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NATIONAL REPORTS OF THE NATIONAL COMMITTEES FOR THE IHP (2010 – 2012)

SUMMARY

The following National Reports of the National Committees for the IHP cover the activities for the intersessional period between the 19th and the 20th sessions of the Intergovernmental Council of the IHP (June 2010 - May 2012).

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

The texts reproduced herewith stand exactly as submitted by the National Committees, in their original language, except for minor editing in some cases exclusively for presentation purposes. Thus, the contents of the reports have not been modified and remain the sole responsibility of the respective National Committees.

NATIONAL REPORT ON IHP RELATED ACTIVITIES
AUSTRALIA

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

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

1.1 Meetings of the IHP National Committee

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

1.1.1 Decisions regarding the composition of the IHP National Committee

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

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

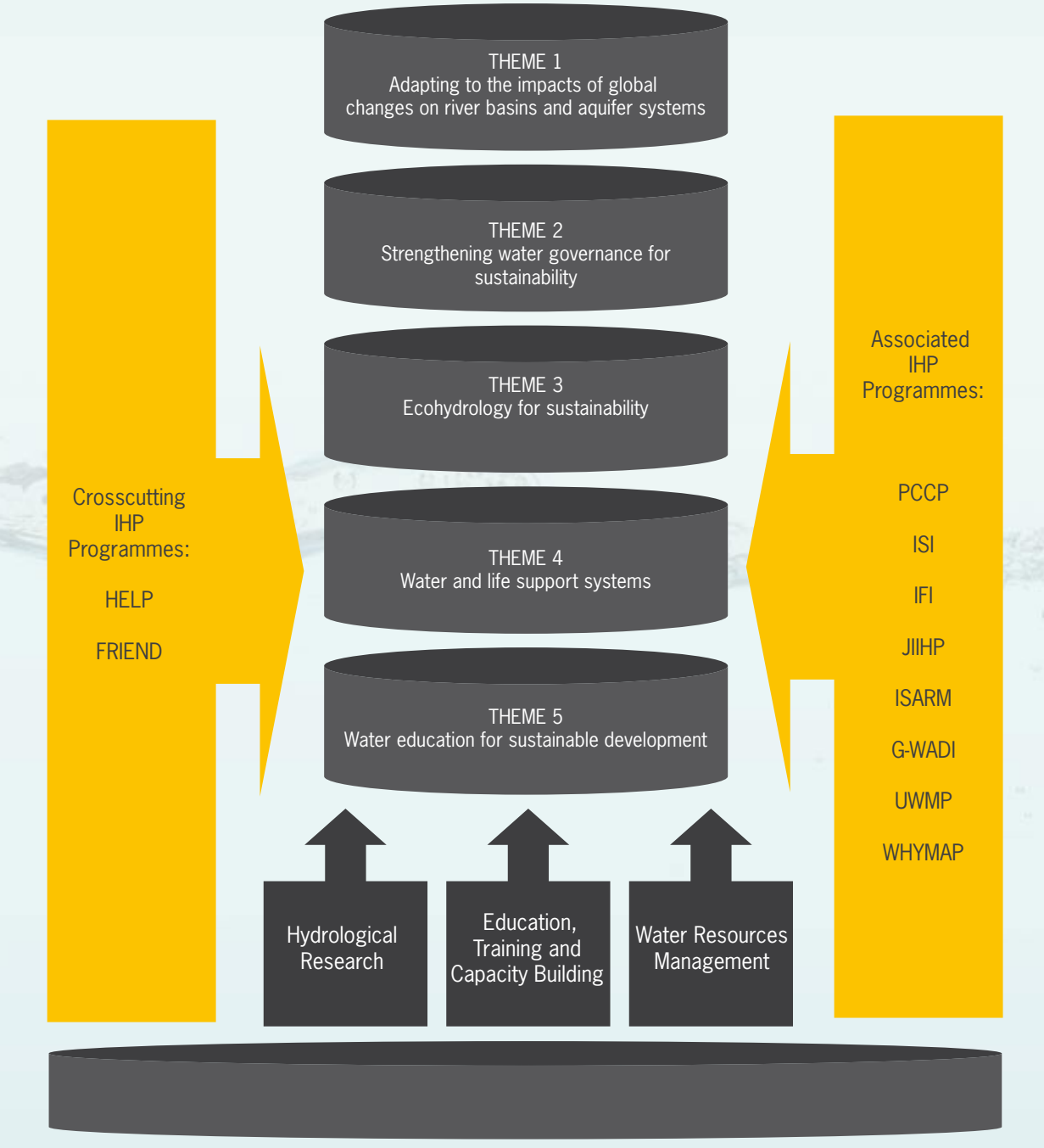
1.1.2 Status of IHP-VII activities

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. Figure 1 from the strategic plan for IHPVII shows the interaction of the various groups within the region as well as the elements of the plan. A description is provided below of some activities pertinent to IHP-VII. The Australian Bureau of Meteorology and CSIRO have also established a Water Information Research and Development Alliance (WIRADA) which undertakes research of direct relevance to the activities of the IHP.

Australia faces major challenges in ensuring sustainable water supply in the face of drying climate and rising demand for water. In response, the Australian Government's initiative, Water for the Future (http://ww.environment.gov.au/water/australia/index.html) is built on four key priorities of

taking action on climate change; using water wisely, securing water supplies and supporting healthy rivers.

FIGURE 1
OVERVIEW OF THE RELATIONSHIPS BETWEEN THE CORE THEMES OF IHP-VII, AND THE CROSSCUTTING AND ASSOCIATED PROGRAMME COMPONENTS



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

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

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

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

- Research activities involving the Pacific Island Countries

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

- The Murray Darling River Basin and GEWEX related research activities

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

- *Crosscutting Program Components – FRIEND and HELP*

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

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

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

Australian National University (ANU) together with 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 National Centre for Groundwater Research and Training (http://www.groundwater.com.au) has an extensive research program including research on groundwater/surface water interaction and is investigating how better to manage groundwater resources. CSIRO is researching use of aquifer storage and recovery with urban stormwater and recycled water to sustain depleted groundwater resources (www.clw.csiro.au/research/urban/reuse). The ANU is researching artesian groundwater processes and modelling of groundwater changes in the lower Great Artesian Basin and in south eastern Australia. ANU, with 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. The Water Information Research and Development Alliance (WIRADA) brings together CSIRO's research and development expertise in water and information sciences and the Bureau of Meteorology's operational role in hydrological analysis and prediction. The Alliance has covered fields of data interoperability, hydrologic modelling, water accounting and water resource assessment. The Water data transfer standards project is defining and developing transfer standards and procedures for supply of specified data from water information providers and has contributed significantly to the development of an international data exchange standard named WaterML.

Among the other significant contributions has been in improving the seasonal streamflow forecasting area using the Bayesian Joint Probability method which has been operationalised using the Bureau operational systems and now well acceped in the industry, One further development is the Australian Hydrological Geospatial Fabric which is a specialised Geographic Information System (GIS). This identifies the spatial relationships of important hydrological features such as rivers, lakes, reservoirs, dams, canals and catchments and makes working with geodata in a hydrological context much easier.

- *THEME 2 Strengthening water governance for sustainability*

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

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

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

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

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

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

Focal Area II-4: Shared Water resources and conflict

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

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

The WIRADA water resources assessment and water use accounting project is developing methods and technologies, to enable the Bureau to provide integrated surface and groundwater resource assessments, water accounts and water resource outlooks.

- *THEME 3 Ecohydrology for sustainability*

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

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

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

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

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

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

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

- Biodiversity and climate change

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

- *THEME 4 Water and life support systems*

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

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

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

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

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

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

- Climate variability and change and water resources for agriculture

The National Land and Water Resources Audit (http://www.nlwra.gov.au/) and http://audit.ea.gov.au/ANRA/atlas_home.cfm) and the Water and the Economy study have

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

- *THEME 5 Water education for sustainable development*

Each of the Cooperative Research Centres (CRC) is required to undertake an active program of training to ensure their research and technology are transferred into practise as soon as possible. The water related CRCs are:
eWater CRC (http://www.ewatercrc.com.au/)
CRC for Irrigation Futures (www.irrigationfutures.org.au/)

These CRCs are a partnership between universities and other research centres that also have educational and training programs. Some of the research centres are listed separately below.
National Centre for Groundwater Research and Training (http://www.groundwater.com.au)
The purpose of the centre is to provide research, education and specialist services for Australian and International land and water industries with the objective of improving the management of resources affected by groundwater processes.
Centre for Environmental Applied Hydrology (http://www.civag.unimelb.edu.au/ceah)
The Centre for Environmental Applied Hydrology is a research centre within the Departments of Civil and Environmental Engineering and Geography and Environmental Science at the University of Melbourne. Specific expertise covers all aspects of surface and groundwater hydrology, hydraulics and geomorphology.
Fenner School of Environment and Society, Australian National University (http://cres.anu.edu.au) conducts research and postgraduate training in spatial-temporal variability and characterisation of climate, integrated catchment management, groundwater modelling and hydrology, floods and droughts, coastal hydrology and land use, salinity, cultural and indigenous water issues, water and land policy and related socio-economic interactions, ecological economics.
The International Centre of Excellence in Water Resource Management (ICE WaRM) (http://www.icewarm.com.au/) is made up of a consortium of universities and has a strong focus on education and training. It promotes itself to international water resource management students to further their education in Australia and is also developing online courses for delivery in Australia and overseas.
International Water Centre (www.watercentre.org/) is a joint venture between University of Queensland, Griffith University, Monash University, University of Western Australia, International RiverFoundation, Moreton Bay and Catchments Partnership and the Queensland Government. The Centre aims to take Australia's expertise in whole of water cycle management to organizations in the rest of the World through Applied Research, Education and Training and Knowledge Services.
Professor David Waite, Director of the Centre for Water and Waste Technology & Dr Ashish Sharma, from School of Civil & Environmental Engineering at UNSW, are collaborating with Hohai University of Nanjing to develop joint research & Masters' level training programs in WATER MANAGEMENT through the Australia China Consortium for Water Research (ACCWR)

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

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

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

1.2.1 National/local scientific and technical meetings

- 13th INTERNATIONAL RIVERSYMPOSIUM, Perth, 11-14 October 2010.
- National Water Week, October 2010
- MODSIM 2011, Perth Convention Centre, Australia from December 12-16, 2011. The theme was "Sustaining Our Future: understanding and living with uncertainty".
- Practical Responses to Climate Change National Conference, Melbourne, Wednesday 29 September to Friday 1 October 2010.
- ENVIRO 2010, Solutions For a Sustainable Future, 21-23 July 2010, Melbourne.
- 13th INTERNATIONAL RIVERSYMPOSIUM CONFERENCE, September 2010.
- Water Reuse and Desalination conference - Sydney, November 15-16, 2010
- 2010 International Climate Change Adaptation Conference, Climate Adaptation Futures, Preparing for the unavoidable impacts of climate change, 29 June - 1 July 2010, Queensland
- MODSIM 2010
- The biennial convention of the Australian Water Association (AWA) (www.awa.asn.au) was Ozwater 11 Convention & Exhibition, which was held in Adelaide, May 2011.
- Workshop on Managed Aquifer Recharge for Safe Drinking Water Supplies, Adelaide, 9 May 2011,. Run by AWA, IAH and IWA at OzWater.
- Stormwater Harvesting Risk Assessment Workshop, 12-13 May 2011, Adelaide. Run by CSIRO for stormwater harvesting for a range of uses, via aquifers and via surface water storage.
- **XXV IUGG General Assembly Earth on the Edge: Science for a Sustainable Planet** 28 June - 7 July 2011, Melbourne Convention & Exhibition Centre, Melbourne, Australia. This incorporated a large number of IAHS streams and 18 IAHS Lead Workshops pertaining to many facets of Hydrology and water resources.
- PACE-Net Second Platform: Key Stakeholder Conference: Strengthening Pacific-European Collaboration in Research, Development and Innovation, Brussels, 20-23rd March 2012.
- Practical Responses to Climate Change 2012, Water and Climate: Policy Implementation Challenges, National Convention Centre Canberra, 1-3 May 2012, Engineers Australia
- 34th IAHR World Congress together with the 33rd National Hydrology and Water Resources Symposium and the 10th National Conference on Hydraulics in Water Engineering was held at the Brisbane Convention and Exhibition Centre, in Brisbane from 26 June - 1 July 2011
- 'Irrigation 2011 - New Horizons, Fresh Ideas Conference', held in Launceston from the 22 – 25 August.
- EcoForum Conference & Exhibition incl 4th ALGA Annual Conference, 9-11 March 2011, Sydney
- *2011* Melbourne *Water* Kids Teaching Kids *Conference* – June 23rd and 24th. *2011*
- International Conference on Integrated Water Management, 2 - 5 February, 2011, Western Australia, Australia
- Water Australia Summit 2011, 29–21 July 2011, Sydney
- Experts Meeting on Extended Hydrological Prediction (EHP) with WMO from 7 to 9 July 2011, Hosted by the Bureau of Meteorology, Australia.
- RiverSymposium 2011, 26–29 September 2011, Brisbane
- WASH Conference 2011 took place in Brisbane, Australia from 16-20th May 2011. It was coordinated by the Water and Sanitation (WASH) Reference Group in conjunction with AusAID
- NCGRT Managed Aquifer Recharge Course, Melbourne,17-19 October 2011.

- Australia - Watermarks, the Heritage of Water 27/10/2011 - 30/10/2011 Annual conference of Australia ICOMOS in partnership with the National Trusts of Australia in Melbourne.
- Water Governance Research Initiative Workshop, 21-22 November 2011, Canberra
- The Water Information Research and Development Alliance (WIRADA) Science Symposium held between 1 and 5 August 2011 in Melbourne, Australia
- WSUD2012 - Water Sensitive Urban Design, Building the Water Sensitive Community, 21 - 23 February 2012, Melbourne Cricket Ground
- Practical Responses to Climate Change 2012, Water and Climate: Policy Implementation Challenges, 1 - 3 May 2012, National Convention Centre, Canberra, Website: www.climatechange2012.org
- A number of meetings of the National Committee on Water Engineering, Institution of Engineer's have been held during this period. Some of the key purposes of these meetings are to coordinate and organise hydrology and water resources symposia and conferences, to coordinate the ongoing revision to the national hydrological design guidelines Australian Rainfall and Runoff, prepare Position Papers on key hydrological issues and to manage the publication of Australian Journal of Water Resources. Position Papers are now all available on the Institution of Engineers, Australia web site: (http://www.eng.newcastle.edu.au/~ncwe/ncwePosPaper/ppHome.htm).

1.2.2 Participation in IHP Steering Committees/Working Groups

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

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

Prof Ian White was elected to the Governing Board of UNESCO IHE, Institute for Water Education, Delft, the Netherlands in 2006 and is a Member Editorial Board UNESCO- Cambridge University. Press International Hydrology Series.
Prof Ian White attended the UNESCO IHE Board Meeting in Delft, the Netherlands, as representative of the South East Asia-Pacific Region of UNESCO IHP.

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

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

1.2.3 Research/applied projects supported or sponsored

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

This work used Multi Agent Systems and a companion modelling approach to develop Negotiation Support Systems to minimise conflicts over water resource development and use.

1. Kiribati Adaptation Programme Phase II
Development of National Water Resources Policy and National Implementation Plans
The Pacific small island nation of the Republic of Kiribati has water resource problems amongst the most challenging in the world: rapidly growing population; urbanisation; high infant death rates due to water borne-diseases; limited freshwater supplies; restricted resources and capacity; vulnerability to climate change and variability; seawater intrusion; unclear management and regulatory roles; and limited information on the quantity and quality of water resources. This project focussed on the development of the country's first National Water Resources Policy and 10-year Implementation Plan. Simple translocations of developed-world policy frameworks and "toolkits" to small island nations are unlikely to succeed because they ignore the local biophysical, socio-cultural, governance and resource context. Instead, analysis of past ministerial declarations, government decisions and community consultations as well as publicly-developed water resource priorities were used as a basis for developing policy. Many of the pressing national problems can be addressed through seven key policy objectives: improved understanding and monitoring of water resources and their use; increased access to safe and reliable water supplies and appropriate sanitation; achieving financially, socially and environmentally sustainable water resource management; increased community participation in water management and conservation; improved governance in water and sanitation sectors; providing training opportunities for and mentoring of staff in the sector; and decreasing unaccounted for water losses and improved cost recovery. These objectives were used as the framework for developing a 10-year National Water Resources Implementation Plan, The Cabinet of the Government of Kiribati endorsed both the National Policy and its Implementation Plan in January 2009.
Project support: The Kiribati Groundwater Hydrology Programme was initiated under UNESCO IHP V Theme 6, Humid Tropics Programme. It has been supported by UNESCO IHP, the Australian Centre for International Agricultural Research grant LW1/2001/050, by the European Union-SOPAC Pacific Water Governance Project, by AusAID, NZAid and the World Bank through the Kiribati Adaptation Programme Phase II and by Agence Francaise de Developpement (AFD), France.

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

here that the future variability of rainfall in Tarawa over the next 20 years will be similar to that in Betio over the period 1947 to the end of 2008.
It was found that there is currently insufficient capacity in South Tarawa to meet the current water needs using piped, treated fresh groundwater from Bonriki and Buota water reserves and from domestic rainwater tanks. Future demand will be even greater than current demand and there is an urgent need, and one mandated by GoK in its National Water Resources Policy, to supply adequate quantities of safe freshwater to meet that demand.
The suggestions of previous studies in Tarawa have been reviewed. Desalination, bulk importation by ship, large constructed rainwater harvesting systems, recycling and a reclaimed island in the lagoon built to act as a source of fresh groundwater for the water supply system have all been critically examined. It is emphasised here that development of any other water source should only be considered once the existing leaks in the reticulation systems are dramatically reduced. There is no point in investing in extra water sources when losses from the reticulation system are 50%.
Project support: The Kiribati Groundwater Hydrology Programme was initiated under UNESCO IHP V Theme 6, Humid Tropics Programme. It has been supported by UNESCO IHP, the Australian Centre for International Agricultural Research grant LW1/2001/050, by the European Union-SOPAC Pacific Water Governance Project, by AusAID, NZAid and the World Bank through the Kiribati Adaptation Programme Phase II and by Agence Francaise de Developpement (AFD), France.

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

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

1.2.4 Hydrology for Environment, Life and Policy (HELP)

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

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

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

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

Ord River Help Basin activities include: successful nomination of the Ord River as a UNESCO Ecohydrology Program Demonstration Site in May 2010; a HELP workshop with Ord stakeholders in July 2010 to develop a HELP workplan; and joint papers and presentation with a comparable basin in Portugal (Guadiana) at conferences in Australia and Portugal (2010) and Korea (2011).

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

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

Activity in the Murray Darling HELP Basin has focussed on the development of a Basin plan, the largest ever water reform in the Murray Darling Basin. A large number of community and stakeholder meetings continue to be undertaken and a revised proposed plan is being considered by Ministerial Council, The key elements of the Plan currently include:

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

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

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

1.2.6 National Plan for water security

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

- a nationwide investment in Australia's irrigation infrastructure to line and pipe major delivery channels;
- a nationwide programme to improve on-farm irrigation technology and metering;
- the sharing or water savings on a 50:50 basis between irrigators and the Commonwealth Government leading to greater water security and increased environmental flows;
- addressing once and for all water over-allocation in the Murray-Darling Basin;
- a new set of governance arrangements for the Murray-Darling Basin;
- a sustainable cap on surface and groundwater use in the Murray-Darling Basin;
- major engineering works at key sites in the Murray-Darling Basin such as the Barmah Choke and Menindee Lakes;
- expanding the role of the Bureau of Meteorology to provide the water information necessary for good decision making by governments and industry;
- a Taskforce to explore future land and water development in northern Australia; and
- completion of the restoration of the Great Artesian Basin.

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

1.3 Educational and training courses

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

1.4 Publications

There are numerous Publications from various conferences and Journals.
Some of Particular interest are :

Australian Bureau of Meteorology and CSIRO, 2011. Climate Change in the Pacific: Scientific Assessment and New Research. Volume 1: Regional Overview. Volume 2: Country Reports. http://www.cawcr.gov.au/projects/PCCSP/publications.html
Neto, S., Chicharo, L. and Camkin, J. 2011. Building synergies from the UNESCO-IHP HELP and Ecohydrology Programmes in the Guadiana river basin. UNESCO-IHP HELP International Symposium Building Knowledge Bridges for a Sustainable Water Future, Republic of Panama, 21-24 November 2011

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

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

1.5 Participation in international scientific meetings

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

Participation in the FRIEND Symposium 2010, Fes, Morocco, 25-29th October by Trevor Daniell as the Chairman of the FIGCC.
Participation in the HELP International Symposium in Panama, November 2011 by Jeff Camkin

2.6 Other activities at a regional level

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

The Pacific HYCOS Project proposal developed by WMO in 2001 has received funding through the European Union. The Pacific HYCOS Project was originally launched at a workshop in Brisbane, Australia 16-19 April 2007 organized by Bureau of Meteorology (BOM) Australia, World Meteorological Organisation (WMO), National Institute for Water and Atmosphere Research (NIWA), and Pacific Islands Applied Geoscience Commission (SOPAC). The meeting and workshop was funded by WMO, BOM and SOPAC.
Dr Peter Dillon of the CSIRO, Water Recycling and Diversified Supplies, Urban Water Theme, Water for a Healthy Country Flagship Program, CSIRO Land and Water, has been active in Managed Aquifer Recharge across the region and beyond.
www.clw.csiro.au/research/urban/reuse

2.6.1 Institutional relations/co-operation

No information available at this time.

2.6.2 Completed and ongoing scientific projects

Refer section 1.2.3 re ongoing Pacific Island projects.

3. Future Activities

2.1 Conference Activities in 2012-13

- The Irrigation Australia 2012 Conference & Trade Show will take place in Adelaide, 24 – 29 June. This meeting incorporates the ICID: 63rd IEC Meeting & 7th Asian Regional Conference
- 9th IWA Leading-Edge **Conference** on **Water** and Wastewater Technologies. 3 - 7 June 2012. Brisbane, **Australia**
- 34th Hydrology and Water Resources Symposium (HWRS) in Sydney, Australia on 19 – 22 November 2012.
- OZWATER'12 will be held in Sydney 8-10 May, 2012 at the Sydney Convention and Exhibition Centre Darling Harbour.
- OZWATER'13 will be held in Perth 7-9 May, 2013 in Perth, Western Australia
- 14th Water Distribution Systems Analysis Conference to be held on 24-27 September 2012 in Adelaide, South Australia. WDSA 2012 is produced as part of the annual conference series sponsored by the American Society of Civil Engineers (ASCE)
- The 40th International Congress of the IAH will be hosted in Perth between 15 and 20 September, 2013. Themed 'Solving the Groundwater Challenges of the 21st Century
- 8th Intl Symp on Managed Aquifer Recharge (ISMAR8) will be held in Beijing, 15-19 Oct 2013,
- MODSIM2013 congress will be held in Adelaide, South Australia, from Sunday 1st to Friday 6th December 2013. The theme for this MODSIM2013 event will be *Adapting to Change: the multiple roles of modelling.*

2.2 Activities Planned for 2012-13

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

2.3 Activities envisaged in the long term

No information available at this time.

NATIONAL REPORT OF IHP NATIONAL COMMITTEE OF THE AZERBAIJAN REPUBLIC

1. ACTIVITIES UNDERTAKEN JUNE 2010 – MAY 2012

1.1 Meetings of the IHP National Committee

1.1.1 Decisions regarding the composition of the IHP National Committee

The IHP National Committee's structure and relevant structure chiefs were approved on 18 July, 2005. The structures and structure chiefs have been carrying out the activity since then.

1.1.2 Status of IHP-VII activities

İHP National Committee of Azerbaijan carried out different activities within the framework of VII programme during june 2010-may 2012-05-11 and these activities has been reflected in the following chapter's of the report.

1.2 Activities at national level in the IHP Framework

1.2.1 National/local scientific and technical meetings

IHP National Committee organizes scientific local conference each year. Moreover, National Academy of Sciences, Baku State University, Ministry of Ecology and Natural Resources, Amelioration and Water Management JSC organize different conferences. The members of IHP National Committee participate in this conferences.

1.2.2 Participation in IHP Steering Committees/Working Groups

We participated in the meeting of IHP National Committee Chairmen in October, 2011, Saint-Petersburg.

1.2.3 Research/applied projects supported or sponsored

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

We participated in regional and national projects of EU, UNDP, NATO, OSCE.

1.2.5 Other initiatives

The NGO Forum in Tbilisi by UNDP/GEF project was organized and the members of IHP National Committee participated in this forum.
The meeting with IHP National Committee members and students was held for the celeberation of International Water Day on 20 March

1.3 Educational and Training Courses

1.3.1 Contribution to IHP courses

1.3.2 Organization of specific courses

- Sobek introduction river flow course, 22-23 February, 2011
- Ribasim Introduction Courses, 24-25 February, 2011
- Integrated Water Resources Management Training, 2-4 April, 2012
- Integrated Water Resources Management Training, 18-25 April, 2012

Participation in the preparation of Integrated Water Resources Management program for master students within the project of UNDP/GEF "Reducing of Transboundary Degradation in Kura Aras River Basin"

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

- Transboundary groundwater of Azerbaijan : current conditions, challenges and mitigation possibilities, Paris, 2010 (A.Alakbarov, F.Imanov)
- Flood management in Azerbaijan, Krakov, 2010 (N.Hasanova, F.Imanov)
- Groundwater of Azerbaijan, Konya, Turkey, 2010 (A.Alakbarov, F.Imanov, A. Hasanaliyev)
- Investigation of drought in subtropic climatic zone of Azerbaijan, Wroslaw, Poland, 2011, (F.Imanov, N.Hasanova, A.Mammadov)
- Estimation of environmental flow for rivers in Republic Azerbaijan (a case study in Samur River) Korea (republic of), 2010, (F.Imanov, R.Verdiyev, R.Rajabov)
- Climate changing's and the water resources of Azerbaijan Republic, Tehran, 2010, (F.Imanov, R.Verdiyev, S. Khalilov, R.Rajabov)
- The impacts of global climate changes on the hydro meteorological conditions of Azerbaijan Republic, Istanbul, 2011 (R.Mahmudov)
- Mingechevir embankment dam collapse: catastrophic risk analysis and management, Istanbul, 2011 (R.Mahmudov, V.A.Aliyev, M.Yu.Yusifiv, S.g.Nabiyeva, A.A.Ahmedov, R.K.Gafarov)

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

Organisation and held of the International Conference dedicated to the 85th anniversary of prof. M.Museyibov- 17th of May, 2012. We're expecting participation of delegations from Russia, Central Asian States, Georgia, Turkey and etc. One of the conference sessions will be devoted to investigations of water resources in comprehensive scale. Conference proceedings have already been printed.

1.6.2 Participation in the meetings abroad

- UNDP/GEF project on Reducing of Transboundary Degradation in Kura Aras River Basin (Steering Committees meeting, November, 2011, Tbilisi)
- The future of science policy connetions, UNESCO, 19 April, 2012, Venice, Italy
- Policy science interactions final conference, UNESCO, 20 April, 2012, Venice, Italy
- ISARM 2010 International Conference, Transboundary aquifers : challenges and new directions, 6-8 December
- International Sustainable water and wastewater management symposium, Konya, Turkey, 2010
- XXXV Ogolnopolski zjazd Agrometeorologow i klimatologow, Wroslaw, Poland, 2011

- Forging targets and solutions for rivers and water ecosystem restoration, Ljubljana, Slovenia

1.7 Other activities at regional level

1.7.1 Institutional relations/cooperation

The two-sided agreement on information exchange about water resourses of transboundary rivers flowing from Georgia to Azerbaijan is being prepared between Ministries of Ecology and Natural Resourses of Azerbaijan and Georgia. The IHP National Committee members are participating in the preparation of this agreement.

1.7.2 Completed and ongoing scientific projects

NATO SIP program supported Transboundary Project on "Water Resources Management of Agro-Eco-Systems in the South Caucasus Transboundary Regions (Azerbaijan, Georgia)
Promoting public participation in the management of the Ganykh river basin, OSCE
Preparing of Ganigh River Basin Management Plan, World Federation of Scientists

UNDP/GEF project of Reducing of Transboundary Degradation in Kura Aras river basin
EU Project of Environmental Protection of International River Basins

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2012

The planning to finalize the legal document on Azerbaijan water policy.

2.2 Activities foreseen for 2013-2014

Reevaluation of the quantity of Azerbaijan water resourses and their evaluation under antropogenic factors and climate change are being planned

2.3 Activities envisaged in the long term

It is planning to study water balance an experimental ways, also to estimate and decrease the flood and drought risks.

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

1. Actividades realizadas en el período junio 2010 a mayo 2012.

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.

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, c) Ecohidrología para la sostenibilidad, d) El agua y los sistemas de sustento de la vida, e) La educación relativa al agua para el desarrollo sostenible.

Los programas transversales de FRIEND Y HELP relacionados con la sétima fase, además de los programas asociados como: Iniciativa Internacional sobre Inundaciones (IFI), Iniciativa Internacional sobre Inundaciones (ISI), Del Conflicto Potencial a un Potencial de Cooperación (PCCP), Programa Internacional Conjunto sobre los Isótopos en la Hidrología (JIIHP), Iniciativa sobre la Gestión de Recursos de Acuíferos Transnacionales (ISARM), Red Mundial de Información sobre los Recursos Hídricos y el Desarrollo en las Zonas Áridas (G-WADI), Programa de Gestión del Agua en Zonas Urbanas (UWMP), Programa Mundial de Evaluación y Cartografía Hidrogeológica (WHYMAP).

Programas Transversales

- **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.

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

En mayo del 2010 el CONAPHI – Costa Rica participó en 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.

Posteriormente en Junio del 2011 en Ciudad de Guatemala, Guatemala el CONAPHI-Costa Rica participó en el 2do. Taller de FRIEND/AMIGO sobre “Máximos Hidrológicos y Bases de Datos”, donde se presentaron los resultados obtenidos de los análisis de eventos severos y las fichas de éstos.

- **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.

-Participación del CONAPHI- Costa Rica en el SIMPOSIO Internacional HELP, "Construyendo Fuentes de Conocimiento para un Futuro Sustentable para el Agua", realizado en Gamboa, Panamá, en noviembre 2011, donde la Sra. Anny Chávez Q. presentó la conferencia sobre "Biodiversidad de la Cuenca del Rio Reventazón"; además el Ing. Guillermo Flores, representante de HELP en Costa Rica participó también en el simposio Internacional de HELP, presentando una conferencia sobre el "Índice de Sostenibilidad de la Cuenca del Río Reventazón". También se participó en talleres sobre planes de manejo de cuencas.

Costa Rica actualizó 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 publicación.

A través de la "Comisión Ordenamiento y Manejo de la Cuenca Alta del Río Reventazón" (COMCURE), se ha realizado varios estudios sobre manejo integrado de la cuenca del Río Reventazón (http://sites.google.com/site/comcurecr/).

Actualmente Costa Rica está preparando una solicitud para incorporar otras cuencas del país al Programa HELP.

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 4 al 7 de mayo 2010 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 representante del CONAPHI Costa Rica en este programa es el Ing. Rodrigo Calvo Porras quién ha participado en los siguientes talleres:

- Del 26 al 28 de octubre de 2010 en Santa Fe, Argentina se realizó el VIII de Coordinación Programa UNESCO/OEA/ISARM, "Acuíferos Transfronterizos de las Américas", con la participación de la red de coordinadores nacionales del programa y autoridades de la Universidad de Litoral UNL, en este evento se hizo entrega de la tercera publicación ISARM Américas y se avanzó en los pasos iniciales para elaborar la estrategia para la gestión de los SATs en las Américas (Libro IV).

- Del 16 al 18 de noviembre de 2011, n Medellín, Colombia se realizó el IX taller de Coordinación Programa UNESCO/OEA/ISARM "Acuíferos Transfronterizos de las Américas". Este taller se realizó en el marco del 7^{o} Diálogo Interamericano del Agua con la

participación de la red de Coordinadores Nacionales del programa y reuniones paralelas con los Puntos Focales OEA y otras autoridades gubernamentales del área de recursos hídricos.

- Para el año 2012 se está organizando en México el X taller de Coordinación Programa UNESCO/OEA ISARM "Acuíferos Transfronterizos de las Américas", cuyo objetivo será consolidar y validar la información para el desarrollo de la cuarta publicación sobre "Estrategia Regional para la Gestión de los SATs de las Américas".

La participación de Costa Rica de estos talleres ha consistido en la confección de resúmenes de manejo sostenible de acuíferos transfronterizos para la publicación del tomo IV sobre "Acuíferos Transfronterizos de las Américas".

- **Proyecto IFI: (Iniciativa 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.

El CONAPHI – Costa Rica ha participado en años anteriores en eventos del grupo de trabajo IFI-PHI-LAC.

En la reunión conjunta de FRIEND/AMIGO e IFI, en Guatemala en junio 2011, se acordó 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, en la actualidad el CONAPHI – Costa Rica ha venido recopilando información sobre este proyecto, el cual se puede ver en www.ifilac.org

- **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.

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

La participación en estos eventos ha sido de gran importancia para el país y para las instituciones nacionales, que investigan en el estudio de sedimentos en embalses y control de la erosión.

Para julio 2012, se estará organizando en Costa Rica un taller de ISI/LAC, con la participación de los integrantes del grupo de trabajo.

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 en el país, 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 de Recursos Hídricos y de PHI / LAC- UNESCO.

Participación de Costa Rica, a través del Centro Internacional de Política Económica (CINPE) de la Universidad Nacional de Costa Rica, en el Proyecto Evidence-basec Policy for Integrated Control of Forested River Catchments in Extreme Rainfall and Snowmelt (EPIC – FORCE).

Dentro del tema de Caudales Ambientales, Costa Rica participó 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 impartió la conferencia sobre "Caudales de Compensación en Costa Rica".

- **Proyecto de Balance Hídrico**

En años anteriores el CONAPHI- Costa Rica 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

La publicación del Balance Hídrico, Documento Técnico N[a] 1, fue financiado por la UNESCO/PHI-LAC, y éste se puede ver en 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 y el Instituto Meteorológico Nacional completó éste en las 19 cuencas restantes del país.

Se ha propuesto a la Oficina Regional del PHI-LAC, otro proyecto para actualizar dicho balance hídrico en los países de la región de América Central.

- **Programa de Agua y Educación para las Américas y el Caribe**

Costa Rica ha venido participando en este programa y contribuyó a la "Guía Regional de Agua y Educación" para América Latina.

- En julio 2010 en París, Francia, el CONAPHI – Costa Rica a través de la Sra. Anny Chaves participó en el Workshop sobre Capacity Building on Water Education: "Criteria for Assessment of tertiary and vocational water education programs".

- En junio 2011, participación del CONAPHI – Costa Rica en el Taller Binacional Costa Rica – Panamá, en Bribrí, Costa Rica sobre Agua y Educación.

- En el año 2011 el CONAPHI – Costa Rica concluyó la Guía de Agua y Educación para Costa Rica" ésta actualmente está en la Oficina Regional del PHI – LAC para su revisión posteriormente.

- **Programa del Conflicto Potencial a la Cooperación Potencial (PCCP)**

- El CONAPHI – Costa Rica participó en el taller de PCCP en junio 2010 en República Dominicana a través del Señor Arnoldo Brenes, del Ministerio de Relaciones Exteriores y Culto de Costa Rica.

Participación en Otras Actividades Auspiciadas por el PHI/LAC-UNESCO

- **Programa GRAPHIC: Evaluación de los Recursos Hídricos Subterráneos Bajo los Efectos de la Actividad Humana y del Cambio Climático.**

En junio 2011 el CONAPHI – Costa Rica se participó en Juan Dolio, República Dominicana en un taller de GRAPHIC, en este proyecto Costa Rica tiene gran interés en participar en un futuro.

Participación del CONAPHI – Costa Rica en otros eventos internacionales dentro del marco del PHI-LAC.

- En el período de junio 2010 a mayo 2012, el CONAPHI – Costa Rica a través el señor Sadí Laporte M. participó en la Reunión Estuatoria de los Comités Nacionales y Puntos Focales del Programa Hidrológico Internacional de América Latina y el Caribe, Juan Dolio, República Dominicana del 28 al 29 de julio 2011, en esta reunión Costa Rica presentó un informe sobre los avances de las actividades del PHI-LAC para ese período.

- En abril del 2011 en Santiago, Chile, el CONAPHI a través del Sr. Berny Fallas participó en el taller de Sequía y Desertificación, organizado por CAZALAC y la UNESCO, mediante el programa EUROCLIMA, en el cual se expuso la experiencia de Costa Rica en eventos con déficit de lluvias y se presentó un esquema de pronóstico utilizado para realizar los pronósticos estacionales.

- En abril del 2012 en Montevideo, Uruguay el CONAPHI-Costa Rica, a través del señor Mario Arias Salguero, Director del Centro de Investigaciones de Ciencias Geológicas, de la Universidad de Costa Rica, participó en la reunión sobre el proyecto "Gobernanza de las Aguas Subterráneas: Un marco global para acciones regionales".

El objetivo de esta actividad es sensibilizar sobre la importancia de desarrollar una gestión racional de las aguas subterráneas a fin de prevenir y revertir la crisis global del agua. Este proyecto se financiará con fondos del Programa para el Medio Ambiente Mundial (GEF) donde se realizarán consultas regionales para preparar un diagnóstico y como resultado final un marco de acción global de recomendaciones y herramientas de gobernanza eficaces para una gestión sostenible de los recursos hídricos subterráneos.

1.2 Actividades a nivel nacional dentro del marco del PHI

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 relacionadas con el recurso hídrico en el país.

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.
- Reglamento para la evaluación y clasificación de la Calidad de Cuerpos de Agua Superficiales. Decreto No.33903-MINAET.
- Participación en la elaboración del "Día Mundial del Agua" y del "Día Mundial del Ambiente", con diferentes instituciones nacionales.
- Participación en el Proyecto de Mejoramiento de Capacidades Nacionales para la Evaluación de la Vulnerabilidad y la Adaptación del Sistema Hídrico el Cambio Climático en Costa Rica. Los documentos pueden ser encontrados en la WEB del IMN, http://cglobal.imn.ac.cr/
- Participación en el Comité Asesor Técnico de Hidrometeorología y ríos de la Comisión Nacional de Emergencia.

- Apoyo por parte del CONAPHI-Costa Rica a los proyectos sobre recursos hídricos que coordina el Comité Regional de Recursos Hídricos, organismo de SICA.
- Participación en el programa de "evaluación del Agua en el Mundo (WWAP) de Naciones Unidas, con el caso de estudio "Informe de Recopilación de Estudios Sobre Recurso Hídrico en Costa Rica" este informe fue elaborado por el COPNAPHI – Costa Rica en coordinación con el Sr. Engin Koncagul del WWAP y el Ministerio de Relaciones Exteriores y Culto de Costa Rica, ver documento en http://www.unesco.org/new/en/natural-sciences/environment/water/wwap/
- Participación en las encuestas de formulación de la octava fase del PHI (2013-2019).
- Participación en marzo 2011 en la encuesta sobre la Evaluación Externa del Programa de la Sexta Fase del PHI.
- Participación en el 2011 CONAPHI – Costa Rica en el cuestionario del PHI-UNESCO/LAC sobre la valoración de la Huella Hídrica con gestión del recurso hídrico.
- Reuniones de trabajo en el 2011 a mayo del 2012 del CONAPHI – Costa Rica con el grupo de trabajo de estadísticas Ambientales de ILAC/PNUMA y el INEC.

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 y 1.2.2.

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 y 1.2.2 se detallan algunos cursos o talleres que se han participado 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 al Agua y otros centros internacionales regionales relacionados con los recursos hídricos bajo los auspicios de la UNESCO.

En años anteriores ha participado en eventos en algunos centros de UNESCO como el de Sedimentos en Beijing, China y CAZALAC en Chile.

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 relacionados con el recurso hídrico y el cambio climático.

-Publicación del Balance Hídrico de Costa Rica con el PHI-LAC.
- 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

El CONAPHI-CR participa en varias actividades sobre recurso hídrico con el Ministerio de Ambiente, Energía y Telecomunicaciones.

A continuación se presentan algunas actividades y proyectos relacionados con el recurso hídrico. Información suministrada por el Ing. José Miguel Zeledón, Director de la Dirección de Aguas del MINAET y miembro del CONAPHI – Costa Rica.

- **Foro Mundial del Agua**

Participación del CONAPHI – Costa Rica a través del Ing. José Miguel Zeledón de la Dirección de Aguas del MINAET, en el IV Foro Mundial del Agua en Marsella, Francia en marzo del 2012.

En este evento Costa Rica participó en la discusión sobre la política de infraestructura y financiamiento del agua, especialmente en inversión para acueductos; además se participó en la redacción de la "Declaración del VI Foro". En el tema de capacitación se contactó con UN WATER y el centro de formación con sede en Holanda, sobre las posibilidades de entrenar personal técnico en el ámbito de acueductos comunales para Costa Rica.

En el marco de "Tiempo de Soluciones" Costa Rica a través de organizaciones como UNAGUAS y otras, presentó varias acciones y experiencias que tuvieron muy buena acogida para ser replicadas en otros países.

- **Proyecto Mejora de la Disponibilidad del Agua**

El CONAPHI-Costa Rica a través del Ing. José Miguel Zeledón de la Dirección de Aguas del MINAET y de otras instituciones que conforman dicho comité, participan actualmente en un proyecto de Mejora de la Disponibilidad del Agua de Costa Rica (IWAVE). Con el auspicio de la Agencia Internacional de Energía Atómica (IAEA), con el fin de mejorar la disponibilidad y sostenibilidad de agua dulce con énfasis en aguas subterráneas.

El objetivo principal es fortalecer las capacidades racionales de recopilación, gestión e interpretación de datos sobre recursos hídricos usando técnicas avanzadas en la gestión de los recursos.

Costa Rica se ha enfocado en seis puntos prioritarios enumerados a continuación:

1. Enfoque integrado en el sector agua sobre investigación, monitoreo de la calidad y cantidad, seguimiento y manejo del agua por parte de los tomadores de decisiones.
2. Mejorar conocimiento del recurso hídrico superficial.
3. Mejorar conocimiento del recurso hídrico subterráneo.
4. Mejorar conocimientos del recurso hídrico superficial y subterráneo integrados y relacionados con los ecosistemas.
5. Mejorar el conocimiento sobre la capacidad de respuesta de los sistemas hídricos ante procesos antrópicos y naturales en términos de disponibilidad de agua.
6. Mejorar el conocimiento sobre la eficiencia en el uso del agua y el impacto de la sostenibilidad de los recursos.

En la página Web (www.drh.go.cr) de la Dirección de Aguas, MINAET se puede ver el proyecto.

2. Actividades futuras:

2.1 Actividades planificadas hasta diciembre 2012

- Realizar un curso a nivel nacional para capacitadores en Agua y Educación.
- Realizar ocho 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.
- Participación en el Diálogo del Agua.
- Editar la publicación de agua y Educación para Costa Rica.
- Editar la publicación sobre Estudio de Sostenibilidad de la Cuenca del Río Reventazón, en el Proyecto HELP.

2.2 Actividades previstas para 2013-2014

- Publicación de la "Revista Técnica en Hidrología LAC" sobre Caudales Ambientales en Costa Rica.
- Participación en el subtema de repercusiones del cambio climático en el ciclo hidrológico y los consiguientes efectos de los recursos hídricos.
- Participación en el subtema 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:**

- Solicitar apoyo para Costa Rica en la Estrategia Nacional de Cambio Climático.
- Mayor apoyo al CONAPHI-Costa Rica para que puedan participar en las reuniones del Consejo Intergubernamental de PHI y en promover proyectos en la región centroamericana sobre temas relacionados con el cambio climático en los recursos hídricos.
- Para Fase VIII debe hacer notar la importancia de los temas la ecohidrología, aguas subterráneas, agua y sociedad, desastres relacionados con el agua y la escasez de los recursos hídricos como ejes transversales, el conocimiento hidrológico, gestión de los recursos hídricos y el fortalecimiento de capacidades.

ACTIVITY REPORT OF THE CZECH NATIONAL COMMITTEE (CNC) FOR THE UNESCO INTERNATIONAL HYDROLOGICAL PROGRAMME (UNESCO IHP) FOR 2010–2012

1. ACTIVITIES UNDERTAKEN IN THE PERIOD JUNE 2010 – MAY 2012

1.1. Meetings of the CNC

1.1.1. Decisions regarding the composition of the CNC

The first quarter of 2012 saw personnel changes in the CNC IHP, which is now composed of 19 elected hydrology experts, of whom three worked in the preceding Committee. The executive is comprised of the Chairman, two Vice-Chairmen, and a Scientific Secretary. In technical and administrative terms, CNC IHP is situated at the Czech Hydrometeorological Institute in Prague, the founder of which is the Ministry of the Environment (ME). The approval process for the new composition of the CNC IHC is currently under way from the position of the superior authorities, i.e. ME and the Czech Commission for Cooperation with UNESCO. At the same time, an amendment to the CNC Statute is being prepared.

CNC Chairman is a member of the Czech Commission for Cooperation with UNESCO. He is appointed to this position by an edict of the Minister of Foreign Affairs of the Czech Republic. At the national level, CNC IHP cooperates with, or has contact observers, in the committees of other international programmes:

- Czech National Committee of Geodesy and Geophysics,
- National Committee for the Czech Climate Programme,
- Czech National Committee for Disaster Reduction,
- Czech Committee of International Commission on Irrigation and Drainage,
- Czech National Committee for IOC UNESCO.

The CNC's cooperation with IAHS is based on 11 elected national correspondents and the fact that the Czech Republic's national representative for IAHS is a CNC Vice-Chairman at the same time.

1.1.2. Status of IHP-VII activities

Under IHP-VII, the Czech Republic also cooperates on the following projects, among others:

(A) EURO FRIEND:

(a) Techniques for extreme rainfall and flood runoff estimation,

(b) Analysis of regimes of low flow and drought.

(B) Groundwater for Emergency Situations (GWES).

(C) Experimental observations in a network of representative catchments in the headwater areas of the Czech Republic to improve knowledge of the water regime under the conditions of climate change.

(D) Regional Hydrological Cooperation of the Danube Countries.

All tasks can be expected to be completed in line with the IHP-VII, i.e. most of the new findings have been published in available periodicals and in published reports; the proposed methodologies have been tested and made available, etc. An exception is the incomplete third stage of the GWES project, where UNESCO has not covered costs of USD 7,000 due to the reduction in funds for the meeting of a task force that would prepare the legend for the methodology of groundwater maps for vulnerable areas.

1.2. Activities of the CNC at national level

1.2.1. National scientific and technical meetings

In 2011, CNC IHP members cooperated with the Institute of Hydrodynamics of the Academy of Sciences of the Czech Republic in the organisation of an international conference on Hydrology of Small Catchments. This three-day event was attended by more than 120 participants, of whom approximately every sixth was from the Slovak Republic. The conference included 41 presentations, and 73 full texts of scientific papers were published in the conference proceedings. The conference brought in particular a number of new methodological

procedures in the evaluation of extreme precipitation and runoff in small unobserved catchments.

In 2010, the second international interdisciplinary conference on Predictions for Hydrology, Ecology and Water Resources Management (HydroPredict) was held. The organisers were IHP UNESCO, IAHS, Charles University in Prague, BOKU Vienna, Czech University of Life Sciences in Prague, and the T. G. Masaryk Water Research Institute, p.r.i (T. G. Masaryk WRI). The conference looked into the modelling of dangerous processes with a high resolution in time and space, and their impacts. The outputs form the basis of a warning system and create the conditions for sustainable environmental development. At the same time it devoted attention to the analysis of the consequences of anthropogenic activities and climate change. Exchange of experience was also organised between experts in various disciplines for the purpose of mitigating harmful consequences.

As part of the Hydrology Days 2010, the 7th conference of Czech and Slovak hydrologists on Water in a Changing Environment was held on 25-27 October 2010 upon initiative of the CNC IHP and SNC IHP. The proceedings contain 86 contributions that map the development of hydrology in the Czech Republic in the period between 2005 and 2010. Some 180 hydrologists and water managers participated in the conference deliberations.

1.2.2. Participation in IHP Steering Committees/Working Groups

Mrs Šárka Blažková was the coordinator of sub-project 4 Techniques of Extreme Rainfall and Flood Runoff Estimation under EURO FRIEND, and Mr Jaroslav Vrba holds the position of the international coordinator of IHP GWES (IHP-VII, Theme 3, local area 3.4).

1.2.3. Supported or sponsored projects

Czech hydrologists carried out a number of activities under the WATCH (Water and Climate Change) and COST (European Cooperation in Science and Technology) projects financed, in full or in part, by the European Union.

1.2.4. Collaboration with other national committees

The Czech Republic cooperates most with the IHP National Committees in the neighbouring countries, i.e. Germany, Poland, Slovakia and Austria, and also in working groups of UNESCO IHP Regional Hydrological Cooperation of the Danube Countries.

1.2.5. Other initiatives

The Czech standard *Hydrological Terminology* was amended, and merged with the standard *Hydrogeological Terminology* to form one whole, with equivalents of terms in three languages (English, French and German). This standard was then modified based on the English version of EN ISO 772 *Hydrometric determinations – Vocabulary and Symbols*.

1.3. Educational and training courses

1.3.1. Contribution to IHP courses

Some Czech experts were invited to speak at international courses.

1.3.2. Organization of specific courses

The Czech University of Life Sciences in Prague organised, in cooperation with experts from the US and Austria, short-term hydrological courses focused on the reduction of damage caused by natural disasters, and the development of hydrological forecasting models. In terms of financing, these courses are subsidised from non-UNESCO sources.

1.3.3. Participation in IHP courses

CNC IHP has not received any reports that Czech experts participated in international IHP courses in the past two years.

1.4. Cooperation with UNESCO-IHE

Some Czech hydrologists and water managers maintain personal and professional contacts with members of the UNESCO- IHE staff.

Czech hydrology is interested in the activities of UNESCO regional centres for water in particular in Poland as regards ecohydrology, in Japan as regards natural disasters and in the Netherlands as regards groundwater and drought.

