



United Nations  
Educational, Scientific and  
Cultural Organization



International  
Hydrological Programme

# IHP-VIII

## WATERSECURITY

Responses to Local  
Regional and Global Challenges  
[2014-2021]





# THE CONTEXT

## **WATER: A VITAL RESOURCE**

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Freshwater is a vital resource for human health, prosperity and security, with crucial importance for sustainable development, including poverty eradication, gender equality, food security and the preservation of ecosystems. Given its vital role, water has a specific target under the Millennium Development Goals, is a thematic area under consultation for the post-2015 Sustainable Development Goals and is recognized as a human right. While water is a distinctive feature of our planet, allowing life to flourish, freshwater is a limited resource and is unevenly distributed in space and time. Billions of people are affected by water challenges, including scarcity, water hazards, water quality, water supply and sanitation. Most of the burden caused by the water crisis is suffered by women, children and those living under conditions of poverty. All regions – in particular Africa – are confronted with serious freshwater challenges. Water resources are under increasingly severe pressures from climate change and other global change drivers. Around 80% of the world's population is exposed to high levels of threat to water security, in terms of water availability, demand and hazards among other factors.

## **WATER SECURITY: A KEY CHALLENGE FOR THE 21<sup>ST</sup> CENTURY**

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UNESCO's strategic plan to achieve water security in response to local, regional, and global challenges was prepared through a 3-year comprehensive consultation process with Member States. This plan, corresponding to the 8th Phase of the International Hydrological Programme (IHP-VIII) and covers the same period as the medium-term strategy of UNESCO (2014-2021). One of the main objectives of IHP VIII is to put science into action, by promoting the process of transformation of information and experience into answering local and regional needs for tools to adapt to global changes and building competences to meet the challenges of today's global water challenges. UNESCO centres and chairs play an important role in this process. The 8th Phase of the IHP comprises of 6 themes.

# IHP-VIII PROGRAMMES

## + **FRIEND-Water (Flow Regimes from International Experimental and Network Data)**

An international collaborative network of experts that aims to generate new understanding about regional hydrology and multi-scale water cycle processes?

## + **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.

## + **G-WADI (Global Network on Water and Development Information in Arid Lands)**

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 semiarid areas.

## + **HELP (Hydrology for the Environment, Life and Policy)**

A new 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.

## + **IDI (International Drought Initiative)**

A long-term initiative through which the research activities related to droughts as well as the development of capacities to address such events will be designed, coordinated and implemented.

## + **IFI (International Flood Initiative)**

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. Partners: the World Meteorological Organization (WMO), the United Nations University (UNU), the International Association of Hydrological Sciences (IAHS) and the International Strategy for Disaster Reduction (ISDR).

## + **ISARM (Internationally Shared Aquifer Resources Management)**

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

## + **ISI (International Sediment Initiative)**

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.

## + **JIIHP (Joint International Isotope Hydrology Programme)**

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.

## + **PCCP (From Potential Conflict to Cooperation Potential)**

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

## + **UWMP (Urban Water Management Programme)**

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.

## + **WHYMAP (World Hydrogeological Map)**

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.

## + **IIWQ (International Initiative on Water Quality)**

An international platform to strengthen knowledge, research and policy and develop innovative approaches to tackle water quality challenges.



# MEMBERS OF THE UNESCO WATER FAMILY

“The UNESCO Water Family it is the leading United Nations agency for water”

(testimonial in The Independent External Evaluation of UNESCO, IOS/EVS/PI/107).

**The International Hydrological Programme (IHP)** is UNESCO’s intergovernmental scientific cooperation program on water. It was created in 1975, becoming the first and only intergovernmental freshwater initiative institutionalized in the UN system. IHP is governed by an Intergovernmental Council, which constitutes a subsidiary body of UNESCO’s General Conference. IHP is implemented in phases developed through a comprehensive consultative process with its 168 IHP National Committees, international scientific associations and other UN bodies, ensuring IHP’s continuous relevance and its overall institutional coordination.

**UNESCO-IHE** Institute for Water Education, located in Delft, The Netherlands, is formally part of UNESCO since 2003. UNESCO-IHE is the largest postgraduate water education facility in the world. The Institute confers fully accredited master degrees and promotes PhDs. It has enhanced the capacities of 14,500 water professionals from over 160 countries. Based on the decisions of the governing boards of UNESCO, the Institute may expand its service to Member States via the establishment of a Global Campus of Water and Development and the potential acquisition of

PhD granting rights in connection with host countries and universities.

**The World Water Assessment Programme (WWAP)**, located in Perugia, Italy, is a flagship programme of UN-Water, which brings together 30 UN agencies. It is housed, administered and led by UNESCO. Starting in 2014, WWAP will produce the periodic World Water Development Reports on an annual basis and on specific topics (e.g. Water and Energy) with a five-year global synthesis report.

