Based Engineering Studies for Water Resources Development around Agusan Marsh, Philippines,* Sixth Regional Symposium on Infrastructure Development (RSID6), Bangkok, Thailand, January 12-13.

1.5 Participation in international scientific meeting

Tabios, G.Q. III, presented paper at Sixth Regional Symposium on Infrastructure Development (RSID6), Bangkok, Thailand, January 12-13, 2009.

Tabios, G.Q. III, UNU and IR3S Consultation Conference on "Role of higher education in adapting to climate change for establishing a regional network to develop postgraduate educational program on climate change adaptation" held at U Thant International Conference Hall, UNU Headquarters, Tokyo, June 10-12, 2009.

Tabios, G.Q. III, International Workshop on "Role of Higher Education in adapting to climate and ecosystems change" held at Halong Bay, Vietnam, August 23-24, 2009.

1.5.1 Meetings hosted by the country

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

29th Annual Philippine-American Academy of Science and Engineering (PAASE) Meeting and Symposium (29APAMS), Ateneo de Manila University, Loyola Heights, Quezon City, Philippines, 13-15 July 2009.

1.5.2 Participation in meetings abroad

No additional information is available.

1.6 Other activities at regional level

1.6.1 Institutional relations /co-operation

No complete information is available.

1.6.2 Completed and ongoing scientific projects

No additional information is available.

2.0 Future Activities

2.1 Activities planned for 2008-2009

Participation in the 17th RSC Meeting and H&DM International Conference, 2-6 November 2009, Wuhan, China.

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

2.2 Activities in the long term

Concerted efforts and initiatives for research and extension activities in flood management, water-related multi-hazard risk assessment and mitigation, climate change mitigation and adaptation, and sustainable development in the context of integrated water resources management (IWRM).

Continued support of, and partcipation in the UNESCO-IHP in general and the RSC in particular, in all present and future: activities: APFRIEND (rainfall IDF and flood frequency studies), Catalogue of Rivers for SEAP, IHP training courses conducted by host countries, and joint hydrologic training courses and researches among member countries.

NATIONAL REPORT ON IHP RELATED ACTIVITIES
IN
REPUBLIC OF KOREA

May, 2010

Korean National Committee
for
The International Hydrological Programme
Republic of Korea

1. ACTIVITIES UNDERTAKEN IN THE PERIOD JULY 2008 - MAY 2010

1.1 Meetings of the IHP National Committee

1.1.1 Decisions regarding the composition of the IHP National Committee

For the solution of water problems and the protection of mans welfare and the quality of human life, a UNESCO Resolution in 1964 created the International Hydrological Decade(IHD). Korea as a participant in the program, then appointed within its Ministry of Construction a IHD National Committee(later, IHP National committee), which undertook pioneer hydrologic surveys of selected representative basins in three major river systems during the program period, and embarked in 1975 on a 6-year International Hydrological Programme (IHP) project as the first step toward an extension of surveys of domestic river basins in order to fulfill its responsibilities in the world's consolidated efforts to cope with the water problem. After the completion of the first phase of IHP in 1980, the second phase of IHP project(1981~1983), the third phase of IHP project(1984~1989), the fourth phase of IHP project(1990~1995), the fifth phase of IHP project(1996~2001), the sixth phase of IHP project(2002~2007) and the seventh phase of IHP project(2008-2013) followed for the continuation of representative basin studies, the adoption of new techniques of water resources development and water quality control, the hydrological evaluation of urbanization and variations of watershed including sustainable development in a changing environment, hydrology and water resources development in a vulnerable environment, water interactions of systems at risk and social challenges and water dependencies of systems under stress and societal responses, and education and training in hydrology and water resources.

From the beginning of the New Millennium through this year(2010), Korean National Committee for the IHP was reorganized and strengthened to fulfill the IHP activities more effectively and actively. All members of the Committee were from every part of water related organizations in the country and executive functions are carried out within the Water Resources Bureau, Ministry of Land, Transport and Maritime Affairs.

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

1.1.2 Status of IHP-VII activities

In the beginning of the seventh phase of IHP(2008-2013) the Korean National Committee for the IHP has prepared the implementation plan of IHP-Ⅶ during the period(2008-2013) as listed in Table-1 and the potential activities to be undertaken by the Korean National Committee for the IHP as listed in Table-2 both according to the core programme Themes and Focal Areas, overviews of which are shown as follows;

WATER DEPENDENCIES: SYSTEMS UNDER STRESS AND SOCIETAL RESPONSES

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

Focal area 1.1 - Global changes and feedback mechanisms of hydrological processes in stressed systems
Focal area 1.2 - Climate change impacts on the hydrological cycle and consequent impact on water resources
Focal area 1.3 - Hydro-hazards, hydrological extremes and water-related disasters
Focal area 1.4 - Managing groundwater systems' response to global changes
Focal area 1.5 - Global change and climate variability in arid and semi-arid regions

Theme 2: STRENGTHENING WATER GOVERNANCE FOR SUSTAINABILITY

Focal area 2.1 - Cultural, societal and scientific responses to the crises in water governance
Focal area 2.2 - Capacity development for improved governance; enhanced legislation for wise stewardship of water resources
Focal area 2.3 - Governance strategies that enhance affordability and assure financing
Focal area 2.4 - Managing water as a shared responsibility across geographical & social boundaries
Focal area 2.5 - Addressing the water-energy nexus in basin-wide water resources

Theme 3: ECOHYDROLOGY FOR SUSTAINABILITY

Focal area 3.1 - Ecological measures to protect and remediate catchments process
Focal area 3.2 - Improving ecosystem quality and services by combining structural solutions with ecological biotechnologies
Focal area 3.3 - Risk-based environmental management and accounting
Focal area 3.4 - Groundwater-dependent ecosystems identification, inventory and assessment

Theme 4: WATER AND LIFE SUPPORT SYSTEMS

Focal area 4.1 - Protecting water quality for sustainable livelihoods and poverty alleviation
Focal area 4.2 - Augmenting scarce water resources especially in SIDS
Focal area 4.3 - Achieving sustainable urban water management
Focal area 4.4 - Achieving sustainable rural water management

Theme 5: WATER EDUCATION FOR SUSTAINABLE DEVELOPMENT

Focal area 5.1: Tertiary water education and professional development
Focal area 5.2: Vocational education and training of water technicians
Focal area 5.3: Water education in schools
Focal area 5.4: Water education for communities, stakeholders and mass-media professionals

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Cross-cutting programmes: HELP, FRIEND

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

Education, Training and Capacity Building across all the themes

Table-1 Implementation Plan of IHP-VII Phase

Name of the IHP National Committee REPUBLIC OF KOREA IHP-NC	Country Priorities 2008-2009	Country Participation in Theme and Focal area 2008-2013	Events organized in the Country	Activity lead/Coordinated by the Country
IHP VII Themes and Focal areas				
Theme 1:				MLTM/KWRA*
Focal area 1.1	●	2008-2009		MLTM/KWRA
Focal area 1.2	●	2009-2010		MLTM/KWRA
Focal area 1.3		●2011-2013		MLTM/KWRA
Focal area 1.4	●	2008-2009		MLTM/KWRA
Focal area 1.5				
Theme 2:				MLTM/KWRA
Focal area 2.1		●2010		MLTM/KWRA
Focal area 2.2	●	2008-2009		MLTM/KWRA
Focal area 2.3		●2010-2011		MLTM/KWRA
Focal area 2.4		●2011-2013		MLTM/KWRA
Focal area 2.5				
Theme 3:				
Focal area 3.1	●	2008-2009		MLTM/KWRA/IHES*
Focal area 3.2	●	2008-2009		MLTM/KWRA/IHES
Focal area 3.3		●2010-2011		MLTM/KWRA/IHES
Focal area 3.4		●2011-2012		MLTM/KWRA/IHES
Theme 4:				
Focal area 4.1	●	2008-2009		MLTM/KWRA
Focal area 4.2				MLTM/KWRA
Focal area 4.3		●2010-2011		MLTM/KWRA
Focal area 4.4		●2011-2013		MLTM/KWRA
Theme 5:				
Cross-cutting programmes				
HELP	●	2008-2013		MLTM/IHES
FRIEND	●	2008-2013		MLTM/IHES
Associated programmes :				MLTM/IHES
International Flood Initiative(IFI)	●	2008-2013		
International Sediment Initiative(ISI)				
Water for Peace(PCCP)				
UNESCO-IAEA Isotope(JIIHP)				
Shared Aquifer(ISARM)				
Global Network Arid Lands(G-WADI)				
Unban Water Management(UWMP)	●	2008-2013		MLTM/KWRA
World Hydrogeological Map(WHYMAP)				

* MLTM : Ministry of Land, Transport and Maritime Affairs
  KWRA : Korea Water Resources Association
  IHES : International Hydrologic Environmental Society
* NOTE : Education, Training and Capacity Building activities are to be undertaken across all the themes

Table-2 Activities to be undertaken by the Korean National Committee

Name of the IHP National Committee REPUBLIC OF KOREA IHP-NC	Activities suggested by the IHP National Committee and their method of implementation
IHP VII Themes and Focal areas	
Theme 1:	
Focal area 1.1	Case studies on facility management techniques for abnormal climate
Focal area 1.2	Case studies of climate change impact on hydrological cycle Case studies of effect on water resources by climate change and development of evaluation system
Focal area 1.3	Case studies on regional hydrological extremes and water-related disasters
Focal area 1.4	Case studies of large scale groundwater dependencies related global change
Focal area 1.5	
Theme 2:	
Focal area 2.1	
Focal area 2.2	Best practices of good governance, capacity development and stakeholder participation at regional level
Focal area 2.3	
Focal area 2.4	
Focal area 2.5	
Theme 3:	
Focal area 3.1	Case studies of ecohydrological measures to protect and remediate catchment process
Focal area 3.2	Case studies on complementing engineering solutions with ecological measures resulting in sustainable carrying capacity of ecosystems Case studies on gravel contact oxidation process technology applied to improvement of stream quality
Focal area 3.3	
Focal area 3.4	
Theme 4:	
Focal area 4.1	Methodologies for safeguards against water borne biotic and abiotic pollutants
Focal area 4.2	
Focal area 4.3	
Focal area 4.4	
Theme 5:	
Cross-cutting programmes	
HELP	Regional casse studies in HELP experimental river basins
FRIEND	Regional comparative case studies in Asia-Pacific river basins
Associated programmes :	
International Flood Initiative(IFI)	Regional case studies on flood and water-related disasters
International Sediment Initiative(ISI)	
Water for Peace(PCCP)	
UNESCO-IAEA Isotope(JIIHP)	
Shared Aquifer(ISARM)	
Global Network Arid Lands(G-WADI)	
Unban Water Management(UWMP)	Development of urban water management strategies and technologies
World Hydrogeological Map(WHYMAP)	

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

During the first, second and this year(2008-2010) of the seventh phase of IHP, the Korean National Committee for the IHP has been and being paid its efforts to achieve the objectives set by UNESCO for this phase of IHP and the following projects have been and being executed in Korean river basins and in the field of hydrology and water resources in Korea;

(1) Global changes and feedback mechanism of hydrological processes
(2) Climate change impacts on the hydrological cycle and consequent impact on water resources
(3) Managing groundwater systems' response to global changes
(4) Strengthening water governance for sustainability
(5) Ecological measures to protect and remediate catchment process
(6) Improving ecosystem quality and services by combining structural solutions with ecological biotechnologies
(7) FRIEND and HELP basin studies

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(The K-Water), and other water-related organizations in Korea. In those meetings, national/local hydrologic issues and water resources problems were dealt with special solution measures and their results were published in the form of scientific or technical reports and papers.

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, Workshop and Working Group meetings held in the period of 2007~2010.

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 2007~2010 have been executed according to the above listed projects in 1.1.2. Some other research or applied projects were also supported or sponsored by the Government and other water-related organizations such as Korea Water Resources Corporation(The K-Water) during this period.

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

which was accepted as a HELP basin in Korea by UNESCO.

· Basic hydrologic analyses and data collection

· Comparative regional flow regimes analyses

- Rainfall models and design storm

- Flood models and design flood

· FRIEND river basins studies

· New HELP river basin studies

1.2.4 Collaboration with other national and international organizations / or programmes

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

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

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

1.3.2 Organization of specific courses

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

1.3.3 Participation in IHP courses

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

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

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

1.5 Publications

The Korean National Committee for the IHP is publishing IHP Annual Research Report and the Catalogue of Rivers in Korea every year in the form of Government Publication since 1975. These reports are distributed to all water-related organizations and IHP-KNC members and research results are published on the journals of academic societies or organizations.

Some other technical reports, proceedings of scientific meetings and specific course's materials are also published by the IHP-KNC.

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

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

- 2008 International Seminar on Climate Change and Water
- 2009 International Symposium on Hydrological Environment
- 2010 International Conference on Hydrology and Water Resources

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 2010, foreseen for 2011-2012 and envisaged in the long term

From the beginning of 2008, IHP-KNC prepared concrete national plan for the seventh phase of IHP and began to implement this plan in Korean river basins. IHP-KNC will also actively continue and participate in the

Asian Pacific FRIEND project to complete with successful results for the Southeast Asia and the Pacific, and also will execute a new HELP river basin project in collaboration with other Asia Pacific HELP projects.

The following international symposiums and workshops will be organized until December 2010 and during 2011-2013 as the IHP-VII activities of IHP-KNC.

- 2010 HELP Inauguration International Conference
- 2010 and 2011 International Symposium on Hydrologic Environment
- Korean Workshops of FRIEND and HELP during 2011-2013

National Committee of Russia for the International Hydrological Programme of UNESCO

Report of the Russian National Committee for the IHP to the XIXth Session of the Intergovernmental Council for the IHP of UNESCO (June 2010)

Moscow – St Petersburg
2010

NATIONAL REPORT ON IHP RELATED ACTIVITIES

1. ACTIVITIES UNDERTAKEN IN THE PERIOD JULY 2008 – MAY 2010

1.1 Meetings of the IHP National Committee

1.1.1 Decisions regarding the composition of the IHP National Committee
1.1.2 Status of IHP-VII activities

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings
1.2.2 Participation in IHP Steering Committees/Working Groups
1.2.3 Research/applied projects supported or sponsored
1.2.4 Collaboration with other national and international organizations and/or programmes
1.2.5 Other initiatives

1.3 Educational and training courses

1.3.1 Contribution to IHP courses
1.3.2 Organization of specific courses
1.3.3 Participation in IHP courses

1.4 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

1.7 Other activities at regional level

1.7.1 Institutional relations/cooperation
1.7.2 Completed and ongoing scientific projects

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2010
2.2 Activities foreseen for 2011-2012
2.3 Activities envisaged in the long term

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)
- State Hydrological Institute (SHI, Roshydromet)
- Moscow State University
- Institute of Geography of the Russian Academy of Sciences (GI , RAS)
- Russian State Hydrometeorological University
- Institute of Water Problems of the Russian Academy of Sciences (WPI, RAS)
- State Oceanographic Institute (SOI, Roshydromet)
- North-Caucasus Administration for Hydrometeorological Service (NCA for Hydromeyeorology, Roshydromet)
- Institute "Hydroproject"

The Report is prepared according to the structure, format and volume, developed at the UNESCO IHP Secretariat.

1. ACTIVITIES UNDERTAKEN IN THE PERIOD JULY 2008 – MAY 2010

1.1 Meetings of the IHP National Committee

1.1.1 Decisions regarding the composition of the IHP National Committee

NC RF exists since establishing within UNESCO the International Hydrological Programmes, however its personnel has been periodically renewed. According to the decision of the RF Government made in 2003 the present NC personnel includes Chairperson Mr. Alexander V. Frolov, Chief of Roshydromet, and two deputy Chairpersons – Mr. Victor M. Kotlyakov, Academician of the Russian Academy of Sciences (RAS), Director of the Institute of Geography, (GI, RAS), and Mr. Igor A. Shiklomanov, Director of the State Hydrological Institute (SHI, Roshydromet). At present the Committee consists of 24 members – scientists and specialists known both in Russia and all over the world, representatives of different ministries and departments, organizations and institutions who actively work in the fields of hydrometeorology, water resources, water management, and education.

During the reporting period there have been no changes in the NC composition.

1.1.2 Status of IHP-VII activities

During the reporting period, three NC meetings have been organized and held where discussed were current problems of the present-day hydrology and water resources and current issues of NC activities. Main subjects of the reports at NC meetings in 2008-2009 were as follows:

1. Results of the Meeting of CIS Countries NC IHP Responsible Representatives (October 1-2, 2008, St. Petersburg, Russia).
2. Russian National Junior Water Contest (contribution to IHP-VII, Theme 5: Water education for sustainable development, Focal area 5.3: Water education in schools).
3. Debates on draft Clean Water Programme.
4. Results of the meeting in the framework of bilateral cooperation between NCs of Russia and Germany.
5. Activity of the International Data Centre on Hydrology of Lakes and Reservoirs.
6. NC RF official Website.

It is planned to hold the 4th NC meeting in the beginning of July 2010.

During the reporting period, the NC Executive Secretary O. V. Gorelits participated in current activities of Commission of the Russian Federation for UNESCO. Prepared were documents concerning cooperation with National Committees of the IHP Intergovernmental Council Member States. Prepared were materials on the activities of NC RF to be reported by the Russian Delegation at the 35th Session of the UNESCO General Conference (October 2009). Also prepared were documents pertaining to the activities of NC RF for the Department of Scientific Programmes, International Cooperation and Information Resources of Roshydromet.

In 2009, work was started on collection and preparation of materials on both organized and forthcoming events within the framework of NC RF activities in 2008-2010. These will be included in the National Report of the Russian Federation at the 19th Session of the IHP Intergovernmental Council in July 2010 in UNESCO Headquarters, Paris.

During the reporting period, the NC activity at national and international levels was provided by the following IHP areas:

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

Focal area 1.1: Global changes and feedback mechanisms of hydrological processes in stressed systems

Focal area 1.2: Climate changes impacts on the hydrological cycle and consequent impact on water resources

Focal area 1.3: Hydro-hazards, hydrological extremes and water-related disasters

Focal area 1.4: Managing groundwater systems' response to global changes

Focal area 1.5: Global change and climate variability in arid and semi-arid regions

Theme 2: Strengthening water governance for sustainability
Focal area 2.2: Capacity development for improved governance; enhanced legislation for wise stewardship of water resources
Focal area 2.4: Managing water as a shared responsibility across geographical and social boundaries

Theme 3: Ecohydrology for sustainability
Focal area 3.1: Ecological measures to protect and remediate catchments process
Focal area 3.2: Improving ecosystem quality and services by combining structural solutions with ecological biotechnologies
Focal area 3.3: Risk-based environmental management and accounting
Focal area 3.4: Ground-water-depend ecosystem identification, inventory and assessment

Theme 5: Water education for sustainable development
Focal area 5.1: Tertiary water education and professional development
Focal area 5.2: Vocational education and training of water technicians
Focal area 5.3: Water education in schools

The official website of NC RF for the IHP of UNESCO was launched in 2009 at www.ihp-russia.ru. The information and technical basis for development and operation of the site have been provided by the State Oceanographic Institute. The site contains information on the IHP objectives and tasks, as well as documents describing the structure and governing bodies. The site is regularly updated with the IHP Secretariat newsletters and information on forthcoming IHP events. The site is provided with a download counter. The statistics show that the newsletters have been downloaded by more than 50 visitors during one month, which indicates real website traffic. NC RF is planning to use the site as a tool for communication and sharing information between National Committees of the CIS countries.

The report "Analysis of international cooperation of the Russian NC for the IHP of UNESCO for the whole period of the IHP realization" in the framework of the Roshydromet Scientific Plan and under NC IHP support was prepared in December 2009.

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

The Meeting of Responsible Representatives of UNESCO International Hydrological Programme (IHP) National Committees of Commonwealth of Independent States (CIS) Countries was held on October 1 – 2 2008 at the State Hydrological Institute of Roshydromet in Saint-Petersburg, Russia. It was aimed at coordination of the IHP National Committees activities, enhancing the efficiency of the CIS countries international cooperation in the field of hydrology and water resources and development of a work plan and cooperation programme taking into account priorities of the countries participating in the UNESCO IHP-VII (2008-2013).

Heads and NC IHP Responsible Representatives of Azerbaijan, Armenia, Belarus, Kazakhstan, Kyrgyzstan, Moldova, Russian Federation, the Ukraine, Uzbekistan, Tajikistan, representatives of the UNESCO IHP Secretariat and the CIS executive Committee, scientists from the State Hydrological Institute, State Oceanographic Institute, Saint-Petersburg State University and Russian State Hydrometeorological University participated in the Meeting.

The Meeting took up a range of key problems and goals in the field of hydrology and water resources both in the world and the CIS countries taking into account their specific features and priorities, analyzed the efficiency of the CIS countries' activities during the IHP-VI, discussed progress and weak points of the international cooperation within the framework of the IHP, possibilities of raising internal and extrabudgetary funds and enhancing administrative

resources, planning cooperation and coordination of activities, elaboration of a joint strategy and programme for effective cooperation with UNESCO Member States and between the CIS National Committees.

As a result of discussion on papers and presentations contributed by the NC IHP Responsible Representatives, recommendations were adopted regarding priority directions of cooperation of the CIS National Committees within the framework of the UNESCO IHP-VII «Water systems under stress and societal responses» (2008-2013). The following issues and problems of the present-day global and regional hydrology were defined as top-priority goals:

- Study of climate change and economic impact on hydrological cycle and consequent impact on water resources (also of arid and semi-arid regions);
- Water resources assessment, management and use of water resources, especially in transboundary basins;
- Study and forecasting of hydro-hazards, hydrological extremes and water-related disasters;
- Ecological assessment of water objects;
- Assessment of transboundary water and non-biodegradable materials transport;
- Monitoring of water objects and improvement of hydrological network;
- Training specialists in the field of hydrology and water resources in the CIS countries, also of highest qualification; organization of advanced training courses.

It was recommended to the National Committees that, following the results of the meeting, they prepare and submit to the NC RF and the IHP Secretariat the their proposals on participation in the IHP-VII (2009-2010) for drawing up and approval of the cooperation and activity plan (programme) for the IHP-VII 1st phase.

