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**RESULTS OF IHP-VI PROJECTS SINCE THE
16TH SESSION OF THE INTERGOVERNMENTAL
COUNCIL OF IHP
(AS OF 31 MAY 2006)**

Item 9.1 of the provisional agenda

SUMMARY

The Council may wish to comment on the results reported in this document and is invited to review foreseen activities.

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INTRODUCTION

A summary of the progress and results of activities related to IHP-VI Themes and Focal Areas is presented below. The information provided in this document is complemented by those included in several other Council documents, inter alia, IHP/IC-XVII/Inf.5 (overview of newly-established category II water-related centres), IHP/IC-XVII/Inf.7 (IHP-related extrabudgetary activities), IHP/IC-XVII/Inf.8 (cooperation with other UNESCO environmental programmes), IHP/IC-XVII/Inf.10 (reports on the International Sediment Initiative and the International Flood Initiative) and IHP/IC-XVII/Inf.13 (IHP's participation in the 4th World Water Forum).

I. THEME 1: GLOBAL CHANGES AND WATER RESOURCES

Focal Area 1.1 Global estimation of resources: water supply and water quality and Focal Area 1.2 Global estimation of water withdrawals and consumption

Progress and results achieved from August 2004 up to 31 May 2006:

- Within the framework of the Joint International Isotopes in Hydrology Programme (JIIHP), implemented by IHP and IAEA, a CD-ROM, which includes a complete set of training material on isotopes application in hydrology, was published. The JIIHP supported an International Workshop on the Isotope Effects in Evaporation, held in Pisa, Italy in May 2006 to strengthen networking among scientists in different regions.
- The contents of a new WMO/UNESCO Manual for Water Resources Assessment were agreed upon at an expert meeting held in Geneva, Switzerland in September 2005.
- Participants were supported to attend the 4th International Implementation Planning Meeting held in Tokyo, Japan, February 2005 for the Coordinated Enhanced Observing Period (CEOP) and the 1st Integrated Global Observing Strategy Partners (IGOS-P) Integrated Global Water Cycle Observations Theme (IGWCO). The 5th CEOP meeting and the 2nd IGOS-P/IGWCO Workshop was hosted in Paris, France in February 2006, where IHP priorities on water cycle studies with a view of future cooperation with participating organisations were presented.
- The Arab Water problems and solutions workshop was organized jointly with the Arab Water Security Center in Damascus, Syria, January-February 2005. The participants approved sustainable training programme in the field of the Arab water resources with the support of all regional and international organisations, including UNESCO.
- ADST 2005 International Conference “Desalination Technologies: Outlook, Challenges and Opportunities”, held in Sharm El Sheikh, Egypt, May 2005, aimed at reviewing the status of desalination in Egypt and in Middle East. Participants exchanged research results and experiences, and recommended to conduct more research on desalination economics.
- The 7th Gulf Water Conference, held in Kuwait, November 2005, aimed at reviewing and assessing progress made in the GCC countries towards the adoption and implementation of comprehensive policies and strategies for IWRM. The conference resulted in better assessment of natural and non-conventional water resources in the region in relation to present and future water demands in the GCC countries. Recommendations from the conference included the GCC Water strategy.
- A study on “Climate variability in the region and its influence on water resources in Sri Lanka and Nepal” was prepared. The study in Nepal focused on the climate change and its influence on snow-cover and glaciers in the Himalaya. The Sri Lankan study focused influence on both short and long-term water availability and socioeconomic influences.
- Within the framework of UNESCO-led World Water Assessment Programme (WWAP) and World Water Development Report (WWDR), a National Water Development Report for Sri Lanka was prepared with specific focus on water resources availability, utilization and governance, and proceedings of the Preparatory Meeting for “Sri Lanka Water Development

Report” held in October 2004 in Sri Lanka was published. Advocacy Material on “Water: a Shared Responsibility” (2005) was prepared.

- A data synthesis system on water resources management was produced using GIS platform for Asia. The interactive CD on “Water Resources of Asia” was published in 2006, with special features on South Asia.

Expected results until December 2007:

- The contents of the WMO-UNESCO Manual for Water Resources Assessment will be completed for publication.
- The 8th Gulf Water Conference which will be held in Bahrain in November 2007.

Focal Area 1.3: Integrated assessment of water resources in the context of global land-based activities and climate change

Progress and results achieved from August 2004 up to 31 May 2006:

- International Symposium on Tropical Mountain Cloud Forests (TMCF), held in Hawaii, USA, July-August 2004 was supported, which explored climate-hydrological linkages and the hydrological importance of TMCF in tropical watersheds.
- Joint IHP/IAEA Integrated Science Initiative Workshop on the Transport and Fate of Organic Contaminants in Catchments was held in Munich, Germany, November-December 2004.
- A book “Forests, Water and People in the Humid Tropics. Past, Present and Future Hydrological Research for Integrated Land and Water Management” was published in December 2004.
- Integrated Science Initiative Workshop on groundwater-surface water interactions in river corridors was held in Oxford, UK, September 2005.
- Joint IHP-IAHS (PUB) Technical liaison group meeting to plan activities in IHP-VII was held at Oregon State University, Corvallis, USA, in November 2005.
- Scientific briefing “Future trends and fate of diffuse contaminants in catchments with special emphasis on stable isotope applications” was published in Journal Hydrological Processes (2006).
- Scientific Briefing “HELPIng FRIENDs in PUBs: Charting a course for synergies within international water research programs in gauged and ungauged basins” was published in Journal Hydrological Processes (2006).
- In continuation of the Humid Tropics Programme, a project funded by the Ford Foundation: “Land Use Change, Watershed Services and Socio-Economic Impacts in the Western Ghats, India” was carried out to address the global issue of the presently-unknown hydrological impacts arising from reforestation of degraded lands in the humid tropics. Reports “Influence of Land-use and Land Cover Change on Watershed Services and Socio-economic Impact in the Western Ghats region of India” and “Influence of Forest Cover on Watershed Functions in the Western Ghats: A Coarse Scale Analysis” were published (2006).
- An expert workshop on “Impact on reforestation-afforestation of degraded lands and the impacts on high and low flows” was held in Roorkee, India, March 2006. An Asia-Australia network of experimental basins was conceived. A set of recommendations for the consideration of the IGC was produced.
- A technical publication on Hydrology and Watershed Services was produced synthesizing findings of the activities carried out under the Ford Foundation-supported project.

Expected results until December 2007:

- Workshop “Forest and Water in a Changing Environment” will be held August 2006 in Beijing, China.
- Joint IHP/IAEA Integrated Science Initiative Workshop on Testing the Integrated Science Initiative linked with the planned joint HELP-University of Newcastle upon Tyne-OECD workshop “The future of rural land and water management, Research strategies to underpin integrated decision making” will be held at the University of Newcastle, September 2006.
- Final workshop on the joint IHP-FORD project “Land use change, Watershed services and socioeconomic Impact in the Western Ghat region of India” will be held in Bangalore, November 2006.
- Three planning meetings and joint IHP/IAEA Integrated Science Initiative Workshops will be held: one on the Chemical and Hydrobiological role of Wetlands in Arid/Semi-arid zones (2007), second on Extreme Hydrological Events and their Role in Transport of Particulates and Dissolved Matter at Different Scales (2008), and third on Integrated Monitoring and Modelling for assessment of different processes and catchment responses.
- Report of the Integrated Science Initiative Workshop on Groundwater-surface water interactions in river corridors will be published.

Results achieved in implementing Theme 1

- Extensive studies on Indian and South Asian water resources were performed, resulting in numerous publications and development of management tools and datasets.
- Water resources management priorities in Middle East were defined and training courses in water management strategies and technologies were implemented.
- Training materials in specific fields of hydrology were developed in collaboration with other international organisations.

II. THEME 2: INTEGRATED WATERSHED AND AQUIFER DYNAMICS

Focal Area 2.1: Extreme events in land and water resources management

Progress and results achieved from August 2004 up to 31 May 2006:

- The International Flood Initiative (IFI) was formally launched by the Director General of UNESCO, in the presence of the Executive Heads of WMO and UNU during the UN World Conference on Disaster Reduction (WCDR) held in January 2005 in Kobe, Japan.
- A set of recommendations on Water Security and Hydrological Extremes: Towards Sustainable Development in Africa was prepared by representatives of 32 Sub-Saharan African countries at a Conference organized in Abuja, Nigeria February-March 2006.
- Within the framework of the project on “Guidelines for the identification and management of strategic groundwater bodies to be used for emergency situations as a result of extreme hydrological events or in case of conflicts” (GWES), a framework document and several case studies were developed and published.
- The 4th International Symposium on River Engineering was held in Cairo, Egypt, June 2005, which focused on floods and droughts and their associated risks.

