



**UNESCO-IHE**  
Institute for Water Education

# ANNUAL REPORT

# 2011

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UNESCO-IHE is the largest international postgraduate water education and research facility in the world. The Institute confers fully accredited MSc degrees and awards PhDs. Since 1957, the Institute has provided post-graduate education to more than 15,000 water professionals from 162 countries, the vast majority from the developing world. 123 PhD fellows are currently enrolled in a water-related research programme. The Institute carries out numerous research and capacity development projects throughout the world.

UNESCO-IHE envisions a world in which people manage their water and environmental resources in a sustainable manner, and in which all sectors of society

- and particularly the poor - can enjoy the benefits of basic services. The mission of UNESCO-IHE is to contribute to the education and training of professionals and to build the capacity of sector organizations, knowledge centres and other institutions active in the fields of water, the environment and infrastructure, working in developing countries and countries in transition.

The Institute encourages its alumni community members to actively engage in knowledge and information generation and exchange. Alumni attain senior positions in their home countries and often become nationally and internationally recognized experts and policy makers. Many have

made significant contributions to the development of the water and environmental sectors. UNESCO-IHE alumni remain part of a global network linking alumni, guest lecturers, experts and renowned centres of knowledge, together providing a vast source of expertise to the sector.

At the centre of a vast international network of water-related institutions, UNESCO-IHE functions as an interface between knowledge networks and centres, public and private sector organizations, scientific and professional associations and other members of the international water community. Through these partnerships, the Institute broadens its knowledge base and increases

its effectiveness in developing the capacities of water sector organizations and individuals worldwide.

UNESCO-IHE centres its education, research and capacity development programmes around a number of key themes.

The current focal areas are Water Security, Environmental Integrity, Urbanization, Water Management and Governance, and Information and Communication Systems, as well as the emerging areas of Water Conflict Management and Climate and Global Change Adaptation. Through each of these themes, the Institute addresses the major issues and challenges faced by many developing countries and countries in transition.



# Rector's Statement

2011 was a complex but successful year in the life of the Institute. We made headway on several fronts by pushing the limits further, both in terms of improving the functioning of the Institute and of securing sustained funding from various new sources. We close a successful academic year with an increased research output, including PhD and post-doctoral activities. All the MSc programmes were successfully delivered. Many online courses were developed further and executed. Capacity development initiatives and specific training courses mushroomed. Given the current economic climate, the Institute has maintained a financially healthy situation by freezing expenditures and investing in acquiring sustainable funding for our educational and research activities. Nevertheless, we are aware of the gloomy times we are in and that are still ahead of us. The global financial crises and changing political climate influenced funding for development aid and international cooperation at both national and international levels.

Last year we concluded the reform process of the Institute that was launched nearly two years ago by our Governing Board. A major document on the 'Comprehensive Strategy for UNESCO-IHE 2010-2020', outlining the development path of the Institute until 2020, was adopted by the Governing Board. En route to the adoption of the decade strategy, in-depth consultations were held between the UNESCO-IHE Governing Board and the Board of the IHE Foundation. The document was published and widely circulated. By the end of the summer recess, we had moved into the implementation phase.

The first phase of the reform concentrated on improving the internal working processes of the Institute. As a first step, the basic principle of academic leadership was re-established by reinforcing the role of the Academic Board. Furthermore, the principle that 'leadership is service' was put into operation along with rotating, finite terms of academic leadership. Chair Groups have been re-grouped into three academic departments, in line with the global developments and emerging trends in scientific research and education in the field of water and environment. Water science, environmental technology and the integrated governance of water systems are the three major pillars upon which the Institute now stands. New Departments Heads have been appointed to lead the Departments of Water Science and Engineering, Environmental Engineering and Technology, and Integrated Water Systems and Governance, respectively. This structure ensures that the Departments are sufficiently distinct in academic orientation and approaches to water systems, while an overall systems approach and interdisciplinary enabling will cause synergies to prevail in project activities. These internal changes were needed to support a move towards an external reform to be implemented as the second phase of the reform process, in accordance with the strategy adopted by the Governing Board.

The second phase of the reform envisages the establishment of a UNESCO-IHE Global Campus with a set of regional Institutes connected to form an effective network. During the reporting period, informal consultations were held with partners



and potential partners that expressed an interest in the concept. Earlier analysis revealed that, given the current capacities of the Institute, we have reached our limits in Delft.

Indeed, the fact is that the Institute by now has reached the limits for growth at the Delft location in terms of physical space and increasing impact on the ground in developing countries and countries in transition. A tremendous number of extremely highly qualified candidates cannot be admitted each academic year due to these constraints. In other words, the current organizational set-up cannot keep pace with the worldwide demand for water expertise. Consequently, the global water sector misses out on a very high number of urgently needed professionals on an annual basis. UNESCO-IHE has to reach out! In close collaboration with her partners, UNESCO-IHE will need to pool the water knowledge accumulated in the City of Delft and its national and international public and private partner organizations and bring it to the world, particularly to the developing world where most of the pressing water issues are occurring, whether one speaks of Africa, Asia or Latin America.

UNESCO-IHE will reach out through the Global Campus, which is envisaged to be established with partners as a system of interconnected campuses set up on various continents. The sorely needed 'new generation of water leaders' will be trained in an interdisciplinary environment in which they will be able to explore insights into water problems from many different perspectives and cultural settings, and contribute to the development of creative, integrated and sustainable solutions. This new generation of water leaders will blend solid knowledge and understanding of one discipline with cognitive competencies outside that discipline, enhanced by an effective combination of functional, personal and ethical competencies learned in different cultures. In short, this is the principal reason why a Global Campus needs to be established in the coming years, given that the role of water in sustained development is becoming critical

and capacities to deal with the relevant issues needs to be established with a sense of urgency.

As in the past 55 years, the Institute continues to look forward to working with its students, researchers, alumni and partners to meet the increasing global challenges in the water sector. Together, we have a key task in transferring knowledge and research to achieve the world's development goals over the next decades.

Last but not least, I would like to present the Annual Report 2011 to you with the hope that we will be able to join forces in continuing our mutual efforts to respond effectively to the existing and emerging global water challenges, particularly for the benefit of developing countries and countries in transition. That is where our help is needed the most.

Professor András Szöllösi-Nagy, PhD, DSc  
Rector

# 2011 at a glance

166

full-time staff equivalents over the whole year:  
54% academic and  
46% supporting staff

4

Master's programmes related to water and environment with a total of 22 specializations

199

participants in 17 online courses

389

professionals in 57 regular short courses

500

professionals in 29 tailor-made training courses

4

refresher seminars held for 92 alumni

## Education

- Two new joint Erasmus Mundus MSc programmes launched: one in International Environmental Technology and Engineering and one in Flood Risk Management.
- A new joint MSc programme on Environmental Technology for Sustainable Development was launched with AIT (Asian Institute of Technology) in Bangkok, Thailand.
- A new joint MSc programme on Agricultural Water Management for Arid and Semi-Arid Climates was launched with Haramaya University in Ethiopia.
- An agreement was reached with the BOKU (University of Natural Resources and Life Sciences) in Vienna, Austria, and Egerton University, Kenya, to deliver an MSc programme on Limnology and Wetlands Management, starting in October 2012, jointly with UNESCO-IHE.
- A double MSc degree programme on the theme of Water for Food is being developed with Nebraska University, Lincoln, USA.
- A contract was signed with the Bill and Melinda Gates Foundation (BMGF) to develop an online Master's programme in Sanitary Engineering, a series of short courses and 55 MSc scholarships in Sanitary Engineering.
- A MSc Fellowship Programme with Rotary International was negotiated with a view towards launching the scheme in 2012.
- A University Teaching Qualification (UTQ) programme focused on active learning and aligned teaching was introduced to UNESCO-IHE staff members.
- The Education Bureau was established in January 2011.
- The Moodle (Modular Object-Oriented Dynamic Learning Environment) open source platform was introduced as the main educational resource base for all students and staff of UNESCO-IHE.

## Research

- The UNESCO-IHE Partnership Research Fund (UPaRF) provided € 8.5 million in funding for 75 collaborative research projects involving 75 partner institutes from 37 countries.
- The Delft Urban Water research platform was set up by researchers from Delft University of Technology, UNESCO-IHE, Deltares and the KWR Water Cycle Research Institute.
- Eight post-docs were involved in the Post-Doctoral Research programme on Adaptation to Climate Change (PROACC) in the Mekong River Basin, South-East Asia.
- The EC-funded SWITCH action research programme of € 21.3 million was successfully completed in 2011. It involved 33 partners from 15 countries working together for five years to create innovative, scientific, technological and socio-economic solutions that can be replicated around the world.
- The EU-funded project KULTURisk was launched in January 2011. The € 4.4 million collaborative project, coordinated by UNESCO-IHE, aims to develop a culture of risk prevention through a knowledge-based approach that assesses the socio-economic benefits of risk prevention techniques.

**193**  
new MSc students

**123**  
registered PhD fellows

**147**  
running projects

**188**  
MSc degrees awarded

**10**  
PhD graduations

Total turnover of just  
over € 30 million

**393**  
scientific publications

Overall positive result of  
€ 220,000

## Capacity Development

- A number of training courses were launched in 2011 as part of the programme to develop the capacity of the recently established UNESCO Category II Center, HidroEx International Centre for Education, Capacity Building and Applied Research in Water, which was established in Frut, Brazil.
- Seven new NICHE projects were included in the UNESCO-IHE portfolio: two in Bangladesh, two in Vietnam, one in Rwanda, and one in Egypt, respectively.
- Work on the training and capacity building component of UN-HABITAT's Lake Victoria Water and Sanitation Initiative continued throughout 2011 and was completed in December.
- The capacity development project for the Netherlands and Western Balkans Environmental Network (NEWEN), aimed at improving the environmental situation in the Western Balkan, was successfully completed in 2011.
- UNESCO-IHE successfully delivered 22 courses within the H2020 Capacity-Building/ Mediterranean Environment Programme (ENP MEP H2020), which started in September 2010 as part of the Horizon 2020 programme and aims to enhance capacity to address pollution problems in the Mediterranean Sea at technical, institutional and societal levels.

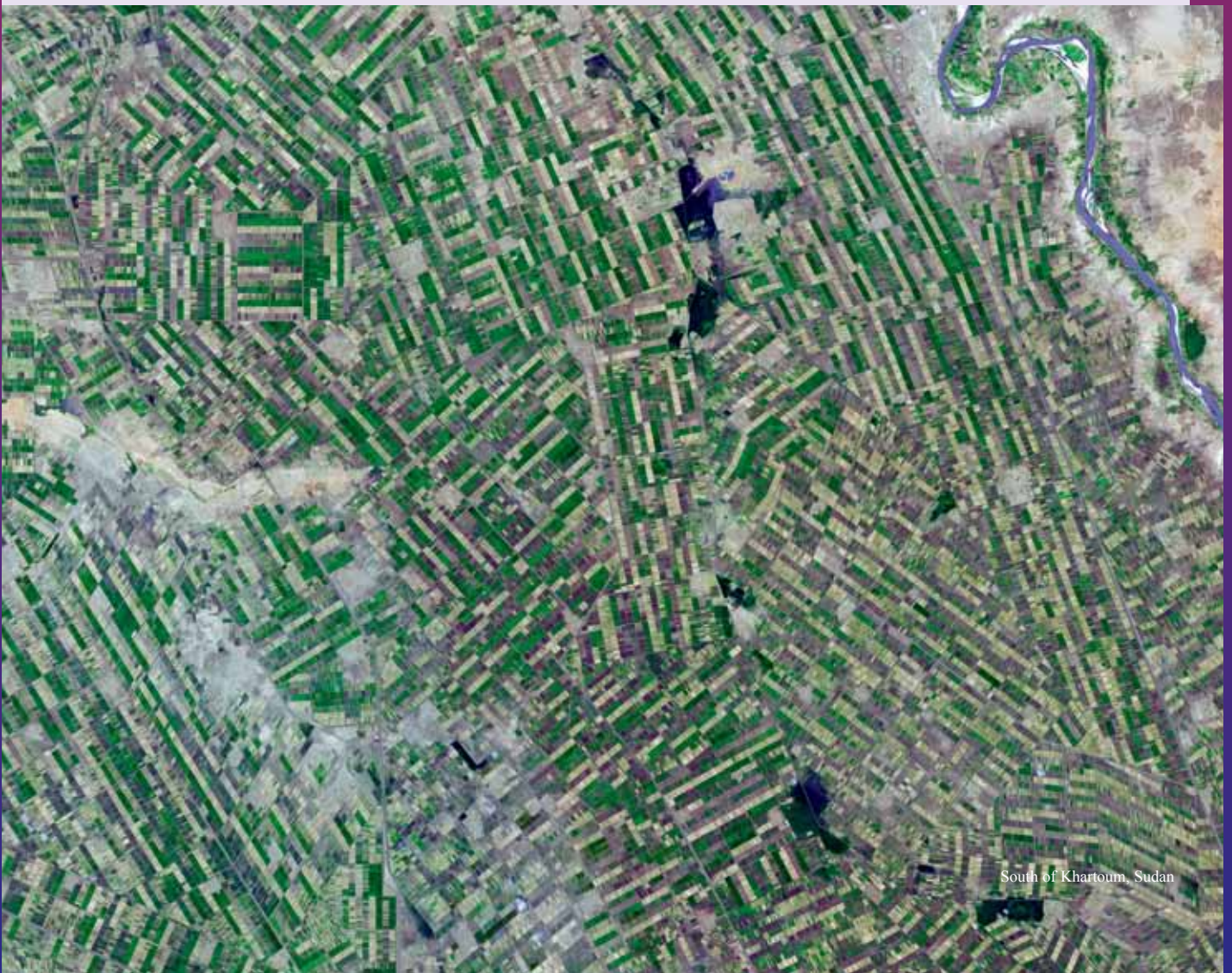
## Institutional Developments

- Two interconnected key policy reform documents - 'Strategic Directions: UNESCO-IHE in 2020' and 'UNESCO-IHE in 2020: The Implementation Plan' - were approved by the Governing Board of UNESCO-IHE. Information on these was presented to the General Conference of UNESCO within the framework of the Report submitted by the Governing Board. The reform process was set in motion by the 2009 session of the Governing Board of UNESCO-IHE with a view towards providing directions for the evolution of the Institute from a Delft-based organization into a global campus of expertise with interconnected regional institutes. Proposals for further deliberations by the Executive Board of UNESCO will be submitted to UNESCO during 2012 by the Governing Board.
- The Institute's emerging new global challenges required some changes in the internal structure, the operational implementation of which started in 2011. In the last quarter of 2011, the academic departments were rearranged from 5 to 3 and new leadership was installed and trained. The relevant administrative changes and resulting adjustments of the relevant systems started at the beginning of 2012.