The most essential elements of enhancing international cooperation and coordination of the NC IHP activities were defined as follows:

- Organization of international conferences, symposia, workshops and meetings of the CIS countries on the most pressing problems of modern hydrology in the framework of the IHP-VII;
- Exchange of literature on hydrology, the most up-to-date manuals, technical regulations, specifications and guidelines published in the Commonwealth of Independent States, as well as joint publications on a wide range of hydrological issues developed in the CIS countries in the framework of the IHP-VII and other WMO programmes on hydrology and water resources;
- Exchange of scientists, students and post-graduates, organization of educational and training courses for students in the CIS countries;
- Introduction of short-term lecture course on international cooperation in the field of hydrology and water resources into syllabi of higher education institutions training hydrologists (activity in the framework of UNESCO, WMO, IAHS, IAHR, UNDP and others);
- Organization of regular refresher courses on hydrology and water resources covering the most challenging subjects of hydrology for the specialists of the CIS countries. The courses are to be organized within the framework of the UNESCO IHP under the terms and conditions of the Agreement on training specialists for national hydrometeorological services and with invitation of the leading scientists (mainly from the CIS countries);
- Regular submission to the UNESCO Secretariat of the list of the most important for the IHP publications being under preparation in the CIS countries for providing them a status of «contribution to the UNESCO IHP-VII»;
- Operational cooperation, exchange of experience and mutual assistance in the course of implementation of programmes and projects for improvement of hydrological networks in the CIS countries;

- Close cooperation and coordination of NC IHP activities with the activities of the Interstate Council on Hydrometeorology of the CIS countries.

During the Meeting, concern was raised by the NC Responsible Representatives that the UNESCO IHP Secretariat does not include a CIS representative.

Recommendations were made to the Russian NC for the IHP on:

- Putting forward a proposal to the UNESCO Moscow Office and Commission of the Russian Federation for UNESCO that such meetings be conducted annually in order to further coordinate activities for effective participation in implementation of the IHP-VII (2008-2013) and to plan the following IHP phase.
- Considering the possibility of establishing in the Russian Federation the UNESCO Centre on Hydrological Education and Training Specialists from the CIS Countries.
- Going into question of granting the WMO International Data Centre on Hydrology of Lakes and Reservoirs the status of Joint WMO-UNESCO Centre.

The participants of the Meeting expressed their hope that implementation of the activities outlined will contribute to enhancing the efficiency of the CIS National Committees in IHP-VII for dealing with pressing problems of hydrology, water resources, water economy complex, environmental protection and ecology in these countries.

The Russian Scientific-Practical Conference "Regional aspects of global climate changes and their impacts" was held in October 2008, Moscow, within the International Year of Planet Earth launched by UNESCO. 35 reports with material publications were presented at this Conference.

42nd Session of the United Collegium of the Union State Committee for hydrometeorology and environmental monitoring took place in December 2008 in Moscow. At the Session, a report "On results of preparation of collective information materials on the state of surface waters in transboundary areas of the Western Dvina and Dnieper Basins for 2004-2008" by A. Nikanorov (Russia, Main Bureau of Hydrochemical Institute) and M Abrajevich (Belarus) was presented.

A decision was made to develop a model for collective representation of data on the state of surface waters in transboundary areas of the Western Dvina and Dnieper Basins and exchange of information on the state of transboundary areas.

In 2009, a draft Survey of the surface water quality in transboundary areas of the Western Dvina and Dnieper Basins for collective representation of information materials was developed at the Hydrochemical Institute and agreed with Belarusian side. Exchange of data on surface water quality in the Western Dvina and Dnieper Basins was performed.

In the first quarter of 2009, a report on the activities of NC RF for the IHP of UNESCO in 2008 was prepared. The report covers major results of work of the NC Delegation at the 18th Session of the Intergovernmental Council for the IHP of UNESCO in 2008 and the results of the Meeting of CIS Countries NC IHP Responsible Representatives. The report was submitted to the Commission of the Russian Federation for UNESCO. The main provisions were included in the Final Report of the Commission.

During the period from 16 to 22 March, 2009, Deputy Chairman of NC RF Igor A. Shiklomanov, as a member of the Russian Delegation, participated in the 5th World Water Forum, Istanbul. He took part in the Ministerial Conference "Bridging the Water and Climate Agendas". At this conference, Prof. Shiklomanov made a report on Russia's achievements in evaluating climate change impact on water resources, especially in transboundary regions, and took part in discussions on the most pressing issues of efficient water use and management under climate change.

In May 2009, a member of the NC Prof. I.S. Zektser (Institute for Water Problems of the Russian Academy of Sciences) was officially nominated an expert on transboundary

groundwater for participation in work of the second workshop of the International Working Group on transboundary groundwater in Central Asia and Caucasus. The workshop was held from 27 to 28 May, 2009 in Almaty, Kazakhstan.

Main objectives of the workshop: to review information on transboundary waters in Central Asia and Caucasus collected in 2007-2009, assess the information collected from the point of view of further cooperation in groundwater resources management. The report **Transboundary aquifers in Russia (state of the art and tasks for investigation)** was presented by I.S. Zekster at the plenary session. Specialists from Azerbaijan, Armenia, Kazakhstan, Turkmenistan, Kyrgyzstan, Tajikistan and Uzbekistan also reported on hydrogeology of border regions of their countries. The reports emphasized the importance of joint efforts for evaluating perspectives of using fresh groundwaters by transboundary aquifers in order to avoid adverse effects (groundwater pollution and depletion) in neighboring countries. The participants approved the proposal by I.S. Zekster to make such meetings of the International Working Group biennial.

In May 2009, a **Meeting of German and Russian NC IHP UNESCO Representatives on Experimental Hydrology and Runoff Mathematical Modelling** was held in the State Hydrological Institute, St. Petersburg. The meeting was aimed at resumption and intensification of bilateral cooperation between NC IHP of Germany and the Russian Federation within the framework of UNESCO IHP-VII and at developing a programme of cooperation in 2009-2014.

Seven papers on the most urgent problems of experimental hydrology and mathematical modelling of river runoff were presented at the meeting (see Appendix).

On discussing the papers and the results of the visit of Prof. A. Herrmann to the experimental watersheds of the Valday Branch of the SHI, the meeting noted that previous bilateral cooperation between NC IHP of Germany and the Russian Federation was highly efficient. Under this cooperation, the International Seminar on Experimental Hydrology on Small Experimental Watersheds in St. Petersburg and Valday, June 2-6, 1997 with participation of 9 countries was organized and successfully held. The Proceedings of the seminar were published in 1999. A number of articles and a final monograph “Forest Hydrology – Results of Research in Germany and Russia” (Koblenz, 2007, in English) were jointly prepared and published by Russian and German scientists.

The meeting analysed demands of future cooperation in the fields of research and science, education and training.

The meeting underlined the priority of experimental hydrology and mathematical modelling of river runoff in development of theoretical, methodological and applied aspects of the present-day hydrology under the conditions of global climate change and increasing economic activity in watersheds. The meeting then emphasized satisfactory condition of field research on experimental sites of the Valday Branch of the SHI and extensive work done on converting the archive and long-term observation and experimental research database into digital form.

The meeting agreed:

- To give first priority to development of mathematical model of river runoff on the basins of the model Hydrograph developed by the SHI, special attention being given in the model to the block of interaction of surface and underground runoff components: the dynamics of soil waters, phase transitions, movement of moisture in the aeration zone and saturated aquifers with the use of natural tracers (isotopes of hydrogen, oxygen etc).
- To organize at the SHI a joint working group, including modellers from the SHI and experimentalists from the Valday Branch of the SHI, in order to develop a mathematical model of runoff formation in the Polomet River Basin. In the course of the model

development, operational communication of the group with German specialists should be established. Through the cooperation of the German and Russian sides, the experience, technologies and results of applying natural tracers for determining the age of underground waters as well as analyzers for assessment isotope water composition obtained by German specialists may be reflected in the model.

- To recommend expansion of the field research programme in the Valday experimental watersheds. The meeting also recommended that the experiments on the Log Taezhny (boreal woodland) be resumed and the site included in the list of small basins for exchange of data within the framework of the EURO FRIEND Project 5.
- To provide exchange of experience in the field of use and ground calibration of radar data in Russia and Germany for solving hydrological tasks.
- To consider the research on hydrology of bogs and wetlands carried out in different countries and generalized under the EURO FRIEND Project 5 to be of current concern taking into account the role of bog landscapes as indicators of climate change and the results of long-term experimental research and generalizations done in recent years in Russia (SHI).
- To consider it expedient to organize and hold in 2012 in St. Petersburg and the Valday Branch of the SHI a regular biannual ERB (Euromediterranean Network of Experimental and Representative Basins) conference within the framework of the UNESCO EURO FRIEND Project 5 (Hydrological and Biochemical Processes in the Changing Environment).
- To submit corresponding proposals of the Russian NC IHP to the coordinator of the ERB, Dr. Ladislav Holko (Slovakia), the UNESCO EURO FRIEND Project 5 Co-ordinator, Dr. Laurent Pfister, Luxembourg, and to the UNESCO IHP Secretariat.
- To complete in 2009-2011 the process of converting the Valday Branch archive and database into digital form.
- To intensify in 2009-2014 bilateral cooperation on the whole range of hydrological problems through exchange of results, technologies, equipment, specilalists, literature and other information, and using the results obtained for performing joint studies.

In the field of education it would be of use and interest to exchange information about education programs applied in Germany and Russia. Development of joint educational programs, including short-term advanced learning and training programs for students and specialists of Russia and Germany is possible. It would also be expedient to exchange teaching staff to deliver some key interesting and important lectures.

Practical training for students can be carried out not only in the laboratories of the University, but on water-balance stations, for example, for studying hydrological cycle.

Exchange of Master students seems to be the most reasonable.

The Russian State Hydrometeorological University is interested in such cooperation.

In the field of training the Russian side proposes visits of and training facilities at institutions like university institutes, research centres and private and state authorities in Germany for technical staff members, which are qualified in the fields of hydrology mentioned here.

During the period from 5 to 6 August, 2009, the 44th session of the board of the Union State Committee for Hydrometeorology and Environmental Monitoring was held in St. Petersburg, Russia. At this session, colleagues from the SHI and Belarus reported on methodological guidance of the hydrological network, collection and processing of data and

generation of information products (V.S. Vuglinsky, SHI Roshydromet; G.S. Chekan, Belhydromet, Belarus), hydrological computations and assessment of water resources (V.Yu. Georgievsky, SHI Roshydromet; G.S. Chekan, Belhydromet, Belarus) and international cooperation in the field of hydrology (I.A. Shiklomanov, Zh.A. Balonishnikova, SHI Roshydromet; I.M. Skuratovich, Belhydromet, Belarus).

In August, 2009, Deputy Chairman of NC RF Igor A. Shiklomanov was invited to participate as the official expert in the 3rd World Climate Conference, Section 4 "Climate and Water". At the conference, Prof. Shiklomanov made comments on two WMO Papers on GCC and the Water Sector "Needs of Climate information for decision making in the water sector" and "Application of the Climate Information and Prediction in the Water Sector: Capabilities".

In October 2009, a **visiting session of NC RF was held in St. Petersburg as part of events dedicated to 90th Anniversary of the State Hydrological Institute**. Main consideration was given to the Russian Clean Water Programme proposed by political Party of United Russia.

In course of preparation to the session, NC members made their proposals and comments to the draft Clean Water Programme which was published within the framework of preparation for the "Clean Water" International Forum held in Moscow in November 2009. One of the reports was made by a member of NC RF A.M. Nikanorov (Corresponding Member of the Russian Academy of Sciences, Hydrochemical Institute). In his report, Mr Nikanorov noted that existence of the state surface and underground water monitoring system is an indispensable part of water resources management, including fresh water supply for population. Information product obtained through the state water monitoring system provides a comprehensive and reliable assessment of water quality and enables one to early identify and forecast development of negative processes as well as immediately undertake measures on their mitigation. Taking into account that nearly all natural waters are to a certain degree human-impacted, a highly important factor of safe drinking water supply is limitation of the adverse impact of waste waters, whereas the condition for efficient water management is availability of reliable information on waste waters. However, none of the documents, including the program of the forum, considers these issues. Therefore, the session welcomed the proposals by the NC members, which were summarized by Mr Nikanorov, to include the most urgent problems of monitoring into the draft Clean Water Programme.

A decision was also made to put forward a proposal to include two topical reports ("Renewable water resources of Russia: present assessment and outlook for the future" by Prof. I.A. Shiklomanov and "Present-day system of water quality monitoring and ways of its improvement" by A.M. Nikanorov) into the work of Thematic Session №1: State Clean Water Programme. Analysis of preparation and mechanisms of implementation.

All the proposals were submitted to the Commission of the Russian Federation for UNESCO and the Chairman of the Organizing Committee of the International Clean Water Forum B.V. Gryzlov.

In November 2009, an expanded report and a presentation of the NC activities were made in the framework of events organized by UNESCO Office in Moscow. Mr Alexander V. Frolov, the Chairperson of the Russian National Committee, presented a report "Activities of the Russian National Committee for the IHP in the framework of cooperation between Russia and UNESCO". The report was presented at a **round-table meeting: "Russia and UNESCO: Meeting of Partners" organized by the Commission of the Russian Federation for UNESCO** on November 23, 2009.

On May 18–21, 2010, the **International Scientific and Practical Conference "Ecology, Water and Climate in Great River Basins in the XXI century"** was held in Nizhny Novgorod within the framework of the International Scientific and Industrial Forum "Great Rivers 2010".

The Conference Program includes the workshop "Sustainable Development of Biosphere Reserves in the Volga Basin". The workshop organized by the UNESCO Chair on Ecologically Safe Development of Large Regions: Volga Basin at Nizhny Novgorod State Academy of Architechture and Civil Engineering (NNGASU) with the support of UNESCO Office in Moscow was attended by the representatives of the Russian Committee for the UNESCO Man and the Biosphere Programme (MAB), research fellows and experts from 10 biosphere reserves of the Volga Basin, representatives of state authority bodies, non-profit organizations, other concerned parties. National IHP Committee reported on its activities, as well as objectives and tasks of the UNESCO-IHP within the framework of the UN International Decade "Water for Life"

The International Conference of UNESCO Associated Schools "The Ob-Irtysh Basin: Youth Studies and Preserves the Natural and Cultural Heritage in the Regions of the Great Rivers of the World" was held in Khanty-Mansiysk during 27 May- 2 June, 2010. The conference was organized within the framework of the UNESCO International Ecological Action "To Save and to Preserve" and certainly provided an impetus for schoolchildren to draw attention to environmental and hydrological problems of their country, raise awareness of possible solutions to ecological problems not only at regional, but also at international level, provided an opportunity for schools to expand their contacts through development and implementation of joint projects. The conference was attended by Zh.Balonishnikova, as a member of NC RF for the IHP of UNESCO. She informed the conference on the IHP objectives and tasks and was included in the panel of jurors for evaluation of research projects presented by the participants.

The events held in May 2010 in Nizhny Novgorod and Khanty-Mansiysk provide a considerable contribution of NC RF to IHP-VII.

1.2.2 Participation in IHP Steering Committees/Working Groups

During the period from 9 to 14 June, 2008 the Russian Delegation took part in work of the 18th Session of the IHP Intergovernmental Council.

The Russian Delegation worked actively at the plenary meetings of the session, making comments on all major issues of the Agenda, at working meetings with the Secretariat, at the meetings with participation of countries of Region II (Eastern and Central Europe) and at daily meetings of the IHP Finance Committee.

During the discussion of the IHP Finance Committee it was noted that there had been a reduction in the IHP budget mainly due to increased expenses related to translation and interpretation into all six working languages (in accordance with the decision of the UNESCO Executive Board). The representative of the Russian Federation in the Finance Committee put forward a proposal to make a comparative assessment of all the IHP budget expenses, including salaries of the Secretariat and invited specialists, translation and travel costs, publications, scientific programmes and others). The proposal was supported by other delegates, and the Finance Committee started the assessment procedure.

When discussing work of the UNESCO-IHE Institute for Water Education, the representative of the Russian Delegation informed the Council about Russian higher education institutions training specialists in the field of hydrology, namely Russian State Hydrometeorological Institute (RSHU) and Moscow State University (MSU). The delegates were informed on postgraduate and tertiary education programmes offered at these institutions and the geography and number of foreign students enrolled. Taking into consideration difficulties related to a great number of applications for training water professionals for the IHP Member States and problems of financing the Institute, it was suggested that the RSHU and MSU educational potential be involved in implementation of IHP water education programme. The Russian Delegation then noted that involvement of the RSHU and MSU educational

potential will be of particular benefit to countries having close historical, cultural and economic relations with the Russian Federation.

The Russian Delegation expressed its support for establishment of seven new regional UNESCO's water-related centres proposed on behalf of the governments of Turkey, Brazil, Portugal, Kazakhstan, Dominican Republic, the USA and Germany, noting that this would be a great success for IHP as operation of such centres contributes to development of hydrological sciences in regions. It was further noted that international and regional water-related centres have been established under the auspices of WMO, therefore work should be carried out to coordinate activities of UNESCO's and WMO centres in order to increase their efficiency and cut down expenses.

In particular, the Russian Delegation informed the Council that, according to the ROSHYDROMET proposal supported by the WMO Commission for Hydrology and Executive Council, as well as by UNESCO and other international organizations, in 2006 a decision was made to establish on the basis of the SHI the International Data Centre for Hydrology of Lakes and Reservoirs. The Centre started functioning in January 2007, and the period of 2007-2008 was determined as a preparatory stage of its work. Upon agreement with the international organizations, in particular UNESCO, the International Scientific-Coordination Committee of the Centre has been created. In June 2007, in St. Petersburg, SHI, at the first meeting of the Committee, the work done on establishment of the Centre and the start of its functioning were approved, as well as the work plan for 2008. The second meeting of the Committee with invitation of UNESCO IHP representative is scheduled for the end of 2010. The Russian Delegation expressed confidence that this centre will be beneficial not only to WMO, but also to the IHP of UNESCO.

In discussing the activities within the IHP-VI, the Russian Delegation made comments and proposals on evaluating the outcomes of the programme and informed the Council on major activities carried out by Russia within the framework of IHP-VI.

It was noted, in particular, that according to the information submitted to the Council, a great number of projects was implemented at regional level. However, the projects have only been listed, and therefore it is not quite clear what most important scientific and applied results were obtained within IHP-VI. It this connection, it is critically necessary for the IHP Secretariat to make a comprehensive report evaluating the outcomes of the IHP-VI projects and disseminate it among all the IHP Member States. This proposal was reflected in the Final Resolution of the 18th Session of the Council.

Among the failures of activities within IHP-VI, pointed out was inadequate attention given to the problems of hydrological consequences of climate change. For instance, in the IPCC 4th Assessment Report which was produced in 2007, attracted much public attention and was awarded the Nobel Prize, the role of UNESCO-IHP is obscured, although such research are being made in the framework of IHP in many countries.

In particular, during the reporting period, in the framework of Themes 1-3, much consideration was focused in Russia on the problem of climate impact on hydrological regime and water resources as it is a great concern to the country. While global temperatures increased by 0.6ºC over the observation period, in Russia this increase amounted to about 1.0ºC, which has already caused noticeable changes in water resources and especially their intra-annual variability. The research indicates that these changes may become even more noticeable in the future.

In the last years, a strategic prediction for the period of 2010 to 2015 of climate changes expected in different regions of Russia has been made based on analysis of past changes and projected global warming under various climate scenarios. Projected was also impact on hydrology, water resources and sectors of the Russian economy and recommendations were made on adaptation and mitigation of negative consequences. The report was submitted to the International Conference on the Problems of Hydrolometeorological Security held in September 2006 in Moscow, Russia.

In the framework of Theme 1 in the period of 2005-2007, an integrated research was carried out and a fundamental monograph "Water Resources of Russia and Their Use" was prepared for publication. The Monograph contains most recent data on the dynamics of water resources (surface and underground) and their quality for all regions and river basins of the country, as well as assessments of their changes in the context of global warming and drastic transformations in social and economic spheres. Particular consideration is given in the Monograph to changes in water resources and availability which occurred over the last two decades and are expected in the nearest future under the scenarios of global warming and social and economic development plans.

During IHP-VI, the VI All-Russia Hydrological Congress with participation of the former USSR countries was held. Traditionally, hydrological congresses in Russia are of extreme importance for all Russian hydrologists and water managers. The Congress was organized with the support of UNESCO, WMO, IAHS and other international organizations. 570 scientists and specialists, including 70 from the former USSR countries and non-CIS states, participated in the Congress. 500 reports covering various hydrological problems, including those related to IHP-VI, were made at the plenary session, 6 sections and two round-table meetings. All the reports presented at the Congress were published in 10 volumes comprising 300 pages in total. At the present time, a volume of selected reports from the Congress is being prepared for publication with the support of UNESCO (in English). The reports are of undoubted interest for hydrologists of different countries. It is highly important that this volume be published in scientific and technical publications of UNESCO as contribution of the Russian Federation to IHP-VI. The Russian Delegation discussed this with the IHP Secretariat at the 18th Session.

In the course of the discussion, the Russian Delegation approved the Plan of IHP-VII for 2008-2013 and for the next two years, as a whole, confirming the willingness of Russian hydrologists to execute activities on all Themes which are of most concern to our country. Hope was expressed that, in the course of research within IHP-VII, proper consideration would be given to development of experimental hydrology rather than application of hydrology to solving various social, economic and ecological problems.

The Council was informed that NC RF for the IHP of UNESCO nominated a group of highly qualified experts to take part in accomplishing of some Themes at national and international levels. The Russian Delegation also mentioned that by proposal of NC RF supported by the Commission of the Russian Federation for UNESCO a decision was made to organize in October 2008 on the basis of the State Hydrological Institute the meeting of CIS countries NC IHP responsible representatives. At the meeting, a range of urgent hydrological tasks and problems facing the countries will be covered, participation in IHP-VII, taking into account the CIS countries specific features and priorities, coordinated, and a single strategy and the programme of international cooperation in the framework of IHP-VII and other international organizations developed.

In the course of discussion of UNESCO IHP cooperation with other international organizations, the Russian Delegation took note of noticeable decline of coordination and collaboration in the field of hydrology and water resources between UNESCO and WMO, the more so both agencies are dealing with a wide range of the same problems – assessment and management of water resources, climate change impact, floods, extreme hydrological events, capacity building and others. In order to increase efficiency and avoid overlapping of activities, it is necessary to align the activities of these organizations as it was about 10 years ago. This proposal was supported by other delegations.

By proposal of the representative of the Russian Delegation supported by all members of the IHP Finance Committee, a program of primary actions of the Committee towards preparation

of new paragraphs of its Status Report was initiated. In particular, a request was made to the Secretariat for the IHP expenditure pattern (scientific programmes, publications, events, salaries, translation and interpreting, other expenditures).

The Russian Delegation underlined that, although the staff of the Secretariat has sharply expanded in the last several years and now comprises more than 30 members, no Russian specialists have been included in the staff for more than 10 years. This is totally unacceptable taking into account Russia's share in the world fresh water reserves, the contribution Russian scientists have traditionally made to studies and assessments of world water resources and contributions made by Russia to the budget of UNESCO.

