Overview of UNESCO’s International Hydrological Programme

TIGER Workshop, JNB 12/12/2011

Y. Filali-Meknassi (Ph.D.)
UNESCO’s work in the water sector is built on 3 tracks:

① Hydrological science for policy relevant advice;
② Education and capacity building responding to the growing needs of sustainable development;
③ Water resources assessment and management to achieve environmental sustainability.

UNESCO’s water family operates as a global network that works together to implement the organization’s strategic goals.
UNESCO hosts the *International Hydrological Programme (IHP) Secretariat* and provides seed funding that is multiplied many times over through cooperation with implementing partners.

*IHP is the only intergovernmental programme of the UN system* devoted to water research, water resources management, education and capacity building.

The IHP Secretariat serves UNESCO’s 195 Member States, through the IHP National Committees, other governmental bodies, and academic and research institutions in the implementation of the programme.
UNESCO-IHE Institute for Water Education – an integral part of UNESCO – is the educational arm.

26 agencies of the UN system cooperate through the World Water Assessment Programme (WWAP) to provide an ongoing global assessment of the state of the world’s freshwater resources. The programme is hosted and led by UNESCO.

UNESCO’s Regional and Cluster Offices assist in the implementation of IHP in the regions.
Water-related Institutes and Centres under the auspices of UNESCO work on relevant thematic and geographic priorities in their areas of expertise. Since Member States have realized the potential of these centres, the network has been rapidly expanding.

UNESCO’s Water-related Chairs are established as teaching or research positions at universities or research institutes around the world.
The only global intergovernmental scientific programme on water resources of the UN system

- Created in 1975 after the International Hydrological Decade (IHD)
- Member States define needs and plans of phases
- Growing emphasis on management and social aspects
- Executed by Member States (there are 164 IHP National Committees) and other partners;
International Hydrological Programme

IHP Phases

IHP-VII: Water Dependencies: Systems Under Stress and Societal Responses

IHD

1965 – 1974
1975 – 1980
1981 – 1983
1984 – 1989
1990 – 1995
1996 – 2001
2002 – 2007
2008 – 2013

Water Interactions: Systems at Risk and Social Challenges

Hydrology and Water Resources for Sustainable Development
IHP-VII: Water Dependences: Systems Under Stress and Societal Responses

IHP-VII is built on lessons learned from results achieved in earlier phases of the programme.

Themes:
1. Adapting to the impacts of global changes on river basins and aquifer systems;
2. Strengthening water governance for sustainability;
3. Ecohydrology for sustainability;
4. Water and life support systems;
5. Water education for sustainable development.
All IHP-related activities are endorsed, recommended and coordinated through the IHP Intergovernmental Council.

- Promoting leading edge research that provides policy-relevant advice to Member States;
- Facilitating education and capacity development as a response to the growing needs linked to sustainable development;
- Enhancing governance in water resources management to achieve ecosystem sustainability.
Outcomes of IHP-VII should establish pathways and benchmarks for water management in the decades to come. They should contribute to sustaining human and environmental health wherever water-dependent systems are under pressure and effective societal responses are not yet in place.

The results achieved during this phase strive to be practical so that both scientific communities and civil society can apply and benefit from them.
OVERVIEW OF THE RELATIONSHIPS BETWEEN THE CORE THEMES OF IHP VII, AND THE CROSSCUTTING AND ASSOCIATED PROGRAMME COMPONENTS
IHP’s cross-cutting programmes, FRIEND and HELP, interact with all IHP themes through their operational concepts. When IHP’s associated programmes cover projects and activities that contribute to the development and implementation of IHP themes, and are often interlinked with joint and interagency programme components.
An international research programme that helps to set up regional networks for analyzing hydrological data through the exchange of data, knowledge and techniques at the regional level.

**Current research**

Low flows, floods, variability of regimes, rainfall/runoff modeling, processes of stream flow generation, sediment transport, snow and glacier melt, climate change and variability and its uncertainties, and land-use impacts.
FLOW REGIMES FROM INTERNATIONAL EXPERIMENTAL NETWORK DATA

FRIEND : A global project
Flow Regimes from International Experimental Network Data

FRIEND in Africa

3 networks in sub-Saharan Africa

- FRIEND-AOC (West and Central Africa)
- FRIEND-SA (Southern Africa)
- FRIEND-Nile

6th International Conference in Fez, Morocco, in October 2010: “Global Change: Facing Risks and Threats to Water Resources”

http://iah.info/redbooks/840.htm

Each network has a coordinator and various themes based on the priority of the region including a regional hydroclimatic database
Hydrology for the Environment, Life and Policy

