International Hydrological Programme

50th session of the IHP Bureau
(Paris, 31 March - 1 April 2014)

REVIEW OF IHP-VII AND RELATED ACTIVITIES OF UNESCO

Item 7 of the provisional agenda

Summary

This document is a report on progress and results achieved in the implementation of the Seventh Phase of IHP (IHP-VII, 2008-2013) since the 20th session of the IHP Intergovernmental Council, highlighting the major achievements. The report covers the period from June 2013 to March 2014. Furthermore this document summarizes specific activities of cooperation with other UNESCO programmes and, subsequently, those that also involve an inter-sectoral component.

Action expected of the Bureau: The Bureau may wish to express its views and appreciation on the implementation of IHP-VII activities and to comment thereon.
MAJOR ACHIEVEMENTS OF IHP-VII PROJECTS SINCE THE 20TH SESSION OF THE IHP INTERGOVERNMENTAL COUNCIL (agenda item 7.1)

INTRODUCTION

1. This document is a report on the implementation of the Seventh Phase of the IHP (IHP-VII, 2008-2013). It highlights major achievements during the period from June 2013 to March 2014. Projects and activities implemented during this period address a broad range of topics under the five themes of IHP-VII and they represent contributions made to science, knowledge and capacity building in the fields of hydrology and fresh water resources. During this period, IHP’s cooperation with, network of, and partnerships with international organizations, academia and other implementation partners were further extended and strengthened.

2. The Austrian Delegation proposed the World Large Rivers Initiative (WLRI) at the 20th session of the Intergovernmental Council in 2012. The IGC asked the Austrian Delegation to work with the Secretariat and the Bureau towards the establishment of a Task Force to refine and align the proposal with the priorities of IHP VIII. The revised proposal will be discussed at the 50th session of the Bureau and subsequently by the 21st session of the Intergovernmental Council in 2014. The Task Force consists of experts from the different UNESCO regions.

3. At the 1st of January 2014 a new UNESCO Chair on Integrated River Research and Engineering was established at BOKU, Vienna, Austria. The Chair task is to coordinate and facilitate the World’s Large Rivers Initiative (WLRI). Currently the Chair is preparing the second World’s Large Rivers Conference which will take place in Manaus, Amazon, Brazil, from the 21st to the 25th of July 2014.

4. WLRI is preparing a proposal for an integrated project on the status and future of the World’s Large Rivers. Contacts with the World Bank were initiated to receive funding including financial support for activities of the UNESCO Secretariat.

5. The present report contains only regular programme activities that contribute to the implementation of IHP-VII. IHP-related extrabudgetary activities implemented by SC/HYD and Field Offices are reported in document IHP/Bur-L/6.

THEME 1: ADAPTING TO THE IMPACTS OF GLOBAL CHANGES ON RIVER BASINS AND AQUIFER SYSTEMS

6. The influence of global change on water plays a significant role in the implementation of IHP-VII. Several research, knowledge dissemination and education activities on assessing and adapting to the impacts of global change on freshwater resources were implemented within the frameworks of several IHP initiatives such as FRIEND, HELP, G-WADI, IFI, ISI, GRAPHIC, GWES, and others. These programmes continue to strengthen in close cooperation with water chairs and centers the scientific understanding of global change impacts on water systems and provide policy advice to Member States so that they may better manage their water resources impacted by global change.

7. **Focal Area 1.1: Global changes and feedback mechanisms in hydrological processes in stressed systems:** The International Sediment Initiative (ISI) information system has been upgraded, major case studies finalized including a synthesis report. Several publications highlighting erosion and sedimentations issues and processes were published by LAC networks. The agreement between UNESCO and the government of China for the renewal of IRTCES as a category 2 centre was endorsed by the 191th session of the Executive Board of UNESCO. The ISI Secretariat continues to disseminate its newsletter along with the updated web-based information. Several workshop seminars were held in LAC, and in Asia UNESCO in
coordination with WMO continue to facilitate the implementation of the Global Framework of Climate Services (GFCS) particularly through the development of a document “Water Exemplar”.

8. Within the Water and science cooperation for peace in the Eastern Nile Basin, UNESCO IHP worked on promoting the water cooperation for peace and sustainable development in the Eastern Nile basin to enhance the capacity of Ethiopia, South Sudan, Sudan and Egypt to manage potential conflicts through the preparation of training need assessments, training manuals and the organization of regional workshops for water professionals, NGOs and Media professionals. Also, a network of universities and water resources experts, institutions, ministries from Egypt, Sudan, South Sudan and Ethiopia was established with a list of identified activities to enhance research cooperation between various institutions in the Eastern Nile basin countries.

9. To address the vulnerability of mountain ecosystems and the need to have mountain specific climate change policy, workshops were organized by UNESCO's International Hydrological Programme (IHP), in cooperation with the Man and the Biosphere Programme (MAB), UNEP, the Mountain Partnership Secretariat at FAO and International Centre for Integrated Mountain Development (ICIMOD). The main objective of the policy workshops was to address climate change mitigation and adaptation. Efforts were focused on increasing these regions' resilience to climate change through the identification of vulnerabilities, opportunities for adaptation, and the development of science-based strategies and policies. The project began with regional workshops to gather more localized information and policy recommendations. The outcomes of the Asian (Kathmandu, Nepal, March 2013), Latin American (San Jose, Costa Rica, August 2013), and African (Nairobi, Kenya, September 2013) workshops helped identify research gaps and vulnerable communities.