Such state of things considerably impedes participation of Russian scientists in the work of UNESCO IHP. This is evident also from the fact that a collection of scientific articles on hydrology submitted by Russian scientists nearly 5 years ago (in English) has not been published in spite of many agreements made with the Secretary.

In view of the above, it appears necessary that effective measures should be taken by the Russian Ministry of Foreign Affairs, Permanent Mission of Russia to UNESCO and NC RF for the IHP of UNESCO to introduce at least one qualified Russian hydrologist into the IHP Secretariat.

The Russian Delegation considers it necessary to engage Russian agencies, institutions and business communities interested in scientific research in the field of hydrology, in particular those related to assessment of climate change impact on water resources and river water regime, into funding of IHP-VII.

In the course of work of the 18th Session, 10 copies of the Report of the NC RF for the period of 2006-2008 (in English), as well as materials pertaining to training programmes offered at the Russian State Hydrometeorological University (in English) were submitted to the IHP Secretariat.

As it was mentioned above, in the course of preparation of the Report of the IHP Finance Committee at the 18th Session of the Intergovernmental Council, the representative of the Russian Delegation put forward a proposal on introduction of new items relating to expenditure patterns of the IHP Secretariat. The proposal was supported by all members of the Finance Committee and the request for relevant information was submitted to the Secretariat. As a result, the Report of the IHP Finance Committee has now sections providing a detailed analysis of the Secretariat costs and expenses. Introduction of new sections was approved by the members of the Intergovernmental Council.

In 2010, much preparatory work has been done on generation of the IHP Report at the 19th Session of the Intergovernmental Council. For the first time, National Committees of all Member States have been involved in the process. Members of the Finance Committee have prepared a letter asking the IHP Committees to answer some questions and express their opinion regarding financial issues of the IHP Secretariat in 2008-2010. After being discussed and corrected through e-mail, the letter has been circulated to the Representatives of the National Committees at regional level.

Executive Secretary of NC RF for the IHP, representing Region II in the IHP Finance Committee, has sent out the letter, collected the replies and submitted the information summarized for the consideration of the Chairperson of the IHP Finance Committee Mr Trevor Daniell, IHP Committee of Australia. The final version of the Report of the IHP Finance Committee is submitted to the IHP Bureau and at the 19th Session of the Intergovernmental Council.

Given below is the text of the letter to the National Representatives of IHP Committees.

«Dear Colleagues;

Dear National Representatives of IHP Committees of Region II;

I am writing to you as a member of IHP Finance Committee of the Intergovernmental

Council of IHP representing Group II (Central and Eastern Europe) Region and also as a national focal point of IHP National Committee of Russian Federation. As you may know the Finance Committee presents information to the Bureau meeting in May 2010 in the form of a written summary report including recommendations for further actions with regards finance at the regional and Intergovernmental level.
A final report suggesting policy and financial issues for the following biennium will be prepared for consideration of the Intergovernmental Council Meeting in July 2010 .
In this context, as you represent IHP at national and regional level, I would like to ask your opinion on the following questions regarding financial issues:
Do you have any regular or extra budgetary contribution to the IHP budget?
° What is your suggestion for possible fund-rising at national
and regional level in order to support IHP budget?
° Do you think decentralization of the IHP Budget is adequate for the program
activities at national and regional level in Region II ?
Please note that IHP Finance Committee is composed of:
Mr Hamza Ozguler (Turkey, Region I), Hamza Ozguler <hamza.ozguler@dsi.gov.tr>
Ms Olga Gorelits (Russian Federation, Region II), gorelits@mail.ru
Mr Evens Emmanuel (Haiti, Region III) evemm1@yahoo.fr
Mr Trevor Daniell (Australia, Region IV). trevord@civeng.adelaide.edu.au
Mr Abel Afouda (Benin, Region V(a)) aafouda@yahoo.fr
Mr Ahmed Murad (United Arab Emirates, Region V(b)) Ahmed.Murad@uaeu.ac.ae
Please also note that this request is being sent to the NC's of the Region II Countries only.
The similar e-mail would be sent by Mr. Hamza Ozguler, as the Region I Representative
and Coordinator, to the NC's of Region I Countries.»

1.2.3 Research/applied projects supported or sponsored

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-VII. 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. For example, within the framework of this Subprogramme, there are projects on development of schemes for a multipurpose use and conservation of water resources of Russia, aimed at optimization of planning water projects and higher efficiency of the investments. Such schemes are currently being developed for large basins of the Volga, Kuban, Don and Amur Rivers (contribution to Theme 1).

- Implementation of the Union State programme "Improvement of the System of Providing Information to the Population and Industries of Russia and Belarus on Existing and Projected Climatic Conditions, the State and Pollution of the Environment" (contribution to Theme 1);

- Multipurpose projects implemented by the organizations within RosVodResursy on development of outlook, principles and practice for more effective management of water resources and water ecosystems in transboundary river basins. There are 70 large and medium transboundary rivers in Russia (contribution to Theme 2, Focal Area 2.4). During the reporting period, much work has been done in the field of cooperation of Russia and Estonia (Pskovsko-Chudskoye Lake) and Russia-Belarus-Latvia on joint use and conservation of water bodies.

- The project "Strategic prediction for the period of up to 2020-2025 of climate change expected in Russia and its impact on the sectors of Russian national economy". In this project climate change tendencies for different regions of Russia were presented and recommendations were formulated on the priority measures on adaptation of social and economic spheres to these

changes. Major results and conclusions were published by ROSHYDROMET (contribution to Theme 1, Focal Area 1.2).

- Preparation of the monograph "Water Resources of Russia and Their Use". The Project was developed by the scientists from the SHI and other organizations of ROSHYDROMET and RosVodResursy. (contribution to Themes 1, 3 and 4).
- Project on the study of the current dynamics of glaciation, maximum snow storage and principles of glacier runoff formation; it is being implemented by the GI of RAS (contribution to Theme 1).
- Publication of the Proceedings of the VI All-Russia Hydrological Congress in 10 volumes.

Different aspects of the Russian contributions to the IHP-VII projects are always discussed at the NC meetings. A necessity and importance of research to be made within the framework of the IHP-VII projects at the national level are emphasized, which is a specific feature of this programme. The NC members decided to give first priority to the basic directions outlined in the IHP-VII in setting up subjects for scientific and technical studies and work of the leading hydrological and water management organizations in Russia.

Particular emphasis was focused on a necessity of active participation of Russian scientists and specialists in the implementation of those very important IHP-VII 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. These are Theme 1 (Focal Area 1.2, 1.3, 1.4, 1.5), Theme 3 (Focal Area 3.1, 3.4) Theme 5 (Focal Area 5.1, 5.2, 5.3).

In the framework of Theme 1, the State Hydrological Institute has accomplished two basic works – the monographs "Water Resources of Russia and Their Use", 2008 (ed. I.A. Shiklomanov) and "Hydrology of Swamped Areas in West Siberian Freezing Zone", 2009 (ed. S.M. Novikov).

The first monograph deals with the problem of studying and assessing renewable water resources of Russia (surface and underground waters and their quality), their distribution over the territory and time variability for long-term period and for the nearest future (2015-2020) under the condition of increased economic activity and man-made global climate changes.

Generalized are the results of research obtained by the Russian scientists in the last two decades, which is of doubtless interest, as it was the period when the most significant changes of the main factors governing water resources fluctuations and their spatial and temporal variations, namely climate change and radical changes of the social and economic spheres, took place.

Based on generalization and analysis of long-term observations of hydrological regime and surface and underground water quality, as well as of data on water use account and results of research into changes in runoff formation due to economic activity and climate change, the most up-to-date assessments of different characteristics of renewable water resources for all main watersheds of the country, subjects of the Russian Federation, Federal districts and hydroclimatic regions, as well as of their spatial and temporal distribution (for the last two decades and for the future) are presented in the monograph. These may provide a reliable basis for planning and development of large-scale measures on integrated use and protection of water resources quality, as well as dealing with complex problem of water availability in different regions and river basins of Russia.

To compare the dynamics of water resources and their use in Russia and other countries and regions of the world, data are cited in the monograph on renewable water resources and water use in the world in the XX century and for the future. The above data are based on results of long-term studies conducted at the SHI in the framework of UNESCO and WMO International Hydrological Programme.

The second monograph states the results of long-term field studies on the structure and hydrometeorological regime of swamp systems of the West Siberian permafrost carried out by the State Hydrological Institute in 1973-1992.

A detailed description of types of swamps and swamp microtopes is given based on the results of ground geobotanical surveys and extensive use of aerial photointerpretation.

Structure of peat deposits and hydrophysical properties of the peat deposit active layer are investigated.
This monograph describes structure, level regime and thermal properties of various types of swamps. It also provides data on temperature regime and freezing of peat deposit, swamp surface radiation balance components and evaporation from swamps.
Much attention is given to consideration of a mathematical model for calculating heat-water regime of frost mound bogs and to the process of formation and calculation of runoff of small and medium rivers.
Characteristic of endotelmic lakes hydrological regime and hydrochemical characteristics of endotelmic water bodies are given based on field observational data.
Anthropogenic impact on endotelmic water bodies is analyzed.

In 2009, another fundamental monograph "Experimental studies and hydrological modeling of river flows and channel processes" (A. Klaven, Z. Kopaliani) was written at the SHI. The monograph contains the results of long-term experimental research carried out by the authors in the Channel Laboratory of the SHI. The objective of the research was to elaborate the theory of channel processes and develop a methodology for hydraulic modeling of river flows and channel process. The research was also aimed at solving various practical tasks with application of physical and hydraulic river channel models.

Studied were turbulent structure of the channel flow and regularities of its interaction with underlying boundary surface and the subchannel flow, hydraulic resistance and conveyance capacity of channels with various types of channel processes, mechanisms of formation and transformation of granulometric composition of river bed load, and regularities of transport of bed load and its substitute in hydraulic flumes and spatial deformation models.

Developed was a methodology for hydraulic modeling of river channels and channel processes by rigid and deformation models of lowland and mountain-sub-mountain rivers.

The monograph addresses effects of engineering structures and measures on river channels, as well as aspects of their rational design and operation. The monograph also contains case-studies of physical modeling of river flows and channel processes by rigid and deformation models of river channels.

The book is intended for scientists and engineers at scientific, research and engineering organizations, teachers, undergraduate and postgraduate students at water management, hydrotechnical, hydrological, ecological and environmental institutes and decision-makers.

Researches on hydrological consequences of climate change as it pertains to changes in water resources and frequency of catastrophic floods and inundations on Russian rivers were done by several institutions of Roshydromet. The research results are published in the "Assessment Report on Climate Change and its Consequences in the Russian Federation", volume II Climate change impacts (2008), as well as in report materials from two Russian Conferences with international participation: "Environment and Sustainable Regional Development: New Methods and Research Technologies" (Kazan, 2009); "Large River Basins: Water Problems and Ways of Problem-Solving (Barnaul, 2009). The research also shown that increased frequency of extreme low flow events during low-water periods can be referred to unfavorable hydrological consequences. Two scientific articles containing the results obtained were prepared. The articles will be published in 2010.

At the Institute for Water Problems RAS, a multi-author monograph "Hydrology of the Kuban River Delta and Estuarine Shore" edited by V.N. Mikhailov, D.V. Magritsky and A.A. Ivanov was prepared and submitted for publishing. The monograph is written jointly by the scientists from the Faculty of Geography, MSU and Kuban Estuarine Hydrometeostation (Temriuk, Russia). It summarizes the results of long-term research into the complex of hydromorphological and hydroecological processes in the Kuban River estuary.

Preparation and publication of reviews of hydrological and morphological processes at river mouths were continued. During the reporting period, articles describing processes at the Rhine (Europe), Mekong, Indus, Chao Phraya, Shatt al-Arab, Irrawaddy (Asia), Colville, Columbia, Sasquehanna (North America), Orinoko, Amazon (South America), Niger, Senegal, Gambia, Salum and Casamance (Africa) River mouths were published in the Water Resources Journal (Vodnye Resursy) in Russian and English.

Managing of hydro-hydroeconomic parts of hydrosystem projects on the Angara, Chereck, Kama Rivers and navigation canal between the Caspian and Azov seas preparatory project, project in Tajikistan (water runoff sharing of the Vahsh river under the regulation of Rogunskaya Hydroelectric Station water-storage basin between Central Asia States), Kyrgystan (hydroeconomic balance of the Sirdarya river), Vietnam and Laos (energetic hydrosystems in basin of the Mekong river) are fulfilled by Hydroproject.

Within the framework of program and independent research in 2009 the Department of Land Hydrology, MSU:

1. -carried out a research into terrestrial water cycle processes taking into account most recent estimates of long-term average discharge from six continents; studied the interrelations between current global hydroclimatic changes and the dynamics of helio-, geophysical and anthropogenic factors; compared the role of eustatic and steric factors in interannual fluctuations in global sea level. It was established that steric (density) fluctuations are caused by changes in sea water density due to corresponding variations in its temperature and salinity.

-analyzed the input of evaporation, precipitation, melting icebergs and density fluctuations to the sea level rise. It was demonstrated that the discrepancies between the observed and estimated sea level trends are rather great, which indicates that one cannot safely draw any conclusions concerning trends in global water balance components.

2. - proved estimates of possible changes in the hydrological regime of Russian rivers in the XXI century; developed methods for specialized runoff computations and determining ranges of variations in local renewable water resources under various scenarios of climate change and world economic development; estimated changes in annual runoff of rivers of the European Part of Russia (EPR) and Western Siberia in the XXI century; determined possible changes in annual runoff variation coefficient, which enabled one to identify changes in probability of low water years for some regions of the EPR; studied statistical significance of the obtained results in terms of inter-model dispersion of estimates; analyzed the impact of projected runoff variations on water availability and hydropower industry of the EPR.

3. -completed work on studying spatial and temporal runoff variability in the Arctic region of Russia; studied variability characteristics of hydrological conditions of large, medium and small rivers of the Arctic region of Russia; determined the amount of bed load-sediment transport into Russian marginal seas; evaluated geoecological risks of environmental management in the Arctic region of Russia.

4. -studied spatial and temporal variability of the rivers of North Caucasus; developed a stochastic model of their water regime; analyzed existing methods of computation and forecasting minimum monthly runoff of these rivers under condition of availability, deficiency and lack of hydrometric observation data.

5. -studied mechanisms and spatial and temporal variability of dangerous hydrological phenomena within the Russian territory; developed a strategy for economically safe and efficient use of water resources; stated the problem of economically efficient use of water resources based on the concepts of general theory of environmentally safe water resources optimization; developed a system of hydrological and environmental safety requirements for population, economy and hydrobionts;

-studied ways of solving the problem of shared water use and protection of the transboundary River Selenga;

-developed a system of recommendations on planning and implementation of measures on protection of the Baikal Lake Basin and solving water problems within the framework of bilateral relations between Mongolia and the Russian Federation.

6. -studied ice regime characteristics of rivers in the north of the EPR in relation to climate change; zoned the territory by simultaneity of ice events and similarity of freeze-up and break-up processes in order to assess risks for population and economy due to dangerous ice events; studied freezing and drying up processes on the rivers of EPR; revealed tendencies in river ice regime over the last decades based on most recent hydrometeorological information. It was established that lower water content of a river corresponds to increased duration of autumn ice and slush drift, increased frequency of ice dams and decreased freeze-up duration. More frequent winter thawing events result in decreased ice and snow thickness in river basins. High stages with subsequent ice formation and slush accumulation provide favorable conditions for formation of disastrous hanging dams during break-up period.

7. -generalized data on channel processes and hydrological events affecting environmental management safety within the Volga-Akhtuba floodplain and in the mouth area of the Volga River; developed a methodology for recording heterogeneous hydrological information in evaluation of impact of hydromorphological processes on environmental management safety along the Volga banks, arms and in their channels; analyzed effects of individual and complex factors on conditions of human activity in the Lower Volga Basin; developed recommendations on reduction of environmental management vulnerability in this part of the Volga Basin.

8. -continued the research into regularities of hydrological processes in mouth areas of the rivers in the world and in Russia; developed theoretical and methodological basis for computation and forecasting the impact of sea level rise on hydrological and morphological processes in river deltas; studied particularities of estuarine processes in the Irrawaddy and Amazonka River deltas; prepared a review of transboundary effects of large-scale hydrotechnical measures on hydrological regime of the Danube River delta; studied particularities of hydrological and morphological processes and dangerous estuarine phenomena in the Holland delta; evaluated the degree of human and natural impact on intensity and trends in estuarine processes; evaluated the respond of river deltas to the Caspian level rise in 1978-1995; developed the concepts of hydrological functions of channel and delta branching and described their characteristics for 35 Russian rivers; developed a new complex hydrological and morphological classification of estuaries;

-in 2009, carried out a series of research into geochemistry of the global hydrological cycle;

-calculated average chemical composition of cumulative discharge from continents including water and dissolved, suspended and bed load.

9. -compared average cumulative discharge composition with composition of the Earth upper crust. The comparison indicated close coincidence for major petrogenic elements. It appeared that the present-day rate of continental erosion is enough to prevent accumulation of inerts and selective washout of transportable components into the ocean.

Within the Theme 3:

1. Regularities of transformation of total phosphorus in Moskvoretsk reservoirs under the condition of increased anthropogenic load on their watersheds were identified. Assessment of the influence of water exchange and morphology of water bodies on phosphorus discharge transformation was made. It was established that the slower the water exchange and the more complex the bed morphological composition is, the stronger the influence of the water body on income of phosphorus to the afterbay.

2. An overview of scientific publications concerning observations of chemical composition of water in reservoirs of Russia was made. Analysis of balance studies at various reservoirs showed the ability of water ecosystems to self-purification which is especially pronounced during longer water exchange period.

3. Hydrological condition of the Multinskiye lake system located within the territory of Katunsky Biosphere Reserve was investigated. Study lakes being located within conservation areas not affected by human activities, the research provided and opportunity to describe background characteristics of chemical composition of natural waters in this area. Exploration of spatial and temporal transformation of mountain rivers chemical composition enabled one to identify the formation mechanism of discharge of dissolved materials in this part of mountain glacier basins and the significance of individual factors in this formation

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

Under the support of NC for the IHP and WMO after the preparatory stage of 2007-2008, the International Data Centre on the Hydrology of Lakes and Reservoirs in the State Hydrological Institute (HYDROLARE) became operational.

The second meeting of the Steering Committee of the HYDROLARE was held at the State Hydrological Institute in St. Petersburg on 15-17 July, 2009. 18 representatives of WMO, GCOS, GEMSWater, GRDC, ILEC, LEGOS/CNES participated in the meeting. The main issues on the Agenda were the following:

– Status report of HYDROLARE – summary of activities and milestones (V. Vuglinsky, SHI, Russia);

– Space-based observation systems for the monitoring of lakes and reservoirs (Jean-Francois Cretaux; LEGOS/CNES, France);

–Observing the Essential Climate Variables: Lakes (Stephan Bojinski, GCOS, Switzerland);

– Presentations by collaborating partners (Ulrich Looser, GRDC, Germany), (N. Aladin, ILEC, Russia);

– Discussion of the HYDLOLARE operation;

- Adoption of work plan and milestones until December 2010.

Researches within **Union State Programme "Improvement of the System of Providing Information to the Population and Industries of Russia and Belarus on Existing and Projected Climatic Conditions, the State and Pollution of the Environment"** (for 2007-2011) were continued in the Hydrochemical Institute and the State Hydrological Institute. Experimental data for developing a methodology of collection and interpretation of remote spectrometric data for characterizing ecosystem water quality were obtained. Draft methodological recommendations on carrying out spectrometric surveys from bridgeworks were prepared.
Exchange of hydrological information in line with the Joint Research Programme of the CIS Intergovernmental Council for Hydrometeorology was performed.

Yearbooks "Surface Water Quality in the Russian Federation" for 2006 and 2007 and 23 normative documents on surface water pollution monitoring prepared and developed at the Hydrochemical Institute were sent to Hydrometeorological Services of Belarus, Azerbaijan, Armenia, Kazakhstan, Moldova and the Ukraine.

Since 1989, the Hydrochemical Institute (GHI) has been participating in implementation of the International Project **GEMS/Water.** Under this project, the Hydrochemical Institute provides scientific guidance to the national subsystem of the Global Environmental Monitoring System GEMS/Water ensuring guarantees and control of hydrochemical data quality. GHI is a national coordination centre of this international programme on behalf of Russia. In the project framework GHI annually collects, analyzes and corrects data on water discharge gathered at 19 sites of the national GEMS/Water subsystem. Data on water composition and characteristics are gathered at 26 sites. The processed results of analysis (more than 500 water samples) are submitted by GHI to the GEMS/Water Headquarters (Canada) where they are later used in

global water resources assessment. Every year GHI makes an assessment of results of external and laboratory water quality control performed at the water observation laboratories of ROSHYDROMET involved in the project.

In 2009, Department of Land Hydrology took part in implementation of two projects within FTP **"Scientific and scientific-pedagogical personnel of innovative Russia"**, one project within FTP **"Research and development in Priority Fields of Russia's S&T. Complex for 2007-2012"** and two international projects. One of the international projects (NOW-RFFI Water № 04144 **"Changing flood pulse dynamics and their impact on fish recruitment in large rivers (Volga, Russia)")** was carried out in collaboration with the University of Utrecht, the Netherlands, near the Volgogradskoye reservoir, and was aimed at analyzing the impact of anthropogenic changes in the Volga regime on fish reproduction. The other project (RFFI № 09-05-92001-HHC_a) was carried out in cooperation with scientists from the Institute for Water Problems RAS and colleagues from scientific institutions of Taiwan. The objective of the research was to study climate effects on underground water and minimum flow in the zone of monsoon climate.

In accordance with the **International Project "Measuring of ground ice by satellites" (GLIMS)** Institute of Geography continues to carry out regular works for deciphering of space images from satellites ASTER and Landsat over territories of the Altai, Pamirs, and Kamchatka. In collaboration with the Tomsk University of the Russian Federation and the Reading University of Great Britain mountain climate and glaciers on the Altai ranges were investigated. The glaciers of Eastern Siberia were investigated jointly with Technological Institute in the Kitami city (Hokkaido). Russian specialists (Institute of Geography RAS) investigated also glaciers on the Svalbard in collaboration with Norwegian (University of Oslo) and Spanish (Polytechnic University of Madrid) scientists.

Scientists of the Institute of Geography participated in works under the **International Project "Problem of controlling joint water resources for the purpose of sustainable economic development in the Aral Sea Basin".** Scales of glacierization in the Vakhsh River Basin in the Pamirs and prospects of its future changes were estimated on the basis of the satellite information. Discussions of methods and exchange of results of calculations of the water budget components in the Aral Sea Basin were carried on.

Also, 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.