Established in 1999
An approach to integrated catchment management by building a framework for water law and policy experts, water resource managers and water scientists to work together on water-related problems.
HELP addresses **5 key policy issues**
- Water and climate
- Water and food
- Water quality and human health
- Water and conflict
- Water and the environment
12 HELP basins in Sub-Saharan Africa

Examples: Ewaso Ng’iro Basin (Kenya), Greater Ruaha basin (Tanzania), Lake Navaisha basin (Kenya), Olifants basin (South Africa), Thukela basin (South Africa)

First Africa HELP basins workshop

- Workshop held from 23-25 November 2011 in Johannesburg
- Took stock of achievements so far and discussed the remapping of HELP in Africa
- Regional HELP Africa coordination unit created and TORs discussed
Associated programmes or Initiatives launched in collaboration with other partners

- UWMP
- WHYMAP
- JIIHP
- PC CP
- INTERNATIONAL FLOOD INITIATIVE
- PCCP
- ISARM
- G-WADI
- Groundwater Resources assessment under the Pressures of Humanity and Climate Changes

Graphic
Groundwater Resources Assessment under the Pressures of Humanity and Climate Change

A UNESCO-led project seeking to improve our understanding of

- How groundwater interacts within the global water cycle,
- How it supports human activity and ecosystems,
- And how it responds to the complex dual pressures of human activity and climate change.
Groundwater Resources Assessment under the Pressures of Humanity and Climate Change

Missions

✓ Provides a platform for the exchange of information.
✓ Serves the global community by providing scientifically-based and policy-relevant recommendations.
✓ Uses regional and global networks to improve the capacity to manage groundwater resources.

A publication of GRAPHIC case studies is currently being compiled and will be published soon: Selection of case studies covering a wide range of subjects, scientific methods, and geographical and climatic settings.
Global Network on Water and Development Information in Arid Lands

Established in 2004

A global network on water resources management in arid and semi-arid zones whose primary aim is to build an effective global community to promote international and regional cooperation in the arid and semi-arid areas.

http://www.gwadi.org/
Global Network on Water and Development Information in Arid Lands

Objectives

- Knowledge of hydrological systems
- Capacity building
- Dissemination to end-users
- Exchange of experience
- Promoting integrated basin management
Global Network on Water and Development Information in Arid Lands

Achievements (some examples)

- Real-time high resolution satellite Precipitation data
  [http://hydis.eng.uci.edu/gwadi](http://hydis.eng.uci.edu/gwadi)
- Promoting access to global users remotely sensed global data products
- Development of training material, software and software tutorials for hydrological modeling
- Providing guidance on best practice and an information resource about chemical and isotopic tracers
- Workshops, conferences and meetings, publications
Global Network on Water and Development Information in Arid Lands

G-WADI in Africa

Workshop held in Dakar in April 2010: recommendation to create the G-WADI network for sub-Saharan Africa

Creation of G-WADI network for sub-Saharan Africa in December 2010: the Secretariat on a rotational basis is hosted by AGRHYMET Regional Center for the next 4 years

http://www.agrhymet.net/
Launched in 2005

An interagency initiative promoting an integrated approach to flood management which takes advantage of the benefits of floods and the use of flood plains, while reducing social, environmental and economic risks.

http://www.ifi-home.info/
Strategic activities focus on research, information networking, education and training, empowering communities and providing technical assistance and guidance.
Some publications

- World catalogue of maximum observed floods, 2003
  
  [http://iahs.info/redbooks/284.htm](http://iahs.info/redbooks/284.htm)

- Frontiers in Flood Research, 2006
  
  [http://iahs.info/redbooks/305.htm](http://iahs.info/redbooks/305.htm)
Internationally Shared/Transboundary Aquifer Resources Management

Initiated in 2002

Multi-agency effort led by UNESCO and the International Association of Hydrogeologists (IAH)

An initiative to set up a network of experts to compile a world inventory of transboundary aquifers and to develop wise practices and guidance tools concerning shared groundwater resources management.

www.isarm.org
Internationally Shared/Transboundary Aquifer Resources Management (ISARM) in Africa

4 sub-regional ISARM components

- ISARM SADC (Southern Africa)
- ISARM ECOWAS (West Africa)
- ISARM IGAD sub-region
- ISARM ECCAS (Central Africa)