10. IHP hosted the final workshop on 23 - 24 January 2014 entitled Climate Change Impacts in Major Mountainous Regions of the World: Multidisciplinary Network for Adaptation Strategies (Africa, Asia, Latin America and Europe). The regional policy recommendations from Asia, Africa, and Latin America were incorporated into a science policy brief that will be widely disseminated through networks, partner intuitions and UN agencies. The final workshop gathered policy-makers, experts and stakeholders to review the recommendations from the regional workshops. This served as an opportunity to deliberate and refine key recommendations to governments for effective climate change policy in mountainous regions.

11. The Science Policy workshop on "Impacts of Global Climate Change on Snow, Glacier and Water Resources in the Andes: Policy recommendations for Adaptation Strategies" was co organized in partnership with the Andean Climate Change Interamerican Observatory Network (ACCIÓN) and CONDESAN in Quito on 20 - 22 November 2013. The workshop discussed following four background papers that were previously prepared by regional experts (i) Prioritizing scientific research for developing adaptation policies; (ii) Policy needs and gaps to address vulnerability (environmental and non-environmental) challenges in the Andean Region; (iii) Education and curriculum needs; (iv) Best practices in local adaptation projects based on the breakout sessions during the workshop, additional inputs to these documents were identified, which will be inserted into the finally published documents and a policy brief will be prepared and disseminated. Separately IHP Snow and Ice Working group meeting was organized in Quito on 23 November 2013.

12. A workshop on trends and variability of climatic parameters was co-organized in partnership with the ACCIÓN in Lima, Peru from 3 - 6 September 2013 (Climate School on Andean Climate Variability and Change), to train professionals in downscaling methods for climate change and water security.

13. UNESCO Regional Science Bureau for Asia and the Pacific and IHP Nepal organized an international conference on Climate Change, Water Resources and Disasters in Mountainous
Regions: Building Resilience to Changing Climate was held on 27 - 29 November 2013 in Kathmandu, Nepal. The conference recommended establishing a well-equipped Mountainous Climate and Water Research Centre in Nepal to carry out high quality scientific research with mechanisms for disseminating research findings from policy to the community levels.

14. **Focal Area 1.2: Climate change impacts on the hydrological cycle and consequent impacts on water resources:** The IHP is partnering with the University at Albany, US to enhance capacity building at both the scientific and the communications levels in the Andean target countries. FRIEND and International Flood Initiative (IFI) regional initiatives started a joint programme aimed at characterizing hydrological maxima in the Asia Pacific region and a data base system has been developed for the LAC region. A project on Climate Change Adaptation Strategy was implemented in the Arab region. Within the Climate Change Risk Management project in Egypt, the institutional and human capacities within the Ministry of Water Resources and Irrigation of Egypt (MWRI-Egypt) for climate change risk management and adaptation was enhanced. Dissemination of the outputs and experience exchange were undertaken with the Nile countries.

15. **Focal Area 1.3: Hydro-hazards, hydrological extremes and water-related disasters:** In cooperation with the Regional Office in Nairobi, WMO, UNESCO category II centers in Africa and Europe and America (ICIWaRM, South Africa, Kenya, Sudan), GWP, ISPRA, AMMA and AGRHYMET a scientific/technical workshop was held at AGRHYMET. Princeton University trained 20 water professionals and water managers on an upgraded version of the African Drought Monitor. The scientific/technical workshop and the training course were held at AGRHYMET, Niger, 19 - 24 October 2013. The outcome of the technical/scientific workshop has identified research gaps, challenges for sustainable water resources management and shortfalls for integrated drought management. A drought policy paper is in preparation and a brochure of the entire project will be published by mid-2014.

16. **A Multi-stakeholder Workshop on Gender Mainstreaming in Drought Management** was organized in parallel to the scientific/technical workshop and focused on vulnerability of women to drought effects, sharing of national experiences, discussing the role of women in drought monitoring and management. A field trip to a local women's organization was organized. 30 women attended the workshop. Both the technical/scientific workshop and the gender workshop gathered at the last day to provide recommendations on sustainable water resources management during drought events.

17. **During the 8th UNESCO Youth Forum a side event to the General Conference was organized, 29 - 31 October 2013, Paris.** The youth organized a stand to provide visitors the opportunity to learn about the drought monitor developed by the Princeton University and to appreciate the tool as an operational tool that can be useful in their communities for near real-time monitoring and seasonal forecasting of droughts.

18. **Within the framework of TIGER NET a Water Observation and Information System (WOIS) for flood monitoring and forecasting has been established at the Ministry of Agriculture and Water, Windhoek, in July 2013 and 5 people have been trained on the system.**

19. **Focal Area 1.4: Managing groundwater systems’ response to global changes:** UNESCO’s GRAPHIC Programme has continued to facilitate the dissemination of knowledge and exchanges of experiences related to groundwater and climate. GRAPHIC led a critical review of the relationship between groundwater and climate change. In cooperation with the IAH a seminar on Climate Change: Challenges and Opportunities were organized at the 40th IAH Congress, Perth, Australia; 15 - 20 September 2013. Attention was given to consider groundwater in the land-surface models (LSMs) incorporated in General Circulation Models (GCMs) and to the use of satellite observations under the Gravity Recovery and Climate Experiment (GRACE). A Workshop was organized in Bobole, Mozambique, 14 - 19 October
2013 to discuss methods related to palaeo-groundwater and present studies evaluating links between recharge and climate.