# Partnerships and Networks

Working in partnership is an overarching principle of the Institute. It cuts across all of UNESCO-IHE's core activities in education, research and capacity development. Partnerships and networks add value to many of the Institute's activities and are essential for linking global knowledge to local sector agendas, and for improving

North–South and South–South collaboration. Partnerships refer to collaboration modalities in which institutes put together resources to develop new products, while networks are looser cooperation mechanisms set up for the purpose of awareness raising, policy development, sharing of experiences, and dissemination.



South of Khartoum, Sudan

### Joint MSc programmes

In 2011, the Institute continued to expand its range of Master of Science programmes implemented with partner institutes. These joint MSc programmes are based on a Credit Transfer System, with students conducting part of their studies at different locations. In the 2011-2012 academic year, four new joint MSc programmes were launched with a number of educational partners:

- For the Erasmus Mundus International Master's in Environmental Technology and Engineering, collaboration has been established with Ghent University (Belgium) and the Institute of Chemical Technology Prague (ICTP, Czech Republic).
- The Technical University of Dresden (Germany), Technical University of Catalonia (Spain), and University of Ljubljana (Slovenia) are partnering in the Erasmus Mundus programme on Flood Risk Management.
- Haramaya University (Ethiopia) is partnering with UNESCO-IHE on the Agricultural Water Management for Arid and Semi Arid Climates programme.
- A new specialization on Environmental Technology for Sustainable Development is delivered with the Asian Institute of Technology (Bangkok, Thailand), a partner with which UNESCO-IHE has already shared programmes.

In total, 18 university partners are currently involved in the delivery of UNESCO-IHE's MSc programmes. For a complete list of all partners in MSc-level education, please refer to the section on 'Institutional Agreements and Joint MSc Programme Partners' in this chapter.

New partnerships in education are to emerge from ongoing feasibility studies about joint MSc programmes with Nebraska University (USA) on the theme of Water for Food, and with BOKU (University of Natural Resources and Life Sciences), Austria. The latter will likely replace the Mondsee Institute of Limnology as the Austrian partner in the existing Limnology and Wetland Management programme.

### Research and capacity development projects

The Institute has continued its strategy to involve its educational partners in research and capacity development projects in 2011. An important acquisition was the project sponsored by the Bill and Melinda Gates Foundation (BMGF) on innovating sanitation for the urban poor, in which KNUST (Ghana), UniValle (Colombia), AIT (Thailand) and Makerere University (Uganda) are the implementing partners. Special train-the-trainers programmes are being organized to acquaint teaching staff at partner organizations with didactic concepts commonly used at UNESCO-IHE.

### Global Campus

The new 'Strategic Directions: UNESCO-IHE in 2020' key policy document, published in May 2011, outlines the major new strategic directions for the Institute. A major new strategy is the expansion of the geographic coverage of UNESCO-IHE by establishing a Global Campus with interconnected regional institutes. The Global Campus will seek to offer demand-responsive, innovative global water education programmes that are internationally appealing and accredited, while at the same time providing support and pursuing enhanced and effective cooperation with the partner institutes, creating new learning alliances for enhanced capacity development.

### The Water Channel

The Water Channel, an online video channel on water subjects, has successfully entered its second phase. This partnership between MetaMeta Communications, Nymphaea, UNESCO-IHE, and Cap-Net was joined in 2011 by the International Fund for Agricultural Development (IFAD), which acts a sponsor and has initiated a number of activities related to rural water supply and poverty alleviation.

### UPaRF

The UNESCO-IHE Partnership Research Fund was established in 2008 to increase the output of development-relevant research on contemporary issues in the water sector and to combine the strengths of the different partner institutes. In 2011, the UPaRF portfolio contained a total of 25 research projects with 75 partner institutes in 37 countries. The partner institutes include 42 universities/research institutes and 13 water sector organizations from developing countries and 20 institutes from developed countries. The 'Research' chapter contains more information on these programmes.

### UNESCO and other UN agencies

In 2011, UNESCO-IHE continued to intensify its collaboration with UNESCO. Joint activities with UNESCO water centres included the MSc specialization in Water Conflict Management with the the PCCP programme of IHP and capacity development activities for the UNESCO Category II Institute HidroEx in Brazil. UNESCO-IHE has also actively contributed to the 4th edition of the UN World Water Development Report. The Institute has been awarded a number of projects funded by UN organizations, such as the Flood Hazard and Vulnerability Assessment project funded by UNDP. Efforts were made in 2011 to achieve greater coherence and standardization of proposal submissions and contracting to the European Commission, where UNESCO-IHE is now treated as an integral part of UNESCO.



## Bilateral Partnerships

**At present, UNESCO-IHE has cooperation agreements with over 65 institutional partners worldwide, some 50 of which are education and knowledge centres. The following institutional agreements were signed in 2011:**

### **Universidad del Valle (UniValle), Cali, Colombia**

Signed: January 2011

*Goal:* Capacity development of UniValle's staff, assistance in maintaining the quality of water MSc programmes at UniValle, and continued collaboration through joint projects and development of joint education programmes. UNESCO-IHE and UniValle continued their long-standing collaboration by renewing this MoU.

### **International Hydropower Association (IHA), London, United Kingdom**

Signed: July 2011

*Goal:* Cooperation on water requirements for energy production, specifically on building consensus around classification and weighting systems, definition of concepts, classification of methodologies and collaboration in strengthening of centres of excellence in relation to post-graduate education.

### **Sam Ratulangi University (UNSRAT), Manado, Indonesia**

Signed: January 2011

*Goal:* Cooperation in IWRM through training UNSRAT staff, submitting joint research projects, working towards the development of an MSc programme on IWRM at UNSRAT, and carrying out research activities aimed at enhancing sustainable use of water and environmental resources in East Indonesia.

### **China University of Geosciences, Beijing, China**

Signed: September 2011

*Goal:* Creation of a Sino-Dutch research centre for ecohydrology at the China University of Geosciences. This MoU is a spin-off of the Partnership for Education and Research in Water and Ecosystem Interactions project, in which UNESCO-IHE, Eijkelpark, Hohai University and Xi'an Center of Geological Survey are partners.

### **University of Peace, San José, Costa Rica**

Signed: February 2011

*Goal:* Creation of a joint initiative on water and peace by developing a research agenda, facilitating exchange of lecturers, developing curriculum components and co-publishing articles.

### **Maastricht School of Management (MSM), Maastricht, The Netherlands**

Signed: November 2011

*Goal:* Cooperation in post-graduate education, research and capacity development. This MoU facilitates opportunities for students to take part in the education programmes offered by the other party, and to join new research and capacity-building proposals.

### **Rotary International, Evanston, Illinois, USA**

With the signing of a strategic partnership agreement in November 2011, Rotary International and UNESCO-IHE joined forces to increase access to graduate education for water professionals from developing and emerging countries. The joint goal is to develop leaders and change agents in order to improve the standards of water and sanitation globally. The strategic partnership model will be used as a basis for expansion into other educational disciplines and regions.

Through the partnership, the Rotary Foundation will offer grants that Rotary clubs may use to select and sponsor eight scholarships annually for graduate students at UNESCO-IHE. These scholarships have been designed to promote long-term productive relationships between Rotary members and highly skilled water and sanitation professionals in their communities.

Scholarship recipients will benefit from the support they receive through regular contact with sponsoring Rotarians from their home country and with Rotarians in the Netherlands. After graduating, the scholars' expertise will be put to work improving water and sanitation conditions in their own community with a project that will be co-designed by the scholar and the sponsoring Rotarians. Students eligible for this scholarship must be provisionally admitted to one of the following degree programmes at UNESCO-IHE (joint programmes are not eligible): MSc in Municipal Water and Infrastructure, MSc in Water Management or MSc in Water Science and Engineering.

Other joint activities include project review and impact evaluation of the scholarships; and subject matter expertise to inform the Rotary Foundation's water and sanitation philosophy and policy.



## Institutional Agreements and Joint MSc Programme Partners

### North America

- Instituto Mexicano de Tecnología del Agua, Mexico
- Florida Earth Foundation, USA
- Nebraska University, USA
- Rotary International, global headquarters in the USA
- US Army Corps of Engineers, USA

### South America

- Instituto Costarricense de Acueductos y Alcantarillados (AyA), Costa Rica
- Technological University of Panama, Panama
- UNESCO-HidroEx, Brazil
- Universidad del Valle, Colombia
- University of Peace, Costa Rica
- University of São Paulo, Brazil

### Asia

- Asian Institute of Technology, Thailand
- Beijing Normal University, China
- Birzeit University/Palestinian Water Authority, Palestine
- China University of Geosciences, China
- Egyptian Ministry of Water Resources and Irrigation, Egypt
- Georgian State Agricultural University, Georgia
- Hydro and Agro Informatics Institute (HAII), Thailand
- International Centre for Water Hazard and Risk Management (ICHARM), Tsukuba, Japan
- Iran Ministry of Energy / Regional Centre on Urban Water Management, Iran

- K-Water, Republic of Korea
- Mekong River Commission for Sustainable Development, Mekong Region
- Sam Ratulangi University, Indonesia
- State Agrarian University of Armenia, Armenia

### Europe

- Bousinesq Centre for Hydrology, the Netherlands
- Center for New Water Technologies, Spain
- Deltares, the Netherlands
- Deutsche Wasserhistorische Gesellschaft, Germany
- Maastricht School of Management, the Netherlands
- Netherlands Ministry of Infrastructure and Environment, the Netherlands
- Suez Environment, France
- The International Institute of Social Sciences, the Netherlands
- Vrije Universiteit Amsterdam, the Netherlands
- Women for Water Partnership, the Netherlands

### Africa

- National University of Rwanda, Rwanda
- National Water and Sewerage Corporation, Uganda
- Spate Irrigation Network
- University of Khartoum, Sudan
- Water Research Institute of Mozambique, Mozambique
- WATERNET Trust, Botswana

### Partners with running joint programmes (MSc level) in 2011

- Asian Institute of Technology, Thailand
- Austrian Academy of Sciences, Austria
- The Christian Albrecht University of Kiel, Germany \*
- Dundee University, Scotland
- Egerton University, Kenya
- Ghent University, Belgium \*
- Haramaya University, Ethiopia
- Hohai University, China
- Institute of Chemical Technology Prague, Czech Republic \*
- Kwame Nkrumah University of Science and Technology, Ghana
- Mondsee Institute for Limnology, Austria / BOKU Vienna, Austria
- The National University of La Plata, Argentina \*
- Sriwijaya University, Indonesia
- Technical University of Catalonia, Spain \*
- Technical University of Dresden, Germany \*
- Universidad del Valle, Colombia
- University of Algarve, Portugal \*
- University of Ljubljana, Slovenia \*
- University of Lodz, Poland \*

### Partners with planned joint programmes (MSc level) in 2011 onwards

- Ain Shams University, Egypt
- BOKU University of Natural Resources and Life Sciences, Austria
- Nebraska University, USA

\* consortium member for Erasmus Mundus programme

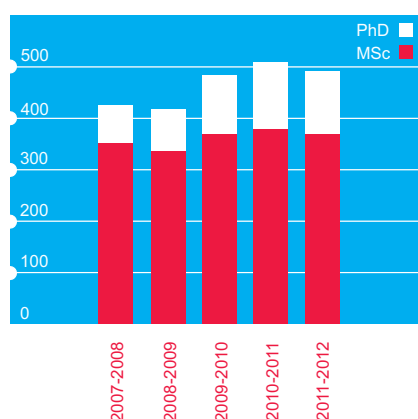
# Education

**UNESCO-IHE offers a wide range of accredited educational programmes for engineers, social and natural scientists and managers working in the water, environment and infrastructure sectors. Educational**

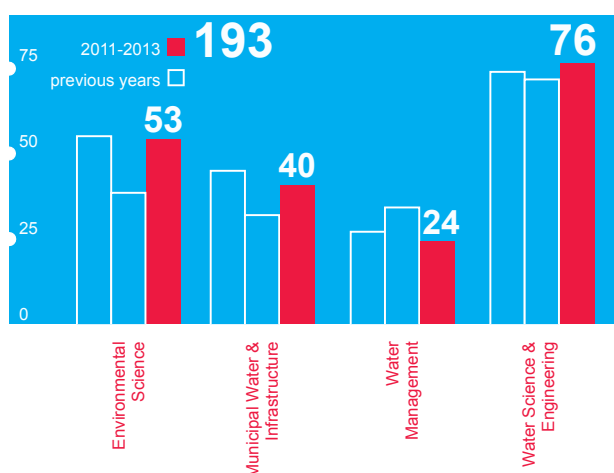
**options at the Institute include four Master of Science programmes with a total of 22 specializations, a PhD programme, a post-doctoral programme, and a range of short courses and online courses.**



**Number of Degree Participants**  
Participants | Academic Year



**Number of MSc Participants**  
Participants | Academic Year



### MSc

In 2011, 193 MSc students started their programme, which is a substantial increase compared to last year. This can be attributed to the launch of two new Erasmus Mundus programmes and the increased number of students enrolled in programmes jointly implemented with partner institutes. The number of applications also continued to increase. Some 188 MSc students completed their study in 2011, while the professionals participating in short courses rose by 26.7% to 389.

### Joint programmes

New joint programmes that started running in 2011 were:

- International Masters in Environmental Technology and Engineering and
- Flood Risk Management, both Erasmus Mundus programmes sponsored by the European Commission;
- Environmental Technology for Sustainable Development with the Asian Institute of Technology in Thailand;
- Agricultural Water Management for Arid and Semi-Arid Climates with Haramaya University in Ethiopia.

These programmes largely make use of modules that are offered in existing MSc specializations.