- An Expert group on Flood and Drainage Management in South Asia was formed by the Delhi Office.
- The first phase of the study on flood and drainage management in Kelani Ganga, Kalu Ganga and Bolgoda Basins in Sri Lanka was completed, coordinated by the IHP National Committee in Sri Lanka and carried out by the Department of Irrigation, Government of Sri Lanka.
- A report “Tsunami Disaster on the Water Resources of the Southeastern Coast of India” was prepared, which provides baseline hydrologic information, appropriate approaches for understanding the mechanisms of how tsunamis affect the groundwater system, impact assessment and strategic plans for appropriate groundwater management and remediation plans in the Indian coast.
- CD ROM “Land and Water Digital Media Series 19 - Major soil of the world” was translated into Chinese in 2004, which was co-sponsored by FAO.
- A training course on landslides and debris flow was held in Pyongyang, DPRK in December 2004 by State Hydrometeorological Administration (SHMA). Upon the request from DPRK National Commission and IHP National Committee, in 2005 the Beijing Office supported development of a flood forecasting model for Daedong River.
- LAC Regional Office supported ongoing Climate Outlook Forums held in the region. The forums brought together representatives of the Meteorological and Hydrological services.
- LAC Regional Office presented an analysis on “Water and Health” within the context of the Conference of the Parties (COP10) of the UNFCCC held in Buenos Aires, Argentina, in December 2004.
- A consultative group on disaster risk reduction was established in LAC within the framework of UNESCO ROTSLAC in February 2006 in Montevideo, Uruguay.
- Planning meetings for workshops on Climatic Variability and Land Cover Change Impact on Flooding and Low Flows-at what scales? were held in Austria (2005) and in Hungary (2006).
- Contribution was made to WMO CHy “Pristine basins” project in the form of a report written by a consultant titled “Pristine Basins: Sentinels of Climatic Variability and Change” in 2006.

Expected results until December 2007:

- Activities planned for GWES project include: (1) setting up cooperation with ICHARM; (2) launching GWES Central Asia Regional Programme in September 2006 at a meeting in Yazd; (3) publication of GWES Methodological guide for the management, protection and use of groundwater resources.
- The Expert group on Flood and Drainage Management in South Asia will organize a high-level regional conference on flood and drainage management in South Asia.
- A study on climate in Colombia will be supported.
- A workshop on climate change, organized by FRIEND/AMIGO LAC and IMTA, will be conducted during 2006.
- Investigations related to the water cycle and the global effects of climate change will be conducted in Ecuador.
- Special session in 5th FRIEND International Conference on land use change vis-à-vis meteorological and climatic impacts in the generation of floods and low flows will take place in Cuba, December 2006.
- A joint WMO CHy-HELP expert workshop on the hydrology of “Pristine Basins” will take place.

- A series of workshops on “Climatic Variability and Land Cover Change Impact on Flooding and Low Flows – at what scales?” will be held in 2007 and 2008.

Focal Area 2.2: International river basins and aquifers

Progress and results achieved from August 2004 up to 31 May 2006:

- Within the framework of cooperation with the Global Environment Facility, International Waters, several regional projects were initiated. An expert has been placed at UNESCO as the UNEP GEF/UNESCO Liaison Officer to assist in developing these projects.
- The Groundwater Resources Assessment under the Pressure of Humanity and Climate Change (GRAPHIC) project has been initiated in order to address the impact of global changes on groundwater resources. An international network was established under the coordination of the Research Institute for Humanity and Nature in Japan.
- Assistance to the Special Rapporteur of the United Nations International Law Commission (UN ILC) resulted in the preparation of a complete set of draft articles on the management of transboundary aquifers. Several international and regional seminars were organized with the participation of a legal consultant and groundwater experts (Paris, France, March 2005; New York, USA, November 2005; Japan, June 2006). Within the framework of the UNESCO-lead initiative on International Shared Aquifer Resource Management (ISARM), several regional meetings have been organized to prepare the inventory of the transboundary aquifers of the Americas, Africa and the Balkan region.
- A report on “Water governance as a manifestation of dialogue” was prepared as a result of a seminar organized in cooperation with the Stockholm International Water Institute and Centre for Water Law, Policy and Science at the World Water Week (Stockholm, August 2005).
- The WHYMAP consortium, lead by UNESCO and the Federal Institute for Geosciences and Natural Resources (BGR), implemented a database for the establishment of the hydrological map of the world at scale of 25.000.000.
- The UNESCO-WMO International Groundwater Resources Assessment Center (IGRAC) initiated the development of a Global Groundwater Information system (GGIS). The database and the maps provide a worldwide overview of selected groundwater related attributes.
- Joint activities were identified for the new interagency initiative set up by IHP and UNU-EHS on Groundwater for Human Security.
- Guidelines for the Sustainable Management of Non-renewable Groundwater Resources prepared jointly by the World Bank was published.
- IHP-led UNESCO-IAEA-IAH working group prepared for publication definitions and methodologies of ten groundwater sustainability indicators. One of the indicators was included in the 2nd edition of the WWDR.
- A training workshop “Integrated Groundwater Resources Management in Arid Regions” was held in April 2005, in Cairo, Egypt.
- Recommendations were prepared on the Step Towards Water Security aimed at presenting and discussing activities pertaining to increasing awareness on the advantages of artificial groundwater recharge with special reference to desalinated water in the GCC and the arid environments (Kuwait, February 2005).
- The 8th Regional Training Course on Groundwater Protection (GWP) and the 8th Steering Committee Meeting, held in Cairo, Egypt, November-December 2005, contributed to rational development and management of Ground Water resources.
- An expert group meeting on transboundary rivers of South Asia was organized in December 2004 in New Delhi, India.

- A pilot study of water resources mapping of the Maldives was implemented to collect and perform checks on the available surface and groundwater data. A tool to assess the status of water resources was prepared.
- Within the framework of the UNESCO/OAS ISARM Americas programme, an inventory of 62 transboundary aquifers in the Americas was developed. UNESCO/OAS ISARM Americas coordination meetings in El Paso (USA, November 2004) and Brasilia (Brazil, March 2005) as well as UNESCO/OAS ISARM-Americas Workshop (Brazil, in November 2005) facilitated the work.
- Three transboundary aquifers in critical areas of the Americas were chosen as models for implementation of aquifer management mechanisms (Artibonito and Masacre in the Hispaniola Island, Yrenda-Toba-Tarijeño in the Great American Chaco, and Hueco Bolson (Mexico-United States)
- Support was given to academic programmes and grants, such as the ALHSUD postgraduate grant programme “Ing. Germán Galarza”.
- Support was provided to the government of Uruguay for the decision-making and policy formulation for the sustainable exploitation of the Littoral Aquifer System.
- Biannual courses on groundwater organized by the School of Engineering of Uruguay of the University of the Republic (Montevideo, Uruguay, October-November 2004) were supported.
- The development of methodology for schematic cartography representation of the Regional Aquifer Systems was supported.
- The First Coordination Meeting of the UNESCO-OAS ISARM Americas Artebonito-Masacre, a GEF-funded project, took place in Santo Domingo, Dominican Republic, November 2005.
- A project “Assessment and Management of Transboundary Water Related Risks in the Balkans - TRANSRISKBA” has contributed to the development of an appropriate database at the UNESCO Chair/INWEB Centre and to the compilation of an inventory of shared surface waters in the SEE region following the UNECE framework document guidelines.
- Jointly with the United Nations Economic Commission for Europe (UNECE), a joint programme of activities on the Monitoring and Assessment of Groundwater Resources was established. Coordination has been set up with the representatives of the SEE countries to develop pilot projects.
- Jointly with United Nations Economic and Social Commission for Western Asia (UNESCWA), a project on Capacity Building for sustainable utilization, management and protections of internationally shared groundwater in the Mediterranean region was implemented.
- As partner of the Petersberg Process supported by the Ministry of Environment of Germany (BMZ), World Bank, GEF and GWP, IHP provided support to SEE countries on Karst Aquifer studies.

Expected results until December 2007:

- The development work of groundwater indicators, including case studies, will be published in the IHP Groundwater Series.
- Within the framework of the GRAPHIC project, a call will be made to all IHP National Committees for contribution of case studies or pilot projects.
- Jointly with UNU-EHS, a plan for an initiative on Groundwater for Human Security will be prepared.

- Second phase of ISARM programme will start in 2006, with an emphasis on legal and institutional aspects of transboundary aquifers.
- An expert group will be formed on transboundary river activities by involving ex-ambassadors and diplomats.
- A report on Transboundary Governance in Africa will be prepared as part of the second phase of the cooperation with the SIWI and BMZ at the Seminar that will be organized at the Stockholm World Water Week, August 2006.
- In collaboration with IHP National Committees of Mongolia and Japan, a new pilot project on Strategy for Sustainable Groundwater Use in Mongolia will begin in June 2006, with a national level training workshop as first activity.
- The preparation of the ISARM inventory on transboundary aquifers in Asia will be initiated.
- A pilot research on Transboundary aquifers in Heilongjiang-Amur River basin will be initiated in collaboration with the Geological Survey of China.
- Two Regional Coordination Meetings of UNESCO-OEA ISARM Americas Project will be held, one in El Salvador, November 2006 and another in 2007.
- Book on inventory of LAC transboundary aquifers will be published in 2006.
- GEF Project on Management of Risks to Sustainability of Coastal Aquifers in SIDS (MoRSCA) will be executed.
- A review of existing data on transboundary aquifers (hydrological, hydraulic, water quality and ecosystem characteristics as well as socio-economic data on water uses, institutions, policies and stakeholders) will be made in SEE.

Focal Area 2.3: Endorheic basins

Progress and results achieved from August 2004 up to 31 May 2006:

- Activities by the Water Centre for Arid and Semi-Arid Zones of Latin America and the Caribbean (CAZALAC), in La Serena, Chile, on endorheic basins were supported.

Expected results until December 2007:

- Call for case studies on endorheic basins will be launched in July 2006.