21. **Focal Area 1.5: Global change and climate variability in arid and semi-arid regions:** G-WADI published a special journal issue on Sciences in Cold and Arid Regions for Water and Development Information for Arid Lands, in partnership with the Arid Regions Environmental Engineering Research Institute, Chinese Academy of Sciences. G-WADI Geo server updated based on available information. Member states and international agencies have recognized G-WADI Geo server as a useful tool to assess floods and droughts. The Namibia Hydrological Services circulates 'daily flood/hydrological drought bulletin', which describes rainfall and drought conditions, flood levels, and risks of floods and droughts for different regions across the country based on the G-WADI Geo-Server data base. The G-WADI data base is included as contribution in the draft 'Water Exemplar' of the Global Framework of Climate Services (GFCS). The 5th Asian G-WADI meeting as well as a global G-WADI meeting was held in the Foreign Experts Building, Beijing, and September 20, 2013. Total 31 participants include representative members from 9 Asian members (China, India, Iran, Kazakhstan, Kyrgyzstan, Mongolia, Pakistan, Thailand and Vietnam) and Oman as well as representatives of UNESCO Offices (Bangkok/Beijing/New Delhi/Tehran/Paris/Santiago). Extra budgetary project was developed and funded by Flemish fund to implement 'Managing Water Managing Water Resources in Arid and Semi-Arid Regions of Latin America and Caribbean (MWAR - LAC) - associated to the G-WADI programme.

22. Prime Minister of Namibia has established a Task Force in May 2013 and requested UNESCO to launch a study to assess whether the amount of data available is enough to perform flood forecasting, and whether the monitoring program covers sufficient and suitable locations for both hydrological data collection and rapid flood response. The draft report was submitted to UNESCO Windhoek office beginning of January 2014 and it now been edited.

**THEME 2: STRENGTHENING WATER GOVERNANCE FOR SUSTAINABILITY**

23. Theme 2 aims to reach a comprehensive understanding of best practices in water governance, to articulate recommendations and support the establishment of a sustainable water governance process in its entirety.

24. **Focal Area 2.1: Cultural, societal and scientific responses to the crises in water governance:** Within the framework of the cooperation established with the OCDE International Initiative on Water Governance, UNESCO-IHP, together with the International River Basin (INBO), is coordinating a Thematic Working Group on 'Basin Governance'. The aim of the Working Group is to identify best practices in the governance of rivers, lakes and aquifer basins, the results of which will be presented during the 7th World Water Forum in April 2015.

25. The UNESCO Chair on Water and Culture, hosted by the Universidad de la República of Uruguay, was launched officially in September 2013 by the Rector of the University and the Dean of the Faculty of Humanities and Education Sciences. The work plan for the coming years is currently being discussed with the IHP LAC. The bi-annual Aqua-LAC Scientific Journal was published during this period with the support of the UNESCO Montevideo office. The total number of journal issues to date stands at eight.

26. A webinar on Multiple Dimensions of Groundwater Governance: What We Are Doing and What More Can We Do? was organized in October 2013. More than 40 specialists from
several regions participated in the debate. The recorded session is available at: www.groundwatercop.iwlearn.net/Webinars

27. A detailed template for a set of guidelines on Arab parliamentarian water capacity-building has been prepared and is currently being circulated within the Arab region. The aim of the guidelines is to strengthen policies on water governance and enhance the knowledge-base of water resources management, particularly as groundwater constitutes a major resource in the Arab region.

28. **Focal Area 2.2: Capacity development for improved governance; enhanced legislation for wise stewardship of water resources:** Within the framework of the project, Groundwater Governance: A Global Framework for Action, executed by UNESCO-IHP, in cooperation with GEF, FAO, the World Bank and IAH, five regional consultations were organized during the period 2012-2013. The consultations were attended by several hundred experts and resulted in the preparation of five regional diagnostics, available at: http://www.groundwatergovernance.org.

29. Within the framework of the IWLEARN Project (groundwater components executed by UNESCO-IHP), a webinar on Groundwater and International Law: Current Status and Recent Developments was organized in December 2013 in cooperation with UNECE, AIDA and the Texas A&M University School of Law. The objective of the webinar was to discuss the challenges behind creating and implementing groundwater law at local, national and international level. Around 30 specialists from different regions participated in the debate, the recording of which is available at: www.groundwatercop.iwlearn.net/Webinars.

30. During the World Water Week (Stockholm) in September 2013, UNESCO-IHP co-convened the workshop, Cooperation Across and within Jurisdictions and Levels for Good Water Governance - Local to Global together with SIWI, GWP, UNDP. This workshop explored the social, economic, institutional, legal and political dimensions of cooperation from the micro-scale through municipal, urban, national, regional, transboundary and global levels. The workshop, attended by more than 50 experts, was an opportunity for IHP to illustrate the interwoven linkages between water cooperation, water security and water governance on different scales and showcase the work carried out in these fields by the Programme, particularly in light of its coordination of the International Year of Water Cooperation. As an integral part of this workshop, a special session to highlight the challenges and opportunities of water cooperation and governance through game theories and other tools was organized by UNESCO-IHP in cooperation with several partners including UN-Water, GWP, UNDP, UNU, UNESCO-IHE, GEF, IGRAC, AQUAFED, Oregon State University, Yale University, and the Butterfly Effect NGO Coalition, amongst others. As a result, a toolkit is now in preparation for use in schools and various other organizations.