1.5. Publications

A contribution entitled Water in the Czech Republic for the 4th World Water Assessment report was prepared and published. At the national level, hydrologists prepared publications, articles, reports and studies, and contributed appropriate chapters to books:

- *Vodstvo a podnebí České republiky v souvislosti se změnou klimatu* [*Water and Climate in the Czech Republic in Connection with Climate Change*] (ISBN 80-903482-7-0).
- *Voda ve vesmíru, na zemi, v životě a v kultuře* [*Water in Space, on Earth, in Life and in Culture*] (ISBN 978-80-86212-98-2).
- *Floods, drought and prediction of uncertainties* (ISBN 978-80-8742-13-9).
- *Časová a plošná variabilita hydrologického sucha v podmínkách klimatické změny na území České republiky* [*Temporal and Spatial Variability of Hydrological Drought in Climate Change Conditions on the territory of the Czech Republic*] (ISBN 978-80-87402-11-5).
- *Testování indikátorů sucha a nedostatku vody navrhovaných Evropskou komisí na pilotním povodí ČR* [*Testing drought and water shortage indicators proposed by the European Commission on a pilot catchment of the Czech Republic*] (2011, T. G. Masaryk WRI).
- *Implementation of the Water Framework Directive and adaptation strategies in the Czech Republic* (IAHS, publ. 340).
- *A limits of acceptability approach to model evaluation and uncertainty estimation in flood frequency estimation by continuous simulation: Skalka catchment, Czech Republic* (*Water Resources Research*, vol. 45, no. 12, ISSN 0043-1397).
- *Vliv preferenčního proudění na pohyb vody a transport kadmia v půdě* [*The impact of preferential flow on water and cadmium transport in soil*] (*Vodní hospodářství* 2011, No. 4, ISSN 1211-0760).
- *Grass cover influences hydrophysical parameters and heterogeneity of water flow in a sandy soil* (*Pedosphere* 2011, ISSN 1002 - 0160).

- *Vegetation impact on the hydrology of an aeolian sandy soil in a continental climate* (*Ecohydrology* 2010)
- *Trees never rest: The multiple facets of hydraulic redistribution* (*Ecohydrology* 2010. Published online in Wiley InterScience)
- *Root Function: In Situ Studies Through Sap Flow Research* (Springer Verlag 2012, ISBN 978-3-642-22066-1).

1.6. Participation in international scientific meetings

1.6.1. Meetings hosted by the Czech Republic

- International Conference on Groundwater in Fractured Rocks, Prague, Czech Republic, May 2012.
- Hydrology Days 2010, Water in a Changing Environment, Hradec Králové, Czech Republic.

1.6.2. Participation in meetings abroad

Periodical participation of Czech hydrologists with papers at conferences:

- European Geophysical Union (EGU) in Vienna.
- 13th ERB 2010 conference on Hydrological Responses of Small Basins to a Changing Environment (Seggau, Austria).
- ERB Workshop on Geochemical, Isotope and Innovative Tracers: Challenges and Perspectives for Small Catchment Research (Belvaux, Luxembourg).
- The XXVth Conference of Danube Countries on Hydrological Forecasting and Hydrological Basis of Water Management in Budapest.

1.7. Other activities at regional level

1.7.1. Institutional relations and cooperation

CNC representatives attended the meetings of working groups as part of Regional Hydrological Cooperation of the Danube Countries and under FRIEND and ERB programmes. There was no delegate at the General Assembly of IUGG, and hence IAHS, in Melbourne due to lack of funds.

1.7.2. Ongoing scientific projects

T. G. Masaryk Water Research Institute, p.r.i., is preparing a project on the Proposed Concept of Addressing the Crisis Situation Caused by Drought and Water Shortage in the Czech Republic.

2. FUTURE ACTIVITIES

2.1. Activities planned until December 2012

Replacements in the staffing of the UNESCO IHP CNC and a new CNC Statute due to the changed conditions in the country compared with those when the original Statute was drawn up.

2.2. Activities foreseen for 2013–2014

Development of activities of CNC working groups.

Completion of IHP-VII tasks and preparation of the Czech Republic's participation in IHP-VIII.

2.3. Activities envisaged in the long term

8th Hydrology Days 2015 in the Slovak Republic.

Coordination of IHP-VIII tasks in the Czech Republic.

IUGG General Assembly in Prague in 2015.

NATIONAL REPORT OF FINLAND

IHP-related activities undertaken in 2010 – 2012

In Finland, the Finnish Environment Institute (SYKE) ***http://www.environment.fi/*** 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.

Some of SYKE's hydrological activities are closely tied to international IHP programs. As an example, SYKE maintains a network of 35 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.

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 ongoing research programme of the Academy, FICCA (2011–2014) includes several hydrology-related projects, e.g. ClimWater: Climate Change and Water Cycle: Effect to Water Resources and their Utilization in Finland. The FICCA programme was launched to respond to the scientific challenges posed by climate change on a broad front. One of the principles underlying the programme is to support the type of multidisciplinary research that addresses the social and environmental spheres side by side – the objective being a systemic approach to research problems.

In 2012–2016, the Academy of Finland will be funding a programme called AKVA, Sustainable Governance of Aquatic Resources. The programme supports research that contributes to the sustainable governance, adequacy and future safety of water and aquatic resources. The main aim of the programme is to generate new, scientifically sound and relevant knowledge and to create and strengthen national and international networks that can help produce this knowledge. At the same time, the programme will aim to achieve significant societal impact.

Finland participated in the IHP Meeting of Region 1 in Dublin, Ireland, in September 2011. We also participated in the Second consultation on the draft Strategic Plan of the Eight Phase of IHP, 2014–2021.

Finland participated in, and had a pavilion at, the sixth World Water Forum in Marseille in March 2012. Finland's focus was on clean drinking water and sanitation, water efficiency improvement green economy and cooperation in the transboundary waters. Finland is a pioneering water solutions provider with unique global know-how in the field. At the pavilion it was possible to see and hear practical examples of partnerships and the work of Finland on water security and sustainable use of water resources.

Finland is also active in its preparations for the United Nations Conference on Sustainable Development, Rio+20. One of the priorities of Finland at the Conference is water. Consequently, Finland will organize a side event on "Sustainable Development and Water: Global Goal, Targets, Partnerships", in which speakers include the Director General of UNESCO.

IHP · HWRP
Germany

Activities
2011 – 2013

IHP/HWRP in Germany

Since 1974, the German contribution to the International Hydrological Programme (IHP) of UNESCO and to the Hydrology and Water Resources Programme (HWRP) of WMO has been coordinated by the German IHP/HWRP National Committee. Its work is funded by the Federal Foreign Office, the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, and the Federal Ministry of Transport, Building and Urban Affairs.

The activities of both programmes are managed by the IHP/HWRP Secretariat at the Federal Institute of Hydrology. The secretariat is a source of information and education in the field of hydrology. At the same time, it serves as communication hub and catalyst for cooperation on water-related issues for the mutual benefit of national and international scientists, operational hydrological services, policy-makers and all interested stakeholders.

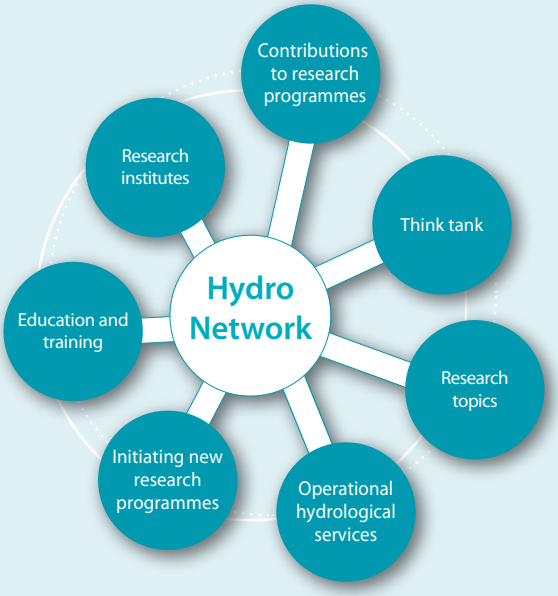
Main Fields of Action

Networking and Cooperation
The IHP/HWRP Secretariat fosters networking between administrative, scientific and operational institutions, both in Germany and on regional and global scales. National networks guarantee the integration of German research programmes and operational expertise in the field of water management into the relevant programmes of UNESCO, WMO, UN-Water and in the context of international river basin commissions. It supports WMO and UNESCO in constituent bodies and key programmes such as UNESCO's FRIEND and WMO's Global Framework for Climate Services.

Education and Training
Education is a crucial piece in the puzzle of future sustainable, fair and integrated water resources management. Therefore, the German IHP/HWRP Secretariat organises and supports knowledge transfer and individual as well as institutional capacity development. All relevant levels, from primary school education to master and PhD level are addressed. The Secretariat organises bilateral and multinational workshops and training courses. Together with experts from around the world, printed learning materials, scientific publications, operational guidelines and e-learning courses are established.

Projects
The Secretariat develops projects that support UNESCO, WMO and UN-Water in their efforts for providing integrated and freely accessible hydrological information with regard to water quality, quantity and further parameters central to water management. Furthermore, the Secretariat is actively engaged in research and development projects as well as in projects aimed at implementing and fostering integrated water management solutions worldwide. This ranges from bilateral research partnerships to cooperation in multinational programmes for improving service delivery from the municipal level to policy implementation.

Key Aspects of Activity



Research Projects

Setup of an internet-based water information platform

Development of robust calibration strategies for hydrological modelling

Analysis of sensitivity of climate projections as to land use

Education and Training

Summer School, Integrated Water Resources Management, Addis Ababa, Ethiopia, 2011

E-Learning Module on Integrated Water Resources Management (IWRM) www.iwrm-education.org

Scientific Events

WMO Workshop, Intercomparison of Flood Forecasting Models, Koblenz, 2011

6th International Conference on Water Resources and Environment Research, Water and Sediment, Koblenz, 2013

Networks

Supporting German administrative, scientific and operational institutions active in the field of hydrology

Publications

IHP/HWRP publication series

FRIEND Report 'A Global Perspective 2006–2010'

WMO Operational Hydrology Report 'Manual on Low-flow, Estimation and Prediction'

2011

2013

Education and Training

Projects

Networking

Since 2011: E-learning module IWRM
39 lectures on IWRM developed in cooperation with IWAS. Target group: hydrological operational services and university students (www.iwrm-education.org).

August 2011 – May 2012: Development of low-flow training material for WMO and UNESCO
Development of free-of-charge training material for low-flow classification and assessment incl. software in cooperation with BOKU University Vienna.

September 2011: Training Workshop on IWRM Addis Ababa (Ethiopia)
Workshop focusing on water, food security, floods, droughts and lake management. Target group: water experts from East African countries.

Jan 2012 – May 2012: E-learning Crop water modelling for optimising agricultural water management
Guide on how to use crop modelling for optimising water use efficiency in agriculture.

October/November 2012: Russian-German modelling workshop (Koblenz)
Objective: Improving modelling skills to optimise water management. Target group: young scientists from Russia and Germany.

January 2013: Training workshop on water resources management in Ethiopia
Target group: water professionals

February – April 2011: German-Russian Cooperation on hydrological modelling (Koblenz)
Visit by scientists from Russian State Hydrological Institute and St. Petersburg University to intensify cooperation in the field of applied hydrological modelling.

September 2011: Workshop on Intercomparison of Flood Forecasting Models (Koblenz)
Workshop dealing with flood forecasting models organised in cooperation with WMO and CHR.

October 2012: Training workshop on Sustainable Sediment Management (Zagreb)
Capacity development in sediment monitoring and management focusing on practical and operational questions. Joint initiative by IHP/HWRP Germany, Sava Commission, SedNet, Deltaris, UNESCO ISI, UNESCO Venice Office.

June 2013: VI. International Conference on Water and Environment Research
Conference on water and environment research with special focus on environmental issues offers a platform for scientists to present and discuss work in: hydrology, environmental research, aquatic ecosystem research, water resources research, management, global change. To be held from 3 – 7 June 2013 in Koblenz (www.water-environment.org)

Since 2011: Development of Global Water Information System
Development of software solution linking various data centres worldwide providing information on water aspects, e.g. quality and quantity. Target group: water managers

October 2011 – April 2012: evaluation of data depth as a tool for assessing ensemble modelling efficiency (Dresden)
Analysis of data depth concept for its potential to support ensemble modelling, master thesis in cooperation with University of Technology Dresden.

April 2009 – June 2012: Copula as a means of analysing historical flow data (Stuttgart)
Research project in cooperation with Stuttgart University. Target group: Young Japanese scientists

September 2012: Summer school hydrology (Koblenz)
In cooperation with German Hydrological Society. Objective: Improving skills in regionalising hydrological parameters and geostatistics. Target group: young scientists

September 2012 – September 2015: Post-processing of hydrological forecasting
Aims at developing applied methodologies and tools for improving post-processing model output in context of hydrological forecasting, in cooperation with Federal Institute of Hydrology, Koblenz

Since September 2011: Cooperation with Turkey and Iraq
Development of more efficient water management options with a focus on agriculture. Project combines technological development, scientific partnerships and capacity development aspects.

June/July 2012: German Russian cooperation on hydrological modelling (Koblenz)
Scientists from the Russian State Hydrological Institute and from St. Petersburg University visit the German IHP/HWRP Secretariat to deepen the cooperation on various issues of applied hydrological modelling

Since 2011: Land use and climate change interactions in central Vietnam
Investigation of adaptation potential for agricultural water management in Vietnam in cooperation with Karlsruhe Institute of Technology. Implementation by Vietnamese doctoral student by means of projecting land use changes into uncertain future scenarios.

April and July 2012: German-Russian Cooperation on hydrological Modelling (Koblenz). Visit by scientists from Russian State Hydrological Institute and St. Petersburg University to intensify cooperation in the field of applied hydrological modelling.

Since November 2011: Rice in East Africa
The German IHP/HWRP Secretariat is part of consortium improving capacity and knowledge basis for using potential that rice offers in fight against hunger in Africa. April 2012 Workshop for drafting project proposal in Nairobi.

November 2011: Commission for Hydrology (CHy), WMO (Geneva)

November 2011: International Meeting of the Commission for the Hydrology of the Rhine Basin (CHR)

November 2011: Young Scientists Workshop at Conference on Water Food and Energy Nexus (Bonn)

December 2011: Meeting of Advisory Working Group of CHy (Geneva)

May 2012: Forum Hydrology WMO Regional Group VI (Koblenz)

June 2012: IHP Intergovernmental Council of UNESCO (Paris)

September 2012: World Water Forum Stockholm

April 2012 – April 2015: Climate projections and land use change (Vietnam)
In current climate projections, land use is often accounted for by simple extrapolation. The German IHP/HWRP Secretariat assesses uncertainty arising from this methodology and develops approach accounting for transient land use changes in climate projections, in cooperation with Karlsruhe Institute of Technology.

Since March 2011: WMO Commission for Hydrology - Advisory Working Group. Hydrological forecasting and prediction

May 2012: International Conference on Advancing Cooperation in the Euphrates Tigris Region: Institutional Development and Multidisciplinary Perspectives (Istanbul)

June 2012 Executive Council WMO (Geneva)

Mai 2013: Meeting of IHP Bureau (Paris)

Since 2010: Member of IWRM Board of UNESCO IHP Programme

German IHP/HWRP Team

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INFORME NACIONAL DE HONDURAS SOBRE ACTIVIDADES RELACIONADAS AL PHI

1. Actividades realizadas en el periodo junio 2010 – mayo 2012

1.1 Reuniones del Comité Nacional del PHI

1.1.1 Decisiones concernientes a la composición del Comité Nacional del PHI

Actualmente se esta trabajando en la conformación del Comité Nacional del PHI (proceso en su primer etapa), para lo cual se esta gestionando la participación de varias instituciones como ser: Servicio Autónomo Nacional de Acueductos y Alcantarillados "SANAA", Empresa Nacional de Energía Eléctrica "ENEE", Instituto Nacional de Conservación Forestal y Vida Silvestre "ICF", Asociación de Municipios de Honduras "AMHON", Universidad Nacional Autónoma de Honduras "UNAH", Red Nacional de Cuencas Hidrográficas "RENACH", Secretaria de Recursos Naturales y Ambiente "SERNA", Asociación Hondureña de Juntas Administradora de Sistemas de Agua "AHJASA", Red de Agua y Saneamiento de Honduras "RAS-HON", Asociación Mundial del Agua "GWP Honduras", Agua Pura para el Mundo, Agua para el Pueblo, Escuela Agrícola Panamericana El Zamorano, entre otras.

Es importante hacer referencia que a pesar que el Comité Nacional del PHI, no se ha terminado de conformar propiamente como tal, a nivel de país existen varias organizaciones cuyos principios y funciones están enfocados al cumplimiento de los lineamientos establecidos por el Comité Nacional del PHI.

A continuación se describen las organizaciones que en Honduras han sido formadas bajo principios de la Gestión Integrada de Recursos Hídricos:

- Plataforma del Agua de Honduras (PAH): Surge en el año 2003 con el propósito de fundamental de promover un espacio de dialogo, evaluación y propuesta a nivel nacional para el fortalecimiento de capacidades e incidencia en la Gestión Integrada de los Recursos Hídricos.

- Comité Técnico de Cambio Climático, dentro del cual opera el Subcomité de Manejo Sostenible de Tierras: Formado en el marco de la implementación de la Convención de las Naciones Unidas de Cambio Climático y la Convención de las Naciones Unidas de Lucha contra la Desertificación, para dar seguimiento a la implementación de los principios de dichas convenciones en Honduras.

- Red de Agua y Saneamiento de Honduras (RAS-HON): Es una instancia de dialogo, consulta e intercambio de información del Sector Agua Potable y Saneamiento, de carácter consultivo, con independencia funcional y técnica de sus miembros.

- Asociación Nacional del Agua (GWP Honduras): Creada para fomentar la Gestión Integrada de los Recursos Hídricos (GIRH), proceso que promueve la gestión y desarrollo coordinado del agua, la tierra y los recursos relacionados, con el fin de maximizar el bienestar social y económico resultante de manera equitativa, sin comprometer la sostenibilidad de los ecosistemas.

- Asociación Hondureña de Juntas Administradora de Sistemas de Agua (AHJASA): La Visión de la AHJASA es obtener servicios de agua eficiente, sostenibles y de buena calidad mediante la educación de los usuarios, el desarrollo de una conciencia colectiva, la constitución de organizaciones comunales democráticas legalmente establecidas, el desarrollo del liderazgo y la administración efectiva de los recursos existentes.

- Red Nacional de Cuencas Hidrográficas de Honduras (RENACH): Fue creada mediante Decreto Legislativo 218-96, con el fin de coordinar la administración de los Recursos

Hídricos los que están ligados con la calidad de vida de las personas, influyendo en sus niveles de productividad y generar espacios para intercambio de experiencia entre manejadores de áreas productoras de agua.

1.1.2 Estado de las actividades del PHI – VI

A nivel de país y conforme a los lineamientos planteados en la fase VI del Programa Hidrológico Internacional se han desarrollado una serie de acciones que se describen a continuación:

Tema 1: Los cambios mundiales y los recursos hídricos

De manera general y como respuesta a los cambios mundiales que afectan todos los recursos naturales, siendo uno de los más afectados el recurso hídrico, en Honduras se elaboró la **Estrategia Nacional de Cambio Climático**, la cual busca aumentar la resiliencia y capacidad de adaptación de los sistemas humanos y naturales, ante las manifestaciones del cambio climático, con el fin de prevenir o reducir sus efectos adversos.

La estrategia responde a los esfuerzos encaminados al cumplimiento de los compromisos internacionales existentes, ya que constituye el marco de referencia fundamental para el establecimiento de un marco de política nacional ante el cambio climático, así como para la definición y ejecución de los instrumentos más apropiados para su implementatación efectiva, tanto en materia de adaptación como de mitigación.

En relación al tema del abastecimiento y calidad del uso del agua, en Honduras existe una diferencia entra la disponibilidad conforme a las áreas geográficas. La vertiente que desemboca en el océano Atlántico se caracteriza por ser un área que cuenta con disponibilidad del recursos agua tanto en época de lluvia como en época seca, no así sucede en la vertiente del pacifico, la cual presenta deficiencias en la disponibilidad y distribución del agua superficial y subterránea, incrementada esta situación por un proceso de canícula prolongada, lo que ha llevado a la realización de programas y proyectos encaminados a minimizar dicha problemática, como es el caso del Plan de Acción Nacional de Lucha contra la Desertificación y Sequía.

El Plan de Acción Nacional de Lucha Contra la Desertificación y Sequía (PAN-LCD) es una iniciativa que se enmarca en las políticas de Estado en materia de desarrollo principalmente en los sectores agropecuario, forestal, ambiental, ordenamiento territorial, descentralización y educación para el desarrollo sostenible, que responde a los postulados de la Convención de las Naciones Unidas de Lucha contra la Desertificación (UNCCD) que entró en vigencia en 1996 a la cual Honduras hizo su incorporación en 1997.

El país ha avanzado no solo en la implementación de proyectos, sino también a nivel organizativo, es así que se cuenta con **juntas de agua** en más de cinco mil comunidades, se encuentra formada la Plataforma del Agua de Honduras (PAH), la Red de Agua y Saneamiento de Honduras (RAS-HON) y la Asociación Hondureña de Juntas Administradoras de Sistemas de Agua (AHJASA), tres elementos fuertes en la organización y administración de recurso hídrico en el país.

A la fecha ya se ha trabajado con la actualización del PAN-LCD y se esta realizando una alineación del mismo con la Estrategia Decenal de las Naciones Unidas en el tema de la desertificación.

Como resultado del trabajo en esta temática, se ha creado dentro de la Secretaría de Recursos Naturales y Ambiente, especificamente en la Dirección General de Recursos Hídricos, un nuevo departamento llamado "**Departamento de desertificación y sequía**", el cual tiene dentro de sus

funciones, todo lo relacionado al cuidado del recurso hídrico para evitar la degradación de suelos y perdida del agua como patrimonio natural y cultural.

En lo referente a los procesos jurídicos y legales, en Honduras se ha avanzado considerablemente mediante la elaboración de dos mecanismos normativos, en primer lugar el desarrollo de una **Política Hídrica Nacional**, la cual surgió como una iniciativa de la Plataforma del Agua de Honduras (PAH) en conjunto con la Secretaría de Recursos Naturales de Honduras (SERNA), específicamente a través de la Dirección General de Recursos Hídricos (DGRH), la sociedad civil, ONG`s, instituciones internacionales, organizaciones locales y demás actores del sector para diseñar una propuesta que promueva una gestión integrada del recurso hídrico, con una visión a mediano y largo plazo.

La Política Hídrica Nacional fue diseñada en el año 2007 mediante una colaboración de varias instituciones interesadas en la temática como ser La SERNA, la Secretaría de Agricultura y Ganadería (SAG), la Agenda Forestal, el CATIE, la Escuela Agrícola Panamericana El Zamorano, la Cooperación Hondureña de Desarrollo Forestal y el Servicio Autónomo Nacional de Acueductos y Alcantarillados (SANAA), bajo el apoyo financiero de la Agencia Canadiense de Cooperación Internacional (ACDI).

Los principios de la Política Hídrica Nacional son:

a) El acceso al agua para consumo humano como derecho fundamental.
b) El Agua es un recurso finito, escaso y vulnerable.
c) La Gestión del agua con participación social y equidad de género.
d) El agua como bien estratégico para el desarrollo del país.
e) El agua es un bien con valor ambiental, social y económico.
f) El deterioro de la calidad del agua tiene un costo ambiental, social y económico.
g) El agua es un bien con valor ambiental, social y económico.
h) El deterioro de la calidad del agua tiene un costo ambiental, social y económico.

Actualmente y después de haber realizado un proceso de socialización en varios sectores del país, se esta trabajando para alinear la Política Hídrica Nacional con base en los lineamientos del Plan de Nación, de manera que la misma forme parte de una política unificada con relación al manejo de los recursos, y como un eje transversal en el quehacer de las instituciones.

La segunda iniciativa es la aprobación de la nueva **Ley General de Aguas**, cuyo objetivo es establecer los principios y regulaciones aplicables a la gestión para la conservación, protección, valorización y aprovechamiento del recurso hídrico nacional, sus ecosistemas y recursos vinculados.

La Ley General de Aguas fue aprobada en agosto de 2009 y publicada en el diario oficial “La Gaceta” mediante el drecreto No. 181-2009 el 14 de diciembre del 2009.

Como parte de las acciones de implementación se elaboró el Anteproyecto de Reglamento de Ley General de Aguas, el cual fue socializado a nivel nacional y se encuentra en proceso de oficialización por parte de la Presidencia de la República, así mismo se inició el proceso de elaboración y socialización de las herramientas legales especiales, como ser el Anteproyecto de Reglamento de Aguas Subterráneas, Anteproyecto de Reglamento de Aguas Residuales y la Norma Técnica para el uso de Aguas Subterráneas.

Otra de las acciones en la cual se esta trabajando actualmente, es en la preparación del equipo de trabajo y representación por Honduras en la cumbre “Rio + 20”, en la cual los paises expondran sus avances con relación a la primera cumbre de Río, y presentaran sus posiciones y experiencias en el cumplimiento de este compromiso mundial al cual estamos inscritos desde hace 20 años.

Tema 2: La dinámica integrada de las cuencas y los acuíferos.

A nivel de país existen varios programas cuyos lineamientos se basan en el **Manejo Integrado Cuencas** con distintas fuentes de financiamiento y áreas de implementación.

En el área académica la Universidad Nacional Autónoma de Honduras ha iniciado a nivel de postgrado, un estudio de **manejo integrado de cuencas hidrográficas** en la zona de occidente y se están haciendo negociaciones para que profesionales e investigadores hondureños puedan obtener maestrías en cuencas transfronterizas.

Entre los avances realizados en este tema se encuentra la elaboración del **Mapa Nacional de Aguas Subterráneas**, identificando su rango potencial a 150 metros de profundidad, el cual fue desarrollado por UNESCO, SANAA y el Instituto Geográfico Nacional (IGN) y continua vigente.

Se ha continuado con el proceso de Declaratoria de Microcuencas Protegidas de las Zonas Productoras de agua con el fín de proteger las zonas mas vulnerables y que son reconocidas como altas productoras de agua; en el año 2010 se realizo la declaratoria de 37 zonas con un extención de 4632 hectareas, en el año 2011 se declararon 49 declaratorias con una extención de 7203.25. Este año 2012 se han realizado 18 declaratorias, teniendo entre el 2010 y 2012 un total de 104 declaratorias a la fecha.

En colaboración con la Universidad Nacional Autonoma de Honduras se está realizando el estudio de la cuenca alta del Rio Choluteca, el cual es pauta para la continuación de estudios y análisis en todo el país; este esfuerzo es de gran importancia, ya que vincula la academia con las instituciones estatales, sinergia que maximiza recursos y crea conciencia no solo en el aparato estatal, sino tambien en la población estudiantil y la población en general.

Se está trabajando en la generación de información hidrogeológica, a fin de conocer el estado de este recurso en las diferentes zonas del país, lo cual se está realizando mediante la recopilación de información y toma de datos para obtener los siguientes parámetros:

- Cantidad de posos existentes
- Conductividad eléctrica del agua
- Cantidad de cloro total en el agua
- Ph
- Salinidad
- Otros

En relación al **manejo de cuencas compartidas,** es importante mencionar que en Centro América no existe legislación concerniente a este aspecto, sin embargo se ha continuado la capacitación y coordinación a través de los siguientes proyectos:

a) Plan Trifinio, con el manejo de la cuenca del rio Lempa entre los países de Honduras, Guatemala y El Salvador.

b) Proyecto Binacional, Plan de Protección y Desarrollo de la Cuenca del Río Goascoran por parte de Honduras y El Salvador.

c) Manejo Integrado de la Cuenca del río Negro, el cual esta siendo ejecutado entre Ministerio de Ambiente y Recursos Naturales (MARN) de Nicaragua y la Comisión de Recursos Hídricos del Ministerio de Relaciones Exteriores de Honduras.

d) Plan Manejo Integrado del Golfo de Fonseca como un seguimiento al Acuerdo de Paz que involucra a Honduras, El Salvador y Nicaragua.

En cuanto a los **fenómenos extremos** la Organización Panamericana de la Salud (OPS) continúa apoyando a instituciones competentes con capacitaciones que han trascendido a nivel regional, por lo cual en todo el país ya se tiene como obligatoriedad, la implementación de planes de emergencia a nivel municipal y conforme a las condiciones de cada zona.

Adicionalmente existe en el país, una Red de Estaciones Hidrometeorológicas de dos tipos: convencionales y telemétricas, manejadas por la Dirección General de Recursos Hídricos (DGRH), en conjunto con otras organizaciones como el Comisión Permanente de Contingencias (COPECO) y el SANNA forman el **Sistema de Alerta Temprana (SAT),** que permite prevenir el comportamiento de los ríos en función del caudal, utilizando tanto los datos de archivo histórico, como los provenientes en tiempo real del sistema de supervisión. Este sistema a su vez es una herramienta para la planificación a largo plazo de la construcción de infraestructuras de protección.

Debido a la importancia de la Red Nacional de Estaciones Hidrometeológicas ya que tiene bastante tiempo de operación, por lo que en el marco del proyecto Fondo de Adaptación se está elaborando un diagnóstico actual sobre el estado de la red de estaciones a ni vel nacional, el cual considera la rehabilitación de estaciones (según necesidades encontradas), la instalación de nuevas estaciones y la rehubícación de algúnas de las ya existentes con relación a las estaciones convencionales.

En lo relacionado a las estaciones telemétricas, actualmente se está en proceso de actualización de las mismas con relación a las velocidades de trasmisión de datos requeridas por el proveedor satelital.

Tema 3: La Hidrología de los hábitats terrestres

La Asociación Nacional del Agua como un capítulo de país del Global Water Partnership (GWP), cuyo objetivo básico es el desarrollo en la gestión de recursos hídricos con un enfoque en el manejo de cuencas hidrográficas, continúa trabjando en el pais mediente diferentes tipos de apoyo.

Honduras se ha mantenido siendo parte de la **Convención Ramsar** y como parte de los compromisos adquiridos en esta convención, continúa trabajando con la elaboración del **Inventario Nacional de Humedales**, con el objetivo de contar con un documento que sea una pauta para el manejo y uso de estos ecosistemas y que al mismo tiempo sea utilizado como herramienta base para la elaboración de políticas y estrategias de uso sostenible.

Con relación a la degradación de los recursos, el país continúa con su **Proyecto de Reforestación Nacional** coordinado por la SERNA y la Secretaría de Defensa, quienes ejecutan acciones para a nivel nacional involucrando la participación de la sociedad civil y el sistema educativo.

Así mismo mediante la declaratoria como áreas protegidas a todas las montañas con una altura igual o mayor a 1,800 metros sobre el nivel del mar, se ha logrado establecer un control en cuanto a ordenamiento e implementación de medidas de conservación forestal, con el fin de mejorar su condición de zonas productoras de agua.

Tema 4: El agua y la sociedad

Existe un esfuerzo continuado con relación a la valorización del recurso hídrico, el cual es realizado por diferentes instituciones, entre ellas el Servicio Autónomo Nacional de Acueductos y Alcantarillados “SANAA”, mediante publicaciones y talleres de diversas temáticas, en los cuales sigue siendo el punto principal el uso del agua.

Debido a lo anterior, se tiene ahora en la población general, una conciencia más amplia con relación al uso del agua, la cual se manifiesta en eventos academicos, institucionales y a nivel de zona mediante la planificación conjunta que se hace en las juntas de agua, quienes han adquirido ya una conciencia sobre la importancia no solo del uso del recurso, sino mediante la planificación en la protección del mismo, habiendose llegado ya a un consenso en el cual se entiende que el desarrollo del recurso debe partir de la protección misma de las cuencas.

Al respecto de lo anterior se cuenta con experiencias compartidas con instituciones como FAO – HONDURAS, SERNA, y otras, las cuales presentan experiencias de manejo de cuencas en las cuales se ha logrado aumentar en un mas de un 100% el caudal de las subcuencas (el ejemplo del río Mocal, sub cuenca del río Lempa, en el Departamento de Lempira); este gran logro se ha obtenido mediante un trabajo de varios años, en los cuales se ha involucrado directamente la sociedad, las instituciones educativas, las empresas existentes en la zona y la población en general.

Actualmente existe un comité trabajando en la ampliación de la experiencia anterior y discutiendo la posibilidad de la incorporación de "Municipios Verdes" como una figura de desarrollo en la zona; el objetivo de los Municipios Verdes, es integrar el desarrollo de cada municipio, utilizando la protección del recurso hídrico y la planificación del manejo de la cuenca como herramienta principal, integradora y legisladora en cada proyecto que en la comunidad se realice.

En Honduras los mayores problemas en cuanto disponibilidad y contaminación del agua, ocurren en las ciudades principales, Tegucigalpa (Capital del país) y San Pedro Sula caracterizada por un desarrollo industrial, ya que es donde se requiere mayor abastecimiento de agua y mejores mecanismos para saneamiento ambiental, es así que se han ido desarrollando diferentes mecanismos para mitigar dicha situación.

A nivel central, la Cámara de Comercio continúa desarrollando un plan a mediano plazo que contempla el uso de agua en la capital, tanto el abastecimiento como el saneamiento. También se han dado iniciativas para el desarrollo de un anillo verde.

En San Pedro Sula, a través de la Comisión Ejecutiva del Valle de Sula ha desarrollado Planes Estratégicos que incorporan acciones de protección de acuíferos y normativa para el control de emisiones, como ser el Reglamento para la Regulación de las Descargas de Residuos líquidos.

Otro aspecto importante ha considerar es la administración de recursos, para lo que se esta trabajando en la descentralización a las municipalidades mediante la implementación de la Ley Marco de Agua y Saneamiento.

Tema 5: La educación y la formación en recursos hídricos

La educación en temas relacionados a los recursos hídricos sigue siendo manejada por varias instituciones entre las que figuran la Secretaría de Recursos Naturales y Ambiente, el Servicio Autónomo Nacional de Acueductos y Alcantarillado (SANAA), la Plataforma del Agua de Honduras entre otras.

Las actividades desarrolladas han sido enfocadas al desarrollo de una conciencia de ahorro y conservación del recurso, para lo cual se han ejecutado actividades como:

- **Ferias Nacionales de Agua**, el objetivo de este evento es concienciar a la población en general sobre la importancia de proteger, preservar, desarrollar y utilizar el recurso hídrico como factor fundamental para el desarrollo integral en beneficio del país. Esta actividad se ha realizado desde el 2006, bajo el tema Gestión Integral de Recursos Hídricos y en el 2007 promoviendo la política de Adoptemos un Río.

- **Campañas de educación ambiental** a nivel de las municipalidades, desarrolladas por la Secretaría de Recursos Naturales a través de la Dirección de Gestión Ambiental.

- **Charlas de concientización sobre el recurso hídrico** y presentación de las acciones que el estado realiza en funció del manejo adecuado del recurso. Este mediante el involucramiento con la academia en espacios dentro de su curricula (de manera informal), en clases como Educación ambiental, ecología, y otras (ejemplo: relación DGRH-SERNA / CEUTEC-UNITEC**).**

- Se ha socializado y divulgado la ley de aguas en todas las regiones del país, no solo a nivel de instituciones estatales, sino tambien sociedad civil y población en general, con lo cual se logra un primer nivel de educación en cuanto a la conciencia sobre el recurso y los lineamientos de pais para el manejo del mismo (SERNA – DGRH)

- **SANAA** a través de la elaboración y divulgación de boletines informativos sobre el ciclo hidrológico, uso del agua y conservación de los recursos naturales.

A nivel de educación formal se ha incorporado dentro de los planes de estudio el componente ambiental, dentro de los que se destaca el manejo de los recursos hídricos, también se esta trabajando con la creación de carreras a nivel secundario y superior con enfoque en los temas mencionados. También se ha mejorado el Manual de Educación Ambiental para el nivel básico.

A nivel universitario actualmente se continúa trabajando en convenios entre la Universidad Autónoma de Honduras y universidades en Canadá para brinda asesoría científica y académica en la implementación de la Maestría en Recursos Hídricos con énfasis en hidrogeología, también la Universidad Agrícola del Zamorano desarrolla una serie de Diplomados relacionados con el tema de recursos hídricos.

Uno de los avances más significativos en cuanto a la educación ambiental es la elaboración de la **Ley de Educación y Concienciación Ambiental**, la cual luego de un proceso de formulación, consulta y socialización ha sido revisada y aprobada por el Congreso Nacional de la República.

1.2 Actividades a nivel nacional dentro del marco del PHI

1.2.1 Certámenes científicos y técnicos nacionales/locales

No contamos a la fecha con este tipo de certámenes de manera formal y específica, pero se cuenta con concursos a nivel prebásico, básico y medio, mediante ferias científicas en escuelas, colegios y últimamente en universidades en el marco de la problemática de cambio climático); aunque la DGRH esta considerando la creación de un espacio anual con las instituciones universitarias en el cual se de relevancia a la concientización del manejo de recurso hídrico y a la presentación de resultados que el país esta logrando sobre el mismo.

1.2.2 Participación en Comités de dirección/grupos de trabajo del PHI

Debido a que el Comité Nacional del PHI, aun esta en proceso de formación, el no funciona directamente como tal, las actividades relacionados a comités o redes, siguen siendo desarrolladas por organizaciones o grupos de trabajo concernientes al tema, los cuales han sido mencionados en el inciso 1.1.1 de este documento.

1.2.3 Proyectos de investigación o de aplicación apoyados o patrocinados.

En relación al aspecto de investigación, en Honduras se han desarrollado un sinnúmero proyectos a pequeña y mediana escala, ejecutados por varias organizaciones a nivel gubernamental, no gubernamental, académico y grupos comunales, pero debido a la dispersión de la información existe dificultad para enumerarlos, sin embargo se puede mencionar los siguientes:

- **Proyecto de Cosechas de aguas lluvias:** Basado en la experiencia del Estado de Brasil con el "Programa de Formación y Movilización Social para la Convivencia en Zonas Semi-Áridas (P1MC)" y siguiendo la metodología y tecnología del proyecto "Un Millón de Cisternas" de ASA-Brasil, se realizó este proyecto piloto, en el cual se conto con la supervisión técnica del Fondo Hondureño de Inversión Social (FHIS) y el apoyo financiero de la Cooperación Técnica Alemana.

  Este proyecto respondió a la iniciativa del Plan de Acción de Lucha contra la Desertificación y Sequía (PAN-LCD), siendo evaluado y verificada la validez de su implementación, de esa manera, ser replicado a nivel nacional, primordialmente en los municipios clasificados como alta vulnerabilidad a la seguía y con ello, colaborar a disminuir la degradación de los recursos naturales y efectos de la sequía en el país.

- **Mapeo Hidrológico en la zona central de Honduras**: El objetivo principal del proyecto fue la elaboración de un mapa geológico, hidrogeológico en escala 1:100,000 de la Zona Central 3 cubriendo 2,500 km^2 y elaboración de mapas temáticos complementarios a los mismos. Este trabajo se realizó mediante transectas a través de las rutas principales, carreteras y caminos vecinales. Este trabajo fue logrado por medio del consultor en geología y el equipo técnico que realizaba mediciones de espesores, texturas, estructuras e identificación de las rocas y su posición cronoestratigráfica

- **Inventario Nacional de Humedales**: La realización se este implica un estudio sobre la relación hidrológica que puedan tener las lagunas costeras del Caribe de Honduras.

- **Proyecto de concientización sobre la importancia del recurso hídrico como patrimonio natural y cultural dentro de la sociedad;** este es un proyecto que se esta diseñando (proyecto a inicial en pequeña escala), el cual consiste en concientizar a la población en general en conjunto con empresas dedicadas al cuidado del patrimonio (empresa Honduras a Mano en este caso) sobre la importancia del recurso no solamente en la salud, seguridad alimentaria, economía, sino en la cultura general del país; somo culturas hídricas y todo nuestro desarrollo desde siempre ha dependido del recurso hídrico para su desarrollo integral.

1.2.4 Colaboración con otras organizaciones o programas nacionales e internacionales

En este aspecto se destaca la participación de Honduras en las siguientes convenciones de las Naciones Unidas:

- Convención de las Naciones Unidas para la Lucha contra la desertificación y Sequía.
- Convención de las Naciones Unidas para el Cambio Climático.
- Convención Ramsar.
- Convenio con el Gobierno de BRASIL para la gestión integrada de los recursos hídricos y el fortalecimiento del marco legal en torno al tema.

En el marco de dichas convención se han desarrollado una serie de programa a nivel regional para homologar los esfuerzos en miras de generar un impacto significativo a nivel político y operativo.

1.2.5 Otras iniciativas

1.3 Cursos académicos de adiestramiento

1.3.1 Contribución a cursos del PHI

1.3.2 Organización de cursos específicos

Organización del Encuentro Internacional de Cuencas Hidrográficas, en el cual se motivo el intercambio de experiencias den el manejo de las cuencas (desarrollado en Tegucigalpa, Honduras año 2011)

1.3.3 Participación en cursos del PHI

- Gestión de los recursos hídricos y cambio climático (Bolivia).
- Gestión integrada de los Recursos Hídricos orientado a aspectos socieconómicos y políticos (Uruguay).
- Curso para PCCP, del Conflicto Potencial a la Cooperación Potencial (Juan Dolio, Rep. Dominicana).

1.4 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.

1.5 Publicaciones

Las publicaciones de mayor relevancia que se han generado en el país son:

- Informe del Estado del Ambiente, Honduras Geo 2006.
- Publicación del Balance Hídrico Nacional.
- Manual de normas de descarga, DGRH.
- Normas técnicas para el uso de aguas subterraneas, DGRH.
- Canon de aguas, DGRH.

Es importante destacar que a través de las diferentes instituciones que trabajan en la temática se han realizado una serie de estudios enfocados en diferentes temáticas, como contaminación, saneamiento, abastecimiento, hidrología, etc.

Estos estudios han sido elaborados para la ejecución de actividades relacionadas a las funciones de cada institución, sin embardo estos en su mayoría no han sido publicados oficialmente.

1.6 Participación en certámenes científicos internacionales

1.6.1 Certámenes realizados en el país.

1.6.2 Participación en certámenes en el extranjero

A nivel regional se han realizado una serie de foros y talleres que directores y tomadores de decisiones de los gobiernos, con el fin de orientar las acciones hacia una Gestión Integrada del Recurso Hídrico.

A continuación se enumeran algunas de las actividades a nivel regional:

- Conferencia de legisladores centroamericanos del Recurso Hídrico, en Tegucigalpa 2006.

- Foro de agua y saneamiento: ¿Son viables las metas del milenio?
- Formación de instructores en el manejo y preservación del agua.
- Reunión centroamericana de Planes de gestión Integrada del Recurso Hídrico.

1.7 Otras actividades a nivel regional

1.7.1 Relaciones/cooperación institucionales

Cooperación con la FAO en el proyecto de recuperación de la subcuenca del río Mocal, en el departamento de Lempira.

1.7.2 Proyectos científicos y en marcha

2. Actividades futuras

2.1 Actividades planificadas hasta diciembre 2010

A nivel general no existe una planificación sistematizada de las actividades a realizarse como país en el marco del PHI, son obstante existen iniciativas de las redes e instituciones que trabajan en el manejo de los recursos hídricos, entre las que sobresalen:

- Apoyo al comité representativo del país en la cumbre Rio + 20
- Continuar con el proceso de implementación de la política hídrica, luego que esta sea aprobada oficialmente por la Presidencia de la República.
- Seguimiento a la divulgación y aplicación de la Ley General de Aguas.
- Ejecución de proyectos cuyos resultados contribuyan con un manejo adecuado, disponibilidad y calidad del recurso agua, basados en el enfoque de cuenca hidrográfica.
- Seguimiento a las estrategias definidas en las convenciones.
- Alineación de la política hídrica nacional con el Plan de Nación
- Diagnostico de las estaciones hidrológicas convencionales y telemetricas a nivel nacional
- Publicación del libro El agua como patrimonio natural y cultural (conjunta con la institución Honduras a Mano).

2.2 Actividades previstas para 2013 – 2013

- Actualización del Balance Hídrico Nacional

2.3 Actividades vislumbradas a largo plazo

- Elaboración del balance hídrico por cuencas

REPORT OF THE
INDONESIA NATIONAL COMMITTEE OF IHP

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

1.1 Meetings of the IHP National Committee

The organizational structure of the Indonesian National Committee for IHP consist of a Chairman, a Vice Chairman, two Secretaries, and 12 members from vrious research institutes, universities and sectoral-Ministries.

The new composition of the National Committee is:

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

The committee hold bimonthly coordination meetings and in additional several technical meetings as needed for the planning and implementation of seminars and workshops organized under coordination of the committee. The committee routine meetings is attended by the Chairman of the Indonesian Committee for UNESCO and by Program Specialist of the UNESCO Jakarta Office. Members of the national

committee through regular meetings distribute informations gathered during the meeting as well as report to the meeting hydrological and related activities in their organizations.

1.1.1 Status of IHP-VII activities

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

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

Theme 2. **Strengthening water governance for sustainibility**

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

Theme 3. **Ecohydrology for sustainibility**

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

Theme 4. **Water and life support system**

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

Theme 5. **Water education for sustainable development**

1. Tertiery water education and professional development
    - Basic hydrological training for the water resources managers of the river area

- DUWRMT formation in the Ministry of Public Works as a unit of knowledge dissemination and knowledge management on water resources including hydrology
- Centre River Basin Organization Management (CRBOM) establishment as a center that will facilitate the implementation of experience in water resources management based on river basin carried out by the RBO (River Basin Organization)

2. Vocational education and training of water technicians
3. Water education in school
4. Water education for communities, stakeholders and mass-media professional

1.1.2 Decisions regarding contribution to/participation in IHP-VII

1.2 Activities at national level in the framework of the IHP

- National Seminar of Limnology : Management of 15 Priority Lakes in Indonesia
- Research of hydroclimate characterization in Semayang – Melintang Lakes National Conggress of Sciences with sub theme “Water and its problems” in Jakarta 2011
- Faculty of engineering students, Indonesia University, in March 28 2012 organized World Water Day Festival, sponsored by the Directorate General of Water Resources, Ministry of Public Works, consiting of
    - kindergarten children : coloring contest;
    - primary school children : reading poetry and singing
    - secondary school children : poster drawing contest and writing
    - high school children : research and draw a poster

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

1.2.1 National/local scientific and technical meetings

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

- Meeting with the Ministry of Education and Culture, and Indonesia National Committee for Unesco

1.2.2 Participation in IHP Steering Committees/Working Groups

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

1.2.3 Research/applied projects supported or sponsored

RC for Limnology – Indonesian Institute of Sciences :

- Development of Saguling Reservoir Demo-site

RDC for Water Resources – Ministry of Public Works

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

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

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

1.2.5 Other initiatives

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

1.3.2 Organization of specific courses

1.3.3 Participation in IHP courses

- International Training Program on Technology for Water Management, Belgium, December, 2011

  Focuses on understanding the water system and applying technology to enhance integrated water management. The program aim to improve the understanding of concepts and systems and enhance knowledge regarding tolls and technologies for water management.

- 21st IHP Nagoya Training Course in Asia and Pacific Region on Introduction to River Basin Environment Assessment under Climate Change. @8 November – 9 December 2011, Kyoto University, Japan. This course focuses on three main objectives: (1) to acquire the latest knowledge on hydrology and environmental assessment under the influence of climate change on the scale of the catchment area in the Asia-Pacific, (2) use of simulation exercises catchment environmental assessment, (3) to discuss the possibility of implementing the environmental assessment of the catchment into several hydrologic and environmental management.

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

1.5 Publications

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

1.6 Participation in international scientific meetings

- Gadis Sri Haryani presented a paper entitled "Concept & Application Of Ecohydrology In Indonesian Inland Waters", International Workshop on New Ecohydrology Demonstration Site Projects "Ecohydrology for

Managing Sustainable Water Futures", in Jakarta, Indonesia, 21 – 23 March 2011

- Peter Hehanussa presented a paper entitled "APCE in Indonesia" on National Symposium on Ecohydrology "Integrating Ecohydrological Principles for Good Water Governance" on 24 March 2011 in Jakarta, Indonesia
- Ignasius D.A. Sutapa presented a paper to the Korea International Symposium : "Addressing water quality challenges in Asia/Pacific", in Daejon, Korea, 7 – 9 December 2011
- Sudarto Notosiswoyo, presented a paper entitled "Prevention of water / groundwater pollution due to mining activities" to the Symposium Global Center of Exellencce – 8th Novel Carbon Resource Sciences in Nagpur – India, 14-16 December 2011
- MHI seminar sponsored by the Ministry of Public Works, the Application of Technology Assessment Agencies, Ministries of Agriculture, Agency for Geospatial Information and Agency for Meteorological and Geophysical.
- National seminar on dam safety sponsored by the Ministry of Public Works, the State Slectricity Company, Indonesia national committee for large dams

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1.7 Meetings hosted by the country

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

1.7.1 Participation in meetings abroad

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- Dr. Gadis Sri Haryani, Dr. Ignasius D Sutapa, Dr. Tri Widiyanto, participated UNESCO IHP 19th RSC Meeting in Kyoto – Japan December 2011
- Prof. Peter Hehanussa and Dr. Gadis Sri Haryani, participated UNESCO IHP 18th RSC Meeting for Southeast Asia & The Pacific (SEAP) in Hanoi, Vietnam. in conjunction with a the Fifth APHW conference on Hydrological Regime and Water Resources Management in the Context of Climate Change (HWCC 2010) took place in Hanoi, Vietnam 8 – 12 November 2010.
- Dr. Gadis Sri Haryani, Dr. Ignasius D Sutapa, Dr. Tri Widiyanto attend to EXTREM Symposium in Kyoto Japan, December 2011
- Dr. Ignasius D.A. Sutapa attend to Korea International Symposium : "Addressing water quality challenges in Asia/Pacific", in Daejon, Korea, 7 – 9 December 2011

1.8 Other activities at regional level

1.8.1 Institutional relations/cooperation

1.8.2 Completed and ongoing scientific projects

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2012

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

2.2 Activities foreseen for 2012-2013

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

2.3 Activities envisaged in the long term

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

United Nations
Educational, Scientific and
Cultural Organization

ISRAEL NATIONAL COMMISSION FOR UNESCO

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 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: Prof. Eilon Adar (Ben Gurion University of the Negev); Mrs. Pnina El Al (Ministry of Foreign Affairs);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. Roni Adam (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); Prof. Haim Gvirsman (The Hebrew University of Jerusalem); Dr. Abraham Melloul (Israel Hydrological Service) and Dr. Orit Ben-Zvi Assaraf (Ben Gurion University of the Negev).

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2. Activities undertaken in the period July 2010 – May 2012

2.1 Prof. Daniel Ronen was invited by ANAM (National Authority of the Environment of Panama) as a key-note speaker to the II Forum of Environmental Education held in Panama between the 27th to 29th of October, 2010. On this occasion he presented the Blue Planet methodology and the needed requirements to incorporate it in Panama. The agenda included a special meeting with the IHP of Panama (CONAPHI) where the following topics were discussed: a) how to strengthen activities related to water education in Panama, b) technology and developments in irrigation and management of solid waste, c) recuperation of water sources in the Arid Area of Azuero.