Focal Area 2.4: Methodologies for integrated river basin management

Progress and results achieved from August 2004 up to 31 May 2006:

- Preparation of Practice Guidelines for IWRM implementation in “Basins, Sub-basins and Aquifers (BSA)” was initiated. The guidelines will address new approaches for IWRM and their applicability under different realities including diverse climates, river basin properties and socio-economic contexts, with a particular focus on developing countries. An Expert Group meeting for the formulation of the guideline was held in July 2005.
- Organization of 5th International Symposium on Artificial Recharge (ISMAR-5) on managing aquifer recharge (MAR) in June 2005 in Berlin, Germany was supported. A booklet “Wise Strategies for Recharge Enhancement in Arid and Semi-Arid Areas” was published with IAHR MAR in 2005. Several workshops were organized to advance the development of a knowledge base, assess the use of the methods and take directions for future action in MAR. A workshop aimed at assessing the effectiveness of MAR was organized with the Scientific and Technical

Advisory Panel of GEF in New Delhi, India. The workshop supported STAP by providing guidance and advice to the GEF for action on groundwater related programmes.

- Activities of the International Sediment Initiative (ISI) focused on increasing awareness on sediment dynamics and erosion issues in water management, in order to promote sustainable management of soil and sediment resources at local, regional, and global scales. Activities carried out by International Research and Training Center on Erosion and Sedimentation (IRTCES) include: organization of the 9th International Symposium on River Sedimentation in October 2004 in Yichang, China; publication of a basic fact book on “Sediment Issues of the Haihe and Liaohe Rivers in China” both in Chinese and English; implementation of pilot research project on “Construction of Warping Dams and its Effect on Environment, Economy and Society in Loess Plateau Region in China”; organization of an International Training Workshop on Watershed Eco-environment and Water Resources Management in September 2005 at IRTCES, Beijing, China, in collaboration with the Beijing Office; organization of a National Workshop on Advanced Sediment Measurement Techniques in November 2005 in Zhengzhou, China; and formulation of a project proposal on the Global Evaluation of Sediment Transport (GEST), in order to develop representative case studies to verify the socio-economic and environmental risks caused by erosion and sedimentation.
- The UNESCO/ESA TIGER project organized a workshop in Pretoria (South Africa, November 2004), co-hosted by the Council for Scientific and Industrial Research and the Department of Water Affairs and Forestry (DWAF) of South Africa. TIGER Executive Bureau will be hosted in UNESCO Nairobi Office. UNESCO offices in Windhoek, Harare and Nairobi organized jointly with the UNESCO Chair in Western Cape, South Africa and with DWAF a training course: “Application of Remote Sensing for Integrated Management of Water Resources and Ecosystems” for participants from SADC in October 2005.
- A Manual/Resource kit was developed by the New Delhi Office, containing information about Regional Data for IWRM.
- The Beijing Office, in collaboration with WWAP and Mongolian National IHP Committee, carried out a Case Study from Mongolia with reference to the Tuul River basin for WWDR2, characterizing the water resources and the relevant institutional and political evolution.
- A diagnostic paper for a future draft methodology for IWRM in LAC was produced by the Regional Office, based on lessons learned from case studies of basins in the region and in coordination with the Practice Guidelines mentioned above.
- Guidance was provided to the consultancy carried out on the multi-basin case study under the project “Status of Integrated Water Management in Latin America and the Caribbean”.
- A plan for the implementation of ISI in LAC in 2006-2007 was prepared in two sub-regional workshops of experts in sediment transport in Brazil and Mexico.
- Postgraduate course on IWRM was conducted in Guatemala in April 2006.
- A course on “Quality of Coastal Waters”, with a particular focus on sediments, was held in Cartagena de Indias, Colombia in September 2005.
- A Training Course on Bio-monitoring and Assessment took place in Guayaquil, Ecuador, in August 2005, organized by the ESPOL and the University of Gent (Belgium).
- A project on “Dinaric Karst Aquifer Systems” was initiated and a project proposal was presented for GEF funding in Belgrade, Serbia, in February 2006.

Expected results until December 2007:

- Volumes “Guidelines for delineation of protection zones around public groundwater supplies and management policy”, “Groundwater Sustainability Indicators” and “Groundwater and Remote Sensing: practical applications” will be published in the IHP Groundwater Series.

- Proceedings of the ISMAR-5 conference will be published and ISMAR-6 conference will be co-organized in Phoenix, USA in 2007.
- Two ISI pilot projects will be carried out with IRTCES: “Sediment Management and Wetland Conservation at Yellow River Mouth” and “Integrated Physical and Ecological Management of Rivers-with Particular Reference to the East River”.
- Within the TIGER Project, the Windhoek Office, the Harare Cluster Office and the Regional Office in Nairobi will organize a training course on the application of satellite techniques for water resources and ecosystems management.
- Final report of the Yellow River case study of ISI will be published.
- Capacity-building activities on sedimentation will be developed in Itaipu, Brasil, during 2007.
- A book on Sedimentation will be published under the framework of the ISI LAC.
- ISI-LAC webpage and database will be established for Mesoamerica and South America regions.
- A course on IWRM will be held in Montevideo, Uruguay, as part of the masters programme on Environmental Engineering of the Universidad de la Republica.

Results achieved in implementing Theme 2

- 1st phase of UNESCO/OAS ISARM Americas Programme was completed and an inventory on LAC transboundary aquifers was published. Other regional ISARM inventories have been successfully launched.
- A framework document for the Project Groundwater in Emergency Situations and several case studies were developed and published.
- The global WHYMAP of transboundary aquifers was published.
- Cooperation with the European Space Agency was established within the framework of TIGER and activities have been expanded to strengthen capacity to apply remote sensing in the field of water.
- Successful launching of new GEF-funded projects, e.g., MoRSCA project in the Caribbean SIDS.
- ISI has gained momentum globally, with a Technical Secretariat in Beijing being established, and regional and river basin wide networks having been formed and/or strengthened.

III. THEME 3: LAND HABITAT HYDROLOGY

Focal area 3.1: Drylands

Progress and results achieved from August 2004 up to 31 May 2006:

- G-WADI (Global Network on Water and Development Information for Arid Lands, led by IHP) expanded its international scope with a number of events, including a hydroclimatology workshop (with WMO-WCRP) in Cairo, Egypt; a hydrological modelling workshop in Roorkee, India; an isotope and geochemical tracers workshop in London, the U.K.; and a global workshop in Paris. Priority needs were identified e.g., in the areas of data, models and the G-WADI website. A regional G-WADI network established for Asia and a workshop for the Asian G-WADI Pilot Sites held in New Delhi, India in 2006 resulted in guidelines for G-WADI pilot basin proposals. The U.K. continued its financial support to G-WADI.
- International Conference on Resources, Ecosystems and Sustainability of Arid and Semi-arid

Regions in Urumuqi, China in September 2004 was organized by the International Centre for Desert Affairs at Xinjiang University.

- Support was provided to a pilot project on Water Harvesting in Fars Province of Iran. This project won the Great Man-Made River Prize of UNESCO in 2005.
- In the Arab Region, new tools and concepts in water management were brought forward in the 9th International Water Technology Conference (Sharm El-Sheikh, Egypt, March 2005) and through the course Training of Trainers of AWRANet with ESCWA, CEDARE and UNEP.
- Knowledge on wadi hydrology was further expanded and disseminated through the 3rd Wadi Hydrology Conference (Sana'a, Yemen, December 2005) and the 8th International Training Workshop on Wadi Hydrology: Application Using Decision Support System (DSS), jointly organized with ALECSO and ISESCO (Amman, Jordan, June 2005).
- CAZALAC worked actively in the organization of capacity building courses, meetings, and implementation of projects, advancing significantly in the production of the regional map of arid and semiarid zones in LAC.

Expected results by December 2007:

- G-WADI: a side event during the international conference Future of the Drylands (Tunis, June 2006) on hydrological changes in the Mediterranean will be organized with IRD of France; the Arab Networks on Wadi Hydrology and the Ground Water Protection meet on the same occasion to consolidate the networks into the Arab regional G-WADI Network; content of the G-WADI website will be developed and will continue to provide news service on arid lands from sources in different languages; pilot schemes will be developed in India and China. A G-WADI workshop on groundwater modelling with focus on arid and semi-arid areas will review the state-of-the-art and produce case studies and other materials for dissemination.
- Support will be provided to CAZALAC activities on arid zones in LAC. Networking and cooperation will be enhanced among UNESCO water related centres focusing on arid and semi-arid areas. A pilot basin for field studies on semi-arid land hydrology at the Elqui Valley in Chile will be established.

Focal Area 3.2: Wetlands

The implementation of ecohydrology activities is reported on under this Focal Area.

Progress and results achieved from August 2004 up to 31 May 2006:

- Ten ecohydrology demonstration projects were launched around the world in 2005. One of the objectives of these projects is to demonstrate the application of the ecohydrology approach to solve issues surrounding water, environment and people. A brochure on these projects was published and a website launched, for information-dissemination purposes.
- A meeting of the Scientific Advisory Committee on Ecohydrology, held in November 2005 in Bali, Indonesia, recommended, inter alia, that Task Forces on ecohydrology be launched in the biennium 2006-2007.
- A consultative workshop "Towards integrating social & cultural aspects into ecohydrology" was held in Paris, France in December 2005, which developed a framework for facilitating the integration of social sciences into ecohydrology.
- The 2nd Workshop of MAB-ECOTONE Phase II and 4th Meeting of Southeast Asia Biosphere Reserve Network (SeaBRnet) with thematic discussions on Biosphere Reserve Application in Large Wetland Areas in Asia was held in Pakse, Lao PDR in October 2005.