Dr. Zh.A. Balonishnikova, Scientific Secretary of the SHI, is a member of the Advisory Working Group of the WMO Commission of Hydrology; she is responsible for the topic "Water Resources Assessment" since 2008.

Prof. V.S. Vuglinsky, Deputy Director of the SHI, is a member of the WG on hydrology of Europe (RA-VI) and a member of the WG on "BALTEX" Project; he attends the meetings of these WGs.

Prof. R.S. Chalov, the Department of Hydrology of the Moscow State University (MSU), is a member of the Presidium of UNESCO World Association for Sedimentation and Erosion Research (WASER).

Prof. R.S. Chalov and N.N. Alexeevsky (MSU) contribute to the work of International Research and Training Centre on Erosion and Sedimentation (IRTCES) (PRC, Beijing).

Prof. A.E. Asarin, a NC member, contributes to the work of the Technical Committee "Floods and Dams"/COLD (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.

1.3 Educational and training courses

1.3.1Contribution to IHP courses

At the present time, 17 students and 5 post-graduates from foreign countries, including 12 persons from the CIS and Baltic States, are fulfilling Bachelor's, Master's, Engineer's and Postgraduate programs at the Department of Hydrology of the Russian State Hydrometeorological University.

Students: Azerbaijan – 1; Benin – 1; Guinea – 1; Latvia -1; Lithuania - 2; Mali – 1; Moldova – 2; Namibia – 1; Tajikistan – 1; Uzbekistan – 1; Equatorial Guinea -1; Estonia – 3.

Post-Graduate students:

Algeria – 1; Jordan – 1; China – 1; Cot-D'Ivuar – 1; Ethiopia – 1.

During the reporting period, the RSHU developed Federal Standards of two-level system of education (Bachelor's and Master' programs) in the field of applied hydrometeorology approved by the Ministry of Education and Science of the Russian Federation in December 2009 (contribution to Theme 5, Focal Area 5.1).

Events aimed at developing professional education in the field of hydrology, water resources and ecohydrology (contribution to Theme 5, Focal Area 5.2):

● Workshop "Application of New Educational Technologies in Training and Retraining of Specialists in the Field of Hydrometeorology" (RSHU, May 2008) – more than 50 participants;

● Workshop-discussion "Ecological Problems of Contemporary State of Water Resources" (RSHU, March 2010) – 30 participants;

● Two Summer Schools/Workhops: "Problems of Integrated Coastal Management" (June - July 2008 and 2009) – 30-35 participants;

● International Students Educational "O-Mega" Forum on global climate changes and ecological problems (RSH U, November 2008 and 2009) – 70 participants;

● Two All-Russia Students Competitions on Hydrometeorology and Hydrology (RSHU, April 2009 and 2010) – 30-35 participants in the top third tour;

● Two final sessions of Hydrological Section of Student Scientific Society (RSHU, April 2009 and 2010) – 20-25 participants.

● Training courses for RSHU students and post-graduates at the Nicolaus Copernicus University (June 2008, May 2009 and 2010) and training courses for Polish students at the educational and scientific station of RSHU (June-July 2008 and 2009, February 2010) within the

framework of agreement between RSHU and the Nicolaus Copernicus University (Torun, Poland) - 6-7 participants;

● Practical training of RSHU students at the Estonian Meteorological and Hydrological Institute (August 2009) – 6 students;

Students also participated in the Xth International Ecological Forum "Baltic Sea Day" (March 2010).

Events aimed at developing education in the field of water resources and ecohydrology in schools (contribution to Theme 5, Focal Area 5.3):

● All-Russia Youth Ecological Forum "Earth Is Our Home" – (Russian State Hydrometeorological University, March 2009, April 2010) – 70-80 participants;

● Trainings for pupils of senior classes - (Russian State Hydrometeorological University) –140-180 participants annually;

● School academic competitions on geography, environmental protection and ecology (Russian State Hydrometeorological University, November 2008, May 2009, May 2010) – 200-250 participants annually.

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.

The following courses were organized during the reporting period:

- Advanced courses for hydrologists "Hydrological computations: spatial–temporal generalizations of hydrological characteristics" June 2008, 2009 St Petersburg, SHI.
- Meeting–Seminar "Observation data processing and prepress preparation of hydrological editions" for hydrologists of the local Administration for Hydrometeoroogy and Environmental Monitoring, 5-7 of November 2008, St-Petersburg, SHI.

Meeting-Seminar "Provision of hydrochemical information quality" for Hydrometeorological Services of Russia and Kazakhstan was held on 6-16 October, 2008 in the Hydrochemical Institute. The following issues of surface water pollution monitoring were lectured and discussed by the leading specialists of the Hydrochemical Institute:

1. Condition and main concepts of improvement and development of rated and special observations system.
2. Modern state and improving of surface water pollution monitoring normative-methodological basis.
3. Increasing adequacy of hydrochemical information received by the network and reduction of observation costs.

Practical trainings in state-of-the-art methods of chemical water analysis and algorithms of aquametry control were conducted.

45 scientists, including 36 persons from Roshydromet, 2 representatives from Kazakhstan Hydromet and 7 young specialists from the Hydrochemical Institute participated in this seminar. Normative methodological documents on surface water pollution monitoring developed at the Hydrochemical Institute and monographs prepared and published by the Institute (total amount of 54) were disseminated on participants' requests.

1.3.3 Participation in IHP courses

During June 2008 – May 2010, UNESCO Higher International Courses were not organized at the MSU due to lack of financing.

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

Working meeting with A. Bogush, Head of International Relations Office, RSHU, M. Mamaeva, Head of WMO Relations Department, RSHU, Prof. András Szőllősi-Nagy, the Rector of the UNESCO-IHE Institute for Water Education, and representatives from departments of hydrology and hydroinformatics was held in December 2009 (Netherlands, Delft, UNESCO-IHE).

At this meeting, a visit by Prof. András Szőllősi-Nagy to the Russian State Hydrometeorological University for discussing future cooperation and signing Memorandum of Understanding between RSHU and IHE was planned for 2010. The issue of granting to the RSHU the status of the UNESCO category 2 regional centre operating in Russian will be also discussed.

1.5 Publications

Monographs

N.P. Ahmetieva, E.E. Lapina, M.V. Lola Ecological state of natural waters in the Ivankovskoye reservoir and ways to reduce their contamination. 2008 (in Russian)

N.I. Alekseevsky, S.R. Chalov Hydrological functions of a branched channel. 2008 (in Russian)

M.N. Anikanova Sulphur compounds in wastes of Baikal Pulp and Paper Mill (composition, analysis methods, monitoring). 2009 (in Russian)

A.E Asarin, V.I. Kravtsova, V.N. Mikhailov Amudarya and Syrdarya rivers and their deltas. The Aral Sea Environment. Ed. A.G. Kostyanoy, A.N. Kosarev. 2010 (in Russian)

M.V. Bolgov, I.O. Sarmanov, O.V. Sarmanov Markov processes in hydrology. Moscow, IVP RAN. 2009 (in Russian)

V.F. Brehovskikh, V.D. Kazmiruk, G.N. Vishnevskaya Biota in the process of mass transfer in water bodies. 2008 (in Russian)

Changes of the environment and climate. Vol. 3. Dangerous natural phenomena on the land surface: mechanism and catastrophic consequences. 2008 (in Russian)

Desertification of the Russian lands. New aspects of analysis, results, and problems. Ed. V.M. Kotlyakov. 2009 (in Russian)

Ecological monitoring in areas with increased anthropogenic load. Ed. A.N. Pavlov. Saint-Petersburg, Russian State Hydrometeorological University. 2009 (in Russian)

U.V. Efremov, V. D. Panov, A.A. Bazeluk, P.M. Lurie Ciscaucasia and Caucasus lakes. 2010 (in Russian)

Ecological state of the Dnieper River Basin in the Russian territory. 2008 (in Russian)

A.S. Gavrilov, V.A. Shelutko, V.V. Dmitriev Ecology and hydrometeorology of big cities and industrial areas (Russia, Mexico). Monograph, v.1 Analysis of environment. Ed. L.N. Karlin, V.A. Shelutko. Saint-Petersburg, Russian State Hydrometeorological University. 2009 (in Russian)

Glacierization of Northern and Central Eurasia during the current epoch. Ed. V.M. Kotlyakov . 2006 (in Russian)

Glacierization of Northern Eurasia in the recent past and nearest future. Ed. V.M. Kotlyakov. 2007 (in Russian)

Hydrology of swamped areas in the Western Siberian permafrost". Ed. S.M. Novikov. 2009 (in Russian)

L.N. Karlin, T.R. Eremina Hydrometeorological risks (collective monograph). Saint-Petersburg, Russian State Hydrometeorological University. 2008 (in Russian)

V.V. Kovalenko Hydrological reliability assurance of construction projects under climate changes. Saint-Petersburg, Russian State Hydrometeorological University. 2009 (in Russian)

V.I. Kravtsova Response of reed mudflats in the Caspian coastal zone to sea level fluctuations. Remote Sensing and Geospatial Techniques for Coastal Ecosystem Assessment and Management. 2009 (in Russian)

B.N. Mikhailenko Deep structure of glaciers in tropical and middle latitudes. 2008 (in Russian)

V.N. Mikhailov, M.V. Mikhailova River mouths. The Black Sea Environment. Ed. A.G. Kostyanoy, A.N. Kosarev. 2008 (in Russian)

N.V. Myakisheva Multicriterial lakes classification. Saint-Petersburg, Russian State Hydrometeorological University. 2009 (in Russian)

A.M. Nikanorov, A.G. Stradomskaya Limnetic ecosystem oil pollution problems. 2008 (in Russian)

A.M. Nikanorov, V.A. Bryzgalo Russian rivers. Part 1. Kola North rivers (hydrochemistry and hydroecology). 2009 (in Russian)

A.M. Nikanorov, A.A. Nazarova Guarantees of quality hydrochemical information control. 2009 (in Russian)

V.A. Nizovtsev, A.V. Postnikov, V.A. Snytko, N.L. Frolova, V.M. Chesnov, R.S. Shirokov, V.A. Shirokova Historical waterways of Russia (XVII-XX centuries) and their role in changing ecological situation. Field work: state, results, outlook. 2009 (in Russian)

A.N. Pavlov Time categories in hydrogeology. Saint-Petersburg, Russian State Hydrometeorological University. 2008 (in Russian)

V.D. Panov, A.A. Baseluck, P.M. Lurie West and East Manich rivers. Hydrography and river runoff. 2009 (in Russian)

V.D. Panov, U.G. Ilichev, A.D. Salpagarov Ciscaucasia glaciers fluctuation in XIX-XX centuries. 2008 (in Russian)

V.S. Savenko, A.V. Savenko Experimental methods of studying low temperature geochemical processes. 2009 (in Russian)

Water Resources of Russia and Their Use. Ed. I.A.Shiklomanov. 2008 (in Russian)

Text books and educational supplies

A.M. Doganovsky, V.N. Malinin, V.G. Orlov, S.M. Gordeeva Hydrosphere studies (Practical work). Saint-Petersburg, Russian State Hydrometeorological University. 2008 (in Russian)

V.N. Malinin Statistical methods of hydrometeorological information analysis. Saint-Petersburg, Russian State Hydrometeorological University. 2008 (in Russian)

Manual on chemical surface water analysis. 2009 (in Russian)

Methodological recommendations for determination of main computed hydrological characteristics under data observing absence. 2009 (in Russian)

A.M. Nikanorov Hydrochemistry. Textbook for high schools. 3rd edition. 2008 (in Russian)

Recommendations. The hydrometrical river propellers. Calibration methods in comparator setting for hydrometrical propellers calibration. 2009. SHI (in Russian)

The Factory standard. – Recommendations on channel processes accounting of underwater conduit crossing areas through rivers. 2009. SHI (in Russian)

Practical guide on air photos landscape decoding of different Western Siberia swamps. 2009. SHI (in Russian)

S.D. Vinnikov, N.V. Viktorova Water of land physics. Russian State Hydrometeorological University. 2009 (in Russian)

Sets of papers:

Contemporary fundamental problems of hydrochemistry and surface water quality water monitoring in Russia. Collected articles of Scientific-Practical Conference with international participation, Azov, 8-10 of June, Part 1 and 2. 2009

Hydrological investigations in Valdai Branch of the State Hydrological Institute. 2008

Genetic and Probabilistic Methods in Hydrology. Proceedings of the International Workshop dedicated to the 100th anniversary of Prof. A.N. Befani. 2009

Genetic and Probabilistic Methods in Hydrology. Proceedings of the International Workshop dedicated to the 100th anniversary of Prof. A.N. Befani. 2009

Materials of the International Conference Natural and Technogenic Risks of Sea Shores. 2008

Proceedings of the VIth All-Russia Hydrological Congress. 2006-2008. 10 volumes.

Results of V International Conference "Ecological and hydrometeorological problems of big cities and industrial areas". Ed. L.N. Karlin, V.A. Shelutko. 2009

Scientific writings of Russian State Hydrometeorological University № 6. (2008). Saint-Petersburg, Russian State Hydrometeorological University.

Scientific writings of Russian State Hydrometeorological University № 7. (2008). Saint-Petersburg, Russian State Hydrometeorological University.

Scientific writings of Russian State Hydrometeorological University № 8. (2008). Saint-Petersburg, Russian State Hydrometeorological University.

Scientific writings of Russian State Hydrometeorological University № 9. (2009). Saint-Petersburg, Russian State Hydrometeorological University.

Scientific writings of Russian State Hydrometeorological University № 10. (2009). Saint-Petersburg, Russian State Hydrometeorological University.

Scientific writings of Russian State Hydrometeorological University № 11. (2009). Saint-Petersburg, Russian State Hydrometeorological University.

Strategic problems of water use in Russia. Proceedings of the All-Russia Conference. 2008

Water resources, ecology and hydrological security. Proceedings of the 2nd Conference of young scientists and talented students. Moscow, RASHN. 2008

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

The Scientific-Practical Conference "Contemporary Fundamental Problems of Hydrochemistry and Surface Water Pollution Monitoring in Russia" with international participation under the umbrella of the Ministry of Natural Resources and Ecology of the Russian Federation, ROSHYDROMET, Hydrochemical Istitute, Institute of Limnology RAS, Southern Scientific Centre RAS and with the support of the Russian Foundation for Fundamental Research took place from June 8 to 10, 2009 in Azov of Rostov Region.

The Conference was dedicated to the 100th anniversary of A. Alekin, the remarkable scientist, father of hydrochemistry in the USSR, Corresponding Member of the USSR Academy of Science.

More than 110 scientists and specialists from Roshydromet Institutions, Russian Academy of Sciences, Ministry of Natural Resources and Ecology, Ministry of Agriculture and Ministry of Education and Science participated in the Conference.

38 presentations by 19 Russian organizations, as well as from Moldova, Kazakhstan and the Ukraine were made. 34 Reports were made at a poster section. Poster papers review and detailed analysis were performed by the leading scientists from the Hydrochemical Institute during one of the sessions.

Research results presented in the reports covered a wide range of issues of fundamental hydrochemistry and surface water quality monitoring, in particular:

- surface water quality formation under anthropogenic impact;
- achievements and outlook for development of methodological basis for surface water quality monitoring;
- methods for estimation and forecasting surface water contamination;

- methods for bioindication and biotesting in the surface water quality monitoring system and controlling ecological state of water bodies.

Analysis of reporting papers showed that the most urgent directions of hydrochemistry are the following:

- creation of common water quality formation theory;
- mathematical formulation of water composition transformation in river ecosystems;
- improvement of integrated assessment of state of water bodies taking into account physical-chemical, hydrological, hydrobiological and toxicological researches;
- monitoring of bed and suspended load as possibly subjected to secondary pollution;
- modeling of contamination propagation in emergency situations;
- development of express methods for surface water biotesting with the use of ecologically suitable test-objects;
- development of techniques for assessing monitoring and environmental measures efficiency.

International Conference "Ecological and Hydrometeorological Problems of Big Cities and Industrial Areas" with total number of participants over 100 persons was held in the Russian State Hydrometeorological University.

Participation of NC members in other meetings:

- International Conference (school-seminar) "Dynamics of Coastal Zone of Non-Tidal Seas", Kaliningrad, Russia, 2008.
- Scientific Session dedicated to the 90th anniversary of the Department of Land Hydrology of the St. Petersburg State University, St. Petersburg, Russia, 2008.
- IV Sakhalin Young Scientists' School "Natural Disasters: Study, Monitoring, Outlook", Yuzhno-Sakhalinsk, Institute of marine geology and geophysics, 2008.
- International Conference "Litodinamics of the Ocean Bed Metamorphic Zone" dedicated to the 100th anniversary of Prof. V. Loginov, Moscow, Russia, 2009.
- VIIth Conference on the Dynamics and Thermal Conditions of Rivers, Reservoirs and Coastal Zones of Seas, Moscow, Russia, 2009.

1.6. 2 Participation in meetings abroad

- ICOLD Annual Meeting, May 2008, Sofia, Bulgaria;
- 12th Conference on Limnology, September 2008, the Nicolaus Copernicus University, Torun, Poland;
- 19th IAHR International Symposium on Ice "Using New Technology to Understand Water-Ice Interaction", Vancouver, Canada, 2008;
- 5th World Water Forum, March 2009;
- 23rd ICOLD International Congress, May 2009, Brasilia, Brazil (Report "Multipurpose hydraulic scheme for water supply of Moscow megalopolis");
- 3rd World Climate Conference;
- International Conference HYDRO 2009, October 2009, Lyon, France;
- International Conference "Erosion and Channel Processes in Flat Areas", September 2009, Belarusian State University, Belarus.

1.7 Other activities at regional level

1.7.1 Institutional relations/cooperation

Working Meeting between Roshydromet Hydrochemical Institute and the Ukrainian Scientific Research Institute of Ecological Problems representatives was held in March 2010 in

Rostov. At the meeting, a decision regarding scientific and technical cooperation in the field of surface water monitoring between Main Bureau of Hydrochemical Institute and the Ukrainian Scientific Research Institute of Ecological Problems was adopted.

1.7.2 Completed and ongoing scientific projects

Meeting with German Consortium specialists aimed at expansion of the Tacis project on designing a monitoring and warning system in the Ob and Irtysh River Basins took place on 20 of August 2008 in the Hydrochemical Institute.

The following issues were discussed:

- Principles of surface water monitoring system organization in the Russian Federation;
- Organization and methods of quality water data sampling;
- Sampling periodicity at monitoring stations of the Ob, Irtysh, Tom, Tobol, Iset, Techa, Miass, Pishma, Tura Rivers;
- List of controlled physical, hydrochemical factors and contaminating materials in the surface water monitoring system;
- Hydrochemical factors and contaminating toxic materials determination methods;
- Principles of construction, operation and possibilities of using automated stations for surface water pollution control;
- List of factors controlled by automated stations;
- Conditions for setting and operating the surface water pollution control automated stations;
- Number of surface water pollution control automated stations to be located in the Ob and Irtysh River Basins;
- Possibilities of cooperation between the Hydrochemical Institute and German Consortium.

As a result of this meeting, a project with Ecological Technologies GMbH of German Consortium VIZUTEK VISMUT within the Tacis project “Monitoring and warning system in the Ob and Irtysh River Basins” was contracted and completed. Within this project, possibilities of locating automated stations for measuring some chemical-toxic indicators of water pollution in the Ob and Irtysh River Basins were investigated.

2 FUTURE ACTIVITIES

2.1 Activities planned until December 2010

The following activities are planned:

- Advanced course on hydrology “Hydrological computations” (Spatial-temporal generalization of hydrological characteristics), June 2010, St Petersburg, SHI.

2.2 Activities foreseen for 2011-2012

These activities will be considered at the meetings of NC RF in 2010 in the course of preparation of research programmes in hydrology and water management in different agencies and organizations of Russia for 2011-2013.

2.3 Activities envisaged in the long term

It is planned to organize the next VIIth All-Russia Hydrological Congress.

MINISTRY OF WATER AND ELECTRICITY

KINGDOM OF SAUDI ARABIA

National Report on IHP Related Activities

1. - Activities and Framework during the Period July 2008 to May 2010

The Saudi government made strong commitment to support efforts for long term and sustainable development of freshwater resources against challenges of increasing demand, potential water quality deterioration, limited availability and future impacts of climatic change at sub-regional, regional and international levels. The Kingdom is actively involved in implementation of past and ongoing UNESCO-IHP activities of water research, water resources management, education and capacity building.

1.1 - Meetings of Saudi IHP National Committee:

The new National Saudi IHP Committee will be activated as soon as possible to discuss the related national water issues related to the IHP-activities and review the progress of implementation of the objectives of the IHP.

1.1.1- Decision regarding the composition of Saudi IHP National Committee:

Recently, the Saudi government planned and implemented a number of reforms in water sector and formulated a new IHP National Committee with mandate to develop comprehensive, integrated, multidimensional and rational approach for sustainable development of water resources of the Kingdom in the 21st century and beyond.

1.1.2- Status of IHP-VI activities:

In the absence of National IHP Committee, Ministry of Water & Electricity (MOWE) will propose effective measures for communications and will establish working rules and guidelines to manage and distribute different tasks to the future members of the committee. The committee will initially review the IHP-VII strategic plan (2008-2013) and will compile the relevant major comprehensive on-going studies of various government organizations as recommended in IHP-VII plan.

1.1.3- Decisions regarding contribution to participation in IHP-VII:

The Saudi government has great ambitions to actively participate in implementing of IHP-VII plan and to share and highlight the Kingdom's experience and achievements to the other national committees. Therefore, the government has selected two members who will participate in the 19th session of the IHP Intergovernmental Council which will be held in Paris during 5 to 8 July 2010.

1.2 – Activities at National Level in the framework of the IHP:

During last two decades, Kingdom of Saudi Arabia has achieved extensive economic development and expansion in all the sectors and has great plans to continue in future. The National IHP Committee has reviewed and compiled all major government on-going projects and activities recommended and listed in IHP-VII themes.

