



United Nations  
Educational, Scientific and  
Cultural Organization



International  
Hydrological Programme

# WATER EDUCATION

## FOR SUSTAINABLE DEVELOPMENT

A Global Synthesis



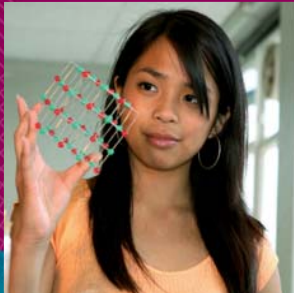
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# WATER EDUCATION FOR SUSTAINABLE DEVELOPMENT

## PREAMBLE

*Water education is key to achieve the water related MDG's. While there is a range of materials and projects focusing on water-related education, these are not well connected to offer customised solutions to individual countries. Some of the limitations identified with the existing water education include use of outdated, biased or irrelevant information; poor medium of instruction; lack of continuity between different levels of water education; lack of integration with the wider curriculum and with local knowledge; lack of practical relevance to local and community needs; lack of resources; and poor linkages with locally available professional bodies.*

### **WATER EDUCATION FOR SUSTAINABLE DEVELOPMENT**

The programme on "Water Education" is an initiative of the International Hydrological Programme (IHP) of UNESCO, Water and Sustainable Education focused on *an integrated understanding of biological and hydrological processes at a catchment's scale in order to create a scientific basis for a new, cost-effective and systemic approach to the sustainable management of freshwater resources.* Its organization follows IHP's biennial programme phases.

### **MISSION STATEMENT AND GENERAL DESCRIPTION OF THE INITIATIVE**

The Water Education is a key theme of the International Hydrological Programme. Water Education is the strategic entry point in developing a new ethic for water governance and management. However, there are many challenges in providing water education for sustainable development. Educational programmes will thus have

to shape a new generation of water managers and decision makers who are able to apply a holistic and multidisciplinary approach to water resources.

IHP's action in the field of water education was substantially extended in the previous phase of the programme. The increasing emphasis on cross-disciplinary activities is being consolidated and continued in the current phase. Education about water issues will have to occur at all levels to equip people with the knowledge, skills and values to play a role in protecting the resource. In addition to the tertiary and professional dimensions of water education, IHP also focuses on policy makers, schools, vocational education and training, mass media and stakeholders in an effort to promote water sustainability.

There is a concerted effort to improve linkages between those engaged in water education at the tertiary level and those working on school, vocational education and training, and community levels.

1. Target 7c: Reduce by half the proportion of people without sustainable access to safe drinking water and basic sanitation

## PURPOSE

Five regional workshops on water education were organized to identify gaps to appropriately respond to the local needs and to achieve the objectives foreseen in the strategic plan for IHP-VII, the DESD Action Plan and the Water Education Workplan. This reflects UNESCO's role as the leading agency within the UN system for the UN Decade of Education for Sustainable Development.

These workshops contributed to the implementation of theme 5 ("Water Education for Sustainable Development") of the strategic Plan for the 7<sup>th</sup> Phase of IHP (2008-2013). In particular, the workshops contributed to the following outputs of focal areas 5.1 to 5.4:

- Recommendations for broader curricula, exemplar educational materials and case studies
- Case studies, best practices and publications on water education within TVET.
- Guidelines for integrating water education related to sustainable development into the K-12 curriculum, with emphasis on "learning by doing" or "experiential learning" approaches.
- Production of guidelines, supported by practical examples, for community-based water education and media reporting of water issues.

The DESD Action Plan was prepared to provide strategic focus to UNESCO initiatives that integrate Education for Sustainable Development with related dimensions of UNESCO's activities in order to help create an enabling environment for capacity-building according to the needs of the Member States and other partners to achieve the objectives of the DESD. The Action Plan envisages several thematic programmes, defined as long-term intersectoral programmes, one of them on education for sustainable water management. For the 2008/09 biennium, the Action Plan implied the "Review, development and dissemination of case studies innovative and effective practice related to the theme" and as expected results "Regional and/or International Experts' Meeting(s) held; Meta-analysis completed; Book of case studies published; Guidelines and Briefing Papers published".

The Water Education work plan, which was developed by an intersectoral group and experts from all regions, highlights the following expected outputs:

- Guidelines for integrating sustainable water management in water education and training.
- Case studies, best practices and publications on water education and training.

## OBJECTIVES OF THE REGIONAL WORKSHOPS

The regional workshops had the following **objectives**:

- ▶ Identify examples of best practices on water education in the region at all educational levels;
- ▶ Analyze examples of best practices to identify barriers and opportunities;
- ▶ Propose recommendations to enable effective water education in the region at all educational levels for:
  - (1) The international community, in particular for UNESCO;
  - (2) National Governments, in particular the ministries in charge of education and freshwater;
  - (3) Local authorities;
  - (4) Educational practitioners, including academics, researchers, trainers, teachers and mass media professionals.

The workshops also developed summaries of case studies in the following areas:

▶ TERTIARY EDUCATION AND PROFESSIONAL DEVELOPMENT OF WATER SCIENTISTS, ENGINEERS, MANAGERS AND DECISION MAKERS

▶ EDUCATION AND TRAINING OF WATER TECHNICIANS

▶ WATER EDUCATION IN SCHOOLS

▶ COMMUNITY EDUCATION

▶ WATER EDUCATION FOR MASS-MEDIA PROFESSIONALS

▶ CROSS-CUTTING CASE STUDIES



## CONCLUSIONS

The importance of water education is at all levels, nevertheless based on the SWOT analysis tables below, the conclusions and the key messages are made for each education area.