An agreement was reached with BOKU University of Natural Resources and Life Sciences in Austria, and Egerton University in Kenya to deliver the joint degree MSc programme in Limnology and Wetlands Management as from October 2012. This programme will replace the existing Limnology and Wetlands Ecosystems programme with Egerton University and the Mondsee Institute of Limnology.

Furthermore, preparations are ongoing with Nebraska University (USA) about the development of a double degree programme on the theme of Water for Food. This programme will be closely linked to the existing Land and Water Development specialization offered in the Water Science and Engineering Programme.

### Sanitary Engineering

A contract with the Bill and Melinda Gates Foundation was signed to develop an online Master's programme in Sanitary Engineering and a series of short courses on the same topic. The project also supplies 55 MSc scholarships in Sanitary Engineering to students who enroll in MSc education delivered by UNESCO-IHE together with its partners in Ghana, Colombia and Thailand.

### Refresher seminars

UNESCO-IHE received 175 applications for the four refresher seminars that were organized in 2011. The first seminar, entitled 'Small Water Supply and Sanitation: Serving the disadvantaged communities in semi-urban and rural areas in developing countries', took place in Cochabamba, Bolivia. The second seminar, entitled 'Serving More With Less: The challenge of sustainably managing African water supply and sanitation assets of the 21st century', was held in Lusaka, Zambia. The third seminar, entitled 'Decision Support Systems in River Basin Management', took place in Addis Ababa, Ethiopia. The fourth seminar entitled 'Management of Climate Change-related Risks in Coastal Lowlands: Balancing water allocations for food, people and environment', was held in Maputo, Mozambique.

# Education

## MSc Programmes and Specializations 2011

MSc Programme in Environmental Science	
Environmental Planning and Management	Db
Environmental Science and Technology	Db   Jdd
Environmental Technology and Engineering	Jem
Environmental Technology for Sustainable Development	Jdd
Limnology and Wetland Ecosystems	J
Water Quality Management	Db

MSc Programme in Municipal Water and Infrastructure	
Sanitary Engineering	Db   Jdd
Urban Water Engineering and Management	Jdd
Water Supply Engineering	Db   Jdd

MSc Programme in Water Management	
Water Conflict Management	Db
Water Resources Management	Db
Water Services Management	Db
Water Quality Management	Db

MSc Programme in Water Science and Engineering	
Agricultural Water Management for Arid and Semi-Arid Climates	Jdd
Agricultural Water Management for Enhanced Land and Water Productivity	Jdd
Ecohydrology	Jem
Flood Risk Management	Jem
Hydraulic Engineering and River Basin Development	Db
Hydraulic Engineering - Coastal Engineering and Port Development	Db   J
Hydraulic Engineering - Land and Water Development	Db
Hydroinformatics - Modelling and Information Systems for Water Management	Db   J   Jdd
Hydrology and Water Resources	Db   J
Integrated Lowland Development and Management Planning	Jdd

- Db Delft-based MSc specialization  
 J Joint programme  
 Jdd Joint double degree programme  
 Jem Joint Erasmus Mundus programme

### Online educational support at UNESCO-IHE

In 2011, UNESCO-IHE completed the implementation of the online support for the Institute's educational programmes through a **Virtual Learning Environment ('eCampus')** based on Moodle (Modular Object-Oriented Dynamic Learning Environment), a worldwide public domain course management system. All educational programmes are now fully supported by the online open source platform and a large part of the lecture material and some specially designed audio-visual materials were published on the platform.

Moodle enables lecturers to update learning objectives, activities, materials and assessments online. These updates are then immediately integrated into the programme handbooks available online. The open source system also facilitates increasing collaboration with other water expertise institutes around the world.

Since 2011, students and staff members can organize and extend their learning activities on their own password-protected personal page. Students can now learn at their own convenience at any time or place anywhere in the world. While communicating on the web with teachers and fellow students, students can apply newly acquired knowledge in their own working environment.

In 2011, a project group was formed to integrate Moodle with the Customer Relationship Management (CRM) and Student Information System (SIS) of the Institute. The Education Bureau also organized training courses and consultation sessions to train the UNESCO-IHE staff members and staff members from partner institutes to use the system.

### Education Bureau

The Education Bureau was established in January 2011. Its main tasks are to coordinate and administer all educational programmes, to provide a quality management framework for education, and to guide the process of educational innovation.

### University Teaching Qualification

High-quality education is seen as one of the most important pillars of UNESCO-IHE. To enhance the effectiveness of knowledge transfer, UNESCO-IHE staff is currently offered a University Teaching Qualification (UTQ) programme, focused on active learning and aligned teaching methods. Lecturers are trained to formulate learning objectives, to choose fitting didactic approaches and to test the relevant objectives in an appropriate examination. Didactic training based on the UTQ concept was also offered to staff from partner universities, pairing their staff with UNESCO-IHE academics to stimulate knowledge exchange. The training forms part of DUPC-financed projects that were set up in 2011 to support the joint degree programmes with KNUST in Ghana, UniValle in Colombia and Egerton in Kenya.

### Accreditation

UNESCO-IHE's MSc programmes are accredited by the Dutch-Flemish Accreditation Organisation (NVAO) until 2013. In view of the upcoming re-accreditation in 2013, the Institute has opted for an institutional accreditation. A limited assessment regime will follow at the programme level. Preparations for the programme assessment started in 2010 and were continued in 2011. All course modules were evaluated and analyzed systematically. A framework for assessing the performance of partner universities was developed and partially implemented. Work started on drafting self-assessment reports; these will be ready in June 2012.

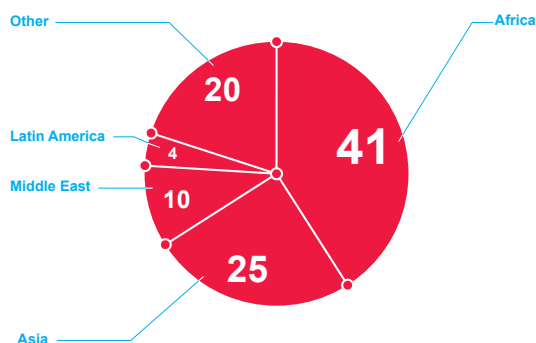
### Online registration

The online registration for short courses and online courses, introduced in March 2010, received the 10,000th online application in June 2011. Online registration proved to be a huge improvement in internal application processing.

### Programme Committees

A novelty in 2011 was the appointment of a student representative in all Programme Committees. The student representative gives feedback on the structure and content of the relevant MSc programme, and serves for a period of one calendar year.

Regional distribution of participants - Academic year 2011-2012  
Percentage



# Research

UNESCO-IHE centres its education, research and capacity development programmes around a number of key themes: Water Security, Environmental Integrity, Urbanization, Water Management and Governance, and Information and Communication Systems.

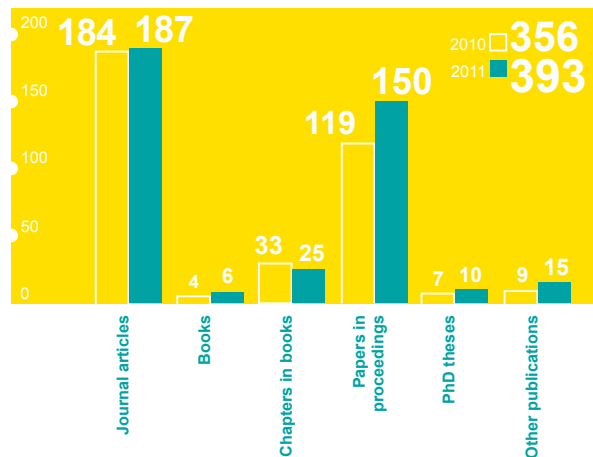
Through each of these themes, the Institute addresses the major water issues and challenges faced by many countries around the world. To illustrate the Institute's research activities, this chapter presents a selection of projects for each theme.



The research themes, and how they relate to the Institute's cores and research lines, are presented in Annex 5 | Research Themes.

A complete list of projects started, ongoing or finished in 2011 are in Annex 4 | Projects.

Research outputs 2011  
Outputs | Year



### UNESCO-IHE Partnership Research Fund

Programmatic cooperation with the Directorate-General for International Cooperation (DGIS) began in 2008. A large part of this collaboration entails research connected to capacity development; to this end, the internal UNESCO-IHE Partnership Research Fund (UPaRF) was founded. Besides financial resources from the DGIS collaboration, UPaRF also includes base funding from the Dutch Ministry of Education and Science. This fund is established to stimulate interdisciplinary and cross-core research projects, and focuses on four themes:

1. integrated management of water supply and sanitation,
2. sustainable management of aquatic ecosystems and land use,
3. water allocation and decision-making processes in river basins and
4. mitigation of and adaptation to climate change.

In 2011, 75 collaborative research projects with 75 partner institutes from 37 countries received a total of € 8.5 million in UPaRF funding.

### Research portfolio

As a result of UPaRF funding, the Institute was able to substantially expand its research portfolio. In 2011, 123 PhD fellows and more than 20 post-docs researchers were registered, which makes UNESCO-IHE the largest international post-graduate water education and research

facility in the world. More information can be found in Annex 3.

Although UPaRF was a very important programme for developing research at the Institute, UNESCO-IHE remained very active in other research programmes as well. In 2011, the Institute's research activities were also funded by agencies including the European Commission, NWO-WOTRO, USAID, the Netherlands Directorate-General for Spatial Development and Water Affairs (DGRW), SenterNovem, the Bill and Melinda Gates Foundation and several private sector organizations.

### Sanitation Crisis in Unsewered Slum Areas (SCUSA)

One of the ongoing projects supported by UPaRF is the Sanitation Crisis in Unsewered Slum Areas (SCUSA) project, conducted in partnership with Makerere University and the Kampala City Council in Uganda. The project aims to identify and implement low-cost sanitation solutions and has been addressing sanitation issues in the poorest parts of African mega-cities for three years now. Project outputs at the end of 2011 included 1 PhD thesis, 8 MSc theses, 14 peer-reviewed publications, and 24 professional papers and products. Involved PhD students also developed a proposal in the project entitled 'Outreach activities for dissemination of SCUSA research findings on sanitation in slums'. Funding for the proposal was granted and activities will start in early 2012.

### Post-graduate Research programme on Adaptation to Climate Change (PRoACC)

The interdisciplinary Post-graduate Research programme on Adaptation to Climate Change (PRoACC) in the Mekong River basin started in April 2010. The programme aims to strengthen the research output of the institute in terms of scientific papers, but also to contribute to the development of better policies in the field of climate change adaptation in collaboration with its partner institutes. The programme consists of eight post-graduate researchers guided by mentors from UNESCO-IHE and partner institutes. In 2011, post-docs started drafting scientific papers and initial outlines of policy briefs and educational materials. In May-June 2011, they visited UNESCO-IHE for a two-month period to help integrating the eight projects.

### Delft Urban Water research platform

In 2011, researchers from Delft University of Technology, UNESCO-IHE, the Deltares research institute and specialist consultancy and the KWR Water Cycle Research Institute established the Delft Urban Water research platform. By combining expertise in the field of urban water, the researchers aim to tackle future problems of increasing urbanization, flooding and a worldwide shortage of good-quality water.





## Research on Water Security

**Water Security** is about sustaining a balance between water availability and demand. It involves protection against the extremes of floods and droughts by reducing the associated hazards, promoting the wise use of water resources, and expanding access to safe and reliable water services. Several major projects were conducted in 2011 related to water security.

**COLCUENCAS** (Piloting Colombia's New IWRM Policy in Key Catchments) is a new research and advisory services project to develop a framework and specific tools to implement Colombia's new national water resource management policy. UNESCO-IHE and its partners - Universidad Nacional de Colombia and Universidad del Valle - are supporting the Colombian Ministry of Environment and Sustainable Development as well as other regional stakeholders. A total of 15 MSc students, four of whom are UNESCO-IHE participants, will develop thesis research in the project.

The **Flood Resilience Group** is a multidisciplinary research group affiliated with both UNESCO-IHE and Delft University of Technology. In February 2011, the Group travelled to Australia to work with the Centre for Water Sensitive Cities (CWSC) in Melbourne to find ways of collaborating on water systems and flood resilience. The Group also took part in the Resilient Tampa Bay 2011 conference in February in the USA, contributing vital expertise to improve flood resilience. Recommendations were made for local governments and planning agencies to consider a number of measures to improve flood resilience.

In 2011, the open source **XBeach model** was applied on the Ningaloo Reef in Western Australia in collaboration with the University of Western Australia, which resulted in a successful validation of hydrodynamics. XBeach is a two-dimensional model for wave propagation, long waves and mean flow, sediment transport and morphological changes of sandy beaches during storms. The model has been developed by a consortium of UNESCO-IHE, Deltares, Delft University of Technology and the University of Miami. Funding and support was provided by the US Army Corps of Engineers, the US Geological Survey and the Dutch government (among others). Developments in 2011 include the organization of short courses in Perth and Delft, simulation of ship waves in complex environments, and the development of a curvilinear grid version. The latter was successfully applied to model storm erosion during a building phase of the new Maasvlakte II extension of the port of Rotterdam.



Four talks were held throughout the year as part of the **UNESCO-IHE Water Colloquium series**. The Water Colloquium series, established in 2008, presents gems within the Institute's research projects and programmes in order to enhance interdisciplinary cooperation and increase the integration of research by stimulating inter-core and inter-department collaborations at UNESCO-IHE. The colloquium series is one of the ways that research results are communicated to a wider audience.

Water History - Shall we really lose our future (like Orpheus), if we look back?

*by László Hayde*

Constructed wetlands research at UNESCO-IHE and beyond: recent advances and new ideas.

*by Diederik Rousseau*

Controls of nitrogen and carbon retention in watersheds: Are wetlands really the kidneys of the Earth?

*by Gretchen Gettel*

Isotope methods in hydrology - a tool to learn more about hydrological processes?

*by Jochen Wenninger*

The project **CASCaDE II Hydrodynamic Modeling** will be undertaken within the framework of the US Geological Survey's project and the Priority Ecosystems Science (PES) programme. A process-based numerical model - DFlow-FM in combination with DelWaq - will be applied to investigate the Sacramento-San Joaquin Delta's response to scenarios of climate change. The investigation focuses on hydrological changes, downstream sea level rise, and changes in local meteorological influences (among others). The project will build upon two years of previous work by several experts from UNESCO-IHE as part of the USGS CASCaDE I project.