1.2.1 – National/local scientific and technical meetings:

1.2.2 – Participation in IHP Steering Committees/Working groups :

1.2.3 – Research/Applied Projects supported or sponsored:

Saudi Government's Activities related with IHP-VII Themes are as:

1. The government has initiated a comprehensive study to identify and evaluate potential future impacts (if any) as result of climate change on the water resources of the Kingdom and to assess vulnerability and possible adaptive measures with the help of advanced climate research models. The initial results forecasted for increasing temperature during summer in northwestern region while lowest in the south and southwest while highest precipitation increase in summer months in all regions of the Kingdom.
2. The government formulated a National Flood Management Program to provide the framework for flood prediction, evaluation of flash flooding events, reducing risks and damage prevention and mitigation in close coordination with national and international agencies.
3. The Saudi government has initiated institutional and governance reforms in water sector to adopt robust, flexible and implementable operation model and redesign the organizational structure to streamline and standardize key work processes (operations) in line with strategic objectives and international best practices to enhance performance efficiencies.
4. Recently, a legislative framework for sustainable development of water resources has been compiled with *Formulation of a new comprehensive Water Act & its Implementing Regulations in the Kingdom.* In addition, National Water Strategy, Groundwater by-Laws and Regulations, Wastewater by-laws and Integrated Water Resources Management Plan are also

under review process. After completion of Restructuring and Supervisory Process Reengineering Plan, Health and Environmental Strategy Implementation Plan, the Ministry of Water & Electricity (MOWE) will work as regulator of water resources of the Kingdom and will implement and enforce the National Water Act and regulations.

5. The government adopted an approach to land and water management and encourages bottom-up approaches that recognize surface and groundwater resources, balancing local and down-stream population demands.
6. The government has implemented very ambitious nationwide water conservation program for efficient use of water which was focused on Water Demand Management (WMD) for domestic and non-domestic customers, organizational restructuring and progressing towards privatization which resulted significant reduction in water consumption. The program included mandatory installation of water saving devices such as constant flow regulators and low capacity flushing toilets; highly efficient sanitation and irrigation equipments, public education and publicity programs on the importance of water conservation; and pricing water to reflect its strategic importance and scarcity value. In addition, the government developed and implemented highly efficient management of transmission and distribution system of potable water from source to consumers with minimizes losses from leakages as cost-effective water conservation measure.
7. Public awareness campaigns have proved to be an effective tool in effecting behavioral changes amongst the public, using different marketing and media tools to spread the message of water conservation. The campaign included production and transmission of many conservation massages via television, radio, and newspapers commercials. It was made sure to renew them as far contents and goals. There were also the use of commercials on big screens and boards on big intersections and plazas.

1.2.4 – Collaboration with other national and international organizations and or programs:

The Ministry of Water & Electricity (MOWE) representing National IHP Committee conducted a number of meetings and extended cooperation with a number of public and private organizations including Presidency of Meteorology and Environment (PME), Ministry of Agriculture (MOA) and King Saud University to develop joint strategy for research and capacity building in advanced hydrological modeling technologies.

1.3 – Educational & Training Courses:

The Saudi Government encouraged a large number of specialists to participate in scientific conferences, symposia, and training sessions inside the Kingdom and abroad. The government has conducted a number of regional workshops for promotion of regional implementation of the international strategy for disaster reduction and management.

1.4 – Participation in International Scientific Meetings:

The Kingdom participated in the relevant regional and sub regional conferences and meetings on sustainable water resources and environmental management including (conservation and combat desertification) as well as on climate changes impacts on water resources.

1.5 – Other activities at Regional Level:

The Regional Workshop "Disaster Risk Reduction for Sustainable Development" for the Promotion of the Regional Implementation of the International Strategy for Disaster Reduction, was convened in response to the resolution by the Council of Arab Ministers Responsible for the Environment in its 20th Session on May 19-21, 2009 held in Jeddah, Saudi Arabia.

2. – Future Activities

2.1 - Activities planned until December 2010:

Recently, The Saudi Government conducted a comprehensive field survey of country-wide Hydrological Monitoring Network (HMN) for rehabilitation & upgrade of the Network in order to meet the present and future water resources management needs. The Hydrological Monitoring Network will be connected with the central processing center through most advanced telemetric system.

2.2 Activities foreseen for 2010 – 2011:

Saudi Government's Future Planned Activities related with *IHP-VII Theme are as*

1. The Saudi National IHP Committee will be formed which will review all research works conducted by national and international research organizations and universities and compile results related with climatic change impacts on hydro-meteorological conditions of Saudi Arabia that includes as
    a. Estimate the change in (air temperature and rainfall) in terms of rate, density, and distribution due to possible climatic change
    b. Delineate the potential areas expected to be impacted by flash floods (high run off) as a result of climatic change (if any), and estimate maximum and minimum values of peak run-off in wadies.
    c. Assess the impact (draught or increase) on natural water resource storage, (if any) due to the climatic changes.
    d. Develop criteria and measures how to mitigate and reduce the effects of climatic change on future water resources of the Kingdom.

2. The National Committee for IHP will conduct a comprehensive study for potential environmental hazards and impacts due to water quality issues of Kingdom which includes collection of environmental data and identify potential environmental hazards, resulting from human, agricultural, industrial activities including contaminants in groundwater, from wastes, wastewater, surface and sub-surface dams, and select most suitable methods and solutions for mitigation and pollution reduction.

3. The National Committee for IHP will review the implementation of Water Conservation program and will initiate future plan for reuse of treated effluent water, In-house water recycling in factories, Water Audits in private, industries and agriculture, UFW Program, Public education of water conservation.

2.3 Activities envisaged in the long term

The government has initiated a rational and integrated approach to determine the relationship between wadi runoff and amount of recharge in wadi aquifers which will help in assessment of groundwater availability and renewability. The research will focus on definition and delineation of wadi flow systems and their relation to regional flow or deep groundwater systems and estimation of aquifer recharge by quantifying the relation between transmission losses and recharge. In addition, the Government will implement the water sector reforms including institutional restructuring program, development of National Water Strategy and formulation of comprehensive National Water Law.

NATIONAL REPORT OF THE SLOVAK REPUBLIC

1. Activities undertaken in the period July 2008 - May 2010

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.

1.1.1 Decisions regarding the composition of the IHP National Committee

There was no change in the composition of the IHP National Committee during the period. The Plenum has 23 members and 9 of them form the Executive Committee. All the main research institutes, universities and ministries related to hydrology in Slovakia are represented in the committee.
The present membership 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
FENDEKOVÁ Miriam, Comenius University, Bratislava
HOLUBOVÁ Katarína, Water Research Institute, Bratislava
MAJERČÁKOVÁ Oľga, Slovak Hydrometeorological Institute, Bratislava
MATUŠKA Milan, Global Water Partnership, Bratislava
MINÁRIK Boris, Slovak Hydrometeorological Institute, Bratislava
SUPEK Marián, Danube River Basin Authority, Bratislava

Plenum:
BABIAKOVÁ Gabriela, Slovak Hydrometeorological Institute, Bratislava
BODIŠ Dušan, State Geological Institute of Dionýz Štúr, Bratislava
ELIÁŠ Pavol, Slovak Agricultural University, Nitra
HLAVČOVÁ Kamila, Slovak University of Technology, Bratislava
HOLČÍK Vladimír, Water Engineering Construction, Bratislava
HOLKO Ladislav, Institute of Hydrology, Slovak Academy of Sciences, 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
POÓROVÁ Jana, Slovak Hydrometeorological Institute, Bratislava
RONČÁK Peter, Slovak Hydrometeorological Institute, Bratislava
ŠKULEC Štefan, retired
ŠOLTÉSZ Andrej, Slovak University of Technology, Bratislava
ŠÚTOR Július, Institute of Hydrology, Slovak Academy of Sciences, Bratislava

1.1.2 Status of IHP-VII activities

The activities of the Slovak institutions were concentrated on the following IHP-VII projects:

CCPC Flow Regimes from International Experimental and Network Data (FRIEND)
1.2 - Climate change impacts on the hydrological cycle and consequent impact on water resources
1.3 - Hydro-hazards, hydrological extremes and water-related disasters
2.4 - Managing water as a shared responsibility across geographical & social boundaries
2.5 - Addressing the water-energy nexus in basin-wide water resources

The Slovak Republic is member of the Intergovernmental Council (IGC) of IHP UNESCO for the period 2006-2010. Chairman of the NC Pavol Miklánek was elected vice-chairperson of IGC and member of the Bureau of IHP UNESCO for the period 2008-2010 representing the UNESCO Electoral group II.

Slovak representative Dr. Holko became the international coordinator of Euro-mediterranean Network of Experimental and Reference Basins (ERB) in September 2008 (CCCP FRIEND).
Dr. Miklánek was elected a member of 4-persons group for drafting of the Braunschweig declaration on hydrological research in experimental basins during the ERB conference in Goslar, Germany. Final formulation was organised by German NC IHP on 18 August 2009 in Koblenz.

Slovak representative Dr. Fendeková is the international coordinator of EUROFRIEND Working group 2 *Low flows and droughts* (CCCP FRIEND).

Slovak representative Dr. Pekárová is the international coordinator of the *Flood Regimes of the Rivers in the Danube Basin* project of the Regional co-operation of the Danube countries in framework of IHP UNESCO (Focal Area 1.3 Hydro-hazards, hydrological extremes and water-related disasters, and Focal Area 2.4 Managing water as a shared responsibility across geographical & social boundaries).

Three international meetings were organised in Slovakia:

UNESCO Workshop and meeting of working group on *Comparative analysis of floods and droughts - Catchment and aquifer typology* was organised on 20-23 April 2008 in Smolenice.

Meeting of the EURO FRIEND 2 Working group *Low flows and droughts* was held on 10-12 November 2008 in Bratislava.

Workshop and meeting of the working group on *Flood Regimes of the Rivers in the Danube Basin* was organised on 15-16 April 2009 in Smolenice.

The Slovak NC participated in organisation of the following international conferences:

24th Conference of Danubian countries on the Hydrological Forecasting and Hydrological Bases of Water Management. (Focal Area 2.4 Managing water as a shared responsibility across geographical & social boundaries.) Bled, Slovenia, 2008.

ERB conference 2008, Hydrological extremes in small basins, Cracow, Poland, September 18-20, 2008.

ERB conference 2010, Hydrological Responses of Small Basins to a Changing Environment, Seggau, Austria, September 5-8, 2010.

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

1.2.1 National/local scientific and technical meetings

The 20th Conference of Young Slovak and Czech Hydrologists was organised in on 30 October 2008 in Bratislava and the conference proceedings were published. Following three papers were awarded:
Marton Daniel: Uncertainty impact for allocation link of real mean monthly discharge series on reservoir storage capacity values
Remiašová Renáta: Assessment of hidden groundwater transmission to the surface streams by selected geophysical methods
Svetlíková Daniela: Hybrid model for upper Hron River basin.

The 21th Conference of Young Slovak and Czech Hydrologists was organised on 12 November 2009 in Bratislava and the conference proceedings were published. Following three papers were awarded:
Danáčová Zuzana, Kaňuková Katarína, Danáčová Michaela – Experimental measurements of open channel discharge using indicator method;
Macurová Zuzana – Impact of climate change on hydrologic regime of the upper Hron basin;
Taufmannová Alice – Modelling of small reservoirs impact on flood events.

1.2.2 Participation in IHP Steering Committees/Working Groups

Representative of the NC took part at the 18th Intergovernmental Council of IHP UNESCO in Paris in 2008 as member of the IHP Intergovernmental Council.
Chairman of the NC Pavol Miklánek took part at 43rd Session of the IHP Bureau in Paris on 3-5 June 2009, and at 44th Session of the IHP Bureau in Delft on 6-8 May 2010 as vice-chairperson of the Bureau of IHP UNESCO for the period 2008-2010 representing the UNESCO Electoral group II.

The Slovak NC is member of the Steering Committee of EUROFRIEND and Slovak experts participate in its Working Groups. Dr. Fendeková is the international coordinator of the WG 2 of the project since 2007.
Representatives of the NC took part at following FRIEND meetings:
EURO FRIEND WG 2 meeting in Bratislava, Slovakia in 2008
EURO FRIEND WG 5 meetings in Cracow in 2008 and in Goslar, Germany in 2009.

FRIEND NWE WG 5 closely collaborates with the European Network of Experimental and Reference Basins (ERB) project including parallel meetings and common conferences. The Slovak NC participated in the ERB Steering Committee meeting and 12th ERB conference in Cracow in 2008 and took part at the ERB Steering Committee meeting in Goslar in 2009.

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 (2008 Bled, Slovenia, 2009 Zagreb, Croatia).

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.

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 did not organize any training seminar during the period of interest.

1.3.3 Participation in IHP courses

There was no participant from Slovakia in IHP courses in 2008-2010.

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 nine volumes were published till now. Two of them were published within the period of this report.

Szolgay, J., Hlavčová, K., Parajka, J., Lapin, M., Kohnová, S. and Hlásny, T. (2008) *„Climate Change Impact on Runoff in the Hron River Basin“*. KEY Publishing, Ostrava, 120 pp., ISBN 978-80-7418-006-4. (SVH Publication 8) as National report for the IHP UNESCO FA 2.4 *Methodologies for integrated river basin management*.

Pekárová, P., Onderka, M., Pekár, J., Miklánek, P., Halmová, D., Škoda, P. and Bačová Mitková, V. (2008) „*Hydrologic Scenarios for the Danube River at Bratislava*“. KEY Publishing, Ostrava, 158 pp., ISBN 978-80-87071-51-9. (SVH Publication 9) as National report for the IHP UNESCO FA 1.3 *Hydro-hazards, hydrological extremes and water-related disasters* and FA 2.4 *Managing water as a shared responsibility across geographical & social boundaries*.

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– UNESCO and IHP publications, mainly proceedings of international conferences.
Unfortunately, none of them was published within the period of this report.

– Proceedings of the conferences organised in Slovakia related to IHP:

Transport of water, chemicals and energy in the system soil-plant-atmosphere. Proceedings of the XVIth poster day. (IHP-VII project 1.2) CD ROM, UH SAV-GfU SAV, Bratislava, Slovakia, 2008.

Transport of water, chemicals and energy in the system soil-plant-atmosphere. Proceedings of the XVIIth poster day. (IHP-VII project 1.2) CD ROM, GfU SAV-UH SAV, Bratislava, Slovakia, 2009.

20th Conference of the Young Hydrologists – Proceedings. CD ROM, SHMI, Bratislava, Slovakia, 2008. ISBN 978-80-88907-64-0

21th Conference of the Young Hydrologists – Proceedings. CD ROM of Hydrological Days conference, SHMI, Bratislava, Slovakia, 2009. ISBN 978-80-88907-70-1

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

Transport of water, chemicals and energy in the system soil-plant-atmosphere. XVIth poster day. (National contribution to IHP-VI Focal Area project 1.2 Climate change impacts on the hydrological cycle and consequent impact on water resources.) Bratislava, Slovakia, 2006.

Transport of water, chemicals and energy in the system soil-plant-atmosphere. XVIIth poster day. (National contribution to IHP-VI Focal Area project 1.2 - Climate change impacts on the hydrological cycle and consequent impact on water resources.) Bratislava, Slovakia, 2007.

20th Conference of the Young Hydrologists. Bratislava, Slovakia, 2008.

21th Conference of the Young Hydrologists. Bratislava, Slovakia, 2009.

UNESCO Workshop and meeting of working group on *Comparative analysis of floods and droughts - Catchment and aquifer typology* was organised on 20-23 April 2008 in Smolenice.

EURO FRIEND 2 *Low flows and droughts* Working group meeting on 10-12 November 2008 in Bratislava.

Workshop and meeting of the working group on *Flood Regimes of the Rivers in the Danube Basin* on 15-16 April 2009 in Smolenice.

1.6.2 Participation in meetings abroad

18th Session of the Intergovernmental Council of the IHP UNESCO, Paris, 2008: Miklánek, P.

NE FRIEND WG 5 meeting, Cracow, 2008: Miklánek, P., Holko, L.

NE FRIEND WG 5 meeting, Goslar, 2009: Holko, L.

ERB (*European Network of Experimental and Representative Basins*) Steering Committee meeting, Cracow, 2008: Miklánek, P., Holko, L.

XIIth ERB Conference and General Assembly, (Conference: *Hydrological extremes in small basins)*, Cracow, 2008: 4 papers and 6 participants.

ERB (*European Network of Experimental and Representative Basins*) Steering Committee meeting, Goslar, 2009: Miklánek, P., Holko, L.

22th Working Session of the Danube countries representatives, Bled, 2008: Miklánek, P., Halmová, D., Pekárová, P.

24th Hydrological conference of the Danubian countries, Bled, 2008: 12 papers and 20 participants.

23rd Working Session of the Danube countries representatives, Zagreb, 2009: Miklánek, P., Halmová, D., Pekárová, P.

Workshop and meeting of the working group on *Flood Regimes of the Rivers in the Danube Basin* on 3 December 2009 in Zagreb, Croatia: Pekárová, P., Miklánek, P., Halmová, D.

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.

1.7.2 Completed and ongoing scientific projects

The Slovak IHP NC did not organise or participate in any projects out of IHP UNESCO.

2. Future Activities

2.1 Activities planned until December 2010

The NC will 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-VII:

FA 1.2 - Climate change impacts on the hydrological cycle and consequent impact on water resources
FA 1.3 - Hydro-hazards, hydrological extremes and water-related disasters
FA 2.4 - Managing water as a shared responsibility across geographical & social boundaries
FA 5.1: - Tertiary water education and professional development
FA 5.3: - Water education in schools
FRIEND, HELP
Associated programmes: International Flood Initiative (IFI), International Sediment Initiative (ISI)

Focal area 1.2	Organization of the annual Poster day on Transport of water, chemicals and energy in the system soil - crop canopy - atmosphere
Focal area 1.3	Co-ordination of Project 9 Flood regime of the Danube river in the Regional co-operation of the Danube countries; Participation in Project 13 Low flow and hydrological drought in Danube basin in the Regional co-operation of the Danube countries
Focal area 2.4	Participation in Regional co-operation of the Danube countries in the framework of IHP UNESCO
Focal area 5.1	Organization of the annual Conferences of young hydrologists
Focal area 5.3	Annual Award for the Best diploma work in hydrology at the Slovak Technical University

Cross-cutting programmes:

FRIEND	Co-ordination of and participation in the EURO FRIEND Working group 2 *Low flows and droughts* Participation in the EURO FRIEND Working group 5 *Catchment hydrological and hydrobiogeochemical processes in changing environment* Cooperation with European Network of Experimental and Reference basins (ERB) project (international co-ordinator L. Holko from Slovakia)
International Flood Initiative (IFI)	Co-ordination of Project 9 Flood regime of the Danube river in the Regional co-operation of the Danube countries;
International Sediment Initiative (ISI)	Participation in Project 12 *Roadmap towards an advice of the implementation of sediment management in the Danube WFD River Basin Management Plan* in the Regional co-operation of the Danube countries

2.2 Activities foreseen for 2011-2012

The continuation in all the main ongoing activities in framework of IHP-VII is foreseen (see para 2.1.). The Slovak NC IHP will contribute to formulation of IHP-VIII.

- Continuation in Regional co-operation of the Danube countries in hydrology.
- Participation at the regular bi-annual hydrological Conferences of the Danube countries.

- Continuation in organisation of the Poster days Transport of water, chemicals and energy in the system soil-plant-atmosphere.
- Publication of SVH Publications

- Participation in European Reference Basins project.

CCPC FRIEND (Flow Regimes from International Experimental and Network Data)
- Participation in EURO FRIEND working groups 2 and 5
- Collaboration and co-ordination of activities with other international programs and projects as European Network of Experimental and Reference Basins (ERB), 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.: 3/10
Ljubljana
15.06.2006

Report on the work of the Slovenian National Committee for IHP/UNESCO in 2010

The work in 2010 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. Mitja Brilly participated at the XXIIIth Working Meeting of the Regional Hydrological Co-operation of the Danube Countries in Zagreb, Croatia, December 2010.

The IHP Committee financially supported the publishing book with reports of the Regional Hydrology cooperation of the Danube Countries. Celebration of UN decade “Water for life” is in the progress.

Chairman

Prof.dr. Mitja Brilly

NATIONAL REPORT ON IHP RELATED ACTIVITIES

Sweden

1. ACTIVITIES UNDERTAKEN IN THE PERIOD JULY 2008 – MAY 2010

1.1 Meetings of the IHP National Committee

1.1.1 Decisions regarding the composition of the IHP National Committee

The composition of the Swedish IHP Committee is based on representation from the expert advisory committee at the Swedish UNESCO board, which based on cooperation between authorities coordinates the activities of the UNESCO scientific committee, Swedish Water House (SWH), the Swedish Hydrological Council (SHR), and the Swedish IHP Secretariate, for which the Swedish Meteorological and Hydrological Institute is responsible. The chairing of the Swedish IHP committee was in February 2009 shifted from Berit Arheimer (the authority cooperation group) to Karin Léxen (SWH). Since then, the committee has had the following composition:

Chair: Karin Lexén (SWH)
Secretary: Lotta Andersson (SMHI)
Other members: Berit Arheimer (the Authorities Expert Advisory Committe), David Gustafsson (SHR).

1.1.2 Status of IHP-VII activities

In addition to activities with involvement of the Swedish IHP committee, Sweden has continued to be actively involved in HELP (Hydrology for the Environment, Life and Policy), with two Swedish HELP basins (Emån and Motala Strom) as well as within the Thukela basin, South Africa in a joint project with University of Kwa Zulu Natal. This activity includes contributions towards the interaction between science and policy, as well as other interactions, such as water bodies and aquatic systems, and also coastal zone issues. The work in the Thukela basin is focused on climate and water.

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

In August 2009, a workshop was arranged with the aim to define strategies for the Swedish IHP committee and to decide which areas the work will focus on. In addition to the two areas, previously reported from Sweden:

1.1 *Global changes and feedback mechanisms of hydrological processes in stressed systems*
1.2 *Climate change impacts on the hydrological cycle and consequent impact on water resources),*

it was decided to also include:

2.1 *Cultural, societal and scientific response to the crises in water governance*
2.4 *Managing water as a shared responsibility across geographical and social boundaries*
5.3 *Water education in schools*
5.4 *Water education for communities, stakeholders and mass media professionals).*

It was also decided that a web site should be established. http://www.smhi.se/svenskaihp/. The web site is currently only available in Swedish.

1.2.2 Research/applied projects supported or sponsored

Supported by and partly with finance from Swedish IHP, SHR has coordinated Swedish activities related to the world water day both in 2009 and 2010.

The Swedish IHP has also supported and partly financed the work initiated by SHR with the aim to develop a Swedish hydrological dictionary. The background to this is that WMO:s international hydrological world book still is missing Scandinavian world lists.

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

Cooperation with national hydrological networks is ensured by the inclusion of the chairs of SHR and the Swedish Water House in the committee. Berit Arheimer is the Swedish rapporteur to IAHS (International Association Hydrological Sciences) which provides possibilities for identifying issues relevant to both IHP and IAHS and organize joint actions. SMHI represents Sweden in WMO, including work in the hydrological commission (CHy). Ways for exchanging information between the Swedish IHP committee secretariate and the Swedish representative in WMO (Cristina Edlund) have been established.

1.3 Participation in international scientific meetings

1.3.1 Participation in meetings abroad

UNESCO Workshop on Integrated Modelling Approaches to Support Water Resources Decision Making: Crossing the Chasm. April 2009, Paris.