April 2011 - Kenya: 2nd workshop of the ISARM IGAD network
May 2011 - Cameroon: 2nd ISARM West Africa meeting and 1st ISARM meeting for Central African countries
Established in 2002

An initiative to assess erosion and sediment transport to marine, lake or reservoir environments aimed at the creation of a holistic approach for the remediation and conservation of surface waters, closely linking science with policy and management needs.

http://www.irtces.org/isi/
International Sediment Initiative

Objectives

✓ Strengthen, at global level, awareness about the importance of erosion and sediment processes and their impacts.
✓ Promote exchange of information.
✓ Foster cooperation in erosion and sediment-related research and education.
Main Activities & Projects

1. Global Evaluation of Sediment Transport (GEST Project)
2. Initiation of case studies for river basins
3. Setting up a global erosion and sediment information system
4. Review of sediment related research
5. Education and capacity building for sustainable sediment management
6. Networking
JIHP  Joint International Isotope Hydrology Programme

Created in 2002

Joint programme of the International Atomic Energy Agency (IAEA) and UNESCO

A programme facilitating the integration of isotopes in hydrological practices through the development of tools, inclusion of isotope hydrology in university curricula and support to programmes in water resources using isotope techniques.
Achievements

Publication of “Environmental Isotopes in the Hydrological Cycle: Principles and Applications”:

Series of 6 textbooks providing a comprehensive review of basic theoretical concepts and principles of isotope hydrology methodologies and their practical application.

www.naweb.iaea.org/nasc/ihs_resources_publication_hydroCycle_en.html
From Potential Conflict to Cooperation Potential

An associated programme of IHP and WWAP

A project facilitating multi-level and interdisciplinary dialogues in order to foster peace, cooperation and development related to the management of shared water resources.

The programme focused on enhancing and building capacities related to shared water management.
Achievements (some examples)

✓ Development of specific training material for the SADC region: pilot courses took place in November 2002 in Maputo, Mozambique and Cape Town, South Africa

✓ Training in “water conflict management” for trainers from African countries was held in September 2010 at WWAP

✓ Case studies, e.g. the Mono River Basin (Benin and Togo)

✓ Publications, such as “Managing and transforming water conflicts”, 2009; “Water and peace for the people”, 2008
A programme that generates approaches, tools and guidelines which will allow cities to improve their knowledge, as well as analysis of the urban water situation to draw up more effective urban water management strategies.
UWMP  Urban Water Management Programme

UNESCO-IHP Urban Water Series
Comprising a set of books on urban water management, addresses fundamental issues related to the role of water in cities and the effects of urbanization on the hydrological cycle and water resources.

Some examples
✓ Urban Water Cycle Processes and Interactions, 2007
WHYMAP  World-wide Hydrogeological Mapping and Assessment Programme

Launched in 2000

An initiative to collect, collate and visualize hydrogeological information at the global scale to convey groundwater-related information in a way appropriate for global discussion on water issues.

Joint programme of the UNESCO, the Commission for the Geological Map of the World (CGMW), the IAH, the International Atomic Energy Agency (IAEA) and the German Federal Institute for Geosciences and Natural Resources.

http://www.whymap.org/
WHYMAP  World-wide Hydrogeological Mapping and Assessment Programme

Objectives

✓ Summarize groundwater information on global scale.
✓ Show groundwater data on maps and map applications.
✓ Provide map information for international discussion on water, such as for WWAP, World Water Development Reports (WWDR) and World Water Forum.
✓ Exchange information on groundwater with other research and development projects.
WHYMAP  World-wide Hydrogeological Mapping and Assessment Programme

Achievements (some examples)

- Publication: “Groundwater resources of the world and their use”
- Groundwater Resources Map of the World 1: 25 000 000 (2008)
- Groundwater Resources of the World - Transboundary Aquifer Systems 1: 50 000 000 (2006)
- GIS with supra-national, continent-wide, groundwater related data
- WHYMAP web map application with embedded World-wide Hydrogeological Map Information System (WHYMIS)
TIGER programme ESA-UNESCO

2009 - 2012

An initiative to support African scientist to develop the scientific skills and the technical capacity to make the best use of Earth Observation technology to better understand, assess and monitor the water resources in Africa.

- 20 projects have been identified for the 2nd implementation phase
- Support to TIGER (three coordinators attended the training workshop on climate change and water resources held in Western cape).
Thank you for your attention!

Y. Filali-Meknassi (Ph.D.) – Contact: y.filali-meknassi@unesco.org
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