- An International Symposium on Ecohydrology and the 3rd Asia Pacific Training Workshop on Ecohydrology, organized by the Indonesian Institute of Sciences (LIPI) and the Indonesian IHP National Committee, were held in Bali, Indonesia in November 2005; the proceedings were published.
- A meeting of experts in erosion and ecohydrology systems took place in December 2005 in Costa Rica, with the aim of addressing impacts of erosion and hydro-ecology systems.
- Educational programmes related to ecohydrology launched in Latin America include: a Masters Programme on “Environmental Evaluation of Hydrologic Systems” at the Universidad Nacional de la Plata, Argentina; and regional course “Development of Capacities in Integrated Management of Water Resources” (Asunción, Paraguay, July 2005).
- A JFIT project on conservation of water resources and biological diversity in the wetland of Polesie region was launched in May 2006. This project aims to generate new scientific knowledge through enhanced transborder scientific cooperation using two international tools: transboundary biosphere reserves of the MAB Programme and the ecological networks advocated by the Convention on Biological Diversity and elaborated by the Council of Europe.
- The formal inauguration of the European Regional Centre for Ecohydrology took place in Lodz, Poland in May 2006.

Expected results by December 2007

- The five Task Forces (TFs) appointed by IHP Bureau in May 2006—(i) Coastal Zones (ii) Monitoring and Impacts of Global Change (iii) Social Sciences (iv) Education and Capacity-building (v) Demonstration Projects—will be officially launched at a meeting in Faro, Portugal in June 2006. The TFs are expected to conduct further scientific research on ecohydrology, in particular to promote integration of the ecohydrology concept with related sciences and to develop education and capacity-building programmes.
- Ecohydrology demonstration projects will continue to be supported world-wide.
- The Scientific Advisory Committee of Ecohydrology, which was reconstituted at the 39th session of the IHP Bureau in May 2006, will hold its meeting in September 2006 in Paris and will develop new strategies for implementation of ecohydrology activities.
- A website on ecohydrology will be launched and brochures published, which will contribute to the wide dissemination of the concept and implementation activities.
- A Category II Asia Pacific Centre for Ecohydrology is foreseen to be established in Indonesia.
- Ecological sciences and the development of the ecohydrological approach will continue to be strengthened by LAC Regional Office through a number of activities, including: (a) ecological flows: Workshop-Seminar on Ecological Flows in Latin America, San José, Costa Rica, June 2007, a publication on ecological flows, a diagnostic on environmental flows to be jointly conducted by the Ecohydrology and ISI programmes, a regional workshop to be held in 2007; (b) Workshop on Ecohydrology Pre V FRIEND World Conference will be held in La Havana, Cuba in November 2006, which will be followed by a publication of the results of the conference; (c) a postgraduate course on ecohydrology, Haiti in 2006, a special seminar during the ecohydrology masters programme at the Universidad de la Plata, Argentina, 2006/2007, and a course on ecohydrology in Bogotá, Colombia, 2007.
- West Polesie Transboundary Biosphere Reserve is expected to be established and be functioning, and the scientific background for a Polesie regional ecological network focussing on the Valleys of the Bug and Pripyat Rivers will be set up.

Focal area 3.3: Mountains

Progress and results achieved from August 2004 up to 31 May 2006:

- A pilot project carried out in the Mount Kenya basin provided the elements for the preparation and publication of “Sustainable Management of Water Resources: Challenges and Prospects”.
- Knowledge base on hydrological aspect of the Andes is being expanded by the work of the Andean Working Group on Snow, Ice, and Glaciers. It held its 2nd meeting in Huaraz, Peru, July 2004, after the Workshop on Mass Balance of Andean Glaciers; the 3rd in Foz de Iguazú, Brazil, April 2005, in the framework of the IAHS Scientific Assembly; the 4th meeting jointly with the Training Workshop on Glacier Observation Methods in La Paz, Bolivia, August 2005, and the 5th in Mendoza, Argentina in April 2006, preceding the CONCORD Symposium on Climate Change.
- The field investigation capabilities of the LAC Andean Snow and Ice and Glaciers Working Group (Bolivian component) was increased by the acquisition of a steam drill device for glacier mass balance with financial support from LAC Regional Office.

Expected results by December 2007:

- Dissemination of knowledge thus far acquired by means of the publication of a book on LAC glaciers in 2007.
- Continuation of the work of the Andean Working Group on Snow, Ice, and Glaciers, by means of the 6th Coordination Meeting plus the 2nd Training Workshop on Glacier Observation Methods in 2007.

Focal area 3.4: Coastal zones

Progress and results achieved from August 2004 up to 31 May 2006:

- Activities of IHP-IOC project on submarine groundwater discharge were reviewed at the UNESCO-IAEA conference at the Marine Environment Laboratory of IAEA in Monaco in October 2004, focusing on diverse applications of tracers, such as for the assessment of groundwater cycling and coastal pollution. A volume “Submarine groundwater discharge: management implications, measurements and effects” was published in 2004.
- Contribution was made to the International Workshop on Freshwater-Coastal-Marine Management Interlinkages held in Mexico City, Mexico in preparation for the Global Forum on Oceans, Coasts, and Islands held in Paris, both in January 2006.
- A GEF project directed towards establishing regional and local capacity for groundwater and related land management in the coastal zone of the Caspian Sea was approved to be executed jointly by IOC and IHP. Likewise, a proposal on the Joint Management of Shared West African Coastal Aquifer Resources was prepared approved for GEF funding.
- A pilot study of water resources mapping was carried out by the New Delhi Office in Maldives involving data collection, data quality checks and preparation of an assessment tool. A series of activities to promote community participation in environmental, developmental and social issues in Maldives were undertaken.
- An investigation was undertaken to assess the impacts from the tsunami disaster on the water resources of the Southeastern Coast of India and to identify resistant groundwater resources, as emergency freshwater sources.
- Integrated Coastal Zone Management meeting was organized in Chennai, India to explore the usefulness of sectoral information to support decision-making. LOICZ, the Indian

Government and Chennai's Anna University were conveners.

- In order to highlight the relevance of desalination in LAC, a desalination session was organized within the framework of the V Inter-American Dialogue on Water Management (Montego Bay, Jamaica, October 2005); a study on the use of desalination plants in the Caribbean was carried out by the Caribbean Environmental Health Institute and is being published; a Group of Experts on Desalination was created with representatives of numerous Caribbean islands. The group first met in St. Lucia in April 2006 to establish a plan of activities.
- LAC Regional Office supported the establishment of the M Sc. Program on Integrated Coastal Zone Management at the Universidad de la República, Uruguay, in collaboration with the University of Dalhousie.

Expected results by December 2007

- Activities on coastal zones in the Caribbean will be further expanded, including the launching in 2006 of a GEF project on Management of Risks to Sustainability of Coastal Aquifers in the Caribbean SIDS having demonstration sites.
- Integrated Coastal Zones Management of Rio de la Plata (ECOPLATA) will be supported.
- Desalination activities in the Caribbean will be followed-up.
- The Mauritius Strategy for SIDS in the Caribbean, including enhancement of local capacity and initiatives for Sustainable Island Living, will be implemented.

Focal Area 3.5: Urban areas and rural settlements

Progress and results achieved from August 2004 up to 31 May 2006:

- A new modelling, planning and management tool on urban groundwater (UGROW), in cooperation with the University of Aberdeen, was developed.
- Draft guidelines on "Data requirements and management for integrated urban water management" were completed. Under the project "Integrated Urban Water Modelling and Management under Specific Climates", deliverables and workplans were defined by a series of workshops on Cold Climates, Arid and Semiarid Zones, Temperate Climates and Humid Tropics. The web-platform for "Urban water education and training tool UWETTT (Urban Water Education Training and Technology Transfer)" was developed.
- Draft guidelines on aquatic habitat in urban environment were examined in joint IHP/MAB workshops in Lodz, Poland, September 2005 and in Verona, Italy, May 2006.
- A volume on "Water, Sanitation and Sustainable Development: Challenges for the Cities in Developing Countries" was published in English, in collaboration with Veolia and the *Programme solidarité Eau* (PsEau).
- A Session at the International Conference on Water Sensitive Urban Design: Cities as Catchments was organized in Adelaide, Australia, November 2004. The proceedings have been published.
- The UNESCO/UNEP project on Assessment of Pollution Status and Vulnerability of Water Supply Aquifers of African Cities was continued. Several training courses and workshops related to groundwater protection and vulnerability were organized.
- A Training of Trainers Manual on Urban Water Management was developed by the Regional Centre on Urban Water Management (RCUWM) in Tehran through a ToT Workshop held in Tehran in February 2006 (MLA2); RCUWM continued its vigorous regional action through various projects and workshops.

- A meeting of experts from the Arab region held in July 2005 developed a framework for urban water resources assessment and management in Jableh Area in Syria with special focus on environment, archeological, architectural, soil and economic preservation.
- A study on traditional spouts as a source of drinking water in the Katmandu Valley was carried out in cooperation with RCUWM- Tehran and the IHP National Committee of Nepal.
- An integrated approach was presented at the International Capacity Building Course on Integrated Urban Flood Management (Lima, Peru, August 2005). The LAC Regional Office provided financial support for participants to this event.
- Four training courses were held in LAC to address the needs for Integrated Urban Flood Management and new related concepts; they were jointly organized with GWP and others and delivered in Venezuela, Ecuador, Peru and Colombia.