Xth Kovacs Colloquium, Hydrocomplexity: New Tools for Solving Wicked Water Problems, July, 2010, UNESCO, Paris.

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2010

International Research Workshop (November 2010): The aim of the workshop is to gather Swedish and European groups that works with different models for assessment of nutrient loads, including source apportionment and scenario modeling (e.g. SWAT, INCA, Moneris, PCRaster, Mike Basin, and HYPE). The groups will be provided with data from the Söderköping catchment with the task to model water and nutrient flow. The aim is to assess how methods and strategies for how to design the work with the models will affect the results. The results will be reflected in the light of the need for input of work and other resources (modelers and monitoring efforts) needed. The workshop will emanate in a scientific paper and input to a dialogue meeting with authorities that work with the WFD.

The Swedish IHP committee is together with UNESCO-IHP, BGR, InWent, AGW-net, IAH and IAHS, co-convening the workshop *"Water Quality in Capacity Development: Policy Options and Practical Solutions in the*

National and Transboundary Context" at the World Water Week, September 2010.

2.2 Activities foreseen for 2011-2012

In early 2011, the modelling workshop will be followed up with an authority dialouge meeting, directed towards authorities and ohter stakeholders active in implementing the WFD, with empasis on the eutrophication issue.

As a follow up to the 2010 research workshop, a workshop aiming to assess the transferability of water quality models developed in and applied in temperate climate regions with rather good access to information will be arranged in 2011. Focus will be on a catchment in Africa, where lake Victoria has been suggested as a possible candidate.

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RAPPORT NATIONAL SUR LES ACTIVITES DU PHI

Abréviations

AFD	Agence Française de Développement
BAD	Banque Africaine de Développement
BEI	Banque Européenne d'Investissement
BIRH	Bureau d'Inventaire et de Recherches Hydrauliques
BRGM	Bureau de Recherches Géologiques et Minières
CAWTAR	Center for Arab Women Training and Research
CERTE	Centre de Recherches et Technologies des Eaux
CLIFA	Climat et Fonctionnement des Agro écosystèmes
CNEA	Centre National des Etudes Agricoles
DGRE	Direction Générale des Ressources en Eau
ENIT	Ecole Nationale des Ingénieurs de Tunis
FAE	Facilité Africaine de l'Eau
FEM	Fonds de l'Environnement Mondial
FEMIP	Facilité Euro Méditerranéenne d'Investissement et de Partenariat
FFEM	Fonds Français de l'Environnement Mondial
GTZ	Coopération Technique Allemande
IAM	Institut Agronomique Méditerranéen
INAT	Institut National Agronomique de Tunis
INRGREEF	Institut National de Recherches en Génie Rural Exploitation Eau et Forêt
IRD	Institut de Recherches pour le Développement
LISAH	Laboratoire d'études des Interactions Sol-Agro système-Hydro système
LMHE	Laboratoire de Modélisation Hydraulique et Environnement
MARHP	Ministère de l'Agriculture des Ressources Hydrauliques et de la Pèche
MEDD	Ministère de l'Environnement et de Développement Durable
ONAS	Office National de l'Assainissement
OSS	Observatoire du Sahara et du Sahel
PISEAU	Projet d'Investissement dans le Secteur de l'Eau
PNUE	Programmes des Nations Unies pour l'Environnement
PPM	Pays Partenaires Méditerranéens
SASS	Système Aquifère du Sahara Septentrionale
SEMIDE	Système Euro-méditerranéen d'Information dans le Domaine de l'Eau
SONEDE	Société Nationale d'Exploitation et de Distribution des Eaux
UMA	Union du Maghreb Arabe
UNESCO	United Nations Educational and Scientific and Cultural Organisation

1. ACTIVITES ENTREPRISES PENDANT LA PERIODE JUILLET 2008-MAI 2010

Consciente du rôle important du Programme Hydrologique International de l'UNESCO (PHI), la Tunisie a toujours porté 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 a pris part à plusieurs manifestations touchant à plusieurs aspects de l'hydrologie, l'hydrogéologie, l'éco-hydrologie, la gestion, la gouvernance et les changements globaux cadrant avec les différents objectifs, thèmes, projets et sous-projets du PHI-VII Dépendances à l'Egard de l'Eau.

1.1 Réunions du Comité National du PHI

En marge des diverses manifestations scientifiques auxquelles le Comité National Tunisien du PHI a contribué, des 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 les programmes des diverses interventions ainsi que pour commenter et superviser les différentes étapes du projet du PHI VII.

1.1.1Décision sur la composition du Comité National du PHI

La composition du Comité National a été élargie par des nouveaux membres dont les activités sont liées à la thématique du programme du PHI; elle se présente actuellement comme suit :

Nom/Prénom (s)	Activité au sein du Comité	Spécialité
Mr Hamza Mekki	Président	Sciences de l'eau
Mr Frigui Hassen Lotfi	Membre	Hydrologie
Mme Ben Mansour Hayet	Membre	Hydrologie
Mr Khanfir Rachid	Membre	Hydrogéologie
Ben Baccar Brahim	Membre	Hydrogéologie
Mr Abdelhadi Taoufik	Membre	Hydraulique
Mme Laatiri Raqya	Membre	Génie rural
Mr Farhat Habib	Membre	Hydrogéologie
Mr Gaaloul Noureddine	Membre	Sciences de l'Eau
Mr Zouari Kamel	Membre	Géologie
Mme Bargaoui Zoubeida	Membre	Hydrologie
Mme Bouhlila Rachida	Membre	Hydrogéochimie
Mr Maalel Khalifa	Membre	Hydraulique
Mr Lebdi Fethi	Membre	Hydrologie
Mme Tarhouni Jamila	Membre	Hydrogéologie
Mr Mourad Bedir	Membre	Géologie
Mr Younes Jedoui	Membre	Géologie
Mr Mahjoub Mohamed Raouf	Membre	Hydrologie
Mr Khattali Houcine	Membre	Agronomie
Mr Moncef Rajhi	Membre	Météorologie
Mr Gaubi Elyes	Membre	Hydrogéologie
Mr Chaieb habib	Membre	Hydrogéologie
Mme Yousra bensalah	Membre	Hydrogéologie
Mme Messai Awatef	Membre	Hydraulique

1.1.2 Bilan des activités du PHI-VII

Dans ce qui suit nous relevons les activités liées à la septième phase du PHI:

- L'étude de la qualité des eaux souterraines et maîtrise des sources de pollution continue 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 DGRE sur la question.
- L'étude relative à la révision et à l'amendement du code des Eaux confiée au Centre National d'Etudes Agricoles (CNEA) par la DGRE avec pour objectif de proposer une révision et une actualisation de l'ensemble de la législation sur l'eau : Code des Eaux et ensemble des textes relatifs à l'eau.
- Le mécanisme de concertation, de suivi et de coopération technique entre la Tunisie, la Libye et l'Algérie porte essentiellement sur le suivi, le contrôle, la gestion des ressources en eaux frontalières et la définition des indicateurs et des bases des données communes pour une gestion durable de la ressource.
- La gestion intégrée des ressources en eau de surface du bassin de la Medjerda axée sur la régulation et la protection contre les inondations avec le concours de l'Agence Japonaise de Coopération Internationale (JICA).
- Projet SASS III (Géo Aquifer):

Ce projet constitue la phase 3 du SASS, Il est réalisé sous la coordination de l'OSS en collaboration avec les trois pays partageant le SASS à savoir L'Algérie, la Tunisie et la Libye durant la période allant du mois de décembre 2008 au mois de novembre 2011.
Le projet SASS III financé par la FAE/BAD, le FEM/PNUE et le FFEM a comme objectif:

- ☞ Compléter la connaissance globale sur la ressource en eau par des données socio-économiques et environnementales sur la demande, les usages et composantes du coût de l'eau ;
- ☞ Démontrer en grandeur nature l'efficacité des organisations de gestion de l'eau et des solutions techniques d'irrigation ou de drainage à travers six pilotes ;
- ☞ Concevoir une stratégie de développement du bassin ;
- ☞ Mettre en place un système informatisé d'aide à la décision, faciliter les échanges et diffuser l'information.

La composante Géo Aquifer constitue la première phase du projet SASS III qui a démarré au mois de juin 2008 à Tunis et vient d'être clôturée au mois de novembre 2009 à Alger. Celle ci a permis de mettre à la disposition des pays un support cartographique des périmètres irrigués surtout dans les zones pilote identifiées par les pays. Ce support peut être exploité dans le cadre de la phase 2 du SASS III relative à la gestion durable des ressources en eau du SASS. Parmi ses résultats et produits, citons :

- ☞ les cartes d'occupation des sols à l'échelle du bassin (les cartes d'occupation des sols au 1/1000.000^{e} sur les zones témoins à deux dates différentes ; les cartes de changement d'occupation des sols au 1/50.000^{e} sur les zones témoins ; les cartes des plans d'eau au 1/50.000^{ème}
- ☞ les Modèles Numériques de Terrain (MNT) et les produits dérivés réalisés à 90m de résolution sur l'ensemble du bassin, et à 30m sur les zones témoins ;
- ☞ le Globe Virtuel (Le référentiel hydro-géographique et l'ensemble des cartes scannées ; le serveur cartographique en 2D mis en ligne et à partir duquel les produits du projet seront accessibles ; le globe virtuel mis en ligne) ;
- ☞ le renforcement des capacités : Le programme de formation a porté sur l'organisation de 6 sessions au niveau national ainsi qu'une session régionale en France.

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 du PISEAU II (Programme d'Investissement dans le Secteur de l'Eau, phase 2 : 2009-2013) groupant les composantes suivantes :

i) Gestion de l'irrigation
ii) Alimentation en eau potable
iii) L'appui de la gestion des eaux souterraines
iv) La protection de l'environnement
v) Le renforcement des institutions et des capacités

- Réflexion et montage d'un projet pilote dans le cadre des thématiques suivantes: l'Aménagement Efficient des Ressources en Eau (AERE). Coopération allemande-GTZ. Etude d'un projet pilote à Jendouba. 2009-2010.
- Réunion d'experts et atelier de réflexion sur la gestion durable des Ressources Hydriques (eau et assainissement) particulièrement en vue de l'initiation aux Etudes d'Impacts Sanitaires, parrainée par l'OMS. 2010.
- Contribution au séminaire international organisé par l'INRGREF sur la « Valorisation Agricole des Eaux Salées, des Eaux Usées Traitées et des Boues résiduaires ». 9-10 novembre 2009.
- Contribution à la réflexion et financement des projets de recherche avec le CERTE (Borj Cedria). Programme en continuation sur:
  - ☞ le phénomène d'entartrage des conduites en eau potable et en irrigation à partir des eaux géothermales, et sur
  - ☞ l'amélioration de la qualité de l'eau potable en milieu rural.
- Séminaire d'information sur les Systèmes Nationaux d'Information sur l'Eau en Méditerranée cas de la Tunisie : le SINEAU Tunis 18 mars 2010. Au cours de ce séminaire d'information qui a été ouvert par le Ministre de l'Agriculture, des Ressources Hydrauliques et de la Pêche a été présenté le futur Système d'Information National sur l'Eau qui s'inscrit dans une démarche fédératrice des institutions tunisiennes en matière de gestion de l'information sur l'eau et d'harmonisation au niveau de la région méditerranéenne.
- Participation active à la célébration de la Journée mondiale de l'eau au cours des années 2009 et 2010 et à la célébration de la Journée nationale de l'Economie d'eau années 2009 et 2010.
- Participation au congrès international Géo Tunis 2009.
- Participation aux X^{èmes} Journées de la Géologie Tunisienne organisées par l'Office National des Mines sous le thème « les cartes géologiques des risques naturels, outil de prévention, de protection et de développement » Tunis, 18/19 mai 2010.
- Participation au Salon Méditerranéen 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 L'IME (Institut Méditerranéen, de l'Eau).

1.2.2 Participation à des comités directeurs ou groupes de travail du PHI

1.2.3Projets de recherches de base ou appliquée, aidés ou patronnés

Le comité tunisien du PHI a participé aux projets de recherches suivants :

- Etude d'aide à la décision pour la Gestion Intégré des Ressources en Eau de la plaine d'El Haouaria (Cap Bon Tunisie) : Cette étude programmée dans le cadre du PISEAU1 est financée par l'AFD. Elle a pour objectif l'analyse et la synthèse de la situation actuelle du système aquifère ainsi que les prévisions d'évolution de la

demande en eau prenant en compte les paramètres socio-agro-économiques collectés et interprétés. La gestion de ce système aquifère sera assurée à l'aide d'un modèle d'aide à la décision qui permettra de tenir compte de l'état de son alimentation, son exploitation et la satisfaction des besoins en eau agricole et en eau potable.
Actuellement cette étude est sur le point d'achèvement avec la mise en place du modèle d'aide à la décision qui sera pris en charge et manipulé au niveau local et au niveau central.

- Projet d'étude de sensibilité des ressources en eaux de la région d'Aouja et Ghar El Meleh exposées aux effets de la salinisation et des changements climatiques.
- Participation au Projet régional SMAS/UMA/OSS. Système maghrébin d'alerte précoce à la sécheresse
- Etude sur un système d'Alerte Précoce pour la Gestion des Risques Liés aux Extrêmes Climatiques et à l'Evolution du Climat en Tunisie
- Projet SONEDE-INAT sur les règles de gestion des barrages et des réseaux d'eau potable.
- Gestion durable des ressources en eaux souterraines côtières-Modélisation physique et probabiliste. Application à la côte orientale du Cap Bon, Tunisie (CAP- BON)
- Projet de recherche Tuniso-Marocain entre le LMHE-ENIT et l'Université de Kénitra intitulé : Modélisation de la contamination des nappes et des sols agricoles par les nitrates : Application à des cas d'études au Maroc et en Tunisie. Période 2007-2009.
- Projet de partenariat pour un programme de Recherche-Action pour l'appui aux associations d'usagers de l'eau d'irrigation (dans 5 régions). Coopération française - AfD. Montage du projet en 2009. Mise en œuvre pour 5 ans.

1.2.4 Collaboration avec d'autres organismes ou programmes nationaux ou internationaux

- Convention d'application hydrologique entre l'IRD de Tunis et la DGRE (Tunisie) : une convention de collaboration scientifique dans tous les domaines concernant la connaissance, la gestion et la protection des eaux continentales, de surface et souterraines, en Tunisie. Ceci concerne en particulier les questions de :

  - ☞ l'observation hydrologique,
  - ☞ la variabilité hydrologique sous la double contrainte des fluctuations climatiques et des modifications environnementales, induites ou non par l'activité de l'homme ;
  - ☞ la dynamique, l'impact et la valorisation des hydro-aménagements, et plus largement la relation entre le milieu naturel et son exploitation durable par l'homme.
- Convention de collaboration de recherche entre le BRGM (France) et l'INRGREF (Tunisie) : une convention de collaboration scientifique qui vise à faciliter la concertation en développant des échanges réguliers en s'invitant à siéger dans les instances prévues à cet effet et s'inscrit dans le cadre :

  - ☞ du domaine de recherche de la « Gestion Active des ressources en eau » et de la « Recharge artificielle des nappes phréatiques à partir des eaux usées traitées ». du BRGM
  - ☞ du domaine de recherche de « Gestion locale des ressources en eau », focalisé sur le problème spécifique de la recharge artificielle des nappes à partir des eaux usées traitées, pour I'INRGREF.
- Projet SEMIDE : Réunion de travail relative au réseau de suivi SEMIDE. Séminaire international sur la gestion des bassins et la coopération dans la région Euro-méditerranéenne et Assemblée générale du réseau méditerranéen des organismes de (REMOB) 5-9/10/2009, Beyrout.

- Projet SEMIDE : Réunion du groupe de travail méditerranéen sur les pénuries en eau et la sécheresse en parallèle avec une réunion du groupe d'experts européens de la Directive Cadre sur l'Eau travaillant sur le même sujet. Madrid février 2010.
- Africain Water Cycle Symposium GEOSS Tunis Tunisia 6-9 January 2009.
- Contribution à l'élaboration de l'Etude financée par le FEMIP- Trust Fund (géré par la BEI) concernant le projet intitulé « Identification and Removal of Bottlenecks for extended Use of Wastewater for irrigation or for other Purpuses », au profit des Pays Partenaires Méditerranéens (PPM). Fin 2008-Janvier 2009. BEI.
- Programme d'Appui budgétaire aux politiques publiques, financé par l'Union Européenne. Il concerne la gestion durable des Ressources en Eau pour le développement rural et agricole (Montage du projet en 2009-2010 pour une durée de mise en œuvre de 4 ans).
- WASSERMED organise un Workshop sur ″Water-related security threats in the Marguellil catchment in Tunisia″, qui concerne 5 études de cas de la région méditerranéenne, financé par l'Union Européenne (1-2- juin 2010).
- Banque Mondiale/GEF: Montage (en 2009) du Projet de Gestion des Ressources Naturelles PGRN II.
- Montage des projets pour la promotion de la gestion participative. Différents financements sont accordés, selon les régions et les projets d'irrigation ou d'AEP:

  - ☞ KfW: Elaboration d'un cadre logique du projet et montage du projet au cours de l'année 2009. Démarrage des études de diagnostic des aspects réglementaires et démarrage de la mise en œuvre pour 8 régions concernant les projets AEP.
  - ☞ AFD- Montage d'un projet de renforcement de capacités pour la gestion des projets d'irrigation dans 15 régions. Démarrage de la mise en œuvre en 2010.
  - ☞ BAD –Projet de renforcement de capacités pour la gestion participative des projets d'AEP dans 12 régions. Démarrage de la mise en œuvre en 2010.
- PNUD Coca Cola /GEF : Projet de ″ Water Governance Program for Arab States″ appliqué à l'eau potable en milieu rural pour la mise à niveau de la gestion participative des usagers de l'eau. Démarrage du projet en mai 2010 pour une durée de trois ans.

1.2.5 Autres initiatives

1.3 Cours d'éducation et de formation

1.3.1 Contribution aux cours du PHI

1.3.2 Organisation de cours spécifiques

- Programme de Formation et session de réflexion pour l'Elaboration de Politiques Agricoles. Organisation de 3 ateliers de réflexion par la DG/Etudes et Développement Agricole du MARHP. Des experts nationaux et internationaux ont accompagné la réflexion. (Juin 2009 - Décembre 2009 - Mai 2010). Financement AfD.
- Programme de Formation sur les Audits des Systèmes d'Irrigation – Session de Mai 2010. Le programme continue avec l'IAM de Bari.
- Programme d'un voyage d'étude au profit de 20 étudiants d'Agro-Paris-Tech (de différentes nationalités) et 2 enseignants français en Tunisie du 13 au 20 juin 2010. Programme d'une Journée d'Information et de visites de terrain sur les aménagements hydrauliques du pays).
- Contribution à la formation de formatrices concernant l'approche GENRE et l'expérience tunisienne en matière de gestion des ressources hydrauliques. 2008 avec le Centre CAWTAR de recherche arabe sur la femme.

- Une formation continue est assurée pour la filière d'ingénieurs en hydrométéorologie à l'Ecole Nationale d'Ingénieurs de Tunis. Ces ingénieurs ont suivi un cursus les habilitant à travailler sur les thématiques du PHI.
- Une formation pour les hydrologues et les hydrogéologues de la DGRE a été assurée par les experts de la GWP – Méditerranée (Global Water Partnership) relative à la Gestion Intégrée des ressources en Eaux (GIRE)
- Organisation d'un atelier de formation au siège du Centre Régional de Télédétection de l'Afrique du Nord (CRTEAN) à Tunis du 05 au 09 avril 2010 sous la coordination du Centre en collaboration avec l'OSS, le Centre National de Télédétection et de Cartographie (CNTC) et la participation des ingénieurs du CNTC, de l'Algérie, la Tunisie et la Lybie. Cet atelier a pour but de montrer aux participants les méthodologies utilisées pour l'utilisation de l'imagerie satellitaire et la télédétection dans l'étude et le suivi des Ressources en eau.

1.3.3 Participation aux cours du PHI

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.

- Gestion des Aquifères Côtiers de Ghar El Melah :
  L'étude de la zone de Ghar el Melah entre dans le cadre du programme « Water Programme for Environnemental sustainability (WPAII)- financé par le Ministère de l'Environnement, Territoire et Mer d'Italie (METT).
  Ce projet de coopération internationale est coordonné par l'UNESCO et le Ministère de l`Agriculture et des Ressources Hydrauliques et de la Pêche (MARHP) et sera exécuté en collaboration avec le BIRH/DGRE, le CRDA de Bizerte, le Ministère de l'Environnement et de Développement Durable (MEDD) et l'Ecole Polytechnique de Turin.
  Il vise à la réalisation des cartes de vulnérabilité intrinsèque à la pollution et à la salinisation de l'aquifère côtier et l'évaluation du risque de pollution des eaux souterraines par les eaux de la lagune dans la zone de Ousja-Ghar el Melah située au Nord Est de Tunis.
- Réunion d'experts à Tunis pour une réflexion sur la Réutilisation des Eaux usées traitées en irrigation et dans la recharge des nappes phréatiques. UNESCO -20-21 Mai 2010.
- L'Organisation des Nations unies pour l'éducation, la science et la culture/Programme Hydrologique International (UNESCO/PHI) est le partenaire scientifique du projet SAAS qui est dans sa troisième phase et s'étale sur deux ans (2007-2009).

1.5 Publications

Les documents concernant les différentes manifestations présentés ci-dessus et qui ont été publiés sont :

- Caractérisation des événements extrêmes en Tunisie et possibilités de la maitrise des excédents pour une gestion durable de la ressource. Revue sur l'Etat de la ressource du Maghreb en 2009, UNESCO, PHI (Frigui H.L. Touzi S).
- Salinisation des eaux souterraines de la nappe phréatique de la Côte Orientale au nord-est de la Tunisie. Revue Géologues, N°159, pp.59-64. (Gaaloul N., Rekaya M., Jelassi F. 2008).
- Publication du 16 ème numéro de la revue interne des ressources en eau
- Séminaire international organisé par l'ONAS : Communications sur l'utilisation des eaux usées traitées (EUT) en agriculture, situation actuelle et perspectives. Le 17 février 2009.

- Projet WADIMENA- 24 octobre 2009:
  - ☞ Communications sur l'utilisation des eaux non conventionnelles en agriculture (EUT et eaux saumâtres).
  - ☞ L'expérience tunisienne en gestion communautaire de l'eau et des aménagements hydrauliques (WUA).