31. **Focal Area 2.3: Governance strategies that enhance affordability and assure financing:** UNESCO-IHP organized several debates attended by around one hundred participants during the 7th GEF International Waters Conference (Barbados, 26-31 October), which focused on Economic Valuation as a Tool to Bridge the Science-Policy Gap. IHP placed special emphasis on reviewing the economic valuation of international waters and the links between economic valuation and science, as well as mechanisms for linking both to policymaking and financing.

32. UNESCO-IHP organized a workshop on “Groundwater Economics” (Morocco, 10-12 December) for project managers of the GEF MENARID portfolio. 30 participants attended the workshop from around different 10 countries. The aim of the workshop was to provide participants with a comprehensive insight into methods for valuing groundwater resources with a view to training project managers in the MENA region. It also sought to inform policymaking
regarding the need to allocate financial resources for the sustainable management of groundwater. The report is available at: www.groundwatercop.iwlearn.net/menarid.

33. **Focal Area 2.4: Managing water as a shared responsibility across geographical and social boundaries:** The International Shared Aquifer Resources Management (ISARM) programme has actively contributed towards the preparation of a detailed inventory and assessment of transboundary aquifers. Regional activities and ISARM networks were established under the supervision of six regional UNESCO offices. UNESCO-IHP and IGRAC are currently implementing the assessment of 166 Transboundary Aquifers in close collaboration with national experts who were identified in consultation with the IHP National Committees. The process of data collection commenced at the end of 2013 in the Americas Region and will subsequently be implemented in all regions by the end of 2014.

34. During the reporting period, a major contribution to the implementation of the ISARM programme was provided by the IGRAC Centre. IGRAC hosts the ISARM website and recently published a report on groundwater monitoring in the SADC Region. IGRAC also manages the project on the ‘Protection and Sustainable Use of the Dinaric Karst Transboundary Aquifer System’ project (DIKTAS). The four countries involved in the DIKTAS project - Albania, Bosnia and Herzegovina, Croatia and Montenegro - have agreed to create two mechanisms aimed at improving consultation and the exchange of information between the various governmental entities engaged in water resources management.

35. Within this reporting period, a series of groundwater maps for Asia were published, notably the Hydrogeological Map, the Groundwater Resources Map and the Geothermal Map. This compilation of maps is the result of cooperation between UNESCO-IHP and the China Geological Survey, the Institute of Hydrogeology and Environmental Geology, Chinese Academy of Geological Sciences and with the support of the International Association Hydrogeologists, and other international and regional institutions. This project employed methodologies devised by UNESCO-IHP, CGMW, IAH, IAEA and BGR for the compilation of the “Groundwater Resources Map of the World” and adopted legends from the International Legend of Hydrogeological Maps. The maps contain highly condensed and synthesized information, resulting in a significant contribution towards research and policy formulation in Asia. The maps, together with explanatory notes, can be downloaded at: http://unesdoc.unesco.org/images/0022/002207/220768EO.pdf.

36. A series of Mexican case studies containing course material on conflict resolution as well as practical examples from Mexico was developed within the framework of the PCCP programme and a course book entitled prevencion de conflictos y cooperacion en la gestion de los recursos hidricos en mexico compiling the Mexican experience was launched in December 2013.

37. During the reporting period, UNESCO-IHP, in cooperation with experts from Argentina, Bolivia, Brazil, Paraguay, and Uruguay, has contributed towards the GEF-funded Framework Programme for the Sustainable Management of the Water Resources in La Plata Basin in Relation to the Hydrological Impacts of Climate Variability and Change.

38. Within the framework of the UNESCO-IHP Transboundary Water Cooperation activities, a workshop on “Latin American and Pan-European Experience: Sharing Experiences and Learning From Each Other”, held at the University of Bologna Center in Buenos Aires in June, 2013, was organized by UNESCO, the United Nations Economic Commission for Europe (UNECE), the Economic Commission for Latin America and the Caribbean (ECLAC), the Global Environment Facility (GEF) International Waters Learning Exchange and Resource Network (IW:LEARN), the International Union for Conservation of Nature (IUCN). 90 experts from more than 10 different countries attended the workshop.
39. Approved by the GEF Council in June 2013, UNESCO-IHP acts as the Executing Agency for the GEF-UNDP regional project, "Enabling Countries of the Transboundary Syr Darya Basin to Make Sustainable Use of their Groundwater Potential and Subsurface Space in Consideration of Climate Variability and Change. UNESCO-IHP collaborated with UNDP to organize the Inception Meeting for the project preparation phase, held in Paris in February 2014. Representatives from the three project countries, Kazakhstan, Kyrgyzstan and Tajikistan, participated in the meeting, together with representatives of international agencies including UNECE, USGS, and INBO. Representatives agreed on the follow-up steps leading to the preparation of the project document.