Expected results until December 2007:

- A landmark monograph on “Urban Water Conflicts: An analysis on the origins and nature of water-related unrest and conflicts in the urban context” will be launched in the World Urban Forum in Vancouver in June 2006.
- A number of monographs, guidelines and manuals will be published by 2007 as the various IHP-VI projects come to a close; this includes (i) a user’s manual for the Urban Groundwater Management Model (UGROW) and a book on Urban Groundwater Management; (ii) a monograph on “Data requirements and management for integrated urban water management”; (iii) books on urban water management indifferent climates for each climate (HT, CC, TC, ASA); (iv) monograph on “Urban aquatic Habitat”, joint IHP/MAB project; and (v) monograph on “Integrated urban water system interactions”.
- Systematic introduction of “groundwater and its sustainable utilization” into the AMCOW agenda and planned outcomes will be continued.
- A Category II Regional Center on Urban Water management for LAC in Cali, Colombia, supported by CINARA Institute of the Universidad del Valle will be established. A UNESCO/UNEP project on Assessment of Pollution Status and Vulnerability of Water Supply Aquifers of African Cities the following activities are planned.

Results achieved in implementing Theme 3

- The global network G-WADI on Water and Development Information for Arid Zones was significantly strengthened and expanded: the Asian G-WADI was launched, a number of well attended workshops of substantial scientific content were held, and the website is operational.
- CAZALAC, now having formally obtained the auspices of UNESCO, has consolidated its status in the region through multiple activities.
- The Ecohydrology programme has expanded its action through the launching of a number of demonstration projects and holding of workshops, and has strengthened its presence throughout the regions; the European Regional Centre on Ecohydrology was officially launched in May 2006.
- The Andean Glacier Monitoring Network has vigorously continued expanding the knowledge on hydrological processes in the Andes through a number of events and publications. The effects of climate change in Hindu Kush-Himalayas were also studied.
- Submarine aquifer discharge along coastal zones was examined through an IOC-IHP project. Two projects in coastal zones in cooperation with GEF were approved. The potential of desalinization of sea water in LAC is being thoroughly analyzed. In the Indian subcontinent various coastal zone water resources management studies were carried out mainly in India and the Maldives.

- The urban water management (UWM) programme has achieved solid progress through the production of deliverables, including a new generation prototype urban groundwater model, production of publications on the urban water cycle, ecological sanitation and urban water conflicts. A number of other products are in the pipeline such as guidelines for data acquisition and management for UWM, monographs for UWM in different climates, guidelines for urban aquatic habitats, and an urban water education and training platform.
- Regional actions were strengthened through RCUWM-Tehran and the newly approved regional centre for LAC in Cali, Colombia, plus a number of individual projects in other regions.

IV. THEME 4: WATER AND SOCIETY

Focal Area 4.1: Water, civilization and ethics

Progress and results achieved from August 2004 up to 31 May 2006:

- The 4th Conference of the International Water History Association on Water and Civilization was held in UNESCO, Paris, France, December 2005, and the outputs will be used to progress the production of the IHP book series on History of Water and Civilization.
- The Network of Water Anthropology (NETWA) was launched on UNESCO's web site. A booklet on NETWA is being printed.
- The Water Ethics and Governance (WEG) project was outlined. Field experts and members of COMEST met and decided to create Advisory Committee for WEG, with a fair geographical and gender distribution to replace the Advisory Committee for Water and Ethics.
- A group of experts studied Qanats from the engineering, managerial, geological, cultural, archaeological and socio-economical perspectives, and presented their work in Bam, Iran in June 2005. A publication is being prepared, which will serve as a reference for future use of Qanats systems in Bam and the other 36 countries hosting Qanats Systems.
- The Arab Network for Water Ethics (ANWE) was launched (March, 2006, Cairo), by the Cairo Office, in collaboration with the Regional Centre for Water Ethics in Cairo and the Regional Center for Training and Water studies.
- In collaboration with OAS, IHP unveiled the painting "Cascada del Indio" (Indian Fall) of the Uruguayan artist Juan Pablo Cao, in the "San Martin y Capitán Bermudez" park in Montevideo, March 2005.
- A workplan and guidelines for the elaboration of the Atlas of Water Cultures in Latin America were developed (Montevideo, Uruguay, October, 2004). Central American experts identified and recovered information and knowledge (reports, manuscripts, etc.) and developed components for the Atlas of Water Cultures in this sub-region (Tegucigalpa, Honduras, September 2005).
- A book "El Hidroscopio" introducing the social dimensions in the water management was published in partnership with PNUMA.
- LAC Regional Office took part in the "VI Reunión de Antropología del MERCOSUR" (Montevideo, November, 2005) and, in the "Nueva Cultura del Agua en América Latina" in Fortaleza, December 2005.
- The Working Group "Water and Gender in Latin America" identified its potential contribution to Member States on water and gender issues (Montevideo, Uruguay, May 2006).
- A special event on "Dialogue: Science, Water and Gender" was organized by LAC Regional Office during the Uruguay Science and Technology Week in Montevideo, Uruguay, May 2006.

Expected results until December 2007:

- The first volume (“The Ideas of Water”) of the book series History of Water and Civilization will be published.
- A publication of NETWA will be issued by the end of 2006.
- A series of technical files for Mexico, Uruguay, Argentina and Paraguay about information water-related knowledge and information gathering will be completed.
- Further progress on the Atlas of Water Cultures - South America Component will be achieved.
- The Working Group on Water and Gender for Latin America, and the one for the Caribbean Region, will meet separately to achieve further progress.

Focal Area 4.2: Value of water

Progress and results achieved from August 2004 up to 31 May 2006:

- AMCOW’s regional programme of action on water to create a framework for concrete actions in addressing key water-related concerns was supported. It contributed to organization of the following meetings of AMCOW: (a) 4th ordinary session (Kampala, Uganda, November 2004); (b) Technical Advisory Committee meeting (Kampala, March 2005); (c) Executive Committee (Addis Ababa, Ethiopia, June 2005); and (d) NEPAD/IRD/UNEP/ AMCOW workshop on developing centres of excellence for water sciences and technology (Nairobi, Kenya, May 2005).
- A case study on “Value of Water in Sri Lanka” was implemented.
- The concept of virtual water trade was introduced at the Inter-American Dialogue in Water Management (Jamaica, October 2005).

Expected results until December 2007:

- An MoU with AMCOW will be finalized.
- WEG Advisory Committee will meet and make a set of recommendations for IHP to play a key role in ensuring that the best ethical practices and good governance are widely and effectively promoted, on a global scale, and beyond the water sector.

Focal Area 4.3: Water conflicts – Prevention and resolution

Progress and results achieved from August 2004 up to 31 May 2006

- During the 2nd PCCP International Conference “Water a catalyst for peace” held in October 2004 in Spain, participants learned about alternative approaches for the management of shared water resources through co-operation.
- Software for the resolution of conflicts in water resources management was produced and published with its users’ manual on a CD ROM.
- A workplan for the creation of Masters Degree programme at UNESCO-IHE, covering the fields of water policy, law, science and water was prepared jointly with UNESCO-IHE and Centre for Water Law, Policy and Science, University of Dundee.
- The demo of a computer game was created to raise awareness about the challenges of climate change and co-operation around shared water.
- PCCP was listed by the United Nations Department of Public Information as one of the “10 stories the world should hear more about”.

- A group of experts from the Arab Region met in Beirut (July 2005) to adapt the PCCP training material to the Arab region and recommended to follow-up, with a focus on Iraq.
- A case study on the co-operation around the Lake Titicaca, Bolivia and Peru, was published in Spanish.
- Short courses on the promotion of co-operation in water management were adapted to the LAC region: A group of PCCP experts met twice to design the workplan and scenario for the adaptation/regionalization of the PCCP short course to the LAC region (Montevideo, Uruguay, May 2005; Miami, USA, October 2005).
- A Pilot Course “Conflict Prevention and Cooperation in Water Management in Latin America” was held in Guayaquil, Ecuador January 2006, followed by an Evaluation Workshop (Guayaquil, January, 2006), which decided how to improve the course material.
- PCCP LAC web page was created. It is being periodically updated.
- A group of experts from South East Europe met in Tessaloniki, Greece, in May 2005, and designed the workplan and scenario for the adaptation/regionalization of the PCCP short course in the region.

Expected results until December 2007:

- The English version of the Lake Titicaca case study will be produced.
- Three courses on “Conflict Prevention and Cooperation in Water Management in Latin America” will be held in Ecuador, Mexico and Brazil.
- PCCP LAC web page will be translated into Portuguese.
- The PCCP-LAC expert group will meet to decide on the way forward for the achievement of the PCCP objectives in the region.

Focal Area 4.4: Human security in water-related disasters and degrading environments

Progress and results achieved from August 2004 up to 31 May 2006:

- A Pilot project on “Community Based Flood Mitigation and Preparedness” was implemented in East Jakarta (Bidaracina) with local partners. A leaflet on the project and its benefits was disseminated to local governments and stakeholders.
- Jointly with the Basic and Engineering Sciences Sector of Regional Office for LAC, an advisory group of experts on disaster risk management in the region have been set up.