### → TERTIARY EDUCATION AND PROFESSIONAL DEVELOPMENT OF WATER SCIENTISTS, ENGINEERS, MANAGERS AND DECISION MAKERS

- ▶ TAKE BOTTOM-UP APPROACH BEFORE GOING TO REGIONAL LEVEL.
- ▶ INCENTIVES TO STAY IN THE COUNTRY AND TO RETURN NEEDS TO BE ESTABLISHED.
- ▶ WORK WITH EXISTING (SUCCESSFUL) NETWORKS.

### → EDUCATION AND TRAINING OF WATER TECHNICIANS

- ▶ TRAINING CENTRES PLAY A MAJOR ROLE.
- ▶ TRAINING NEEDS TO BE STRATEGICALLY LINKED WITH CAREER PATH AND INSTITUTIONAL NEEDS.
- ▶ TECHNICAL TRAINING NEEDS TO BE WELL GROUNDED IN BASIC KNOWLEDGE, REFLECTION AND INNOVATION.

### → WATER EDUCATION IN SCHOOLS

- ▶ THERE IS A ROLE FOR NGOs IN THIS AREA, POTENTIALLY PARTNERING WITH LOCAL GOVERNMENT AND UNIVERSITIES.
- ▶ FOLLOW EXAMPLES FROM ELSEWHERE.

### → COMMUNITY EDUCATION

- ▶ WATER PRICE IS A KEY PROBLEM. COMMUNITIES NEED TO UNDERSTAND THE COST OF WATER.
- ▶ COMMUNITIES NEED TO BE EDUCATED TO BE ABLE TO DISCUSS INFRASTRUCTURE AND DEVELOPMENT PROJECTS THAT AFFECT THEM.
- ▶ COMMUNITIES HAVE THEIR OWN INDIGENOUS KNOWLEDGE ABOUT WATER.

### → WATER EDUCATION FOR MASS-MEDIA PROFESSIONALS

- ▶ BRING MEDIA PEOPLE ALONG TO MAJOR WATER EVENTS.
- ▶ WATER PROFESSIONALS SHOULD TAKE THE RESPONSIBILITY OF COMMUNICATING WITH THE MEDIA, NOT THE OTHER WAY ROUND.

# SELECTION OF STUDY CASES BY REGION

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## AFRICA REGION

### TERTIARY AND TRAINING PROGRAMMES

Tertiary Education and Professional Development of Water Scientists, Engineers, Managers and Decision Makers in South Africa- Experiences and Highlights

### COMMUNITY AND STAKEHOLDER EDUCATION

Enhancing community participation in IWRM through targeted training and education: examples from the Volta Basin

## ARAB REGION

### EDUCATION AND TRAINING OF WATER TECHNICIANS

The Water Management and Irrigation Institute (WMII): Experience in Water Education in Sudan

## ASIA REGION

### WATER EDUCATION FOR MASS-MEDIA PROFESSIONALS

Outputs of the International Workshop on “Capacity Development for Water Journalists” Tehran-Iran

### TERTIARY EDUCATION STUDY ACROSS A GENDER STUDY IN SOUTH ASIA

Regional Capacity Building on IWRM and Gender & Water in South Asia: A Case from Crossing Boundaries

## EUROPE AND NORTH AMERICA REGION

### WATER EDUCATION IN SCHOOLS

Water Education for Children and Young Adults, Through School and Community Educators. Project WET Foundation, USA

## LATIN AMERICA AND CARRIBEAN REGION

### WATER EDUCATION IN SCHOOLS

General Guide for Educators of the Americas and the Caribbean  
Joint Program UNESCO IHP/WET Project



# TERTIARY EDUCATION AND PROFESSIONAL DEVELOPMENT OF WATER SCIENTISTS, ENGINEERS AND MANAGERS AND DECISION MAKERS

## IN SOUTH AFRICA: EXPERIENCES AND HIGHLIGHTS

### BACKGROUND

The initiatives have been undertaken by different educational institutions in South Africa to support technical education to strengthen water resources planning and management:

#### Technicians, Technologists and Engineers

1. Technician Training: Diploma in one of the disciplines in engineering (civil engineering) in former Technikon, now University of Technology.
2. Technologists: Bachelors Degree (BTech) in one of the disciplines in engineering (civil engineering) in former Technikon, now University of Technology.
3. Engineers: Bachelors Degree (BEng, BSc. Eng.) in civil engineering in traditional university.

#### Water Scientists

1. Diploma and BTech Degree holders generally get a Diploma or BTech Degree in water care.
2. Professionals from other background like Botany, Biology, Chemistry, Microbiology, can also do the degree to work in the water industry mainly in the process control section of the water industry.

#### Post Graduate Level Professional Development

1. University of KwaZulu Natal (UKZN) offers post graduate training courses leading masters degree in water related courses for non water backgrounds people (chemistry, Botany, Microbiology, etc) to give them sufficient grounding in water subjects together with a dissertation in the water area.
2. Business schools that have Master of Business Administration (MBA) courses tailored to the water sector.
3. Research by senior academics in water related matters, and this research takes on students at the masters or doctorate levels that covers a wide range of water disciplines.