40. **Focal Area 2.5: Addressing the water-energy nexus in basin-wide water resources:**
Future work on water and energy in the region will be channeled through the UNESCO Chair on Water and Energy hosted by the University of Parana in Brazil with strong support from Itaipu Binacional and other interested partners. Such work will cover the different aspects of the nexus: hydropower, biomass, etc. It is expected that an initial regional event will take place in Itaipu coinciding with the 2014 World Water Day which will be devoted to the topic of "Water and Energy".

**THEME 3: ECOHYDROLOGY FOR SUSTAINABILITY**

41. **Focal Area 3.1: Ecological Measures to Protect and RemEDIATE CATCHMENT Processes.** The Government of Uruguay requested support from UNESCO in order to introduce the concept of environmental flows as a management tool for water resources. The results of the studies carried out by a multidisciplinary group of experts in the Santa Lucia river basin in 2011 - 2013 have been published in January 2014 by the IHP in the LAC Technical Series as a contribution to the regional Ecohydrology programme.

42. The Erasmus Mundus on Ecohydrology has one of its international seminars coordinated by La Plata University, Argentina, attended by 15 students from about 12 countries in 2013, and being an opportunity for capacity development for Latin American postgraduate students focusing on water management by applying the eco-hydrological approach. The IHP keeps on supporting the special seminar that ensures the presence of lecturers from the global and regional ecohydrology.

43. **Focal Area 3.2: Improving Ecosystem Quality and Service by Combining Structural Solutions with Ecological Biotechnologies.** In cooperation with the European Regional Centre for Ecohydrology (ERCE) the “International Symposium on Ecohydrology, Biotechnology and Engineering: towards the harmony between Biogeosphere and Society on the basis of long term ecosystems research”, was held in Lodz, Poland from 16 to 19 September 2013. This international symposium, attended by 210 participants from 31 countries, included 95 talks and 50 posters and helped to develop a dialogue on integration of the efforts between ecohydrologists, engineers, and social and economic scientists to contribute to ecologically sound solutions towards harmony between the biogeosphere and humanity.

44. New demonstrations sites from LAC in the Trifinio region (El Salvador, Guatemala, and Honduras), Costa Rica, and Exuma (The Bahamas). were included in the global network. In the site in Costa Rica a methodology was introduced to estimate compensatory runoff. The methodology is a combination of observation, discussion – based approaches and biological response modeling. This results in a hybrid methodology combining the best from available methods. The site Trifinio in Central American studies integrated management of natural capital in El Salvador, Guatemala and Honduras: the case study addresses the main issues that this region faces, such as erosion and sedimentation; flooding; landslides; etc.; and how is the region managing these shared resources. The site in Exuma, Bahamas studies restoration of Victoria Pond and restoring wetland habitat in historic George Town. In Great Exuma it looks for
sustainable management to control eutrophication and enhance near shore fish habitat that has become polluted due to poor management of the pond.

45. The Ecohydrology Regional Conference “Engineering harmony for a sustainable world” (Santiago de Chile, 11-13 November 2013) was launched in the occasion of the LA World Water Week in March 2013. The Conference was organized by the University of Santiago and the National Water Authority, with support from IHP NatCom of Chile and the IHP-LAC and counted with distinguished keynote speakers and panelists from the Ecohydrology IHP initiative. The IHP LAC also supported several participants from LAC with approved papers. The Conference was also the opportunity for the presentation of two publications from the IHP LAC Series jointly developed with the University of Newcastle from UK.

46. **Focal Area 3.3: Risk-Based Environmental Management and Accounting.** In the framework of the Ecohydrology regional programme, a paper on challenges and opportunities for risk management was developed, with the objective of introducing such concepts into the disaster strategy initiative of UNESCO, and especially in the support to Haiti after the earthquake.

47. Moreover, the EBA approach was included as one of the main topics in the discussion on climate change adaptation in mountainous regions of LAC, especially in the collaboration established with UNEP ROLAC that could be further expanded to other areas of work.

48. **Focal Area 3.4: Groundwater-dependent ecosystems identification, inventory and assessment.** Within the framework of the project on Management of Coastal Aquifers and Groundwater, UNESCO-IHP organized an experts meeting on the ‘Management and Protection of Coastal Wetlands’ in Paris in June 2013. The meeting brought together 20 national and 10 international experts from organizations and projects, such as the Ramsar Convention Secretariat, the Mediterranean Wetlands Initiative (MedWet), as well as regional centres and programmes. The objective of the project is to undertake a hydro-geological pre-assessment of Mediterranean coastal wetlands dependent on groundwater resources and to develop methodology and guidelines for hydrogeological management of coastal wetlands (wetlands typology and classification).

49. UNESCO-IHP, in cooperation with IGRAC, has been entrusted with assessing the groundwater systems of Small Island Developing States (SIDS). One of the activities under this project, coordinated by Professor Diana M. Allen from the Department of Earth Sciences, Simon Fraser University, is the assessment of groundwater indicators for aquifer systems in the SIDS.