Expected results until December 2007:

- Following request of the local government of Jakarta, further projects on flood mitigation in other areas of Jakarta, with different local based NGOs, will be implemented.
- The advisory group on disasters will link with other relevant regional groups in LAC.

Focal Area 4.5: Public awareness raising on water interactions

Progress and results achieved from August 2004 up to 31 May 2006:

- An exhibition on “Water issues as perceived by our children” encouraged school children to participate in water security awareness activities in Alexandria, Egypt, December 2005. It enhanced public and students’ awareness on water problems.

- Best projects in the water resources/sciences category within the framework of the Fair of Science and Technology in Ecuador was awarded.
- The outcomes of the sub-regional Climate Outlook Forum (COF) were disseminated and support was given to the COFs of the South American Pacific Coast.
- For the first time, both English and Spanish speaking IHP National Committees and Focal Points in LAC met in Montego Bay, Jamaica, October 2005. They agreed to continue having such joint meetings.
- The 5th Inter-American Dialogue on Water Resources Management was co-organized and co-sponsored in Montego Bay, October 2005.
- LAC Regional Office presented its information platform at the 8th Water Information Summit and exchanged information with other water information initiatives held in Brasilia, June 2006.

Results achieved in implementing Theme 4

- Increased knowledge of indigenous populations and cultures' relation with water. Identification of documentation about their approaches to manage water through the activities of the Water and Culture programme.
- Increased awareness of actors in the water sector on the historical and cultural dimensions of water, and strengthened research in related matters.
- Atlas of Water Cultures of Central America was made available.
- Capacities of LAC Member States and other key players enhanced in the management of shared water resources, to anticipate, prevent, and resolve water conflicts.
- PCCP course adapted to Latin America and the Caribbean, and pilot course delivered.
- Involvement of minority groups in the development of water science and integrated water resources management encouraged.
- Improved awareness among stakeholders and general public on water related issues.
- Strengthening of IHP-LAC National Committees.

V. THEME 5: WATER EDUCATION AND CAPACITY BUILDING

Focal Area 5.1: Teaching techniques and material development

Progress and results achieved from August 2004 up to 31 May 2006:

- Training of Trainers Manual on urban water management developed by the Regional Centre on Urban Water Management through a ToT Workshop held in Tehran, Iran, February 2006.
- PCCP training material and an appropriate institutional framework for conflict resolution in the Arab region was developed by an expert group meeting for conflict resolution courses in the Arab Region in July 2005, in Notre Dame University, Lebanon.

Focal Area 5.2: Continuing education and training for selected target groups

Progress and results achieved from August 2004 up to 31 May 2006:

- Education grants were given to African students in Cameroon (3 students), Senegal (2), Burkina Faso (1), Kenya (10) and Uganda (2).
- Access to safe drinking water and sanitation was improved through implementation of the water project in the Rabuor-Sinaga Area (Yala Division), Kenya.

- Training to popularize technologies for efficient use of rainfall and other available water resources (water harvesting, supplemented irrigation management), was organized in May 2005, in cooperation with the Belgium Technical Cooperation (BTC).
- Regional capacities in groundwater management were improved in training courses organized on groundwater/surface water interaction and model sensitivity analysis, and fractured rock aquifers respectively in October 2004 and July 2005 in Cape Town, South Africa.
- Training courses held for Afghan experts in the field of Water Resources Management and Environment in 2004 by RCUWM.
- Continuous capacity-building in environmental hydrology methodologies was ensured through the 24th and 25th International Post-Graduate Training Course on Environmental Hydrology for Arid and Semi Arid Regions, held respectively from May to July 2004 and May to June 2005 in Cairo, Egypt, jointly organized by Cairo Office with the Hydraulics Research Institute.
- Second Workshop on “Ecohydrology of Drylands in the Arab Region” held in Beirut, Lebanon in October 2004, jointly organized by Cairo Office with ACSAD, ALECSO, UNEP, UNU and CNRS. Contributed to capacity building and exchange of experiences in the field of ecohydrology of drylands including the review of the content of a suggested training manual as well as the status of ecology in drainage basins.
- Training Course on “Drainage of Agricultural Lands” was held in Cairo, Egypt, November-December 2004. Cairo Office co-organized this course with JICA and the Regional Training Center for Training and Water Studies (RCTWS).
- Capacity for groundwater management in arid and semi arid regions was enhanced by the Cairo Office through organizing of: JIIHP Regional Training Course on the Application of Isotope Hydrology to Artificial Recharge, Cairo, Egypt, February 2004; 7th and 8th Regional Training Course on Groundwater Protection, in Cairo, Egypt, respectively in December 2004 (with the Research Institute for Groundwater (RIGW)) and November/December 2005, in the context of the IHP-Network on Groundwater Protection in the Arab region; a Training workshop on Integrated Groundwater Resources Management in Arid Region, jointly organized with WMO in Cairo, Egypt in April 2005; a Regional Seminar on Artificial Groundwater Recharge: A Step towards Water Security held in Kuwait in February 2005; a Groundwater and Soil Resources Protection Workshop (ACSAD) held in Amman, Jordan in June 2005.
- Water Resources Protection Workshop organized within the celebration of Suez Canal University at the occasion of Water World Day, at Ismailia, Egypt, in March 2005.
- Workshop on “Integrated Water Resources Management and Water Governance” was organized by ToT of AWRANet with ESCWA, CEDARE and UNEP in May 2005 in Kuwait. This workshop enhanced the exchange of practical experience and built capacity among hydrologists and water managers from the Arab region and abroad.
- Training on issues related to Watershed Eco-environment and Water Resources Management, was provided in the framework of ISI through an International Training Workshop in September 2005 at IRTCES, Beijing, China, in collaboration of Beijing Office with IRTCES. Tehran and Almaty Offices also sponsored participants.
- Training on the integrated management of groundwater resources, aquifer recharge and rainwater harvesting was provided through training workshop in April-May 2005, Lahore, Pakistan; June 2004, Hyderabad, India; at the University of Science, National University in Ha Noi, and Institute of Environment and Resources, National University in Ho Chi Minh City, Vietnam, both in October 2005.
- 14th IHP Training Course “Hydrology in Asia” was held in Kuala Lumpur, Malaysia, in October 2004. Jakarta Office and the Humid Tropics Centre for Hydrology, Kuala Lumpur, organized the workshop with support from the Government of Japan.

- International Training Course on “Hydrological Droughts and Low Flows” was held, organized by Jakarta Office and the Regional Humid Tropics Hydrology and Water Resources Centre, in Kuala Lumpur, Malaysia, September 2005.
- 15th IHP Training Course “Water and Carbon Cycles in Terrestrial Ecosystems”, held in Nagoya and Chiba, Japan, February-March 2006, organized by Hydrospheric Atmospheric Research Centre of the Nagoya University and Jakarta Office, was supported by JFIT.
- Training courses in water education were resumed (since 1990) by the National IHP Committee in Mongolia through a National Training Course on IWRM in Ulaanbaatar, in October 2004.
- 8th International Training Workshop on Wadi Hydrology: Application Using Decision Support System (DSS) was jointly organized with ALECSO and ISESCO in Amman, Jordan, June 2005.
- A study of sedimentation problems in basins all over the world and the discussion of sediment issues, transport, training and education, data collection, utilization and analysis were fostered through the 4th Steering Committee and Workshop of ISI, held in Egypt in November 2005.

Expected results until December 2007

- “Review of Global Erosion and Sediment Related Research and Education for Sustainable Development” will be implemented and case studies on risks from sedimentation will be launched.
- 9th International Training workshop will be held in Jordan in July 2006 jointly with ALECSO, ISESCO and ACSAD.
- Training on using isotopes tools for managing water, in particular artificial recharge will be organized at the Institute of Environment and Resources, National University in Ho Chi Minh City, Vietnam, June 2006.
- 16th IHP training Course “Oceanography Basics” will be organized in Nagoya, Japan, in 2006.
- Establishment of ICHARM in Tsukuba, Japan will be completed and its educational unit will be operational.

Focal Area 5.3: Crossing the digital divide

Progress and results achieved from August 2004 up to 31 May 2006:

- UNESCO-IHE, together with partner institutions in developing countries, delivered on-line courses on a range of topics. The courses offer over a period of three months the same content as the regular three-week courses on-site in Delft.
- UNESCO-IHE started in 2004 the development of joint graduate programmes. Among them is a programme on Hydroinformatics, run jointly with Hohai University, Nanjing, China.

Expected results until December 2007

- The UNESCO-IHE joint programme on hydroinformatics will be started at IIT Rookee in India.

Focal Area 5.4: Institutional development and networking for W.E.T.

- ICHARM was established in Tsukuba, Japan. ICHARM provides, *inter alia*, the institutional framework for training in water related disaster prevention and management.
- Concept developed for the integration of water-related educational elements in the programme of the United Nations Decade of Education for Sustainable Development (UNDESD).

Expected results until December 2007

- Integration of water-related educational elements in the programme of UNDES.D.

Results achieved in implementing Theme 5

- Capacities improved in developing countries for IWRM and water governance.
- Training material developed on sustainable water management, on-site and on-line.
- Educational and training material was produced, *inter alia*, for conflict prevention/resolution and groundwater management, hydroinformatics.
- Institutional capacities in the field of groundwater assessment and management enhanced.