2.2 A Workshop for the transfer of "The Blue Planet" methodology was held in Santiago, Chile on January 2011. The Workshop was organized by:

- The Water Authority of Chile ("Dirección General de Aguas de Chile")
- The National Initiative for Hydro Efficiency ("Iniciativa Nacional de Eficiencia Hidrica") of the Water Authority of Chile
- The IHP National Committee of Chile
- The Israel National Commission for UNESCO, and
- The Israel IHP National Committee

In Israel, the activity was made possible thanks to the fruitful collaboration between the Ben Gurion University of the Negev, the Weizmann Institute of Science, The Agricultural Research Organization, the Israel Water Authority and UNESCO - Israel. An invitation to the Workshop was prepared and circulated in Chile by the Water Authority of Chile (Fig. 1).

The workshop was held in the Santiago branch of the University of Talca, in Santiago de Chile, between the 3th and the 7th of January, 2011, with the participation of 35

professionals from Chile (most of them teachers), two participants from Costa Rica and 4 instructors from Israel: Prof. Nir Orion, Dr. Orit Ben-Zvi Assaraf, Prof. Jorge Hugo Lemcoff and Prof. Daniel Ronen.

Fig. 1. Invitation to the Blue Planet Workshop – Chile, January 3 – 7, 2011

2.3 We finalized with great success a third "Latin America – Israel Collaboration" knowledge-transfer workshop entitled "The Blue Planet Earth Systems Approach (BEPESA) for the Study of Water Related Systems". The workshop, held in Chaco, Argentina, was organized by:

- Gobernación del Chaco, Argentina
- Administración Provincial del Agua (APA), Chaco, Argentina
- Consejo Hídrico Federal (COHIFE) , Argentina

- Subsecretaria de Recursos Hídricos, Argentina
- Ministerio de Educación, Cultura, Ciencia y Tecnología, Argentina
- La Comisión Nacional del Uruguay para la UNESCO
- The Israel National Commission for UNESCO
- The Israel IHP National Committee

In Israel, the activity was made possible thanks to the fruitful collaboration between the Ben Gurion University of the Negev, the Weizmann Institute of Science, the Israel Water Authority and UNESCO - Israel.

The workshop was held in the Universidad Popular (UP), in Resistencia, Chaco, Argentina, between the 14th and the 18th of November, 2011, with the participation of 18 professionals from Uruguay and 39 professionals from Argentina (most of them teachers) and 4 instructors from Israel and USA: Prof. Nir Orion, Dr. Molly Louis Yunker (USA), Prof. Jorge Hugo Lemcoff and Prof. Daniel Ronen.

2.4 The Israel National Committee for Hydrology presented (December 2011) to the Head of the Israel Water authority a document analyzing the needs for: 1) increasing and strengthening the number of professionals working in water related areas, and 2) increasing Israel's international cooperation activities on water related teaching programs.

2.5 The English version of "The Blue Planet - The Water Cycle in Earth Systems" has been published (May 2012) under the sponsorship of UNESCO (Fig. 2). 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 English translation was possible thanks to the devoted work of Dr. Molly Yunker at the Science Teaching Department of the Weizmann Institute of Science in Israel.
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.

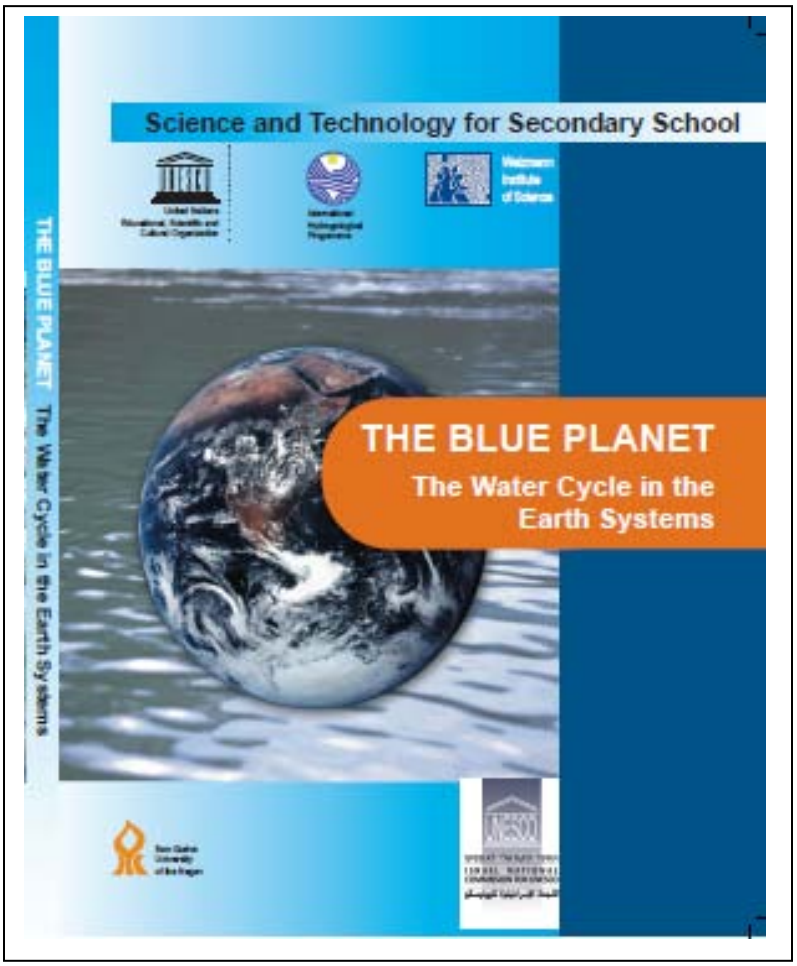

Fig. 2. Cover page of the English version of "The Blue Planet".

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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. Japanese National Commission for UNESCO has discussed and made proposal on "Sustainability Science" which is a scientific concept as the integrated approach to build a truly sustainable society. At the occasion of 36th General Conference in November 2011, Japan has submitted a proposal on "Sustainability Science" to UNESCO (see Annex I). This concept contributes to the International Hydrological Programme (IHP) of UNESCO from the view of promoting sustainable development and sustainability science within the framework of UN Decade of Education for Sustainable Development 2005 - 2014 (DESD). Based on this concept, Japanese National Committee for IHP of UNESCO is expected to solve complex global challenges through following activities with a cross-cutting approach in collaboration with all the studies including social and human sciences, in addition to changing value. The following summary includes the activities of Japanese National Committee for IHP of UNESCO undertaken during July 2010 to May 2012.

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

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 May 2012.

	Name	Position	E-mail
Chair *	TAKARA Kaoru	Prof., DPRI, Kyoto Univ.	takara.kaoru.7v@kyoto-u.ac.jp
*	UEMATSU Mitsuo	Director and Prof., CICAORI, Univ. of Tokyo.	uematsu@aori.u-tokyo.ac.jp
*	SUZUKI Kunio	President, Yokohama National Univ.	k-suzuki@ynu.ac.jp
	OKI Taikan	Prof., IIS, Univ. of Tokyo	taikan@iis.u-tokyo.ac.jp
	KAWAMURA Akira	Prof., Tokyo Metropolitan Univ.	kawamura@c.metro-u.ac.jp
	KOIKE Toshio	Prof., Univ. of Tokyo	tkoike@hydra.t.u-tokyo.ac.jp
	SHIMIZU Yoshihisa	Prof., Kyoto Univ.	shimizu@biwa.eqc.kyoto-u.ac.jp
	TACHIKAWA Yasuto	Assoc. Prof., Kyoto Univ.	tachikawa@hywr.kuciv.kyoto-u.ac.jp
	TANAKA Shigenobu	Deputy Director, ICHARM	s_tanaka@pwri.go.jp
	TANIGUCHI Makoto	Prof., RIHN	makoto@chikyu.ac.jp
	TSUJIMURA Maki	Prof., Univ. of Tsukuba	mktsuji@geoenv.tsukuba.ac.jp
	NAKAMURA Kenji	Prof., HyARC, Nagoya Univ.	nakamura@hyarc.nagoya-u.ac.jp
	NAKAYAMA Mikiyasu	Prof., Univ. of Tokyo	nakayama@k.u-tokyo.ac.jp
	HORI Tomoharu	Prof., WRRC, DPRI, Kyoto Univ.	hori.tomoharu.3w@kyoto-u.ac.jp
	WATANABE Tsugihiro	Prof., RIHN	nabe@chikyu.ac.jp

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

Secretariat of the Japanese National Committee for IHP, UNESCO:
c/o Ms. HORIO Taka
Japanese National Commission for UNESCO,
Ministry of Education, Culture, Sports, Science and Technology (MEXT)
3-2-2 Kasumigaseki, Chiyoda-ku, Tokyo 100-8959, Japan
E-mail: "Natcom Japan" <jpnatcom@mext.go.jp>
TEL: +81-(0)3-6734-2585 / FAX: +81-(0)3-6734-3679

http://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]
  There are number of activities led by Prof. Koike (Univ. of Tokyo) and others as:
  in Asia
  - International Coordination Group (ICG) Meetings on the Global Earth Observation System of Systems (GEOSS) and Asian Water Cycle Initiative (AWCI) (GEOSS/AWCI/ICG)
    - 2nd GEOSS/AWCI/ICG Meeting, Tokyo, Japan, 16-17, April 2008
    - 3rd GEOSS/AWCI/ICG Meeting, Beijing, China, 6 November 2008
    - 4th GEOSS/AWCI/ICG Meeting, Kyoto, Japan, 6-7, February 2009
    - 5th GEOSS/AWCI/ICG Meeting, Tokyo, Japan, 15-18, December 2009
    - 6th GEOSS/AWCI/ICG Meeting, Bali, Indonesia, 13 March 2010
    - 7th GEOSS/AWCI/ICG Meeting, Tokyo, Japan, 5-6, October 2010
    - 8th GEOSS/AWCI/ICG Meeting, Seoul, South Korea, 6-8 October 2011

  in Africa
  - 1st African Water Cycle Symposium, Tunis, Tunisia, 6-8 January, 2009.
  - 1st Task Team meeting in preparation of the Second GEOSS African Water Cycle Symposium, Geneva, Switzerland, 23-24 September 2009
  - 2nd African Water Cycle Symposium, Addis Ababa, Ethiopia, 6-8 January, 2011.
  - GEO-UNESCO Joint Workshop on Earth Observation and Capacity Development for IWRM at River Basins in Africa, Nairobi, Kenya, 12 - 14 January 2012.
  - 3rd African Water Cycle Symposium, Libreville, Gabon, 27-29 February, 2012.

- Interaction between hydrological cycle and physical/biochemical oceanography by cooperation between IHP and IOC [JAMSTEC, Univ. of Tokyo, Kyoto Univ.]

- IHP-IOC sessions are organized at the meetings of Japan Geoscience Union (JpGU) at Makuhari Messe in May 2011 and in May 2012.

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

- Climate change research focusing on impacts on water-related disaster risk using “Earth Simulator”: MEXT Kakushin Project (2007-2012).

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

- GWSP-Asia: HydroChange2008 Conference, Kyoto, Japan, 1-3 October 2008:
  HydroChange 2008 conference was held in Kyoto on October 1-3, 2008, and more than 180 papers were presented. The conference was organized by RIHN, GWSP, IAHS with co-sponsored by EOMF and IAHC. The conference results was published as a book “From headwaters to the ocean” from Taylor and Francis.
  http://www.chikyu.ac.jp/HC_2008/

- Groundwater research such as GRAPHIC.
  International symposium on “Groundwater as key for adaptation to changing climate and society” was held in Kyoto on November 14, 2010. The symposium was organized by RIHN, UNESCO-

IHP-GRAPHIC, DPRI (Kyoto University), HyARC (Nagoya University), and MEXT, and more than one hundred people attended the symposium.
http://www.chikyu.ac.jp/archive/topics/2010/e-topics_101114.html

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

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

- Second Phase of PUB project in cooperation with IAHS [Kyoto Univ.].
  Climate change research under the MEXT Kakushin program was intensively conducted from 2008 to 2012.
  Climate change research on dam safety and dam functions at JCOLD.

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

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

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

- Improving the predictability of hydrological extremes in ungaged or poorly gaged basins using new measurement technology and promoting the local use of satellite information for improved river basin management in partnership with GEOSS.
  The predictability of the largest recorded flood at the Kumano River basin in 2011 was examined to verify the performance of a hydrologic model for predictions of extreme events [Tachikawa].
  Space Application for Environment (SAFE), Asia-Pacific Regional Space Agency Forum (APRSA) [Koike]
  Demonstration projects:
  - Hong River, Viet Nam, 2008-2010
  - Sangker River, Cambodia, 2009-2012
  - Indus River, Pakistan, 2010-2012

- Case studies on human security and water-related disasters.

- Japan has experienced very severe water-related disasters in 2010-2012. Especially, the Great East Japan Earthquake and Tsunami (GEJET) damaged Japan very much, causing the tsunami disasters in wider coastalzones and its aftermath including radioactive contamination issues from nuclear power plants in Fukushima.

- Best practices on water risk management
  *ICHARM, as an ICFM5 Secretariat organized the 5th International Conference on Flood Management (ICFM5) in Tokyo from 27 to 29 September 2011.
  * ICHARM has started a UNESCO funded project "Strategic Strengthening of Flood Warning and Management Capacity of Pakistan" in response to the unprecedented Indus river flood disaster (2012-2013).
  * ICHARM had announced a flood inundation forecast of Chao-Phraya river basin to help local people in emergent operation(2011-).

* Flood forecasting and management [ICHARM, PWRI, IFNet, JMA and universities] under the MEXT Kakushin Program from 2007 to 2012, changes of water-related disasters and water resources under global warming were investigated.

FA 1.4 – Managing groundwater systems' response to global changes

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

  UNESCO-GRAPHIC organized several international activities including symposiums and training courses to evaluate the effects of climate change and human activities on groundwater resources. Many case studies are synthesized by books including "Groundwater System Responses to Changing Climate (eds.: Taniguchi and Holman)" and "Climate Change Effects on Groundwater Resources: A Global Synthesis of Findings and Recommendations (eds.: Treidel et al.)", from Taylor and Francis.

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

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

  DPRI initiated the Japan Egypt-Hydro Network (JF-HydroNet) with the coordination with three Egyptian Institutions under the umbrella of GCOE-ARS project at Kyoto Univ. for a joint research and education project on the water resources and environmental problems of the Nile Delta of Egypt [Prof. Tetsuya Sumi, WRRC, Kyoto Univ.].

THEME 2: Strengthening Water Governance for Sustainability

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

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

  To share the knowledge of hydrologic modeling techniques and enhance the understanding of hydrologic predictions, CommonMP (Common Modeling Platform for water-material circulation analysis) was developed at the National Institute for Land and Infrastructure Management (NILIM). The hydrologic modeling software is a tool for construction of hydrologic models that anyone can download from the NILIM home page [Tachikawa et al.].

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

- Research on "virtual water"

  Developed inventories of the virtual water/water footprint of industrial commodities [The University of Tokyo]

  Dispatched an expert for the ISO/TC207/SC5/WG8 Waterfootprint and supported developing the community draft [The University of Tokyo]

- Collaboration with IHP-LAC for Rio de La Plata Basin Workshops

  Preparatory Meeting for 6th International Workshop of Regional Approach of Development and Management of Reservoirs in La Plata River Basin [Dr. Yosuke Yamashiki, Kyoto Univ.]

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

THEME 3: Ecohydrology for Sustainability

FA 3.1 – Ecological measures to protect and remediate catchments process

- Participation in ecohydrology research development

- Effect of forest devastation on water resources and environmental issues [Univ. of Tsukuba, Kyoto Univ., Kyushu Univ., Univ. of Tokyo, Tokyo Univ. of Agriculture and Technology]

- Ecohydrology symposia and sessions at AOGS meetings

  Ecohydrology session (JHW02: Interaction between fresh water and ecosystem in the coastal zone) was organized at IUGG2011 meeting on July 2, 2011 at Melbourne, Australia.

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

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

- A new CREST Project on the impact of the forest thinning on the groundwater recharge has been launched since 2010 [Univ. Tsukuba, Kyoto Univ., Univ. Tokyo, Kyushu Univ., …]

THEME 4: Water and Life Support Systems

FA 4.3 – Achieving sustainable urban water management

- Hydrogeological and sociological survey on development processes of East-Asian cities co-existing with floods [Kyoto Univ.]

- Human impacts on Urban subsurface environments were evaluated in seven Asian cities including Tokyo, Osaka, Seoul, Taipei, Bangkok, Jakarta and Manila by RIHN project (http://www.chikyu.ac.jp/USE/index-e.html) . The results were shown in a book edited by M. Taniguchi "Groundwater and Subsurface Environment – Human Impacts in Asian Coastal Cities – " from Springer, Mar. 2011.

- New CREST (Core Research for Evolutional Science and Technology) research projects supported by the JST (Japanese Science and Technology Agency) since 2009 for Innovative Technology and System for Sustainable Water Use
  The JST adopted 17 projects: 7 in 2009, 6 in 2010 and 4 in 2011.

FA 4.4 – Achieving sustainable rural water management*

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

THEME 5: Water Education for Sustainable Development

FA 5.1 – Tertiary water education and professional development

FA 5.2 – Vocational education and training of water technicians

FA 5.3 – Water education in schools

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

- Nagoya University Training Courses: The 20th and 21st Training Courses have been conducted by Nagoya University and Kyoto University, respectively, with collaboration of Research Institute for Humanity and Nature (RIHN) , etc.

- ICHARM Training Programmes and a one-year Master Degree Program on water-related risk management in cooperation with the National Graduate Institute for Policy Studies (GRIPS) supported by JICA.

- ICHARM has been jointly conducting a three-year doctoral course, "Disaster Management", with GRIPS since October 2010.

- Six short term training courses have been conducted about Hazard Map, Early Warning System and Climate Change Adaptation, November 2010-May 2012.［ICHARM］

- Capacity building and education for observation experts for continuous monitoring of terrestrial environments in Asia [Univ. of Tsukuba]
  Workshops focusing on the training for the young scientists and engineers in the field of water and environment were held in July 2010 and 2011 in Tunisia, October 2010 and September 2011 in Mongolia in collaboration with UNESCO Chair Program on Groundwater in Mongolia and Environmental Diplomatic Leader Education Program, funded by MEXT.

Other regional and cross-cutting themes activities include:

(1) Catalogue of Rivers: The format of the Catalogue of Rivers for Southeast Asia and the Pacific, Vol. 6 was announced at the 15th Session of IHP Regional Steering Committee (RSC) for Southeast Asia and the Pacific (SEAP) in Manila, the Philippines, on 22-23 November 2007. Japanese contribution to Vo. 6 is the Yoshiigawa, of which draft was prepared by Dr. Hidetaka Chikamori, Okayama Univ. This volume contains seven rivers from seven countries with the inclusion of first

time contributions from Korea (D.P.R.), Mongolia and Myanmar, and brings the total number of rivers catalogued in the region, including those in volumes I to VI, to 121. The information of previous five volumes locates at:
http://flood.dpri.kyoto-u.ac.jp/ihp_rsc/riverCatalogue/index.html

(2) Asian Pacific FRIEND: With the dissemination of information from the SEAP region it is hoped that there will be better understanding and co-operation on matters related to water resources within each country as well as regionally. Of particular importance was the establishment of the Asian Pacific FRIEND, a UNESCO-IHP regional collaborative project, and the Asian Pacific Water Archive (APWA) that archives and makes available hydrometeorological and related data for Asian Pacific FRIEND projects and other IHP related activities in the region. Japan has been contributing to Asian Pacific FRIEND since its first Technical Sub-Committee (TSC) meeting in Kuala Lumpur in May 1997.

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

(4) Prediction in Ungauged Basins (PUB) by IAHS:
PUB-Japan members will attend IAHS 90th anniversary PUB Symposium, Delft, the Netherlands, on 23-34 October 2012.

(5) International Flood Initiative (IFI), International Sediment Initiative (ISI) and International Programme on Landslides (IPL):
- Contribution to IFI as secretariat
ICHARM has been serving as the secretariat of the International Flood Initiative (IFI), a joint initiative with international organizations such as UNESCO (IHP), WMO, UN/ISDR, UNU, IAHS and IAHR. ICHARM manages the IFI website (http://www.ifi-home.info/) and compiles inputs, materials and tools provided by member agencies, while also providing its own outputs. ICHARM made active contribution to the organization of the ICFM5, held in Tokyo in September 2011.

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

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

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

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

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

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 18th RSC was held in Hanoi, Vietnum in conjunction with the International Conference "Hydrological Regime and Water Resources Management in the Context of Climate Change HWCC2010" on 8-12 November 2010. The RSC Secretariat Prof. Takara was re-elected for 2010-2012. [Takara, Kawamrua, Tachikawa]

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

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

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

1.2.3 Research/applied projects supported or sponsored

- MEXT Kakushin Program "Flood forecasting and management" 2007-2012, changes of water-related disasters and water resources under global warming [ICHARM, PWRI, IFNet, Kyoto Univ., Univ. Tokyo and others]

- Global COE Program "Sustainability/Survivability Science for a Resilient Society Adaptable to Extreme Weather Conditions" 2009-2014 sponsored by MEXT-JSPS [PL: Prof. Kaoru Takara]

- JSPS-Asian Core Program, " Research and Education Center for the Risk Based Asian Oriented Integrated Watershed Management," 2011-2015 [PI: Prof. Yoshihisa Shimizu].

- Program for Leading Graduate Schools "Inter-Graduate School Program for Sustainable Development and Survivable Societies" 2011-2018 sponsored by MEXT-JSPS [PC: Prof. Kaoru Takara]

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

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

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

UNESCO IHP Nagoya Training Courses (TC) have been held by Nagoya University since 1991 every year. Topics of the course were relevant to fit the IHP-VII themes: Water Resources for Sustainable Development, Hydrology and Water Resources under Vulnerable Environment, and Water Interactions (Systems at Risk and Social Challenges). The host or convener body is the Hydrospheric Atmospheric Research Center (HyARC), Nagoya University. After the 19th TC, the Disaster Prevention Research Institute (DPRI), Kyoto University joined as a convener body. After that, HyARC and DPRI took the convener role alternatively. This made the TC have wider scope

including water resources and disaster prevention. About ten participants from East and Southeast Asian countries selected by UNESCO Jakarta Office took lectures and practices every year in the training course. The 20th was with a title of "Groundwater as a key for adaptation to changing climate and society" under a collaboration of the Research Institute for Humanity and Nature (RIHN), the 21st was with "Introduction to river basin environment assessment under climate change" organized by DPRI.

An important development of TC is information dissemination on website. The broadcasting of the lectures to universities in Asia via Internet was successfully performed with collaboration of EST (Engineering, Science, and Technology) programme. When the visiting participants and some graduate school students join the TC's, the number is limited as only 10-20. The lectures are now available via internet, and many participants at remote sites can join the TC's. The lectures are also opened to graduate school students in the host universities such as Nagoya University and Kyoto University. TC is a good opportunity for graduate school students, and conveners of TC encourage graduate students to join the TC's.

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.

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

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

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

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

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

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

1.5 Publications

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

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

(1) International Symposium"Groundwater as a key for adaptation to changing climate and society" was held at Kyoto on 14 November 2010, co-organized by RIHN, UNESCO, Japanese National Commission for UNESCO, HyARC, DPRI and MEXT.
(2) UNESCO Chair Workshop on International Strategy for Sustainable Groundwater Management: Transboundary Aquifers and Integrated Watershed Management was held at the University of Tsukuba, Japan on 24 February 2011.
(3) Special event entitled "International Forum on Mega-Water-Disaster", which was held on the first day (27 September 2011) of ICFM5 at UNU. For this purpose, some high-level national and international officials were invited for the conference.

(4) International symposium, “Floods – A global problem that needs local solutions”, was jointly held by ICHARM and UNU on 28 September 2010 at UNU in Tokyo. The symposium was followed by a panel discussion on “Global cooperation to help local solutions” by members of international disaster prevention organizations.
(5) The 5th International Conference on Flood Management (ICFM5) was held in Tokyo on 27-29 September 2011. Japan with more than 450 participants gathered from 41 different nations throughout the world.
(6) IHP Symposium on Extreme Events: “Meteorological, Hydrological and Tsunami Disasters: Social Adaptation and Future (EXTREME2011)” (24-28 October 2011) was held in conjunction with the 19th Regional Steering Committee Meeting for UNESCO-IHP for Southeast Asia and the Pacific in Kyoto, organized by Japanese National Committee for UNESCO-IHP; DPRI; Global COE Program “Sustainability/Survivability Science for a Resilient Society Adaptable to Extreme Weather Conditions” (GCOE-ARS); UNESCO Jakarta Office: 96 participants from 23 countries.
(7) IUGG-IAHS Sub-Committee Meeting was held in Makuhari, Chiba, Japan on 23 May 2012 at the occasion of JpGU (Japan Geoscience Union) meetings on 20-25 May 2012 [Taniguchi, Takara, Tsujimura].

1.6.2 Participation in meetings abroad

(1) FRIEND Database Harmonization Workshop at UNESCO Headquarters, 7-8 June 2010. Dr. Hidetaka Chikamori (Okayama Univ.) attended as the representative of AP-FRIEND.
(2) The 10th IHP-IAHS George Kovac Colloquium “Hydrocomplexity: New Tools for Solving Wicked Water Problems”at UNESCO Headquarters, 2-3 July 2010. [Nakajo]
(3) Emeritus Prof. Tadashi Tanaka attended the international conference on “Transboundary Aquifers: Challenges and New Directions”, which took place from 6-8 December 2010 at UNESCO Headquarters in Paris and was convened by UNESCO IHP and IGCP programmes, IAH, and UNEP.
(4) IRDR Conference 2011 took place in Beijing, China, from October 31 to November 2, 2011. The conference was hosted by the Integrated Research on Disaster Risk International Programme Office (IRDR) and the China Association for Science and Technology. Prof. Takeuchi (ICHARM) served the session B1 “Improving the Quality of Decision-Making Practice－Japanese Earthquake” as a chairperson.
(5) The 6th World Water Forum « Time for Solution », Marseille, France, 12-17 March 2012 [Takara, Watanabe and others]
(6) The 20th Session of the IHP Intergovernmental Council at UNESCO Headquarters, 4-7 June 2012. [Takara, Tachikawa and others]

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 2012

(1) The 20th Session of the IHP Regional Steering Committee (RSC) for Southeast Asia and the Pacific will be held in Malaysia in November 2012.
(2) The 22nd IHP Training Course with the theme “Precipitation Measurement from Space and its Applications” will be held in Nov.-Dec. 2012 (see Annex II).
(3) The International Workshop of the UNESCO Chair in Mongolia will be held at Ulaanbaatar in July/August 2012.
(4) ASLO summer meeting: Lake Biwa, 8-13 July 2012
(5) IAHS-IHP Joint National Workshop for Water Issues, MEXT, Tokyo, 15 October 2012.

2.2 Activities foreseen for 2013 - 2014

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

2.3 Activities envisaged in the long term

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

Annex I

August 3rd, 2011

Japanese National Commission for UNESCO

Proposal to UNESCO on “Sustainability Science”

Overview

Science has brought about extremely beneficial, remarkable transformations for humankind. The progress of science has developed the advanced technology and improved the possibility of human in a lot of fields and expanded its sphere of activities.

On the other hand, the application of scientific advances and the development of human activities have not only engendered obvious benefits but have brought about negative impacts such as exhaustion of limited global resource, ecological disorder, atmospheric and oceanic contamination, climate changes, enlarged and complexed natural hazard and reduction in biodiversity.

Here, challenges are mounting such as the expansion of economic inequality between developed and developing countries caused by modern-day economic activities supported by the development of science and technology.

The biggest problem which we come up against today is sustainability of an earth system. The science plays a significant role in solving this problem.

In order to make the best use of science and technology in a responsible way without abuse, it is important to seek appropriate solutions through building up discussions with the participation of a wide range of people.

Further efforts are required so that a consensus may be reached through the process of open debates on how science should be promoted and utilized, how its negative impacts should be controlled and on the nature of science itself.

In obtaining such mutual agreement, it is important to take note that the modern environmental, economical and social system is extremely complicated and comprised of problems that are not independent but closely interrelated.

On the side of the science which contributes to solve the problems, specialization and subdivision of science are advanced, causing the difficulties to deal with various global problems

only by an individual branch of science.

Therefore, all the cooperation is encouraged among the plural disciplines, and it should not be only fields of so-called natural science and the technology.

The complicated challenges in the contemporary society are deeply related to people's minds, sense of values, social systems, the behavior of people or deed of enterprises, which are also influenced by the selection of government policy.

Though new findings in natural science are necessary to figure out several global challenges, it is not sufficient. It is essential to solve complex challenges genuinely with a cross-cutting approach among all the studies including social and human sciences, in addition to changing values.

We must continue to ask the question whether science as a whole is managing to achieve the goal of a sustainable society and to connect science to the building of a sustainable society.

In order to do so, the consilience is required by the general mobilization of various sciences.

It is necessary to recognize that the science is required not only to ensure intergenerational equitable treatment and to correct the disparities between developed and developing countries but to respond to the new challenges of the sustainability of an Earth system including global and abiotic factors.

What is “Sustainability Science”?

We aim to use a new scientific concept, in the form of “Sustainability Science”, as the integrated approach to build a truly sustainable society.

The concept of “Sustainability Science” was officially introduced at the World Congress “Challenges of a Changing Earth 2001” in Amsterdam organized by the International Council for Science (ICSU) and other international organizations.

The origin of the concept goes back to the Brundtland Commission, formally the World Commission on Environment and Development held in 1987 which called for “Sustainable Development”.

This Commission proposed the concept of “Sustainable Development” from the perspective of intergenerational equity through “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” and made an appeal to the world that development which aimed for coexistence between the economy and the

environment was necessary – a recommendation which gained a lot of support.

"Chapter 35" of "Agenda 21" addresses the contribution of science and technology for sustainable development as its theme, which was adopted at the United Nations Conference on Environment and Development held in Rio de Janeiro in 1992.

10 years after the Rio Conference, the first World Summit on Sustainable Development was held. The Plan of Implementation adopted at the Summit reviewed the status of the progress of implementation of Agenda 21 and proposed as a means of implementation that improvements be made to policy and decision-making at all levels, which would include urgent action at all levels, through the improvement of a cooperative framework particularly between natural scientists and social scientists as well as between scientists and policy makers.

And now, various checks are being implemented as government-level international efforts in preparation for next year which will celebrate 20 years since the Rio Conference.

On the other hand, since the concept of sustainability developed without an adequate academic basis, its connection with the science that supported it was not always clear.

In the 1990s, ICSU initiated a study of science and technology for sustainability. In 1999, the "Declaration on Science and the Use of Scientific Knowledge" and the "Science Agenda – Framework for Action" intended to put the principles into action were adopted at the World Conference on Science held in Budapest, Hungary.

As a result, increasing momentum developed for the creation of sustainability science, and studies were repeated and mainly carried out by the US and European academic world including Japanese society.

These studies primarily made contributions to the individual discipline of science contributing to the sustainable development proposed at the Rio Conference, but we believe that these studies does not achieve anything notable for the consilience which is being sought today.

Today, what we need to tackle these global challenges is not a separate discipline.

Bearing in mind the need for correction of the North-South gap and to ensure intergenerational equity and variety of values, integrated science which aims to pursue sustainability and well-being on a temporal-spatial scale spanning over the globe, society and people is required which is capable of serving the entire human race without compromising the ecosystem.

This is an approach of new science which integrates knowledge in all areas including social and human sciences.

We aim to use this very concept, in the form of “Sustainability Science”, as the basis for a vision to resolve the urgent issues the international community faces and to lead to a global society which is truly sustainable.

And, an important role of UNESCO in the science field must be the promotion of such Science.

UNESCO, reflecting on the ravages of World War II, has included science in its development from the onset, and has been working in cooperation not only with UN agencies but with ICSU, International Social Science Council (ISSC) and International Council for Philosophy and Humanistic Studies（ICPHS) as well as other organizations since its inception, and has been working on the issues not just from the perspective of natural science but from the viewpoint of social and human sciences.

Moreover, UNESCO as the leading agency of Education for Sustainable Development (ESD) has played a vital role to promote the principles proposed to the international society under the leadership of the Japanese government through a perspective of the importance of education for establishing the sustainable society.

Therefore, the Japanese National Commission for UNESCO anticipates that UNESCO will show powerful leadership for the promotion of “Sustainability Science” and proposes the following points.

Proposals to UNESCO

1. Promote “Sustainability Science” and establish an implementation structure. To be specific:

1) From the viewpoint of “Sustainability Science”, implement unified management with a view to strongly collaborating with the social and human science sector and the natural science sector, and reflect the principle of “Sustainability Science” which is an integrated approach into the next medium-term strategy (37C/4) and the programme and budget (37C/5) based on the strategy.

2) Have scientists, policymakers and others participate and have UNESCO take the initiative to establish a forum at an early date where all the discussions which thus far have been held separately can be coordinated.

2. Focusing on the fact that UNESCO is a forward-looking agency, show a concrete image of “Sustainability Science” which looks to the shape of the world in 30 years’ time and will be useful for every country and region, and develop diverse measures through various initiatives. To

be specific:

1) Align and integrate separate scientific knowledge to utilize as wisdom and launch a structured, multidisciplinary initiative programme, serving needs of the society.

2) Build a network among various sites to promote “Sustainability Science”, follow the achievements of the activities and business models of such sites, consistently reflect these in the forum abovementioned 1. 2), and develop them.

3) Focus on the development of human resources who will be able to sustainably tackle global challenges through cooperation among various fields in order to promote “Sustainability Science”. In particular, considering the collaboration and relations with ESD, implement and accelerate education to foster knowledge and wisdom which makes wise use of science, cultivated through tradition from the stage of primary education.

3. Develop diverse measures in order to encourage a larger number of countries and stakeholders to realize the significance of “Sustainability Science” and participate in promoting it. To be specific:

1) Depending on the development of “Sustainability Science”, hold conferences which foster political leadership and continue to disseminate messages to global opinion leaders who have influence on the international community aiming for the penetration of sustainability science,

2) Hold workshops and other events highlighting the characteristics of each region with the participation of other international agencies, governments, the industry and NGOs in order to promote and assess the activities on a regional level.

We anticipate that these proposals will greatly contribute to the formulation of the next medium-term strategy (37C / 4).

Annex II

United Nations Educational, Scientific and Cultural Organization

Japan Funds-in-Trust

The Twenty-second IHP Training Course

Precipitation Measurement from Space and its Applications

18 November - 1 December, 2012

Nagoya, Japan

Hydrospheric Atmospheric Research Center, Nagoya University

Supported by

Water Resources Research Center, Disaster Prevention Research Institute, Kyoto University

Japan Aerospace Exploration Agency

National Institute of Information and Communications Technology

Outline

A short training course on precipitation measurement from space and its applications will be programmed for participants from Asia-Pacific regions as a part of Japanese contribution to the International Hydrological Program (IHP). The course is composed of a series of lectures and practice sessions.

Precipitation is one of the major components of the Earth climate system. Precipitation has also a big impact as a major fresh water resource to the ecosystem and human activity. Thus, observation of precipitation distribution is crucial not only for understanding and predicting changes of precipitation under the current global climate change but also for human activities. Global or even locally, precipitation observation is, however, difficult, because it has large spatiotemporal variations.

Progress of Earth observation technology from space is remarkable. The observation targets are land/ocean surface conditions, air quality, cloud distribution, etc. Precipitation is one of the major targets of Earth observation from space. However, the spatial and temporal resolutions and accuracy of the rain retrieval from space are far from sufficient. To meet the requirements, along with the sensor and rain retrieval algorithm developments, other ideas to construct global precipitation maps have emerged. One is the so-called "constellation" satellites in which multiple satellites data are utilized to construct global precipitation maps. The other is data merging in which the satellite precipitation data and ground-based rain gauge data are combined. Nowadays, several satellite-satellite based precipitation maps have already been available, and tests on utilization of the maps to short-term weather forecast, river runoff prediction and flood warming have already started.

In this training course, the basics of precipitation retrieval from space and current global precipitation maps will be introduced. The accuracy will also be included. Examples of global precipitation maps from space will be demonstrated. Practices are for learning skills to utilize the precipitation maps.

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www.ihpnagoyaforum.org

NATIONAL REPORT ON IHP RELATED ACTIVITIES

Report Format

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1. ACTIVITIES UNDERTAKEN IN THE PERIOD JUNE 2010 – MAY 2012

1.1 Meetings of the IHP National Committee

There are ten meetings existed each year as almost 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
- University of Science and Technology, Irbid
- Yarmouk University, Irbid
- Muta University, Karak
- Hashemite University, Zarqa
- Al Albayt University, Mafraq
- Balqa Applied University, Salt
- Meterological Department
- Natural Resources Authority (NRA)
- The Higher Council for Science and Technology (HCST)

1.1.2 Status of IHP-VII activities

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 Trans-boundary Water.
* Watershed and Aquifers / Climatic Change Impacts.
* Hydrology / Eco-hydrology.
* Others

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

A scientific workshop on a topic " Climate Change and Biodiversity", at AL-Albayt University, Jordan, in 9th June 2011.

- A workshop has been conducted in 2010 by the Jordan National IHP Committee On " Shared Water Resources and Trans-boundary Water ".

A workshop in September, 2010 in a topic of G.Wadi at Aqaba, that organized by UNESCO Amman office.

- Several Training workshops conducted in Jordan within 2010 and 2011 in cooperation between UNESCO Amman office and the Ministry of Water and Irrigation, Jordan.

- Celebration in the World Water day and Arab Water Day in March 2011 and March 2012.

1.2.2 Participation in IHP Steering Committees/Working Groups

1.2.3 Research/applied projects supported or sponsored

* Research program of " Wastewater Resources Management in Rural Areas in Jordan ", supported by UNESCO-IHP, (2008-2010).

Also, the following **three research projects** have been implemented and completed within (2010-2011) by the members of the national committee, financed by MDG Spanish Fund.

-The assessment of the quantitative and qualitative of the climate change impact on the quality of water resources in (Amman-Zarqa Basin).

-The assessment of the surface water harvesting due to rainwater irregularity in intensity and distribution.

-The impact of using wastewater under climatic conditions on pollutants residue in soil and the impact of different climate conditions on waste water quality.

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

- UNESCO Chair in Wadi Hydrology at the University of Jordan, Amman.

- UNESCO Regional Office in Cairo.

- UNESCO Chair in Desertification Studies at the Yarmouk University, Irbid

-Steering Committee of the project entitled, " Adaptation To Climate Change To Sustain Jordan,s MDG Achievement, United Nation Country Team Joint Program.

-UNESCO, Amman Office..

-ALECSO, ISESCO and ACSAD.

-NATCOM for Education, Science and Culture in Jordan.

-Water, Environment and Energy Centers and Institutes at Jordanian Universities.

- NGO,s and Civil Associations in Jordan as for public engagement in water management.

1.2.5 Other initiatives

Contribution in celebration of the World Water Day and Arab Water Day in march 2011, 2012 at the Ministry of Water and Irrigation headquarter. The celebration consists of public awareness programs with presence of students, institutions, Public, NGO,s and donors.

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

*Contribution to the Wadi Hydrology training course.

*Several Training courses conducted at the Ministry of Water and Irrigation, Jordan within 2010 and 2011.

-

1.3.2 Organization of specific courses

*Several Training workshops conducted in Jordan within 2010 and 2011 in cooperation between UNESCO Amman office and the Ministry of Water and Irrigation, Jordan.

-

1.3.3 Participation in IHP courses

* participation in an annual Wadi Hydrology Course.

* Participation in three IHP courses/ Meetings abroad that organized through UNESCO Cairo office, ISESCO and others.

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 AL-AlBayt University, Jordan in June 2011 through a CD.

* Research program of " Wastewater Resources Management in Rural Areas in Jordan ", supported by UNESCO (2008-2010). Through paper publication and CD.

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

1.6.2 Participation in meetings abroad

* Participation in UNESCO 19th Session of the Intergovernmental Council of the IHP in July 2010.

* Participation in the Arab National IHP Committees Meeting that held in Lebanon, in April, 2012. The meeting organized by UNESCO Cairo Office, ISESCO, UNESCO office and NATCOM of Lebanon.

* Participation at UNESCO General Conference Held at UNESCO Headquarter in Paris in October, 2011.

* Participation in three Scientific meetings abroad that organized through UNESCO Cairo office, ISESCO and others.

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 G.Wadi Network, UNESCO Cairo Office, Groundwater Protection, ACSAD

* Cooperation with the Arab National IHP Committees.

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 researchers and supported by UNESCO (2008-2010).

Also, the following **three research projects** have been implemented within (2010-2011) by the members of the national committee, financed by MDG Spanish Fund and completed.

-The assessment of the quantitative and qualitative of the climate change impact on the quality of water resources in (Amman-Zarqa Basin).

-The assessment of the surface water harvesting due to rainwater irregularity in intensity and distribution.

-The impact of using wastewater under climatic conditions on pollutants residue in soil and the impact of different climate conditions on waste water quality.

2. FUTURE ACTIVITIES

2.1 Activities planed until December 2012

*A Third Regional Consultation Meeting 8-10, October 2012, entitled, « Groundwater Governance : A Global Framework for Country Action « is going to be held in Jordan under, UNESCO head quarter, UNESCO Amman Office, UNESCWA and the Ministry of Water and Irrigation (MWI), Jordan.

There are several foreseen activities planned to be implemented within 2012 and the beginning of 2013 as follows:

* A training program for WEAP.

* A Transboundary and shared water resources.

*Strategic planning.

* Water harvesting and artificial recharge.

*Public engagement in water management.

2.2 Activities foreseen for 2013-2014

* Celebration in the international water day in March 2013 and 2014.

A scientific workshop at the first quarter 2013.

* A Scientific Seminar Probably in the second quarter 2013.

* A training coarse in one of the themes mentioned in IHP- VII. within the third quarter 2013.

A scientific workshop at the first quarter 2014.

* A scientific seminar Probably in the second quarter 2014, followed by a panel discussion. The topic will be selected to coincide with the IHP-VIII, (2014-2021).

* A training coarse in one of the themes mentioned in IHP- VIII within the third quarter 2014.

*Implementation a scientific research depending weather it is supported through a permanent financial program of UNESCO within (2012-2013).

2.3 Activities envisaged in the long term

The future recommended activities would be upon the final approval of the 8th IHP-VIII Mid Term Phase, and the possible available finance.

Suggested Research Proposals within the Mid Term Plan:

-Utilizing dead sea quarries in the Badia region, Jordan.
-Usage of brackish water in irrigation and crop production.
-Managing treated sewerage water to be reused in civil engineering works.
-Shared water resources and transboundary water-negotiation skills.
-Climate change forecasting and modeling.
-Development of preparedness, adaptation and mitigation programs under different climate change scenarios.

United Nations
Educational, Scientific and
Cultural Organization

COUNTRY REPORT

of the

NATIONAL COMMITTEE FOR
MALAYSIA INTERNATIONAL HYDROLOGICAL PROGRAMME

20th SESSION OF IHP INTERGOVERNMENTAL COUNCIL MEETING
UNESCO, PARIS

[ACTIVITIES UNDERTAKEN FOR THE PERIOD OF JUNE 2010 – MAY 2012]

NATIONAL REPORT ON IHP RELATED ACTIVITIES

Report Format

Name of the Centre		UNESCO - International Hydrological Programmes Malaysia
Name of Chairman		Dato Ir. Hj. Ahmad Husaini Sulaiman
Name and title of contact person (for cooperation)		Mr. Muhammad Al-Muzammil Chu Ahmad
E-mail		ihp@water.gov.my
Address		Water Resource and Hydrology Division, Dept. of Irrigation and Drainage Malaysia, KM 7 Jalan Ampang, 68000 Kuala Lumpur.
Website		
Location of centre		city/town : Kuala Lumpur country : Malaysia
Geographic orientation *		global regional
Year of establishment		1975
Themes	**Focal Areas ♦**	☒ groundwater ☒ urban water ☒ arid / semi-arid zones ☒ humid tropics ☒ droughts and floods ☒ sediment transport and management ☒ water and environment ☒ ecohydrology ☒ water law and policy ☒ transboundary river basins/ aquifers ☒ IWRM ☒ global and climate change ☒ mathematical modelling ☒ social and cultural dimensions of water ☒ water education ☒ other: stormwater management, ☒ water hazard.
	Scope of Activities ♦	☐ vocational training ☐ postgraduate education ☐ continuing education ☒ research ☒ institutional capacity-building ☐ advising/ consulting ☐ software development ☐ other: (please specify) _____
Support bodies 1		The Government of Malaysia
Hosting organization 2		Department of Irrigation and Drainage Malaysia/ Ministry of Natural Resources and Environment
Sources of financial support 3		The Government of Malaysia/ UNESCO

Existing networks and cooperation 4	UNESCO/ICHARM/RCUWM/RSC for Southeast Asia and The Pasific/ Partner of the GWP/ IWA/ APAC Water-related Centre Category II/MyWP/Malaysian Stormwater Organization / AWGWRM
Governance	☒ director and governing board ☐ other: Frequency of meetings: twice every year(s) ☐ Existence of UNESCO presence at meetings (UNESCO Jakarta Office)
Institutional affiliation of director	IWA/IAHS/Partner of the GWP/Malaysia Nuclear Agency/MyWP/ Board of Engineers Malaysia
Number of staff and types of staff	total number of staff (full-time, or equivalent) : 10 persons number of staff who are water experts: 3 persons. number of visiting scientists and postgraduate students: 1 person.
Annual turnover budget in USD	Operational = USD 150,000.00 Programmes and Activities = USD 250,000.00

* check on appropriate box
♦ check all that apply
1 please specify bodies that cover the operational costs of the centre, and other essential costs such as salaries and utility bills, and that provide institutional support to ensure centre's sustainability
2 if different from support bodies
3 please specify sources of main budgetary and extrabudgetary funds to implement projects
4 please write international networks, consortiums or projects that the centre is part of, or any other close links that the centre has with international organizations or programmes, which are not already mentioned above

1. ACTIVITIES UNDERTAKEN IN THE PERIOD JUNE 2010 – MAY 2012

1.1 Meetings of the IHP National Committee

1.1.1 Decisions regarding the composition of the IHP National Committee

NATIONAL COMMITTEE

The Malaysia International Hydrological Programme is the National Programme Committee and UNESCO's state member for international scientific cooperative programme in water research, water resources management education and programme.

Primary Objectives are:

- to act as a Member States for IHP, 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 resources management
- 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

EXCO MEETING - MEETINGS OF THE IHP NATIONAL COMMITTEE

The programme structure of the Malaysia National Committee for IHP consists of a Chairman, Secretaries, Vice Secretary, 8 Executive Committees and 3 Working Committees from various research institutes, universities and sectorial-departments. These programme EXCO consist of the Department of Irrigation and Drainage Malaysia (DID), UNESCO-Humid Tropics Centre Kuala Lumpur (HTC KL), National Commission of UNESCO Malaysia (Nat Com), Ministry of Science and Innovation (MoSTI), University of Technology Malaysia(UTM), National Hydraulic Research Institute Malaysia (NAHRIM), Department of Meteorology (MMD), of Mineral and Geoscience Department Malaysia (MGD), Malaysian Nuclear Agency (Nuclear Malaysia).

The Malaysia National Committee for IHP is on the threshold of restructuring its activities based on considerations:

i. Retuning the programme within the new path of IHP Programme Phase VII
ii. Obtaining better participation from key stakeholders.

The present composition of the National Committee:

Chairman : H.E Dato' Ir Hj Ahmad Husaini Sulaiman
Secretary : Hj Hanapi Mohamad Noor
Vice Secretary: Muhammad Al-Muzammil Chu Ahmad

EXCO Members:

1. Dato' Nordin Hamdan
   - Department of Irrigation and Drainage Malaysia
2. Mohammad Zulkifli Mohammed
   - National Commission for UNESCO Malaysia
3. Dr Mohamed Roseli Zainal Abidin
   - Humid Tropics Center Kuala Lumpur
4. Prof Dr Zulkifli Yusop
   - University of Technology Malaysia
5. Jailan Simon
   - Department of Meteorology Malaysia
6. Badzran Mat Taib
   - Mineral and Geoscience Department Malaysia
7. Hj Ahmad Jamaluddin Saaban
   - National Hydraulic Research Institute Malaysia
8. Dr Wan Zakaria Wan Mohd Tahir
   - Nuclear Agency Malaysia
9. Assc. Prof Dr Ismail Abustan
   - University of Science Malaysia
10. Dr Zawawi Daud
   - Tun Hussien Onn University Malaysia

The committee holds bi-monthly coordination meetings and in additional several technical meetings as needed for the planning and implementation of seminars and workshops organized under coordination of the committee. The committee routine meetings is attended by the Chairman of the Malaysia Committee for IHP. Members of the national committee through regular meetings distribute information gathered during the meeting as well as report to the meeting hydrological and related activities in their organizations.

<u>YEAR 2010 -2012</u>

- 39th AGM Meeting : 23 Jun 2010 in Johor
- 1st EXCO Meeting : 7 Feb 2011 in Bangi, Selangor
- 2nd EXCO Meeting : 11 Mar 2011 in Kuala Lumpur
- 3rd EXCO Meeting : 19 Dec 2011 in Kuala Lumpur
- 4th EXCO Meeting : 25 Apr 2012 in Kuala Lumpur
- 5th EXCO Meeting : Nov 2012 in Langkawi, Kedah

ANNUAL GENERAL MEETING

The 39th AGM was held on 23 Jun 2010. Since then the AGM has been replaced with the bi-annual meeting (namely EXCO Meeting).

IHP MALAYSIA PARTNERSHIPS

To implement its programmes, the UNESCO IHP Malaysia collaborates with an extensive range of public and private partners, in particular with other intergovernmental agencies, practitioner and NGO's programmes.

The partners of UNESCO Malaysia water related and research institution from various government departments, universities and research institutions. Meetings were periodically held to discuss and implement programs and projects in line with the IHP—VII (2008-2013) UNESCO strategic plan. More projects related to IHP-VII themes are to be supported by Ministry of Natural Resources and Environment and Ministry of Science and Innovation through IHP National Committee.

STANDING COMMITTEE

UNESCO-IHP Malaysia plans its activities through its Committee and they are carried out by the three standing committees which are:

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

SECRETARIAT OF THE UNESCO-MALAYSIA NATIONAL COMMITTEE FOR IHP

The Secretariat provides information and facilities needed to perform the programme activities and daily responsibilities .

Mr. Muhammad Al-Muzammil Chu Ahmad

Secretariat Office
UNESCO-IHP Malaysia
Water Resources Management and Hydrology
Department of Irrigation and Drainage Malaysia
KM 7 Jalan Ampang
68000 Ampang
Kuala Lumpur, MALAYSIA

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Tel : +603 4289 5545
Fax : +603 4256 2645

1.1.2 Status of IHP-VII activities

Selected activities related to the IHP-VI programme are implemented by and in various departments, universities, and research institutions, members of the IHP National Committee. During the bi-monthly committee meeting, reports of activities from each group were delivered for the knowledge and use by other members and for related IHP-VII activities.