## INTEGRATING BODY, WATER INSTITUTE OF SOUTHERN AFRICA (WISA)

The professionals of Water Institute of Southern Africa (WISA) are organizing specialized conferences every two years that bring together over 2000 professionals and practitioners in the sector to showcase what they do and in many instances to learn from one another.

### ➔ CONTACT

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## SWOT ANALYSIS: TERTIARY EDUCATION AND PROFESSIONAL DEVELOPMENT OF WATER SCIENTISTS, ENGINEERS, MANAGERS AND DECISION MAKERS

	STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
<b>AFRICA</b>	Trainers available.  Misuse of human resources.	Aging staff.  Absence of water management in the scientific programs of universities.	Customized packaging to meet national / sub-national needs (specialization).  Regional based networking can provide critical mass.	International conflicts on trans-boundary waters will become major issue if professionals are not available.
<b>ARAB</b>	Infrastructures already in place (e-learning, teachers, professors, etc.).  Most of individuals are professionally water literate.	Lack of communication and information exchange between stakeholders and institutions.  Absence of water management in the scientific programs of universities.	Demand for water professionals.	Irrelevant individual water management disciplines.
<b>ASIA</b>	Most countries have infrastructure already in place.	Lack of communication and information exchange between stakeholders and institutions.	Professional development for future careers.	Irrelevant individual water management disciplines.
<b>EUROPE &amp; NORTH AMERICA</b>	Collaboration between universities, practitioners, politicians.	Universities often focus on research, not on teaching.  Regional differences.	The use of existing materials that are transferable to many different countries.	Mono-disciplinary focus of university education and reward structure.
<b>LATIN AMERICA AND CARIBBEAN</b>	Water as a cross-cutting issue.	Out-of-date study plans at university/tertiary system.	Implementation of a water resource tertiary education strategy.	Poverty may constitute a barrier to tertiary training / education.



# REGIONAL CAPACITY BUILDING ON IWRM AND GENDER & WATER

## IN SOUTH ASIA: A CASE FROM CROSSING BOUNDARIES PROJECT

### BACKGROUND

SaciWATERS, the South Asian Consortium for Interdisciplinary Water Resources Studies, based in Hyderabad, India and the Irrigation and Water Engineering group at Wageningen University, implement the project with six South Asian partner institutions:

- ▶ Bangladesh Centre for Advanced Studies (BCAS), Dhaka, Bangladesh
- ▶ Institute of Water and Flood Management (IWFM), Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh
- ▶ Centre for Water Resources (CWR), Anna University, Chennai, Tamil Nadu, India
- ▶ Nepal Engineering College (NEC), Pokhara University, Kathmandu, Nepal
- ▶ Postgraduate Institute of Agriculture, University of Peradeniya, Peradeniya, Sri Lanka
- ▶ Tata Institute of Social Sciences (TISS), Mumbai, India

Daily implementation of the project activities are being carried out by the South Asian Partner Institutions. The coordination of the different project activities and implementation of the South Asia level activities are being undertaken by the Crossing Boundaries (CB) Project Office at SaciWATERS.

### SOUTH ASIAN CONSORTIUM FOR INTERDISCIPLINARY WATER RESOURCES STUDIES (SACIWATERS)

The Crossing Boundaries (CB) project aims to contribute to the paradigm shift in water resources management in South Asia, summarized in the concept of IWRM (Integrated Water Resources Management), by means of a partnership-based program.

**Education Component:** Human resources capacity development on IWRM and gender & water in South Asia (Curriculum revision, SAWA Fellow Training, Teaching Case Development).

**Research Component:** Innovation and social learning oriented research (Research at partner institutes, Brainstorming on Training workshop on impact oriented research,



linking research program to the ongoing projects, implementation of the research program, Research workshop and International Conference on Water Resources Policy in South Asia).

**Exchange, Discussion and Collaboration Platform:** Knowledge base development and outreach (Water in South Asia Series, Women Water Professional Network and Documentary preparation).

## ➔ CONTACT

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# ENHANCING COMMUNITY PARTICIPATION IN IWRM THROUGH TARGETED TRAINING AND EDUCATION

## EXAMPLES FROM THE VOLTA BASIN

### BACKGROUND

The International Union for the Conservation of Nature (IUCN) has since 2004 been implementing the “Volta Water Governance Project”, which is commonly known by its French acronym ‘PAGEV’ aimed at addressing some of the water governance challenges in the basin.

The project has focussed on the implementation of community-based actions, delivered outcomes which have began to influence and encouraging the communities living on the river banks to collaborate in conserving the integrity and diversity of natural resources of the basin.

### ACTIVITIES

#### Local actions

1. Creation of village committees where communities worked together to reforest the degraded river banks.
2. Establishment of national and local transboundary forums to resolve water use conflicts at the local level.

#### Indigenous skills Development

- ▶ Soil moisture retention
- ▶ Compost preparation
- ▶ Grafting of fruit trees
- ▶ Raising awareness on catchments protection
- ▶ Awareness on environmental hygiene and HIV/AIDS carried out

#### Training on IWRM principles

Global Water Partnership (GWP/WA) experts every year conduct training on IWRM specially for technical services and the local government staff.