VI. CROSS-CUTTING IHP THEME: FRIEND

Progress and results achieved from August 2004 up to 31 May 2006

FRIEND Nile:

- Rainfall-Runoff Modelling (RRM) Theme Researchers Workshop was held in Addis Ababa, Ethiopia, September 2004. A technical report covering all implemented research activities and presentations during the workshop was prepared for internal use within the FRIEND/Nile team. The report is available on the FRIEND/Nile website (<http://62.193.88.134/fn/>).
- Drought and Low Flow Analysis (DLFA) Workshop was held in Nairobi, Kenya, November 2004. All research activities carried out during the working group sessions of the workshop were compiled in a technical internal report and available on the project website.
- Flood Frequency Analysis (FFA) and Sediment Transport and Watershed Management (STWM) Workshop was held in Nairobi, Kenya, November 2004. A report focusing on the technical issues of the workshop was prepared and available on the project website.
- FRIEND/Nile Workshops was held in Khartoum, Sudan, July 2005. A technical report focusing on all research achievements carried out during the project was prepared. The report is available on the FRIEND/Nile website.
- Required equipments for the FRIEND/Nile research team of the Drought and Low Flow Analysis component and GIS software (ESRI-GIS ARC Software) was purchased for the coordination centres of the Rainfall-Runoff Modelling and Flood Frequency Analysis components.
- Required hydrological and spatial data for the implementation of the research activities of the FRIEND/Nile project were collected.
- 27 technical joint papers as the technical output of the project during the FRIEND/Nile Flanders-UNESCO Science Trust funds (FUST) first phase was finalized.
- International Conference for the FRIEND/Nile Project "Towards a Better Cooperation" was held in Sharm El Shiekh, Egypt, November 2005. Proceedings of the conference was published.
- The 4th and 5th Project Management Meeting was held in Addis Ababa, Ethiopia, February 2005 and in Sharm El Shiekh, Egypt, November 2005.
- Brainstorming Meeting on Water Management in Nile basin Countries was held in Cairo, Egypt, February 2006 to explore the application of proposals to the European Union Twinning projects within the International Research Co-operation 7th Research Framework Programme.
- The Sixth Project Management Meeting of the FRIEND/Nile Project was held in Cairo, Egypt, February 2006.

- Additional Flemish Contribution included support for the participation of one person from Sudan in the International Training Program on Scientific and Technological Information Management in Universities and Libraries, Belgium during the period October to December 2004 and secondment of Prof. Willy Bauwens to IHP as complementary activities to the ongoing UNESCO/Flanders FUST Projects.

FRIEND AOC

- The launching meeting of the project on African Munson Multidisciplinary Analysis (AMMA) was held in Cotonou, Benin, November 2004.
- FRIEND/AOC was reorganized at the hierarchical and geographical levels.
- An MoU between FRIEND and AMMA project was prepared.
- Technical NE/AMY FRIEND Extremes Workshop and 5th FRIEND Inter-Group Coordinating Committee (FIGCC) meeting was held in Koblenz, July 2004.

FRIEND Southern Africa

- GIS water resources software and data was completed by specific training courses, carried out by CEH in collaboration with Malawi.
- Water availability assessment system (GWAVA) and drought assessment and monitoring software (ARIDA) were implemented; the modelling exercise to apply the software in Swaziland was completed.
- Training courses and technology transfer in the areas of low flows, droughts and water resources for regional water managers were completed.

FRIEND Asia Pacific:

- Catalogue of Rivers for Southeast Asia and the Pacific Volume V was published by Jakarta Office in May 2004.
- The AP FRIEND 10th Technical Subcommittee Meeting on the intensity on flood duration (IFD) was held in conjunction with the 12th RSC Meeting for Southeast Asia and the Pacific, Adelaide, Australia, November 2004.
- FRIEND AP meeting “Intensity Frequency Duration and Flood Frequencies Determination“ was held in Kuala Lumpur, Malaysia, June 2005. Proceedings were published as IHP-VI Technical Documents in Hydrology No. 5.
- The International Training Course on “Hydrological Droughts and Low Flows“, organized by Jakarta Office and the Regional Humid Tropics Hydrology and Water Resources Centre, was held in Kuala Lumpur, Malaysia, September 2005.
- The AP FRIEND 11th Technical Subcommittee Meeting on design rainfall and design flood analysis in conjunction with the 13th RSC Meeting for Southeast Asia and the Pacific, was held in Bali, Indonesia, in November 2005.

FRIEND LAC/AMIGO

- The IHP/FRIEND/WWAP Workshop on Database and Web Site (Havana, Cuba, August 2004) and FRIEND Data Base workshop at the Instituto Mexicano de Tecnología del Agua (IMTA) (Cuernavaca, México, May, 2005) were followed by combined project on databases among FRIEND/AMIGO LAC and FRIEND AMHY.

- FRIEND South America Meeting for the establishment of the FRIEND South America project was organized in Montevideo, Uruguay, October 2004, where Project Coordination for South America was designated and the workplan 2004-2005 approved.
- The web site of the project was developed (<http://www.friend-amigo.org/>).
- Diagnostic and evaluation of the Meso American and Caribbean drought to regional scale was conducted.

FRIEND HKH

- A pilot project has been undertaken by ICIMOD, Nepal as technical coordination agency along with the HKH-FRIEND Research Group in Low Flow and Hydromet Division, Department of Energy, Ministry of Trade and Industry of the Royal Government of Bhutan, in coordination with New Delhi Office.
- Local level stakeholders workshops at Bahunmara in the inner valley of the Siwaliks and at Jaleswar Municipality in the lower Terai were held in October 2004, and Micro level assessment of flood Hazard and community/Institutional response: A case study of the inner valley in the Siwaliks and Jaleswor area in the Terai were prepared.
- Consultative Meeting Study of Climate Change Impact on Snow Cover of Nepalese Himalaya using Remote Sensing and Geographic Information System Kathmandu was held in February 2006, and publication of study was published (2006).
- Low-flow studies were carried out in Bhutan and Nepal rivers. “Low-flow study of Rivers in Bhutan” was published in 2006.
- “Flood Risk and Vulnerability Mapping using GIS: A Case Study from the Ratu River in Central Nepal” was completed.

FRIEND NE and AMHY

- International Conference Hydrology of Mountain Environments was held September-October 2004 in Berchtesgaden, Germany. Extended abstracts and proceedings were published.
- The FRIEND Planning Meeting was held in Cuba, December 2005, which led to the preparation of the draft Scientific Timetable before the Vth FRIEND International Conference focused on Climate Variability and Change – Hydrological Impacts.
- The Website FRIEND NE <http://ne-friend.bafg.de> was created.
- The Europe Water Archive (EWA) was transferred from the Centre for Ecology and Hydrology, Wallingford, UK to the GRDC located at the Federal Institute of Hydrology in Koblenz, Germany. The EWA is a database independent from that of the GRDC. The new homepage of the EWA gives information about data availability and data access for different end-users.
- Through AMHY, AOC and AMIGO, a data base model allowing to easily exchanging data between the three FRIEND Groups was elaborated and disseminated.
- International Scientific Colloquium on Impacts Climatiques et Anthropiques sur la Variabilité des Ressources en Eau, Montpellier was held November 2005.
- An International Workshop on Hydrological Extremes (Observing and modelling exceptional floods and rainfalls) was organized May 2006, University of Calabria, Cosenza (Italy).
- IHP Training Course on Hydrological Droughts and Low Flows, developed for regional water managers, was held in Malaysia in September 2005.
- To ensure a regular exchange of information outside the Low Flow group a European Drought Centre (EDC) (<http://www.geo.uio.no/edc>) was established in 2004. The EDC is a virtual centre of

European drought research and drought management organisations to promote collaboration and capacity building between scientists and the user community.

- European Research Basin (ERB) Steering Committee Meeting and FRIEND NE Group 5 Steering Committee Meeting was held in Sophia, Bulgaria in October 2005.
- Proceedings of the 10th ERB Conference (Turin, Italy, October 2004) “Progress in Surface and Subsurface Water Studies at Plot and Small Basin Scale” was produced.
- A meeting on Low flows was held 22-24 April 2005 at the University of Natural Resources and Applied Life Sciences, Vienna (BOKU). A Text Book - Linked with publication of textbook in Elsevier series “Developments in Water Sciences, 48”; “Hydrological Drought: Process and Estimation methods for Streamflow and Groundwater”, was produced. The textbook is for university students, practicing hydrologists and researchers and provides a comprehensive review of processes and estimation methods for streamflow and groundwater drought.

Expected results until December 2007

- 5th FRIEND World Conference: Climate Variability and Change: Hydrological Impacts will be held in Havana, November-December 2006 and a Red Book will be published.
- Final report and scientific publications based on the implemented research activities during the first phase of the FRIEND/Nile FUST project will be prepared.
- FRIEND Nile Research team in Uganda will be formed.
- Involvement of other Nile countries and launching workshop of the FRIEND/NILE FUST second phase in Cairo, Egypt in August 2006. This workshop will include hands-on training on softwares: Water Strategy Man (WSM) and Soil Water Assessment Tool (SWAT).
- FRIEND Nile Erosion Modelling Training workshop will be held in September 2006 in Mekelle, Ethiopia.
- The 7th Project Management Meeting and the 10th Steering Meetings will be held in Khartoum, Sudan in November 2006.
- FRIEND Forum on Water Resources variability will be organized on the Web.
- Joint implementation of activities in Nakambe catchments, Burkina Faso with HELP and AMMA projects will be proposed.
- AP FRIEND 2nd Phase research on flood design will commence.
- The AP FRIEND 12th Technical Subcommittee Meeting on design flood analysis will be held in conjunction with the 14th RSC Meeting for Southeast Asia and the Pacific, Bangkok, Thailand, October 2006.
- FRIEND LAC project on identification of high risk drought areas to consolidate a regional drought diagnostic system will begin. Workshop on the implementation of this system will be held in Montevideo, Uruguay during 2006.
- Workshop on the implementation of the climate change project will be developed jointly with IMTA during 2006.
- FRIEND South America program will be launched before the end of 2006.
- Implementation, development and promotion of a LAC database specialized in regional processes.
- FRIEND technical documents and reports will be prepared and projects will be presented: variability and climatic change, hydrological regionalization, hydrological extremes (maxima and minima) and study of cases.
- Support will be given to graduate degree studies, masters and doctorates thesis.