1. A series of workshops on Review of the National Water Resources Study (2000-2050) and Formulation of National Water Resources Policy was held starting February 2010: This is a contribution for IHP VII Theme 2: Integrated Watershed and Aquifer Dynamics.

2. A contribution to IHP VII Theme 5: Water Education and Training: under the flag of the UNESCO-IHP Malaysia, consisting of stakeholders related to water have took place in the annual World Water Day since year 1994. Its main objective is to conduct campaign through training, educating and dialogue, and seminar programmes to augment public participation. Annual themes were changed according to the prevailing national needs. Three strategic target groups have been prioritized, namely school children and their teachers, decision makers cum academics, and farmers.

3. Decisions regarding contribution to/participation in IHP-VII

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

- Standing Committees of Science Meetings (under Ministry of Science, Technology & Innovation)
- IWRM Traning for Government Officials :
  - Training Course On Developing The Capacity Of Government Officers For The Practical Implementation Of Integrated Water Resources Management In Malaysia | 2-3 Nov 2010, National University Malaysia
  - Training Course On Developing The Capacity Of Government Officers For The Practical Implementation Of Integrated Water Resources Management In Malaysia | 1-2 Dec 2010, Labuan, Sabah
- Malaysia IHP Strategic Planning Meetings (yearly)

1.2.2 Participation in IHP Steering Committees/Working Groups

- Annual meetings of IHP Regional Steering Committee within Asia and the Pacific (yearly commitment)

1.2.3 Research/applied projects supported or sponsored

2011-2012

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

2013

- Impact studies of Waste Trap and Solid Waste Management in Putrajaya
- Upscaling Of MSMA Eco-Hydrology At Catchment Level in Sg. Langat – Construction
- Retrofitting Green Roof System At Block A5-1, DID Headquarters

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

- UNESCO Jakarta Office
- Malaysian National Commission for UNESCO
- Humid Tropics Center Malaysia
- Mineral and Geoscience Department Malaysia
- National Hydraulic Research Institute Malaysia
- University of Technology Malaysia

1.2.5 Other initiatives

None

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

- Malaysia IHP Technical Talks (3 sessions in 2010, 12 sessions in 2011, 12 sessions in 2012). The talks will cover topics on hydrology, water resources, meteorology, agriculture, civil & structures etc.
- National Conference on Hydrology and Environment (HIDRAS 2010) | 23-24 Jun 2010 , Universiti Tun Hussein Onn Malaysia
- International Conference on Water Resource (ICWR) | 5-9 Nov 2012 , Langkawi Kedah, Malaysia
- IWRM Seminar : Best Management Practice | 2-4 Nov 2011, Malacca, Malaysia
- World Water Day Colloquium 2011 | Kuantan, Pahang

1.3.2 Organization of specific courses

- Regional Water Watch Programme for Young Leaders (4 sessions yearly for each zones - north, south, east and Borneo)
- National Water Watch Programme for Young Leaders (once yearly)
- Operational Training for Integrated Flood Forecasting : Detailed Project Design, Supply, Installation And Testing of Hydrology Equipment, Forecast And Warning System For Integrated Flood Klang Valley | 7-14 May 2012, iFFRM Center, DID Malaysia

1.3.3 Participation in IHP courses
(Courses/Seminars attended by IHP Malaysia & members)

2012

Mr. Asmadi Ahmad
Construction of Compherensive Advance Numerical Run-off model Meeting under Research and Development Programme for Reducing Geo Hazard Damage In Malaysia Caused By Lanslide and Flood.
Joint-venture by Japan (JICA) & Malaysia (UNITEN/DID).
21-28 Apr 2012
Chiba University, Tokyo, Jepun
Japan International Cooperation Agency (JICA)

Mr. Abdul Hafiz Bin Mohammad
APEC Training Course on Quantitative Precipitation Estimation/Forcasting
27-30 Mar 2012
Quezon City, Filipina
Asia-Pacific Economic Corporation (APEC)

Mr. Livia binti Lahat
Short Training for Integrated Flood Analysis System (IFAS)
10 Jan 2012 - 9 Mar 2012
ICHARM Institute, Japan
Japan International Cooperation Agency (JICA)

Mr. Mohd Khardzir Bin Hj Husain
17th MANCID Annual Conference & World Water Day Colloquium 2012
22 - 23 Mar 2012
Bukit Merah Laketown Resort, Perak, Malaysia
IHP Malaysia, MANCID & Ministry of Agriculture Malaysia

Mr. Engineer Hanapi Mohamad Nor
6th World Water Forum
12 - 17 Mar 2012
Marseille, France
French National Committee & World Water Council

Mr. Mohamad Radzi Abdul Talib
Training on Disaster Risk Management Technology on Volcanic Eruption, Debris Flow and Landslide
3 Jun - 23 Nov 2012
Japan
JICA

2011

Mr. Hafizul Aimme
Short Training for Integrated Flood Analysis System (IFAS)
Nov 2011
ICHARM Institute, Japan
Japan International Cooperation Agency (JICA)

2010

- Short Course on Introduction of Water Sensitive Urban Design | June-July 2010, UNITEN Malaysia

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

A number of Malaysian students are currently pursuing post-graduate studies at master's and PhD levels at this institute.

1.5 Publications

- Malaysia IHP e-Bulletin (every quarterly)
- Environmental Education For Sustainable Development (EEfSD) For Everyone Series (by Prof. Nabsiah Abdul Wahid, University of Science Malaysia) :
  - Application of Simple and Effective Domestic Water Management for Household Consumers
  - Family Recreational Activity: Learning River Water Quality Estimation Using Biological Indicator

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

1.6.2 Participation in meetings abroad

2011

Mr. Engineer Hanapi Mohamad Nor
SOM For The 13th Informal Asean Ministerial Meeting On Environment (IAMME)
18 October 2011
Phnom Penh, Cambodia

Dato Ahmad Husaini Sulaiman & Mr.Hanapi Mohamad Nor
19th IHP Regional Steering Committee Meeting
27-28 October 2011
Kyoto, Japan
UNESCO-IHP

Mr. Mohd Zaki Mashud
11th Meeting Asean Working Group Water Resource Management | Jun 2011, Singapore

2010

Mr. Mohd Zaki Mashud
10th Meeting Asean Working Group Water Resource Management | Mar 2010, Vientiane, Laos

1.7 Other activities at regional level

1.7.1 Institutional relations/cooperation

- Water Watch Programme For Young Leaders (collaboration with Community College, Malacca)
- Malaysia UNESCO Cooperative Programme (MUCP)
- World Water Day celebrations for 2010, 2011 & 2012
- National Exhibition for World Water Day (yearly)
- Best Hydrology and Water Referees Thesis Award (Gold, Silver & Bronze medals)
- Water Watch Programme For Young Leaders (regional and National levels)
- Water Treatment Plants open day (nationwide) co-op with Water Supply Department & National Water Management Commission
- Secretariat for Asia Water Resource 2012 Expo & Forum | 27-29 Mar 2012, Kuala Lumpur Convention Center
- Advising for Urban Storm Water Management Manual 2nd Edition 2011 by DID Malaysia
- Training of Trainers Workshop on Groundwater Management in IWRM | 25-27 July 2011

1.7.2 Completed and ongoing scientific projects

Please refer 1.2.3

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2012

- Legislation for Malaysia National Standard for National Guidelines of Quality Assurance for Hydrological Management
- Preparing Guidelines of Quality Inspection for Hydrology Management
- Preparing Guidelines of hydrology data validation
- Preparing Guidelines of Water Balance Condition.
- Participation in IHP-RSC Meeting, Asian Pacific FRIEND and Catalogue of Rivers
- Participation in Training course in 2012 at Nagoya University
- Participation in programme at the International Center for Water-related hazards and risk management (ICHARM)
- Workshop for National Water Resource Policy : Strategic Action Plan (in collaboration with DID)
- International Water Resource Conference | 5-9 Nov 2012, Langkawi Kedah

2.2 Activities foreseen for 2013-2014

- Participation in IHP-RSC meeting Asian Pacific FRIEND and Catalogue of Rivers
- Participation in IHP-Training course at Nagoya University
- The On Job Training (OJT) IHP Training Course: "The Tank Model"
- Implementation of projects related to IHP-VII.
- Implementation of Malaysia-UNESCO Cooperative Programme funding by Government of Malaysia for South-South Country and Small Island.
- Collaboration with UNESCO-IOC activities.
- The 3rd International Conference on Water Resource in 2014

2.3 Activities envisaged in the long term

- Malaysia National committee for IHP will promote activities to public coordinate participations at national level to augment people's awareness through, educations and trainings on hazards caused by global warming, as well as hazards caused by geological events, These include sea level rise, flood and drought hazard, debris control, tsunamis, water and food security, and access to save water. Area of priorities is mega cities, and coastal areas.
- Participation in IHP-VII projects and RSC activities.
- Nagoya University IHP Training Courses.
- Information dissemination through a web page of the National Committee.
- Participation in IHP-RSC activities and IHP Intergovernmental Council meetings.
- Malaysia IHP commitment to IHP Phase VIII (2014-2019)
- Scientific Researches by Malaysia IHP Standing Committee

Rapport National sur les activités du PHI Mauritanie

1. **Activités entreprises pendant la période Juin 2010-Mai 2011**

1-1 Réunion du comité national du PHI

1-1-1. Décision sur la composition du comité national du PHI

Le comité national du PHI est composé de :

- Secrétaire Général du Ministère de l'Hydraulique et de l'Assainissement, Président ;
- Le chargé de mission chargé de l'OMVS
- Directeur du Suivi, de la Planification et de la Coopération (DSPC), membre ;
- Directeur de l'Hydraulique (DH), membre ;
- Directeur de l'Hydrologie et des barrages(DHB), membre ;
- Directeur de l'Assainissement(DA), membre ;
- Directeur de l'Aménagement Rural (DAR), membre ;
- Directeur du Centre National des Ressources en Eau (CNRE), membre
- Directeur général de la Société Nationale d'Eau ;
- Directeur Général de l'Office Nationale des Services d'Eau en milieu rural
- Le Directeur Général de la Société des Forages.

1-1-2 Bilan des activités du PHI-VII

Durant la période Juin 2010 – Mai 2011, le bilan du comité national du PHI se résume comme suit :

- Suivi des activités du projet Aménagement et Gestion Intégrée des Ressources en Eau au niveau des Wilayas du Brakna et du Trarza;
- Contribution à la création des comités régionaux de l'eau ;

- Participation à l'inauguration des projets d'alimentation en eau potable.

1-2 Activités nationales dans le cadre du PHI

1-2-1 réunions scientifiques et techniques

Participation aux réunions d'élaboration du cadre stratégique de lutte contre la pauvreté.

1-2-2 Participation à des comités ou groupes de travail du PHI:

Le comité national n'a pas été invité à participer à des comités directeurs ou des groupes de travail du PHI.

1-2-3 Projets de recherche de base ou appliquée, aide ou patronné:

Dans la cadre des activités du PHI, la Mauritanie n'a pas encore bénéficié des projets PHI.

1-2-4 Collaboration avec d'autres organisations ou programmes nationaux ou internationaux :

Les activités de collaboration du comité national du PHI avec les autres organismes nationaux ou internationaux se présentent comme suit :

- Un membre du comité national du PHI (Directeur du CNRE) participe régulièrement aux réunions du comité technique du Conseil des Ministre Africains Chargés de l'Eau (AMCOW/TAC).

- Deux membres du comité national du PHI participent (DHB et CT/OMVS) aux réunions de l'OMVS.

1-3 Cours d'éducation et de formation

Le comité national du PHI n'a bénéficié ni de cours ni formation du PHI, et souhaite être intégré dans les futures programmes.

1-4 Coopération avec l'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.

Pas de coopération à ce niveau.

1-5 Publication

Dans le cadre du projet de coopération technique entre l'AIEA et la Mauritanie sur la période 2009 - 2011, le CNRE a bénéficié d'une étude d'analyse isotopique pour évaluer la recharge des nappes du bassin sédimentaire côtier. Les résultats de cette étude ont été publiés. Les travaux de cette étude sont relatifs à l'échantillonnage d'une centaine de points d'eau du bassin sédimentaire côtier mauritanien (13 points d'eau de surface, 22 des eaux de la nappe phréatique, ainsi que 65 échantillons de la nappe subphréatique). Les échantillons ont fait l'objet d'analyses chimiques, parmi lesquels une vingtaine pour la datation au carbone 14. Suite à ces travaux (sur terrain, et au laboratoire) et interprétation, des résultats assez intéressants ont été mis en exergue confirmant la recharge de la nappe du Trarza par le fleuve Sénégal.

1-6 Participation aux réunions scientifiques internationales

1-6-1 Réunion tenues dans le pays

Néant.

1-6-2 Participation à des réunions à l'étranger

- Réunion à Vienne en 2011, dans le cadre du projet de coopération technique avec l'AIEA.

- Participation à la conférence de Copenhague sur les changements climatiques, décembre 2009.

- Participation au forum mondial de l'eau, Mars 2012 à Marseille.

1-7 Autres activités au niveau régional

1-7-1 Coopération ou relations :

Certains membres du comité national du PHI participent à des réunions au niveau régional :

- Réunions de la commission permanente des eaux de l'Organisation de la Mise en Valeur du fleuve Sénégal (OMVS),

- Réunion du Conseil des Ministre Africains Chargés de l'Eau (AMCOW),

- Réunion de l'Agence Africaine Eau et Assainissement pour l'Afrique (EAA),

- Réunions de la Facilité Africaine de l'eau (FAE).

1-7-2 Projets scientifiques achevés ou en cours

- Analyse isotopique des ressources en eau du bassin sédimentaire côtier Mauritanien, achevé.

- Utilisation des techniques isotopiques pour l'étude de la recharge des ressources en eau du bassin de Taoudenni, en cours de réalisation.

2. Activités futures

2-1 Activités planifiées jusqu'au Décembre 2012

- Suivi des activités du projet de gestion intégrée des ressources en eau

- Suivi des projets d'alimentation en eau potable

2-2 Activités prévues pour la période 2013-2014

- Intégration et Participation au programme PHI

- Suivi du programme GIRE dans une autre wilaya

- Elaboration de programme de formation pour le renforcement des capacités des directions régionales de l'eau

- Contribution à l'élaboration du bilan de l'atteinte des OMDs pour l'eau en Mauritanie

2-3 Activités envisagées à long terme

- Une plus grande participation dans les activités du PHI

- Promotion de la Gire au niveau de l'ensemble des wilayas

- Amélioration de la Gouvernance de l'eau au niveau national, régional et local.

INFORME NACIONAL SOBRE ACTIVIDADES RELACIONADAS AL COMITÉ NACIONAL DEL PHI DE MÉXICO

1. Actividades realizadas en el periodo junio de 2010 - abril de 2012

1.1 Reuniones del Comité Nacional del PHI

El ConamexPHI de México ha continuado con su labor de cooperación regional e internacional para fomentar un manejo integrado de los recursos hídricos en beneficio del desarrollo sustentable del país. El IMTA es la sede del Comité Nacional Mexicano del PHI (Conamexphi). El Conamexphi tiene coordinaciones en todos los programas globales y grupos de trabajo del PHI. Ha realizado tres reuniones de coordinación.

1.2 Cursos académicos o de adestramiento

El programa ***Agua y Educación*** participo en el Taller Cultura del Agua del Foro Nacional Agenda 2030 de Unesco México, en el foro Agua y Eduación Regional y Fondo para la Comunicación y la Educación Ambiental en *Septiembre 2010*
También llevo a cabo la formación de facilitadores en el marco de la "Reunión Regional y Nacional del programa Agua y Educación del Programa Hidrológico Internacional de la UNESCO y de la Fundación del Proyecto Wet" *(Octubre 2010)*

El programa ***ISI*** durante 2011 llevó a cabo diversas conferencias en el tema de sedimentos en las instalaciones del Instituto de Ingenieria de la UNAM, a saber:

- Medidas de mitigación de impacto de fenómenos erosivos y de sedimentación impartida por el Dr. Roberto Pizarro.
- Análisis de propagación de antidunas impartida por Francisco Nuñez.
- Estudio matemático y experimental de la erosión en ríos por extracción aluvial y retirada de presas impartida por Carlos Ferrer.
- La modelación y descarga de sedimentos del rio Grijalva en la dinámica costera del Golfo de México impartida por el Dr. Hermilo Ramírez León.
- Posibles mecanismos de falla en las márgenes y bordos del Río Carrizal impartida por el Dr. Armando Ramírez Rascón.

Asimismo, el programa ***ISI*** realizó contribuciones a la revista Aqua-LAC del PHI-LAC en el cuarto número, volumen 2 de la edición especial sobre sedimentos

El programa ***IFI*** organiso el Tercer Seminario de Potamología "José Antonio Maza Álvarez" se llevó a cabo los días 25 y 26 de agosto de 2011 en la ciudad de Tuxtla Gutiérrez, Chiapas. Se contó con la participación de 3 conferencistas internacionales (España, Argentina y Chile) y 11 nacionales (CONAGUA, CFE, Instituto de Ingeniería de la UNAM, Instituto Politécnico Nacional, IMTA), así como también de 250 asistentes promedio por día, entre especialistas, estudiantes y personas interesadas en el estudio de la potamología.

El programa ***JIHPP*** organizó el III Curso de Hidrogeoquímica aplicada del 20 al 23 de junio de 2011 en Jiutepec, Morelos, México.

El programa ***Género y Agua*** impartio cuatro talleres sobre vulnerabilidad social y de género en el municipio de San Felipe, Costa de Yucatán. Mayo y Diciembre de 2010.

El programa **Friend/ Amigo** llevó a cabo el Curso – Taller sobre "Establecimiento de un sistema de monitoreo para detectar el cambio climático en el futuro" en el 2011.

1.3 Publicaciones

El programa ***Agua y Educación*** elaboró la Guía *Encaucemos el Agua*, la cual incluye Agua y Educación para las Américas. Agosto de 2010.

El programa ***GWADI*** publicó el documento *"Sequía y cambio climático en México"*, Junio 2010.

El programa ***PCCP*** publicó 200 ejemplares de la *Guía para la construcción de Consensos en la Gestión Integrada del Agua*, julio de 2010.

El programa ***Género y Agua*** elaboró el trabajo titulado "*Vulnerabilidad social y de género frente a huracanes en la costa de Yucatán*", Diciembre de 2011

El programa ***Agua y Cultura*** en colaboración con el Archivo Histórico del Agua, elaboró el disco compacto "*La Gestión de la Comisión del Papaloapan en imágenes, 1944-1983". Agosto de 2011*.

1.4 Participación en certámenes científicos internacionales

Participación en el foro *Arid and Semi Arid Development Through Water Augmentation*, 13 al 17 de diciembre de 2010, en Valparaíso, Chile, que
Organizó el **CAZALAC**.

Participación en la Reunión **GWADI-LAC** en Juan Dolio, República Dominicana el 1 de julio de 2011 donde se presentó el trabajo "Detección y evaluación de periodos deficitarios para la Región Hidrológica VIII" y "Detección y evaluación de periodos húmedos de la para la Región Hidrológica VIII".

Asistencia al curso **PCCP-LAC** sobre prevención de conflictos por agua, 27 al 30 de junio 2011.

1.5 Otras actividades a nivel regional

El programa ***G-Wadi*** apoya en la elaboración del boletín mensual de sequía para la cuenca del río Culiacán, con Conagua

Preparación y envió al PHI-LAC de doce nuevas cuencas mexicanas al programa ***HELP*** (Hydrology for the Environment, Life and Policy).

El programa ***FRIEND/AMIGO*** planteo el Desarrollo de asistencia técnica en temas especializados de climatología para la formulación del Sistema para la Detección de la Variación del Cambio Climático en México

El grupo de trabajo ***Eco-hidrologia*** llevo a cabo el proyecto: Evaluación de los requerimientos de caudal para la conservación de los ecosistemas fluviales.

El programa ***IGRAC*** colaboro con un capitulo del libro "Aumento de oferta hídrica en el Caribe" editado en el 2010 por la Unesco.

El programa ***ISARM*** llevo a cabo cuatro reuniones binacionales: dos sobre los acuíferos de Sonora-Arizona y otras dos para los acuíferos de Chihuahua-Nuevo México-Texas, con el fin de determinar las actividades del estudio y los responsables de parte de cada país.

El programa ***ISI*** llevo a cabo la conformación de la Red_Ines, indicando que es una excelente opción para difundir e intercambiar experiencias en el tema de sedimentos.

2 Actividades futuras

El programa ***IGRAC*** plantea la realización del IV Curso "Hidrogeoquímica aplicada"

El grupo de trabajo ***JIHPP*** de isótopos ambientales en la hidrología prepara el desarrollo del proyecto ARCAL 2012 – 2014: "Using Isotopes for Hydrogeological Assessment of Intensively Exploited Aquifers in Latin America, ARCAL CXXVII".

El programa de ***Agua y Educación*** prepara la reproducción de material audiovisual y de un cuadernillo de actividades que complementa la guía "Descubre una cuenca "Rio Santiago" para el 2012.

En el programa ***Agua y Género*** y a partir del trabajo realizado en el 2011 titulado "*Vulnerabilidad social y de género frente a huracanes en la costa de Yucatán*" se plantea para el 2012:

- Generar redes sociales
- Estrategias de acompañamiento con perspectiva de género para incorporarlas en programas
- Foros de acompañamiento, formación y asesoría.
- Diseñar una estrategia para sensibilizar a la población y a los actores políticos

El programa ***Agua y Cultura*** prepara la edición del disco compacto "Documentos para la historia del agua en el Noroeste de México, 1873-1994", en colaboración con el Archivo Histórico del Agua y la Facultad de Historia de la Universidad Autónoma de Sinaloa. Así

como la edición del libro “Culturas del agua y cosmovisión indígena en un contexto de diversidad cultural”.

El programa ***PCCP*** prepara la re-edición de la Guía para la construcción de consensos en cuencas hidrográficos adicionando casos de estudio.

El programa ***ISI*** prepara la elaboración del libro “Guía metodológica para la estimación de erosión y sedimentación, Volumen 3”.

El programa ***GWADI*** formula un programa de manejo de la sequía en las regiones del norte del país afectadas por este fenómeno.

El programa ***Friend/Amigo*** llevará a cabo el Curso para la Detección de la variación del Cambio Climático en México. El curso se dará el año que entra dentro del Objetivo 7 del PNH-2007-2012. “Evaluar los efectos del cambio climático en el ciclo hidrológico”.

NATIONAL REPORT ON IHP RELATED ACTIVITIES

1. ACTIVITIES UNDERTAKEN IN THE PERIOD JUNE 2010 – MAY 2012

1.1 Meetings of the IHP National Committee

1.1.1 Decisions regarding the composition of the IHP National Committee

Oman National Committee for IHP has initiated in 1997 by a Ministerial decision No. (257/97) from the Ministry of Water Resources and has been reissued in 2005 by a Ministerial decision No. (224/2005) from the Ministry of Regional Municipalities, Environment and Water Resources after merging of the two Ministries. The Committee, on 2011 re-issued by a Ministerial decision (331/2010) from the Ministry of Regional Municipalities and Water Resources. Oman National Committee has representatives from the Ministry of Health (MOH), Ministry of Housing (MOH), Ministry of Agriculture and Fishers (MOAF), Ministry of Environment and Climatological Affairs (MECA), Scientific Research Council, Office of Dhofar Governorate, Muscat Municipalities, Oman Commerce and Industrial Chamber, Sultan Qaboos University (SQU) and Petroleum Development Oman (PDO)

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

- ✓ The Oman National Committee for IHP had it's first meeting, after reformation on 21 February 2011 to discuss the following issues:
- ✓ Activate the role of Oman IHP National Committee locally, regionally and on the international level regarding the UNESCO International Hydrological Program aims and targets.
- ✓ Set up a plan for the remaining next 2 years of the IHP-VII phase. The plan set the steps and actions proposed for achieving the aims of the IHP-VII themes and areas of knowledge.
- ✓ All members agree on the necessity of strengthen the role of Oman IHP National Committee during the future.
- ✓ Agree on the construction of a web site on the Internet for Oman IHP National Committee in order to have better national communications with all water sector stakeholders and to communicate with other regional National Committees regarding water related subjects (on going process).
- ✓ The Committee will had a regular meetings 3 times every year to discuss the achievement progress on the work plan.
- ✓ The second meeting held on 24 May 2011 to discuss the following issues:
- ✓ The importance of continuing activating the role of the Omani National Committee in the implementation of the objectives of the seventh stage through their constructive participation in their respective areas of specialization, and also reviewed the organizational structure of the

International Hydrological Programme, functions and terms of reference of the Omani National Committee and its role in the implementation of the objectives of the International Hydrological Programme.

- ✓ Proposed a Logo for the Committee in order to increase the publicity of the committee within the society focusing on the role and goals of the committee.

- ✓ Celebrating World Water Day 2011 (Urban Water Management) with the Ministry of Regional Municipalities and Water Resources and Sultan Qaboos University. The objective of World Water Day 2011 is to focus international attention on the impact of rapid urban population growth, industrialization and uncertainties caused by climate change, conflicts and natural disasters on urban water systems.

1.2.2 Participation in IHP Steering Committees/Working Groups

1.2.3 Research/applied projects supported or sponsored

- ✓ Oman National Committee for IHP have contributed in the **G-WADI Program**, which is a cross cutting program of the several UNESCO International Hydrological Programme launched. The meeting discussed the Global Network on Water and Development Information in Arid Lands particularly for the Arab Countries. The Committee members decided to have a Secretariat Office in Muscat, Oman for the Initiative Programme.

- ✓ Contributing on the activities related to the celebration of the "2011 year of Chemistry" through several events (Mr. Sulaiman bin Khalfan Al Mabsaly).

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

1.2.5 Other initiatives

A Member State Survey and Detailed Consultation were completed for the Formulation of the Eighth Phase of the International Hydrological Programme (IHP-VIII, 2014-2021). The proposed themes, knowledge area and key elements for the IHP-VIII phase are Water-related disasters and hydrological change; Water and human settlements of the future; Groundwater in a changing environment; and Eco-hydrology, engineering harmony for sustainable world. The second draft plan was distributed to all members of the Oman National Committee for IHP to give their input on the proposed projects and activities.

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

- ✓ Oman National Committee for IHP have contributed in the "**1st TROPICAL CYCLONES PREPAREDNESS AND RISK REDUCTION 21 June 2011 MUSCAT-SULTANATE OF OMAN**", which organized by the Oman Water Society. Two lectures had been presented by Faisal bin Nasser Al Hajri (Assistant Director of the executive Office for the National Oman Self Defense Committee) and Eng. Tariq Helmi (Hydrogeologist Expert, Ministry of Regional Municipalities and Water Resources).

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 2012
2.2 Activities foreseen for 2013-2014

- ✓ Organize a workshop to gather all the Arab National Committee's for IHP in order to communicate and share knowledge and experiences (Faisal bin Salem Al Hajri).

- ✓ Organize a Conference and exhibition on "Education In Water" with collaboration of the Water Research Center – Sultan Qaboos University focusing on training courses for water technicians on Assessment and Upgrading of Hydrometric Network.

- ✓ Perform field study on "Domestic Water Quality and it's Negative Effects on Human Health" with collaboration of the Ministry of Health**.**

2.3 Activities envisaged in the long term

NATIONAL REPORT ON IHP RELATED ACTIVITIES

1. ACTIVITIES UNDERTAKEN IN THE PERIOD JUNE 2010 – MAY 2012

1.1 Meetings of the IHP National Committee

The last meeting of Pakistan National Committee on IHP (PNC-IHP) was held on 19th March, 2009. During the reporting period, meeting of the Committee could not be convened due to change in hierarchy at provincial and federal level through introducing various reforms and amendment in Constitutions in 2010. Therefore, concerned administrative ministry has been requested to re-constitute of the Committee. Meanwhile, the Chairperson of the Committee has been holding discussion with the concerned available members of the committee from time to time.

1.1.1 Decisions regarding the composition of the IHP National Committee

The following measures are under consideration to mobilize the PNC-IHP:

i. Reconstitution of National Committee on IHP including newly established national organizations in water sector. (Request has already been submitted to MoST)
ii. Convene meeting of the Committee to make strategy for preparation of National programme for the coming Eight Phase of UNESCO's IHP (2014-19).
iii. Hold regular meetings of the Committee on bi-annual basis at least or as and when required.
iv. Strengthen IHP Secretariat at PCRWR's Headquarters, Islamabad.
v. Publish a regular bi-annual bulletin regarding IHP activities in Pakistan.
vi. Launch Web site for the National IHP Committee.

1.1.2 Status of IHP-VII activities

Since 2008, number of activities has been carried out in Pakistan under all the Themes of IHP-VII except Theme 2. Focal Area-wise status of the activities is as:

Focal Area 1.2: <u>Climate change impact on the hydrological cycle and consequent impact on water resources</u>

Following two activities were carried out under this focal area;

i. Hydrological Modeling of Upper Indus Basin

The Soil and Water Assessment Tool (SWAT Model) has been applied to the Upper Indus Basin watershed on an area of about 4,00,000 sq. km falling in four countries; India, Pakistan, China and Afghanistan. The model is calibrated for hydrology at Indus at Tarbela and Kabul at Nowshera for a period of eleven years (1994-2004) initially. The 90 DEM SRTM (Shuttle Radar Topographic Mission), FAO Soil data

and European Union Land Use / Land Cover datasets developed at global scale has been used to define the Hydrological Response Units (HRU's). Climatic data of 22 weather stations falling in watershed in Pakistan, India, China and Afghanistan has been used for simulation period of 11 years (1994-2004). The calibration of model for various components of water balance yielded good agreement between measured and simulated values which indicates the capability of the SWAT model for a large mountainous watershed.

ii. Hydrological Modeling of Mangla Watershed

A GIS based distributed watershed model; Soil and Water Assessment Tool (SWAT) is applied to study the hydrology of the Mangla watershed for optimal utilization of water resources of the River. The total area of the Mangla watershed is about 33,000 sq.km. The watershed falls in Disputed Jammu & Kashmir, Azad Kashmir and Pakistan. Delineation of watershed is accomplished by using SRTM 90 meters Digital Elevation Model (DEM). The FAO Digital Soil Map is used for soil information and European Union Land Use / Land Cover data is integrated for defining hydrological response units in the watershed. Ten years (1994-2003) climate data of 12 weather stations falling in watershed is used for simulation. The model is calibrated for flow and sedimentation at upstream Mangla and its performance is assessed by Pearson Correlation Coefficient, Coefficient of Determination and Nash-Sutcliffe Efficiency value of 0.75, 0.56 and 0.92 respectively.

Focal Area 1.3: Hydro-hazards, hydrological extremes and water related disasters

Following activities were carried out during floods of 2010 and 2011 in collaboration with UNICEF and WHO respectively:

- Monitored 6000 contaminated water sources
- Performed 8000 residual chlorine tests and identified over 500 alternate sources in 25 flood affected districts
- Chlorinated 350 million liters of water
- Installed 5 water filtration plants and 650 chlorinators
- Distributed 1.626 million chlorine tablets

Focal Area 1.5: Global change and climate variability in arid and semi arid regions

Snowmelt generates 70 to 80 % of runoff of IBIS and its tributaries. Forecasting snowmelt generated flow is important for water management, reservoir operation and channel diversion. River Swat being not direct contributor to the existing reservoirs remained out of focus for characterizing its snowmelt regime. Thirty years (1971-2000) data of upper Swat catchment above Kalam gauging station was acquired from WAPDA. Normal monthly values over the period and average monthly values of each year were determined for stream flow, precipitation and temperature together with average monthly values of weighted and maximum temperature. Snowmelt regime was ascertained from plot of normal values of flow, precipitation and temperature. Using temperature index approach, average monthly flow over the snowmelt months

(April, May and June) in terms of depth (mm) over the catchment was regressed on all the temperature indices using exponential, power and third degree polynomial functions. T_{max} was found the best index for snowmelt with R^2 as 0.902 for the third degree polynomial function. Runoff coefficient (ROC) for the total precipitation was conceptualized and through iteration was found as $T_{max}/100$. The optimized value of ROC was used to segregate rain induced and snowmelt induced runoff. The segregated snowmelt induced runoff was again regressed on T_{max} using the same function which slightly improved R^2 to 0.916. The model was tested for four years of data and forecasted flow was found reasonable in the context of simplicity of the approach. Such models can be very useful for characterization of individual watersheds and their integration into the model for the entire basin (PCRWR, 2012).

Focal area 2.4: <u>Managing water as a shared responsibility across geographical and social boundaries.</u>

The major agro-ecological zones of the country include irrigated areas of Punjab and Sindh, rainfed areas of Pothwar, Cholistan desert, coastal areas of Sindh, northern mountainous areas of KPK and upland mountainous areas of Balochistan and Azad Jammu & Kashmir. The site-specific water management package was developed and implemented for different regions considering native conditions and feasibility of technologies in consultation with stakeholders and local agriculture department. Farmers were also made responsible for operation and maintenance to ensure sustainability. An integrated water management plan was developed as an outcome of the project. The technologies found feasible for irrigated areas include watercourse lining, improvement in farm layout, precision field leveling, improved irrigation techniques like bed and furrow for cotton, zero tillage for wheat, ditch/trickle irrigation for orchards, sprinklers for a few field crops and use of good quality groundwater by skimming wells with proper irrigation scheduling. For rainfed areas of Potohar, construction of mini dams, watershed management, sprinkler irrigation system and afforestation were found feasible. The northern mountainous areas of KPK were found suitable for hydraulic ram pump, lift irrigation system, sprinkler system, trickle irrigation system, and improvement of water channels. In the Cholistan desert, the feasible technologies were found to be rainwater harvesting ponds, sprinkler irrigation and trickle system and installation of deep turbine wells. Upland mountainous areas of Balochistan were found requiring leaky dams and injection wells coupled with trickle irrigation to improve water availability for irrigation of orchards. The feasible technologies for coastal areas were sorted as rainwater harvesting ponds, desalinization of saline water through reverse osmosis technology and skimming wells. The Azad Jammu and Kashmir area was found a good agricultural source whereby irrigated agriculture could substantially improve national productivity; the technologies found feasible were check structures across nullah, lift irrigation system, sprinkler irrigation systems for field crops and drip system for orchards. It was however found that fully subsidized technologies proved unsustainable as farmers did not bother for its proper operation and maintenance. Mass replication of the integrated program targeting whole country particularly those with small landholdings on participatory basis was recommended to improve agricultural productivity (Malik and Bhatti, 2011)

Focal Area 3.1: Ecological measures to protect and remediate catchment processes

Northern mountainous areas of KPK and Gilgit-Baltastan are one of the most rugged regions of Pakistan. The major constraints to agricultural production in the region are extreme weather, lack of land and water due to scanty rainfall and uneven topography which severely limits the expansion of farmland. Water in streams and rivers generally flow in deep depressions due to which people even living along the streams banks are unable to use it, whereas that coming from upslopes could not be used due to lack of storage facilities. Other physical constraints include remoteness/inaccessibility, marginality, and fragility in terms poor soil conditions, short growing season and other socio-economic limitations. All these lead to under utilization of resources and limit economic growth in the region. PCRWR launched a pilot project in the area to identify water and soil management issues, extension of innovative water conservation/utilization technologies at selected sites and water analysis of surface and groundwater resources. Under the project, water storage reservoirs and conveyance systems were constructed at 33 sites lift irrigation systems were installed at 34 sites and high efficiency irrigation systems at 27 sites. As a result of the extended integrated water conservation technologies, per capita farm income was reported to increase by 235 percent at the sites due to more water availability and increased farm production. The maximum component of farm income came from vegetables and fruits. The pilot-sites are also serving for continuous metamorphic evolution and further improvement of the implemented water conservation technologies, besides continuous awareness of the farmers and improvement of catchment of upper Indus Basin. The water quality status report serves as a baseline for launching mass scale water quality improvement programme for the areas, particularly in the context of provision of safe drinking water (Malik and Bhatti, 2011).

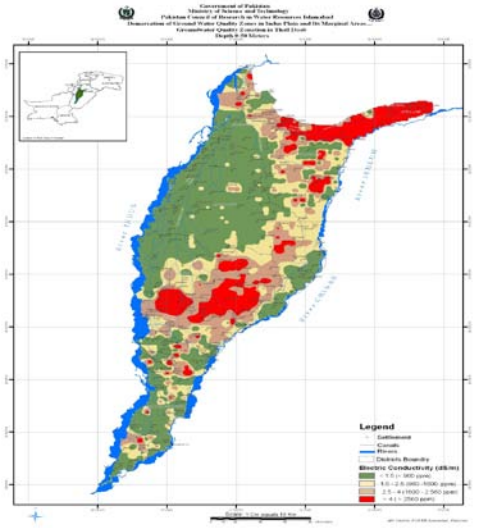
Focal Area 3.4: Groundwater-dependent eco-systems identification, inventory and assessment

Groundwater is currently contributing about 40% in total water resources of the country. The un-thoughtful and indiscrimination pumping is creating groundwater mining in many areas of the country. Therefore, proper groundwater mapping and safe yield was required to manage groundwater resources for sustainable irrigated agriculture in Indus basin. A program "Groundwater Evaluation of Thal and Bari Doabs of Indus Plain" was implemented to evaluate the national aquifers in upper Indus plain which continued about 80% of groundwater resources of the country. The program mainly consist of geophysical survey which includes, shallow resistivity survey (up to 300 meters), deep resistivity survey (up to 1 km) and exploratory well drilling at regular grids.

Groundwater Evaluation of Thal Doab: In Thal Doab, about 1100 resistivity probes up to the depth of 300 meters at 5*5 km grid, 107 vertical electrical and induced polarizations sounding are conducted to the depth of 1 Km at regular grid of 25*25 km grid. The investigations were supported by 56 exploratory wells drilling at 25*25 km grid. Total 1680 soil samples were collected and analyzed for textural analysis (clay, fine sand, medium sand) and 1200 water samples were analyzed as these parameters are required for irrigation water quality. Environmental isotopes were

applied for determination of recharge sources. About 200 water samples collected and analyzed for hydrogen and oxygen isotopes. Similarly the water samples were also analyzed for Tritium to determine age of groundwater.

Quantitative and qualitative mapping of groundwater zones in Upper Indus Basin (Thal Doab – Mianwali, Khushab, Bhakkar, Layyah, Muzaffargarh) and identified about 5 MAF of additional fresh groundwater sources from unexplored zones which may irrigate 1.34 million hectare of additional land



Groundwater Evaluation of Bari Doab: In Bari Daob, about 1156 Electrical resistivity probes were conducted up to the depth of 300 meters at 5*5 km grid and 107 deep resistivity survey probes up to the depth of 1 km at 25*25 km grid. About 1650 lithological samples were collected and analyzed for textural analysis (clay, fine sand, medium sand, and 1200 water samples were analyzed for water quality analysis for the parameters required for irrigation water.

Water quality maps were prepared for the depths. 0-50, 50-100, 100-150 …… up to 1000 meters depicting four water quality zones depending on electrical conductivity based on geophysical survey and drilling. The total water contained in alluvium and specific yield were calculated under fresh and marginal water quality zones. This program has generated information useful for sustainable management of national aquifer.

Focal Area 4.1: <u>Protecting water quality for sustainable livelihoods and poverty alleviation</u>

Following activities were performed for protecting water quality at national level:

- Established ISO-17025 Accredited National Water Quality Laboratory at Islamabad having analytical capabilities for more than 200 parameters
- Carried out monitoring of drinking water sources in 24 districts of rural areas of the country and published water quality profile
- Conducted quarterly monitorin bottled/mineral water brands

- Established a network of 26 Water Quality Laboratories at district level in all provinces

- Developed and introduced innovative and low cost water testing and treatment products: Microbiology Testing Kits; Arsenic Testing Kits; Chlorination Tablets; Community Level Safe Water Filter; Arsenic Removal Safe Drinking Water Filter

Focal Area 4.3: <u>Achieving sustainable urban water management</u>

A demonstration pilot project on "Artificial Aquifer Recharge with Harvested Rainwater" was implemented in collaboration with Capital Development Authority, Islamabad to increase recharge in local aquifer system. This helped to conserve rainwater that goes waste to drainage system.

Nation-wide Assessment Survey of more than 1800 urban water supply schemes was carried out which has revealed that 78% schemes are operational and only 23% are supplying safe drinking water to the consumers. The survey has also identified technical, financial and social issues relating to water supply schemes. The survey results would act as baseline data for rehabilitation of these schemes in future by the respective water supply agencies. The results have been shared and disseminated with the concerned agencies and general public by organizing seminars and printing reports and brochure in the local languages. Further, action plan is being developed with the concerned provincial departments.

Focal Area 4.4: <u>Achieving sustainable rural water management</u>

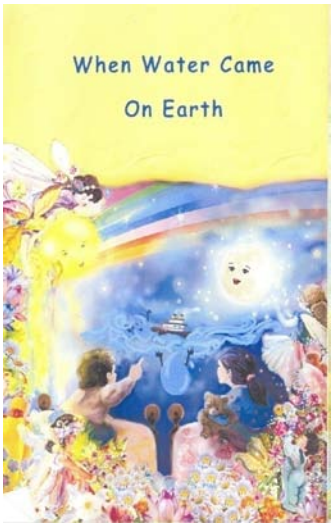
Nation-wide Assessment Survey of more than 8,000 rural water supply schemes was conducted which has revealed that 71% schemes are operational and only 14% schemes are supplying safe drinking water to the consumers. The survey has also identified technical, financial and social issues relating to water supply schemes. The survey results would act as baseline data for rehabilitation of these schemes in future by the respective water supply agencies. The results have been shared and disseminated with the concerned agencies and general public by organizing seminars and printing reports and brochure in the local languages. Further, action plan is being developed with the concerned provincial departments.

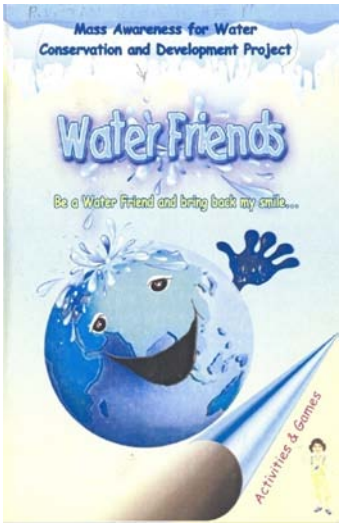
Focal Area 5.2: <u>Vocational education and training of water technicians</u>

Capacity Building of 3000 professionals associated with Water Supply Agencies was carried out for three management levels (senior, middle and technician) belonging to all four provinces, FATA, AJK and Gilgit-Baltistan. This activity was carried out due to identification of lack of trained manpower in water supply agencies. This activity assisted the respective district and provincial governments to achieve the ultimate goal of provision of safe drinking water to the masses. In continuation to this activity, a National Capacity Building Institute for Water Quality Management is being established with funding from Korea International Cooperation Agency (KOICA) and Government of Pakistan. The Institute will offer diploma and certificate level courses for the general public and persons working in various water supply agencies. Besides, establishing infrastructure for the Institute, KOICA would impart training to the Master Trainers of Pakistan in Korea.

Focal Area 5.3: <u>Water education in schools</u>

Published story books on water conservation for school children and distributed in different schools in the country. Arranged puppet shows in schools on water conservation and water quality.





Focal Area 5.4: Water education for communities, stakeholders and mass-media professionals

Launched mass awareness campaign to promote water conservation among water users preparing Urdu booklet on Islamic teachings for conserving water; painting of message in Urdu on water tankers, installing moppies, bill boards and bridge displayed at appropriate locations, launching TV and radio commercials, special supplements in Newspapers, participating in live TV talk shows in Urdu and regional languages, broadcast from TV, airing strolls for Cable network, etc. Moreover, an MoU has been signed with a National Television Network "Sohni Dharti" to aware and educate the masses about water related issues and their solutions.

Establishment of Category-II Center in Pakistan

The PNC-IHP also submitted a proposal in 2006 for establishment of Regional Centre for Water Management Research in Arid Zones in Pakistan (Category II) under the auspices of UNESCO. Following activities have been carried out since 2008:

- Organized a consultative meeting of PNC-IHP on 19th March, 2009 regarding establishment of a Regional Centre for Water Management Research in Pakistan. Following decisions were made:
    - The Committee endorses the proposal and draft agreement approved by the UNESCO
    - The PNC-IHP secretariat is advised to pursue the approval of the PC-I from the competent forum
    - The MoST may develop a strategy for establishing legal entity of the proposed Center and
    - The MoST may consider the observations and concerns of the Federal Ministries and Security agencies separately while drafting Rules of Procedure
- Prepared and submitted a PC-I amounting to Rs. 39.366 million for the period of 6 years (as per draft agreement) to MoST in January, 2009 which was considered during DDWP meeting held on April 23, 2009. The PC-I was deferred with observation that the project duration may be reduced to one year which was not favorable for establishing the proposed Centre.
- Submitted a request to MoST for provision of Rs. 7.000 million per annum from non-development on 18th September 2009 and persuaded accordingly.
- Briefed the 3-member delegation of UNESCO Pairs Office about the status of establishment of the proposed category-II Center in Pakistan.
- Highlighted the following issues relating to the proposed Center during a meeting held in MoST on 8th February, 2011under the Chairmanship of the Secretary, MoST:

- Signed the Agreement between UNESCO and Government of Pakistan
- Approval for provision of proposed funds

- Briefed the Secretary, MoST on 2nd February, 2012 on the above mentioned pending issues of the proposed Centre.

- Apprised the Chief, Water and Sustainable Development Section, UNESCO Office, Paris about the meeting held with the MoST on 8th February, 2011 and 2nd February, 2012 regarding establishment of the proposed category-II Center in Pakistan.

- Re-highlighted the pending issues pertaining to the proposed Center during a meeting held in the office of Secretary MoST on 15th March, 2012 with Chief, Water and Sustainable Development Section, UNESCO Office, Paris.

- Apprised the Joint Secretary (UN) Economic Affairs Division about the role of PCRWR in establishing the proposed category-II Center in Pakistan under auspices of UNESCO during a meeting held on 22nd March, 2012 with the Chief, Water and Sustainable Development Section, UNESCO Office, Paris.

UNESCO participation programs

The PNC-IHP also submitted following 6 proposals for UNESCO participation programs for 2008-09 and 2012-13through MoST:

- Improvement of Sandy Desert Rangelands through Scientific Management of Available Vegetation, Land and Water Resources (2008-09)
- Evaluating Artificial Recharge Methods in Water Stressed Areas of Balochistan, Pakistan (2008-09)
- Efficient Irrigation Techniques to Enhance Water Use Efficiency (2008-09)
- Modeling Climate Change Impact Assessment on Hydrology of Upper Indus Watershed (2012-13)
- Wastewater Treatment through Phyto-Remediation using Water Hyacinth (2012-13)
- Promotion of Water Disinfection Tablets for Provision of Safe Drinking Water (2012-13)

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

- A meeting held on 12th November, 2010 at PCRWR, Islamabad with a three-member UNESCO delegation comprising Dr. Gretchen Kalonji, Asstt. Director General for Natural Resources, Dr. Jose Alberto Tejada-Guibert, Secretary, IHP/Director Division of Water Sciences and Prof. Dr. Shahbaz Khan, Chief, Water and Sustainable Development Section, UNESCO Paris Office. The

Chairperson, PNC-IHP briefed the delegation about activities of the PNC-IHP and progress regarding establishment of the proposed Category-II Regional Center.

- A meeting held on 8th February, 2011 at MoST, Islamabad to review the IHP activities in Pakistan and to discuss current issues regarding establishment of the proposed Category-II Regional Center. The meeting was attended by the Chairperson, PNC–IHP and the Director, PCRWR. A presentation was also given to the Secretary, MoST.
- Engr. Masood Ahmed, Assistant Director, PCRWR participated in International Workshop on "Climate Change and Sustainable Management of Water Resources in the Asia-Pacific-Region" held from 22-24th November, 2011 at Institute of Banking and Finance, Islamabad organized by COMSATS Institute of Information Technology, Higher Education Commission, UNESCO and Commission on Science and Technology for Sustainable Development in the South.
- Participated Engr. Muhammad Farooq, Assistant Director, PCRWR in International Training Workshop on "Stakeholders Capacity Building in Flood Warning and Management" held at National University of Science & Technology (NUST), Islamabad from 20-23 December, 2011 organized by NUST and UNESCO.
- Attended two meetings held in MoST on 2nd February and 15th March, 2012 regarding pending issues of the proposed category-II Center in Pakistan.
- Attended a meeting held on 22nd March, 2012 in the office of the Joint Secretary (UN) Economic Affairs Division and highlighted the role of PCRWR in establishing the proposed category-II Center in Pakistan under auspices of UNESCO.
- The Chairperson, PNC-IHP briefed the Secretary General, PNCU about IHP activities in Pakistan during a meeting held on 18th April, 2012 at Islamabad.

1.2.2 Participation in IHP Steering Committees/Working Groups

PNC-IHP did not participate in any IHP Steering Committee/Working Group during the report period. However, the Chairperson, PNC-IHP and other members attended the following two events:

- 3rd Steering Committee meeting of Friends of Democratic Pakistan (FODP) Water Sector Task Force (WSTF) held on 29th September, 2011 at Ministry of Water and Power, Islamabad
- 2nd Stakeholders Workshop on "Infrastructure, Institutions for Water Security and Productivity in Pakistan" held on 14th December, 2011 at Islamabad jointly organized by the Ministry of Water and Power, and the WSTF of the FODP

1.2.3 Research/applied projects supported or sponsored

- Water Quality Monitoring and mitigation in Flood Affected Areas of Balochistan
- Water Quality Monitoring and Mitigation in 11 Flood Affected Districts of Sindh Province
- Water Quality Monitoring and Water Chlorination in Flood Affected Areas of Khyber Pakhtukhwa
- Mass Chlorination and Monitoring of TMA/PHED water supply scheme in Flood Affected Areas of KPK
- Water Quality Monitoring and Mitigation in Flood Affected areas of Punjab
- Dry land Management in Cholistan Desert
- Hydrological Modeling of Upper Indus Basin and Mangla Watershed
- National Water Resources Data Warehouse with Technical Assistance of USGS
- Evaluation of Groundwater in Thal and Bari Doabs of Indus Plain

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

International Centre for Integrated Mountain Development (ICIMOD), Kathmandu, Nepal

PNC-IHP has established good working relation with ICIMOD under HKH-FRIEND. Many research activities are proposed to be initiated in collaboration with ICIMOD. Meanwhile, the PNC-IHP participated in the following activities of the ICIMOD:

- Dr. A.D. Khan, Director, PCRWR attended International Expert Workshop on "Climate and Environment Change Impact on the Glaciers of the Indus Basin and its Implication on Future Scenario" held from 2-4 July, 2010 at Kathmandu, Nepal.
- Dr. Manzoor Ahmed Malik, Director, PCRWR attended the study workshop on "Climate Change Adaptation, Glacial Melt and Downstream Impacts on Indus Dependent Water Resources and Energy" Jointly organized by ADB and ICIMOD held on 10th August 2010 at Islamabad.
- Dr. A.D. Khan, Director, PCRWR participated in Training Workshop on "Stream Flow Measurement using Fluorescent Tracer" held from 25-27 September 2010 at Islamabad.
- Mr. Naveed Iqbal, Assistant Director, PCRWR participated in Workshop on "Remote Sensing of the Cryosphere-Assessment and Monitoring of Snow and Ice in the HKH Region" held from 4-6 October, 2010 at Katmandu, Nepal.
- Engr. Rashid Aftab, Director, PCRWR participated in Policy Level Information Dissemination Workshop on Cyosphere (Snow and Glacier) Dynamics of the Indus Basin held on 16th March, 2012 in Islamabad.