**THEME 4: WATER AND LIFE SUPPORT SYSTEM**

50. **Focal Area 4.1: Protecting Water Quality for Sustainable Livelihoods and Poverty Alleviation:** UNESCO - IHP has initiated a new project on Nanotechnology for Water Purification and Wastewater treatment, which aims at fostering the scientific knowledge and information on innovative technological solutions to water quality problems. IHP, organized a special session on Nanotechnology Applications in Water and Wastewater Treatment at the UNESCO Conference on “Emerging Ethical Issues in Science and Technology” held in Bratislava, Slovakia, in May 2013. The session, organized jointly with UNIDO and the Social and Human Sciences Sector of UNESCO, was attended by about 100 participants of the conference. Experts from Austria, South Africa, Sweden and USA were invited to the session as resource persons. IHP established an Experts Group on Nanotechnology for Clean Water, bringing together leading international experts in the field of nanomaterial and nanotechnology applications in drinking water purification, wastewater treatment, desalination and agricultural irrigation. The Expert Group includes 15 internationally-leading experts from Australia, India, France, Oman, Singapore, the Netherlands, South Africa, Korea, Nigeria, China, USA, etc.. The first meeting of the Experts Group Nanotechnology for Clean Water, held at UNESCO in
December 2013, made a valuable contribution towards UNESCO efforts to foster scientific discussions on potential applications of emerging and novel nanotechnologies in water and the role nanotechnology can play in improving access to clean water and wastewater treatment in developing countries.

51. The implementation of UNESCO-IHP project on Emerging Pollutants in Water and Wastewater has continued. IHP organized an International Symposium on Emerging Pollutants in Water and Wastewater in Belgrade, Serbia, in July 2013, with around 40 participants from Austria, Check Republic, Germany, Serbia, Slovenia, Spain, and Ukraine.

52. The Hydro Free and/or Open-source software Platform of Experts (HOPE) provides a free alternative to commercial specialized engineering software in the field of hydrology (e.g. water resources, rivers and groundwater; water modeling, wastewater treatment) since most software applications are not affordable for low and middle-income economies. As members of the Steering Committee, AMCWOW, Regional Centre for Integrated River Basin Management (RC-IRBM), Southern African Network of Water Centers of Excellence and UNECA actively participated in the development of the HOPE platform. SADC countries are drawing immediate benefits in improving relevant engineering curricula in the continent. 55 participants from 14 countries attended the TVET in SADC: monitoring progress and revitalizing actions workshop held in Cape Town in November 2013: http://www.hope-initiative.net/blog/tvet-in-sadc-monitoring-progress-and-revitalizing-actions. Through this workshop, participants from DR Congo, Lesotho, Malawi, Mauritius, Mozambique, Namibia, South Africa and Swaziland attended their first HOPE wastewater training.

53. In the LAC region, and in partnership with Itaipu, water quality issues linked to intensive farming activities in Brazil vis-à-vis energy production have been addressed by the IHP in the context of the working group on water and energy. It is expected that in the 2014-2015 biennium, the Ecohydrology initiative shall start a task force that shall address water quality issues in LAC.

54. Focal Area 4.2: Augmenting Scarce Water Resources, especially in Small Island Developing States (SIDS): In the Southern, Eastern and Adriatic Mediterranean basins coastal aquifers represent the main source of freshwater. Under the project on the management of coastal aquifers of the Med partnership, national reports from 12 participating countries have assessed the risks and uncertainties related to the management of these freshwater resources. A regional synthesis report was prepared, as well as a geo-referenced web information system, which is currently only available to experts from member countries. In 2012, UNESCO-IHP initiated the assessment of aquifers in 43 small island countries.

55. Within the framework of the GEF-funded project on “Groundwater Systems in SIDS”, an assessment was undertaken on a set of hydrogeological, biophysical, socio-economic and institutional indicators in 43 SIDS.

56. Focal Area 4.3. Achieving Sustainable Urban Water Management: IHP continued its efforts to strengthen and disseminate scientific knowledge and information on urban water management through UNESCO-IHP Urban Water Series, which is a major publication series; co-published by UNESCO and Taylor & Francis and comprises eight major books on sustainable urban water management. The translation of the UNESCO-IHP Urban Water Series books in other languages was initiated in 2013. The publication of the UNESCO-IHP Urban Water Series in other language editions has been successfully initiated in 2013. The agreement for Chinese language edition of six books of the series was established with China Water and Power Press in August 2013 and the translation of these books into Chinese is being finalized for publication in March 2014. The agreement for the translation of another book into the Farsi language was initiated with the UNESCO category 2 centre RCUWM in July 2013.
57. In the framework of IHP-VII, the IHP-LAC has promoted the establishment of a Working Group on Urban Water Management in the region launched in 2009. During the 2012-2013 biennium, this group has identified the flooding as a major concern for urban water management in LAC. The LAC working group is advancing in its work plan, including the development of a web page for disseminating regional experiences. Also publications, and contributions to AquaLAC and a regional symposium are foreseen in 2014. Furthermore, the Government of Santa Fe, Argentina, requested UNESCO Regional Office for Science to provide advice in the management of water resources in its major cities (Rosario and Santa Fe) and a MoU has been signed in 2012 among both institutions to foster collaboration on this issue.

58. In the area of urban flood management, UNESCO Regional Science Bureau for Asia and the Pacific has completed a project titled “Establishment of Community-based Point of Interest in Flood Prone Areas in Jakarta” as part of the “UNESCO’ World POI” Map Project. UNESCO collaborated with Humanitarian OpenStreetMap Team (HOT) to conduct a series of trainings attended by 150 persons from local government, schools, NGOs and vocational bodies from Jakarta to support the development of ‘community-owned-knowledge’ for management of extreme floods in urban areas.