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**SWOT ANALYSIS: COMMUNITY AND STAKEHOLDERS EDUCATION**

	<b>STRENGTHS S</b>	<b>WEAKNESSES W</b>	<b>OPPORTUNITIES O</b>	<b>THREATS T</b>
<b>AFRICA</b>	Willingness by some governments to provide water education to communities.	Not enough linkage between the various programs and water.	Community-government partnerships for disaster preparedness.	Lack of links between different organizations across the region.
<b>ARAB</b>	Good partnerships and networks among the Arab countries.	Weak partnerships between university and public.  Students in Arab region do not speak other languages, only Arabic.	Ask governments to increase finance in water education.	Lack of links between different organizations across the region.
<b>ASIA</b>	Communities are willing to participate if the needs are satisfied.	Multi level sectoral stakeholders.  Lack of trust on regulatory bodies.	Opportunities for greatest impact on behalf of stakeholders.	Water management needs community involvement.
<b>EUROPE &amp; NORTH AMERICA</b>	Adaptation to local context.  Cultural sensitivity.	Inadequate capacity of trainers and educators.	Team up together with other stakeholders.	Difficulty to access financial resources of education/training providers.
<b>LATIN AMERICA AND CARIBBEAN</b>	Environmental education in communities, water and sanitation, gender and water issues.	Lack of community education and training on water-related issues in some countries.	Foster synergies with government, private, NGOs and/or social background entities.	Reliable indicators to measure the influence and/or success of training or awareness-raising water-related interventions.

# THE WATER MANAGEMENT AND IRRIGATION INSTITUTE (WMII)

## EXPERIENCE IN WATER EDUCATION IN SUDAN

### BACKGROUND

The Water Management and Irrigation (WMII) is located in the middle of irrigation schemes and close to the desertification, an ideal situation to work on water education. This location is sitting on good quality groundwater and gets support from authorities, ministry of irrigation and water and the legislative council.

### OBJECTIVES

1. Multi-disciplinary approach: amalgamation of engineering, agriculture, economics, environmental science, health and sociology.
2. Co-operation with national and international institutions working in the field of water management.
3. Promotion of communication between stakeholders.
4. Problem-solving oriented research, focusing on major issues.
5. Applied research is carried out in the fields and canals.
6. Promotion of gender equity, participation and transfer of governance of resources to stakeholders.



### ACTIVITIES

1. Extensive experience training technicians for irrigated, rainfed and domestic water supply sectors.
2. Working towards building the local capacity to conduct training.
3. Membership in non-governmental organizations, workshops with other partners, seminars and discussion groups and visits to agricultural schemes.
4. The Non-Degree Training Strategy: the process involves knowledge transfer and acquiring skills to promote professional development.
5. Future plans include a Data Bank, water harvesting training and State Ministry of Education Roving Seminar.

→ CONTACT

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## SWOT ANALYSIS: EDUCATION AND TRAINING OF WATER TECHNICIANS

	STRENGTHS S	WEAKNESSES W	OPPORTUNITIES O	THREATS T
<b>AFRICA</b>	Training centres are available.	Evaluation and career paths not established.  Out-of date training programs.	Strengthen water training centres and link them with universities.	Establishment of training centres is costly.
<b>ARAB</b>	Strategies for water education and capacity building are developed.	Finance is a major problem at training institutes.  Poor links between different bodies working in the field of water education and training.  Problem finding the suitable teachers.	Ask governments to increase finance in water education.  Training of trainers.  Utilize the information revolution for water education.	The linkages between different organizations are missing.  Too slow to adapt to a rapidly changing environment.
<b>ASIA</b>	Accredited professional training programs.	Lack of appropriate sub-professional accreditation.	Big demand for skilled technicians.  Creation of training centers.	Deterioration of water infrastructure.
<b>EUROPE &amp; NORTH AMERICA</b>	Established training organizations.  Open source materials.	Integrated approaches to planning and management are not common.  Professionals need to learn teaching techniques.	E-learning and distance learning courses.  'Tailorable' programs.	Language barriers limit cooperation between foreign organizations.  Facilitators need to compile different views.
<b>LATIN AMERICA AND CARIBBEAN</b>	Some short courses established.	Lack of trained water technicians.	Reinitiate and develop training programs.	Regulatory framework for water technicians needs to be established.

# CAPACITY DEVELOPMENT FOR WATER JOURNALISTS

## OUTPUTS OF THE INTERNATIONAL WORKSHOP IN TEHRAN, IRAN

### BACKGROUND

The media plays an important role in swaying public opinion on key issues such as water. Based on this rationale, the Regional Centre on Urban Water Management – Tehran (RCUWM-Tehran) as a category II Centre under the auspices of UNESCO in close cooperation with United Nations Human Settlements Programme (UNHABITAT) and United Nations Water Decade Programme on Capacity Development (UNW-DPC) organized the International Workshop on “Capacity Development for Water Journalists” (A Regional Perspective, Asian Countries) in Tehran, Iran, 26-28 November 2007. Journalists from electronic and print media from countries in Central Asia: Armenia, Azerbaijan, Kazakhstan, Kyrgyzstan, Nepal, Tajikistan, and Uzbekistan; from other Asian countries China, India, Lao PDR, and Nepal; and journalists from Iran, nearly half of them women attended this workshop.