- Dr. Manzoor Ahmed Malik, Director, PCRWR attended the ICIMOD Pakistan National Consultation Meeting held on 19th March 2012, Islamabad.

Inter-Islamic Network on Water Resources Development and Management (INWRDAM)

PNC-IHP has also established very good working relationship with INWRDAM. Professionals of PCRWR are fully benefiting through its training programs. Following activities were carried out:

- Engr. Ishtiaque Rao, Director, Water Resources Research Centre, Quetta attended the Workshop on "Climate Change and Possible Impacts on Water Resources in OIC Countries" held from 25 to 28 October, 2010 in Kuala Lumpur, Malaysia.
- The Chairperson PNC-IHP briefed Dr. Murad Jabay Bino, Executive Director, INWARDAM about the activities carried out in collaboration with nation and international agencies who visited Islamabad on 14th January, 2011.

1.2.5 Other initiatives

The World Water Days were celebrated on 22nd March, 2011 and 2012 under the themes of the UNESCO. Quiz programmes and public gatherings were organized to bring awareness among the masses with regards to the importance of water for its use and recycling. PNC-IHP also contributed their opinion/views during the discussions organized by the electronic media and actively participated in the exhibitions organized on the eve.

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

Due to law and order situation, no allocation in budget and financial crunch in Pakistan, no IHP course could be organized.

1.3.2 Organization of specific courses

- Conducted following specific training courses for improvement of water quality and assessment at Islamabad:
    - Training Workshop for Managers and Technicians of Water Quality Monitoring Line Agencies of AJK and KPK.
    - Three-day WHO Training Workshop for Technicians of FATA Water Supply Schemes from 13-15 July, 2010.
    - Five-day Training Course for Technicians of Punjab, KPK, Gilgit-Baltistan and Azad Jammu Kashmir Water Supply Schemes from 2-6 August 2010.
    - Five-day Training Course for Technicians of Punjab, KPK, Gilgit-Baltistan and Azad Jammu Kashmir Water Supply Schemes from 20-24 December, 2010.

- Organized two-day training program on “Management of Dryland Resources” from 7 to 8 April, 2012 at Bahawalpur. Twenty five participants attended the training including Scholars from Cholistan Institute of Desert Studies, Cholistan Development Authority, Forest and Agriculture Department. Four-member delegation from UNISCO office, Islamabad also participated in the training session and field visit.

1.3.3 Participation in IHP courses

- Engr. Ali Bahzad, Assistant Director, PCRWR attended the workshop on “Hydrology Remote Sensing Modeling and Data Assimilation” held from 13-17 July, 2010, at Beijing, China.
- Ms. Rizwana Perveen, Research Officer, PCRWR attended the workshop on “Asia Science Educator Academy 2011 Fostering Innovative STEAM Curricula” held from 30 Novembers to 02 December, 2011 at Seoul, Korea.

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

PNC-IHP is actively cooperating with UNESCO-IHE Institute through improving Capacity Building of Pakistani Professionals. Two Research Officers of PCRWR (Ms. Saiqa Imran and Ms. Fouzia Altaf) got training on “Water Quality Assessment” from UNESCO-IHE Institute of Water Education in Delft, Netherland from 13 February to 2 March, 2012.

1.5 Publications

- Post Flood Water Quality Assessment Report (Sindh and Balochistan 2010)
- Water Quality Status in Rural Areas of Pakistan
- Technical Assessment of Water Supply Schemes in Sindh Province
- Technical Assessment of Water Supply Schemes in Northern and Central Punjab

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

None

1.6.2 Participation in meetings abroad

No meeting has been attended due to financial crunch in the country.

1.7 Other activities at regional level

1.7.1 Institutional relations/co-operation

As indicated in Section 1.2.4

1.7.2 Completed and ongoing scientific projects

None

2 FUTURE ACTIVITIES

2.1 Activities foreseen until December 2012

A meeting of the Committee will be convened in June/July, 2012 to make strategy for preparation of National programme for the coming Eight Phase of UNESCO's IHP (2014-19).

2.2 Activities planned for 2013-2014

- Establishment of a Regional Centre for Water Management Research in Arid Zones in Pakistan

- Execution of following project/studies under UNESCO's Participation Program:

  - Modeling Climate Change Impact Assessment on Hydrology of Upper Indus Watershed
  - Wastewater Treatment through Phyto-Remediation using Water Hyacinth
  - Promotion of Water Disinfection Tablets for Provision of Safe Drinking Water
  - Development of Easy to Understand Training Videos for Water Quality Capacity Building Programs
  - Combating Arsenic Contaminated Drinking Water in Kasur Area
  - Assessment of Persistent Organic Pollutants (Organchlorine and Polybrominated biphenyls) in the Commercially Available Bottled Water Brands in Pakistan

2.3 Activities envisaged in the long term

Following studies/projects in collaboration with UNESCO-IHP:

- Hydrological Modeling of all Main Rivers of Pakistan
- Assessment of Climate Change Impacts on Water Resources
- Evaluation of Groundwater Potential, Groundwater Modeling and Determination of Safe Yeild of Major Aquifers (Lower Indus Plain, Peshawar Valley, Mardan Valley, etc).

NATIONAL REPORT ON IHP RELATED ACTIVITIES

PHILIPPINES

1. ACTIVITIES UNDERTAKEN IN THE PERIOD JUNE 2010 – MAY 2012

1.1 Meetings of the IHP National Committee

1.1.1 Decisions regarding the composition of the IHP National Committee

The institutional members of the Philippine National Committee for the UNESCO-IHP are agencies and organizations (public and private) which are mandated with, and are engaged in research, development and management activities in the water sector:

Bureau of Soils and Water Management (BSWM), Department of Agriculture (DA)
Bureau of Research and Standards (BRS), Department of Public Works and Highways (DPWH)
Environmental Management Bureau (EMB), Department of the Environment and Natural Resources (DENR)
Flood Control & Sabo Engineering Center (FCSEC), Department of Public Works and Highways (DPWH)
Laguna Lake Development Authority (LLDA)
Local Water Utilities Administration (LWUA)
LPA & Associates (private sector)
Metropolitan Waterworks and Sewerage System (MWSS)
Mines and Geoscience Bureau (MGB), Department of the Environment and Natural Resources (DENR)
National Economic and Development Authority (NEDA)
National Hydraulic Research Center, University of the Philippines (UP-NHRC)
National Irrigation Administration (NIA)
National Mapping and Resource Information Authority (NAMRIA)
National Power Corporation (NPC)
National Water Resources Board (NWRB)
Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA), Department of Science and Technology (DOST)
Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD), Department of Science and Technology (DOST)
Philippine Council for Aquatic and Marine Research and Development (PCAMRD), Department of Science and Technology (DOST)
Philippine Water Partnership (PWP)
Mapua Institute of Technology, School of Civil Engineering, Manila
University of Santo Tomas (UST), Department of Civil Engineering (UST), Manila
University of the Philippines at Los Baños (UPLB), College of Engineering and Agro-Industrial Technology (UPLB-CEAT), Los Baños, Laguna
Ateneo De Manila University (ADMU) - Manila Observatory, Quezon City
Central Luzon State University (CLSU), Muñoz, Nueva Ecija
De La Salle University (DLSU), Department of Civil Engineering (DLSU), Manila
University of San Carlos (USC), Department of Civil Engineering & Water Resources Research Center (USC), Cebu City

Officers of the Philippine National Committee for UNESCO-IHP:

Chairman: Leonardo Q. Liongson (UP Diliman)

Treasurer: Lino P. Aldovino (LPA & Associates)
Secretariat: NHRC and PWP staff (on secondment)

Agency Lead Representatives:
Ramon B. Alikpala, MWSS
Virgilio Basa, NAMRIA
Antonio Morano, DPWH-BRS
Resito David, DPWH-FCSEC
Virgilio Rivera, MWCI
Lennie Santos-Borja, LLDA

Finance Sub-Committee members:
Leonor Cleofas, MWSS
Dolores Hipolito, DPWH-FCSEC
Ms. Lyn Almario, MWCI
Francisco Arellano, MWSI
Romualdo Beltran, NPC
Lino P. Aldovino, PNC-UNESCO-IHP Treasurer

Technical Sub-Committee members::
Guillermo Q. Tabios III, UP-NHRC & C.E. Dept.
Romualdo Beltran, NPC
Samuel Contreras, BSWM
Emiterio Hernandez, LLDA
Milo Landicho, NIA
Rosa Perez, PAGASA

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

1.1.2 Status of IHP-VII activities

In response to the questionnaire from the UNESCO-IHP Paris office, the following has been indicated in 2008 as the Philippines Country Priorities for IHP-VII Themes:

Theme 1: ADAPTING TO THE IMPACTS OF GLOBAL CHANGES ON RIVER BASINS AND AQUIFER SYSTEMS (General priority of the Philippines in all focal areas)
Focal area 1.1 - Global changes and feedback mechanisms of hydrological processes in stressed systems

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

Theme 2: STRENGTHENING WATER GOVERNANCE FOR SUSTAINABILITY
(General priority of the Philippines in all focal areas)
Focal area 2.1 - Cultural, societal and scientific responses to the crises in water governance
Focal area 2.2 - Capacity development for improved governance; enhanced legislation for wise stewardship of water resources
Focal area 2.3 - Governance strategies that enhance affordability and assure financing
Focal area 2.4 - Managing water as a shared responsibility across geographical & social boundaries
Focal area 2.5 - Addressing the water-energy nexus in basin-wide water resources

Theme 3: ECOHYDROLOGY FOR SUSTAINABILITY (priority of the Philippines for focal area 3.1)
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)

UNESCO International Hydrological Programme IHP-VIII
Submission of Accomplished Annex 3 Survey Form - Initial Detailed Consultation with Member States and Partners (10 January 2010), Formulation of the Eight Phase of IHP (IHP -VIII, 2013-2019), UNESCO-IHP (submitted 27 January 2012).

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

32nd Annual Scientific Meeting (ASM) under the theme "Millennium Development Goals (MDGs) and Beyond: Are We Making Progress?", 14-15 July 2010, Manila Hotel, Manila., organized by the National Academy of Science and Technology Philippines (NAST).

Symposium: Reducing Risks and Disasters due to Rainfall Variability - protecting life, food and property from flood and drought, 28 July 2010, organized by UP Diliman and UP Los Banos, UP NISMED Auditorium, University of the Philippines, Diliman.

Specialty Workshop on Status of Research and Education on Climate and Ecosystem Change Adaptation in the Philippines, 9 August 2010, Beta Epsilon Multimedia Room, College of Engineering, University of the Philippines, Diliman. This workshop is part of the Comparative Studies on Development Strategies considering Impacts of Adaptation to Climate Change (CSDS-IACC) project initiated by the United Nations University Institute for Sustainability and Peace, Tokyo.

Climate Change: Scenarios, Uncertainties, Parameters and Other Things, Forum on Climate Change and Water Resources, 25 September 2010, Mandarin Oriental Suites, Cubao, Quezon City.

Dialogue: One Year After the Big Floods. What really happened? Where are we now?, organized by Philippine Water Partnership (PWP), 22 September 2010, Sulu Riviera, Diliman, Quezon City.

Joint National Academy of Science and Technology (NAST) and Philippine Water Partnership (PWP) Roundtable Discussion (RTD) on Priority Legislation for the Philippine Water and Sanitation Sector, 22 November 2010, Discovery Suites, 25 ADB Avenue, Ortigas Center, Pasig City, Objectives: 1. To develop an updated list of development issues and set of recommendations for water sector reforms (Water Code and other water-related laws) to be presented to both executive and legislative branches of government; 2. Identify potential champions for water reforms in Congress, water- related government agencies and NGOs.

National Academy of Science and Technology (NAST) and Philippine Water Partnership (2011). *Report on the Round Table Discussion (RTD) on Priority Legislation for the Philippine Water and Sanitation Sector,* held on 22 November 2010, Discovery Suites, 25 ADB Avenue, Ortigas Center, Pasig City,

NAST Roundtable Discussions on Water Themes:

Roundtable Discussion on Climate Change and Water, 16 November 2011, Traders Hotel, Roxas Blvd., Pasay City.

Roundtable Discussion on Water Rights and Water Wrongs: Towards Good Water Governance for Development on January 26, 2012, Hyatt Hotel and Casino Manila.

Roundtable Discussion on Laguna de Bay: Status, Concerns, Opportunities, and Plans, 8 March 2012, Traders Hotel, Roxas Blvd., Pasay City.

Roundtable Discussion on the Ecology and Biodiversity of Lake Lanao and Agusan Marsh, April 12, 2012, Traders Hotel, Roxas Blvd., Pasay City.

Roundtable Discussion on Water Supply and Sewerage Plans, Drainage and Flood, April 13, 2012, Traders Hotel, Roxas Blvd., Pasay City.

Roundtable Discussion on Water Borne Diseases, 10 May 2012, Thursday, 9:00 am at the Hyatt Hotel and Casino Manila, 1588 Pedro Gil cor M.H. Del Pilar, Malate, Manila.

Roundtable Discussion on Water and Agriculture, 18 May 2012, Friday, 9:00 am at the Hyatt Hotel and Casino Manila, 1588 Pedro Gil cor M.H. Del Pilar, Malate, Manila.

Roundtable Discussion on "How Safe is the Water We are Drinking, 24 May 2012, Traders Hotel Manila, Roxas Bvld., Pasay City

National Academy of Science and Technology (NAST), 34th Annual Scientific Meeting (ASM 34): Philippine Water 2050, 11-12 July 2012, Manila Hotel, Roxas Blvd., Manila.

1.2.2 Participation in IHP Steering Committees/Working Groups

Leonardo Q. Liongson (UP Diliman) – Philippine national representative to the RSC (2002-2009); and attending the 18th RSC Meeting in 2010 in Hanoi, Vietnam, and as National Representative to the 19th IGC Meeting of UNESCO-IHP held on 5-9 July 2010 in UNESCO HQ, Paris, France, where he was elected as a member of the Draft Resolution Committee.

Guillermo Q. Tabios III (UP Diliman), RSC member - has served as co-coordinator with RSC member Prof. Trevor Daniels of Adelaide University/Australia IHP in the RSC-assigned task group for APFRIEND (2005-2010) on the development of Rainfall Intensity Duration Frequency (IDF) and with Mr. Dennis Jamieson of New Zealand IHP on the 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.

Daniel C. Peckley Jr. (UP Diliman). Rain-induced landslide susceptibility: a guidebook for communities & non-experts, 9 November 2010, 2nd IHP Flood Project – DRH Implementation Workshop (2nd IHP-DRH Workshop, part of HWC2010 and RSC18 framework).

1.2.3 Research/applied projects supported or sponsored

Institute of Civil Engineering (UP-ICE) and National Hydraulic Research Center (NHRC)

Flood Hydrology of the September 26, 2009 Extreme Event, by Leonardo Q. Liongson, Team Enery Professorial Chair, Institute of Civil Engineering, 21 July 2010, Beta Epsilon Multimedia Hall, Juinio Hall, College of Engineering, University of the Philippines, Diliman.

Hydraulic Analysis of a Cascade of Flood-Control Dams
Project Leader: L. Q. Liongson, Institute of Civil Engineering
Duration of research: one year (June 1, 2010-May 31, 2011)

Flash Flood Analysis for Varied Morphology of Steep Catchments
Project Leader: L. Q. Liongson, Institute of Civil Engineering
Duration of research: one year (June 1, 2010-May 31, 2011)

Hydrological Modeling Studies for Proposed Flood-Control Dams in the Marikina River Basin, Team Enery Professorial Chair, Institute of Civil Engineering,4 July 2011, College of Engineering, University of the Philippines, Diliman.

Need for Climate Change Studies and Parameters Prior to Climate Change Adaptation Efforts in the Philippines, by Guillermo Q. Tabios III, Dean Marino Mena Professorial Chair in Engineering, Institute of Civil Engineering,4 July 2011, College of Engineering, University of the Philippines, Diliman.

Philippine Water Partnership (PWP)

Coping With Climate Change in the Philippines with Focus on the Water Sector (May 2011), funded by Global Water Partnership South East Asia (GWP-SEA).

The Philippine Report - Evaluation of the Status of IWRM Implementation in Southeast Asia 2000-2010 – In Respect to Policy, Legal and Institutional Aspects, by Jessica Salas, funded by Global Water Partnership South East Asia (GWP-SEA).

Formulation of the Philippine Water Sector Development Plan - (2011), Cabinet-level policy paper (ongoing) by Guillermo Q. Tabios III (UP-NHRC) and Rosario Villaluna (Chair-elect, PWP), funded by ADB-Philippines National Economic and Development Authority (NEDA).

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.

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) & Global Water Partnership South East Asia (GWP-SEA)

Global Water Partnership - South East Asia (GWP-SEA) Steering Committee Meeting, 10 October 2010, Oakwood Hotel, Ortigas Center, Pasig City, Philippines. Hosting the Philippine Water Partnership and attendance by SEA country partners.

Global Water Partnership - South East Asia (GWP-SEA), 22nd Steering Committee Meeting, 28 February – 1 March 2011, Kuala Lumpur, Malaysia.

Global Water Partnership - South East Asia (GWP-SEA), 23rd Steering Committee Meeting and IWRM Workshop, 19-24 September 2011, Bangkok, Thailand.

National Executive-Legislative Dialogue on Water Supply and Sanitation, Quezon City, Philippines, 17 March 2011.

"Philippines Walk for Water" (guest speaker: President Benigno C. Aquino III), World Water Week, Pasay City, 22 March 2011.

Evaluation of the Status of IWRM Implementation in Southeast Asia 2000-2010 – In Respect to Policy, Legal and Institutional Aspects (2011), Global Water Partnership South East Asia (GWP-SEA).

National Academy of Science and Technology (NAST) and Philippine Water Partnership (2011). *Report on the Round Table Discussion (RTD) on Priority Legislation for the Philippine Water and Sanitation Sector,* held on 22 November 2010, Discovery Suites, 25 ADB Avenue, Ortigas Center, Pasig City,

Meeting of the NAST Task Force on Climate Change, Global City, Taguig. 28 June 2011.

United Nations ESCAP

Expert Group Meeting (EGM) on Monitoring of Investment and Results (MIR) in the Water Sector in Asia and the Pacific, as a supporting event for the ADB Water Week, 11-13 October 2010, ADB, Pasig City, Metro Manila, United Nations Economic and Social Commission for Asia and the Pacific in collaboration with Philippine Water Partnership (PWP), Global Water Partnership (GWP), FAO, ICHARM, UNESCO, IUCN and ADB.

JICA AUNSEED Net, ASEAN Foundation, JSPS Asian Core Program

UP ICE Centennial Conference on Harmonizing Infrastructure with the Environment, featuring the 3rd ASEAN Civil Engineering Conference, the 3rd ASEAN Environmental Engineering Conference and the 1st Seminar on Asian Water Environments (JSPS Asian Core Program), 11-12 November 2010, EDSA Shangri-la Hotel, Mandaluyong City, Metro Manila.

Asia-Pacific Association of Hydrology and Water Resources (APHW)

International Conference on Hydrological Regime and Water Resources Management in the Context of Climate Change (HWWC2010), Asia-Pacific Association of Hydrology and Water Resources (APHW), 8-9 November 2010, Hanoi, Vietnam.

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

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Laguna Lake Development Authority (LLDA), Lake Fishery Management Program.

Laguna Lake Development Authority (LLDA), Laguna de Bay Shoreland Management.

1.3 Educational and training courses

1.3.1 Contribution to IHP courses
(none)

1.3.2 Organization of specific courses
(none)

1.3.3 Participation in IHP courses

20th IHP- Nagoya Training Course on "Groundwater as a key for adaptation to changing climate and society", 7-20 November 2010. Philippine participant: Josephine R. Billones, Engineer II, National Water Resources Board, Philippines.

21st IHP Training Course on "Introduction to River Basin Environment Assessment under Climate Change", 28 November – 10 December 2011 , Kyoto , Japan. Philippine participant: Cornelio Q. Dizon, Institute of Civil Engineering, University of the Philippines, Diliman, Quezon City, Philippines.

Ecohydrology International Symposium on New Ecohydrology Demosite Project, 22-23 March 2011, Jakarta, Indonesia. Philippines Participant: Ruth Gamboa, University of the Philippines, Davao City, Philipines.

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

APFriend Training Workshops, Regional Humid Tropics Hydrology and Water Resources Centre for South-East Asia and the Pacific (HTC Kuala Lumpur)

1.5 Publications

Liongson L. Q. (2010). Flood Mitigation in Metro Manila, Philippine Engineering Journal.

Dulawan, J. M. T. and L. Q. Liongson (2010). A 2-D Steady-State Seepage Flow Model for Rice Paddies and Terraces, UP ICE Centennial Conference on Harmonizing Infrastructure with the Environment, featuring the 3rd ASEAN Civil Engineering Conference, the 3rd ASEAN Environmental Engineering Conference and the 1st Seminar on Asian Water Environments (JSPS Asian Core Program), 11-12 November 2010, EDSA Shangri-la Hotel, Mandaluyong City, Metro Manila.

Liongson, L. Q. (2010). Recent Flash Floods and their Predictions for Rural and Urban Catchments in the Philippines, Special Session on Flood Disasters and Prediction in Asia-Pacific Region, International Conference on Hydrological Regime and Water Resources Management in the Context of Climate Change (HWWC2010), Asia-Pacific Association of Hydrology and Water Resources (APHW), 8-9 November 2010, Hanoi, Vietnam.

Department of Environment and Natural Resources (June 2010), Philippine Strategy on Climate Change Adaptation 2010-2022.

Draft Training Manual on Climate Proofing for Development, Philippines (August 2010).

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

Global Water Partnership - South East Asia (GWP-SEA) Steering Committee Meeting, 10 October 2010, Oakwood Hotel, Ortigas Center, Pasig City, Philippines. Hosting and attendance by the Philippine Water Partnership.

Expert Group Meeting (EGM) on Monitoring of Investment and Results (MIR) in the Water Sector in Asia and the Pacific, as a supporting event for the ADB Water Week, 11-13 October 2010, ADB, Pasig City, Metro Manila, United Nations Economic and Social Commission for Asia and the Pacific in collaboration with Philippine Water Partnership (PWP), Global Water Partnership (GWP), FAO, ICHARM, UNESCO, IUCN and ADB.

Water Week ADB: "Water Crisis and Choices" ADB and Partners Conference 2010,11-14 October 2010. Asian Development Bank (ADB), Ortigas Center, Pasig City, Metro Manila.

UP ICE Centennial Conference on Harmonizing Infrastructure with the Environment, featuring the 3rd ASEAN Civil Engineering Conference, the 3rd ASEAN Environmental Engineering Conference and the 1st Seminar on

Asian Water Environments (JSPS Asian Core Program), 11-12 November 2010, EDSA Shangri-la Hotel, Mandaluyong City, Metro Manila.

1.6.2 Participation in meetings abroad

20th Steering Committee Meeting of the Global Water Partnership Southeast Asia (GWP SEA), 08 June 2010, Benpasar, Bali, Indonesia.. Attendance as national delegate and Chairman of the Philippine Water Partnership (PWP) which is the Philippine member of GWP SEA, as well as in behalf of the National Hydraulic Research Center, University of the Philippines which is a member institution of PWP.

ASEAN Workshop on Risk and Impact from Extreme Event of Floods in ASEAN Countries, 09-10 June 2010, Benpasar, Bali, Indonesia. Attendance as GWP-PWP Philippines participants.

19th Session of the Intergovernmental Council (IGC) of the International Hydrological Programme (IHP) of UNESCO, 05-09 July 2010, UNESCO Headquarters, Paris, France. Attendance as Philippine representative.

18th Regional Steering Committee Meeting for Southeast Asia and the Pacific UNESCO International Hydrology Programme (18th RSC Meeting for SEAP UNESCO-IHP) in conjunction with The International Conference on Hydrological Regime and Water Resources Management in the Context of Climate Change HWCC2010, held on 8-12 November 2010, in Hanoi, Viet Nam.

International Conference on Hydrological Regime and Water Resources Management in the Context of Climate Change (HWWC2010), Asia-Pacific Association of Hydrology and Water Resources (APHW), 8-9 November 2010, Hanoi, Vietnam.

19th Regional Steering Committee Meeting for Southeast Asia and the Pacific Pacific, UNESCO IHP, and the International Symposium on Extreme Events "Meteorological, Hydrological and Tsunami Disasters: Social Adaptation and Future" (EXTREME2011), 24-28 October 2011, Uji, Kyoto, Japan.

5th International Conference on Flood Management (ICFM5), The International Centre for Water Hazard and Risk Management (ICHARM-Tsukuba), 27-29 September 2011, Tokyo, Japan.

Asia Pacific FRIEND Workshop, 28 February – 1 March 2011, Hanoi, Vietnam.

Global Water Partnership - South East Asia (GWP-SEA), 22nd Steering Committee Meeting, 28 February – 1 March 2011, Kuala Lumpur, Malaysia.

Global Water Partnership - South East Asia (GWP-SEA), 23rd Steering Committee Meeting and IWRM Workshop, 19-24 September 2011, Bangkok, Thailand.

1.7 Other activities at regional level

1.7.1 Institutional relations/cooperation

Asia-Pacific Association of Hydrology and Water Resources (APHW)

Global Water Partnership - South East Asia (GWP-SEA) (IWRM)

JICA AUNSEED Net (engineering graduate programs)

United Nations ESCAP (IWRM workshops)

1.7.2 Completed and ongoing scientific projects

United Nations University, Tokyo, Japan (Climate Change Studies)

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2012

Participation in the 20th RSC Meeting to be held in Langkawi, Malaysia in 2012.

Participation in currently RSC-supported programs and activities such as APFRIEND, Catalogue of Rivers for SEAP, FFWS, DRH and the IHP training courses conducted by the University of Nagoya.

Participation in the review of cross-cutting programs such as FRIEND, HELP and IWRM.

Evaluation by the national committee of the proposed IHP-VIII Themes, Focal Areas and Activities.

National Academy of Science and Technology (NAST), 34th Annual Scientific Meeting (ASM 34): Philippine Water 2050, 11-12 July 2012, Manila Hotel, Roxas Blvd., Manila.

2.2 Activities foreseen for 2013-2014

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).

2.3 Activities envisaged 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,

DRH, 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, 2012

Korean National Committee
for
The International Hydrological Programme
Republic of Korea

1. ACTIVITIES UNDERTAKEN IN THE PERIOD JUNE 2010 - MAY 2012

1.1 Meetings of the IHP National Committee

1.1.1 Decisions regarding the composition of the IHP National Committee

Korea as a participant in the program, appointed within its Ministry of Construction a IHD National Committee(later, IHP National committee), which undertook pioneer hydrologic surveys of selected representative basins in three major river systems during the program period, and embarked in 1975 on a 6-year International Hydrological Programme (IHP) project as the first step toward an extension of surveys of domestic river basins in order to fulfill its responsibilities in the world's consolidated efforts to cope with the water problem.

After the completion of the first phase of IHP in 1980, the second phase of IHP project(1981~1983), the third phase of IHP project(1984~1989), the fourth phase of IHP project(1990~1995), the fifth phase of IHP project(1996~2001), the sixth phase of IHP project(2002~2007) and the seventh phase of IHP project(2008-2013) followed for the continuation of representative basin studies, the adoption of new techniques of water resources development and water quality control, the hydrological evaluation of urbanization and variations of watershed including sustainable development in a changing environment, hydrology and water resources development in a vulnerable environment, water interactions of systems at risk and social challenges and water dependencies of systems under stress and societal responses, and education and training in hydrology and water resources.

From the beginning of the New Millennium through this year(2010), the Korean National Committee for the IHP was reorganized and strengthened to fulfill the IHP activities more effectively and actively.

Particularly, the Korean National Committee for the IHP has been reorganized to include more members from various water organizations in Korea under the supplement of the legal background in the beginning of 2011.

All members of the Committee were from every part of water related organizations in the country and executive functions are carried out within the Water Resources Bureau, Ministry of Land, Transport and Maritime Affairs.

Decisions regarding most of IHP related activities are made by this committee which is held regularly and on request in special occasion.

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) and the potential activities to be undertaken by the Korean National Committee for the IHP as listed in the following tables both according to the core programme Themes and Focal Areas;

Implementation Plan of IHP-VII Phase

Name of the IHP National Committee 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
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

Activities to have been and 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	
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 period of 2008-2012 of the seventh phase of IHP, the Korean National Committee for the IHP has been and being paid its efforts to achieve the objectives set by UNESCO for this phase of IHP and the following projects have been and being executed in Korean river basins and in the field of hydrology and water resources in Korea;

(1) Global changes and feedback mechanism of hydrological processes
(2) Climate change impacts on the hydrological cycle and consequent impact on water resources
(3) Managing groundwater systems' response to global changes
(4) Strengthening water governance for sustainability
(5) Ecological measures to protect and remediate catchment process
(6) Improving ecosystem quality and services by combining structural solutions with ecological biotechnologies
(7) FRIEND and HELP basin studies

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 2010~2012.

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 2010~2012 have been executed according to the above given table. Some other research or applied projects were also supported or sponsored by the Government and other water-related organizations such as Korea Water Resources Corporation(The K-Water) during this period.

The following projects have been and are being implemented for the Asian Pacific FRIEND in the 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

· 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 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 and IHES.

·2010 International Conference on Hydrology and Water Resources

·2011 UNESCO IHP Joint HELP/Ecohydrology International Symposium on Restoring and Managing River for Future, 13-15 April 2011, Daegu, Korea - Formulated and issued “A Statement of River Restoration”

·2011 Regional Agricultural Water Practice Workshop

·2011 Water Business Forum and Water Expo

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 2012, foreseen for 2013-2014 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 HELP river basin project in collaboration with other Asia Pacific and international HELP projects.

The following international symposiums and workshops will be organized until December 2012 and during 2013-2014 as the IHP-VII and VIII activities of IHP-KNC.

·2012 Nakdong River International Water Week : International Conference & Symposium

·2013 IHP Regional Steering Committee(RSC) Meeting and International Symposium

·Korean Workshops of FRIEND and HELP during 2013-2014

National Committee of Russia for the International Hydrological Programme of UNESCO

Report of the Russian National Committee for the IHP to the XX Session of the Intergovernmental Council for the IHP of UNESCO (June 2012)

Moscow – St Petersburg
2012

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1.2. Activities at international level in the framework of IHP

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1.2.2. National (local) scientific and technical meetings

1.2.3. Participation in IHP Steering Committees/Working Groups

1.2.4. Research/applied projects supported or sponsored by the NC

1.2.5. Participation in other national and international organizations and programmes

1.2.6. Other initiatives

1.3. Educational and training courses

1.3.1. Participation in IHP courses (at IHP Centres)

1.3.2. Organization of specific courses

1.3.3. Organization of Category II UNESCO IHP Centre

1.4. Cooperation with UNESCO-IHE Institute for Water Education

1.5. Publications – monographs, collected works, manuals and study guides

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. International relations/cooperation

1.7.2. Completed and ongoing scientific projects (Russia and other countries)

2. Future activities

2.1. Activities planned until December 2012

2.2. Activities foreseen for 2013-2014

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:

- ☐ State Hydrological Institute of Roshydromet (SHI)
- ☐ State Oceanographic Institute of Roshydromet (SOI)
- ☐ State Hydrochemical Institute of Roshydromet
- ☐ All-Russian Research Institute of Hydrometeorological Information of Roshydromet
  Caspian Marine Scientific and Research Center of Roshydromet
  Federal Agency for water resources (RosVodResursy)
- ☐ Moscow State University
- ☐ Institute of Geography RAS
- ☐ Russian State Hydrometeorological University (RSHU)
- ☐ Institute of Water Problems RAS
  Institute of Water and Ecological Problems SB RAS
- ☐ 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 June 2010 – May 2012

1.1 Meetings of the IHP National Committee

Decisions regarding the composition of the IHP NC of Russia

The NC of Russia (hereinafter the NC) exists since the time when International Hydrological Programmes of IHD/IHP were launched by UNESCO; the personal composition of the NC, however, has been renewed periodically. The present NC composition was nominated by a decision of the Russian Government in 2003. The Chairperson of the NC is the Head of Roshydromet Dr Alexander V. Frolov, the deputy Chairpersons are Academician Victor M. Kotlyakov, Director of the Institute of Geography RAS, and Dr Vladimir Yu. Georgievsky, Director of the State Hydrological Institute of Roshydromet (in accordance with the NC decision of 19.10. 2011 and the appointment order № 635 of 29.11.2011 issued by the Head of Roshydromet). At present the Committee consists of 21 members – scientists and specialists known both in Russia and all over the world, representatives of different ministries, departments, organizations and institutions who actively work in the fields of hydrometeorology, water resources, water management, education and training.

Main points discussed

In 2010-2012 the NC performed its activities in accordance with the following plan:

1. In 2010 two meeting were held at which current and future activities within the framework of IHP-VII were discussed. The meetings considered the results of the most important projects in the fields of hydrology and water management implemented in Russia and developed a general strategy of the NC on the key issues of international cooperation in the above mentioned fields, in particular with participation of the Russian delegation in the 19th session of the IHP Intergovernmental Council.

2. In 2011 two meetings were held which discussed proposals of the NC on participation in the IHP-VIII which had been submitted to the UNESCO IHP Secretariat, as well as priority areas of scientific research within the framework of the Federal Target Programme "Development of water sector of the Russian Federation until 2020" which may constitute a contribution to the next IHP phase.

The main topics of the reports at the NC meetings are as follows:

Transboundary underground water resources and perspectives of their use.
Speaker – Prof. I. Zetsker

On the activities of the International Data Centre on Hydrology of Lakes and Reservoirs.
Speaker – V. Vuglinsky

On the results of work of delegation of the Russian NC at the 19th session of the Intergovernmental Council for the IHP of UNESCO and plan of activities for 2011.
Speaker – O. Gorelits

On participation in the International Symposium "Floods – a global problem that needs local solution" held by the International Centre for Water Hazard and Risk Management (ICHARM) under the auspices of UNESCO.
Speaker – Z. Kopaliani

Proposals of the Russian NC on participation in the UNESCO IHP-VIII (preparation of action plan).
Speaker – Zh. Balonishnikova

Elaboration of priority areas of scientific research in the system of Ministry of Natural Resources of Russia to meet strategic needs of water sector of the Russian Federation in accordance with Water Strategy of the Russian Federation until 2020.

Speaker – M. Bolgov

1.2 Activities at international level in the framework of IHP

1.2.1 Status of IHP activities and contribution to IHP-VII

During the reporting period, the NC implemented activities at national and international levels on the following IHP-VII Themes:

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 2.2 – 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
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 catchment processes
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 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

During the reporting period, the NC Executive Secretary O. Gorelits took part 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. On the request of Mr Badarch, Director of the UNESCO Moscow Office, the Executive Secretary took part on 13 March 2012 in the presentation of the 4th edition of the UN annual report "Managing Water under Uncertainty and Risk" held in the UN Information Center in Moscow. On this occasion, a presentation of cooperation since 2008 between the NC and the UNESCO Moscow Office was prepared. The presentation was submitted to the UNESCO Moscow Office and the report from the event was made available on the UNESCO Moscow Office and the NC RF official web sites.

19-20 April at the European regional office (bureau) UNESCO (Venice) held a seminar and conference on the PSI-Connect program – «Connecting Policy and Science through Innovative Knowledge Brokering in the field of Water Management and Climate Change» http://www.psiconnect.eu/, and also meeting of secretaries NC IHP UNESCO European cluster (in t.ch.Rossiya). Executive Secretary of the National Committee took part in this event with the presentation on the activity of the IHP UNESCO in Russia.

The official website of NC RF for the IHP of UNESCO was launched in 2009 at www.ihp-russia.ru and renewed continuously. 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.

1.2.2 National scientific and technical meetings

One of the most important events undertaken during the reporting period was organization of the Second Meeting of Responsible Representatives of UNESCO IHP National Committees of CIS Countries. It was held on the proposal of the NC of Russian Federation supported by the Commission of the Russian Federation for UNESCO. Roshydromet adopted a decision to hold the Second Meeting of Responsible Representatives of UNESCO IHP National Committees of CIS Countries which took place on 18-19 October 2011 at the State Hydrological Institute (SHI), St. Petersburg, Russia, with the support of the UNESCO Moscow Office. The meeting was chaired by the Head of Roshydromet Dr A. Frolov.

Heads and responsible representatives of NCs of Azerbaijan, Armenia, Belarus, Kyrgyzstan, Moldova, Russian Federation, the Ukraine, Uzbekistan, Tajikistan, representatives of the UNESCO IHP Secretariat and the Bureau of the IHP Intergovernmental Council, the representative of the CIS Executive Committee, members of the NC of Russian Federation, scientists from the State Hydrological Institute, State Oceanographic Institute, Arctic and Antarctic Research Institute, Russian State Hydrometeorological University, Institute of Water Problems RAS and Institute of Water and Ecological Problems SB RAS participated in the meeting.

The meeting addressed a range of key problems and tasks in the field of hydrology and water resources both in the world and CIS countries taking into account their specific features and priorities, analyzed the efficiency of the CIS countries activities during IHP-VII, discussed progress and weak points of international cooperation within the framework of IHP, possibilities of raising internal and extrabudgetary funds and enhancing administrative resources, planning of cooperation and coordination of activities, elaboration of a joint strategy and programme for effective cooperation with UNESCO Member States and between National Committees of CIS countries.

As a result of the discussion and exchange of opinions on the reports and presentations contributed by responsible representatives, recommendations were adopted on the most urgent and top-priority lines of cooperation between NC for the IHP of UNESCO of CIS countries within the framework of the IHP-VII “Water systems under stress and societal responses” (2008-2013). The following problems and tasks of the present-day global and regional hydrology were recognized as top-priority fields for cooperation:

- Study of climate change and economic impact on hydrological cycle and water resources (also of arid and semi-arid regions);
- Assessment, management and use of water resources, especially in transboundary basins;
- Study and forecasting of hydro-hazards, hydrological extremes and water-related disasters;
- Monitoring of water bodies and improvement of hydrological observing networks;
- Evaluation of ecological state of water bodies and water quality monitoring;
- Assessment of transboundary transport of water and non-biodegradable materials;
- Training of specialists in the field of hydrology and water resources in the CIS countries, also of highest qualification; organization of advanced training courses.

The following critical components of enhanced international cooperation and coordination of activities of NCs of CIS countries were outlined:

- Organization within the framework of IHP-VII of international conferences, symposia, workshops and meetings of the CIS countries on the most urgent problems of the present-day hydrology;

- Exchange of literature on hydrology, most recent manuals, regulatory documents, standards and technical regulations published in the CIS countries, as well as joint publications on a wide range of hydrological problems developed in the CIS countries within the framework of IHP-VII and other WMO programmes on hydrology and water resources;
- Exchange of scientists, post graduates and students, organization of educational and training courses for students in the CIS;
- Development of curricula and programs for tertiary students trained in the field of land hydrology at WMO Regional Meteorological Training Centres;
- Organization within the framework of the UNESCO IHP subject to the terms and conditions of the Agreement on training specialists for national hydrometeorological services of regular advanced training courses on hydrology and water resources addressing the most challenging subjects of hydrology for the specialists of the CIS countries with invitation of leading scientists (mainly from the CIS countries);
- Cooperation, exchange of experience and mutual assistance in the course of implementation of programmes and projects for improvement of hydrological observing networks in the CIS countries;
- Close cooperation and coordination of NCs activities with the activities of the Interstate Council on Hydrometeorology of the CIS countries.

During the meeting, concern was raised by NC responsible representatives that the UNESCO IHP Secretariat does not include a CIS representative.

It was recommended that CIS NCs conduct mutual consultations, as well as consultations with the IHP Secretariat, aimed at putting forward a CIS representative to the IHP Secretariat.

Participants agreed on the need to organize a third NCs' meeting under the umbrella of the VIIth Hydrological Congress (October 2013) for discussion and coordination of their activities and in order to summarize their participation in the IHP-VII (2008-2013) and to plan the activities within IHP-VIII (2014-2019). In order to enhance cooperation in the field of water resources, participants consider it expedient to organize in 2013 a conference on topical issues of hydrology and ecohydrology of water bodies of CIS countries (section meeting during the Congress).

Participants expressed their hope that implementation of the outlined activities will contribute to enhanced efficiency of participation of CIS NCs in IHP-VII for solving challenging tasks in the field of hydrology, water resources, water sector, environmental protection and ecology in these countries.

In May 2010 a scientific conference with international participation "Current problems of hydrochemistry and water quality formation" dedicated to 90th anniversary of Hydrochemical Institute, the city of Azov, was organized.

Invited reports of leading Russian scientists in the field of hydrochemistry and surface water monitoring were presented at the conference.

The reports considered fundamental issues of land water quality formation under current conditions, the problem of climate and anthropogenic impact on the volume and seasonal variation of runoff, sediments and chemicals for the Russian rivers, modern techniques for evaluating and forecasting state and contamination of water bodies and possibilities of using field modeling in isolated water ecosystems for regulating permissible pollution load on water bodies.

Representatives of 28 organizations, including scientific and research institutions of the Russian Academy of Sciences and Roshydromet, Centres for Hydrometeorology and Environmental Monitoring, leading higher educational institutions, including Moscow State University (MSU), and scientific institutions of the Ukraine and Kazakhstan participated in the conference.

In May 2010 an International Scientific Conference “Groundwater resources: problems of study and use” was jointly organized in Moscow by the Faculty of Geology of MSU and the Institute of Water Problems RAS. More than 200 scientists and specialists from CIS, USA, Bulgaria and China participated in the conference. The reports considered preset-day methods for mapping and evaluating variability of natural groundwater resources, models of surface and groundwater resources interaction, as well as climate change impact on groundwater resources. Conference proceedings are published.

In May 2011 a High-level International Scientific Conference on Study and Use of Groundwater for Water Supply and Irrigation was jointly organized in Moscow by the All-Russian Research Institute of Hydrogeology and Engineering Geology (VSEGINGEO) and the Institute of Water Problems RAS under the support of the International Association of Hydrogeologists. The conference was hosted by VSEGINGEO. About 300 scientists from Russia (RAS, MSU, VSEGINGEO, Federal Subsurface Management Agency (Rosnedra), Rosvodresursy, Ministry of Natural Resources and other universities and higher educational institutions) participated in the conference. The President of IAH, representatives of the UNESCO Chair in Water Resources, scientists from Bulgaria, China and the CIS made their reports at the conference. Recommendations of the conference were submitted to the Federal Subsurface Management Agency for implementation. All conference reports are published.

In July 2011 the International Steering Committee for the International Data Centre on Hydrology of Lakes and Reservoirs (HYDROLARE) held its third meeting in the SHI. 13 representatives of GRDC, CNES/LEGOS,WMO, GCOS and ILEC participated in the meeting.

The following issues were discussed: status of HYDROLARE activities (SHI); re-designed official web site of the Centre (SHI); preliminary results of collection and processing data from outside Russia (SHI); collaboration with national and international data providers and partners; outcomes of a joint GRDC-HYDROLARE workshop held in 2010, Koblenz, Germany; integration of in-situ and satellite data (all participants).

Members of the Steering Committee noted and highly appreciated significant progress in the activities of the Centre.

The following were noted among main achievements of the Centre:

- the largely re-designed website containing new important information and documents;
- development of the database including encoding system (following recommendations of WMO);
- completion of upload of data from Russia and former USSR countries into the database;
- elaboration of policy guidelines for data acquisition and dissemination;
- development and carrying out demonstration project showcasing integration of in-situ and satellite data.

The meeting adopted a work plan of the Centre for 2011-2012, as well as on-going actions until December 2012.

Efficient activities of the Centre contribute to enhanced cooperation with international hydrological organizations and improve exchange of hydrological data at international level.

In February 2012 a Meeting on Hydrology of North Eurasia was held in the SHI. The meeting discussed various aspects of hydrological consequences of changes in the state of underlying surface and climate across the North Eurasian territory. The meeting was held under the support of the University of New Hampshire, USA.

In April 2012 a workshop with participation of Russian and Japanese specialists from the Civil Engineering Research Institute for Cold Region (CERI), (Hokkaido, Japan), a subdivision of the International Centre for Water Hazard and Risk Management (Tsukuba, Japan), operating under the auspices of UNESCO, was held in the State Hydrological Institute (Workshop on

Rivers and Water Resources Engineering in Snowy Cold Regions). Participants discussed the results of applied research on rivers and water resources in cold snowy regions as well as issues related to specific character of this type of research and possibilities for exchange of experience and further research activities. As a result, a decision on collaboration was adopted and a Memorandum of Understating was signed.

Besides, for the reporting period the various organizations and the departments, participating in the NC activity, organized the following conferences:

• The third All-Russia conference with the international participation «Fundamental problems of water and water resources» (Barnaul, 2010г.)
• V scientific and practical conference «Drinking waters of Siberia 2010» (Barnaul, 2010г.)
• II International conference «Geoinformatics: technologies, scientific projects» (Barnaul, 2010г.).
• International seminar «Climate change: an assessment of influence and consequences» within the project «Scientific and technological cooperation of EU and Russia in the field of environment» (E-URAL) of the Seventh Framework Programme of the European Union (on November 22-25, Barnaul).
• The All-Russia scientific conference «Safety problems in a water economic complex of Russia». (Krasnodar, 2010г.)
• Conference on formation of the scientific program of the International polar decade. (Sochi, 2010г.)
• X scientific and practical conference of the Ministry of Emergency Situations «Problems of forecasting of emergency situations. Assessment of risks». (Moscow, 2010г.)
• IV International Water Forum «Strategic problems of protection and use of water resources». (Minsk, 2010г.)
• International scientific conference «Climate change and water balance of the Caspian region». (Astrakhan, 2010г.)
• XIV congress of Russian geographical society. Scientific conference. (St.-Petersburg, 2010г.)
• The III All-Russia conference «Ice and thermal processes on water objects of Russia». (Onega, 2011г).
• International scientific and practical conference «Modern problems of reservoirs and their watersheds». (Perm, on May 17-20 2011г)
• International symposium «Physics, chemistry and mechanics of snow». (Yuzhno-Sakhalinsk, 2011г)
• Meeting of Scientific council of Russian Academy of Sciences «Water resources of a land» and All-Russia scientific conference «Stability of water objects, water national teams and coastal territories; risks of their use». (Kaliningrad, 2011г)
• IV International technical symposium «Preventive geotechnical measures for reduction of natural and technogenic disasters». (Khabarovsk, 2011г)
• The IV International scientific and practical conference «Problems of preservation of ecosystem of the Caspian Sea in the conditions of development of oil and gas fields». (Astrakhan, 2011г)

1.2.3 Participation in IHP Steering Committees/Working Groups

During the period from 5 to 9 July 2010 Russian delegation participated in the 19th Session of the IHP Intergovernmental Council. The delegation consisted of NC members from various organizations, including Federal Agency for Water Resources, State Hydrological Institute, State Oceanographic Institute and Russian State Hydrometeorological University. The delegation submitted to the IHP Secretariat a comprehensive report on the activities in the period 2008-2010 compiled by the NC of Russian Federation on the basis of materials provided by all members of the NC.

The delegation included:

1. M. Seliverstova, Head of Rosvodresursy, Head of the delegation
2. I. Shiklomanov, Professor, Director of the State Hydrological Institute, Doctor of Sc. in Geography, Deputy Chairman of the NC of Russia for the IHP of UNESCO;
3. O. Gorelits, Senior Scientist, State Oceanographic Institute, Executive Secretary of the NC of Russia for the IHP of UNESCO;
4.V. Sakovitch, Candidate of Sc. in Geography, Vice-rector, Russian State Hydrometeorological University;

Russian delegation participated actively in all plenary meetings of the 19th Session of the IHP Intergovernmental Council, its representatives reported on all key issues of the Agenda. Consultations were conducted during working meetings with the Secretariat and meetings of RA II countries (East and Central European countries). Representatives of the NC were elected to various IHP bodies.

Proposals of the NC addressing issues of development of scientific hydrology within the framework of IHP-VII and the planned VIII phase were adopted by the Secretariat and their implementation started in 2011.

1.2.4 Research/applied projects supported or sponsored by the NC

During the recent years a number of national scientific and technical projects in hydrology and water resources are being developed in Russia, which are supported by the NC of Russia and fully agree with purposes and objectives of the IHP-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:

- «Water strategy of the Russian Federation for the period 2020г.». «The plan of measures on realization of Water Strategy of the Russian Federation for the period 2020г» and the Federal target program «Development of the water management complex of the Russian Federation to 2020г.», which main objectives consist of the guaranteed providing with water resources of sustainable social and economic development of the Russian Federation, preservation and restoration of water objects to a condition providing ecologically favorable living conditions of the population, in ensuring security of the population and objects of economy from floods and other negative impacts of waters, and as in development and modernization of system of hydrological monitoring.
- 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.

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).

1.2.5 Participation in other national and international organizations and programmes

On 18 – 21 May 2010 a workshop "Sustainable Development of Biosphere Reserves in the Volga Basin" was held in Nizhny Novgorod under the umbrella of the 12th International Scientific and Industrial Forum "Great Rivers 2010". The workshop organized by the UNESCO Chair at NNGASU with the support of the UNESCO Moscow Office was attended by the representatives of various UNESCO committees, scientific and educational institutions. The NC of Russia for the IHP presented a detailed report on its activities, tasks and objectives within the framework of the UN International Decade "Water for Life" and IHP-VII.

On 15-18 May 2012 a Workshop on Implementation of Joint Research Programme on Enhanced Hydrometeorological Security jointly organized by Roshydromet and RAS, as well as a roundtable "Provision of programmes and works within the framework of integrated baseline monitoring of rational use of biosphere reserves" jointly organized by the NC and the Russian Committee for the Man and the Biosphere Programme of UNESCO, were held under the umbrella of the 14th International Scientific and Industrial Forum "Great Rivers (ecological, hydrometeorological, energy security)". Representatives of Roshydromet institutions, RAS and the Volga Basin biosphere reserves participated in the roundtable discussions. It was noted, in particular, that integrated baseline monitoring in biosphere reserves is one of the principal tools for environmental control in vast territories remote from urban and industrial centres. Participants elaborated recommendations for sustainable development of the Volga Basin.