The **Rwanda Integrated Water Security Programme (RIWSP)**, set up in 2011, seeks to improve sustainable management of water quantity and quality to positively impact human health, food security, and resilience to climate change for vulnerable populations in Rwanda. Partnering with Florida International University, UNESCO-IHE takes joint responsibility for the implementation of technical assistance to the government of Rwanda regarding IWRM and decentralized governance at the national level. Additionally, technical assistance to the government of Rwanda will be provided by strengthening the government's hydrological plan.

The project **Partnership for education and research in water and ecosystem interactions**, financed by the Dutch Government Asian Facility for China programme, was successfully completed in 2011 with a scientific seminar held at China University of Geosciences in Beijing. The project produced the following tangible results: well-trained Chinese researchers able to conduct education and research programmes in water and ecosystem interactions; a fully-instrumented research catchment in the Erdos Plateau, China; a module curriculum in water and ecosystem interactions embedded in the regular education programmes of partner institutes; training of professionals and water managers from provincial and local governments; and a joint Sino-Dutch Research Centre for Ecohydrology at China University of Geosciences for long-term cooperation in joint MSc education, PhD research, and staff exchange.



## Research on Urbanization

Urbanization is concerned with the enormous political and social pressures placed on local governments to expand services and infrastructure related to water supply, treatment and distribution, wastewater collection and treatment, storm drainage and solid waste, while minimizing the impact on the environment.

The EU FP7 project **Natural water systems and treatment technologies to cope with water shortages in urbanized areas in India (SAPH PANI)** started in October 2011. It deals with the analysis of the potential of riverbank filtration, managed aquifer recharge, constructed wetlands and pond systems to improve urban water supply, and sanitation services provision in India. The project brings together 20 partners from universities and water utilities in India and different European countries. It involves laboratory and pilot plant experiments as well as field studies in different case study sites in India. UNESCO-IHE coordinates work packages on i) post-treatment and ii) training and dissemination.

UNESCO-IHE was granted EC funds through EuropeAid to carry out **two projects in Cuba**. One project focuses on adapting to climate change and mitigating water scarcity by innovative urban water management, while the other focuses on strengthening the Cuban food production and aquaculture sector through resource optimization and recovery. Both projects started in 2011 and are intended to help reduce water shortages in Cuba, as well as to increase food security through the recovery and optimization of resources (water, energy, nutrients) in the food processing chain. They will strengthen the expertise of Cuban water professionals and experts from the food sector by transferring the knowledge generated through the project to local graduate and post-graduate schools.



In June 2011 the contract was signed for a major project entitled **Stimulating Local Innovation on Sanitation for the Urban Poor in Sub-Saharan Africa and South-East Asia**. This project, funded by the Bill and Melinda Gates Foundation, is the largest research and capacity-building project for pro-poor sanitation ever conducted. It includes 5 post-doc researchers, 20 PhD fellows, 60 MSc students, 500 online course participants and 130 man-years of research. The total project budget is US\$ 11.1 million and is partially output-based, providing incentives to excel and outperform project expectations. The project will be jointly executed by UNESCO-IHE as principal grantee and eight partners from developing countries in sub-Saharan Africa, South-East Asia and South America.

The **SWITCH** (Sustainable Water Management Improves Tomorrow's Cities Health) project led by UNESCO-IHE was successfully completed in 2011. The project with a total budget of € 21.3 million set out to achieve more sustainable urban water management in the 'City of the Future'. SWITCH was an action research programme funded by the European Union that was implemented and co-funded by a cross-disciplinary consortium. 33 partners from 15 countries worked together for five years to create innovative, scientific, technological and socio-economic solutions that can be replicated around the world. Action research, demonstrations, training and wide dissemination have created a 'SWITCH' in thinking about urban water management.



## Research on Environmental Integrity

**Environmental Integrity recognizes the complementary needs of societal development and of the consequent quality of the aquatic environment. Core issues are the equitable allocation and use of natural resources, the prevention and control of pollution, and the sustainable use of aquatic ecosystems.**

The **SOWACOR** project, funded by the King Abdullah University of Science and Technology, studies metal removal by microorganisms. Processes that can be applied for the removal and recovery of metals from contaminated groundwater or wastewater are developed. In 2011, metal removal experiments were done in high-yield bioreactors. The metal-biomass particles that formed were characterized using XANES at the ESRF cyclotron facility in Grenoble via a NWO Dutch-Belgian Beamline (DUBBLE) grant. In addition, a Collaborative Fellows proposal was accepted and a post-doctoral researcher who works jointly at KAUST and UNESCO-IHE was appointed to the position.

The second cohort of the **Erasmus Mundus ETeCoS3 - Joint Doctorate Environmental Technologies for Contaminated Soils, Sediments and Solid Waste** - started in 2011. This new EC-funded programme combines training through research with training through education. It results in a European PhD degree in Environmental Technology, issued jointly by the University of Cassino (Italy), University Paris-Est (France) and UNESCO-IHE. The enrolled students carry out laboratory research on anaerobic oxidation of methane coupled to sulfate reduction, biological removal of selenium from wastewaters and bioremediation of gypsiferous soils.



### **The Ecology of Livelihoods in East African papyrus wetlands (ECOLIVE)**

The Nyando wetland on the edge of Lake Victoria in Kenya is one of the many African wetlands that is threatened by the need to produce food through agriculture and fisheries. The UPaRF-funded interdisciplinary project on ‘The Ecology of Livelihoods in East African papyrus wetlands’ (ECOLIVE) focuses on understanding how wetlands can support livelihoods without negative impacts on the wetland ecosystem. UNESCO-IHE’s partners in this project are the Egerton University and VIRED International (both in Kenya) and the University of Amsterdam (Netherlands). The project consists of three PhD projects on hydrology, ecology and social science and an integrative post-doctoral research project, all with Kenyan researchers. Project outputs in 2011 included six MSc theses on the Nyando wetland from Kenyan universities and from UNESCO-IHE, ECOLIVE presentations at conferences in Arusha, Prague, San Francisco and Maputo, a newsletter for the Nyando wetland community and a scientific review paper on the project.

Two **Marie Curie International Research Staff Exchange Schemes** were initiated.

One scheme focuses on Advanced Biological Waste-to-Energy Technologies (BIOWET), and is carried out with the University of South Florida (USF).

Secondly, the MinPolControl exchange scheme focuses on bio-weathering of mining wastes, pollution control and monitoring and foresees exchanges with the University of Minas Gerais and the University of Unimontes (Brazil).



## Research on Information & Communication Systems

Information and Communication Systems addresses the opportunities provided by advances in information and communication technologies for data monitoring and acquisition, computer-based modelling, decision support, and knowledge-based systems for integrated water resources management. This is paralleled by the ongoing concern to enhance the corresponding knowledge base through research, and the effective sharing and transfer of knowledge.

The **Lennis** project was successfully completed in 2011. The project aimed to develop an innovative collaborative decision support network for exchange of location-based environmental and health services between stakeholders and citizens. This enhances capacity to assess population exposure and health risks in order to improve the management of the concerned ecosystems. An internet portal for water users was developed, tested and appreciated by Dutch users throughout 2011. In November 2011, UNESCO-IHE organized the Lennis Symposium where all results of the project - innovative tools for collaborative decision-making, web services and mobile phone applications in the water domain - were presented to public and professional users.

The EU-funded project **KULTURisk** was launched in January 2011. The € 4.4 million collaborative project coordinated by UNESCO-IHE aims to develop a culture of risk prevention

through a knowledge-based approach that assesses the socio-economic benefits of risk prevention techniques. A methodology will be developed, applied and validated using specific European case studies, including transboundary areas. The project will demonstrate the benefits of state-of-the-art prevention measures, such as early warning systems, non-structural options (e.g. mapping and planning), risk transfer strategies (e.g. insurance policy), and structural initiatives.

The EC FP7 project on 'Merging hydrological models and EO data for reliable information on water' (**MyWater**) started in 2011. The MyWater concept entails enhancing operational water management by improving water resources analysis through integrated use of in-situ measurements, earth observation information, meteorological predictions, and catchment simulation models. The overall objective is to develop and validate data-model



approaches to supply access to multiple sources of data in order to obtain reliable information on watershed water availability and quality assessments in different environments and with different technological support. The project is coordinated by GMV, Spain. UNESCO-IHE is mainly involved with a PhD research fellowship and the development of courses in Africa, South America, and Europe that are tailored to regional needs.

The **EnviroGRIDS** project aims to develop an integrated catchment observation and system for the Black Sea Region to support sustainable development. It started in 2009, will be completed in 2013, and involves 26 partners. Several work packages focus on developing new infrastructure for observing environmental data and on using this infrastructure to develop parallelized (gridified) environmental models. In 2011, UNESCO-IHE hosted the full EnviroGRIDS project meeting, which was

organized in conjunction with the OpenWater symposium. The meeting focused on the usage of interoperability standards interfaces and open source environmental modelling software.

The **MorphoFlood** project received DUPC funding in 2011 and is carried out with a number of partners from Bangladesh: the Institute of Water Modelling (IWM), the Center for Environment and Geographic Information Services (CEGIS) and the Institute of Water and Flood Management, Bangladesh University of Engineering and Technology (IWM BUET). The project focuses on identifying the ways flood risk can be managed and minimized in the flood-prone 'hot spots' in Bangladesh, focusing specifically on the Haor region. The project will run until December 2012.





## Research on Water Management & Governance

Water Management and Governance deals with the multi-disciplinary nature of water management and addresses the need for a holistic view of the complex water-based systems that are the subject of such management. Maintaining the integrity of natural resources can only be achieved with the involvement of the natural and mathematical sciences, engineering and technology, health and medical sciences, and the social and behavioral sciences, including law, politics and institutional development and management.

The **Blue Nile Hydrosolidarity Research** project continued in full swing and so far involved full-time contributions of 1 post-doc (work completed), 9 PhDs and around 20 MA/MSc students. Most of the field research on land degradation in Ethiopian highlands was completed. Results were disseminated during a workshop in April 2011 in Debre Markos, Ethiopia, which included local government officials and land and water management practitioners. Two PhD researchers who joined the project in 2010 started fieldwork to understand water and sediment flows in the Blue Nile and irrigation schemes in Sudan. Preliminary results were disseminated to policy makers and water practitioners in Wad Medani in October 2011.

The DUPC-funded **PROBE research project** on pro-poor water and sanitation services provision continued to grow. The number of partners increased to 17 in 2011. Two PhD students and more than ten MSc students are contributing to the project. Allocation of additional funds to the project enabled the participation of CEPT University, India. Moreover, although only academic partners had participated in the annual workshop in previous years, the extended budget allowed the attendance of professional partners as well, much to the benefit of the project.



The PhD research project on **Sustainable Irrigation Development in the White Volta Sub-Basin** was successfully completed. The study identified growing markets for irrigated products as an important driving force behind the expansion of irrigation, which has given rise to new technologies. Direct control of the farmers over water sources has contributed to the spread of the new technologies. The new technologies allow relatively small farms to be adequately managed by the surveyed farmers and to achieve high productivity. The hydrological impact of upscaling irrigation in the sub-basin is sustainable and will maximize the overall benefits derived from water resources in the Volta Basin.

In 2011, a research group on **Governance of large water works** was established between UNESCO-IHE and Delft University of Technology. This has led to substantive development of the research topic and is supported by ongoing research work by PhD and MSc students. The group will develop a larger research proposal in 2012.

# Capacity Development

UNESCO-IHE provides capacity development services to knowledge institutes and water sector organizations around the world. Through these operations, the Institute increases its global impact and helps

to build sustainable organizations that are equipped to properly manage water resources and deliver water services to all communities. Services include institutional development projects, tailor-made training and policy advice.



UNESCO-IHE alumni from all over Africa learning about sustainable use of wetlands for livelihoods during refresher course in Kenya

**In 2011, UNESCO-IHE continued to expand its portfolio on NICHE capacity development projects. Seven new projects were awarded grants: two in Bangladesh, two in Vietnam, one in Rwanda, and one in Egypt.**

The inception phase of the four-year project on **Capacity Development of Higher Education on Integrated Water Resources Management at CUET** was completed. The project will enhance the capacity of the Chittagong University of Engineering & Technology, Bangladesh, with special emphasis on curriculum development of the University in Integrated Water Resources Management.

The four-year project on **Consolidation and upgrading of education and research within Water resources, Environment and Health Science and Engineering at the National University of Rwanda** also completed its inception phase. The project is a follow-up of a previous Nuffic-NPT project which established the Water Resources and Environmental Management MSc programme at the university's Faculty of Applied Science, and will further embed the WREM programme into the academic structure of NUR and intensify links with the water and environmental sector in Rwanda.

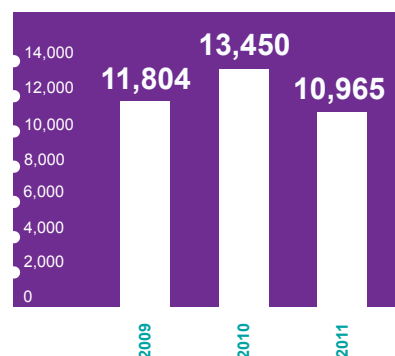
Two NICHE projects are taking place in Vietnam. The project on **Strengthening education programmes in water management and climate change adaptation**, which will enhance the capacity of Vietnam National University – Ho Chi Minh City, started its inception phase in the end of 2011. The project on **Improvement of Higher Education in Water Management in view of Climatic Change in Vietnam** was awarded at the end of 2011 and will start its inception phase early 2012.

The NICHE project entitled **To increase capacity of TSWRI to provide high-quality training for the human resources in the water sector** is a four-year project which will enhance the capacity of the Training Sector for Water Resources and Irrigation (TSWRI) organization within the Egyptian Ministry of Water Resources and Irrigation. The project will focus on developing curricula for TSWRI based on modern learning techniques, achieving accreditation of existing courses, and enhancing management capacities in the organization.