59. **Focal Area 4.4: Achieving Sustainable Rural Water Management:** The implementation of this focal area has been combined with activities of Focal Areas 4.1 and 4.3 due to the limited budget. Consequently, rural water issues have been addressed in the context of water quality, water pollution and urban-rural water management.

**THEME 5: WATER EDUCATION FOR SUSTAINABLE DEVELOPMENT**

60. **Focal Area 5.1: Tertiary Water Education and Professional Development:** The knowledge base on water education was strengthened via the publication of a global synthesis of examples of best practices on water education was published, covering all regions and different educational levels.

61. Educational capacities and cooperation strengthened via the establishment of three new water-related UNESCO Chairs, focusing respectively on Sustainable Water Services (at the Tampere University of Technology, Finland), on Water for Ecologically Sustainable Development (at the University of Belgrade, Serbia) and on Water and Environment Management for Sustainable Cities (at the Sharif University of Technology, Iran), with the agreements for additional chairs ready to be signed soon.

62. In the framework of the Water for Peace in Africa five national assessment studies focusing on each country’s training and capacity needs were conducted in hydrology and water resources management (one for each of the Eastern Nile countries). Different needs were identified such as integrated watershed planning and management, climate change risk management, water cooperation and benefit sharing, conjunctive use of surface and groundwater, hydrologic models using GIS/GPS/remote sensing, water quality assessment and protection, groundwater water resources assessment, development and management (including numerical models in groundwater) and design and management of water harvesting systems.

63. **Focal Area 5.2: Vocational Education and Training of Water Technicians:** The Hydro Free and/or Open-source software Platform of Experts (HOPE) provides a free alternative to commercial specialized engineering software in the field of hydrology (e.g. water resources, rivers and groundwater; water modeling, wastewater treatment) since most software applications are not affordable for low and middle-income economies. As members of the Steering Committee, AMCOW, Regional Centre for Integrated River Basin Management (RC-IRBM), Southern African Network of Water Centers of Excellence and UNECA actively participated in the development of the HOPE platform. SADC countries are drawing immediate benefits in improving relevant engineering curricula in the continent. Indeed, 55 participants
from 14 countries attended the TVET in SADC: monitoring progress and revitalizing actions workshop held in Cape Town in November 2013: http://www.hope-initiative.net/blog/tvet-in-sadc-monitoring-progress-and-revitalizing-actions. Through this workshop, participants from DR Congo, Lesotho, Malawi, Mauritius, Mozambique, Namibia, South Africa and Swaziland attended their first HOPE wastewater training.

64. **Focal Area 5.3: Water education in schools**: Youth involvement on water cooperation and commitment towards water security strengthened via a youth event organized in Mexico City for the Closing of the International Year, in collaboration with AccionAgua in December 2013. Collaboration with Youth strengthened via a MoU for the World Youth Parliament for Water.

65. Cooperation among schools of all regions on water education projects was strengthened via a web-based school project that produced audiovisual materials released at thewaterchannel.tv. The strengthening of capacities of teachers and educators in LAC was pursued within the framework of Water and Education for the Americas and the Caribbean in Paraguay under the agreement with OMAPA. In addition, Uruguay is advancing in the organization of a series of workshops of the Blue Planet initiative. In the Arab Region, a regional water campaign was initiated through the development of informal water educational and awareness tool within a game environment posted on social media, including competitions and challenges among schools students and youth discussions. Additionally, water education general guides for teachers in the Arab region were outlined based on joint experience of educators and water professionals. The H2Oooh! Cartoon initiative was expanded with the release in May 2013 of a new version based on stories collected in Jordan; 2 new cartoons were elaborated by the participants of the 24th Ciak Junior Festival in Cortina (Italy) and 26 cartoons were made available in Spanish and are being disseminated in LAC. The concept of a treasure hunting and H2Oooh! Game in the city of Venice was developed for Expo 2015 in close cooperation with the WWAP Secretariat.

66. **Focal Area 5.4: Water education for communities, stakeholders and mass-media professionals**: Capacity of 22 water professionals from Ministries in charge of water for ECCAS countries (Gabon, Burundi, Congo, Chad, Cameroon, DRC, Central African Republic, Guinea Equatorial, Sao Tome et Principe) enhanced on water conflict management and cooperation during regional workshops held in November 2013. Similar workshops have been held for professionals from Lake Chad Basin Commission in 2013.

67. Information was disseminated through the Water Portal on IHP’s activities and involvement in major high-visibility events, particularly the launching of the UN International Year of Water Cooperation under UNESCO’s lead, as well as celebrations for World Water Day themed around water cooperation. Various news items and highlights on other events organized with partner organizations as well as just-released IHP publications were posted online. In collaboration with thewaterchannel.tv, over 1500 water-related videos in 39 categories are now available online.

**EVALUATION OF THE SEVENTH PHASE OF IHP (IHP-VII, 2008 – 2013) (agenda item 7.2)**

68. The IHP Bureau, at its 49th session, discussed the planning for an evaluation of IHP-VII, exploring different alternatives, including an evaluation through UNESCO’s mechanisms with reliance on previous evaluations. The Bureau highlighted that the evaluation should be forward looking, rather than focusing on past experiences. The IHP Secretariat, with the support of the Internal Oversight Service (iOS) of UNESCO, initiated the evaluation of IHP-VII. The draft ToR of the evaluation was commented by the IHP Bureau in August 2013 and IOS issued a call for
proposals in September, with a subsequent on-line advertisement. Three consultants were selected and initiated their work in November 2013. Additional data collection is foreseen and a draft of the evaluation report will be sent to IHP Bureau members for comments in due time. The final report is intended to be due in time for submission to the 21st session of the IHP Council.