From 27 May to 2 June 2010 and 2011 an 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" (2010) and a Youth Ecological Forum "Green Dress to the Earth" (2011) were held in the city of Khanty-Mansiysk. Representative of the NC reported at the conference on the IHP tasks and objectives and was included in the panel of jurors for evaluation of research projects presented by the participants.

The events held in May 2010 and 2011 in Nizhny Novgorod and Khanty-Mansiysk provide a considerable contribution of the NC to IHP-VII- related activities.

On invitation of the Focal Point for the Central Asian Programme on Climate Risk Management of UNDP, a member of the NC Zh. Balonishnikova was included in the First International Complex Expedition for Studying of Glacier State, Environmental Situation and Socio-economic Conditions in Upstream Regions of the Vakhsh and Pyandzh Rivers (1-15 August 2011) in the capacity of observer.

The main goal of the expedition was to assess the state of glaciers and the dynamics of water resources in their area of formation under changing climate conditions in order to develop practical recommendations on sustainable socio-economic development of Tajikistan mountain regions. The expedition was organized under the umbrella of the International Polar Year (IPY) and State Programme for Study and Preservation of Glaciers 2010-2030 and was aimed at drawing attention of international community to the challenges facing glaciers and water resources of Tajikistan, which have direct effects on the entire Central Asia (CA).

After the expedition, a report was prepared and submitted to UNDP containing recommendations on development of international cooperation in the field of hydrology and water resources. Also, a report was presented at the international conference "Climate change and disaster risk in mountainous regions" held on 19-21 September 2011 in Dushanbe, Tajikistan.

In December 2011 a proposal was made to SHI by the Minister of Civil Engineering and Communications of Paraguay to visit this country in order to discuss current problems with the Pilkomayo River and other water economy problems of the country, to conduct a field survey of the river, as well as to prepare proposals on scientific and technical cooperation in the field of water problems. In order to provide scientific and methodological assistance, the members of Russian NC for IHP – D-r V.Georgievski and D-r Z.Kopaliani from the SHI performed this work and a Memorandum of Cooperation in the field of water problems was signed between SHI and the Paraguayan colleagues.

Also, practically all members of Russian NC take active part in works of the international organizations.

Frolov Alexander V., the Chairman of Russian National committee for IHP UNESCO (since 2004), the President on oceanography of the Joint commission UNESCO/WMO on sea meteorology and oceanography (since 2009), the Representative of the Russian Federation in the Intergovernmental Council on hydrometeorology of CIS countries (since 2010).

Alekseevsky Nikolay I., the member of the World association on sedimentation and erosion researches WASER

Asarin Alexander E., the member of National committee of the International commission on Large Dams (ICOLD)

Balonishnikova Jeanne A., the member of the International Association of hydrological sciences (IAHS), the member of the Consulting group of the Commission on Hydrology of WMO Bolgov Mikhail V., the member of National committee of the International commission on Large Dams (ICOLD)

Vasilyev Oleg F., the member of the committee of the Russian Academy of Sciences according to the system analysis, the member of National committee on theoretical and applied mechanics, the member of the International association on hydraulic researches (IAHR) (since 1961, since 2001. – honorary member), member of the International Association of hydrological sciences (IAHS), honorary member of the Hungarian hydraulic society (1980), honorary doctor of engineering sciences of Karlsruhe University (Germany) (1988).

Gorelits Olga V., the member of the International association of water resources (IWRA)

Zektser Igor S., the Vice-president of the International association of hydrogeologists (IAH), the academician of the Bulgarian Academy of Sciences

Kopaliani Zurab D., the member of Consulting council of the International research and training center of UNESCO on erosion and sedimentation (IRTCES), Beijing, China, the member of Consulting council of the International center of UNESCO on water natural disasters and management of risk, Tsukuba, Japan

Kotlyakov Vladimir M., the Chairman of the Russian national committees on the International geosferno-biospheric program, on researches of Antarctic.

Nikanorov Anatoly M. Acting member of the International Engineering academy, International academy of computer sciences and systems. Ecological academy of Russia, corresponding member of the Russian Academy of Sciences (since 1997г.), The chairman of the International commission on protection of waters from pollution, the International association of geochemistry, the First vice-president of the International commission for quality of waters of the International association of hydro-geological sciences, the Honorary professor of Viskonsinsky university of the USA.

1.2.6 Other initiatives

In November 2011 Russian Federation organized an International Conference on Problems of Adaptation to Climate Change (PACC-2011). Organization of the event was supported by the G8 leaders in Muskoka, Canada, 25-26 June 2010. The principal organizing institutions of this conference were Roshydromet and the NC of RF.

The major objective of the conference was to thoroughly discuss and give a scientific rationale to measures on adaptation to current and expected climate change, as well as to

exchange international experience and scenarios in this area, which would make it possible to contribute signisicantly to establishing Global Framework for Climate Services envisaged by the Third World Climate Conference (2009) and become an important step towards integration of international efforts in adaptation, including anticipatory adaptation, to climate changes.

Main topics of the conference addressed assessment of climate change impact on sustainable development, vulnerability, risks, damage and benefits, possibilities of adaptation to current and expected climate changes, large-scale weather anomalies and their consequences, including development of monitoring and early warning systems, as well as identification of new approaches which could contribute to stable climate preservation. The major outcomes of the conference are as follows:

- Assessment of current state of research into adaptation to and consequences of climate change for environment and the economy.
- Formulation of problems, priorities and prospects of research in the field of adaptation, also in order to contribute to identification of priorities of national and international programmes coordinating climate research.
- Identification of possibilities for consolidation of international community, multidimensional integration and cooperation of scientific and bussiness communities, social groups (including small and indigenous peoples), government institutions at national and international levels to solve adaptation problems, as well as in order to contribute to the establishment of Global Framework for Climate Services.

1.3 Educational and training courses

1.3.1 Participation in IHP courses (at IHP Centres)

Not participate

1.3.2. Organization of specific courses

- Advanced training courses for Roshydromet specialists “Monitoring of surface water pollution. Principles of monitoring system organization, methods and techniques”, 20 September – 1 October 2010, Rostov-on-Don. Attended by 35 specialists from Roshydromet branches.
- Workshop on education and training specialists from Kazakhstan on calculation of ambient concentrations for determination of waste discharge limit values and on using of GHM-1 and GHM-2 computer programmes for making these calculations. The workshop was held at the request of the Department of Ecological Monitoring of RSE “Kazgidromet” on 20-22 September 2011 in the Hydrochemical Institute, Rostov-on-Don.
- Courses of experts – hydrologists of Roshydromet and other research and design organizations of the various ministries and departments of the Russian Federation «Engineering hydrological calculations» (St.-Petersburg, GGI, on June 27 – on July 8 2011г.).
- School seminar «Problems of geography and a land hydrology (Krasnovidovo, September, 2010),
- Preparation and scientific educational program realization «Studying of regularities of transformation of an ecosystem of the Lake Tagus (the USA, California) under the influence of natural and technogenic factors» (geographical faculty of the Moscow State University Tagus-Baikal Institute, Agency of the USA on the international development in Moscow and Institute of water problems of the Russian Academy of Sciences (February, 2011)

Outreach and professional educational events in the field of hydrology, water resources and ecohydrology organized by RSHU:

- International summer ecohydrological school at the training and observation station on Valaam Island, Ladoga Lake (July 2011) – 15 students from the University of Helsinki (Finland) and RSHU;
- All-Russian Interuniversity Conference of Young Researchers in the Field of Environment, Water Resources and Ecology "Education. Science. Profession" (March 2011) – 70 participants;
- All-Russian Student Academic Competitions on Hydrometeorology and Hydrology (April 2011, RSHU) – 53 participants in the 3rd round;
- Regional Competition of Tertiary Students on Ecology (October 2010) – 71 participants;
- Activities of hydrological and ecological sections of a Conference of RSHU Scientific Student Society (April 2011) – 25-30 participants in each section;
- Training for students and post graduate students and one teacher from RSHU under hydrological education development program (May 2011) and training for students and a teacher from Poland at the RSHU training station (July 2011) – 6 students from each university (jointly with the Nicolaus Copernicus University, Toruń, Poland);
- Practical training on ecology for Russian students in the University of Łódź, Poland, and for Polish students in RSHU, Russia – 10-14 students from each university (jointly with the University of Łódź, Poland);
- Summer hydroecological training for RSHU students in Armenia, Lake Sevan, and students from the Yerevan State University at the training and observation station on Valaam Island, Ladoga Lake, (July 2011) - 4 students and a teacher from each university (jointly with the Yerevan State University, Armenia);
- RSHU Open Days – outreach and educational guidance meetings with high school students and their parents (five meetings from September 2010 to April 2011) – up to 700 attendees;
- Job Fairs – monthly meetings with high school students;
- Educational and outreach exhibitions on environmental protection, water resources and ecology "The Horizons of Education" (2 exhibitions in November 2010 and April 2011);
- All-Russian Youth Ecological Forum "Earth Is Our Home" (RSHU, February 2011) – 62 participants;
- Career-guiding Competition on geography, environmental protection and ecology for high school students (RSHU, May 2011) – 3 rounds, 650 participants;

128 specialists were trained under professional development and retraining programs in the field of hydrology, water resources and ecohydrology (9 programs).

1.3.3 Organization of Category II UNESCO IHP Centre

Now negotiations between RSHU and the Secretariat of IHP UNESCO are carried on for giving to RSHU the status of the IHP Center of UNESCO of Category II.

1.4 Cooperation with UNESCO-IHE Institute for Water Education

No

1.5 Publications – monographs, collected works, manuals and study guides

Monographs

• Alekseevsky N.I., Frolov N.L., Hristoforov A.V. Monitoring of hydrological processes and increase of safety of water use. M: Geographical Moscow State University f-t, 2011. 387 pages

• Asarin A.E., Kravtsova V.I., Mikhailov V.N. Amudarya and Syrdarya rivers and their deltas//The Aral Sea Environment. Ed. Kostyanoy A.G., Kosarev A.N. Berlin Heidelberg: Springer-Verlag, 2010. River 101–121.

• Chalov R. S. Theory, geography and practice in channel processes . M, 2011. 955 pages

• Danilov-Danilyan V. I., Hranovich I.L. Water resources management. Coordination of strategy of water use. 2010. M: Scientific world, 232 pages
• Ecology and hydrometeorology of large cities and industrial zones in 3 volumes (Ed. Carlin L.N., Shelutko V.A.) 2010, RSHU, SPb.
• Extreme hydrological situations. (Ed. Koronkevich N. I., Barabanova E.A., Zaytseva I.S.) M, 2010. 460p.
• Ferronsky V.I., Ferronsky S.V. Dynamics of the Earth. Dordrecht-Heidelberg-London-New York: Springer, 2010, 299 p. • V.A.Shirokov, N.L.Frolov. WATER: seas and oceans, rivers and lakes. Publishing house: OLMA of Media of Groups. 2012. 304 pages (the nuchno-popular book).
• Garkusha D. N., Fedorov Yu.A. Methane in delta area of the Don River. - Rostov-on-Don – Moscow, 2010, 181p.
• Garmayev E.Zh., Hristoforov A.V. Water resources of the rivers of the basin of the Lake Baikal: bases of their use and protection. Novosibirsk, 2010. 231 p.
• Gusev E. M, Nasonov O. N. Modeling of the heat and moisture exchange between land and atmosphere. M: Science. 2010. 328 pages
• Hydrology of the delta of Kuban / Ed. N. Mikhaylov, D.V.Magritsky, A.A.Ivanov. M:2010, 728 pages
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• Shumova N. A. Regularities of formation of water consumption and water security in the south of the Russian plain. M: Science, 2010. 239 pages
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Study guides

- Magritsky D.V. Discharge and mouths of the rivers. M: Geographical faculty of the Moscow State University, 2011. 211 pages
- • Nikanorov A.M. Regional hydrochemistry. Manual. - Rostov-on-Don., 2011 – 388 pages
- • Povalishnikova E.S., Frolov N. L., Yefimov L.E. Hydrological practice. M, Geographical faculty of the Moscow State University, 2011, 135 pages
- • Hristoforov A.V. Ecology and economy bases of water use. Manual. M: Geographical Moscow State University f-t, 2010. 162 pages.

1.6 Participation in the international scientific meetings

1.6.1 Meetings hosted by the country

- Sergeevskie Chteniya (Sergeev's Readings): Proceedings of the annual conference of the Scientific Council RAS on geoecology, engineering geology and hydrogeology, 23-25 March 2010.
- International Scientific Conference “Marine Research of Polar Regions of the Earth in the International Polar Year 2007/2008”, 21-23 April 2010
- International symposium «Ecology of the Arctic and subarctic territories» (Arkhangelsk, on June 6-10 2010)
- International Conference (school) of the Dynamics of Coastal Zone of Non-Tidal Seas (school-seminar), Baltiysk (Kaliningrad Oblast, Russia), 27-30 June 2010
- International conference on environmental observations, modeling and information systems, Tomsk, July, 5-11, 2010
- International conference «Deltas of Eurasia: origin, evolution, ecology and economic development» (Ulan-Ude, on August 16-19, 2010)
- Third All-Russian Conference with international participation “Fundamental Problems of Water and Water Resources”, 24-28 August 2010, Barnaul
- The 2nd International Workshop on Water Cycle of Inland River Valley in Arid Region under Climate Change, 4-5 September 2010, Urumqi
- The IV All-Russia conference on a water ecological and water toxicology «Anthropogenic influence on water organisms and ecosystems» (with participation of experts from neighboring countries), 24-28 September. 2011, Borok of the Yaroslavl region.
- The international scientific and practical conference «Environmental problems of river systems», Minsk, September 21-23, 2010.
- All-Russian Conference “Problems of Security in the Russian Water Sector”, 20-25 September 2010, Krasnodar
- Conference on developing a program of the International Polar Decade, 4-7 October 2010, Sochi.
- International scientific conference «Modern problems of hydroecology». St.-Petersburg. October 11-15, 2010
- Coordination council on problems of erosion an channel processes (Astrakhan, October 12-16, 2010)
- Russian scientific conference on health and safety problems. Moscow. October 25, 2010
- IV International conference «Ecological and geographical problems of environmental management of oil and gas regions: theory, methods, practice, October 26-30, 2010, Nizhnevartovsk.
- International conferences «The Caspian Region: Environmental Consequence of the Climate Change. Moscow. October 14-16 2010
- All-Russia scientific and practical conference «Scientific bases of environmental monitoring of reservoirs», Khabarovsk, on October 26-29, 2010
- • International conferences «Environment and management of natural resources». – Tyumen’, 2010
- The II international conference «Modern problems of regional development», Birobidzhan, November 22-25, 2010
- The XI international scientific and practical symposium «Pure water of Russia (on May 18-20, 2011, Yekaterinburg)
- All-Russian Conference “Current Problems of Water Toxicology”, 17-19 May 2011, Petrozavodsk.
- International Scientific Conference “Study and Development of Marine and Land ecosystems in Arctic and Arid Climates”, 6-10 June, 2011, Rostov-on-Don.

- IVth All-Russian Conference on Water Ecotoxicology “Anthropogenic Impact on Water Organisms and Ecosystems” (with participation of specialists from the near-abroad), 24-28 September 2011, Papanin Institute for Biology of Internal Waters RAS, Borok, Yaroslavl Region.
- XXYI coordination council on problems of erosion and channel processes (Ulyanovsk, October 7-14, 2011)
- Lomonosov readings in the Moscow state university (Lomonosov-2011) (Moscow, November 14, 2011)
- The international scientific conference «Global climatic processes and their influence on ecosystems of the Arctic and subarctic regions» (Murmansk, on November 9−11, 2011)
- 5 international conference «Earth from space− the most effective decisions» (Moscow, November 29 - December 1, 2011)
- The first open conference of the Moscow State University scientific and educational center and IVP Russian Academy of Sciences «Resources and quality of waters of a land: assessment, forecast, management» (Moscow, on December 8-9, 2011)

1.6.2 Participation in meetings abroad

Participation in more than 40 conferences

2 Future activities

2.1 Activities planned until December 2012

The following activities are planned:

1. Advanced course on hydrology “Hydrological computations” (Spatial-temporal generalization of hydrological characteristics), June 2010, St Petersburg, SHI.

2. Organization of Conference on Studies of Hydrological Processes in Research Basins: Current Challenges and Prospects, St.Petersburg, SHI, September 17-20, 2012 .

Convened by ERB Steering Committee in cooperation with

- IHP UNESCO North European FRIEND Project 5
- State Hydrological Institute, St.Petersburg
- Russian IHP Committee and Roshydromet
- Germany IHP-HWRP

Conference Themes

- Uncertainties in surface and ground water interactions.
- Changes in hydrological regimes resulting from climate variations and human impacts.
- Current state, problems and perspectives of hydrological modelling.
- Study of runoff formation in research basins and the transfer of results to ungauged basins.
- New methods for water balance components measurements.
- Open session on hydrological and ecologically related research in small basins.

2.2 Activities foreseen for 2013-2014

Organization of the Seventh All Russian Hydrological Congress in 2013.

2.3 Activities envisaged in the long term

These activities will be considered at the meetings of NC RF in 2012 in the course of preparation of research programmes in hydrology and water resources in different agencies and organizations of Russia for 2013-2020.

SERBIAN NATIONAL COMMITTEE FOR UNESCO IHP

NATIONAL REPORT ON IHP RELATED ACTIVITIES

Report Format

1. ACTIVITIES UNDERTAKEN IN THE PERIOD JUNE 2010 – MAY 2012

1.1 Meetings of the IHP National Committee

1.1.1 Decision regarding the composition of the IHP National Committee

The Serbian National Committee for UNESCO IHP was adopted at the meeting held at the Commission for cooperation with UNESCO, Ministry of Foreign Affairs, Republic of Serbia, on May 6th, 2010.

The decision was adopted as a need for closer cooperation with UNESCO IHP Programme and more intensive engagement of water sector professionals from Serbia in topics IHP is focused on. The Serbian National Committee consists of nine members that represent Ministries of the Republic of Serbia and national and public institutions responsible for water management in Serbia: Prof. Marko Ivetic, Dr. Milan Dimkic, Mr. Dejan Lekic, Mr. Tioslav Petkovic, Mr, Slavimir Stevanovic, Prof. Jovan Despotovic, Ms. Nada Lazic, Dr. Nikola Marjanovic, Mr. Mihajlo Gavric

Prof. Siegfried Demuth, Chief of the Section of the Hydrological Processes and Climate, UNESCO Division of Water Sciences, visited Belgrade in July 2010 following the invitation of the Sebian Committe for UNESCO IHP. During the visit Prof. Demuth had meetings with the University of Belgrade, Republic Directorate for Water of the Ministry of Agriculture, Forestry and Water Management, Ministry of Science and Development, Serbian Academy of Science and Arts, Institute for Water Resources Development Jaroslav Cerni, Faculty of Civil Engineering, Institute for Hydraulic and Environmental Engineering, University of Belgrade. The purpose of the visit was assistance from the IHP Secretariat of UNESCO on how to bring together the expertise from national research institutes, universities and ministries. Furthermore, guidance was given on how the Serbian research community could bring in their expertise in the design of the upcoming IHP VIII. Support was given for the initiative of the Serbian National Commission for establishment of the Chair at the University of Belgrade.

Following the Initial meeting Serbian National Committee held the meeting on October 2010. Final Report from the 19th session of the Intergovernmental Council (Paris, 5-9 July 2010) was presented. Support was given for two initiatives: 1. for establishment of the UNESCO Chair in Water for Ecologically Sustainable Developments at Belgrade University, and 2. for establishment of II category regional centre on Water Research, Management and Global Change at the Jaroslav Cerni Institute for the Development of Water Resources. Furthermore, plans for participation in the regional meetings (eg. IHP UNESCO 24th Working Meeting of the Danube Countries), conferences (Regional Rainfall 2010, World Water Day 2011, IWA Groundwater 2011, Urban Drainage Modelling 2012) and international projects and programmes in a framework of IHP. Both initiatives have received the support at the IHP Sercretariate.

Scientific Committee of the Serbian National Committee for UNESCO IHP was established with the following members: Jasna Plavsic (University of Belgrade – Faculty of Civil Engineering), Slobodanka Blagojevic (Faculty of Civil Engineering and Architecture - University of Niš), Marina Babic Mladenovic (Jaroslav Cerni Institute for the Development of Water Resources), Stanimir Kostandinov (University of Belgrade – Faculty of Forestry) and Ivana Ivancev Tumbas (Faculty of Sciences, University of Novi Sad).

1.1.2 Status of IHP-VII activities

The Serbian National Committee for UNESCO IHP was not involved in VII phase of IHP since it was established in May 2010.

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

On the occasion of the celebration of the World Water Day 2012, Serbian National Committee organized two conventions – one organized together with the University of Belgrade who was the host of the convention and another at the Faculty of Civil Engineering, University of Belgrade. The celebration focused on the theme of the World Water Day – Water and Food Security.

The Agenda included two major topics: (1) Integrated Water Resources Management, including water resources evaluation while providing ecologically sustainable approach, and (2) Integrated Urban Water Management, including institutional, legal, scientific and professional domains.

The event was attended by guests from abroad (representative of Russian National Committee for UNESCO IHP, representative of Black See University Network) and national - the Commission for Cooperation with UNESCO, Ministry of Foreign Affairs, Republic of Serbia, Ministry of Agriculture, Trade, Forestry and Water Management, Republic of Serbia, public enterprises responsible for water management – Srbijavode, Directorate for Water, several universities - University of Belgrade, University of Nis, several institutes, students and other interested parties. The main event of the convention was lecture that Prof. Dragan Savic, visiting professor of the University of Belgrade, held with the title "Global Water Security: Should we be worried?".

Serbian National Committee organized celebration of the World Water Day 2011 together with the City of Belgrade and water municipal companies. The celebration is focused on the impact of rapid urban population growth, industrialization and uncertainties caused by climate change, conflicts and natural disasters on urban water management challenges.

Lecturers presented on above events are available on the following sites:

http://media.amres.ac.rs/multimedia/viewvideo/268/proslava-svetskog-dana-voda

www.ihp.unesco.rs

Serbian National Committe was involved, together with other national and local authorities (City of Belgrade, PU Beogradvode, Belgrade Waterworks, and others), in organization of the celebration of the World Water Day 2011. The celebration was organized under a slogan "Water for Cities: Responding to the Urban Challenge".

Serbian National Committe participated in the working meeting "Research on climate change for environment protection, adaptation and risk decrease", organized by the Republic Hydrometeorological Service of Serbia in April 2011.

Numerous informal meeting were held with the members of the National Committe in Novi Sad, Belgrade, Nis, Kragujevac and other cities.

1.2.2 Participation in IHP Steering Committees/Working Groups

Prof. Jovan Despotovic participated at the XXV Conference of the Danube Countries on Hydrological Forecasting and Hydrological Bases of Water Management in Budapest, Hungary, in June 2011, organized in the frame of the IHP UNESCO Regional Hydrological Cooperation of the Danube Countries as a event of the Hungarian National Committee for UNESCO International Hydrological Programme (IHP).

Prof. Jovan Despotovic, Vice-Chair of the IHP UNESCO Council Bureau and Chair of the Serbian National Committee for UNESCO IHP participated at the 46th session of the IHP Bureau (30 May 1 – June 2011) in Paris. Among conclusions of the meeting selected themes related to the VIII phase of the IHP Programme are of special interest to Serbian National Committee – water security, including aspects of risks; water quality aspects; climate change aspects, effects and attenuation of those; and groundwater within IWRM. Furthermore in consultation with the Secretariat support was given for establishment of the UNESCO Chair in Water for Ecologically Sustainable Developments at Belgrade University. Furthermore, task that the National Committee should undertake in order to achieve more active participation of Serbia in IHP programmes such as HELP, FRIEND and other, are set.

Several meetings were organized with the Commission for Cooperation with UNESCO.

Prof. Jovan Despotovic, Chair of the Serbian National Committee for UNESCO IHP participated at the 19th session of the Intergovernmental Council of the International Hydrological Programme in Paris in July 2010. Prof. Despotovic was elected Vice-Chair of the Group II at the session.

Prof. Jovan Despotovic, Vice-Chair of the IHP UNESCO Council Bureau and Chair of the Serbian National Committee for UNESCO IHP, and Prof. Marko Ivetic, Vice-Rector of the University of Belgrade and a member of the Serbian Committe for UNESCO IHP, had an invited lectures at the International Conference on "Education & Governance for Sustainable Development" held in Constanta, Romania, from 16th to 19th March 2011, after invitation sent by the Black See University Network (BSUN). As a follow up of the conference two papers were published.

Prof. Jovan Despotovic participated in the XXIV Working Meeting of the experts and representatives of the Regional Hydrological Cooperation of the Danube Countries in the framework of the IHP/UNESCO, held on 25 November 2010 in Zagreb, Croatia.

A tedious consultations during evaluation of the proposal for the Phasis VIII IHP within the Group II at the meetings in St. Petersburg, Budapest, Bucharest, Constanta and via internet provided numerous comments to the Task force till final draft in Nov 2011.

1.2.3 Research/applied projects supported or sponsored

Several research projects related to water sector have been implemented of which five projects financed by the Ministry of Education and Science, Republic of Serbia are listed:

- Measurement and modeling of physical, chemical, biological and morpho-dynamic parameters in rivers and reservoirs
- Systems for drainage of storm waters as a part of urban and transport infrastructure
- Management and protection of reservoirs
- Development of new hydroinformatic systems for management and protection of water resources
- Risks in implementation of Water Framework Directives in Republic of Serbia

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

IRTCUD, International Research and Training Center under auspices of UNESCO, from its establishment have intensive coopearation with UNESCO and other UN organizations (UNEP, UNDP, and UNIDO), professional institutions (IAHR, IAWPRC, IAHS), World Meteorological Organization (WMO), universities and research institutions all over the World.

IRTCUD has a role of global coordinator of the regional IRTCUD Centres for the Cold Climates (Trondheim, Norway), Humid Tropics (Porto Alegre, Brazil) and Centre for Arid and Semiarid Climates established in the Regional Center of Research and Studies of Water Ethics (Cairo, Egypt).

Prof. Despotovic participated in the working meeting and training "Policy and Science Connections", organized by the Regional UNESCO centre, in Venice, from 18th to 21 st April 2012, and Sava River Commission, in Zagreb, from 30th November to 2nd December 2011.

The Serbian National Committee for UNESCO IHP participated in the meeting held in Maribor and Ljubljana, Slovenia, in January 2012, organized by the Slovenian National Committee for UNESCO IHP.

Prof. Jovan Despotovic participated at the UNESCO General Conference, held in October/November 2011 in Paris.

Following the invitation by the Black See University Network, BSUN, representatives of the Serbian National Committee participated at the meeting held in Bucharest in September 2011 regarding consultation of experts from the Danube Basin on establishment of the regional center Danube-Danube Delta-Black See.

The Serbian National Committee for UNESCO IHP participated in the meeting organized by the Russian National committee for UNESCO IHP, held in St. Petersburg on from 17th to 20th October 2011. The meeting focused on the proposed program for the IHP VIII. As a result of this meeting and consultations with other country members of the II Group, suggestions for improvement of the programme was submitted to the Secretariat.

Serbian National Committee submitted an application for UNESCO Participation Programme 2012-2013. The project with title "The treasures of water resources and historical heritage" is based on strengthening of the network of countries that share common natural and historical cites located in boundary regions – first at boundary region of South-East Serbia and the second on East Serbia. Countries that will be participating in the projects are:

Serbia, Croatia, Bosnia and Herzegovina, FYRO Macedonia, Bulgaria, specifically:

a) Region 1: South - East Serbia (Vlasina area, Bela Palanka), South-West Bulgaria (Kunstendil), and Macedonia

b) Region 2: Western Serbia (Srem), East Croatia, East Republic of Srpska - Bosnia and Herzegovina (Semberija)

1.2.5 Other initiatives

Serbian National Committee for Serbia took part in preparation of the Report on "Hydroglogy and Water Resources Management in the Danube Catchment / Structures, Players, Projects. Financila Respirces", Regional Hydrological Cooperation of the Danubian Countries in the framework of UNESCO IHP, august 2011.

Following the support Serbian National Committee gave to the initiatives for establishment ot the Chair and II category Centre, proposals were submitted to UNESCO as follows: 1. for establishment of the UNESCO Chair in Water for Ecologically Sustainable Developments at Belgrade University proposal submitted in August 2011, and 2. for establishment of II category regional centre on Water Research, Management and Global Change at the Jaroslav Cerni Institute for the Development of Water Resources proposal submitted in November 2010.

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

Serbian National Committe for IHP UNESCO was not involved in implementation of IHP courses.

1.3.2 Organization of specific courses

Among educational activities the Faculty of Civil Engineering focused also on a postgraduate studies and specialized courses prepared for professionals in water sector. Programmes of studies are focused on up to date knowledge and water problems societies deal with nowadays.

IRTCUD, together with four leading Universities in the South-Eastern European region: National Technical University of Athens, the University of Belgrade, the Technical University of Civil Engineering of Bucharest and the University of Ljubljana organizes an international postgraduate programme in Water Resources and Environmental Management - EDUCATE!. The postgraduate programme is a two-year, full-time course that consists of four taught semesters and the preparation of a thesis. The entire programme is values at 120 ECTS.

Course in Software 3DNet is organized by the Faculty of Civil Engineering. 3DNet is an integrated hydroinformatic tool designed for modeling of water supply and sewerage networks. Simulation procedures for water supply and sewerage are embedded into GIS model that include information on terrain elevations, facilities in the water supply and sewerage networks, catchment surface covers, and others.

1.3.3 Participation in IHP courses

Serbian National Committe for IHP UNESCO was not involved in implementation of 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

Nine books (four more to follow) published in the Urban Water Series initiated within the IHPVI, Series editors Č. Maksimović and J.A. Tejada-Guibert, staring with the book:

Data Requirements for Integrated Urban Water Management". T.D. Fletcher and A. Deletić, ed. Book Series, Series ed. C. Maksimovic, Tejada-Guibert, Sarantuyaa Zandaryaa, J.A., Taylor and Francis, ISSN 1749 0790

- Urban Water Cycle Processes and interactions
  Jiri Marsalek, Pascal Breil, Blanca Jiménez-Cisneros, Mohammad Karamouz,Per-Arne Malmquist, Joel Goldenfum and Bernard Chocat. 2007
- Data requirements for integrated Urban Water Management
  Edited by Tim D. Fletcher and Ana Deletić. 2007
- Aquatic Habitats in Sustainable Urban Water Management Science, Policy and Practice
  Edited by Iwona Wagner, Jiri Marsalek and Pascal Breil. 2007
- Urban Water Security: Managing risks
  Edited by Blanca Jiménez and Joan Rose. 2009
- Integrated Urban Water Management: arid and Semi-arid regions
  Edited by Larry W. Mays. 2009
- Integrated Urban Water Management: Humid tropics
  Edited by Jonathan N. Parkinson, Joel A. Goldenfum and Carlos E.M. Tucci. 2010
- Advanced Simulation and Modeling for Urban Groundwater management – UGrOW
  Edited by Dubravka Pokrajac and Ken Howard. 2010

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

The IWA Specialist Groundwater Conference, organized by the Jaroslav Černi Institute for the Development of Water Resources, was held in Belgrade from 8th to 10th September 2011. The Conference was held under the auspices of the Serbian Government (the Ministry of Agriculture, Trade, Forestry and Water Management/Directorate for Water and the Ministry of Education and Science), the Serbian Academy of Sciences and Arts, as well as the following international organizations: the International Water Association (IWA), the International Association of Water Supply Companies in the Danube River Catchment Area (IAWD), and the International Commission for the Protection of the Danube River (ICPDR). UNESCO contributed through the presence of its officials.

Regional Rainfall Conference of the Balkans –Regional Rainfall and Climate Change was held in November 2010 at the Faculty of Civil Engineering, University of Belgrade. It gathers about 100 participants from the Balkan

Region and hydrology experts from France, Germany, Italy and Portugal. The themes included:

- rainfall measurements and data processing, including radar applications
- characterization of rainfall at the Balkans, including climate change
- safety of traffics during severe storms and floods
- storm runoff quality and quantity measurements
- and others.

The idea on establishment of the Experimental Urban and/or Infrastructure Catchments was adopted at the conference. Implementation of this idea has started including several cities – Belgrade and SUbotica (Serbia), Rijeka (Croatia) and Maribor (Slovenia), with support of IRTCUD and IHP Secretariat.

Union of Engineers and Technicians of Serbia, with support of the National Committee, organized 32nd Scientific Conference "Water supply and sewerage" held in Kladovo from 4th to 7th October 2011.

1.6.2 Participation in meetings abroad

Representatives of the Serbian National Committee for UNESCO IHP participated at the conference on Education and Management for Sustainable Development held at the University Ovidius, Constanta, in March 2011, through several contributions - presentations regarding Belgrade University, IRTCUD and presentation of the paper "Sustainabe Education on the Integrated Water Resources management"

Prof. Despotovic participated at the XVI Conference of the World Metheorological Organization held in Geneva, Switzerland, May 2011.

Meeting in Bucarest, Romania, under the BSUN organization, in regard to application for establishing of European Center for Science CADDSS (The Danube - Delta Delta - Black Sea), 18th to 20th September 2011.

IRTCUD members participated in the 11th conference "Water supply and sewerage system" held on Jahorina mountaints, Republika Srpska, in May 2011.

1.7 Other activities at regional level

1.7.1 Institutional relations/cooperation

Meetings of the Danubian countries held in Zagreb and Budapest that were already commented.

1.7.2 Completed and ongoing scientific projects

Already commented activities with numerous IHP National Committees concerning joint research and other activities.

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2012

The 9th International Conference on "Urban Drainage Modelling" (UDM) will be held in Belgrade, Serbia, in 2012 from 4 to 7 September. This is a Specialized Conference, an IWA event organized by Joint IAHR/IWA Committee on Urban Drainage (JCUD). The Conference is designed to bring together specialists, researchers and practitioners, to exchange experiences, demonstrate present potential, improve the reliability of urban drainage modelling and to set-up the stage for its future developments. So far more than 200 participants have submitted their abstracts.

Prof. Jovan Despotovic will participate in the 20th session of the IHP Intergovernmental Council that will be held at UNESCO Paris, June 2012, as a Vice-Chair of the IHP UNESCO Council Bureau and Chair of the Serbian National Committee for UNESCO IHP.

Serbian National Committee supports organization of the 12th Conference Water Supply and Sewerage Systems, organized by the Association fro water technology and sanitation engineering, that will be held on Jahorina, mountain, 23rd to 25th May, 2012.

IRTCUD organizes The First Workshop for Creation of The Blue Green Dream Regional Centre for the Central & South Eastern Europe (CSEE) that will be held in Belgrade on 28th May 2012. This project addresses challenges of changing paradigm of design and operation of urban water (blue) infrastructure and urban vegetated areas (green assets) ,currently operating as two separate systems, by applying innovation in bringing stakeholder together and linking blue-green assets at various scales across urban areas bringing existing as well as newly developed green spaces together with urban water infrastructure and amenities in order to exploit their synergies and obtain a wide range of multiple benefits.

Meeting with National Com IHP UNESCO of Romania, **Dr. Mary-Jeanne Adler** concerning preparation of the joint programs for the Danube Strategy initiatives is scheduled for 29th of June, 2012 in Temisuara, Romania.

Under discussion is a regional preparatory meeting for the countries of the Group II, either in July or September 2012 concerning joint research work in connection with IHP Phasis VIII under the UNESCO Chair in Water for Ecologically Sustainable Developments.

Under discussion is a provisional planning for a Study and research work within or in a connection with The Danube Strategy together the Group II countries and the Danubian countries as well.

Under preparation is a meeting with Kenya UNESCO Center during Autumn 2012. together with the UNESCO Chair in Water for Ecologically Sustainable Developments at Belgradu University.

Conference of National Serbian Association of Hydraulics - SDHI & Serbian Hydrologic Association – SDH that will be held in October 2012 meeting under support of IRTCUD and National Committee of IHP UNESCO is under preparation.

Union of Engineers and Technicians of Serbia will organize 33rd Scientific Conference "Water supply and sewerage", under support of the National Committee, that will be held from 9th to 12th October 2012 in Vrsac.

2.2 Activities foreseen for 2013-2014

Guidelines for flood frequency analysis, by support of Public Enterprize Srbija vode, Belgrade, is under preparation.

Union of Engineers and Technicians of Serbia plan to organize the following conferences with support of the National Committee:

- Water conference, March 2013
- Waste water, solid waste and hazardous waste, April 2013
- Water supply and sewerage systems, May 2013

2.3 Activities envisaged in the long term

Two case studies were proposed for IFI IHP UNESCO Programme, such as: The Skadar lake high waters shared by three countries Montenegro, Albania and Macedonia, since in fall 2010 most severe floods ever occurred. The other was a Study on floods in Serbia started under conductance of the National Com IHP UNESCO in Belgrade.

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Appendix

МИНИСТАРСТВО СПОЉНИХ ПОСЛОВА
РЕПУБЛИКЕ СРБИЈЕ
Комисија за сарадњу са УНЕСКО
Број: 317
Датум: 6. мај 2010. године

ЗАПИСНИК

са оснивачке седнице Комитета за сарадњу са Међународним хидролошким програмом (IFP) одржане 5. маја 2010. године

Оснивачком састанку Комитета за сарадњу са Међународним хидролошким програмом (IFP) су присуствовали: помоћник министра за заштиту животне средине Н. Покимица, в.д. председника Комисије Јован Ћирилов, генерални секретар Комисије, Јасна Зрновић, оп. министар у ОУН/МСП Здравко Тувић, саветник у ОУН/МСП Н. Драгић и чланови Комитета: Ј. Деспотовић (Грађевински факултет БУ), Н. Лазић (Воде Војводине) Н. Марјановић (Србијаводе), М. Гаврић (ЕПС), Т. Петковић (СДХИ), М. Димкић (Министарство пољопривреде, шумарства и водопривреде и Институт Јарослав Черни), М. Иветић (Министарство за науку и технолошки развој и БУ), Д. Лекић (Агенција за заштиту животне средине).

На почетку седнице будућим члановима Комитета се обратио помоћник министра за животну средину Н. Покимица који је нагласио да место Р. Србије у Међународном савету Међународног хидролошког програма (2010-2014) и наш стручни потенцијал у области вода отварају велике могућности за развијање сарадње у овој области.

В.д. председника Националне комисије за сарадњу са УНЕСКО Ј. Ћирилов је истакао потребу да Национална комисија, у садашњем сазиву, формира Комитет за хидрологију у циљу свестранијег представљања Р. Србије у УНЕСКО.

Генерални секретар Националне комисије Ј. Зрновић истакла је да су воде приоритет УНЕСКО. Упознала је да, у складу са тим, постоји значајан ванбуџетски фонд за финансирање пројеката из области вода.

У радном делу састанка верификовано је чланство предложеним кандидатима Комитета. За председника је, са једним уздржаним гласом, изабран проф. др. Ј. Деспотовић (Грађевински факултет БУ), а за потпредседнике М. Иветић (Министарство за науку и технолошки развој и БУ) и М. Димкић (Министарство пољопривреде, шумарства и водопривреде и Институт Јарослав Черни). Договорено је да до избора секретара Комитета те послове обавља Т. Петковић (СДХИ).

Будући да су учесници састанка имали примедбе на нацрт Пословника, одређен је рок од седам дана за његово усаглашавање.

Такође, после упућених примедби на број чланова и састав Комитета, изнета је могућност да се, у оквиру рада Комитета по стручним групама, додатно ангажују стручњаци за поједине области из научних и наставних института.

Председник Комитета је подсетио да до 23. мај о.г. УНЕСКО треба доставити предлог пројеката из области вода.

Напомена: Састанку нису присуствовали чланови Комитета С. Стевановић (РХМЗ) и М. Гаврић (ЕПС).

Сачинила:

Н. Драгић, саветник
Сектор за мултилатералну сарадњу
Одељење за Уједињене нације

Верификовала и одобрила:

Ј. Зрновић, опуномоћени министар
Сектор за мултилатералну сарадњу
Одељење за Уједињене нације

Science Sector – Mission Report

Mission undertaken by: S. Demuth, Chief, SC/HYD/HPC

Creation Date: 4 August 2010

Travel Order:

Dates of Mission: 24 to 29 July 2010

Type of Travel: Meeting

Country: Serbia

Town: Belgrade

Region: Europe

Institutions Visited:

Rectorate of the University of Belgrade, Republic Directorate for Water of the Ministry of Agriculture, Forestry and Water Management, Ministry of Science and Development, Serbian Academy of Science and Arts, Institute for Water Resources Development Jaroslav Cerni, Faculty of Civil Engineering, Institute for Hydraulic and Environmental Engineering, Belgrade University.

Purpose of Mission:

After the turbulent political times the Republic of Serbia experienced in the past, the National Commission of Serbia for UNESCO has decided to revitalise its commitments towards the International Hydrological Programme (IHP) and requested assistance from the IHP Secretariat of UNESCO on how to bring together the expertise from national research institutes, universities and ministries. Furthermore, guidance was given on how to contribute to the current programmes and initiatives of IHP VII and how the Serbian research community could bring in their expertise in the design of the upcoming IHP VIII. It has to be noted that the current chair of the Serbian National Commission for UNESCO has been elected by region II to represent the region at the governing board of the IHP programme which is the IHP bureau. In this function Prof Despotovic acts also as a Vice – Chair of the Intergovernmental Council. The programme of the visit was very dense and the above mentioned institutions were visited.

Monday 26 July - Meeting at the Rectorate of Belgrade University

Present: Vice Rector Prof. Marko Ivetic - MI, Prof. Siegfried Demuth - SD, Dr. Biljana Radojevic - BR, and the Chair of the Serbian Committee of IHP (NatCom), Prof. Jovan

Despotovic – JD; the Vice Rector Prof Marko Ivetic is a member and Vice President of the Serbian Committee of IHP.

The Vice Rector Prof. Ivetic reported about the experience and potential of the University for Education at international level, at graduate, postgraduate and doctoral studies, and also e – learning at the University of Belgrade. The University has again started to receive foreign students e.g. from Libya, Syria and other countries. The University is interested in cooperating through the NatCom to the science programmes of IHP and is willing to strengthen their activities in education and research, not only in the country but also in the region and internationally. A restructuring and strengthening of the National Commission of Serbia for UNESCO was discussed and it was found that a first step would be to identify potential institutions in the country that would be willing to contribute financially and scientifically. The National Commission has to develop a vision for the future including the expertise in the water sector of the country. In the first place, it has to identify tasks which are linked to the IHP VII phase in general and specifically identify national water programmes which can directly contribute to the specific programmes of IHP VII. The current International Research & Training Centre on Urban Drainage (IRTCUD) has to be revitalised and restructured and the potential for the creation of a new chair at the University in close cooperation with the Institute Jaroslav Cerni was subject of discussion. A strong interest of the university in helping to shape the new IHP phase was expressed by the Vice-Rector and the Chair of the NatCom.

Monday 26 July - Meeting at the Republic Directorate for Water of the Ministry of Agriculture, Forestry and Water Management, Bulevar metnosti str. 2, Belgrade.

Present: Director Mr. Aleksandar Prodanovic, Prof. Siegfried Demuth - SD, Dr. Biljana Radojevic - BR, Prof. Jovan Despotovic – JD, Dr. Milan Dimkic – MD.

The Director Mr Prodanovic gave a short introduction to the organisation of the water sector in Serbia, the number of ministries, institutions and their responsibilities. He expressed his support for the National Commission of Serbia for UNESCO especially to the IHP programmes. He stressed that for his institution it is very important to contribute with concrete actions and projects to the IHP programmes. He is also willing to support the initiative of the NatCom to establish a chair in water which would be an asset for his institute. Furthermore he stressed the need to recover IRTCUD in order to strengthen the Serbian National Commission of Serbia for UNESCO.

Monday 26 July - Meeting at the Ministry of Science and Development, Government of Serbia, Nemanjina Str. 10, Belgrade.

Present: Chief of Cabinet Mr Vuk Dapcevic - VD, Prof. Siegfried Demuth - SD, Dr. Biljana Radojevic - BR, Prof. Jovan Despotovic – JD, Dr. Milan Dimkic – MD.

The Chief of Cabinet Mr Dapcevic reported about the Danube initiative and the discussion focused on how to link this initiative with the International Flood Initiative (IFI) and the International Sediment Initiative (ISI). Mr Dapcevic expressed his willingness to bring to the attention of the minister the need to have strong support for the Serbian National Commission and underlined the necessity for close cooperation between the institutes in Serbia.

Monday 26 July - Meeting at the Serbian Academy of Science and Arts – SANU, Kney Mihajlova Str. 29, Belgrade.

Present: Academicians Prof. Lj. Rakic - LJR, Prof. Miljanic - MM, Prof. Siegfried Demuth - SD, Dr. Biljana Radojevic - BR, Prof. Jovan Despotovic – JD, Prof. Milan Dimkic – MD.

Prof. Rakic expressed the support of the Serbian Academy of Science and Arts for the National Commission and indicated that they would especially strongly support the activities related to water sciences. He also thanked UNESCO's Division for Water Sciences for its financial support to the Milankovic Symposium held in Belgrade in 2009.

Thursday 27 July – Meeting at the Institute for Water Resources Development, Jaroslav Cerni, Belgrade.

Present: Director of the Institute Prof Milan Dimkic – MD, Prof. Siegfried Demuth – SD; Dr. Biljana Radojevic – BR, Prof. Jovan Despotovic – JD, Prof. Miljanic – MM and staff members from the Institute.

The director introduced the facilities and the research programmes of the institute and highlighted some of the project priorities such as groundwater and Belgrade waste water treatment structures, also in different parts of the country, including numerous water supply projects. There is a high demand in the country for engineers, currently 1392 engineers are working in municipalities, but the capacity is not enough to match the funding site, therefore there is a need for higher education at the university level. The current capacity of the different faculties in the country is 100 academics per year, but the need is 200 to 300 e.g. in water law there is a special need also in a shift in priorities within the curricula of the engineering faculties. The institute is involved in several projects of the EU especially a project on groundwater. Several staff members of the institute reported about ongoing research projects such as sediment monitoring and transport of the river Danube, which is part of the international SedNet Initiative. This project can be used as one case study for the International Sediment Initiative of the IHP programme. The data on suspended loads can be implemented into the Sediment Data Base of the International Research and Training Center on Erosion and Sedimentation (IRTCES) in Peking, China.

Wednesday 28 July - Meeting at the Faculty of Civil Engineering, Institute for Hydraulic and Environmental Engineering.

Present: Prof. Siegfried Demuth (UNESCO IHP), Dr. Biljana Radojevic (UNESCO IHP), Prof. Marko Ivetic (University of Belgrade), Prof. Jovan Despotovic (IHP Serbia, Faculty of Civil Engineering), Prof. Dejan Ljubisavljevic (Faculty of Civil Engineering), Dr. Jasna Plavsic (Faculty of Civil Engineering), Dr. Milos Stanic (Faculty of Civil Engineering), Dr. Nenad Jacimovic (Faculty of Civil Engineering), Dr. Zorana Naunovic (Faculty of Civil Engineering), Dr. Milan Dimkic (Institute for Water Resources Development Jaroslav Cerni), Dr. Marina Babic Mladenovic (Institute for Water Resources Development Jaroslav Cerni), Mr. Milan Trickovic (Institute for Water Resources Development Jaroslav Cerni), Ms. Ljiljana Jankovic (Faculty of Civil Engineering).

The agenda for the meeting included:

- Meeting with the Dean, Prof. Djordje Vuksanovic (Dean's Office)
- Visit to the Center for Doctoral Studies
- Visit to the Institute for Hydraulic and Environmental Engineering
- Background on the Faculty of Civil Engineering and Institute for Hydraulic and Environmental Engineering (Dr Jasna Plavsic)
- 3Dnet model: Hydroinformatic tool for water resources management

  (Dr Milos Stanic)
- Educate! – Postgraduate course in Water Resources and Environmental Management (Dr Zorana Naunovic)
- Pilot River Basin Plan for the Sava River, CARDS Regional Sava Programme, Risks in EU WFD implementation projects

  (Dr Jovan Despotovic)
- Discussion on the role of the Faculty of Civil Engineering in the National Commission for IHP
- Discussion on international doctoral study programs

Prof. Djordje Vuksanovic, Dean of the Faculty welcomed the guest from the UNESCO IHP and presented the scientific capacities of the Faculty of Civil Engineering, University of Belgrade and the Institute for Hydraulic and Environmental Engineering and laid emphasis on international doctoral study programs.

Dr. Jasna Plavsic presented the Faculty and the Institute through academic studies and research activities. Academic studies were presented with study programs, curricula, and current PhD thesis under preparation, laboratory facilities, and others. Research activities include involvement in scientific project financed by the Ministry of Science and

Technological Development, participation in IHP VI programme – focal area 3.5, activities of the UNESCO II category centre IRTCUD, cooperation with Kyoto University in Japan, COST, international project, cooperation with industry and others.

Dr. Milos Stanic presented a contribution in the UNESCO IHP VI programme, particularly in Focal Area 3.5 with the following projects:

- Data requirements for integrated urban water management and
- UGROW (UrbanGROroundWater) – An advanced modelling tool for the transient simulation and management of urban groundwater systems.

As a result of the above projects several books have been published.

Dr. Nenad Jacimovic presented long term cooperation with the Kyoto University in Japan, specifically in the area of Numerical modelling of environmental hydraulics:

- Modeling of hydrodynamics and water quality in lakes and reservoirs
- Application of advanced technologies for lake revitalization
- Aquifer restoration technologies

Dr. Zorana Naunovic presented an International Post graduate Programme in Water Resources and Environmental Management – EDUCATE. The project partners involved in the project are the following:

- National Technical University of Athens, Greece – School of Civil Engineering and School of Chemical Engineering
- University of Ljubljana, Faculty of Civil and Geodetic Engineering, Slovenia
- Technical University of Civil Engineering Bucharest, Romania
- University of Belgrade, Faculty of Civil Engineering, Serbia
- IRTCUD, Serbia

The postgraduate course in Water Resources and Environmental Management is a flexible, distance learning programme based on both – e-learning and traditional way of lecturing. The students gather at their host university several times during the course: introductory week at the beginning of the course, examination for each thematic area, at a half of the course for definition of thesis and at the end of the course for presentation of thesis. Lectures and tutorials are developed in English. Duration of the course is two calendar years.