### Project turnover

The total project turnover in 2011 was € 10,965 million, including the DUCP fund - DGIS UNESCO-IHE Programmatic Cooperation. Institutional capacity development and research again represent the majority of UNESCO-IHE's projects (respectively 41% and 40%). Advisory services projects showed a slight increase in turnover from € 422 thousand in 2010 to € 691 thousand in 2011. The turnover of both institutional capacity development and research projects decreased from € 5.4 million in 2010 to € 4.4 million in 2011, and from € 6 million in 2010 to € 4.3 million in 2011, respectively. The complete overview of projects in which UNESCO-IHE was involved in 2011 is presented in Annex 4.

Project turnover  
Euro x 1,000 | Year





## Capacity Development

The **Netherlands and Western Balkans Environmental Network (NEWEN)** was successfully completed in 2011. NEWEN was an environmental cooperation and capacity-building programme to contribute to the improvement of the environmental situation in the Western Balkan region by environmental cooperation and capacity building. It ran from October 2008 to May 2011 with partners from six universities in the Western Balkans and three universities and institutes in the Netherlands. The programme was developed as part of the current Western Balkans Regional Environmental Programme of the Dutch Embassy in Belgrade. Activities in the Western Balkan included workshops for (young) scientists and policy makers, MSc fellowships, training for university and government staff, fieldwork at a contaminated area, and a closing symposium at the end of the project to disseminate the outcomes.

A successful conference of the **Nile Basin Capacity Building Network (NBCBN)** in November 2010 marked the end of the Knowledge Networks for the Nile Basin (KNNB) project. 2011-2012 forms a bridging period to prepare a new phase of collaborative research, improve the competence of current water professionals in the region, and facilitate regional knowledge exchange and improvement of water education programmes, thus enabling an influx of new young professionals for the water sector. In 2011, two regional knowledge exchange workshops were facilitated: one on 'Climate Change and Adaptation', leading to a new Community of Practice initiative, and one on 'River Modelling and Morphology'. An MoU with the Nile Basin Initiative (NBI) will be signed in the beginning of 2012.

In the framework of the **EU-China River Basin Management Programme**, seven study tours for Chinese professionals were organized by UNESCO-IHE staff in 2011. One tour was tailor-made for high-ranking Director-Generals from Chinese ministries, while the other six were designed for mid-level professionals. The topics that were covered in the tours included post-project evaluation, decentralized wastewater treatment, climate change adaptation, early warning systems, composition mechanisms for ecological services, watershed rehabilitation, and carbon sequestration. The tours took place in the Netherlands and a number of other European countries.

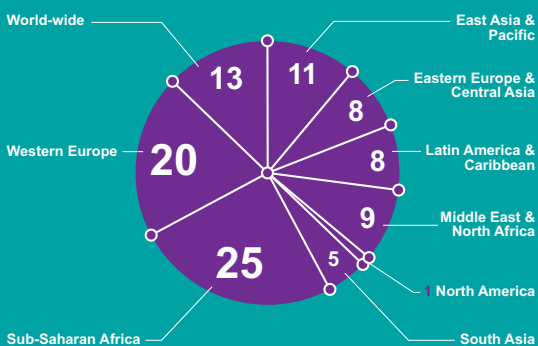
The **H2020 Capacity-Building/Mediterranean Environment Programme (ENP MEP H2020)** started in September 2010 as part of Horizon 2020, a project which aims to enhance capacity to address pollution problems at institutional and societal levels. It focuses on 14 Mediterranean countries and includes 150 training courses for about 3,000 water sector professionals at the national, sub-regional and regional levels, provided by the consortium of 12 partners. UNESCO-IHE is responsible for providing 30 courses on the theme of urban wastewater. 22 courses were successfully completed by the end of 2011 and involved 17 UNESCO-IHE academic staff and a number of guest lecturers.



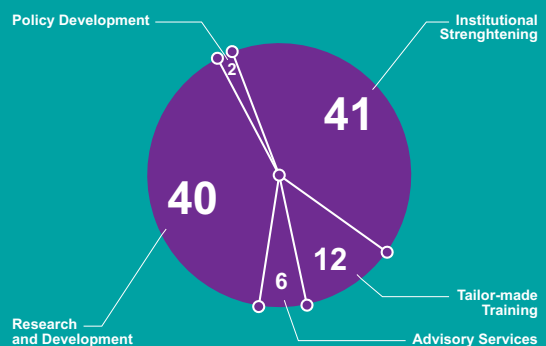
A new programme of advisory and capacity-building efforts was set up to support the recently established **UNESCO Category II Centre HidroEX**. The programme began with a training course on water quality taught in November in Frutal, Brazil, and will include additional courses in 2012 on natural hazards and integrated river basin management. Support is also being provided in the establishment of new laboratories at HidroEx and in the launch of short courses in Lusophone Africa.

The Training and Capacity Building component of **UN-HABITAT's Lake Victoria Water and Sanitation Initiative** was completed in 2011. The initial assessment done in 2010 to identify capacity deficiencies resulted in the preparation of 21 action-oriented courses, of which ten were prepared by UNESCO-IHE. The courses were implemented by NETWAS, a local capacity builder, and reached out to about 2200 people from various stakeholder groups that came in from 11 project towns in three countries. In 2011, UNESCO-IHE participated in training and coaching the facilitators, in conducting final inquiries to see evidence of training impact, and in holding top-level consultations with key local stakeholders.

**Projects per region in 2011**  
Percentage



**Projects per type in 2011**  
Percentage





## Capacity Development

UNESCO-IHE was involved in a **government to government (G2G) project on Transposition of the Water Framework Directive and Establishment of an Environmental Administration**. The project started in January 2011 and is being coordinated by the Netherlands Government Service for Land and Water Management (DLG) and the Turkish Ministry of the Environment. A number of missions took place in Turkey to identify the main organizational issues in relation to the implementation of the European Water Framework Directive. A generic model was developed in which all tasks of integrated water management have a logical place. This model was used to investigate the logic behind the allocation of the responsibilities and tasks of the different institutions. In addition, a train-the-trainers mission and two monitoring missions were organized in accordance with the obligations of the Water Framework Directive. The project will be completed in 2012.

UNESCO-IHE was contracted by the National Water and Sewerage Corporation of Uganda to implement the short course component of the capacity-building component of the **Harari Water Supply and Sanitation Project**. The contract served 103 participants through six short thematic courses for professional staff. In addition, a group of nine senior officials, including the Ugandan federal Minister of Water, attended the 2011 International Water Week at Stockholm accompanied by UNESCO-IHE representatives. Evaluation showed a very high level of appreciation for the content and facilitation of the activities.

The **Water Development and Management Institute in Tanzania** offers a variety of training programmes for aspiring and practicing water professionals. The Institute has enjoyed an independent status since 2008, but encountered difficulty in re-positioning itself in the education market. IRC International Water and Sanitation Centre, ICLEI - Local Governments for Sustainability, UNESCO-IHE and a local consultant assisted the Institute in market research, organizational development, training of trainers and preparation of curricula and materials for new courses. UNESCO-IHE delivered input for market research, took responsibility for preparing the Strategic Plan and the Business Plan, designed several courses and prepared training materials.

### Capacity Building for Water Programmes in Higher Education in the Caribbean (CapCar)

In 2006, the Water and Sewerage Authority of Trinidad and Tobago and UNESCO-IHE signed a Cooperation Agreement focused on staff capacity building in the Caribbean water sector. Together with the Faculty of Engineering of the University of the West Indies in Trinidad, the Faculty of Technology of the University of Guyana and the College of Science, Technology and Applied Arts of Trinidad and Tobago, these parties presented a project proposal to EDULINK, the EU initiative to boost education and research in developing countries. The proposal was approved and started in January 2009 under the name of 'Capacity Building for Water Programmes in Higher Education in the Caribbean (CapCar)'. The project involves a broad mix of water educational activities and an outlook for research in order to furnish capable staff to serve the regional water sector. A € 500,000 total budget was set for the three-year project; 85% was provided by the EU and 15% by the Dutch government through DUPC, and by the Caribbean countries.

Highlights of the Caribbean project activities include the compilation of assessment reports by multi-disciplinary UNESCO-IHE and Caribbean partner teams on policies, curriculum development, IT and materials. A research agenda and research themes were formulated and textbooks, equipment and software were delivered to the educational institutes. Another initiative involved staff capacity training at UNESCO-IHE in the fields of Hydrology and Water Resources, River and Coastal Engineering, and Water and Wastewater Engineering. Nine short courses were successfully completed in Trinidad and Guyana in 2011 and attracted almost 200 participants employed by regional water sector organizations. The courses covered diverse water topics and enhanced the sector's capacity by improving the knowledge level of their Caribbean staff.

The MRC Flood Management and Mitigation Programme's capacity-building programme on **Anticipating and Resolving Flood Issues, Differences and Disputes in the Lower Mekong Basin** was implemented in collaboration with Mekong institutions (universities in Cambodia, Laos, Thailand and Vietnam) and international partner institutes and programmes. The programme focuses on capacity building in the fields of flood and water management, conflict management, water law and institutions, as well as the use of technical tools to support transboundary water cooperation. National and regional knowledge institutes are involved in developing training curricula that are sustainable and strongly embedded within the region. The programme, including short courses at UNESCO-IHE, was attended by staff from national universities in the Mekong region. In 2011, the Phase 2 training workshops were implemented, which included a role-play session on addressing and resolving a transboundary issue. The first two training workshops organized and implemented by national university staff also took place in 2011 (test phase 3).

WaterNet is a regional programme to build and strengthen regional capacity for integrated management of water resources in Southern Africa through education, research, and training. **WaterNet phase IIb** was successfully evaluated and completed. In 2011, the 12th edition of the WaterNet symposium was held in Maputo, Mozambique. 56 papers were published in the tenth special WaterNet peer-reviewed issue of the Journal of Physics and Chemistry of the Earth. UNESCO-IHE continues to support WaterNet with scientific backstopping activities, such as the educational restructuring process and chairing scientific sessions at the symposium. WaterNet is a key partner of UNESCO-IHE in a number of projects. In 2011, WaterNet also formulated its new strategy (2012-2015); the Dutch government has pledged to fund a significant share of the costs.

UNESCO-IHE is the only institution in the world that has a Chair and programme dedicated to **Knowledge and Capacity Development (KCD)** for the Water Sector since 2001. The group is conducting academic research on KCD and related science policy, participating in operational field-based capacity development projects, and contributing to policy dialogues at the levels of UN-Water and the World Water Council. The group also analyses UNESCO-IHE's own wide range of capacity development approaches, drawing on the in-house expertise at UNESCO-IHE stemming from both on-going and completed capacity development projects. This serves as a basis for reflection and joint learning in order to strengthen the ability of the institute and other partner organizations to contribute to better policies and provide more effective capacity development interventions that are more innovative, interdisciplinary and demand-responsive.



# Organizational Developments



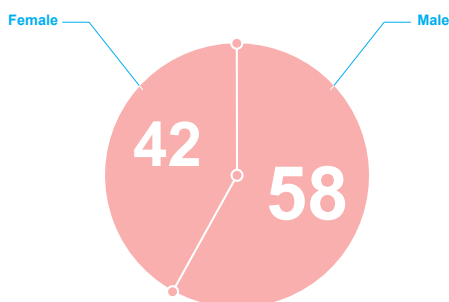
## Human Resources Management

The operational implementation of the required change of structure, outlined in the documents 'Strategic Directions UNESCO-IHE in 2020' and 'UNESCO-IHE in 2020 Implementation Plan', was launched in 2011. The administrative change and adjustment of all the systems will start in 2012.

As regards staff development, the Human Resources Management department has put all its focus on developing and upgrading the existing Staff Development and Appraisal Systems (SDAS) policies. The new measures will be launched in early 2012, following consultation with the Works Council.

On 31 December 2011, UNESCO-IHE employed 166 full-time staff equivalents (FTE), of whom 54% were academic and 46% supporting staff. 38% of the staff members are female and 62% are male. UNESCO-IHE employs 29% international staff and 71% Dutch staff. These numbers encourage the institute towards the further development of a diversity policy. Concerned staff members have confirmed that an increasingly diversifying population requires a targeted approach within our policies.

Male and female staff members  
Percentage



## IT

In 2011, the IT department continued the process of professionalization. Performance and reliability has been improved by modernizing both hardware and software. Virtualization of hardware has also been widely implemented.

The IT department has prepared the network services for the creation of a global campus. Additional services such as eduroam (education roaming) network access, email services on smartphones, and VPN access were introduced to make it possible to connect to the institutional network from remote locations.

The IT department started supporting the educational and scientific processes more actively by acquiring a more in-depth knowledge of the services that are being used in these processes.

## Facility Management

In the week before Christmas, with the completion of Oude Delft 95, the refurbishment was completed after 2 years. All staff moved to their new refurbished workspace, including the staff members that were housed outside the IHE buildings.

This transition went well with as little disruption to the organization as possible. The works were executed as set out in the original plans. The budget was exceeded by € 750,000, due to three factors:

- Additional legal and safety requirements;
- Change request from users, amongst others adaptation of the original housing plans to the implementation of the reform process;
- Unforeseen circumstances such as asbestos in the cellars and heating in the library.

Due to an unforeseen delay, the elevator planned in Oude Delft 95 will be installed before July 2012. Overall, the project has been completed successfully and meets the requirements of the organization.

## Communication and Marketing

A UNESCO-IHE Alumni group was created on LinkedIn to strengthen the network among alumni and between alumni and the Institute. All alumni that have completed a MSc, MEng or PhD programme at UNESCO-IHE/IHE Delft are invited to actively participate in discussions and share events, vacancies, best practices, research and projects.

The layout of the UNESCO-IHE website was upgraded in line with the new house style. More social media links, dynamic and graphic elements have been included and the homepage now includes an increased focus on news, events and research outputs.

UNESCO-IHE initiated an 'update your email address' campaign. Efforts proved to be very successful, as 2000 email addresses were updated. Actions included the sending of an 'update your email address' card to all alumni and asking them to join UNESCO-IHE's social media networks and to encourage their alumni friends.

Visits were frequently organized for high-level visitors, including the Ambassador and Permanent Delegate of the Republic of Korea to UNESCO in Paris, the Afghan Minister of Agriculture, Irrigation and Livestock and the President of Vietnam National University, among others.