### OBJECTIVES

1. Create awareness among the Media Professionals regarding the current situation of water and sanitation in Iran and various other countries of Asia.
2. Seek the indulgence and involvement of the media for creating public awareness and advocacy to promote sector reforms for the urban poor and encourage pro-poor investments in water and sanitation.

### ACTIVITIES

- ▶ Water media and networking;
- ▶ A resource data base of water experts and related water resources for journalists;
- ▶ The role of media in capacity development of the public at large;
- ▶ The role of media in water resources management and its reformation.



## KEY RESULTS

- The struggle for achieving the Millennium Development Goals (MDGs) for water and sanitation.
- The transnational corporations which cause most of pollution need to be followed up in investigative journalism.
- The need for economic incentives for water saving, and putting economic value to water.
- The need to provide the politicians with stories on water conservation and water policies.
- The water policies should be known to the public, so that these policies become accepted, and contribute to better insight and understanding that can help change mindsets.

### ➔ CONTACT

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## SWOT ANALYSIS: WATER EDUCATION FOR MASS-MEDIA PROFESSIONALS

	STRENGTHS S	WEAKNESSES W	OPPORTUNITIES O	THREATS T
<b>AFRICA</b>	Media have wide impact. Availability of communication materials.	Journalists are not familiar with the jargon of water scientists.	Link with journalism schools and give courses on water.	Media messages may not focus on the most relevant information.
<b>ARAB</b>	Arab region speaks the same language.	Communication channels between water professional and media should be strengthen.  Lack of water education media professionals contributes to inappropriate coverage of water issues.	Linkages between professional bodies and media associations.	Lack of water concepts and knowledge leads to misunderstandings.
<b>ASIA</b>	Multimedia outreach and availability.	Learn on content, therefore can reinforce wrong perception.	Tremendous potential to create public opinion and awareness.	Lack of water concepts and knowledge leads to misunderstandings.  Non reliability of information sources.
<b>EUROPE &amp; NORTH AMERICA</b>	Financial resource allocation.	Message outreach.	Internet base media, websites and encyclopedies.	Pushing messages on journalists backfires.
<b>LATIN AMERICA AND CARIBBEAN</b>	Wide dissemination of some information related to water use, protection, conservation for specific target groups.	Lack of synergies among the media and the institutions connected to water.	Develop communication and dissemination plans with the water-related education initiatives at all levels.	Lack of water concepts and knowledge leads to misunderstandings.



# WATER EDUCATION FOR CHILDREN AND YOUNG ADULTS, THROUGH SCHOOL AND COMMUNITY EDUCATORS

PROJECT WET FOUNDATION,  
USA

## BACKGROUND

Project WET Foundation is a water resources education program with over 25 years of experience in reaching children and youth through school and community educators since 1984 to motivate and empower “all” people in the water and education sector to become active and effective water educators. Each year, Project WET reaches millions of children and youth through its global network of regional partners (ex., UNESCO-IHP Latin America and Caribbean) and country host institutions (ex., Project WET Argentina, Canada, France, Italy, Mexico, UAE, Uganda, USA, and Vietnam).

The Project WET Foundation has raised over \$50 million (\$US) from public and private donors and invested the funds in the creation of one of the largest sets of original water science activities (teaching methods) in the world. The regional and country host institutions partner with Project WET to adapt and localize the educational materials for use in their respective regions and countries. Project WET’s network annually conducts over 3000 Train-The-Trainer workshops and reaches over 30,000 educators. The research conducted by the Project WET Foundation over the past twenty-five years has clearly documented the value and importance of educating children and young adults about water and its use, management and protection. The most successful water education programs combine the scientific and technical expertise of water professionals with formal and non-formal educators.

## KEY RESULTS

- ▶ Water and education sector leaders and practitioners need to link education to locally appropriate solutions and actions (ActionEducation™).
- ▶ The universal nature of water will allow education and program developers to e-publish materials that can be used around the world - a water science education template for schools.
- ▶ The digital version of the Global Water Education Village and Children’s Water School (5<sup>th</sup> World Water Forum Interventions) provided a site for 60 Proceedings Workshop Water & Education, February 2009, UNESCO-IHE, Delft, The Netherlands;



- ▶ A series of WaterCourses™ ranging from general water science and water management to more focused and in-depth courses on specific priority topics such as groundwater, wetlands, water and health, or sanitation will be designed and made available to non-technical education providers and learners of all ages. The materials and programs will be available for use by any government, agency, organization or business interested in educating people about water and thus support scaling-up.
- ▶ Water and education sector leaders should establish a certification program to establish credibility and value to the educational programs for school and community educators and to the people who take their courses. The key question is: “Does learning occur and can the learner use the information in their daily life to better manage and improve water conditions?” If the answer is yes, we have done our job.