The course programme is organized as a pedagogic continuum and consists of four thematic areas:

- Thematic Area 1 presents introduction of the course and is focused on scientific background in water resources and ecology
- Thematic Area 2 targeted on integrative concepts of urban water management, including water supply and storm and waste waters
- Thematic Area 3 includes issues of catchment and environmental management by utilizing hydro-informatics tools, including distributed hydrologic models, advanced optimization and geo-statistics
- Thematic Area 4 focuses on policy, legislation, decision-making and environmental assessment with an emphasis on the Water Framework Directive (WFD), as well as on other advanced topics

A research thesis comes as a follow up of the thematic areas.

Prof. Jovan Despotovic presented some of the projects financed by international and national authorities regarding water resources management, as follows:

- Pilot River Basin Plan for the Sava River
- Risks in implementation of EU WFD in Serbia
- Belgrade Blue Regulative
- Technical assistance in the preparation and implementation of the Sava River Basin Management Plan

Prof. J. Despotovic briefed the audience that research and methods for an analysis of the risk of traffic - motor and pedestrian, during floods in urban conditions should also be a topic after frequently floods during recent years in the region. Within this framework, an international conference on Regional Rainfall is scheduled for November 2010.

Prof. J. Despotovic also provided information on the Serbian Committee for IHP UNESCO, as a focal point for future cooperation and presented its composition. He drew conclusions from the discussions with the Directorate for Water and Ministry for Science and Development and Commented on the IRTCUD Centre and other activities and Programs/Projects in progress in the Balkan area.

Main Results:

- The meetings brought to the attention of the parties involved the importance of a well functioning National Commission and a strong national IHP committee.
- There was also a general agreement that both the National Commission and the national IHP Committee need strong political and financial support from the government. Support has already been confirmed by the Chief of Cabinet Mr Vuk Dapcevic, Ministry of Science and Development, Government of Serbia, and Mr. A. Prodanovic from the Directorate for Water
- The National Commission should help in strengthening the water sector and institutions responsible in regard to speed up its development
- It was agreed that the National Commission needs to come up with a strategy on how to include the relevant institutes in the National Commission and take advantage of the expertise of the various institutions in the country.
- There is a need to strengthen education on water and environmental engineering to meet the challenges the country faces.
- It was decided that the National Commission will provide a proposal for a UNESCO Chair which serves education and helps the country to provide input to the International Hydrological Programme (IHP).
- Several research programmes carried out by the Faculty of Civil Engineering, Institute for Hydraulic and Environmental Engineering, University of Belgrade and the Institute for Water Resources Development, Jaroslav Cerni have been identified as contribution to UNESCO's IHP and links will be established in the near future.
- There is a need to raise awareness for UNESCO's programmes in the country.
- There is a willingness to contribute to the design of the next phase of IHP.
- The Serbian National Commission intends to play an active role in the governing bodies of IHP and will consult with the region II countries on how to better coordinate their contributions to the IHP programme.
- The Faculty of Civil Engineering, Institute for Hydraulic and Environmental Engineering, University of Belgrade will continue to host the National Commission and the IHP committee.
- The Serbian Academy of Science will give strong intellectual support to the National Commission and the IHP Committee.

Follow up:

The Serbian National Commission will come up with a proposal on a water chair and concept on how to improve the national and international cooperation with UNESCO's IHP.

Attachments:

Invitation letter

Agendas for the different meetings

Prof. Dr. Siegfried Demuth

Chief of the Section of the Hydrological Processes and Climate

UNESCO Division of Water Sciences

1 Rue Miollis, 75 015 Paris

France

Belgrade, 5 June 2010

Dear Prof. Demuth,

The Serbian National Commission for UNESCO has the honour to invite you officially in Belgrade for a visit from 19 to 24 July 2010. We would like you to help the Serbian National IHP Committee to step into the current phase of IHP in the shortest time frame. We would like to discuss with you together how Serbian hydrology and water resources in general can successfully give the contribution to the next, eight phase of IHP.

Particularly, we would like to share your valuable experience as a Head of the German IHP National Committee and to get your advice how Serbia could follow the German model in the best way.

The Serbian National IHP Committee of the Serbian Commission for UNESCO will cover your travel and stay costs in Belgrade.

We look forward to working with you in Belgrade.

Yours sincerely,

Prof. Jovan Despotovic,

President of the Serbian National IHP Committee

Jassna Zrnovic

Записник са састанка Комитета за сарадњу са Међународним хидролошким програмом (IHP – International Hydrological Programme)

место: Грађевински факултет Универзитета у Београду

датум: 26. октобар 2010**.**

Присутни: Триво Инђић (председник Комисије за сарадњу са УНЕСКО-ом), Јасна Зрновић (генерални секретар Комисије), Јован Деспотовић (Грађевински факултет БУ), Нада Лазић (Воде Војводине), Никола Марјановић (Србијаводе), Михајло Гаврић (ЕПС), Славимир Стевановић (Републички хидрометеоролошки завод), Милан Димкић (Институт Јарослав Черни), Јасна Плавшић (Грађевински факултет), Љиљана Јанковић (Грађевински факултет).

Дневни ред:

1. Преглед активности у периоду од претходног састанка.
2. Извештај са учешћа на 19. састанку Савета IHP UNESCO-a у Паризу од 4. до 10. јула 2010.г.
3. Извештај Prof. Siegfrieda Demuth-a из Београда о боравку на позив Националног комитета
4. Конференције / састанци на које су позвани чланови Националног комитета
5. Предвиђени семинари и конференције
6. Учешће Националног комитета у међународним пројектима и у програмима IHP VII i IHP VIII
7. Оснивање Научног комитета при Националном комитету
8. Разно

Главне тачке дискусије:

1. Представљен је Завршни извештај са 19. састанка Савета IHP UNESCO-a који је одржан од 4. до 10. у Паризу.

   Усвојени су наративни и финансијски извештаји Проф. Деспотовића са учешћа на 19. састанку Савета IHP UNESCO. Проф. Деспотовић је дао кратак извештај о свом учешћу на Савету. У оквиру Бироа изабрани су следећи чланови:

   - Група I (Северна Америка и Западна Европа): г-дин Matthew Carl Larsen
   - Група II (Источна и Централна Европа): г-дин Јован Деспотовић
   - Група III (Јужна Америка и Кариби): г-дин Polioptro F. Martinez Austria
   - Група Va (Африка): г-дин Juma Chrispine Omondi

   Наративни извештај са састанка, као и финансијски извештај, су достављени Делегацији Србије при UNESCO-у и Комисији за сарадњу са UNESCO-ом.

У оквиру припрема за учешће на Савету обављени су бројни разговори са члановима Делегације Србије при UNESCO-у, члановима IHP UNESCO (проф. Siegfried Demuth, проф. Shahbaz Khan, др Биљана Радојевић).

Истакнуто је историјско ангажовање стручњака из Србије у UNESCO-у, као и велика подршка Марије Антонијевић и др Биљане Радојевић за избор проф. Деспотовића у Савет.

2. Представљен је извештај Prof. Siegfrieda Demuth-a о боравку у Београду у јулу 2010. године. Истакнуте су две иницијативе покренуте том приликом:

   - Интезивирање активности центра друге категорије IRTCUD (International Research and Training Centre for Urban Drainage) чије се седиште налази на Грађевинском факултету.
   - Формирање Катедре за последипломске наставе на нивоу универзитета, укључујући и институте (Chair). Прелиминаран садржај предлога за формирање Катедре је припремљен.

   Др. Милан Димкић је затражио подршку за оснивање друге катедре којој би Институт Ј. Черни био председавајући, као и оснивање Центра за истраживање и менаџмент под покровитељством UNESCO-а чије би седиште било у Институту Јарослав Черни.

   Из дискусије која је уследила издваја се следеће:

   - С обзиром да IRTCUD већ постоји и да капацитети наше земље нису велики, логично је да постоји један јак центар у коме би активно учествовале све релевантне институције у земљи.
   - Формирање Катедре за последипломску наставу је искључиво везано за Универзитет који мора бити носилац наставе
   - Госпођа Јасна Зрновић је изнела тренутне активности UNESCO-а и тенденције у вези центара прве и друге категорије. Генерална тенденција је да се смањује број центара и да се пажљиво прати рад свих центара. Једна од тема којом ће се бавити наредна седница која ће се одржати у Венецији 20. новембра јесу управо центри прве и друге категорије и оцена њиховог рада.
   - Одлучено је да се да подршка интезивирању активности у циљу јачања IRTCUD, да се ради на формирању једне Катедре за последипломску наставу и да се подржи предлог за формирање Центра за истраживање.

   Проф. Demuth је истакао своје гледиште да је потребна помоћ како би се успоставила добра сарадња са суседним земљама.

3. За састанак у Загребу - 24. радни састанак Подунавских земаља IHP UNESCO предложени су и подржани следећи учесници: Проф. Ј. Деспотовић, др Марина Бабић Младеновић, проф. Стеван Прохаска, Тиослав Петковић, док ће Др. Никола Марјановић проверити могућност да присуствује састанку. Предложено је да састанку присуствују и представници из „Вода Војводине" и Републичког хидрометеоролошког завода. Институт „Ј. Черни" ће платити трошкове путовања др. Бабић Младеновић и проф. Прохаске.

   За састанак Савета који ће се одржати у марту или априлу у Паризу 2011. године треба дефинисати теме до децембра 2010.

4. Најављене су следеће конференције и семинари ради истицања подршке:
    - Regional Rainfall 2010, od 3-5. novembra 2010.
    - Dan voda, 22. mart 2011.
    - IWA Groundwater 2011.
    - UDM – Urban Drainage Modelling 2012.

    Дата је генерална подршка наведеним догађајима. Конкретна подршка за сваки догађај ће се засебно разматрати.

5. Учешће Националног комитета у међународним пројектима и у програмима IHP
    - У претходно обављеним разговорима са Philippe Pyraert – ом пренесена је жеља за укључивањем Србије у пројекат који се бави карстом. Очекује се одговор од г-дина Pyraert-a.
    - Г-дин Слава Стевановић је пренео информацију о предлогу пројекта из Грчке у вези карста. Проследиће детаљније информације.
    - Проф. Siegfried Demuthu је послат предлог да пројекат под насловом Прорачун великих вода у Србији, као пример (case study), буде пријављен у оквиру IHP Projekta IFI - International Flood Initiative.
    - Предлоге пројеката за следећу фазу IHP VIII која је предвиђена за период 2013 - 2018. треба најкасније доставити до фебруара 2011. г. како би предлози били разматрани на састанку Бироа, који ће бити у марту или априлу 2011. године.
    - Истакнуто је да је препрека за успостављање активности, радова и формирање пројеката како би се равномерније „покрила" цела Србија чињеница да се стручњаци из хидротехнике углавном налазе у највећим градовима, а да велики број општина има сасвим мали број стручних особа; у великом броју општина нема ни једне стручне особе.
    - У складу са претходним, и другим аспектима, предложено је да се припреми предлог пројекта који би се бавио институционалним положајем вода у Србији
    - Др. Димкић је дао информацију о припреми Плана управљања водама који треба да буде завршен до 2012. године

6. Формиран је Научни комитет при Националном комитету за сарадњу са Међународним хидролошким програмом. Договорено је да чланови Научног комитета морају имати звање магистра наука или више. Предложени су следећи чланови Научног комитета:
    - Јасна Плавшић (Грађевински факултет, Универзитет у Београду),
    - Слободанка Благојевић (Грађевинско-архитектонски факултет, Ниш),
    - Марина Бабић Младеновић (Институт „Јарослав Черни"),
    - Проф. Станимир Костандинов (Шумарски факултет, Београд),
    - Ивана Иванчев Тумбас (Природно математички факултет, Универзитет у Новом Саду).

Договорено је да Републички хидрометеоролошки завод предложи једног члана из својих редова.

7. Неколико тема је разматрано под темом "Разно"

- Финансирање Комитета за сарадњу са IHP

  Појединим институцијама је достављено писмо са молбом за финансијску подршку Комитету. Истакнуто је да ће сви трошкови Комитета бити транспарентни.

  Председник Комисије за сарадњу са UNESCO-ом, господин Триво Инђић је истакао да је буџет Комисије изузетно мали и да су мале шансе да Комисија учествује у финансирању рада Комитета. Ипак, Комисија ће размотрити могућност да се у буџет за наредну годину укључе и поједини трошкови Комитета.

  Договорено је да се члановима Комитета достави прелиминарни план активности и потреба, и предрачун трошкова за наредну годину.

- Дата је информација о конкурсу IHP UNESCO-a, под насловом: „The Vacancy Announcement for the post of Chief Technical Advisor (UN-Water)"

- Проф. Деспотовић је дао информацију о реализацији пројекта „Sava River Basin Management Plan" чија је реализација у току. Овај пројекат је битан за нашу земљу јер ће резултати пројекта бити обавезујући. Од свих аспеката који се разматрају за Србију је посебно битан аспекат квалитета воде у реци Сави, поред пловидбе и заштите од поплава. Реализација пројекта није најбоља и постоји забринутост да резултати неће бити у складу са очекиваним.

- Почеле су припреме интернет стране Комитета за сарадњу IHP. Комисије за сарадњу са UNESCO - ом мора да одобри интернет страну пре пуштања у рад.

- Све активности чланова Комитета за сарадњу са IHP морају бити координиране преко Комитета, било на националнином или међународном нивоу. Комитет за сарадњу са IHP једини има ингеренције за контакт са Комисијом за сарадњу са UNESCO-ом, а Комисија даље за контакт са осталим UNESCO-вим организацијама.

Записник саставила Љиљана Јанковић

World Water Day

22nd March 2012

Serbian National Committee for UNESCO IHP organized celebration of the UNESCO World Water Day 2012 together with the University of Belgrade, in two locations – at the Rectorate of the University of Belgrade and at the Faculty of Civil Engineering, University of Belgrade.

Celebration of the World Water Day at the Rectorate of the University of Belgrade started at 11 A.M. Guests from the Commission for Cooperation with UNESCO, Ministry of Foreign Affairs, Republic of Serbia, Srbijavode, Directorate for Water, Ministry of Agriculture, Trade, Forestry and Water Management, The Jaroslav Černi Institute for the Development of Water Resources, Faculty of Civil Engineering University of Belgrade, Faculty of Civil Engineering and Architecture, University of Nis, students from the Faculty of Civil Engineering University of Belgrade, water professionals from various institutions, and others. The meeting was addressed by Vice-Rector of the University of Belgrade, Prof. Marko Ivetić, Director of the Black See University Network Prof. Eden Mamut, member of the Russian National Committee for IHP UNESCO, Dr Elena Ostrovskaya, Chair of the Serbian National Committee for UNESCO IHP, Prof. Jovan Despotović and professor from the University of Exeter, Prof. Dragan Savić. Central event of the celebration was lecture given by Prof. Dragan Savić with title "Global Water Security: Should we be worried?".

Celebration of the World Water Day was organized by Serbian National Committee for IHP UNESCO at 3 P.M. on the same day at the Faculty of Civil Engineering, University of Belgrade. The meeting gathered guests from abroad, Prof. Eden Mamut and Dr Elena Ostrovskaya, Vice-Rector of the University of Belgrade, Prof. Marko Ivetić, representatives from Srbijavode, Directorate for Water, Ministry of Agriculture, Trade, Forestry and Water Management, International Sava Commission, Dr. Dejan Komatina, Serbian Chambers of Engineers, Prof. Dragoslav Sumarac, Faculty of Civil Engineering University of Belgrade, Faculty of Civil Engineering and Architecture, University of Nis, students from the Faculty of Civil Engineering University of Belgrade, water professionals from various institutions,, for example Republic Hydrometeorological Service, Belgrade Waterworks, Electro Power Industry of Serbia, and others. Presentations were given by Prof. Marko Ivetic, Prof. Eden Mamut, Dr Elena Ostrovskaya, Dr. Dejan Komatina, Prof. Dragoslav Šumarac and Prof. Jovan Despotović.

Central theme of this year celebration of the World Water Day was "Water and Food Security". Message from Mr. Irina Bokova, director general of UNESCO, asking for common action in order to ensure water for drinking and food for every inhabitant was read at the meeting. Providing water and food is great challenge since that currently 7 billions of people live on the Earth and additional 2 billions will live on the Earth in next forty years. Needs for food are great and it is assumed that needs for food are about 70 % greater, especially in developing countries. Intensive food production would cause

significant increase in water consumption in agriculture. Inclusion of all participants is necessary in order to ensure water and food for all inhabitants, as well as implementation of certain technologies and directions that promote equal rights in terms of water and a stronger legal capacities.

Celebration of the World Water Day was an opportunity to promote UNESCO Chair in Water for Ecologically Sustainable Development. The Chair aims at strengthening cooperation in the Balkan region and Central Asia in water sector and ecology through more intensive research and education, organization of workshops, meeting and conferences, improvement of legal capacities, and others. Programme will be implemented through postgraduate study, courses, research programmes, exchange of lecturers, institutional strenghtening aiming at development of training tools knowledge exchange.

ИЗВЕШТАЈ СА 46. САСТАНКА МЕЂУВЛАДИНОГ БИРОА МХП УНЕСКО-А

који је одржан у Паризу од 30. маја до 3. јуна 2011. г. у просторијама УНЕСКО-а, у улици Миолис 1.

Садржај састанака:

1. Прихватање дневног реда за састанак.
2. Извештај са 185. и 186. састанка Извршног Бироа УНЕСКО-а.
3. Извештај о примени резолуција и других препорука усвојених на 19. састанку Међувладиног Бироа МХП УНЕСКО-а у јулу 2010. г.
4. Извештај о сарадњи МХП и Института МХЕ.
5. Предлог за успостављање центара 2. категорије.
6. Извештај о раду центара 2. категорије;

   У фази припреме је извештај о раду Међународног центра за истраживања и едукацију у области градских вода са садиштем на Грађевинском факултету у Београду – IRTCUD.
7. Извештај о примени Фазе VII МХП од 19. састанка Савета.
8. Активности МХП на бази ванбуџетских средстава.
9. Извештај Финансијског комитета МХП.
10. Извештај о напретку у Комитету МХП за публикације и комуникације у УНЕСКО-у.
11. Извештај о кооперацији са другим програмима УНЕСКО-а.
12. Извештај о евалуацији Фазе VI МХП УНЕСКО-а.
13. Новије иницијативе МХП УНЕСКО-а.
14. Извештај о формулацији програма Фазе VIII МХП за период 2014 – 1019.
15. Сарадња са системом УН и другим организацијама
16. Сарадња МХП УНЕСКО-а и УН Програма sa оцену вода у свету (WWAP)
17. Припреме за учешће МХП УНЕСКО-а у раду 6. Светског форума за воде.

Закључци су у Секретаријату МХП УНЕСКО-а у фази финализације, и биће достављени накнадно.

За Србију су од највећег значаја следећи закључци:

- Предлог Комисије за УНЕСКО Републике Србије за оснивање Центра 2. категорије у Институту „J. Черни" је подржан.
- Основне теме које су предложене за Фазу VIII МХП УНЕСКО-а су следеће:
  - Обезбеђеност (од) вода, укључујући аспекте поплава, суша, прекомерног захватања и друго, уз анализе ризика и др. / Water security, incl. Aspects of risks.

- Квалитет вода / Water quality aspects,
- Аспекти, ефекти и могућности за адаптацију на промену климе / Climate change aspects, effects and attenuation of those
- У оквиру Интегралног управљања водама аспекти подземних вода / Ground water within IWRM

2. Састанци са члановима Бироа и у секретаријату МХП УНЕСКО-а:
    a. Са председником Бироа проф. Сонтак Лијем је договорена израда заједничког пројекта националних комитета Кореје и Србије за обнову и ренатурализацију изабраног сливног подручја у Србији. Такође и подршка оснивању Катедре зе интегрално управљање водама на Универзитету у Београду.
    b. Са члановима Секретаријата су договорени задаци за Национални комитет за МХП како би се Србија укључила у програме HELP, активније у FRIEND и друге.
    c. Договорено је да се наслов предложене Катедре Универзитета у Београду са седиштем на Грађевинском факултету промени у ***„Интегрално управљање водним ресурсима"***, у складу са једним од најпознатијих и најуспешнијих програма МХП УНЕСКО-а. Примедба је прихваћена и наслов је преформулисан; у прилогу.

Извештај поднео

Проф. Јован Деспотовић

Члан Комисије за УНЕСКО

Председник Националног комитета за сарадњу са МХП УНЕСКО-а

Потпредседник Бироа Међувладиног Савета МХП УНЕСКО-а

Националном Комитету за сарадњу са МХП УНЕСКО-а

Комисији за УНЕСКО Републике Србије

Грађевински факултет у Београду

Рачуноводство

Предмет: ИЗВЕШТАЈ СА ПУТА НА СКУПШТИНУ УНЕСКО-А 31.10.-3.11.2011.г.

Поштовани,

На позив Председника Бироа МХП УНЕСКО-а и Секретара МХП УНЕСКО-а у Паризу, боравио сам на Скупштини УНЕСКО-а од 31. октобра до 03. новембра 2011.г.

1. На аеродром сам пошао у 15h.
2. На пут сам пошао 31. октобра у 15h, а границу сам прешао око 17:30.
3. Боравио сам у хотелу Аберхотел, 3 ноћења.
3. На путу сам био до 03.11 2011.г.
4. У повратку сам пошао у 15h из Париза, границу прешао око 22h.

Авионску карту је преко рачуна платио Грађевински факултет.

Трошкови: Хотел – 297 ЕВРА + такси за аеродром – 250 динара, метро у Паризу до аеродрома – 9 ЕВРА. + дневнице за 4 дана.

С поштовањем,

Проф. Ј. Деспотовић

05. новембра 2011. г, у Београду

У копији: Делегацији Републике Србије у УНЕСКО-у, у Паризу

Грађевински факултет у Београду

Рачуноводство

Предмет: ИЗВЕШТАЈ СА ПУТА У СЛОВЕНИЈУ ОД 03 - 04. 01. 2012. г.

Поштовани,

У Марибору (03) и у Љубљани (04. 01. 2012) на позив председника Комитета за сарадњу са МХП УНЕСКО-а из Словеније – Проф. Митје Брилија, и Директора Института за еколошки инжењеринг из Марибора Др. Уроша Крајнца и Мр. Жељка Блажека, обавио сам разговоре о њиховом учешћу у раду и организацији Катедре за одрживо еколошко управљање водним ресурсима која је додељена Универзитету у Београду под покровитељством УНЕСКО-а, са седиштем на Грађевинском факултету

Преглед поласка и одласка из Београда следе.

1. На аеродром сам пошао 03. јануара 2012. г. у 12 часова.
2. Полазак авиона је у 14:45 , а границу сам прешао око 15 часова.
3. Боравио сам у хотелу Табор у Марибору – рачун је у прилогу.
4. Превезен сам из Марибора у Љубљану 04. јануара у 10 часова.
5. У повратку сам пошао у 16 часова из Љубљане, границу прешао око 16:10 h
6. У повратку са аеродрома Никола Тесла платио минибус 250 динара.

Трошкови: Хотел – 46 ЕВРА + такси од аеродрома – 250 динара + дневнице за 2 дана.

С поштовањем,

Проф. Ј. Деспотовић, Београд 05. јануар 2012. г.

Теме за састанак са Председником Комисије за УНЕСКО Г. Тривом Инђићем који је одржан 23. маја 2011. г.

1. Катедра УНЕСКО-а под насловом ***Еколошки одрживо и интегрално управљање у сектору вода*** (UNESCO Chair in Water for Ecologically Sustainable Integrated Development) на Универзитету у Београду - Грађевинском факултету у Београду са партнерима из региона, Европе и Азије.

   До данас – 23. маја 2011.г. Секретаријат није прецизно и таксативно доставио услове, рокове, потребне кораке, нити упутства за подношење предлога, и поред поновљених питања, електронских порука и захтева.

2. Центар УНЕСКО-а под насловом ***Регионални центар за истраживања воде, управљање и глобалне промене*** (Regional Centre on Water Research, Management and Global Change - Belgrade, Serbia).

   Кандидатура је заобишла Делегацију у Паризу и барем да информише Председника Комитета. Било је много неспоразума. Зашто је процедура ишла тако кад је обећана сва подршка ?

   У сваком случају не може се допустити формална настава – едукација, која у сваком случају мора да буде у складу са Законом о високом образовању у свим државама - као што је речено на Бироу јула 2010.г. за сличан предлог из Холандије (IHE UNESCO), који је наведен као партнер овог центра, шта је и записано у Резолуцијама са састанка. Бојим се да се могу јавити проблеми.

3. Програм партиципације са суседним земљама на истоку под насловом **–**

   Путеви којима се ређе иде од Ђердапа до Дорјана

   Вођени су разговори са делегацијама Румуније, Македоније и Бугарске током Конференције у Констанци од о потреби успостављања сарадње у пограничном појасу суседних земаља на овом делу Балкана.

   Молим да се организује састанак са Г. Министром В. Јеремићем ради подршке - тачке 1, 2 и 3.

4. У сектору вода – водопривреди Републике Србије ситуација је све гора.

   Молим да се организује састанак са Г. Председником Б. Тадићем.

   Ј. Деспотовић, 22. мај 2011.г.

У копији: Делегацији Републике Србије у УНЕСКО-у, у Паризу

Националном Комитету за сарадњу са МХП УНЕСКО-а

Комисији за УНЕСКО Републике Србије

Грађевински факултет

Рачуноводство

ПРЕДМЕТ: Извештај са пута у Букурешт поводом иницијативе за оснивање истраживачког центра под именом Река Дунав – Делта Дунава - Црно море (The Danube - Danube Delta – Black Sea) на састанак експерата са дунавског слива од 18. до 20. 9. 2011.

Поштовани,

Као председник Националног комитета за међународни хидролошки програм и представник групе земаља центерлнае Еворпе, ценралне Азије и балканских земаља и помоћник Председавајућег у Међувладином бироу Међународног комитета за хидролошки програм УНЕСКО-а (IHP UNESCO) позван сам да присуствујем састанку о концепту и садржају рада истраживачког центра на Црном мору, у Констанци.

Материјали за упознавање са идејом и припрему дискусије о иницираном Центру стигли су раније и припремљена је дискусија, као и низ питања и сугестија.

На пут сам пошао из Београда дана 18.9.2011. г. ујутру у 4, а прешао мађарску границу око 6:30 пошто је пут авионом за Букурешт преко Минхена у Немачкој.

Повратак из Будимпеште је био дана 20.9.2011 г. око 23:30, а границу прешао око 23.

Трошкове пута и смештаја је платио организатор, мрежа универзитета на сливу Црног мора (BSUN).

Рачун за такси у одласку на аеродром Никола Тесла је у прилогу у износу од 1595 динара.

Посебан је извештај о садржају састанака и плановима за заједнички едукативни и истраживачки рад са прилозима који су изложени на састанку у Букурешту.

Подносилац извештаја

Проф. Ј. Деспотовић,дипл.грађ.инж.

20. 6. 2011.г , у Београду

У копији: Делегацији Републике Србије у УНЕСКО-у, у Паризу

NATIONAL REPORT OF THE SLOVAK REPUBLIC

ON IHP RELATED ACTIVITIES

1. ACTIVITIES UNDERTAKEN IN THE PERIOD JUNE 2010 – MAY 2012

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 were only several changes in the composition of the IHP National Committee during the period due to retirements. The Plenum consists of 20 members and 8 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

Plenum:
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
PASTIRČÁK Vladimír, Slovak Hydrometeorological Institute, Bratislava
PEKÁROVÁ Pavla, Institute of Hydrology, Slovak Academy of Sciences, Bratislava
POÓROVÁ Jana, Slovak Hydrometeorological Institute, Bratislava
RONČÁK Peter, Slovak Hydrometeorological Institute, Bratislava
ŠOLTÉSZ Andrej, Slovak University of Technology, 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 representative Dr. Holko serves as the international coordinator of Euro-mediterranean Network of Experimental and Reference Basins (ERB) since September 2008 (CCCP FRIEND).

The Slovak representative Dr. Fendeková was the international coordinator of EUROFRIEND Working group 2 *Low flows and droughts* (CCCP FRIEND) till October 2010.

The 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).

The Slovak NC organised two international meetings:

Workshop and meeting of the working group on *Flood Regimes of the Rivers in the Danube Basin* was organised on 24 November 2010 in Zagreb, Croatia.

Workshop and meeting of the working group on *Flood Regimes of the Rivers in the Danube Basin* was organised on 16 June 2011 in Budapest, Hungary.

The Slovak NC participated in organisation of the following international conferences:

7th Czech-Slovak Hydrological Days 2010 on Water in a Changing Environment, Hradec Králové, Czechia, 25-27 October 2010.

ERB conference 2010, Hydrological Responses of Small Basins to a Changing Environment, Seggau, Austria, September 5-8, 2010.

25th 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.) Budapest, Hungary, June 16-17, 2011.

ERB conference 2012, Studies of Hydrological Processes in Research Basins: Current Challenges and Prospects, St.Petersburg, Russia, September 17-20, 2012.

1.2 Activities at national level in the framework of the IHP

1.2.1 National/local scientific and technical meetings

The 22nd Conference of Young Slovak and Czech Hydrologists was organised in on 10 November 2010 in Bratislava and the conference proceedings were published. Following three papers were awarded:

- Boris Bodácz, Michaela Stojkovová, Andrea Šabíková, Denisa Lehotová (Slovakia) – Assessment of the karstic-fractured water quality of the Plešivec Plateau
- Jiří Sázel (Czechia) - Is it possible to forecast the stream discharge using only the historic measurements?
- Věra Váňová (Czechia) – Modelling of the land cover change impact on floods in the upper Lužnice basin.

The 23rd Conference of Young Slovak and Czech Hydrologists was organised on 9 November 2011 in Bratislava and the conference proceedings were published. Following three papers were awarded:

- Václav Královec (Czechia) – Methods of evaluation of different land cover impact on runoff processes in headwaters
- Antonín Malý (Czechia) – Recent possibilities of the deterministic modelling to determine the T-year discharge on small ungauged basins in the CHMI practice
- Tatiana Pindjaková (Slovakia) – The influence of the flood wave in the surface stream on groundwater regime.

1.2.2 Participation in IHP Steering Committees/Working Groups

Representative of the NC took part at the 19th Intergovernmental Council of IHP UNESCO in Paris in 2010 as outcoming member of the IHP Intergovernmental Council.

The Slovak NC is member of the Steering Committee of EUROFRIEND and Slovak experts participate in its Working Groups. Dr. Fendeková was the international coordinator of the WG 2 of the project till October 2010.
Representatives of the NC took part at following FRIEND meetings:
EURO FRIEND WG 2 meetings in Vienna, Austria in 2010 and 2011
EURO FRIEND WG 5 meetings in Seggau, Austria in 2010 and in Belvaux, Luxembourg in 2011.

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 13th ERB conference in Seggau, Austria in 2010 and took part at the ERB Steering Committee meeting in Belvaux, Luxembourg in 2011.

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 (2010 Zagreb, Croatia, and 2011 Budapest, Hungary).

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 and/or 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 2010-2012.

1.4 Cooperation with the UNESCO-IHE Institute for Water Education and/or international/regional water centres 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. None of them was published within the period of this report.

– 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 XVIIIth poster day. (IHP-VII FA 1.2) CD ROM, UH SAV-GfU SAV, Bratislava, Slovakia, 2010. ISBN 978-80-89139-21-7

Transport of water, chemicals and energy in the system soil-plant-atmosphere. Proceedings of the XIXth poster day. (IHP-VII FA 1.2) CD ROM, GfU SAV-UH SAV, Bratislava, Slovakia, 2011. ISBN 978-80-89139-26-2

22nd Conference of the Young Hydrologists – Proceedings. CD ROM, SHMI, Bratislava, Slovakia, 2010. ISBN 978-80-88907-73-2

23rd Conference of the Young Hydrologists – Proceedings. CD ROM of Hydrological Days conference, SHMI, Bratislava, Slovakia, 2011. ISBN 978-80-88907-76-3

Results of the Slovak institutions in the framework of the Regional co-operation of the Danube countries were published in three chapters of a monograph :

- Petrovič, P., Mravcová, K., Holko, L., Kostka, Z., Miklánek, P. 2010. BASIN-WIDE WATER BALANCE IN THE DANUBE RIVER BASIN. In Brilly, M. (Ed.) Hydrological Processes of the Danube River Basin, Perspectives from the Danubian countries. Springer, Dordrecht, Heidelberg, London, New York, ISBN 978-90-481-3422-9, p. 227-258.

- Stančíková, A. 2010. THERMAL AND ICE REGIMES OF THE DANUBE RIVER AND ITS TRIBUTARIES. In Brilly, M. (Ed.) Hydrological Processes of the Danube River Basin, Perspectives from the Danubian countries. Springer, Dordrecht, Heidelberg, London, New York, ISBN 978-90-481-3422-9, p. 259-291.

- Stančíková, A. 2010. TRAINING OF THE DANUBE RIVER CHANNEL. In Brilly, M. (Ed.) Hydrological Processes of the Danube River Basin, Perspectives from the Danubian countries. Springer, Dordrecht, Heidelberg, London, New York, ISBN 978-90-481-3422-9, p. 305-341.

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. XVIIIth 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, 2010.

Transport of water, chemicals and energy in the system soil-plant-atmosphere. XIXth 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, 2011.

22nd Conference of the Young Hydrologists. Bratislava, Slovakia, 2010.

23rd Conference of the Young Hydrologists. Bratislava, Slovakia, 2011.

1.6.2 Participation in meetings abroad

19th Session of the Intergovernmental Council of the IHP UNESCO, Paris, 2010: Miklánek, P., Halmova, D.
EUROFRIEND WG 2 meeting, Fes, 2010: Fendekova. M., Miklánek, P.
EUROFRIEND WG 2 meeting, Vienna, 2011: Fendekova. M.
EUROFRIEND WG 2 meeting, Vienna, 2012: Fendekova. M., Kohnova, S.
EUROFRIEND WG 5 meeting, Seggau, 2010: Miklánek, P., Holko, L.
EUROFRIEND WG 5 meeting, Belvaux, 2011: Miklánek, P., Holko, L.
EUROFRIEND5 Workshop on Geochemical, Isotope and Innovative Tracers: Challenges and Perspectives for Small Catchment Research, Belvaux, 2011: Miklánek, P., Holko, L., Danko, M., Onderka, M.
ERB (*European Network of Experimental and Representative Basins*) Steering Committee meeting, Seggau, 2010: Miklánek, P., Holko, L.
XIIIth ERB Conference and General Assembly, (Conference: , *Hydrological Responses of Small Basins to a Changing Environment)*, Seggau, 2010: 4 papers and 6 participants.
ERB (*European Network of Experimental and Representative Basins*) Steering Committee meeting, Belvaux, 2011: Miklánek, P., Holko, L.
24th Working Session of the Danube countries representatives, Zagreb, 2010: Miklánek, P., Halmová, D., Pekárová, P.
25th Working Session of the Danube countries representatives, Budapest, 2011: Miklánek, P., Halmová, D., Pekárová, P.
25th Hydrological conference of the Danubian countries, Budapest, 2011: 14 papers and 22 participants.
Workshop and meeting of the working group on *Flood Regimes of the Rivers in the Danube Basin*, 2010 in Zagreb, Croatia: Pekárová, P., Miklánek, P., Halmová, D.
7th Czech-Slovak Hydrological Days 2010 on Water in a Changing Environment, Hradec Králové, Czechia, 2010: 26 papers and 28 participants.

1.7 Other activities at regional level

1.7.1 Institutional relations/cooperation

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 2012

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

CCPC - 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	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 co-ordinator P. Pekarova from Slovakia);
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 2013-2014

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.: 4/12
Ljubljana
18.May 2012

Report on the work of the Slovenian National Committee for IHP/UNESCO in 20112012

The work in 2011 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.

The IHP Committee supported organisation of the First Congress of Slovenian waters and the publishing book with reports. The Congress was organised by Slovene water associations and Declaration, final document accepted by participants is in the attachment.

Attachment: Declaration

Chairman

Prof.dr. Mitja Brilly

D E C L A R A T I O N

On the occasion of the 1st Congress on Water of Slovenia, held on 22 March 2012, the Slovenian water-related societies and associations issued the following observations, conclusions and recommendations:

Protection of water and its sustainable use is the key of sustainable development. Therefore the United Nations proclaimed the period 2005–2015 as the International Decade for Action »Water for Life«. Achieving sustainability of water resources for man and nature is also one of the requirement of the EU Water Framework Directive, one of the goal of the international Decade of Education for Sustainable Development 2005–2014 and, last but not least, the requirement of the Slovenian Water Act. Furthermore, the EU Floods Directive is a warning that a constant care in protection from adverse effects of water is imperative. The problems of erosion and landslides, as forms of adverse action of water, are addressed by the EU Soil Framework Directive, protecting soil, especially soil as food source.

Slovenia is a country abundant in water resources, however, it is still unable to protect and sustainable explore these resources properly. In recent decades, in some areas the situation has deteriorated, with negative implications for the development of water activities and the protection of water. The adverse effects of water rise due to the insufficient care and investment into precautionary and structural measures in the last decade. This is why water-related societies and associations of Slovenia decided to convene the 1st Slovenian Congress on Water, which was held on 22 March 2012, at the Biotechnical Faculty of the University of Ljubljana. The institutions participating in the organization of the Congress were:

Društvo vodarjev Slovenije (Water Management Society of Slovenia)
SDZV – Slovensko društvo za zaščito voda (Slovenian Water Pollution Control Association)
SDNO – Slovensko društvo za namakanje in odvodnjo (SINCID Slovenian National Committee on Irrigation and Drainage)
SZGG – Slovensko združenje za geodezijo in geofiziko – Nacionalna sekcija za hidrologijo (Slovenian Association of Geodesy and Geophysics – National Hydrology Section)
SDHR – Slovensko društvo za hidravlične raziskave (Slovenian Association for Hydraulic Research)
SLOCOLD – Slovenski komite za velike pregrade (Slovenian National Committee on Large Dams)
RZS – Ribiška zveza Slovenije (Fishing Association of Slovenia)
Slovensko kemijsko društvo (Slovenian Chemical Society)
Društvo biologov Slovenije (Biological Society of Slovenia)
SKIAH – Društvo slovenski komite mednarodnega združenja hidrogeologov – IAH (International Association of Hydrogeologists – Slovene Committee)
Zveza prevoznikov po celinskih vodah Slovenije (Association of Inland Waterways Navigators of Slovenia)
Odbor za mednarodni hidrološki program IHP UNESCO (Slovenian Committee for IHP UNESCO)

129 representatives of the societies and associations attended the Congress and, after a full day of discussions, the following conclusions and recommendations were agreed upon:

The regulations related to water policy in Slovenia are non-transparent, while the responsibilities are dispersed among different ministries and organisational units inside these ministries. Complex problems are all too often solved by professionally not adequate skilled civil servants, who are not able to deal with all tasks. This results in long procedures, professionally inadequate regulations, deficiency in field oversight, postpondement of decisions, large material damage and also fatalities. Besides inadequate organization of public services, the reason for such situation is also the disregard of professional criteria in employing and promotion of professional staff. River Basin Management Plans, adopted to satisfy the requirements of the

Water Framework Directive, are not operational documents, since they contain many deficiencies, and above all they lack the bases for sustainable use of water. The national interests of the state and interests of development are being neglected. Some articles of the Water Act (2002) have been dead norms for more than a decade. In the long-term, the question of granting concessions in relation to the management of the water regime has also remained unsolved.

The existing Slovenian legislative and regulatory provisions, and corresponding operational programmes of environmental protection and water management have implemented the EU legislation faster and more rigorously than required and expected by the EU. Professional norms have been introduced into regulatory provisions, thus precluding professional approach to individual, specific problems (different local terrain, geological, hydrologic, ecosystem and socio-economic environments). We propose that such norms, covered by regulatory provisions, are issued as specific technical standards, which is the norm in other EU member states also.

There are no long-term development plans, water management bases nor any other regulations enabling coordinated sustainable development of water-related activities. We are potentially losing a lot of resources in GDP, many work places in the countryside and, finally, environmental protection is suffering as a result. Regarding research and development, the Slovenian researchers obtain more funds from the different EU programmes than from national research projects.

Regarding drinking water supply, the protection of drinking water resources is subject to Government's decisions, and, considering the way of the decision-making, only in the next few decades all drinking water resources of Slovenia will be protected by governmental decrees. In the process of adopting the decrees, the drinking water supply operators are not a party in the procedure nor are they invited to offer their opinion refer the planned activities in the drinking water protection zones. The drinking water supply operators are obliged to ensure the quality of tap water, but they are not responsible for the state of installations at the end-user location.

The threat and pollution of water resources are rising, which indicates the lack of proper control over potential polluters. About 43% of Slovenia is Karst area, however, the Karst aquifers recharging important water resources are not researched enough for us to be able to protect them properly and ensure safe water supply.

The technology of drinking water treatment is not always adequate and it does not in line with technological advancements. Small drinking water supply systems are especially critical, where the economic power of local communities fails at introducing modern technology and proper control.

Water infrastructure is poorly maintained due to the lack of funds and the present situation will even deteriorate in the future, resulting in reduction of public water supply quality, increased damage during accidents, and fatalities. The safe maintenance and operation of dam structures is also insufficiently regulated. For large dams, a proper administrative organization and safety system must be set up, which requires the adoption of relevant regulations on dam safety as soon as possible, in accordance with international standards, and a clear division of responsibility between the owners and operators. It is necessary to record the actual state of the of dams and reservoirs, to prepare a strategy for managing the structures and regulate the formal legal relationships regarding ownership and management of structures, where needed, which is a precondition for enforcing the dam safety policy. Regarding the use of water potential, now 4,296 GWh/year is exploited, which is 47 % of the total technically available water potential. According to strategic documents the plan is to exploit approx. 5,800 GWh/year (63 % of technical water potential) by 2030. The construction of hydropower plants has important implications for economic development and undisputed economic benefits: If the Sava river hydropower chain had been built 30 years ago, the investment would have returned in full already, based only on the power sold. Important is the role of hydropower plants in taking over

ancillary services in the electric power system of Slovenia, and environmental benefits – it is estimated that with the planned production of the hydropower plants the CO_2 emissions would be reduced by 1,800 kT, which is 30 % of all thermal power plant emissions in 2011.

Due to time constraints, Slovenia will not be able to use most of the Cohesion Fund (2007–2013), planned for new investments of water infrastructure, while the problems of water supply of the Primorska and Pomurje regions and flood protection are to remain and, in the future, will have to be addressed through funding from the Slovenian state budget. The reason lies in the lack of political will in carrying out large and long term projects. The other reasons are also not prepared project documents, changing administrative procedures and reorganization of administrative services to frequent, which results in poor realization of operational programmes adopted in the past and still in force today (traffic and water infrastructure, collection and treatment of wastewater) and ineffective of the funds of EU financial programmes. We need better preparation of projects on the part of professionals and improved and co-ordinated support of different administrative services in the preparation and implementation. Both, the professionals and administrative services, have to act in a proactive way. Due to the non-enforcement of provisions of water acts a large portion of water land is privately owned, which makes the carrying out of projects difficult.

In the last twenty years, river-side space has been left to overgrow, while the consequences of overgrowth and costly maintenance of such rivers are not considered. The maintenance is further conditioned by the prohibition of interventions into the river bed and banks during most part of the year. This results in flooding of surrounding areas and flood-incurred damage. Regarding maintenance, the public benefit of rivers and flood protection are neglected and subordinated to environmental protection. The overgrown parts of the river space develop into precious ecological niches, which, however, must be destroyed during intervention activities. Storm-water is a special problem, since during floods storm-water cannot be discharged by the storm-water system and the surrounding areas are flooded. A long-term solution of stable funding of regular and investment maintenance is necessary.

Rivers and streams are inseparably connected to the river-side belt and hinterland, and only integrated management can provide sufficient amount and quality of water in the landscape, with favourable consequences for agriculture and biotic diversity in the long term.

When trying to achieve larger and improved food self-sufficiency the scope of agrarian operations will have to be increased, especially through hydromelioration (irrigation, drainage, remediation of existing systems) and through enlargement of agricultural land by intensifying soil amelioration operations (remediation and revitalisation of forest – overgrown agricultural land and with strict restrictions of urbanization of agricultural land), without increasing the load on groundwater and surface water through intensification of production. The amelioration measures of agrarian operations should not increase land erosion and the rate of flood wave formation.

Regarding the trend of changing river regimes, characterised by highering hydrological extremes, especially in water deficient regions, it will be necessary to build new reservoirs for drinking water supply and irrigation, and with these measures to increase the proportion of exploitation of available water quantities, which is today at only 1%.

Today, water recreation activities are developing rapidly with exceptional potential for development. However, they are left to their own devices, being poorly controlled, non-coordinated with other uses of water and without the proper protection of users, which can ultimately lead to fatalities.

We are not prepared for the impacts of climate change and other man-made activities or for the introduction of non-native species into water and water-side space.

In the society it is necessary to define a comprehensive and long-term approach of water management with new professional, organizational, financial and political solutions, and clearly defined responsibilities. We need a long-term national strategy of water protection, which will be, with the support of sustainable economic development, directed into ensuring sustainable supply of the population with safe drinking water, its strategic reserves in case of extreme droughts and devastating natural disasters with regional effects, reduced flood and landscape risk, safe operation of water facilities and preservation of aquatic ecosystems. We, the non-governmental organizations whose work is related to water, undertake to encourage proactive attitude of all the interested parties in the processes of harmonizing the policies of water use and protection, share knowledge about water and ensure ecosystem services and goods of water systems in the future also.

In order to reach the goals set, the water-related professionals will have to design new methods, using research, and introduce new practices in water management (whereby knowledge from the state administration, and political will from policy-makers, will be required). Integral water management requires a multi-disciplinary approach and cooperation of many professions related to water. In order to make the proposed expert solutions and development projects feasible, fields of dialogue and meetings between sectoral policies, the public, stakeholders, politicians and professional institutions should be organized and enabled. To this end, the awareness, knowledge and information of all citizens should be strengthened. The Slovenian citizens should know the value of aquatic ecosystems, the meaning of water retaining capacity of land and the implications of past water-related interventions.

In order to reach the mentioned goals and a successful solutions to identified problems the following is proposed:

Establishment of Water Administration, as was known in the ex-banate and was successfully in operation as the Water Community Association until 1989, while today it is known in some developed EU countries. The administration should be fit for integrated and sustainable water management and achievement of long-term goals. We need a professional supervision service with the authority for preventive action in the field. The minimum professional criteria in employing civil servants in water-related offices and proper work experience for managerial staff should be defined.

Furthermore, we propose changes of the Water Act, to eliminate the unnecessary administrative procedures, to strictly introduce the principle of subsidiarity, abolishment and proper rewriting of those parts of the legislation that have remained a dead norm. We propose the preparation of proper bases for management, that is, long-term strategic plans, adopted by the parliament. It would be sensible to confirm the individual long-term plans by means of a referendum.

A special attention should be given to monitoring of micropollutants and other substances that are introduced by chemical technology to the market each day. Equally, the introduction of non-native plant species into aquatic space should be addressed.

We need research and development projects, and pilot projects, which would enable the checking of modern technical and management achievements in practice. Special attention should be given to Karst, mountain areas and protected areas, where the study of water regimes should provide an important expert groundwork for any activities.

For remediation works the project documentation should be elaborated at same technical level as for the construction works, taking into account the implications for water regime and safety of other activities and users of space.

In order to reach sustainable development of water-related activities and protection of water, the water associations and societies will in future closely co-operate and co-ordinate their work. The next Congress on Water will be convened in 2016.

NATIONAL REPORT ON IHP RELATED ACTIVITIES

Report Format

1. ACTIVITIES UNDERTAKEN IN THE PERIOD JUNE 2010 – MAY 2012

1.1 Meetings of the IHP National Committee

1.1.1. Decisions regarding the composition of the IHP National Committee:

The committee has two regular meeting per month. The important decision that has been taken by the committee is restructuring of the Committee on July 2012 according to the law of the National Commission for UNESCO.

1.1.1 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:

1.2.1.1 The World Water Day is organized by the IHP national Committee and Ministry of Water Resources under the patronage of H.E. Minister of Water Resources and in collaboration with, Public Water Corporation, Ministry of Electricity and Dams, Sudanese Sugar Company and UNESCO Office in Khartoum.

In this year the celebration was addressed by H.E. Minister of Water Resource, H.E. Minister of General Education, Chairperson of the National Commission for UNESCO, UNESCO Representative in Sudan and Chairman of IHP – National Committee. T here was an exhibition presenting the achievement in water sector in Sudan. During the celebration of this year the Committee honoured the following scientists for their outstanding contributions:

- H.E. Engineer Kamal Ali Mohamed, Former Minister of Water Resources
- Professor Mammoun Ibrahim Daw Elbeit, Minister of Agriculture, Gadarif State
- Engineer Alsir Ahmed Mohamed, ex undersecretary of Ministry of Irrigation and Water Resources
- Professor Hussein Suleiman Adam, former director of Istitute of Water and Irrigation Research

- Engineer Mohamed Elhassan Mahmoud Ammar, Director of Public Water Corporation

The scientific side of the celebration includes:

1. Keynote lectures on Efficient utilization of water for sustainable agricultural development presented by Professor Mohamed Ali Dingil and Water harvesting for achieving food security presented by Dr. Adil M. Khidir

2. Also there was a panel on the theme of the celebration 'Water and Food Security" covering the following topics:

- Efficiency of water use in agricultural schemes – Prof. Ali M. Adeeb
- World Food security – FAO representative
- Food security in the Arab region – representative of Arab Organization for Agricultural Development
- National food security - Ministry of Agriculture and Irrigation

1.2.1.2 in cooperation with UNESCO Khartoum Office, Technical Organ on Water Resources/Ministry of Irrigation and Water Resources and the Training Center of the Public Water Corporation, the IHP National Committee organized a training course on Hydrometric and Surface Water Resources assessment from 12-19 May 2011. The target groups were senior technicians and young Engineers.

The aim of the TOT is to enhance and strengthen the human capacities' developments towards proper performance of their duties in assessing and monitoring of the water resources in the different states specially those who are working on the Hydrometric Stations. It also aims at supporting Sudan in building related capacities on water education that tackle the multidimensional aspects of sustainable development as well as environmental issues.

The subjects include the following:

- Introduction; general information, importance of water resource assessment
- the effect of climate change on water resources
- Meteorological aspects as interface for surface water assessment,
- How meteorological data could be used as interface to hydrological assessment
- Wadi aspects- -hydrometric of Wadi System

- Historical, current and future Status of Water Resources Assessment in ephemeral streams
- Gauging and analysis of Data – including site visit
- Historical, current and future Status of Water Resources Assessment in Nile System
- Gauging and analysis of Data- level and discharge in the Nile with a site visit.

1.2.2 Participation in IHP Steering Committees/Working Groups: Sudan is re-elected as a member of the IHP Council during 36th session of the UNECO General Conference. The chairperson of the Committee is a member of the IHP Bureau.