COOPERATION WITH OTHER UNESCO PROGRAMMES (agenda item 7.3)

World Commission on the Ethics of Scientific Knowledge and Technology - COMEST

69. IHP’s International Initiative on Water Quality has developed close cooperation with the World Commission on the Ethics of Scientific Knowledge and Technology (COMEST) of the Social and Human Sciences Sector on ethical implications of nanotechnology applications in water and wastewater treatment. A concrete example of this new inter-sectoral collaboration effort includes a special session dedicated to Nanotechnology Applications in Water, organized jointly with Social and Human Science Sector of UNESCO and UNIDO, as part of the UNESCO-COMEST Conference on Emerging Ethical Issues in Science and Technology, Bratislava, Slovakia, 30 - 31 May 2013. The session was attended by about 100 participants of the conference, including experts from Austria, South Africa, Sweden and USA.

Cooperation with the Man and the Biosphere Programme (MAB)

70. The cooperation between the International Hydrological Programme (IHP) and the Man and the Biosphere (MAB) Programme is clearly expressed through the implementation of several joint activities. Throughout the past biennia, the IHP-MAB cooperation has covered a wide range of fields and aimed to encourage the incorporation of ecosystems approach in water resources management with emphasis on mountains and dry lands.

71. A project on “The Impact of Glacier Retreat in the Andes: International Multidisciplinary Network for Adaptation Strategies” funded through the Flanders Trust Fund is implemented in close cooperation with the MAB programme. The main objective of the current project is to establish a multidisciplinary network which will help to enhanced resilience to changes, particularly climate change, through improved understanding of vulnerabilities, opportunities and potentials for adaptation. The network will develop strategies and policy advice based on sound scientific knowledge for the Andean region.

Cooperation with the Intersectoral Platform on Climate Change

72. The Inter-sectoral Platform on Climate Change endorsed the IHP-coordinated project on “Climate Change Impacts in Major Mountainous Regions of the World: Multidisciplinary Network for Adaptation Strategies (Africa, Asia, Latin America, and Europe)”. Within the framework of the Inter-sectoral Platform project, workshops were organized by IHP, in cooperation with the MAB, UNEP, the Mountain Partnership Secretariat at FAO and International Centre for Integrated Mountain Development (ICIMOD). The main objective of the policy workshops was to address climate change mitigation and adaptation. Efforts were focused on increasing these regions’ resilience to climate change through the identification of vulnerabilities, opportunities for adaptation, and the development of science-based strategies and policies. The project began with regional workshops to gather more localized information and policy recommendations. The outcomes of the Asian (Kathmandu, Nepal, March 2013), Latin American (San Jose, Costa Rica, August 2013), and African (Nairobi, Kenya, September 2013) workshops helped identify research gaps and vulnerable communities. Attendees came from all around world, including glaciologists, hydrologists, water resources specialists, and mountain biosphere managers, representatives from Natural Heritage sites, policy makers, social scientists, local stakeholders, and communication experts. Altogether 200 participants’ from Africa, Latin America, Asia,
Europe and North America provided contribution to the regional and the final synthesis workshop.

73. IHP hosted the final workshop on 23-24 January 2014 entitled “Climate Change Impacts in Major Mountainous Regions of the World: Multidisciplinary Network for Adaptation Strategies (Africa, Asia, Latin America and Europe)”. The regional policy recommendations from Asia, Africa, and Latin America were incorporated into a science policy brief that will be widely disseminated through networks, partner intuitions and UN agencies. The final workshop gathered policy-makers, experts and stakeholders to review the recommendations from the regional workshops. This served as an opportunity to deliberate and refine key recommendations to governments for effective climate change policy in mountainous regions.

**Cooperation with the International Oceanographic Commission (IOC)**

74. IHP and IOC are cooperating in the context of the ‘Race of Water’, an educational and awareness raising initiative conducted by Multi One Attitude Foundation.

**Cooperation within the Inter-sectoral platform on Priority Africa and contribution to Inter-sectoral Platform on a Culture of Peace and Non-Violence**

75. IHP through its PCCP programme (associated programme with WWAP) collaborates effectively with various other programmes within the activities of the Priority Africa inter-sectoral platform. The overall objective of this inter-sectoral platform activity was to: (i) produce a summary paper synthesizing the relevant socio-cultural, economic, biological, hydrological and environmental issues which require consideration within the future integrative and collaborative management of Lake Chad and its watershed; and (ii) develop an information and advocacy document to assist the future sustainable and peaceful management of natural resources in the watershed.

76. The research work synergized with capacity building approaches developed under the PCCP programme (i.e. 2 seminars on enhancement of sills for cooperation and sustainable development with a total of 40 participants). The combination of research, capacity building and advocacy work is assisting the Lake Chad Basin Commission (LCBC) in the management of the lake and the water resources across the watershed. Programmes and sectors involved in this endeavor are Science sector (MAB, SC/PSD/SII); Sector of Culture (CLT/WHC); Social and human sciences sector (SHS/ESS/GEC), Africa department (AFR/PSI).