## ➔ CONTACT

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## SWOT ANALYSIS: WATER EDUCATION IN SCHOOLS

	STRENGTHS S	WEAKNESSES W	OPPORTUNITIES O	THREATS T
<b>AFRICA</b>	Water education content in some school curricula.  Some teachers trained in environment and water.	Schools are not up to standard.  Lack of infrastructure.  In some countries there is no water education in schools.	Availability of trained teachers and educational materials that are already created in other countries.	Lack of water programs for schools may lead to reduced interest at all level.
<b>ARAB</b>	International concern about the water education in schools in the Arab region.	Finance is a major problem.  Staff is small and limited.	Training of trainers. No promotion without training.	Lack of funding.  Lack of links between different organizations across the region.
<b>ASIA</b>	Good examples to follow: Republic of Korea, Australia, Indonesia.	Weak national programs on water education.	The understanding of water issues and develop skills from early age.	Teachers and students are already overloaded.
<b>EUROPE &amp; NORTH AMERICA</b>	Integration of classroom/field education.  Use of ICTs to share knowledge and strengthen out-of-school learning experiences.	Inadequacy of learning materials (particularly for non formal settings).  Funds availability and project sustainability.	Stakeholders cooperation (including researchers and policy-makers).	Funds availability.  Project sustainability.
<b>LATIN AMERICA AND CARIBBEAN</b>	Synergy efforts developed in the region.	Finance is a major problem.	Expansion of regional network initiatives.	Efforts towards teachers and professors training “motivated educators, motivated students”.

# GENERAL GUIDE FOR EDUCATORS OF THE AMERICAS AND THE CARIBBEAN

JOINT PROGRAM UNESCO IHP/WET  
PROJECT

## BACKGROUND

UNESCO/IHP and Project WET International Foundation aim to increase cooperation in the development of water education programs in Latin America and the Caribbean and to work together developing Water Education Programs in LAC.

National Committees and from the Project WET International network from Mexico, Argentina, Chile, Costa Rica, Dominican Republic, the United States of America and Israel worked to select the final proposal of the Guide. New educational proposals were also developed to include relevant topics such as climate change.

## OBJECTIVES

1. Create a new conscience and culture about the knowledge and sustainable use of water in children of earlier ages.
2. Provide teachers with proper material to promote and work for the valuation, importance and care of water resources, within the frame of the 2 International UN Decades “Water, Source of Life” and “Education for Sustainable Development”.

## ACTIVITIES

The book is comprised of 32 educational proposals for teachers and educators of the pre-school levels to the secondary level divided in three major topics:

- ▶ Reacquainting ourselves with water.
- ▶ Water, life and health.
- ▶ Water management.



## KEY RESULTS

A set of appropriate water education proposals for the region, taken from several successful programs.

- Project WET (USA)
- Discover a Watershed Series (Mexico and USA)
- ¡Encaucemos el Agua! (Project WET-Mexico)
- UNESCO-IHP LAC Regional Programme Agua y Educación (IHP- Argentina) and Healthy Water-Healthy People (USA and Mexico).

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## INSTITUTIONS THAT PARTICIPATED IN THE REGIONAL WORKSHOPS

### AFRICA REGION

- Université de Bamako, FLAHS
- Namibia National Commission for
- UNESCO, Ministry of Education, Namibia
- UNESCO Office Namibia
- UNESCO Chair in Water Resources (UNESCO-CWR), Sudan
- IWRM-Net Sudan
- Kwame Odame-Ababio, PAGEV, Burkina Faso
- ZEF Centre for Development Research, Dept of Political and Cultural Change, Germany
- GWP-Cameroon, Faculty of Agronomy and Agricultural Sciences, University of Dschang, Cameroon
- Direction de l'environnement, Ministère de l'environnement et des ressources forestiers, Lomé
- Water Resources Development Bureau of Somali Regional State, Somali
- National University of Lesotho
- ASSAf (The Academy of Science of South Africa)
- School of Bioresources Engineering and Environmental Hydrology, University of KwaZulu-Natal, South Africa
- Water Research Commission, South Africa
- Wetland Alliance for Training, Education and Research (WATER), Wildlife and Environment Society of South Africa (WESSA), South Africa
- Faculty of Engineering and the Built Environment, Tshwane University of Technology, South Africa
- South African National Commission for UNESCO Science/CI Sector and Department of Education
- Council for Scientific and Industrial Research (CSIR), Water Research Institute, South Africa
- University of the Western Cape, South Africa
- Department of Water Affairs and Forestry, S.A Government, South Africa
- University of Fort Hare, South Africa

- Department of Science & Technology, S.A Government, South Africa
- Bloem Water, South Africa

### ARAB REGION

- Agricultural College, Al Zaeem al Azhari University, Sudan
- Public Water Corporation, Sudan
- President of IHP, Sudan
- Regional Centre for Training and Water Studies, Sudan
- King Su'od University, Sudan
- Khartoum State, Water Corporation, Sudan
- Water and Irrigation Management Institute, Sudan
- Chief of IHP National Committee, Sudan
- Fatati Journal, Sudan
- National Centre of Curriculum and Educational Research, Sudan
- Water Corporation of North Kurdufan State, Sudan
- University of Khartoum, Sudan
- Ministry of Irrigation and Water Resources, Sudan
- IHP National Committee, Sudan
- Ministry of Agriculture and Environment, Sudan
- Friends, UNESCO club, Sudan
- Sudan University of Science and Technology, Civil Department, Sudan
- University of Nyala, Sudan
- D. G. White Nile State S.W.C., Sudan
- GSWC, Sudan
- MOI, Sudan
- UNESCO Chair in Water Resources, Sudan
- University of Khartoum, Faculty of Engineering, Sudan
- Sudan University of Science and Technology
- Sana'a University, Water Centre, Yemen
- Al-Shalf University, Algeria
- Al-Qadi Ayad University
- Al-Jazeera University
- United Arab Emirates University