1.2.3. Research/applied projects supported or sponsored:

The Sudanese IHP National committee received the approval for the project proposal on Sustainable Management of Wadi Hydrology Systems in Sudan, within the UNESCO Participation Programme. In the proposal two wadi systems were selected as pilot project within the national network.

(a) Abu Habil crossing the three states (south Kordofan, north Kordofan and the White Nile) with average annual flow of 90mm^3 feasible for future development through surface water storage and artificial recharge for ground water aquifers.

(b) El Awatib in Nahr El Nil State some 150 km north of the capital Khartoum. This is selected for training students, technicians and young engineers as the site is close to many universities and research institutions.

Following the approval an expert team was formulated covering the related disciplines as follows:

- Eng. Mohamed El Hassan Eltayeb — Team Leader
- Dr. Babiker Barsi — Hydrologist
- Dr. Gamal Murtada — Hydrologist
- Dr. Tag Elsir Bashir — Eco-Hydrologist
- Eng. Sidig Omer — Hydrologist
- Eng. Mohd Khalafalla — Hydro geologist
- Mrs Wafaa Sid Ahmed — coordinator

Assistant Secretary-General

The report editing was assigned to Prof. Abdin Salih

The team started the work by collecting data and maps of the two areas followed by a field visit to the two sites prior to the analysis and technical report preparation.

The findings of the different sections of the report were presented in a specialized workshop where about thirty scientists and decision makers were invited to participate and comment on the report and the project appraisal. Their comments and recommendations were considered in the final version of the technical report. The project document is annexed to this study report.

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

- Sudanese IHP-National Committee celebrates world water day since 1994. The activities include organization of workshops, symposia and lectures which aim at raising awareness on water resources and their conservation at all levels. In addition to that the committee honours and gratifies some eminent scientists for their outstanding contribution in this vital field. This celebration is organized in cooperation with UNESCO Khartoum Office, UNICEF, UNEP, FAO, Ministry of Water Resources, Ministry of Electricity and Dams, Arab Organization for Agricultural Development, Public Water Corporation, Sudanese Sugar Corporation and many other institutions.

1.3 Other initiatives

Upon request of the IHP National Committee the Minister of Irrigation and Water Resources issued a Ministerial Decree No. 1, dated 2nd January 2010, regarding The Establishment of a National Water Harvesting Center, to be hosted at the premises of the Hydraulics Research Station (HRS).

1.4 Educational and training courses

1.4.4 Contribution to IHP courses

1.4.5 Organization of specific courses: training course on Hydrometric and Surface Water Resources assessment (paragraph 1.2.1.2)

1.4.6 Participation in IHP courses: see paragraph 1.7

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

Election of Sudanese expert to the Governing Board of the UNESCO-IHE Institute for Water Education during the 19th session of the IHP Intergovernmental Council

1.6 Publications: Study on Sustainable Management of Wadi Hydrology Systems in Sudan and report of celebration of the World Water Day.

1.7 Participation in international scientific meetings

Meetings hosted by the country;

- International conference on water resource management in Darfur.
- Annual meeting on flood forecast organized by the Sudanes Meteorological Corporation.
- Steering Committee for the Water Harvesting Center.

Participation in meetings abroad:

- Study visit to Water Research Center in Egypt for two members of the IHP National Committee.
- Workshop on operational management of groundwater resources organized by UNESCO Cairo Office in UAE.
- Advanced Training Workshop on water and soil conservation held in China.
- Teleconference organized by UNESCO IHP on the review of the Draft Strategic Plan of IHP-VIII
- Meeting of the Executive Board of UNESCO held on October 2011 in France.
- Regional training workshop on reuse of sewerage water organized by ISESCO in Jordon.
- Training Course on digital modeling of groundwater organized by ALECSO in Tunis.

- 36th session of UNESCO General Conference held in Otober/November 2011 in France.
- The 6th World Water Forum held in Marseille, France March 2012.
- Informal IHP Bureau meeting held in Marseille.
- Workshop on impact of climate change on water resources and desertification organized by ISESCO in Tunisia.
- Regional meeting of Arab IHP National Committee organized by UNESCO Cairo Office in Lebanon.

1.8 Other activities at regional level

1.8.4 Institutional relations/cooperation:

The Sudanese IHP-National Commette is affiliated to the Sudanese National Commission for UNESCO and the activities of the Commette are organized under the patronage of H.E. Minister of Water Resources. The Commette has a good relation with of Ministry of Energy and Mining, Ministry of Environnent, Ministry of Electricity and Dams, Ministry of Physical Planning, Ministry of Agriculture, Public Water Corporation, Khartoum State Water Corporation, Kenana Sugar Corporation, Sudanese Sugar Corporation, Universities, UNESCO Chairs and private sector, n addition to some NGOs.

1.8.5 Completed and ongoing scientific projects:

To implement the recommendation of 13th session of the Arab IHP – Committees Meeting and Regional Workshop on Groundwater Management In Arid and Semi-Arid Regions held 27-28 September, Khartoum Sudan, concerning Establishment of Regional Centers of Excellence for water harvesting (recharge and recovery) and the management of water resources in basement complex and hard rock aquifers, the IHP –National Committee organized a consultation meeting for establishing a regional center for capacity development and research in Water Harvesting. An ad hoc committee was formed to prepare the proposal of the establishment of the center. In response to a proposal by the Government of Sudan to establish on its territory this regional centre, as category 2 centre placed under the auspices of UNESCO, the 19th session of the Intergovernmental Council of the International Hydrological Programme (IHP) adopted Resolution XIX-6 in July 2010 welcoming the establishment of the centre

and requesting UNESCO's assistance in preparing the necessary documentation to be submitted to UNESCO's governing bodies. A UNESCO mission, hosted by the Government of Sudan was undertaken in February 2011 in order to assess the feasibility of establishing the proposed Centre which was approved by the 36th session of the UNESCO General Conference.

2 FUTURE ACTIVITIES

2.2 Activities planned until December 2012:

- Organization of experts meeting on 4th edition of the UN World.
- Training of trainers courses on the Ground Water Resources assessment and Trans-boundary aquifers issues.
- Organization of a monthly lecture in the different disciplines of hydrology and water resources management.

2.3 Activities foreseen for 2013-2014:

- Celebration of the united nations international Year of Water Cooperation.
- Preperation of a study on impact of climate change on water resources in Sudan.
- Organization of a monthly lecture in the different disciplines of hydrology and water resources management.

2.4 Activities envisaged in the long term:

- Revising of science curriculum to prepare quality package of water and sanitation to be delivered to all primary schools. This is one of the most important issues which are underscored by H.E. Minister of Education, Chairman of the National Commission for UNESCO.
- Introduction of water ethics in higher education curriculum.
- Building the capacity of women in integrated water resource management.

NATIONAL REPORT ON IHP RELATED ACTIVITIES

Sweden

http://www.smhi.se/svenskaihp

1. ACTIVITIES UNDERTAKEN IN THE PERIOD JUNE 2010 – MAY 2012

1.1 Meetings of the IHP National Committee

The committee has regular meetings. During the period June 201-May 2012 seven meetings where held (24th June 2010, 16th Sept 2010, 31st Jan 2011, 18th Feb 2011, 2 Dec 2011 8th Feb 2012 and 18th April 2012).

1.1.1 Decisions regarding the composition of the IHP National Committee

UNESCO:s scientific programs, including IHP, are coordinated by the Swedish National Commission for UNESCO. With the aim to facilitate communication and cooperation between the programs and disseminate results from activities to the National Commission, an expert group with representatives from the committees is established. The expert group is hosted by the Swedish Research Council. It proposes budgets to the Swedish National Commission for UNESCO and distributes financial means between the various programs. The Swedish Meteorological and Hydrological Institute (SMHI) (www.smhi.se) is pointed out by the Government as the responsible organization for the Swedish IHP and hosts of the Secretariat of the Swedish IHP. Two committee members represent SMHI. The chair of the committee is the head of the Swedish Water House (SWH) (www.swedishwaterhouse.se). Also the head of the Swedish Hydrological Council (SHR) (www.hydrologi.org) is a member of the committee.

The following have been members of the committee during the reporting period:

Chair: Karin Lexén, Swedish Water House (Karin.lexen@siwi.org)
Secretary: Lotta Andersson, SMHI (lotta.andersson@smhi)
Representative in the Swedish expert group and in the Intergovernmental council:
Berit Arheimer, SMHI (berit.arheimer@smhi.se)
Member: David Gustafsson, SHR (davidg@kth.se)

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

The Swedish IHP committee was co-convener for the SWH seminar"the role of water in an urbanized world", held in connection to the 2011 world water day. http://www.swedishwaterhouse.se/en/seminars/previous/seminar.html?id=350&year=2011&type=archive

The workshop "Water status and hydrological models – handling of uncertainties in water management" was arranged the 15-16 September 2011. The workshop was directed towards water administrators and modelers, as a follow up to the international research workshop described below.
http://www.smhi.se/svenskaihp/aktiviteter/workshop-om-att-anvanda-modeller-i-vattenforvaltning-1.17992

1.2.2 Participation in IHP Steering Committees/Working Groups

From 2012, Sweden is member of the IHP Intergovernmental council, with Berit Arheimer appointed as the Swedish representative in the council.

1.2.3 Research/applied projects supported or sponsored

A "terminology group", hosted by SHR has been appointed and sponsored by the Swedish IHP committee. The task of the group is to establish an Swedish-English dictionary. The available "Nordic Glossary of Hydrology", established witin the NHP 1973-1981 framework will be the basis of the new electronic dictionary. The output aims to be a Swedish contribution to the "Glossary of Hydrology", published by WMO.

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

For the 2011 and 2012 World Water Days, SHR has, by appointment by the Swedish IHP committee coordinated Swedish activities during and initiated new activities www.vattendag.org

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

The Swedish IHP, represented by Berit Arheimer, was co-convener of the 2010 World Water Week workshop « Water Quality in Capacity Development: Policy Options and Practical Solutions in the National and Transboundary Context (http://www.worldwaterweek.org/sa/node.asp?node=750&selEvent=&selTheme=&selYear=&filter=1&mySchedule=&txbFreeText=arheimer&selRegion=&sa_content_url=%2Fplugins%2FEventFinder%2Fevent%2Easp&id=3&event=288).

A scientific workshop "Nutrient model comparison" was arranged by the Swedish IHP committee in Söderköping, Sweden, the 28-30th March 2011. The aim with the meeting was to increase knowledge about uncertainties in model-based information aimed to be used for decision support. Twenty participants from five countries participated in the meeting. Seven water and nutrient models where set up for the Söderköping river basin in connection with the workshop. Revealed uncertainties were analysed and recommendations for how to deal with uncertainties were proposed. Documentation is available at http://www.smhi.se/svenskaihp/Nyhetsarkiv/planned-workshop-on-nutrient-model-comparison-1.12423

1.6.2 Participation in meetings abroad

Xth Kovacs Colloquium, Hydrocomplexity: New Tools for Solving Wicked Water Problems, July, 2010, UNESCO, Paris. Lotta Andersson was invited speaker with the presentation "Use of participatory scenario modelling as platforms in stakeholder dialogues" http://iahs.info/conferences/2010Kovacs.htm

Sixth World FRIEND Conference, Fez, Morocco, October 2010. Lotta Andersson presented : "Participatory modelling for locally proposed climate change adaptation related to water and agriculture in South Africa" and (on behalf of C. Donnely et al) "High-resolution, large-scale hydrological modelling tools for Europe". http://www.unesco.org/water/water_events/Detailed/1713.shtml

"Raising awareness and enhancing the adaptive capacity of water resources planning and management to climate change impacts", 14-15 November, UNESCO, Paris. Karin Lexen was invited speaker to the panel. http://www.worldwaterforum6.org/en/news/single/article/raising-awareness-and-enhancing-the-adaptive-capacity-of-water-planning-and-management-to-climate-ch/?tx_ttnews%5BbackPid%5D=20&cHash=19957e9d8fad58e86fdc202c2374feb7

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 2012

The Swedish IHP committee will host a side-event workshop during the International Conference on Fresh Water Governance for Sustainable Development - – 5th to 7th Nov 2012, in South Africa. Use of seasonal forecasts and scenario-modelling to facilitate planning for food security and water quality in the developing world – possibilities and challenges. The workshop aims to create a meeting place for policy makers and modellers from South and North who will share experiences and evaluate possibilities and challenges related to the use of models in a policy context in the developing world, with focus on planning for food security and water quality. The workshop will be based on experiences from the two workshops held in 2011. http://www.wrc.org.za/Lists/Events/DispForm.aspx?ID=176

A number of scientific and popular papers related to the two modelling/policy workshops arranged in 2011 will be compiled.

2.2 Activities foreseen for 2013-2014

2.3 Activities envisaged in the long term

RAPPORT NATIONAL SUR LES ACTIVITES DU PHI

Contribution de la Suisse

1. ACTIVITES ENTREPRISES PENDANT LA PERIODE JUIN 2010 – MAI 2012

1.1 Réunions du Comité national du PHI

1.1.1 Décisions sur la composition du Comité national du PHI

Le Comité national suisse du PHI a été intégré au sein de la commission suisse d'hydrologie de la société suisse des sciences naturelles. Cette commission regroupe les instituts de recherche en hydrologie de la Suisse ainsi que des représentants des autorités fédérales et cantonales et des bureaux privés.

1.1.2 Bilan des activités du PHI-VII

La Suisse, nouvellement élue au sein du Conseil intergouvernemental du PHI, n'a pas contribué activement aux activités du PHI. Une exception notable est l'Initiative internationale relative à la sédimentation (ISI), dont la présidence est assurée par Manfred Spreafico de l'université de Berne. Dans ce cadre et en sus des activités régulières de l'ISI, la Suisse a préparé un manuel d'estimation des volumes sédimentaires qui devrait être publié soit en 2012, soit en 2013.

1.2 Activités nationales dans le cadre du PHI

1.2.1 Réunions scientifiques et techniques au niveau national ou local

Les activités essentielles ont consisté à organisé la structure et les coordinations du comité national avec notamment la chaire UNESCO de l'EPFL et la Direction du développement et de la coopération (DDC).

1.2.2 Participation à des Comités directeurs ou des groupes de travail du PHI

Néant

1.2.3 Projets de recherche de base ou appliquée, aidés ou patronnés

Néant

1.2.4 Collaboration avec d'autres organisations ou programmes nationaux ou internationaux

Dans le cadre de la commission internationale pour l'hydrologie du bassin du Rhin, émanant de l'UNESCO, plusieurs projets ont été élaborés, s'agissant notamment d'une homogénéisation des estimations des débits le long du Rhin.

1.3 Cours d'éducation et de formation

Néant

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

Néant

1.5 Publications

1.6 Participation aux réunions scientifiques internationales

1.6.1 Réunions tenues dans le pays

Néant

1.6.2 Participation à des réunions à l'étranger

La Suisse a participé et présenté un article lors de la 26e conférence d'hydrologie nordique à Riga, patronnée par l'UNESCO.

1.7 Autres activités au niveau régional

Néant

2 ACTIVITES FUTURES

2.1 Activités planifiées jusqu'au décembre 2012

La Suisse poursuivra l'organisation de son comité national, en coordonnant notamment ses activités avec celles connexes de l'OMM. Elle évaluera sa contribution dans les différents programmes et projets du PHI qui seront discutés lors de la XXe session du PHI en juin.

2.2 Activités prévues pour la période 2013-2014

Les activités précises seront définies en fonction des résultats de la session du PHI, tenant compte des projets déjà en cours et avec lesquels des synergies pourront être identifiées.

2.3 Activités envisagées à long terme

De manière générale, la Suisse entend appuyer les activités de l'UNESCO dans les différentes activités pour les quelles elle dispose de connaissances particulières. De par ses compétences larges et l'étendue des problématiques hydrologiques identifiées en Suisse, elle dispose de l'expertise nécessaire pour participer activement au PHI et contribuer à ses développements et visions futures.

TURKEY NATIONAL REPORT ON IHP RELATED ACTIVITIES

JUNE 2010 – May 2012

1. ACTIVITIES UNDERTAKEN IN THE PERIOD JUNE 2010 - MAY 2012

1.1 Meetings of the IHP National Committee

The National Committee meeting was held during the 6th National Congress of Hydrology, 22-24 September 2010. Committee members has been in contact via e-group in all other times.

1.1.1 Decisions regarding the composition of the IHP National Committee

The composition of the Turkish IHP Committee is mainly composed of representatives from hydrology-related governmental organizations, as well as universities. General Directorate of State Hydraulic Works (DSI), General Directorate of Water Management (SYGM), General Directorate of State Meteorological Affairs (DMI), as well as Middle East Technical University (METU), Hacettepe University (HU), Gazi University, Istanbul Technical University (ITU) are members of the Turkish Hydrological Community.

Turkish National Hydrological Commission (TNHC) under the Union of Turkish National Geodesy and Geophysics (TNGG) is also represented in the Committee.

The composition of the Turkish IHP Committee remained the same in the mentioned period.

1.1.2 Status of IHP-VII activities

The involvement in IHP-VII activities was rather limited. Even the annual international postgraduate UNESCO course on "*Sediment Transport Technology*" couldn't be held because of the financial constraints.

1.1.3 Decisions regarding contribution to/participation in IHP-VII

As the national focal point for IHP, DSI has been an increasing responsibility in shaping national water resources policies. It can be generally stated that educational, technological and institutional capacity of hydrometeorological services has been improved. Synergy among the responsible institutions has also been increased via number of conferences, symposiums, as well as joint projects.

Hydrology e-group is linked to the DSI's Web Site http://www.dsi.gov.tr. And, all available publications, as well as national activities were introduced into the hydrological community in the internet environment.

1.2 Activities at national level in the framework of the IHP

This section is prepared according to the information obtained from e-group members.

1.2.1 National / local scientific and technical meetings

National activities as a part of the hydrological program carried out by different institutions in Turkey, in the period of 2008-2010 are as listed below:

- 2nd Flood Symposium, Istanbul, 22-24 March 2010.
- 6th National Congress of Hydrology, Denizli, 22-24 September 2010.
- 1st National Water Database Systems Seminar, Izmir, 11-15 October 2010.
- 2nd National Water Database Systems Seminar, Sanlıurfa, 25-29 October 2010.
- Eastern Blacksea Region Landslide and Flood Symposium, Trabzon, 10-11 February 2011.
- 5th National Water Engineering Symposium, Istanbu1, 12-16 September 2011.

1.2.2 Participation in IHP Steering Committees / Working groups

1.2.3 Research/applied projects supported or sponsored

Studies Regarding Improvement of Flow Measurement Stations

Number of studies were supported in order to improve conditions of national hydrometeorological stations. In this regard, the observation errors and failures were tried to be removed/minimized via modern facilities. The measurements now are conducted in a more sensitive way and the observed data are transferred by modern telemetry technology. Real time data is read, evaluated and stored at the office simultaneously.

At present, related institutions are working on increasing the number of electronic gauges in river basins.

Studies Regarding Snow Observations

Seasonal snow-melt runoff estimates are extremely important in mountainous regions with semi-arid climatic conditions, like eastern part of Turkey. For that reason, automated snow and meteorological stations have been established at higher altitudes especially in the upper Euphrates River basin since 1996 within the context of joint research programme carried out by Middle East Technical University (METU) and General Directorate of State Hydraulic Works (DSI).

In the 2010-2012 period, real time modelling studies were supported in order to forecast runoff (rate/volume) resulted in rain on snow events in early spring. Remote Sensing techniques were introduced into the system in order to trace the snow cover areas and measure real time snow depths.

Research Studies

Research studies carried out in the context of IHP activities in the period of 2008-2010 are as follows:

- ‘Physical and numerical investigation of dam break flood waves—Application to real dams in GIS environment’, 110M240 TUBITAK (Turkish Science and Research Council). (In Progress).

- “*Investigating surface water and groundwater potential of campus of Izmir Institute of Technology”*. Izmir Institute of Technolgy Research Fund, Project No: 2007MUHYL01, 2011.

- “*Experimental and theorethical investigation of unstaedy and non-equilibrium sediment transport in open channels—application of the results to Tahtali basin creeks*.” TUBITAK project No. 106M274, 2010.

1.2.4 Collaboration with other national and international organizations/programs

The members of the Turkish hydrologic community are cooperated with many other institutions/programmes listed below:

IAEA, International Atomic Energy Agency
IAH, International Association of Hydro-geologists, Karst Commission
IAHS, International Association of Hydrological Sciences
JIIHP, Joint International Isotopes in Hydrology Program
UNESCO, Division of Water Sciences International Hydrology Program
UNESCO, FRIEND
WMO, World Meteorological Organization
WWC, World Water Council
WWC, World Water Council

1.2.5 Other initiatives

22 March world water days were celebrated with a series of activities such as competition of composition, picture, photo and placard, celebration of the day and exhibition display with the aim of increasing awareness on the world water day themes of the corresponding years.

1.3 Educational and training courses

1.3.1 Contribution to IHP courses

1.3.2 Organization of specific courses / seminars

Annual one-month international post graduate UNESCO course on “*Sediment Transport Technology*” were organized by the Technical Research and Quality Control Department of State Hydraulic Works.

1.3.3 Participation in IHP courses

Governmental staff was stimulated to apply for IHP courses especially on the prioritized water-related issues in Turkey. Courses held by IHP_HELP Center for Water Law, Policy and Science, International Center for Water Hazard and Risk Management (ICHARM), and International

Groundwater Resources Assessment Center (IGRAC) were the most highlighted ones in the related period.

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

1.5 Publications

- Baba A., Tayfur G., 2011. Groundwater contamination and its effect on health in Turkey ENVIRONMENTAL MONITORING AND ASSESSMENT, 183 **(**1-4**),** 77-94.
- Baba A. and Tayfur G., 2011. Groundwater contamination and its effect on health in Turkey , ENVIRONMENTAL MONITORING AND ASSESSMENT, 183 **(**1-4**),** 77-94.
- Bombar G., Elci S., Tayfur G., Guney S. and Bor A., 2011. 'Experimental and numerical investigation of bed-load transport under unsteady flows.' JOURNAL OF HYDRAULIC ENGINEERING, 137 **(**10**),** 1276-1282**.**
- Bombar G., Guney M.S., Tayfur G et al., 2010. 'Calculation of the time-varying mean velocity by different methods and determination of the turbulence intensities.' SCIENTIFIC RESEARCH AND ESSAYS, Volume:5, Issue:6, Pages:572-581.
- Gurer, I., Ucar I., Tasdemir G., 2010. Hydroclimatology of Sarız creek watershed, and simulation of the snowmelt runoff using remote sensing and geographic information systems, Global Change and the World's Mountains Symposium, Perth-Scotland.
- Gurer, I., Ucar, I., 2010. The importance of flood zoning using GIS: A case study from Macka, Trabzon, Northeastern Turkey, BALWOIS 2010 Conference on Water Observation and Information System for Decision Support Makedonya-Ohrid.
- Kadıoglu M., 2011. "Disaster risk mangement: expecting an unforeseen, managing the worst", Marmara municipalities Union, Publication Number 65, Istanbul (in Turkish).
- Ulke A, Ozkul S, Tayfur G, 2011. 'Empirical Methods for Predicting Suspended Sediment Load in Gediz River', TEKNIK DERGI, 22 **(** 2), 5387-5407**,** 2011.
- Tayfur G, Singh VP, 2011. 'Simulating Transient Sediment Waves in Aggraded Alluvial Channels by Double-Decomposition Method', JOURNAL OF HYDROLOGIC ENGINEERING, 16 **(**4**),** 362-370**.**
- Tayfur G, Singh VP, 2011. 'Predicting Mean and Bankfull Discharge from Channel Cross-Sectional Area by Expert and Regression Methods', WATER RESOURCES MANAGEMENT**,** 25**(**5), 1253-1267**.**
- Tayfur G, Tanji KK, Baba A 2010. 'Two-dimensional finite elements model for selenium transport in saturated and unsaturated zones.' ENVIRONMENTAL MONITORING AND ASSESSMENT, Volume: 169, Issue: 1-4, Pages: 509-518.
- Tayfur G, Tanji KK, Baba A 2010. 'Two-dimensional finite elements model for boron management in agroforestry sites .' ENVIRONMENTAL MONITORING AND ASSESSMENT, Volume: 160, Issue: 1-4, Pages: 501-512.

1.6 Participation in international scientific meetings

1.6.1 Meetings hosted by the country

Following meetings were hosted;

- International Sustainable Water and Waste Water Management Symposium, Konya, 26-28 October 2010.
- 2nd Internatonal Istanbul Water Forum, Istanbul, 3-5 May 2011.

1.6.2 Participation in meetings abroad

National representatives were participated to the

- ISARM 2010 International Conference: "Transboundary Aquifers: Challenges and New Directions", Paris, 6-8 December 2010.
- 6th World Water Forum, Marseille, 12-17 March 2012.
- UNECE task force and working group meetings related to Convention of the Protection and Use of Transboundary Watercourses and International Lakes.

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/programmes listed below:

EMWIS, Euro-Mediterranean Water Information System
NIMH, Bulgarian National Hydrology and Meteorological Institute
U.S. National Committee for IHP
UfM, Union for Mediterranean

1.7.2 Completed and ongoing scientific projects

Following projects supported by EU Programmes were completed;

- The Project on Capacity İmprovement for Flood Forecasting and Flood Control in the Turkey Bulgaria Cross Border Cooperation Region
- Capacity Buiding Support to the Water Sector in Turkey-Buyuk Menderes River Basin Management Plan
- Water Database Project
- Development of GIS Based Discharge Estimation Models to Determine Discharges in Ungauged Basins: Case Study Kızılırmak Basin

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2012

DSI representative will attend 20th session of the Intergovernmental Council of IHP from 4 to 7 June 2012.

2.2 Activities foreseen for 2013 - 2014

Turkey will continue to re-organise/support its longstanding IHP activities, namely, post graduate course on sediment transport technology, world water day celebrations, national and international symposiums, seminars, congresses and forums. In this regard, already scheduled activities are as follows;

- 3rd Istanbul Water Forum, Istanbul 2013.
- 7th National Hydrology Congress, Isparta, 2013.

Participation to the UNESCO-IHP courses will be encouraged and supported with a view to increasing capacity especially on the integration of flood risk management, climate impact, ecosystem and transboundary water management issues into river basin management.

Attandence of governmental representatives in IHP events such as intergovernmental council sessions, committee and hydrological programme meetings, and workshops will be supported.

2.3 Activities envisaged in the long term

A working group consisting of water related institutions, universities, science and research institutions, NGOs and business representatives will be established in order to identify the research themes and projects with the aim of supporting projects and research studies in the agreed areas in line with IHP programme.

Appropriate co-ordination with respect to funding of research studies and projects will be ensured.

Links among other national and international bodies will be established in order to provide technical assistance for the studies.

NATIONAL REPORT ON IHP RELATED ACTIVITIES FOR THE 20TH SESSION OF THE IHP INTERGOVERNMENTAL COUNCIL

PARIS, JUNE 2012

UNITED KINGDOM

1. ACTIVITIES UNDERTAKEN IN THE PERIOD JUNE 2010 – MAY 2012

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 2 March 2011 and 6 March 2012. 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 2012).

Natural Environment Research Council (NERC)
Centre for Ecology and Hydrology (CEH)
Department for Environment, Food and Rural Affairs (DEFRA)
Department for International Development (DfID)
Department for Transport (DfT)
Welsh 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 Category II IHP-HELP Centre of Water Law, Policy & Science, Dundee
UK Committee of the International Association of Hydrological Sciences (IAHS)
UK in WMO Commission for Hydrology (WMO-CHy)
UK Water Industry Research (UKWIR)
British Hydrological Society (BHS)
International Association of Hydrogeologists (IAH)
UK National Commission for UNESCO

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 as its secretary.

1.1.2 Status of IHP-VII activities

IHP-VII Themes:

The UK is able to contribute towards the IHP through a large number of current scientific research programmes at a national and international scale. Table 2 outlines examples of activities by UK researchers pertinent to Phase VII of the IHP.

Table 2 UK participation in/contribution to IHP-VII (Note: many projects contribute to multiple IHP-VII Themes/Focal Areas but are only reported against one area).

THEME 1: ADAPTING TO THE IMPACTS OF GLOBAL CHANGES ON RIVER BASINS AND AQUIFER SYSTEMS	
Focal Area 1.1	Study of Hydrologic and Carbon Services in the Western Ghats: responses of Forests and Agro-Ecosystems to Extreme Rainfall. Funded by the NERC and Indian Ministry of Earth Sciences. *University of Dundee IHP-HELP Centre*
Focal Area 1.2	Analysis to quantify and predict components of the current and future global water cycle and related water resources. Evaluation of uncertainties and clarification of overall vulnerability of water resources within key societal and economic sectors. Research contributions through coordination of the EU-FP6 WATCH (Water and Global Change) project. Outputs published in 2011. *Centre for Ecology & Hydrology* Systematic review of glacier shrinkage in the Hindu-Kush Himalayas in order to provide an evidence base for policy decisions by the UK Department for International Development (DFID). Project findings incorporated into a region assessment of the impacts of climate change in the Hindu Kush-Himalayas presented at UNFCCC COP-17 (December 2011, Durban, South Africa). *Centre for Ecology & Hydrology, University of Salford* Analysis of driving forces and policy measures likely to affect future pan-European water demand as part of the EU-FP6 SCENES (Water Scenarios for Europe and for Neighbouring States) project. *Centre for Ecology & Hydrology* Analysis of observed streamflow trends in near-natural catchments across Europe. *Centre for Ecology & Hydrology*
Focal Area 1.3	Development of a catalogue of observed European droughts and floods (delivered as part of EU-FP7 WATCH project). *Centre for Ecology & Hydrology, University of Reading* Investigation of climatic sensitivity of river flow regimes in: northern North Atlantic region, Western Europe, Turkey, pan-Mediterranean and the UK. *University of Birmingham* Research into the role of basin properties in modifying hydrological responsiveness to the climate. *University of Birmingham, Centre for Ecology & Hydrology*
Focal Area 1.4	Launch of web-based archive of information on groundwater occurrence and investigations in the Southern African Development Community (SADC) region, containing over 2000 reports and

	maps from the 'grey literature'. *British Geological Survey* Research to improve the understanding of the impacts of climate change on groundwater resources and local demand in Africa. Including development of an aquifer resilience map, case studies of aquifer resilience to climate change and policy recommendations for sustainable groundwater development and management. *British Geological Survey*
THEME 2: STRENGTHENING WATER GOVERNANCE FOR SUSTAINABILITY	
	Project to bring together the non-governmental organisations in four river basins (Tweed and Dee in Scotland, Fraser in Canada and Motueka in New Zealand) to explore their roles in policy delivery and participatory management. *University of Dundee IHP-HELP Centre, University of St. Andrews* Integrated catchment management research reviewing experiences of non-governmental catchment organisations outside Scotland and their relationship with statutory delivery of catchment improvements. Working with a wide range of HELP basins in the UK, Europe, Philippines, USA and Australia to compare approaches to priority setting; to stakeholder engagement, and to aligning plans between local communities and national targets. *University of Dundee IHP-HELP Centre*
Focal Area 2.2	Development and dissemination of results from comparative studies into governance, legal regimes for good water governance, and indicators for governance, working with stakeholders on basin and global scale. Projects build capacity and develop better legal and administrative frameworks. EU-FP6 projects: STRIVER and BRAHMATWINN; EU-FP7 projects: GENESIS, LIVEDIVERSE, AQWA and LAGOONS. *University of Dundee IHP-HELP Centre*
Focal Area 2.4	Two year project for LVBC (Lake Victoria Basin Commission), funded by the World Bank through the EAC (East African Community), to develop a new water release and abstraction policy for the Lake Victoria basin. *Centre for Ecology & Hydrology* Ongoing development of a wetland management plan for a NELSAP (Nile Equatorial Lakes Strategic Action Programme) project, funded by the World Bank through the NBI (Nile Basin Initiative), which will develop an integrated watershed management plan for the Kagera basin, the principal tributary to Lake Victoria. *Centre for Ecology & Hydrology* Production of a guide on the 1997 UN Watercourses Convention, which seeks to make the text of Convention more accessible to a range of stakeholders. *University of Dundee IHP-HELP Centre* Regional assessments of the role and relevance of the 1997 UN Watercourses Convention in East Africa, South East Asia, China, Central Asia, South America and the Congo *University of Dundee IHP-HELP Centre* Participation in 6th World Water Forum, including in a high level panel Global Water Governance organised by World Water

	Council; a WWF organised side event on UN Watercourses Convention; a thematic session co-organised along with IUCN, WWF and others; and a side event organised with Finnish Government (SYKE) and UNECE on relationship between the UN Watercourses Convention and the UNECE Water Convention. *University of Dundee IHP-HELP Centre*
THEME 3: ECOHYDROLOGY FOR SUSTAINABILITY	
Focal Area 3.1	Review of the Lake Naivasha, Kenya ecohydrology initiatives published in *Freshwater Reviews* (December 2010). *University of Leicester* East African Great Lakes Observatory (EAGLO) project seeking to share scientific knowledge through establishing a regional-wide database and network between scientists, decision-makers and development agencies/NGOs responsible for poverty alleviation. Project funding under joint NERC, Economic & Social Research Council (ESRC) and DfID *Ecosystem Services for Poverty Alleviation* research programme. *University of Leicester* Study of forest management and flood alleviation to improve understanding of the water storage capacity of organic soil-subsoil below ancient forest, planted forest and grassland. *University of Dundee IHP-HELP Centre, James Hutton Institute, Abertay University and Forestry Commission* Study of the hydrological impacts of reforestation of the middle hills of Nepal and links with community water supply. UK project funded by the Royal Society. *University of Dundee IHP-HELP Centre*
Focal Area 3.2	Spatial assessment of ecosystem services in Europe. Analysis of methods, case studies and policy as part of the PEER (Partnership for European Environmental Research) research on ecosystem services. *Centre for Ecology & Hydrology*
THEME 4: WATER AND LIFE SUPPORT SYSTEMS	
Focal Area 4.4	Partnership project funded by the Scottish Government and SEPA in the Eddleston subcatchment of the Tweed HELP basin (Scotland) to take forward twin objectives of habitat maintenance and natural flood management within a catchment approach and considering the inputs of stakeholders. *University of Dundee IHP-HELP Centre, British Geological Survey, Forestry Commission, Scottish Borders Council and Tweed Forum*
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 bodies. *Various UK Universities* Masters courses in *Water Law*, *Water Governance and Conflict Management* (offered in collaboration with UNESCO IHE) and *Water Resources Management and Law* (with United Nations University Institute for Environment and Health). Short courses and training provision are provided at tertiary and professional level. *Dundee UNESCO IHP-HELP Centre* International Water Law Symposium hosted by the Dundee IHP-

	HELP Centre in cooperation with the Regional Centre on Urban Water Management in Tehran (June 2010). *University of Dundee IHP-HELP Centre*
Focal Area 5.2	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 Hydrology & Ecology, British Geological Survey* Water law training course conducted in cooperation with the Regional Centre for Urban and Water Resources Management (April 2011, Kish, Iran). *University of Dundee IHP-HELP Centre*
Focal Area 5.4	Investigation of knowledge controversies around flood management in the Wooler and Eddleston catchments (Scotland). Funded through the UK *Rural Economy and Land Use* Programme. *University of Dundee IHP-HELP Centre, Universities of Newcastle, Durham and York and Tweed Forum* Series of training and awareness raising workshops related to the 1997 UN Watercourses Convention in East Africa (Addis Ababa, Ethiopia) and Southeast Asia (Siem Reap, Cambodia and Hanoi, Vietnam) *University of Dundee IHP-HELP Centre* Seminar at Stockholm World Water Week 2011 on *Strengthening Water Diplomacy in Transboundary Basins* - co-organised with IUCN, GWP, UNESCO-IHP and the Swiss Agency for Development and Cooperation. *University of Dundee IHP-HELP Centre*

Cross-Cutting Programmes:

The UK continues to play a leading role in many of the cross-cutting and associated programmes of the IHP. Current involvement includes that detailed below.

FRIEND

The UK has maintained its involvement in the FRIEND Programme providing support and research contribution to FRIEND initiatives worldwide through the activity of many hydrologists from across the country. Harry Dixon (CEH) replaced Gwyn Rees (CEH) as the UK representative on the Steering Committee of European (EURO) FRIEND in March 2011. Gwyn Rees is remains a member of the Steering Committee of Hindu Kush Himalayan (HKH) FRIEND. Helen Houghton-Carr (CEH) continues to represents the UK on the Steering Committee of Southern Africa (SA) FRIEND

Professor David Hannah (University of Birmingham) coordinated the EURO-FRIEND Project Group 3 (Large Scale Hydrological Variations), one of four sub-projects of European FRIEND between 2003 and 2012 and continues to be actively involved in a number of FRIEND activities. Harry Dixon acts as a Regional Coordinator of the EURO-FRIEND European Water Archive (EWA).

UK scientists have participated in a range of FRIEND initiatives over the reporting period, including:

- Harry Dixon and David Hannah attended the EURO-FRIEND Steering Committee meeting held in October 2010 (Fez, Morocco).
- David Hannah continues to contribute to the development of the Programme through participation in a number of meetings between FRIEND Project leaders and the IHP Secretariat held since 2011.

- Ten UK scientists contributed towards the Sixth World FRIEND conference, *Global Change: Facing Risks and Threats to Water Resources* (Oct 2010, Fez, Morocco). Conference proceedings were published in the UK by IAHS Press. David Hannah was a member of the conference's International Organizing Committee and contributed to the 6th Global FRIEND Report.
- Gwyn Rees was amongst a team of six EURO-FRIEND based scientists that delivered a regional study course on *Climate Change, Hydrological Droughts and Floods* in Thimphu, Bhutan (November 2010).
- The University of Birmingham, King's College London and others have continued activities contributing to EURO-FRIEND Project Group 3. In addition to a number of individual research projects, a conference session was convened at the EGU General Assembly (April 2011) on the issue of *Large-scale hydrology* and a special issue of Hydrological Processes was published.

Significant UK research contributions to the FRIEND programme have been conducted over the reporting period, examples of which include:

- Between 2007 and 2011 considerable contributions to the FRIEND Programme were made through the EU-FP6 WATCH (Water and Global Change) project – see Section 1.1.2 for examples of this research (CEH).
- Research into the connections between Atmospheric Rivers and winter/autumn flooding in the UK and Western Europe (University of Reading).
- Continuing research into climate-hydrology interactions (University of Birmingham and CEH).
- David Hannah, Gwyn Rees, Dr. Christel Prudhomme (CEH) and other EURO-FRIEND co-authors published an invited commentary paper regarding *Large-scale river flow archives: importance, current status and future needs* (2011).

HELP

The University of Dundee IHP-HELP Centre for Water Law, Science and Policy, a Category II 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:

- Continuing initiatives within the active UK HELP basins including the Don, Eden, Tweed, Dee and Thames.
- Professor Mike Bonell (University of Dundee) participated in the 2010 IHP//IAHS Kovacs Colloquium, *Hydrocomplexity: New Tools for Solving Wicked Water Problems* (July 2010, Paris).
- Professor Chris Spray (University of Dundee) contributed to the 2nd International HELP Symposium (November 2011, Panama).
- Dr. Sarah Hendry (University of Dundee) and Mike Bonell led a collaborative project (*Developing Networks Amongst UK River Basins: Interfacing Science with Emerging Law and Policy Frameworks*) funded by the Carnegie Trust to identify synergies across UK and Irish HELP basins.
- Research conducted by the Dundee IHP-HELP Centre, in both the water law/policy and science fields, continues to develop the HELP approach and involve the HELP network/basins – see Section 1.1.2 for examples of this work.
- Dr David Harper (University of Leicester) continues to jointly coordinate two HELP basins, the Welland (UK) and Lake Naivasha (Kenya). The *Welland River Trust* was incorporated in 2010 and works to advance the principles of the HELP and the UNESCO Ecohydrology programmes.

Associated Programmes:

G-WADI

The involvement of UK scientists in the development of the G-WADI programme continued between 2010 and 2012. Professor Mike Edmunds (University of Oxford) continues to serve on the G-WADI steering committee and has been involved in coordination of activities across the global network. UK contributions over the reporting period include:

- Mike Edmunds chaired a special session of the international conference, *Arid and Semi-arid Development through Water Augmentation* (December 2010, Valparaiso, Chile) at which the regional G-WADI for Latin America and the Caribbean (LAC G-WADI) was inaugurated.
- Following the G-WADI workshop on *Water – Science, Policy and Capacity Building* (April 2010, Dakar), which was coordinated by Mike Edmunds, a new regional network for Africa (G-WADI AFRICA) was setup.
- Mike Edmunds presented a paper on *Water based rural development and water security in semi-arid regions* as part of a special IHP session at the *2nd Arab Water Forum* (November 2011, Cairo).

ISI

The UK has maintained active 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 ISI Core Steering Group and attended its meetings in September 2010 (Stellenbosch) and April 2011 (Vienna). Other recent UK contributions have included:

- Des Walling presented a paper at the, ISI co-sponsored, *International Symposium on River Sedimentation* (September 2010, Stellenbosch, South Africa).
- ISI is collaborating with SedNet, the European Sediment Network, to develop a Practical Training Course dealing with Sediment Management in Sustainable River Basin Management. Des Walling attended a meeting of a small group of ISI and SEDNET members in August 2011 (Paris), to discuss the development of such a course. A course outline has been produced and sources of funding to support the development of the course are being sought.
- Papers from a 2–day workshop on *Sediment Problems and Sediment Management in Asian River Basins* (held at the IAHS/IAH Scientific Assembly in September 2009, Hyderabad, India) and co-sponsored by IAHS, ISI and WASER were published as IAHS Publication no. 349 in late 2011. Des Walling coordinated the compilation of this publication and edited the individual contributions.
- Des Walling contributed to the UNESCO Technical Document in Hydrology, *Sediment Issues and Sediment Management in Large River Basins: Interim Case Study Synthesis Report*, and associated case study reports, published in 2011.
- Des Walling is a member of the Advisory Council of the UNESCO Category II *International Research and Training Center on Erosion and Sedimentation* (IRTCES, Beijing, China).

Ecohydrology

Dr. David Harper (University of Leicester) continues to play a leading role in coordinating research and capacity building activities in the area of Lake Naivasha (Kenya) – which was renewed as an IHP Ecohydrology Operational Demonstration Project over the reporting period. Recent UK contributions include:

- Ongoing research by the University of Leicester supporting the *Imarisa Naivasha* initiative to restore the ecosystem of Lake Naivasha (launched May 2011).

- A paper on the Lake Niavasha project was given by Ed Morrison (University of Leicester) at the First HELP Sub-Saharan Africa Basins Workshop (November 2011, Johannesburg, South Africa).
- David Harper's served as a Western European representative on the Governing Board for the UNESCO Category II *European Regional Centre for Ecohydrology* (Lodz, Poland) until his term of office ended in 2011.

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/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 *Hydrometry, Upland Hydrology* and *Applied Flood Hydrology*. The Society's latest International Symposium was held in Newcastle upon Tyne in July 2010 with delegates from 24 countries attending. *Hydrology Research* is the official journal of the Society and the Nordic Association for Hydrology.

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, and ISI (see Section 1.1.2). UK hydrologists sit on the Governing Boards of a number of Category II Centres (see Section 1.4).

The UK continues to actively engage with other National Committees in IHP Region 1, providing contributions to consultations and other initiatives. In September 2011, Alan Jenkins and Harry Dixon represented the UK National Committee for the IHP at the IHP Region 1 meeting in Dublin, Ireland.

The UK maintains strong links with the UNESCO Division of Water Sciences. Over the reporting period the National Committee for the IHP has provided a UK response to both the Member State consultations on the formation of IHP-VIII and feedback to the Evaluation Committee for IHP-VI.

Nationally Alan Jenkins and Harry Dixon (as Chair and Secretary of the UKCNIH) represent UK involvement in the IHP on UK National Commission for UNESCO initiatives. Harry Dixon attended the recent UNESCO Category II status renewal evaluation of the Dundee IHP-HELP Centre as an observer on behalf of the UK National Commission. Through the Commission the IHP National Committee provides input on relevant policy issues to both UNESCO and UK Government.

Professor Pat Wouters (University of Dundee IHP-HELP Centre) serves on the International Advisory Committee for the United Nations University Institute of Water, Environment and Health (UNU-INWEH) as well as the UK National Commission for UNESCO's Scotland Committee and UNESCO Chairs Group.

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 recently completed European Union Sixth Framework Programme for Research and Technological Development (EU-FP6) Integrated Project Water and Global Change (WATCH) provided opportunities for UK scientists to contribute to the FRIEND programme.

The UK, through NERC, are members of the EU Joint Programming Initiative on Water which has an international dimension and will be developed over the next 3 years as part of a Coordination and Support Action.

Through the Belmont Forum and G8 Heads of Research Councils (G8HORCs) the UK are contributing to the recently established International Opportunities Fund aimed at supporting excellent research on the themes of Coastal Vulnerability and Freshwater Security.

Within the UK the Natural Environment Research Council (NERC), the Economic & Social Research Council (ESRC) and the Department for International Development (DfID) continue to fund the *Ecosystem Services for Poverty Alleviation* (ESPA) research programme, a multi-disciplinary programme that aims to improve ecosystem management and contribute to reducing poverty in developing countries.

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.

Linkages with the IAHS are maintained through David Hannah, Chair of the UK National Committee for IAHS, and UK scientists continue to contribute to a wide range of IAHS Commissions and activities. At the XXV IUGG General Assembly (July 2011, Melbourne, Australia) a total of ten IAHS symposia and workshops were (co-)convened by UK hydrologists.

Professor Mike Acreman (CEH) continues to offer support to the Ramsar Convention on Wetlands as a member of the Scientific and Technical Review Panel. Dr Eleanor Blyth (CEH) is a member of the Global Energy and Water Cycle Experiment (GEWEX) Scientific Steering Group. Pat Wouters is a member of the Global Water Partnership Technical Experts Committee and sits on the World Economic Forum Global Agenda Council on Water Security.

UK hydrogeologists continue to be actively involved in a number of Commissions and Working Groups of the IAH. The British Geological Survey (BGS) has continued its involvement in IAH/UNESCO IHP sponsored initiatives related to the development of the global network on Managed Aquifer Recharge (MAR). Dr. Ian Gale (BGS) continues to be actively involved in MAR-NET and was a member of the organising committee for the 7th International Symposium on MAR (October 2010, Abu Dhabi).

1.2.5 Other initiatives

1.3 Educational and training courses

The UK continues to provide and contribute to a wide range of hydrological training and education both nationally and overseas. See other areas of report for examples, including current educational initiatives by the Dundee IHP-HELP Centre. In 2011 the British Hydrological Society launched a studentship scheme to help support members who wished to study hydrology at postgraduate masters level.

1.3.1 Contribution to IHP courses

See other sections of report.

1.3.2 Organization of specific courses

1.3.3 Participation in IHP courses

See other sections of report.

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

University of Dundee IHP-HELP Centre for Water Law, Science and Policy (UNESCO Category II Centre)

The Centre for Water Law, Science and Policy was officially launched as a Category II IHP-HELP Centre under the auspices of UNESCO in November 2006. The Centre

underwent its five yearly UNESCO Category II status renewal evaluation in December 2011, the report and recommendations from which are still awaited.

The Centre aims to find new ways of effectively integrating law, policy and science to address water challenges of the 21st century. Activities fall within the following main areas, all of which are relevant to IHP-VII:

i. Promotion of an interdisciplinary approach to addressing global water issues with a focus on poverty reduction and international development issues, and, including water law as an essential and integral element thereof.

ii. Provision of intellectual leadership necessary in achieving this approach and dissemination of relevant research and scholarship on the topic.

iii. Communication of legal expertise on global water issues for the IHP-HELP Programme, especially through the HELP Regional Coordinating Units, as well as to support the other water-related activities of IHP.

iv. Operation of the Regional Coordinating Unit for the European HELP basins.

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 Section 1.1.2. IHP-VII Theme 5: *Water Education for Sustainable Development* (tertiary education) is of high relevance to the centre's work. Graduate degree programmes are offered in collaboration with UNESCO IHE and UNU-INWEH. The Centre works with the Global Water Partnership *International Knowledge Chain Scholarship Programme* to enable students to study international water law at Dundee. Over the reporting period, the Centre has collaborated with the Category II *Regional Centre on Urban Water Management* in Tehran to host an International Water Law Symposium (June 2010) and training course (April 2011).

As the European Regional Coordinating Unit for IHP-HELP basins, the Centre continues to actively contribute towards this cross-cutting programme; details of some recent initiatives in this area are given in Section 1.1.2.

European Regional Centre for Ecohydrology (UNESCO Category II Centre)

David Harper (University of Leicester) served as Western European representative on the Centre's Governing Board between 2006 and 2011.

International Research and Training Centre on Erosion and Sedimentation (UNESCO Category II Centre)

Des Walling (University of Exeter) continues to serve as the Region 1 representative on the Centre's Advisory Council.

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

UK hydrologists continue to be involved in collaboration with counterparts in the Republic of Ireland with scientists from the Northern Ireland Rivers Agency and

Northern Ireland Environment Agency attending the annual Irish National Hydrology Conferences in 2010 and 2011.

1.7.2 Completed and ongoing scientific projects

See other sections of report.

2. FUTURE ACTIVITIES

2.1 Activities planned until December 2012

See other sections of the report. UK hydrologists will organise and contribute to wide range of forthcoming international activities, including:

- UNWC Global Initiative Symposium, *The 1997 UN Watercourses Convention – what relevance in the 21st century*. Co-organised by the Dundee IHP-HELP Centre for Water Law, Policy & Science and WWF (June 2012, Dundee, UK).
- 3rd Annual International Law and Transboundary Freshwaters Symposium and Workshop: *Preparing for the 2013 International Year of Co-operation*, Dundee IHP-HELP Centre for Water Law, Policy & Science (June 2012, Dundee).
- Adrian Collins (ADAS) is a member of the Organising Committee for the IAHS-International Commission on Continental Erosion Conference on *Wildfire and Water Quality: Process, Impacts and Challenges* (June 2012, Banff, Canada).
- British Hydrological Society 11th National Hydrology Symposium, *Hydrology for a Changing World* (July 2012, Dundee, UK).
- Des Walling is a member of the International Organising Committee and Chair of the Scientific Committee for the IAHS-International Commission on Continental Erosion Symposium on *Erosion and Sediment Yields in the Changing Environment* (October 2012, Chengdu, China).

2.2 Activities foreseen for 2013-2014

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.

Report compiled by Dr. Harry Dixon and Professor Alan Jenkins (Centre for Ecology and Hydrology) on behalf of the UK Committee for National and International Hydrology. May 2012.

For further information regarding the activities outlined in this report please contact Harry Dixon (harr@ceh.ac.uk).