Results achieved in implementing IHP-VI FRIEND

- Improved institutional, technical and human resources capacity building and enhanced knowledge of the hydrological processes in the field of water resources of the Nile basin.
- Fostered networking, regional cooperation and experience exchange among water experts and institutions in the Nile basin countries through workshops and trainings courses.
- Free exchange of data among FRIEND members.
- Link to international Programmes and preparation of many theses.
- Establishment of an Asian Pacific Water Archive. The archive contains river flow data, hydrometeorological and other related water resources information. It is web-based and consists of a central node at the Regional Humid Tropics Hydrology and Water Resources Centre in Kuala Lumpur, Malaysia, with two national nodes at the Bureau of Meteorology in Canberra, Australia and in Kofu, Japan at the Yamanashi University. Additional rainfall information will be added to the Archive to enable IFD technique comparisons across the Region.
- FRIEND National Focal Points were designated to establish FRIEND regional programmes. An increase in the number of countries participating in FRIEND was observed.
- Development of initiatives to reduce the regional and countries hydrological vulnerabilities; to improve the hydrological risk analysis and to contribute to the regional adaptation to the variability and climate change impacts, making emphasis in results that contributes to the improvement of political and administration strategies on the water resource area, including the developing of capacities.
- Development of tools, databases and methodologies related with: hydrological process analysis, variability and climatic change impacts on water resources, hydrological regionalization, and database management; associated with training courses.

VII. CROSS-CUTTING IHP THEME: HELP

Progress and results achieved from August 2004 to 31 May 2006

- Communication on HELP activities increased through: improvement of the website (<http://www.unesco.org/water/ihp/help>), creation of a new brochure in English, French and Spanish, creation of a database on HELP basins, and creation of a newsletter.
- First and second sessions of the International Symposium Steering Committee were held August-September 2005, Paris, France and March 2006, Mexico.
- Report was written on the planning of the proposed International Conference on “HELP experiences in the Southern Hemisphere: *Local Solutions to Global Water Problems - Lessons from the South*” in Pretoria South Africa, November 2007.
- Joint GWSP GLOWA HELP International Conference on Integrated Assessment of Water Resource and Global Change: A North-South Analysis was held in Bonn, February 2005 resulted in a publication in *Water Resources Management* in November 2006.
- “IHP-HELP Centre on Water Law, Policy and Sciences under the auspices of UNESCO”, was established in Dundee, Scotland, in October 2005.
- The outputs of the HELP Symposium held in Kalmar 2002 were published as a Special Issue of the *International Journal of Water Resources Development* in September 2004.
- HELP session was held in SAHRA Transboundary waters symposium, held in Tucson, Arizona, November 18, 2004 to coordinate HELP strategy in transboundary basins.

- HELP was represented at Rural Economy and Land Use (RELU) UK-HELP workshop, Oxford, November 2004, and RELU Science symposium, January 2005 in Birmingham, UK.
- HELP session was held at the Headwater Control VI: Hydrology, Ecology and Water Resources in Headwaters in Bergen, Norway, June 2005.
- Climate vulnerability index workshop was held in collaboration with CEH and CPWC, and selected N/S American basins in Guayaquil, Ecuador, March 2005 to assess climate vulnerability criteria in HELP basins.
- Pacific HELP Symposium was held November 2005 in Nelson, New Zealand, which was the first formal HELP event to take place in the Pacific region in order to establish a formal HELP Southern Pacific network.
- Modelling workshop on “Global Climate Change and Water Management Models” was held at the Global Climate Impacts Studies Centre, Islamabad, Pakistan, December 2004.
- Capacity Building training of 30 LGU, NGO and community partners in Crop and Water Management was implemented, which provided orientation on water, its cycle, watershed and crop water requirements in Davao River Basin Philippines during September 2005.
- Murrumbidgee-Davao twin basin agreement under the International Network of Basin Organisations was signed and accepted in 2006. This agreement is aimed at the transfer of SWAGMAN series of hydrologic models and smart irrigation technologies for Urban Water Use.
- Asia-Pacific HELP Regional Symposium and Public Debate “Is it possible to have sustainable water management in an arid environment?” was held at Charles Sturt University, May 2006.
- Wealth from Water Festival and the Wagga Wagga ‘Global Water Smart City’ project was launched, which extends Murrumbidgee HELP basin into urban regions, May, 2006.
- HELP Programme in LAC was implemented and disseminated. See inventory of HELP basins in LAC on webpage: www.fimcm.espol.edu.ec/Webpages/help/index.htm
- A Virtual Application Center was established at the Escuela Superior Politécnica del Litoral (ESPOL), Guayaquil, Ecuador.
- Workshop of Coordination of the IHP/LAC FRIEND and HELP Programmes was held (Foz de Iguazú, Brazil, August 2005) to strengthen links between HELP and FRIEND.
- Two international capacity-building courses were developed by ESPOL with the cooperation of the VLIR-ESPOL Programme, the University of Gent (Belgium) and Itaipu Binacional.
- A scientific article was published on the HELP Panama Canal Basin in a book titled *Hydrology and Water Law – Bridging the Gap*.
- Scholarships were awarded to promote academic and research work related to HELP.
- The NA-HELP group set up monthly teleconferences to keep up to date on progress and to continue dialogue among the various NA-HELP basin professionals.
- A special session at the Environmental and Water Resources Institute of the American Society of Civil Engineers, Watershed Management Conference, was hosted.
- Discussions with South American HELP partners took place to set up twinning activities among basins.
- Lake Champlain adopted the HELP framework to form voluntary collaborative settings for policy leaders, water resource managers and scientists.
- In the Upper San Pedro Basin, the HELP framework facilitated binational meeting to share technology with its upstream counterparts in Mexico

- The Luquillo Mountains UNESCO HELP Project held the first two water dialogues with representatives from municipal, state, and federal governments, local community groups and researchers.

Expected results until December 2007

- A book on Water law and policy is scheduled to be published, titled *Hydrological information in water law and policy: current practice and future potential*.
- International HELP Symposium, “Local Solutions to Global Water Problems - Lessons from the South” will be held in Pretoria, South Africa, November 2007.
- A special issue of Global Change Impact on Watersheds will be published as a follow-up of the joint Global Change-HELP International Conference “North-South Analysis of Global Change Impact on Watersheds”, Bonn, Germany, late 2006.
- A book “How to implement HELP philosophy through a spectrum of socio-economic perspectives” will be published.
- Pacific HELP Framework for Action will be published, which is designed to guide future HELP action in the Pacific sub-region on the basis of recommendations made at the Pacific HELP Symposium within the context of the Pacific Regional Action Plan on Sustainable Water Management.
- HELP approaches will be adopted at several Pacific island country basin management pilot sites in the context of the upcoming large-scale regional IWRM and Pacific HYCOS projects coordinated by SOPAC.
- Stakeholder exchange will take place between the Murrumbidgee, Davao, Motueka and Indus Basins for sharing modelling tools and integrated water resources management expertise.
- A “Water and Food HELP basin network” will be developed in South, East and South-East Asia and Australia through the HELP Regional Coordinating Unit based at the Charles Sturt University in Australia. This network will be called the IHP-HELP International Centre of Water for Food Security.
- Twinning agreements river basins will take place, which would combine their energies to develop proposals for funding to sustain the initiatives. The concept will look at HELPing communities deal with the impacts of farmer’s inability to deal with agricultural water requirement in a timely and efficient manner; lack of access to climate and water data; lack of rational agriculture water management technologies and limited and reducing (because of increasing population and restrictions on land use’s) farm lands.
- Watershed Sustainability Index will be applied in HELP basins of LAC.
- A book on integrated management of basins with a HELP approach will be published.
- Specific software, tools and monitoring equipment to be used by policy-makers for integrated water management in HELP basins of the region will be developed.
- A NA-HELP workshop will be held to exchange experiences and plan future twinning activities among NA-HELP basins and between NA and SA-HELP Basins.

- HELP activities will be publicized through participation in society meetings and publications.

Results achieved in implementing IHP-VI HELP

- Establishment of a regional network of HELP Basins ready to exchange stakeholders and hydrologic knowledge.
- Twin basin agreements and stakeholder led HELP workshops identifying future research needs.
- A major sub-regional event – the Pacific HELP Symposium – introduced the HELP Programme and its potential to the Pacific region and to small islands (i.e., Talise, Vanuatu)
- A blueprint for HELP action in the Pacific was developed for publication, in coordination with major donors and technical agencies in the region.
- Five additional HELP basins have been established or are in process of being established, adding up to 9 the HELP basins in the LAC region.