### ASIA REGION

- The International Centre of Excellence in Water Resources Management, (ICE WaRM), Australia
- Murray Darling Basin Commission, Cranberra, Australia
- Department of Civil Engineering, National Institute of Technology (NIT), India
- Institute of Geo-ecology, MAS, Division of Water resources and Water Utilization, Mongolia
- University of Agriculture, Faisalabad, Pakistan.
- United Nations Secretary General Advisory Board, Sustainable Development Solutions for Asia Pacific (SDSAP), Philippines
- Humid Tropics Centre Kuala Lumpur, Department of Irrigation and Drainage, Malaysia
- SaciWATeRs, Sri Lanka
- Faculty of Civil, Urban and Environmental Engineering, Yeungnam University, South Korea
- Daegu Regional Centre on Urban Water Management (RCUWM) under the auspices of UNESCO, Iran
- Research Division Asia Pacific Center for Ecohydrology – LIPI, Indonesia
- Bogor Agricultural University, Indonesia
- Faculty of Bandung, Indonesia
- APCE, Indonesia
- Research Center for Limnology, Indonesian Institute of Sciences
- Bureau for Cooperation and Promotion of Science and Technology, Indonesian Institute of Sciences, Indonesia
- Research and Development Center for Water Resources, Ministry of Public works, Indonesia
- Division for groundwater conservation, Ministry of Energy and Mineral Resources, Indonesia
- LEMTEK, Technical faculty of Indonesia University
- Research Center for soil and agroklimat, Ministry of Agriculture, Indonesia

- Secretariat of Water Resources Council, Ministry of Public Works, Indonesia
- National Water Sector-Capacity Building Network (NS-CBN), BAPPENAS, Indonesia
- IHE Jakarta, Indonesia
- UNDP, Indonesia
- Research Center for Limnology, Indonesian Institute of Sciences, Indonesia
- UNESCO Office Jakarta
- Indonesian Institute of Sciences, Indonesia
- Indonesian National Committee for IHP
- Indonesian National Committee for UNESCO

## EUROPE AND NORTH AMERICA REGION

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- European Water Partnership (EWP), Belgium
- Hidrodoe, Belgium
- Ducks Unlimited Canada, Canada
- International "Water and Film" Events (IWFE), Canada
- Project "AQUA Freshwater aquarium", Project "Water Check", Denmark
- ICLEI-Local Governments for Sustainability Germany
- German Aerospace Center, Water Strategy Initiative
- International Water Alliance Saxonia; Technische Universität Dresden, Germany
- Leuphana University of Lüneburg, Germany
- Institute of Environmental Systems Research, University of Osnabrueck, Germany
- RWTH Aachen University, Germany
- Wasserland Consulting, Germany
- Regional Environmental Centre for Central and Eastern Europe (RECCEE), Hungary
- Ben Gurion University, Israel

- HydroAid , Italy
- UNESCO-IHP/Project WET Water and Education Coordination Committee, Jamaica
- UNESCO Chair and network INWEB on sustainable water management and conflict resolution; Aristotle University Greece of Thessaloniki
- MEDIES ESD Network of Educators, Greece
- Luonto-Liitto, Environmental NGO for children and young people, Finland
- Stichting Leerplan Ontwikkeling, The Netherlands
- Rotterdam University of Applied Sciences Water management, The Netherlands
- International Water Association (IWA), The Netherlands
- International Groundwater Resources Assessment Centre (IGRAC), The Netherlands
- Stichting Water Opleidingen, The Netherlands
- SME Advies, The Netherlands
- DHO, Dutch Network for Sustainable Development in Higher Education, The Netherlands
- Hogeschool Rotterdam, The Netherlands
- Ministry of Transport, Public Works and Water Management, The Netherlands
- Hogeschool Rotterdam, Delft University of Technology, The Netherlands
- Sint Jozef Mavo, Vlaardingen, The Netherlands
- UNESCO-IHE, The Netherlands
- Wageningen University and Research centre (WUR), The Netherlands
- IRC, The Netherlands
- Netherlands Water Partnership, The Netherlands
- Hoogheemraadschap van Delfland, The Netherlands
- Dutch Watermuseum, Arnhem, The Netherlands
- Wetsus Academy, The Netherlands
- SME Advies, The Netherlands

- Karlstad University Centre for Climate and Safety, Sweden
- Karlstad University, Sweden
- University of Belgrade, Serbia
- Slovak Association for Young Scientists – SAYS, Bratislava, Slovak republic
- UNESCO Moscow, Russia
- UNESCO Centre for Water Law, University of Dundee, Scotland UK
- Bath University, United Kingdom (UK)
- CIWEM (Chartered Institution of Water and Environmental Management), United Kingdom (UK)
- University of New Mexico, USA
- Kent State University, USA
- Institute for Water Resources, U.S. Army Corps of Engineers, USA