On World Water Day on 22 March, Dutch artist and filmmaker Ap Verheggen was nominated Cultural Ambassador to UNESCO-IHE. Verheggen became internationally known for his 'cool(E)

motion' art project in March 2010, in which he placed two sculptures on melting icebergs in the Arctic.

UNESCO-IHE participated in a number of large international conferences, including

- the Stockholm World Water Week in Stockholm, Sweden;
- the conference on 'Water and the Green Economy in Practice: Towards Rio+20' in Zaragoza, Spain; and
- the 2nd IWA Development Congress in Kuala Lumpur, Malaysia.

UNESCO-IHE also contributed to:

- the first International Water Week (IWW) in November 2011 in Amsterdam, the Netherlands.
- The Young Water Professionals Programme of the IWW was organized by Waternet, International Water Association (IWA) and Amsterdam RAI in collaboration with UNESCO-IHE, the Netherlands Water Partnership (NWP) and the Royal Dutch Water Network.

The NFP received 20% more applications in 2011 for their fellowships from UNESCO-IHE candidates for the MSc programmes than last year. Overall, the NFP received 17.6% more applications as compared to last year. These numbers do not give a reliable indication of the number of NFP fellowships granted to UNESCO-IHE candidates, as they are divided on a competitive basis via an intricate system between countries and institutes. However, they clearly indicate the ongoing demand for water education.

## Student and Educational Affairs

122 participants registered in a regular Master's programme in the academic years 2011-2013. The number of joint and dual degree MSc programmes has increased to 18. In total, a number of 82 participants have been registered in a jointly conducted programme in the academic years 2011-2013. Mainly due to this increase in joint programme students, the number of incoming Master's students remained stable (equal to 2009), despite the economic crises and budget cuts.

Other significant developments included:

- The number of participants registered for a non-degree programme in 2011 increased by 24% compared to 2010.
- In 2011, fellowships from the Netherlands Fellowships Programme were selected via the Nuffic Scholarship Online System (SOL) for the first time.
- More contacts were established with partner universities regarding procedures, scholarships and students.
- A new format for the annual introduction days has been implemented successfully.
- The process for the selection of a new Student Information System (SIS) started in 2011 and is expected to be completed and implemented in 2012.

### Alumni tracer survey

In an effort to better understand the relevance and impact of our studies, and in view of further improving our services for future generations of water professionals, all UNESCO-IHE alumni were asked to participate in an internet-based tracer survey. The survey included questions on the education profile, career development, and professional networks of alumni. The survey closed at the end of January 2011, gathering a total of 1153 fully completed surveys and exceeding the target of 1000 by more than ten percent.

Results of the tracer survey reveal the relevance and impact of studying at UNESCO-IHE. Alumni generally indicate that their studies helped them gain new knowledge and competences and

improved their confidence for tackling the challenges they face while pursuing their career. In the words of an alumnus from India: "I am very grateful to IHE, not only for enhancing my knowledge base, but also for shaping my personality to face the professional world - teaching me to work in a group, communicate with different cultures and accept different ideas, practice critical and lateral thinking, improving leadership qualities, management skills and so forth; the list is endless!"

The vast majority stays active in the field of water and environment in their home country or region, steadily making professional advancement, either by improving their job positions or by changing employers.



# Farewell Party

Goodbye Graduates

Welcome Alumni!



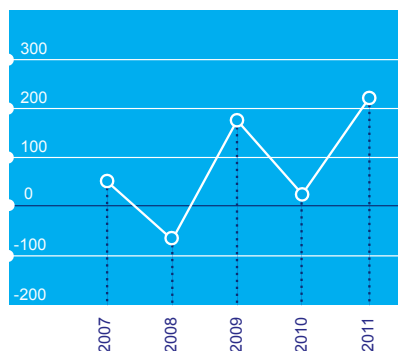


# Financial Report

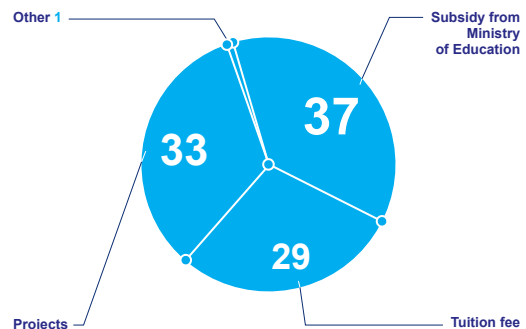
UNESCO-IHE financial operations in 2011 showed a marginal increase in revenues and a modest decrease in expenditures, as compared to 2010. The total turnover increased to just over € 30 million. The overall result shows a surplus of € 220,000.

This corresponds to an operational result against turnover of less than 1%. The main challenges are still securing financing for fellowships and replenishing the general reserves to guarantee continuity of operations.

Overall Financial Results  
Euro x 1,000 | Academic year



Sources of Income in 2011  
Percentage



**Statement of income and expenditures** (in Euro\*1000)

<b>Income</b>	<b>2011</b>	<b>2010</b>
Subsidy from the Ministry of Education	10,904	11,012
Tuition fee	8,772	9,253
Projects	9,980	9,181
Others	351	378
<b>Total income</b>	<b>30,007</b>	<b>29,824</b>
<b>Programme expenditures</b>	<b>2011</b>	<b>2010</b>
Tuition fee (stipends, guest lecture, etc.)	5,255	5,632
Projects	6,863	6,128
<b>Total programme expenditures</b>	<b>12,118</b>	<b>11,760</b>
<b>Non-programme expenditures</b>	<b>2011</b>	<b>2010</b>
Staff and management	11,741	11,774
Buildings	2,719	2,449
Facilities	1,364	1,321
Education-related costs	1,372	1,452
Acquisition and marketing	369	363
General costs	332	765
Interest	-135	-122
<b>Total non-programme expenditures</b>	<b>17,662</b>	<b>18,052</b>
<b>Operating result</b>	<b>227</b>	<b>12</b>
Extraordinary charges/Appropriations from Fellowship Trust Fund	-7	8
<b>Overall result</b>	<b>220</b>	<b>20</b>

**Balance sheet** (in Euro\*1000)

<b>Assets</b>	<b>31-12-2011</b>	<b>31-12-2010</b>
Fixed assets	4,308	2,680
Accounts receivable	3,003	3,431
Cash and banks	13,563	8,930
<b>Total</b>	<b>20,874</b>	<b>15,041</b>
<b>Equity and liabilities</b>	<b>31-12-2011</b>	<b>31-12-2010</b>
Equity	1,851	1,631
Fellowship Trust Fund	262	255
Provision	57	113
Current liabilities	18,704	13,042
<b>Total</b>	<b>20,874</b>	<b>15,041</b>

## Income

The income of the Institute originates from three main sources: the base subsidy of the Dutch Ministry of Education; the tuition fees of MSc students, short course participants and PhD fellows; and project revenues. Other income sources are minor and include the renting out of conference and laboratory facilities and student housing to third parties and PhD graduation grants received from Dutch universities for joint graduations.

The subsidy from the Ministry of Education was reduced by € 148,605 in accordance with the decision of the Dutch Government. Including a small (0.4%) indexation the overall decrease, compared with 2010, was € 107,961. Since this cut in base subsidy had not been anticipated in the operational budget, action plans had to be revised to end up with a balanced result. Despite these decreasing budgets, follow-up took place on the following activities:

- Refurbishment of the building, including completion of the final three out of five phases;
- Implementation of the IT strategy, including a new ERP administrative system (AFAS) to be implemented in January 2012;
- Further development of joint MSc specializations with partners;
- Internal reform process leading to a new strategy for UNESCO-IHE towards 2020;
- Further strengthening of the Institute's research programme by an increased number of registered PhD participants and the co-funding of 17 large research projects through the UPaRF facility.

The tuition fee income decreased slightly, due to a decrease in MSc student years (3%) and an increase in the intake of PhD fellows (10%). Education-related expenditures decreased by 7% due to the lower number of MSc participants and related fellowship costs.

Project income from research, non-degree courses and capacity development projects was 9% higher in 2011, but the direct project costs also increased by 12%. This resulted in a net project fee

income improvement of 2%. Some 7% of the project income was generated through projects co-funded by the programmatic cooperation agreement with DGIS, which includes contributions from various third parties and the Internal Research Fund (IRF). About 60% of the net project income was received from Dutch governmental sources (i.e. DGIS, OCW, I&M, NUFFIC, EVD, NWO, SenterNovem), 22% from EC funds, and 18% from other national and international sources.

## Expenditures

UNESCO-IHE makes a distinction between programme expenditures and non-programme expenditures. Programme expenditures relate to the direct outputs of the Institute's main activities, while non-programme expenditures concern general items such as staff costs and indirect or overhead costs. Programme expenditures are therefore directly linked to the revenue items (education, training, projects) mentioned in the income section.

Non-programme expenditures showed a modest decrease (2%) in 2011, mainly due to an increased exchange rate of the US Dollar and a revaluation of the accounts payable. These developments, combined with decreased costs for the management of the refurbishment, lowered the (general) costs compared with 2010.

The staff and management costs stayed constant compared with 2010. Salaries did not rise in 2011, since no agreement on a new Collective Labor Agreement (CAO) for the Dutch Institutions for Higher Education has been reached by the negotiating parties. The total average number of staff throughout the year increased slightly, while the number of academic (billable) staff was slightly lower than in 2010. Overall, salary expenditures increased by 1%, compensated by lower costs for seconded staff, staff studies and temporary employees.

The overall costs for operation and maintenance of the building increased

by 9%, as a consequence of unforeseen major repairs; extra maintenance costs in the refurbishment; depreciation charges on the refurbishment investments; and an increase in property taxes. The costs of running the facilities decreased by 4% due to lower costs related to hired IT systems and catering.

Education-related costs decreased by 7% as a result of lower costs for introduction days, fewer unfunded fellowships and the first batch of participants who bought their rented laptops. Acquisition and marketing costs were markedly higher (8%) than in 2010, partly due to the publication of two UPDATE Magazines, compared to one in 2010.

## Balance Sheet

The balance sheet shows a ratio of 10/90 between equity and borrowed capital, which corresponds to a solvency ratio of 10%. This ratio is still far from the targeted percentage (20%). The expected improvement of the ratio was challenged by the generic saving measures of the Dutch Government. Efficiency measures in procedures and tools (e.g. new ERP administrative software), the purchase of the building (2013) and a more explicitly output-oriented (project-based) approach are expected to improve the ratio in the coming years.

The borrowed capital includes provisions and current liabilities. In the current liabilities, reservations have been made for leave hours, holiday bonuses and the cost of one term of payment for the lease of the building. The provisions only consist of a reservation for jubilee payments to staff. The provision for long-term building maintenance is fully utilized in the refurbishment. The current ratio is at a level of 0.89, compared to 0.95 in 2010. This means that the Institute remains creditworthy in the short term, although the ideal level of a ratio of 1 has still not been reached. For the long-term financial sustainability of the Institute, focus will be on increasing the financial reserves as foreseen in the business plan currently being implemented.



# Fellowship Trust Fund

The UNESCO-IHE Fellowship Trust Fund (FTF) was created to raise funds from private and public organizations, companies, alumni and other (individual) benefactors for partial or full sponsorship of an individual's studies at UNESCO-IHE. This support

enables water professionals who possess the intellectual stamina and ability, but lack the proper funding, to receive post-graduate education at UNESCO-IHE. Every contribution is directed towards its equivalent value in terms of output.

## Financial Statement for the Fellowship Trust Fund (amounts in Euro)

<b>Fund on 1 January 2011</b>	<b>255,283</b>
<b>Gifts</b>	
SUEZ, France	125,130
Christmas contribution staff 2011 (35*)	1,225
Christmas contribution IGRAC	105
Donation LIONS	500
Mevr. T. Huizinga	230
Dr. J.M. Verbakel	130
Interest	4,420
<b>Total</b>	<b>131,740</b>
<b>MSc Fellowships</b>	
Marissa Syafrul Ihsan, 2010-2012, Indonesia	41,870
Irene Ade Tatumia, 2010-2012, Indonesia	1,000
Herni Kartika Ratri, 2011-2013, Indonesia	41,130
Mira Yuliawati, 2011-2013, Indonesia	41,130
<b>Total</b>	<b>125,130</b>
<b>Fund on 31 December 2011</b>	<b>261,893</b>

In 2011, the FTF provided financial support to four students. All students were enrolled in MSc studies and will continue their studies in 2012.

SUEZ Environnement continued to donate to the Fund.

Donations up to € 2,190 were received from individual staff members, in-house partners, the LIONS club and two other private parties.