1.6 Participation aux réunions scientifiques internationales

1.6.1 Réunions tenues dans le pays

- Participation au colloque International "L'eau en Milieux Arides et Semi Arides: Apport des traceurs environnementaux à la gestion des ressources", avec une communication orale intitulée : Modélisation des écoulements des eaux souterraines, l'exemple du modèle du Cap Bon. 4, 5 et 6 Décembre 2008 - Sousse – Tunisie.
- Participation au séminaire international sur la Valorisation Agricole des Eaux Salées, des Eaux Usées Traitées et des Boues Résiduaires avec une communication orale intitulée : Les isotopes du bore, traceurs de la recharge artificielle des eaux souterraines de la nappe de Korba-Mida par les des eaux usées traitées. Organisé par l'INRGREF, 9-10 novembre 2009, Hammamet, Tunis.
- La gestion de risques en milieu urbain. Recherche par télédétection sur le ruissellement dans le bassin Essijoumi ». 31 congrès international de Géographie. Tunis le 12 au 15 Août, 2008. (Mejebri abdelletif, Med Raouf Mahjoub et Amor Mokhtar Gammar).
- Contribution a l'appréciation du ruissellement en milieu urbain : recherches sur le bassin versant d'Essijoumi (Tunisie). VII^{ème} Colloque du département de Géographie. Climats et Villes. Faculté des Lettres, des Arts et des Humanités. Université de Manouba. 5 – 8 Mars 2008 (Mejbri Abdellatif, Med Raouf Mahjoub et Amor Mokhtar Gammar,)
- Régionalisation et Estimation des débits spécifiques en Tunisie. 14ème Journée Nationale sur les acquis de la Recherche Agronomique. Hammamet, 06/ 07 Décembre 2008 (Mahjoub M.R., Ouasli A).

1.6.2 Participation à des réunions à l'étranger

- Participation de Mr Mekki Hamza au 5ème Forum mondial de l'eau, processus ministériel 4^{iéme} réunion préparatoire (PREPCOM4).UNESCO, 3-4 Mars 2009. Paris France.
- Participation de Mr Mekki Hamza au 5ème Forum mondial de l'eau Istambul, Turquie 16-22 Mars 2009.
- Visite technique sur le thème : Solutions pratiques face aux défis des ressources en eau, exemple de l'expérience espagnole 20-26 Juillet 2008.Saragosse, Almeria. Espagne.
- La 5^{ième} Conférence des directeurs de l'eau des Pays Euro Méditerranéens et de l'Europe du SUD-EST : Participation de Mr Ben Baccar Brahim, directeur des eaux souterraines à la DGRE (MARHP) à la 5^{ième} Conférence des directeurs de l'eau des Pays Euro Méditerranéens et de l'Europe du Sud-Est tenue à Cavouri-Athènes, Grèce, le 21 et 22 juillet 2008 **.**

  Cette réunion a pour but de préparer la conférence Ministérielle Euro Méditerranéenne sur l'eau qui aura lieu en Jordanie le 29 octobre 2008.

  Les directeurs de l'eau des Pays Euro Méditerranéens et de l'Europe du Sud-Est présents ont contribué aux discussions des ébauches des papiers thématiques pour la Conférence ministérielle sur l'eau qui a abordé les thèmes suivants:

  (i) la gouvernance de l'eau en Méditerranée,

  (ii) l'intégration de la dimension du changement climatique dans la gestion des ressources en eau en Méditerranée,

  (iii) l'optimalisation du financement de l'eau,

(iv) la gestion de la demande en eau, l'utilisation rationalisée et les ressources hydriques non conventionnelles

- La conférence ministérielle Euro-méditerranéenne sur l'eau :
  Participation de Mr Brahim Ben Baccar, directeur des eaux souterraines à la DGRE (MARHP), à cette conférence ministérielle sur l'eau tenue le 22 décembre 2008 à la mer morte en Jordanie, co-présidée par la France, l'Egypte et la Jordanie.

- Participation de Mr Mekki Hamza à la conférence conjointe de l'Egypte et des Pays Bas sur l'eau « Vers une nouvelle stratégie de long terme pour l'eau en Méditerranée ».Second meeting des groupes d'experts sur l'eau (WEGII) 2-3 Novembre 2009. Caire Egypte.
- Participation à la Première Conférence des Ministres Responsables de la Météorologie en Afrique qui s'est tenue à NAIROBI (Kenya) 12-16 avril 2010.
- Participation de Mr Mekki Hamza à la 4ème conférence ministérielle Euro-méditerranéenne sur l'eau Barcelone (Espagne) 12-13-14 Avril 2010.(Stratégie méditerranéenne de l'eau).
- Participation à l'atelier sur l'étude de faisabilité d'une méthodologie de modélisation à l'échelle globale du bassin versant de la Medjerda (Liège – Belgique) du 24 au 31/01/2009.
- Participation à l'atelier sur les ressources en eaux frontalières tuniso-algériennes dans le cadre de la Commission Technique Tuniso-Algérienne de l'Hydraulique et de l'Environnement, 19-21 octobre 2009.
- Participation de Mr Chaieb Habib à la réunion des directeurs de l'eau des Ministres Arabes concernés par les ressources en eaux souterraines communes et la législation internationale tenue à Damas 2009
- Participation à la 60ème session du conseil exécutif de l'Organisation Météorologique Mondiale (OMM) Genève (Suisse) Juin.2008.
- Participation de Mr Mekki Hamza à la première réunion du Conseil Ministériel Arabe de l'Eau Alger 29-30 Juin 2009.

1.7 Autres activités

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 Tunisien et le Royaume d'Espagne, un projet relatif à la gestion intégrée des ressources en eau souterraines- cas de la plaine du Cap Bon au Nord Est de la Tunisie a été établi entre l'Institut National de Recherches en Génie Rural, Eaux et Forêts (INRGREF),l'Université Polytechnique de Barcelone (Espagne), la DGRE et le CRDA de Nabeul entant que partenaires.
- Dans le cadre de la coopération bilatérale, la DGRE a reçu les délégations du Tchad de la Palestine du Mali et de la Mauritanie pendant la période 2008-2009.

1.7.2 Projets scientifiques achevés ou en cours

- Régionalisation de l'envasement des lacs collinaires- cas de la dorsale tunisienne**.**
- Contribution à l'étude d'impact du semis direct : Effets sur le ruissellement et l'érosion
- Maitrise des crues dans le tronçon aval du bassin de la Medjerda
- Evaluation des impacts des aménagements hydro-agricoles sur les ressources en eau (quantité et qualité) dans le bassin versant du Merguellil, en collaboration avec l'Unité Mixte de Recherche UMR G-eau (Montpellier).

- Etude des impacts des aménagements sur la ressource en eau (bassin versant de Lebna), en collaboration avec LISAH (Montpellier).
- Variabilité climatique et vulnérabilité des écosystèmes méditerranéens en Tunisie septentrionale en collaboration avec l'Unité de Recherche CLIFA (Montpellier) projet CORUS (2007-2009).

2. ACTIVITES FUTURES

2.1 Activités planifiées avant décembre 2010

La DGRE et le BRGM ont signé au mois de mai 2010 une Convention cadre pour travailler ensemble (1) au développement d'actions de connaissance et de valorisation d'une coopération institutionnelle, méthodologique et technique pour la réalisation d'études et de projets dans les domaines de la connaissance, de la préservation, du développement et de la gestion des ressources en eaux souterraines et de surface, conventionnelles ou non, et (2) à la mise en place d'outils et de méthodes pour leur gestion et leur utilisation, l'échange d'expériences mutuelles en études et en recherches hydrogéologiques mais aussi dans le cadre d'études socio-économiques valorisant les usages des ressources en eau souterraine.

Dans ce cadre, un projet commun visant la «Gestion des Aquifères Côtiers des oasis de Gabès» est cofinancé par le FFEM, la République Tunisienne et le BRGM. La finalité globale du projet proposé est de protéger les aquifères côtiers et l'environnement littoral en Méditerranée. Pour cela le projet se base sur l'étude des aquifères côtiers de la région de Gabès et des oasis côtières qui en dépendent avec l'objectif d'établir une démarche intégrée de gestion globale des ressources en eaux souterraines. Cette démarche de gestion doit pouvoir être reproductible à d'autres sites d'aquifères côtiers méditerranéens. Ainsi les méthodes et outils qui seront développés dans ce projet ont aussi pour objectif d'être, moyennant adaptations appropriées, applicables ailleurs sur le pourtour méditerranéen.

- Projet WALL (WATER AND LAND LEGACY) : Lutte contre la désertification : techniques locales en faveur d'une utilisation efficace des ressources hydriques et des sols ; utilisation durable des nappes aquifères et implication des acteurs locaux pour une meilleure utilisation des ressources.
- UE- Coopération transfrontalière dans le cadre de l'instrument Européen de Voisinage et de Partenariat (IEVP). Décision CE C(2008) 4242. Projet intitulé ″Systèmes intégrés de gestion de l'eau d'irrigation dans les bassins méditerranéens. Etude de cas. Montage du projet en 2008- Sur 36 mois.
- Wetlands programme- Projet de Recherche-Action sur ″le Genre et la gestion des ressources en eau en milieu rural dans le bassin versant de l'Ichkeul″ . En cours de mise en œuvre: 2009-2010.

2.2 Activités prévues pour la période 2010-2011

- Démarrage du projet : Impact in Aquifer media and Soils of non-conventional water (treated-desalinated) use and sewage sludge application: laboratory and field investigations, qui est soumis pour financement dans le cadre du programme Plan Nacional de I+D+i émanant du Ministère des Sciences et de l'Innovation de l'Espagne de l'Université Polytechnique de Catalogne et l'INRGREF et CRDA de Nabeul.
- Coopération Japonaise: Partnership for sustainable development within «Cool Earth Partnership Mecanism». Mai 2010. En cours de négociation.

2.3 Activités envisagées à long terme

- Gestion des Aquifères Côtiers des oasis de Gabès : Ce projet exécuté conjointement par le BRGM, DGRE et le CRDA de Gabès durant la période de 2010-2013.
- Réflexion et montage d'un projet relatif aux ressources en eau partagées (CNTC, CRTEAN, DGRE)

TURKEY NATIONAL REPORT ON IHP RELATED ACTIVITIES
July 2008 – May 2010

1. ACTIVITIES UNDERTAKEN IN THE PERIOD July 2008 - May 2010

1.1 Meetings of the IHP National Committee

Regularly, IHP National Committee of Turkey meets two times every year. However, the Committee members keep the contact using the facility of e-group. During the related period, two meetings have been 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 Relations, established 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. It is envisaged that during IHP-VII phase, in the light of experience gained from the previous stages, the UN Millennium Development Goals, the number of projects about the socio-economic aspects of water management, health, eco-hydrology and ground water would be increased.

In this context, it is an idea that the preparatory process for the 6th 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 2008-2010.

- Sessions related to UNESCO were held during the 5th World Water Forum as follows:

UNESCO-IHP was the Coordinator:
Topic 6.2: Water Science and Technology: Appropriate and Innovative Solutions for the 21st Century to Address the Needs of Society

UNESCO-IHP was the Convener:
Session 6.2.4: Wrap-Up and Synthesis
Session 6.5.1: Cultural Diversity: Key to Water Sustainability
Session 6.5.2: Water and History: Understanding the Water Cultures of Past Civilizations and Deriving Lessons for the Present

UNESCO-IHP representatives were the panelists:
Topic 1.1: Adapting to Climate Change
Session 1.1.2: Can We Plan Our Way to Adaptation?
Session 1.2.2: Rural to Urban Migration "Rural Migrants in Urban Slums: Dreams Fulfilled or the Beginning of a Nightmare?"
Session 6.2.3: Integrated Water Management: Can We Get There?
Session 6.2.4: Wrap-Up and Synthesis
Session 6.4.1: Data Needs and Data Acquisition

UNESCO-IHE Institute for Water Education was the Coordinator:
Topic 6.1: Education, Knowledge and Capacity Development Strategies

UNESCO-IHE Institute for Water Education was the Convener:
Session 6.1.0: Opening Plenary
Session 6.1.3: Get Involved! Whose and What Empowerment will ensure the Provision of Sustainable Water Services?
Session 6.2.2: Decision Making in an Uncertain World: Achieving Greater Use and Impact of Research through the Learning Alliance Approach and Other Multi-Stakeholder Approaches

UNESCO-IHE Institute for Water Education was the Co-convener:
Session 2.3.2: How Can Food Market Measures Boost Rural Development and Poverty Alleviation?
Session 6.2.3: Integrated Water Management: Can We Get There?

UNESCO-IHE Institute for Water Education representatives were the panelists:
Session 1.2.1: Rural to Rural Migration "Imbalances between Water, Land and People: The Drivers of Rural Migration"
Session 1.3.1: Trialogue Session: Building Bridges between Government, Science and Civil Society
Session 1.3.3: Managing Water Related Risks in Changing Climate
Session 6.2.4: Wrap-Up and Synthesis

- The National Committee IAHS-related Turkish National Hydrological Commission (TNHC) meeting will be held during the 6th National Congress of Hydrology, 22-24 September 2010.

1.2.2 Participation in IHP Steering Committees / Working groups

IHP Financial Committee Report Annex-I for current IHP Implementation Phase to the forthcoming Bureau meeting has been prepared with collaboration. The draft summary of the feedbacks is available.

1.2.3 Research/applied projects supported or sponsored

1.2.4 Collaboration with other national and international organizations/programs

1.2.5 Other initiatives

In the year of 2010, the celebration of World Day of Water, March 22nd, was held with the theme of 2010 "Clean Water for a Healthy World".

During the celebration programme, 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 Water Day 2010, with the theme of "Clean Water for a Healthy World" was celebrated by Ministry of Environment and Forestry. For the purpose of celebrating World Day of Water, 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.

On the other hand, World Water Day 2010 was celebrated in Afyon Province together with World Forestry Day and World Meteorology Day at the beginning of a national meeting held on flood. After the celebration, 2nd National Flood Symposium was hold with participation of experts from different sectors, 157 academicians and students from various universities, local administrators and representatives of public administration and public institutions. 1530 people participated in the symposium.

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

1.3.2 Organization of specific courses / seminars

1.3.3 Participation in IHP courses

1.4 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.

A discussion meeting was held for the feasibility study of the proposal to establish a category-2 centre in Ankara, Turkey under the auspices of UNESCO. The name of the proposed centre is "Regional Centre of International Training and Research on Sediment, Isotope and Erosion Techniques". The discussions were held at DSI and the draft document for the feasibility was discussed. It was felt that DSI would need a new legislation and legislative efforts in order to establish such center.

1.5 Publications

- Determination of Groundwater-Surface Water Relation in Develi Closed Basin by Using Environmental Isotopes (F.Ebru YILDIZ, Alime Temel DİLAVER, İbrahim GÜRER, Nail ÜNSAL, Serdar BAYARI, Selami TÜRKİLERİ, Sedat ÇELENK)
- Groundwater Investigation and Management Project Studies in Edremit Basin (Zeynep AKTUNA, Tolga YALÇIN, Alime T. DİLAVER, M. T. SAFA, Cengiz SAĞNAK)
- Measuring Oxygen-18 And Deuterium Isotopes in Waters by Using Isotope Ratio Mass Spectrometer Dual Inlet System (Hasan DENİZ, Nermin DOĞAN, Alime TEMEL DİLAVER)
- GURER, I., YILDIZ, F.E., 2008, "Water Management for Sultansazlığı Wetland at Develi Closed Basin", Küresel Isınmanın Su Kaynaklarına, Havaya, Doğal Yaşama ve Erciyes Dağı'na Etkileri Paneli, 7-9 March 2008, Erciyes, Kayseri.
- GURER, I., YILDIZ, F.E., 2008, "General Overview of the Wetland Politics of Turkey, Case Study: Sultansazlığı Wetland Region", TMMOB 2. Water Politics Congress, 20-22 March 2008, Ankara.
- GURER, I, YILDIZ, F.E., 2008, "Current Rainfall Network Level Of Turkey at 2008", BALWOIS 2008-Ohrid, REPUBLİC OF MACEDONIA-27,31 May 2008
- GURER, I, YILDIZ, F.E., 2008, "Determination Of Groundwater - Surface Water Relation By Using Environmental Isotopes At Sultansazlığı Wetland-Turkey", BALWOIS 2008- Ohrid, REPUBLİC OF MACEDONIA-27,31 May 2008.
- GURER, I., YILDIZ, F.E., KORKUT, E., 2008, "Hydrogeology and Water Chemistry Analaysis at Sultansazlığı Wetland", Wetlands Conferences, 10-12 July 2008, Kayseri.

- YILDIZ, F.E., DILAVER, A., GURER, I., UNSAL, N., BAYARI, S., TURKILERI, S., CELENK, S., 2008, "Determination of Groundwater-Surface Water Relation in Develi Closed Basin by Using Environmental Isotopes", III. Symposium on the Use of Isotope Techniques in Hydrology, 13-17 October 2008, İstanbul.
- UNSAL, N., YILDIZ, F.E., GURER, I., 2008, "Groundwater Chemistry Analaysis at Develi Closed Basin", Symposium on Water-Energy-Health, 20-23 October 2008, Aksaray.
- Gurer, I., Yildiz, F.E., Ucar, I., Gurer, N., 2009, "Water Resources Management of the Wetlands in Turkey", Dahlia Greidinger International Symposium on Crop Production in the 21th Century : Global Climate Change, Environmental Risks and Water Scarcity, 2-5 March 2009, Haifa, Israel
- GURER, I., UNSAL, N., YILDIZ, F.E., 2009 "Determination Of Surface Water-Groundwater Relationship At Develi Closed Basin", IV. National Water Engineering Symposium, 06-10 July 2009, İstanbul
- YILDIZ, F.E., GURER, I., 2009 "An Integrated Water Resources Management of Develi Closed Basin in Kayseri – Türkiye", G.U. Journal of Science, 22(3): 203-213, Ankara
- GURER, I., UCAR, I., 2009, "Flood Disasters' Inventory in Turkey in 2009", International Symposium on Water Management And Hydraulic Engineering, 1-5 September 2009, Ohrid/Macedonia.
- GURER , I., 2009, "Current Level of Rainfall and Snow Observation Network of Turkey", 1st International Congress of Hydroclimatology, 24-28 August 2009, Cochabamba/Bolivia.
- Ucar, I., Gurer, I., 2009, "Modeling of Flood Plain Areas, Case Study: Trabzon-Maçka", II. National Flood Symposium, 22-24 March 2010, Afyonkarahisar (Original in Turkish).

1.6 Participation in international scientific meetings

Various international scientific meetings were attended or organized by the related organizations and Universities.

1.6.1 Meetings hosted by the country

- 3rd National Symposium on Isotope Techniques in Hydrology (13-17 October 2008 –ISTANBUL) The Symposium was organized by General Directorate of State Hydraulic Works (DSI) Technical Research and Quality Control Department, International Atom Energy Agency (IAEA) and UNESCO-IHP.

1.6.2 Participation in meetings abroad

- UNESCO International Hydrological Programme Meeting of Region 1, Europe and North America 24-25 September 2009 Hosted by the IHP United States National Committee at the National Academy of Sciences, Washington, DC 20001, USA.

1.7 Other activities at a regional level

1.7.1 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
- EMWIS
- UfM (Union for Mediterranean)
- WWC (World Water Council)

1.7.2 Completed and ongoing scientific projects

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2010

- Organization of 6th National Hydrological Congress, 22-24 September 2010, planned by Civil Engineering Department, Pamukkale University, Denizli, Turkey.

2.2 Activities foreseen for 2011 - 2012

- Second Istanbul Water Forum 2011
- 4th National Symposium on Isotope Techniques in Hydrology 2011

2.3 Activities envisaged in the long term

- During this period, Statistical Hydrology Working Group "Hidroist" was formally established. A flyer of Hidroist was prepared and distributed to relevant people via email. A participant list has been generated based on e-mail responses. For the near future, it is planned to bring people together during the VI. National Hydrological Congress that will take place in Denizli, Turkey in September 22-24, 2010. Also for the future, it is planned to construct a web-site for the Hidroist working group. The group will also spend effort to find financial support to establish a one-week course on use of Statistics in Hydrology mainly for young researchers.

- In the long term, it is proposed to be more effective in improving the way that the national hydrological community would be well organized under the leadership of DSI.

NATIONAL REPORT ON IHP RELATED ACTIVITIES FOR THE 19TH SESSION OF THE IHP INTERGOVERNMENTAL COUNCIL

PARIS, JULY 2010

UNITED KINGDOM

1. ACTIVITIES UNDERTAKEN IN THE PERIOD JULY 2008 – MAY 2010

1.1 Meetings of the IHP National Committee

1.1.1 Decisions regarding the composition of the IHP National Committee

Two meetings of the United Kingdom National Committee for the IHP were held during the reporting period; on 6 March 2009 and 3 March 2010. Since its formation in 2007 (through the merger of the UK National Committee for the IHP and the UK Inter-Departmental Committee on Hydrology) the *UK Committee for National and International Hydrology* (UKCNIH) has acted as the UK National Committee for the IHP. The committee comprises representatives from UK bodies with a major stake in hydrology and water resources research; the current organisations represented are detailed in Table 1.

Table 1 Representation on the *UK Committee for National and International Hydrology* (as of May 2010)

Natural Environment Research Council (NERC)
Centre for Ecology and Hydrology (CEH)
Department of the Environment, Food and Rural Affairs (DEFRA)
Department for International Development (DFID)
Department for Transport (DfT)
Welsh Assembly Government
Scottish Government
Northern Ireland Environment Agency (NIEA)
Department of Agriculture and Rural Development, Northern Ireland (DARDNI)
Scottish Environment Protection Agency (SEPA)
Environment Agency (EA)
Met Office
British Geological Survey (BGS)
IHP Flow Regimes from International Experimental and Network Data (FRIEND)
IHP Hydrology, Environment, Life and Policy (HELP)
IHP Water and Development Information for Arid Lands (G-WADI)
IHP International Sedimentation Initiative (ISI)
UK interests in UNESCO Ecohydrology projects
UNESCO Centre of Water Law, Policy and Science, Dundee
UK Committee of the International Association of Hydrological Sciences (IAHS)
UK in WMO Commission for Hydrology (WMO-CHy)
British Water
UK Water Industry Research (UKWIR)
British Hydrological Society (BHS)

The Natural Environment Research Council (NERC) Centre for Ecology and Hydrology (CEH) continues to provide the UK IHP secretariat with Professor Alan Jenkins remaining as chair of the UKCNIH and Dr. Harry Dixon replacing Gwyn Rees (in 2009) as its secretary.

1.1.2 Status of IHP-VII activities

IHP-VII Themes:

The UK is able to contribute towards IHP activities through a number of current research programmes at a national and international scale. Table 2 outlines a number of examples of activities by UK researchers pertinent to Phase VII of the IHP.