## LATIN AMERICA AND THE CARIBBEAN REGION

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- ITAIPÚ Binacional, Brazil
- Water Resources and the Environment, University of Chile
- ISARM Americas Programme on Transboundary Aquifers of the Americas.
- Water and Education Programme, IMTA, Mexico
- CONAGUA, Mexico
- MOPC, Vice-Ministry for Mines and Energy, Paraguay
- Ministry of Education and Culture, Paraguay
- Ministry of Environment, Paraguay
- Scientific and Technological Research, National University of Asuncion (UNA), Paraguay
- National Radio, Paraguay
- Project WET
- Water Resources Directorate, SEAM
- CONAPHI, Paraguay
- UNESCO Paraguay National Commission
- UNESCO-IHE Institute
- UNESCO-IHP


Edited by Shahbaz Khan and Carolina Llovera

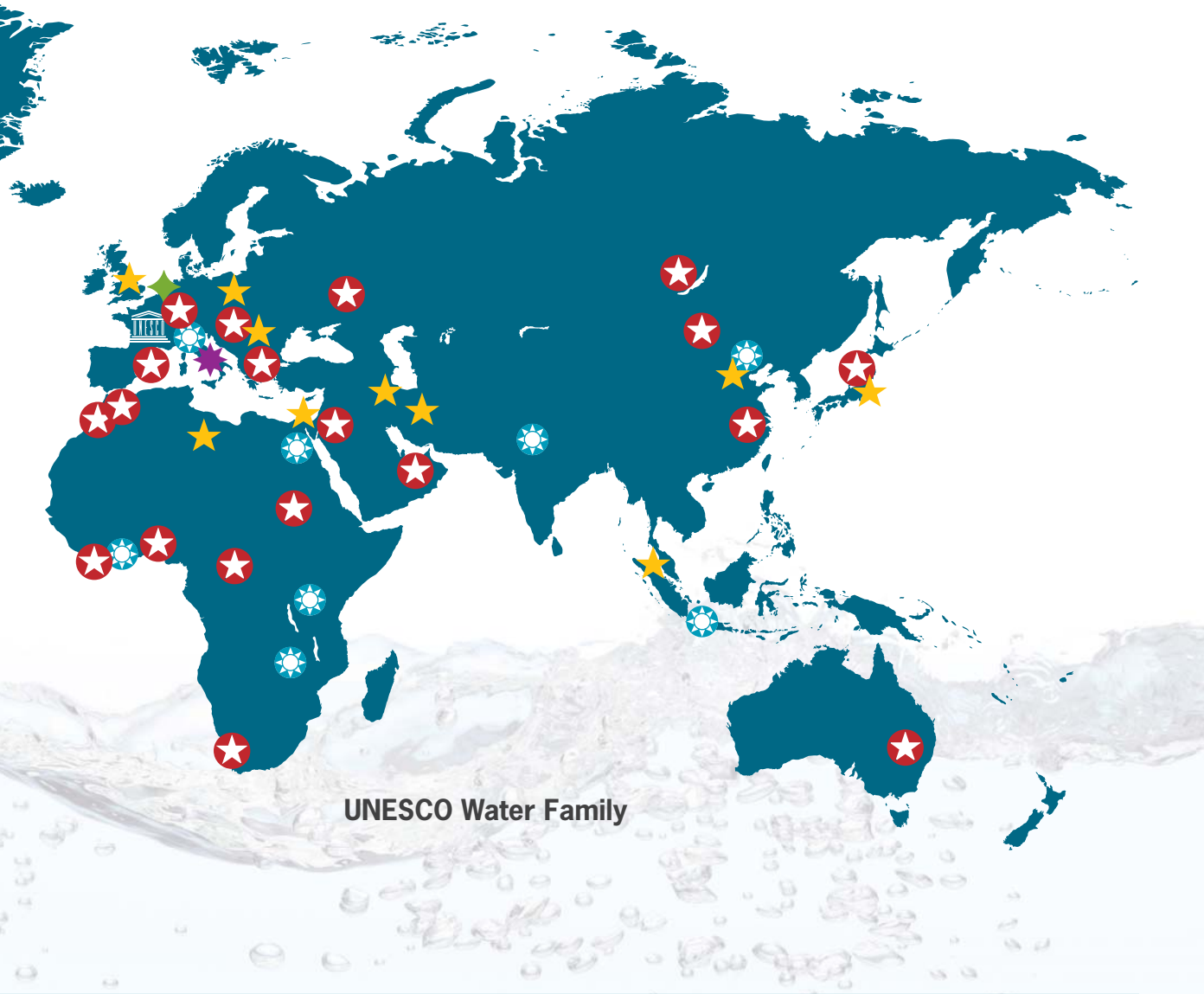
The editors acknowledge contributions from the following colleagues:  
Miguel Doria (UNESCO IHP), Judith Kaspersma (UNESCO IHE)  
and Bernard Combes (UNESCO ESD)



## HOW WE WORK

**UNESCO's water family** operates as a global network that works together to implement the organization's strategic goals.

 UNESCO hosts the **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 193 Member States, through the IHP National Committees, other governmental bodies, and academic and research institutions in the implementation of the programme.



## UNESCO Water Family

- ◆ **UNESCO-IHE Institute for Water Education** – an integral part of UNESCO – is the educational arm.
- ✳ Twenty-six 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.







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