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REGISTERED DEGREE PROGRAMME PARTICIPANTS FOR THE ACADEMIC YEAR 2011-2012											
	SOURCE OF FUNDING			REGION OF ORIGIN					GENDER		TOTAL
	Full NFP	Co-financed NFP	Other	Africa	Asia	Latin America	Middle East	Other	Female	Male	
<b>MSc programmes 2010-2012</b>	<b>95</b>	<b>0</b>	<b>81</b>	<b>77</b>	<b>49</b>	<b>15</b>	<b>8</b>	<b>27</b>	<b>65</b>	<b>111</b>	<b>176</b>
- Water Science and Engineering	30	0	42	22	34	5	1	10	17	55	72
- Water Management	20	0	14	18	9	1	1	5	18	16	34
- Environmental Science	25	0	13	24	4	3	1	6	19	19	38
- Municipal Water and Infrastructure	20	0	12	13	2	6	5	6	11	21	32
<b>MSc programmes 2011-2013</b>	<b>75</b>	<b>0</b>	<b>118</b>	<b>73</b>	<b>43</b>	<b>7</b>	<b>18</b>	<b>52</b>	<b>86</b>	<b>107</b>	<b>193</b>
- Water Science and Engineering	17	0	59	20	27	2	7	20	30	46	76
- Water Management	13	0	11	9	3	1	4	7	12	12	24
- Environmental Science	22	0	31	28	9	0	2	14	32	21	53
- Municipal Water and Infrastructure	23	0	17	16	4	4	5	11	12	28	40
<b>PhD programmes 2011</b>	<b>27</b>	<b>1</b>	<b>95</b>	<b>53</b>	<b>39</b>	<b>17</b>	<b>3</b>	<b>11</b>	<b>39</b>	<b>84</b>	<b>123</b>
<b>Total</b>	<b>197</b>	<b>1</b>	<b>294</b>	<b>203</b>	<b>131</b>	<b>39</b>	<b>29</b>	<b>90</b>	<b>190</b>	<b>302</b>	<b>492</b>
Percentage	40.0	0.2	59.8	41.3	26.6	7.9	5.9	18.3	38.6	61.4	

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389

## REGULAR SHORT COURSES

COURSE	DATE	TOTAL PARTICIPANTS
Coastal Systems	10/01/11 – 28/01/11	1
Coastal and Port Structures I	07/02/11 – 25/02/11	6
Conventional Surface Water Treatment	07/02/11 – 25/02/11	1
Negotiation and Mediation for Water Conflict Management I	07/02/11 – 25/02/11	5
Water Quality Assessment	07/02/11 – 25/02/11	9
Lake Ecology *	14/02/11 – 04/03/11	5
Coastal and Port Structures II	28/02/11 – 18/03/11	3
Constructed Wetlands for Wastewater Treatment	28/02/11 – 18/03/11	2
Environmental Engineering	28/02/11 – 18/03/11	3
Environmental Policy Making	28/02/11 – 18/03/11	3
Groundwater Resources and Treatment	28/02/11 – 18/03/11	1
Negotiation and Mediation for Water Conflict Management II	28/02/11 – 18/03/11	5
Stream and River Ecology *	07/03/11 – 25/03/11	5
Advanced Water Treatment Technology	28/03/11 – 15/04/11	3
Environmental Monitoring and Modelling	28/03/11 – 15/04/11	9
Environmental Planning and Implementation	28/03/11 – 15/04/11	10
Financial Management of Water Organisations	28/03/11 – 15/04/11	5
Groundwater Exploration and Monitoring	28/03/11 – 15/04/11	7
Hydrological Data Collection and Processing	28/03/11 – 15/04/11	9
Integrated Asset Management Systems	28/03/11 – 15/04/11	1
Nanotechnology for Water Technology	28/03/11 – 08/04/11	2
Resource Oriented Sanitation	28/03/11 – 15/04/11	1
River Basin Modelling	28/03/11 – 15/04/11	4
Water Resources Planning	28/03/11 – 15/04/11	9
East-African Wetlands for Water Quality *	04/04/11 – 22/04/11	5
Fisheries and Aquaculture *	25/04/11 – 13/05/11	6
Cleaner Production and the Water Cycle	26/04/11 – 13/05/11	1
Integrated Coastal Zone Management	26/04/11 – 06/05/11	3
International Port Seminar	26/04/11 – 13/05/11	18
Introduction to River Flood Modelling	26/04/11 – 13/05/11	6
Modelling Wastewater Treatment Processes and Plants	26/04/11 – 13/05/11	5
Urban Flood Modelling and Disaster Risk Management	26/04/11 – 13/05/11	1
Water and Environmental Law and Institutions	26/04/11 – 13/05/11	3
Water Transport and Distribution I	26/04/11 – 13/05/11	2
Environment and Global Change: Uncertainty & Risk Assessment	02/05/11 – 13/05/11	6
Applied Groundwater Modelling	14/06/11 – 01/07/11	12
Aquatic Ecosystems: Processes and Applications	14/06/11 – 01/07/11	5
Environmental Systems Modelling	14/06/11 – 01/07/11	7
Flood Risk Management	14/06/11 – 01/07/11	13
Industrial Effluents Treatment and Residuals Management	14/06/11 – 01/07/11	6
Managing Water Organisations	14/06/11 – 01/07/11	9
Urban Water Systems Modelling	14/06/11 – 01/07/11	4
Water Treatment Processes and Plants	14/06/11 – 01/07/11	7
Climate Change in Integrated Water Management	04/07/11 – 22/07/11	19
Decentralised Water Supply and Sanitation	04/07/11 – 22/07/11	15
Modelling Urban Drainage and Sewerage	04/07/11 – 22/07/11	1
Public-Private Partnerships in the Water Sector	04/07/11 – 22/07/11	14

**REGULAR SHORT COURSES**

COURSE	DATE	TOTAL PARTICIPANTS
River Restoration and Rehabilitation	04/07/11 – 22/07/11	4
Solid Waste Management	04/07/11 – 22/07/11	21
Water Transport and Distribution II	04/07/11 – 22/07/11	5
Watershed and River Basin Management	04/07/11 – 22/07/11	21
Spate Irrigation and Water Management under Drought and Water Scarcity	05/09/11 – 16/09/11	18
Morphological Modeling using Delft3D	12/09/11 – 16/09/11	1
World History of Water Management	12/09/11 – 16/09/11	1
Membranes in Drinking & Industrial Water Treatment	03/10/11 – 07/10/11	11
GIS and Remote Sensing	31/10/11 – 11/11/11	21
GIS Modelling SWAT	31/10/11 – 11/11/11	9
<b>Total</b>		<b>389</b>

\* held at Egerton University, Kenya

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199

**ONLINE COURSES**

COURSE	DATE	TOTAL PARTICIPANTS
Service Oriented Management of Irrigation Systems	15/01/11 – 15/05/11	5
Flood Modelling for Management	01/03/11 – 15/05/11	6
Biological Wastewater Treatment: Principles, Modelling and Design	01/03/11 – 30/06/11	24
Ecological Sanitation	01/03/11 – 30/06/11	11
Integrated Coastal Zone Management	01/03/11 – 30/06/11	7
Integrated River Basin Management	01/03/11 – 30/06/11	24
Policy and Management in Developing Countries	01/03/11 – 30/06/11	7
Water Quality Assessment	01/03/11 – 30/06/11	9
Wetland Management	01/03/11 – 30/06/11	7
Water and Environmental Law and Policy	01/04/11 – 15/07/11	13
Decision Support Systems in River Basin Management	01/09/11 – 31/11/11	6
Constructed Wetlands for Wastewater Treatment	01/09/11 – 31/12/11	9
IWRM as a Tool for Adaptation to Climate Change ( <i>formerly known as: Water and Climate Change</i> )	01/09/11 – 31/12/11	16
Public Private Partnerships	01/09/11 – 31/12/11	8
Solid Waste Management	01/09/11 – 31/12/11	26
Water Transport and Distribution	01/09/11 – 31/12/11	13
Modelling Sanitation Systems	01/11/11 – 29/02/12	8
<b>Total</b>		<b>199</b>

4

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**REGIONAL REFRESHER SEMINARS**

SEMINAR	COUNTRY	DATE	TOTAL PARTICIPANTS
Small Water Supply and Sanitation Systems: serving the disadvantaged communities in semi-urban and rural areas in developing countries.	Bolivia (Plurinational State of)	19/09/11 – 24/09/11	21
Serving More With Less: The challenge of sustainably managing African water supply and sanitation assets of the 21st Century	Zambia	23/10/11 – 30/10/11	23
Decision Support Systems in River Basin Management	Ethiopia	06/11/11 – 16/11/11	23
Management of Climate Change Related Risks in Coastal Lowlands: Balancing water allocations for food, people and environment	Mozambique	14/11/11 – 18/11/11	25
<b>Total</b>			<b>92</b>

**TAILOR-MADE COURSES**

Tailor-made courses are developed and implemented on demand. These courses serve to upgrade or refresh the knowledge and skills of experts, or to provide exposure to applications of conventional methods. All tailor made courses of 2011 are listed in Annex 4 - Projects.

## 10

PROMOTIONS IN 2011				
NAME	PROMOTION DATE	COUNTRY	PROMOTOR	TITLE THESIS
Ms. M. Babu	January 28, 2011	Uganda	Gijzen	Effects of Algal Biofilm and Operational Conditions on Nitrogen Removal in Wastewater Stabilization Ponds
Mr. S. Munir	February 24, 2011	Pakistan	Schultz	Role of sediment transport in operation and maintenance of supply and demand based irrigation canals
Mr. T.K.A. Waly	April 27, 2011	Egypt	Amy	Minimize the use of chemicals to control scaling in SWRO
Mr. I. Masih	June 21, 2011	Pakistan	Uhlenbrook	Understanding Hydrological Variability for improved Water Management in the Semi-Arid Karkheh Basin, Iran
Mr. S. Oduro-Kwarteng	August 29, 2011	Ghana	Van Dijk	Private Sector Involvement in Urban Solid Waste Collection. Performance, capacity and regulation in five cities in Ghana
Mr. S.G. Salinas Rodriguez	October 3, 2011	Bolivia	Amy / Kennedy	Particulate and Organic Matter Fouling of Seawater Reverse Osmosis Systems. Characterization, Modelling and Applications
Ms. X. Liang	October 5, 2011	China	Van Dijk	The Economics of Sustainable Urban Water Management. The case of Beijing
Mr. M.B. Siek	December 6, 2011	Indonesia	Solomatine	Predicting Storm Surges: Chaos, Computational Intelligence, Data Assimilation, Ensembles
Mr. P.K. Dissanayake	December 12, 2011	Sri Lanka	Roelvink	Modelling Morphological Response of Large Tidal Inlet Systems to Sea Level Rise
Mr. E.A. Ofosu	December 13, 2011	Ghana	Van der Zaag / Van de Giesen	Sustainable Irrigation Development in the White Volta Sub-Basin



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## REGISTERED PHD FELLOWS

NAME	COUNTRY	PROMOTOR	WORKING TITLE THESIS
Mr. Abel	Sudan	Amy/Kennedy	Assessment of soil aquifer treatment (SAT) for multiple contaminant removal and its applicability in developing countries
Mr. Acheampong	Ghana	Lens	Biosorption of Copper, Arsenic and Cyanide from Goldmine Wastewater
Mr. Adeboye	Nigeria	Schultz	Productive and sustainable use of land and water under deficit irrigation in Ogun-Osun River Basin, Nigeria
Ms. Ahmed	Egypt	Uhlenbrook/Solomatine	Climate Change and Development Impacts on Groundwater Resources in the Nile Delta, Egypt
Mr. Ali	Sudan	Wright	Effects of erosion control practices in the upper Blue Nile River Basin on downstream sedimentation rates
Mr. Almoradie	Philippines	Solomatine	Virtual environments for stakeholder participation in river and flood management
Ms. Alvarez Mieles	Ecuador	Mynett	Ecological Modelling in Tropical Rivers and Wetlands
Ms. Andreev	Moldova	Lens	Terra preta as an approach to manage human excreta for its reuse in agriculture
Mr. Ansa	Ghana	Gijzen	The Role of Algae in the Removal of Faecal Coliforms From Domestic Wastewater in Pond Systems
Mr. Arias Hidalgo	Ecuador	Mynett	Reducing uncertainty in coupled wetland-catchment models
Mr. Baghoth	Uganda	Amy	Characterization of natural organic matter in water using multiple detectors
Ms. Balica	Romania	Wright	Applying the Flood Vulnerability Index as a knowledge base for flood risk assessment
Mr. Barreto Cordereo	Venezuela	Price/Solomatine	Multi-criteria optimisation in the rehabilitation of urban drainage networks
Mr. Bayissa	Ethiopia	Solomatine	Drought assessment and forecasting for Upper Blue Nile Basin by assimilating remotely sensed data into hydrological model
Mr. Betrie	Ethiopia	Mynett	Regionalization of models for large-scale water quality simulation
Mr. Bhatt	Nepal	Uhlenbrook	An Integrated approach for adapting agriculture and water management to Global Change. Case study of a Himalayan River Basin in Nepal
Mr. Bin Ab Razak	Malaysia	Roelvink	Modeling of Headland Sediment Bypassing Process & Nearshore Evolution of Embayed Beach
Mr. Bin Abdullah	Malaysia	Price	Web-based spatial decision support system for integrated urban water management
Ms. Bremere	Latvia	Schippers	Saving energy and ater by maximizing the conversion of membrane filtration system
Mr. Bruins	Netherlands	Kennedy	Improved manganese removal from groundwater
Ms. Calderon Palama	Nicaragua	Uhlenbrook	Development of new tracer methods and groundwater and water resources development in Nicaragua
Ms. Cassidy	Portugal	Lens	Anaerobic oxidation of methane by sulfate reduction
Mr. Chung	Rep. of Korea	Lens	Point-of-use drinking water disinfection methods for African peri-urban areas
Mr. Dejen	Ethiopia	Schultz	Hydraulic and Operational Performance of Irrigation Systems in view of Interventions for Water Saving and Sustainability. Sugar Estates and Community-Managed Schemes in Ethiopia
Mr. Delipetrev	Macedonia	Solomatine	Decision Support System for Water Resources Management in the Republic of Macedonia: Case Study of Bregalnica River Basin
Ms. Delos Reyes	Philippines	Schultz	Modernization Strategy for National Irrigation Systems in the Philippines: Linking Design, Operation and Water Supply
Mr. Demessie	Ethiopia	Uhlenbrook	Past-present-future land use in the Blue Nile and impacts on hydrology
Mr. Dhakal	Nepal	Kennedy	A novel method to predict antiscalant dose in membrane system: comparison and bench marking synthetic and bio-based antiscalant in BWRO & SWRO application
Ms. Digna	Sudan	Uhlenbrook	<i>under construction</i>
Ms. Donoso	Panama	Roelvink	Analysis of the upper ocean thermal structure of the eastern tropical Pacific: establishing correlations with precipitation in Latin America
Ms. Duong	Viet Nam	Roelvink / Ranasinghe	Climate Change Impacts on the Stability of Small Tidal Inlets (CC-STI)
Mr. Ebrahim	Ethiopia	Mynett	Modelling groundwater flow and reactive contaminant transport of chlorinated solvents for assessing risk in a fuzz-probabilistic approach
Ms. Elsheikh	Sudan	Schultz	Crop Water Productivity of Sunflower ( <i>Helianthus annuus</i> L) under different Irrigation Regimes for Gezira Clay Condition
Ms. Essandoh	Ghana	Tizaoui	Soil aquifer treatment of wastewater: a framework for technology implementation in a developing country
Mr. Galvis Castano	Colombia	Gijzen	Development of a technology selection model for pollution prevention and control in the municipal water cycle
Mr. Gebrekristos	Ethiopia	Uhlenbrook	Impact of impoved Land management practices on hydrology in Blue Nile River Basin / Up-scaling of Hydrological model