The network of 18 established **water-related centres** under the auspices of UNESCO (category 2 institutes and centres) contributes to the implementation of the IHP at the international and regional level. Eight additional centres were approved by the General Conference and are in the process of being established.

The 29 water-related **UNESCO Chairs and UNITWIN networks** promote intellectual cooperation through twinning and other linking arrangements among institutions and academics to foster access to and sharing of knowledge.

## The UNESCO Water Family

### UNESCO-Offices

- UNESCO-HQ/IHP
- ▲ WWAP
- ★ IHP Regional Hydrologist
- UNESCO-IHE

### Water-related Category 2 Centres

- Established
- In Process

### UNESCO Water-related Chairs

- UNESCO Chair



# IHP-VIII AT A GLANCE

## THEMES AND FOCAL AREAS

### THEME 1: WATER RELATED DISASTERS AND HYDROLOGICAL CHANGES

**Focal Area 1.1** – Risk management as adaptation to global changes

**Focal Area 1.2** – Understanding coupled human and natural processes

**Focal Area 1.3** – Benefiting from global and local Earth observation systems

**Focal Area 1.4** – Addressing uncertainty and improving its communication

**Focal Area 1.5** – Improve scientific basis for hydrology and water sciences for preparation and response to extreme hydrological events

### THEME 2: GROUNDWATER IN A CHANGING ENVIRONMENT

**Focal Area 2.1** – Enhancing sustainable groundwater resources management

**Focal Area 2.2** – Addressing strategies for management of aquifers recharge

**Focal Area 2.3** – Adapting to the impacts of climate change on aquifer systems

**Focal Area 2.4** – Promoting groundwater quality protection

**Focal Area 2.5** – Promoting management of transboundary aquifers

### THEME 3: ADDRESSING WATER SCARCITY AND QUALITY

**Focal Area 3.1** – Improving governance, planning, management, allocation, and efficient use of water resources

**Focal Area 3.2** – Dealing with present water scarcity and developing foresight to prevent undesirable trends

**Focal Area 3.3** – Promoting tools for stakeholders involvement and awareness and conflict resolution

**Focal Area 3.4** – Addressing water quality and pollution issues within an IWRM framework - improving legal, policy, institutional, and human capacity

**Focal Area 3.5** – Promoting innovative tools for safety of water supplies and controlling pollution

### THEME 4: WATER AND HUMAN SETTLEMENTS OF THE FUTURE

**Focal Area 4.1** – Game changing approaches and technologies

**Focal Area 4.2** – System wide changes for integrated management approaches

**Focal Area 4.3** – Institution and leadership for beneficitation and integration

**Focal Area 4.4** – Opportunities in emerging cities in developing countries

**Focal Area 4.5** – Integrated development in rural human settlement

**AXIS 3**  
Developing institutional and human capacities for water security and sustainability

WATER-RELATED DISASTERS AND HYDROLOGICAL CHANGE



GROUNDWATER IN A CHANGING ENVIRONMENT



WATER SECURITY

**THEME 5: ECOHYDROLOGY, ENGINEERING HARMONY FOR A SUSTAINABLE WORLD**

**Focal Area 5.1** – Hydrological dimension of a catchment – identification of potential threats and opportunities for a sustainable development

**Focal Area 5.2** – Shaping of the catchment ecological structure for ecosystem potential enhancement – biological productivity and biodiversity.

**Focal Area 5.3** – Ecohydrology system solution and ecological engineering for the enhancement of water and ecosystem resilience and ecosystem services

**Focal Area 5.4** – Urban Ecohydrology – storm water purification and retention in the city landscape, potential for improvement of health and quality of life

**Focal Area 5.5** – Ecohydrological regulation for sustaining and restoring continental to coastal connectivity and ecosystem functioning

**THEME 6: WATER EDUCATION KEY, FOR WATER SECURITY**

**Focal Area 6.1** – Enhancing tertiary water education and professional capabilities in the water sector

**Focal Area 6.2** – Addressing vocational education and training of water technicians

**Focal Area 6.3** – Water education for children and youth

**Focal Area 6.4** – Promoting awareness of water issues through informal water education

**Focal Area 6.5** – Education for transboundary water cooperation and governance

EDUCATION, TRAINING AND CAPACITY BUILDING ACTIVITIES ARE DEVELOPED ACROSS ALL THEMES

**AXIS 1**

Mobilizing International cooperation to Improve knowledge and innovation to address water security challenges



**AXIS 2**

Strengthening the Science-Policy interface to reach water security at local, national, regional, and global levels

## INTERNATIONAL HYDROLOGICAL PROGRAMME (IHP)

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