Table 2 UK participation in/contribution to IHP-VII

THEME 1: ADAPTING TO THE IMPACTS OF GLOBAL CHANGES ON RIVER BASINS AND AQUIFER SYSTEMS	
Focal Area 1.1	Quantification of land-surface/climate feedbacks at different scales using the Joint UK Land Environment Simulator (JULES); focus of West Africa and northern India through the European Union Sixth Framework Programme for Research and Technological Development (EU-FP6) Integrated Project Water and Global Change (WATCH). Other activity includes: evaluation of regional simulations of snow cover by a land-surface model and investigation of the effects of climate change on soil erosion. *Centre for Ecology and Hydrology / UK Met Office* Research on the Tweed HELP basin, Scotland, to refine knowledge of the efficacy of natural techniques in sustainable flood management and to develop scenarios which couple land cover change vis-a-vis climate change impact on surface water-groundwater interactions across scales. Specific activities include headwater catchment flow monitoring and modelling the hydrological effects of river channel restoration. *Dundee UNESCO IHP-HELP Centre*
Focal Area 1.2	Analyse to quantify and predict components of the current and future global water cycle and related water resources states. Evaluation of uncertainties and clarification of overall vulnerability of water resources related to societal and economic sectors. Specific activities include; continued development of an improved model for assessment of global and regional water resources (Global Water Availability Assessment model, GWAVA); application of GWAVA to assess impacts of changing climate and water demands across South America (EU-FP6 project TWINLATIN); ongoing applications focusing on European (EU-FP6 project SCENES) and global assessments (EU-FP6 project WATCH). *Centre for Ecology and Hydrology* Research into improved rainfall disaggregation methods, and impact on floods and water resources, particularly groundwater dominated systems. *Imperial College London*
Focal Area 1.3	Research into the effects of rural land management on flooding, groundwater flooding, and new tools for urban flood management as part of the UK NERC Flood Risk from Extreme Events (FREE) research programme and the UK Engineering and Physical

	Sciences Research Council (EPSRC) Flood Risk Management Research Consortium (FRMRC). *Imperial College London* Dissemination of the results of the EU-FP6 funded project BRAHMATWINN, enhancing capacity to carry out a harmonised integrated water resources management approach in headwater river systems of alpine massifs already impacted from climate change. *Dundee UNESCO IHP-HELP Centre* Legal input into the WMO/GWP Associated Programme on Flood Management. Contribution to WMO HelpDesk for Integrated Flood Management by provision of legal support to Member States through the HelpDesk mechanism. *Dundee UNESCO IHP-HELP Centre* Quantification of the social and economic impacts of floods and droughts in light of anticipated or predicted changes in land-use and climate. Example activities include: Evaluation of the association between weather types and flood occurrence across Europe (European Union COST-733 Action). Analysis of river flow drought frequency, extend and spatial coherence, including the generation of a catalogue of hydrological and meteorological droughts across Europe (contributions under EU-FP6 project WATCH). Development of national approach for assessing the impacts of climate change on high river flow across Britain, underpinning national policy on climate change for the Flood Management community. *Centre for Ecology and Hydrology*
Focal Area 1.4	Research in palaeohydrology and renewable/non-renewable resources and management and related policy issues. *Oxford University* Membership of the scientific committee for UNESCO ISARM conference on Transboundary Aquifers providing legal input. *Dundee UNESCO IHP-HELP Centre* Research into the responses of European groundwater systems to climate change and land use impacts as part of EU Seventh Framework Programme (EU-FP7) project, GENESIS.
Focal Area 1.5	Research into climate change effects in Yemen and contributions to International Conference on Water Resources and Climate Change in the MENA Region (Muscat, 2008). *Imperial College London*
THEME 2: STRENGTHENING WATER GOVERNANCE FOR SUSTAINABILITY	
Focal Area 2.1	Co-convened a Transboundary Water seminar with UNESCO Paris at the Stockholm World Water Week (2009), involving broad range of global stakeholders; involvement in several panels at the Stockholm Water Week including UNU-INWEH panel on Shared Lakes and Governance. *Dundee UNESCO IHP-HELP Centre*
Focal Area 2.2	Development and dissemination of results of comparative studies into governance, legal regimes for good water governance, and indicators for governance, working with stakeholders at basin and

	global scales. (EU-FP6 projects: BRAHMATWINN and STRIVER; EU-FP7 projects: LIVEDIVERSE and GENESIS). These projects build capacity and develop better legal and administrative frameworks. *Dundee UNESCO IHP-HELP Centre* Technical assistance to the Government of India to address the issues of intra-sectoral water demands and overall water resource planning and management (World Bank Indian Hydrology Project Phase II). *Centre for Ecology and Hydrology*
Focal Area 2.3	Provision of input to World Economic Forum through Global Agenda Council on Water Security regarding the economic importance of water, so as to enhance financing in the sector (Dubai WEF summit; Davos Economic Summit). *Dundee UNESCO IHP-HELP Centre*
Focal Area 2.4	Research to develop methods for assessing and strengthening governance arrangements at the international (transboundary) level (EU-FP6 projects BRAHMATWINN and STRIVER; EU-FP7 project LIVEDIVERSE). Evaluation of the role and relevance of the 1997 UN Watercourses Convention in strengthening the management of international watercourses as a shared responsibility, in collaboration with World Wildlife International and other international partners. *Dundee UNESCO IHP-HELP Centre*
Focal Area 2.5	Jointly convened a conference on the *Intersections for Energy and Water Law* (Calgary, 2009) with University of Calgary and McGeorge University to look at water/energy nexus in a number of watersheds around the world. *Dundee UNESCO IHP-HELP Centre*
THEME 3: ECOHYDROLOGY FOR SUSTAINABILITY	
Focal Area 3.1	Research into the ecology & conservation of East African soda lakes and fauna. *University of Leicester* Assessment of the capabilities of alternative land covers on the landscape hydrology through an integrated science perspective (surface water-groundwater-ecohydrology). *Dundee UNESCO IHP-HELP Centre* Qualitative estimates of the environmental impacts of scenarios of future climate and water demand at a pan-European scale (EU FP6 project SCENES). *Centre for Ecology and Hydrology*
THEME 4: WATER AND LIFE SUPPORT SYSTEMS	
Focal Area 4.1	Research into the management of agrochemicals in a Scottish HELP basin. *Dundee UNESCO IHP-HELP Centre*
Focal Area 4.3	Further development of integrated urban water management; including institutional strengthening of the African Municipal water companies in order to address the Millennium Development Goals. *Imperial College London*

Focal Area 4.4	Major experimental and modelling study on impacts of rural land management on flooding (NERC FREE research programme and EPSRC FRMRC). *Imperial College London*
THEME 5: WATER EDUCATION FOR SUSTAINABLE DEVELOPMENT	
Focal Area 5.1	Numerous tertiary water education and professional development activities are provided in the UK by a range of academic institutions. Examples of particular relevance to the IHP include: Master of Laws courses in *Water Law* and *Water Governance and Conflict Management* (taught at Dundee UNESCO IHP-HELP Centre and UNESCO IHE). Masters degree in *Water Resources Management and Law* with the United Nations University Institute for Environment and Health (to commence in January 2011). Short courses and training provision are provided at tertiary and professional level. *Dundee UNESCO IHP-HELP Centre*
Focal Area 5.2	Contributions to a training needs assessment of staff responsible for hydrological data in Lake Victoria basin (Lake Victoria Basin Commission/World Bank Project). Capacity building of hydrological staff in state ministries as part of World Bank Indian Hydrology Project Phase II. *Centre for Ecology and Hydrology* Professional training on water regulation for Malawi delegation; devising a new multi-sector regulatory framework for water and energy. *Dundee UNESCO IHP-HELP Centre*

The UK continues to play an active role in the cross-cutting and associated programmes of the IHP. Current involvement includes that detailed below.

Cross-Cutting Programmes:

FRIEND

The UK continues to play a leading role in the FRIEND Programme providing support and research contribution to FRIEND initiatives worldwide through the activity of many hydrologists from across the country. Gwyn Rees (CEH) represents UK interests on the Steering Committee of EURO-FRIEND, and is member of the Steering Committee of HKH-FRIEND. Dr. David Hannah (University of Birmingham) coordinates the Project Group 3 (Large Scale Variations) of EURO-FRIEND, one of four sub-projects of EURO-FRIEND. Helen Houghton-Carr (CEH) continues to represents the UK on the Steering Committee of Southern Africa FRIEND while Harry Dixon (CEH) acts as a Regional Coordinator of the EURO-FRIEND European Water Archive (EWA).

UK scientists have participated in a range of FRIEND activities over the reporting period, including:

- David Hannah, Gwyn Rees and Harry Dixon attended the EURO-FRIEND workshop on the European Water Archive, at the Federal Institute of Hydrology, Koblenz, Germany (2008).
- Lectures on Hydrological Data Management were given by Gwyn Rees at the WATCH Summer School on Hydrological Droughts (Trieste, Italy, 2008).

- Several UK scientists attended the FRIEND workshop on Low Flow and Drought at the Comenius University, Bratislava (Slovakia, 2008).
- David Hannah and Christel Prudhomme (CEH) convened session at the 2009 General Assembly of the European Geophyical Union (EGU) on *Large-scale hydrology: understanding and predicting hydrological variations*.

Several UK scientists plan to attend the forthcoming 6th International FRIEND Conference, *Global Change: Facing Risks and Threats to Water Resources*, to be held in Fez, Morocco, October 2010 and David Hannah is a member of the International Organising Committee.

Significant UK research contributions to the FRIEND programme have been conducted over the reporting period, examples of which include:

- Investigation of the role of basin properties as modifiers of climate signals in river flows (*CEH/University of Birmingham*).
- Research focusing on the impact of large-scale climate-hydrology interactions on the UK, Turkey and Mediterranean (*CEH/University of Birmingham*).
- Study of the spatial coherence of drought in Europe using indicators of rainfall and stream flow deficit (*CEH/Walker Institute, University of Reading/JBA Consulting*).
- Research evaluating the association between circulation types and flood occurrence across Europe. Relationships were assessed using data from the FRIEND European Water Archive and circulation types from weather type catalogues developed within the EU COST-733 Action (*CEH*).

HELP

The Dundee IHP HELP Centre for Water Law, Science and Policy, a Category 2 Centre under the auspices of UNESCO, is the European Regional Coordinating Unit for the HELP programme. In coordinating the European HELP Basins, the centre seeks to actively engage with the HELP agenda in the UK and Europe.

Over the reporting period UK activities in relation to HELP have included:

- Dr Sarah Hendry and Dr Alistair Rieu-Clarke (University of Dundee) contributed to the HELP seminar *Strengthening Water Governance for Sustainability* (Evora, Portugal, 2009).
- A workshop on *Water Management for Development* was held as part of a wider meeting hosted by UNESCO Scotland on *Good Practice in International Development* (Edinburgh, 2009).
- Sarah Hendry published an article in the Journal of Water Law, looking at how water law, policy and science are combined under a HELP approach.
- Sarah Hendry and Professor Mike Bonell visited some of the active UK HELP basins in 2009 to develop possible research agendas and improve communication amongst the basins.
- To mark the 2010 World Water Day the Dundee IHP HELP Centre (with the support of UNESCO Scotland) hosted a successful interactive online e-conference entitled *Scottish HELP Online Pilot Project: Interactive Ning Gathering (HELP-SHOPPING)* (March 2010).
- The University of Leicester (Dr David Harper) continue to jointly coordinate two HELP basins, the Welland (UK) and Lake Naivasha (Kenya).

Other active HELP basins within the UK include; the Don, Eden, Tweed, Dee and Thames.

Associated Programmes:

G-WADI

The involvement of UK scientists in the development of the G-WADI programme continued between 2008 and 2010. Professor Mike Edmunds (University of Oxford) and Professor Howard Wheater (Imperial College London) continue to serve on the G-WADI steering committee and have been involved in coordination of activities in Asia, Africa, Middle East and North Africa and South America. UK contributions over the reporting period include:

- Mike Edmunds has led an initiative promoting the formation of an African G-WADI and development of activities in the science to policy areas.
- Howard Wheater has led the promotion of Groundwater Modelling activities, including co-editing a forthcoming book on *Groundwater Modelling in Arid and Semi-arid Areas* (Wheater, H.S., Mathias, S.A., and Li, X., (eds.), 2010, International Hydrology Series, Cambridge University Press/IHP, in press). This publication results from the 2007 G-WADI workshop (Lanzhou, China).
- Both Mike Edmunds and Howard Wheater contributed to the recent G-WADI workshop on *Water – Science, Policy and Capacity Building* (Dakar, April 2010), supporting capacity development in Sub-Saharan Africa.

ISI

The UK has maintained involvement in ISI over the reporting period. Professor Des Walling (University of Exeter) continues to act as a member of the ISI Steering Committee and is actively involved in several ongoing ISI activities. He is a member of the recently formed ISI Core Steering Group and attended its first meeting in March 2010 (Bern). Other recent UK contributions have included:

- On behalf of ISI, Des Walling contributed a section on Erosion and Sediment Loads to the 3rd World Water Development Report.
- A World Water Assessment Programme side publication series paper on *The Impact of Global Change on Erosion and sediment Transport by Rivers: Current Progress and Future Challenges* was published in 2009 as an output of the ISI programme, authored by Des Walling.
- Des Walling presented a paper at the ISI co-sponsored LANDCON Symposium on *Global Change – Challenges for Soil Management* (Serbia, 2009).
- ISI, represented by Manfred Spreafico and Des Walling, contributed to a UNESCO IHP workshop on *Adapting to the Impact of Global Change on River Basins and Aquifer Systems* (UNESCO, Paris, 2008).
- ISI was co-sponsor of the *International Workshop on Erosion, Transport and Deposition of Sediment* (Berne, Switzerland, 2008). Des Walling presented a paper on 'Investigating the changing sediment loads of the world's rivers: problems and findings'.
- Des Walling contributed to the ISI/IAHS/WASER *Sediment Problems and Sediment Management in Asian River Basins* workshop at the IAHS/IAHR Scientific Assembly (Hyderabad, India, 2009).
- Des Walling is a member of the Advisory Council of the *International Research and Training Center on Erosion and Sedimentation* (IRTCES). In this role he attended the meeting of the 7th Advisory Council (Beijing, 2008), held in association with the ISI Steering Committee meeting.

Ecohydrology

Dr David Harper (University of Leicester) represents UK interests in the UNESCO Ecohydrology Programme on the UK Committee for National and International Hydrology (Section 1.1) and is a member of the International Committee of the IHP Ecohydrology Programme. He continues to play a leading role in research activities in

the area of Lake Naivasha (Kenya) – an IHP Ecohydrology Demonstration Project. Several UK authored papers on this area were contributed to the recent *International Symposium on Ecohydrology for Water Ecosystems and Society in Ethiopia* (Addis Ababa, Ethiopia, 2009). David Harper was a member of the symposium's International Advisory Committee. David also co-edited the publication *Ecohydrology: Processes, Models and Case Studies* (Harper, D., Zalewski, M. and Pacini, N., (eds.) 2008, CAB International), considering the concepts of Ecohydrology as developed under previous phases of the IHP.

ISARM

The Dundee UNESCO Centre for Water Law, Science and Policy (see Section 1.4) are represented on the Scientific Committee for the forthcoming ISARM conference on *Transboundary Aquifers* (Paris, December 2010).

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

The UK hydrological community continues to convene a comprehensive range of national and local scientific and technical meetings. The British Hydrological Society (BHS) is a UK national society for the advancement of hydrology. The society's membership is drawn from both the academic (universities and research institutes) and operational sectors. The society holds regular national and regional scientific and technical meetings related to Hydrology. Over the reporting period numerous meetings have been held focusing on topic such as *Hydromorphology and Ecology of Lakes*, *Spatial Planning and Hydrology* and *Emerging Challenges in Flood Hydrology*, while a National Hydrological Symposium was held in September 2008.

1.2.2 Participation in IHP Steering Committees/Working Groups

UK researchers continue to be involved in wide range of IHP Steering Committees and Working Groups. In relation to the cross-cutting and associated programmes of IHP, UK scientists serve on, amongst others, the committees of FRIEND, HELP, Ecohydrology, G-WADI and ISI (see Section 1.1.2).

The UK continues to maintain strong links with the UNESCO Division of Water Sciences. Over the reporting period CEH hosted a visit by members of the IHP Secretariat to the CEH headquarters in Wallingford (July 2008) and Professor Alan Jenkins (CEH) visited UNESCO Paris in July 2009. The UK continues to collaborate with other National Committees in IHP Region 1, providing contributions to meetings and other initiatives.

Nationally Alan Jenkins, as Chair of the UKCNIH, represents UK involvement in the IHP on the UK National Commission for UNESCO Sciences Committee and is a member the commission's working group on *Increased Cooperation among UNESCO Intergovernmental/International Scientific Programmes in the UK*. The Group meets regularly to share information, feedback and discourse on key ISP activities and priorities. It identifies opportunities for shared action, including raising the visibility of and strengthening UK participation in UNESCO programmes. It also provides coordinated input on relevant policy issues to the UK National Commission for UNESCO, UNESCO globally and UK Government.

1.2.3 Research/applied projects supported or sponsored

The European Union continues to be an important source of funding for UK research activities contributing to the IHP. For example, the European Union Sixth Framework Programme for Research and Technological Development (EU-FP6) Integrated Project Water and Global Change (WATCH) provides opportunities for UK scientists to contribute to the FRIEND programme. The Centre for Ecology & Hydrology is the main coordinating institute for the WATCH project, heading a consortium of 25 leading research centres in climate change and hydrological science throughout Europe.

Within the UK the Natural Environment Research Council (NERC), the Economic & Social Research Council (ESRC) and the Department for International Development (DfID) have jointly established the *Ecosystem Services for Poverty Alleviation* (ESPA) research programme, a multi-disciplinary programme that will address how to achieve sustainably managed ecosystems. This work aims to contribute to reducing poverty and improving well being in developing countries. Details of the programme can be found at: http://www.nerc.ac.uk/research/programmes/espa/.

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

Close links are maintained between the UK National Committee for the IHP (UKCNIH, see Section 1.1) and other international organizations and programmes. Dr Ann Calver continues to represent UK involvements in the WMO Commission for Hydrology (WMO-CHy) and UK scientists continue to be actively involved in a wide range of WMO initiatives. Professor Howard Wheater (Imperial College London) was recently elected as Vice-Chair of the Global Energy and Water Cycle Experiment (GEWEX) Scientific Steering Group and is also a member of the UKCNIH. Linkages with the IAHS are maintained through Professor Ian Cluckie (Swansea University), Chair of the UK National Committee for IAHS. Several UK scientists contributed to the 8th IAHS Scientific Assembly/37th IAH Congress (Hyderabad, India, 2009).

The British Geological Survey (BGS) have been actively involved in the IAH/UNESCO IHP sponsored initiatives related to the continued development of the global network on Managed Aquifer Recharge (MAR), driven by the IAH Commission on MAR. Ian Gale (BGS) is co-chair of IAH-MAR and BGS maintain the commission's website. Specific activities over the reporting period include contributions to both the UNESCO/IAH-MAR Network meeting to identify objectives and activities for MAR-NET (Bangkok, Thailand, 2009) and the MAR-NET launch at 8th IAHS Scientific Assembly/37th IAH Congress (Hyderabad, India, 2009).

Professor Pat Wouters (Dundee UNESCO IHP-HELP Centre) serves on the International Advisory Committee for the United Nations University Institute of Water, Environment and Health (UNU-INWEH) and is a member of the Global Water Partnership Technical Experts Committee; the World Economic Forum Global Agenda Council on Water Security and the SUEZ Foresight Advisory Committee. She is also co-chair of the Legal Experts Group of the World Water Assessment Programme.

1.2.5 Other initiatives

1.3 Educational and training courses

See other areas of report, including current educational initiatives by the Dundee UNESCO Centre for Water Law, Science and Policy.

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

Dundee IHP-HELP Centre for Water Law, Science and Policy

The Dundee UNESCO Centre for Water Law, Science and Policy was officially launched as a Category 2 IHP-HELP Centre under the auspices of UNESCO in November 2006. The Centre aims to become a world leader in its field and find new ways of effectively integrating law, policy and science to address water challenges of the 21st century. The Centre's activities fall within the following main areas, all of which are relevant to IHP-VII:

a) Promoting excellence in research in water in Scotland.
b) The Millennium Development Goals and Global Change.

c) The HELP Programme and the IHP
d) Water Law Water Leaders: education and training

Whilst the Centre's activities relate to a broad range of the themes of IHP-VII, there is a clear focus on governance in many areas. Examples of specific contributions to IHP-VII by the Dundee Centre are included in Table 2 (Section 1.1.2).

IHP-VII Theme 5: Water Education for Sustainable Development (tertiary education) is of high relevance to the centre's work. The collaborative graduate degree programme in *Water Governance and Conflict Resolution*, delivered by the Dundee Centre and UNESCO IHE, continues to be implemented. The Masters degree in *Water Resources Management and Law* with the United Nations University Institute for Environment and Health is to commence in January 2011.

The Dundee UNESCO HELP Centre is the European Regional Coordinating Unit for the HELP programme; details of some recent initiatives in this area are given in Section 1.1.2.

1.5 Publications

No list is maintained of publications related to the IHP. See other sections of report for examples of related publications.

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

UK scientists have led and contributed to numerous international scientific meetings in relation to the IHP over the reporting period, both in the UK and abroad. See other sections of the report for examples of these meetings.

1.6.2 Participation in meetings abroad

See other sections of report.

1.7 Other activities at regional level

1.7.1 Institutional relations/cooperation

1.7.2 Completed and ongoing scientific projects

See other sections of report.

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2010

See other sections of the report. Other forthcoming activities include:

- Dundee UNESCO Centre for Water Law, Policy & Science, *International Law and Transboundary Freshwaters Symposium and Workshop 2010: Global, national and regional strategies for promoting security and sustainability within a rapidly changing world – Water for All* (Dundee, UK, 21-24 June 2010).
- British Hydrological Society Third International Symposium, *Role of Hydrology in Managing Consequences of a Changing Global Environment* (19-23 July 2010, Newcastle upon Tyne, UK).
- British Geological Survey contribution to IAH/UNESCO IHP MAR-NET seminar to be held at Stockholm World Water Week (5-11 Sept 2010).
- Several UK scientists are to contribute to the forthcoming 6th International FRIEND Conference, *Global Change: Facing Risks and Threats to Water Resources*, to be held in Fez, Morocco, October 2010 (see Section 1.1.2).

2.2 Activities foreseen for 2011-2012

2.3 Activities envisaged in the long term

UK scientists intend to continue their participation in the IHP, contributing to a wide range of initiatives and programmes (including FRIEND, G-WADI, HELP, ISI) as funding permits.