**REGISTERED PHD FELLOWS**

NAME	COUNTRY	PROMOTOR	WORKING TITLE THESIS
Mr. Guo Leicheng	China	Roelvink	Morphodynamic modeling of the river- and tide-dominated Yangtze Estuary, China: processes and mechanisms
Mr. Ha	Rep. of Korea	Amy	Optimization of the Ceramic Membrane filtration in Surface Water Treatment Applications
Mr. Hartanto	Indonesia	Solomatine	Making integration work - Merging earth observation, meteorological, in-situ monitoring, and numerical modelling information for reduced uncertainty in water management
Mr. Hategekimana	Rwanda	Irvine	<i>under construction</i>
Ms. Hoang	Viet Nam	Mynett	The effectiveness of wetlands to remove water pollution at the river basin scale. Case study: Odense river, Denmark
Ms. Hu Yorong	China	Uhlenbrook	Assessment of climate change and its impacts on hydrological processes and water resources in the Yellow River source region, China
Ms. Ingabire	Rwanda	Uhlenbrook	Impact of land use on nitrogen cycling and water quality in Rwanda - A case of Migina catchment
Mr. Jain	India	Lens	Biogenic production of selenium nanoparticles
Mr. Janyasuthiwong	Thailand	Lens	Biogenic Sulfide Production and Selective Metal Precipitation at Low pH for Semiconductor Wastewater Treatment
Mr. Junaidi	Indonesia	Schultz	Optimisation of the Urban Drainage and Flood Protection of Padang City, Indonesia
Mr. Karimi	Iran	Lens	<i>under construction</i>
Ms. Kassa	Ethiopia	vd Zaag	Gender, Environment and Sustainable Development-Understanding the Linkages. The case of Blue Nile river basin
Mr. Katukiza	Uganda	Lens	Sustainable technical sanitation solutions for urban slums
Mr. Kayastha	Nepal	Solomatine	Dealing with uncertainties in remotely linked models
Ms. Kayoza	Tanzania	van Dijk	Integrated infrastructure for sustainable improvement of right-of-way safety in dynamic urban environments
Mr. Keita	Mali	Schultz	Subsurface drainage of valley bottom rice irrigated schemes in the Sudanian climate. Case study of Moutori in Burkina Faso
Mr. Khatri	Nepal	Vairavamoorthy	Risk Assessment of Urban Water Systems for the City of the Future
Mr. Khisa (Sifuna)	Kenya	Uhlenbrook	Ecohydrological functioning of Nyando Wetland in a changing catchment context
Ms. Kijjanapanich	Thailand	Lens	Sulfate reduction for remediation of gypsiferous soils and wastes
Mr. Kilonzo	Kenya	Lens / Bauwens	Assessing the Impacts of Climatic Changes on Hydrology and Water Resources of the Mara River Basin, Kenya
Mr. Kiptala	Kenya	vd Zaag	Managing Basin Interdependencies: Understanding tradeoffs and synergies in the Pangani River Basin, Tanzania
Mr. Komakech	Uganda	vd Zaag	Agent-based modelling for collaborative catchment water resources management in the Pagani river basin, Tanzania
Mr. Kuntiyawichai	Thailand	Schultz / Uhlenbrook	Flood management and land use in the Chi River basin, Thailand
Mr. Li	China	Mynett	Multi-reservoir-based Flood Control and Management software system
Ms. Lin Yuqing	China	Mynett	Unstructured cellular automata in ecohydraulics modelling
Mr. Love	Zimbabwe	Vd Zaag / Uhlenbrook	Land/water/livelihood strategies and water resources availability
Mr. Mabiza	Zimbabwe	vd Zaag / Gupta	IWRM, institutions and livelihoods: cases and perspectives from the Limpopo River Basin
Mr. Masese	Kenya	Irvine	Spatio-temporal dynamics in trophic resources and transfers among food webs in the Mara River
Mr. Mawioo	Kenya	Brdjanovic	Emergency Sanitation following Natural and Anthropological Disasters
Mr. Mburu	Kenya	Lens	Modelling studies for optimal design of horizontal subsurface flow constructed wetlands
Mr. Md. Ali	Malaysia	Solomatine	Flood Risk Mapping Under Uncertainty: Application to Sungai Johor Basin, Malaysia
Mr. Meesuk	Thailand	Mynett	Merging Topographical Data From Multidimensional Views For Enhanced Urban Flood Modelling
Ms. Minaya Maldonado	Ecuador	Mynett	Development of methodologies, environmental indexes, indicators and programs for integral environmental evaluation and restoration of degraded systems
Ms. Minikowski Achete	Brazil	Roelvink	Long term Morphodynamics Modeling of San Francisco Bay
Mr. Mukolwe	Kenya	Solomatine	Modelling of Floods Under Uncertainty
Mr. Munyaneza	Rwanda	Uhlenbrook	Space-time patterns of hydrological processes and water resources in Rwanda, with special focus on the meso-scale Migina catchment
Mr. Mustapha	Nigeria	Lens	Treatment of petroleum-contaminated wastewater using constructed wetlands
Mr. Mutikanga	Uganda	Vairavamoorthy	Decision Support Tools for Water Loss Management in Developing countries
Mr. Mvulirwenande	Rwanda	Alaerts	Beyond Structuralism to Explain the Effectiveness of Knowledge and Capacity Development in Water Supply. Towards an Actor-Interaction Oriented Perspective
Ms. Mwelwa	Zambia	Wright	Flow, morphology and vegetation in the Middle Zambezi: a Study of spatial and temporal scales
Mr. Nabuyanda	Zambia	Irvine	The Fate and Transport of Heavy Metals in Wetlands
Mr. Narrain	Germany	Wright	Computer modelling for the optimisation of low-head hydropower schemes
Mr. Natumanya	Uganda	Uhlenbrook	Spatial-Temporal Dynamics of Flow Regime and Water Resources in the Upper Mara basin, Kenya
Mr. Nyenje	Uganda	Uhlenbrook	Hydrological aspects of alternative sanitation solutions in slum areas in african mega-cities
Ms. Osman	Sudan	Schultz	Sediment and Water Management in Large Irrigation System, Case Study: Gezira Scheme, Sudan
Mr. Owusu-Ansah	Ghana	vd Zaag / vd Giesen	Near-real time monitoring of flows in the Volta basin using variational data assimilation
Ms. Pascual Sanz	Spain	Alaerts	Partnerships between water operators as a vehicle for capacity development and change
Ms. Rogelis Prada	Colombia	Wright	Operational Flood Forecasting, Warning and Response for Multi-Scale Flood Risks in Developing Cities
Ms. Rongoei	Kenya	Irvine	Wetland Ecosystem Integrity in Relation to Exploitation for Livelihoods in Nyando Wetlands, Kenya
Mr. Salifu	Ghana	Amy	Fluoride removal from drinking water
Mr. Sanchez Guillen	Panama	Brdjanovic / van Lier	Cost-Effective Municipal Wastewater Treatment by Coupling of UASB and ANAMMOX Reactors
Mr. Sanchez Torres	Colombia	Mynett	The use of agent-based models for integrated urban water management
Ms. Sanz Galindo	Colombia	Gupta	Developing conflict resolution as a policy tool for small and medium enterprises
Ms. Saraiva Okello	Mozambique	Uhlenbrook / vd Zaag	Bridging the gaps between Hydrology, Land use and Water Management using Tracers and Water resources Modelling in the Incomati Basin

**REGISTERED PHD FELLOWS**

NAME	COUNTRY	PROMOTOR	WORKING TITLE THESIS
Mr. Sekomo	Rwanda	Lens	Mechanisms of heavy metals removal in natural wastewater treatment systems
Mr. Sembiring	Indonesia	Roelvink	Nearshore operational modeling for storm impact and swimmer safety
Ms. Setyamukti	Indonesia	Gijzen / Rotter	Decentralized Small Scale Processing: The Organic Fraction of Municipal Solid Waste
Mr. Seyoum	Ethiopia	Solomatine	Integrated urban water systems modelling
Mr. Silva Vinasco	Colombia	Gijzen	Greenhouse gas emissions from ecotechnologies for sustainable domestic wastewater management in tropical regions
Mr. Simanjuntak	Indonesia	Mynett	Coupled Stress-Seepage Numerical Design of Prestressed Concrete-Lined Pressure Tunnels
Mr. Smit	Netherlands	vd Zaag	Understanding persistence of soil erosion and siltation
Mr. Staicu	Romania	Lens	Biorecovery of selenium from inorganic wastewaters
Mr. Subagadis	Ethiopia	vd Zaag	Water Allocation as a Planning Tool for Sustainable Water Resource Management in Data Scarce River Basin: the case of Tekeze River basin – Ethiopia
Ms. Tabatabai	Iran	Kennedy	Low chemical consuming UF.RO for desalination
Ms. P. Trambauer	Uruguay	Uhlenbrook	Hydrological Drought Forecasting in Africa at Different Spatial and Temporal Scales
Ms. Uwamariya	Rwanda	Amy	Assessment of ground as source of drinking water in Rwanda
Mr. Uwimana	Rwanda	Irvine	Rehabilitation of Sediment and Nutrient Retention Functions in Wetlands of Migina Catchment, Rwanda
Mr. Velez Quintero	Colombia	Price	Real time control in integrated urban water management
Mr. Verma	India	vd Zaag	Groundwater recharge movement in India
Ms. Villa Gomez	Mexico	Lens	Biogenic sulfide production and selective metal precipitation in an innovative reactor configuration: the inverse fluidized bed reactor
Mr. Villacorte	Philippines	Kennedy	Anti-(bio)fouling strategy for integrated membrane systems
Mr. Waktola	Ethiopia	Lens	Invitro Investigation on the antibacterial activities of Microcystis species from Koka reservoir against some human pathogenic bacteria
Mr. Wan Yuanyang	China	Roelvink	Dynamics of fluid mud and its influence on the backfilling at the North Passage of Yangtze Estuary, China
Mr. Wang	China	Mynett	Coupling of meteorological models for hydrological predictions in the Yellow River
Mr. Welles	Netherlands	Brdjanovic / v Loosdrecht	Impact of Salinity on the Biological Phosphorus Removal in Activated Sludge Systems
Mr. Winaktoe	Indonesia	Schultz	<i>under construction</i>
Mr. Wong	Malaysia	Uhlenbrook	Assessment and modelling of large-scale hydrological variability in Peninsular Malaysia
Mr. Worku	Ethiopia	Wright	<i>under construction</i>
Mr. Yalew	Ethiopia	Uhlenbrook / vd Zaag	Integrated Assessment of Land Use and Water Resources Management in the Upper Blue Nile River Basin
Mr. Yan	China	Solomatine	Global Inundation Modelling Under Uncertainty Using Globally and Freely Available Remote Sensing Data
Mr. Yang	China	Uhlenbrook	Quantitative assessment of Groundwater and Surface water interactions in Erdos plateau, China
Mr. Ye	China	Roelvink	A generic morphodynamical model and its validation.
Ms. Yekti	Indonesia	Schultz	Role of Reservoir Operation in Sustainable Water Supply to Subak Irrigation Systems Case Study in the South of Bali
Ms. Yihun	Ethiopia	Schultz	Agricultural Water Productivity Optimization in a Water Scarce Semi-arid Region of Ethiopia
Ms. Zapater Pereyra	Peru	Lens	Design and Development of a novel constructed wetland (CW) set-up: Duplex-CW
Mr. Zhou	China	Vairavamoorthy	Decision Support System for Managing Underground Water Related Assets (Water Distribution)
Ms. Zhu	China	Mynett	Web-based virtual environment for decision support in water based system

## ANNEX 4 | PROJECTS

INSTITUTIONAL STRENGTHENING					
COUNTRY	TITLE	FUNDING	PARTNERS	START	END
<b>Azerbaijan</b>	CB for the Water Supply and Sanitation Sector	WB		20-07-11	31-12-11
<b>Bangladesh</b>	CD of Higher Education of Integrated Water Resources Management at CUET	Nuffic-NICHE	WU, AIT	01-09-11	01-09-15
<b>China</b>	Partnership for education and research in water and ecosystem interactions	EVD	Eijkelpark, China University of Geosciences (CUG), Beijing, Hohai University, Nanjing, Xi'an Center of Geological Survey	15-11-09	30-10-11
<b>Colombia</b>	Piloting Colombia's New IWRM Policy in Key Catchments	National Government		15-05-11	30-06-15
<b>Cuba</b>	Adapting to CC and Mitigating Water Scarcity by Innovative UWM in Cuba	EC-EuropeAid	CUJAE, INRH, IIIA	01-02-11	31-12-14
	Strengthening the Cuban Food Production and Aquaculture Sector.	EC-EuropeAid	ACPA, IIIA, CPAM, Univ. Zagreb	01-02-11	31-12-15
<b>Egypt</b>	Adaptation of the Libra Simulation game for the Egyptian Situation	DGIS		01-09-11	31-12-12
	The National Water Resources Plan - Coordination Project	Ministry of Water Resources	CBI	15-03-09	21-12-12
	Technology Management & Integrated Modeling in Natural Resources	EC-Tempus	Ain Shams University, Assiut University, Sohag University, Martin-Luther-University, University of Exeter	15-01-09	15-01-12
<b>Ethiopia</b>	Harar Water Supply and Sanitation Project	AfDB	NWSC	01-06-11	30-09-11
	Capacity building in Integrated River Basin Management for HEIs to support RBOs	Nuffic-NPT	WUR, Meta-Meta, VU, IWMI	01-03-09	30-06-12
<b>Ghana</b>	Africa Partnership Station: Coastal Processes	Office of Naval Research		01-01-10	31-12-11
<b>Kenya</b>	Module transfer of the Limnology program to Egerton University	DGIS-DUPC		15-11-08	31-12-12
<b>Mongolia</b>	Strengthening IWRM in Mongolia for the Ministry of Nature and Environment (MNE)	DGIS	Deltares, Haskoning, The Water Centre	01-03-09	31-12-12
<b>Mozambique</b>	University of Zambeze Capacity Building Project	Nuffic-NICHE	Rijksuniversiteit Groningen	01-01-11	31-12-13
	Introduction of Water & Sanitation curricula at the UEM	Nuffic-NICHE	IRC	01-01-11	31-12-13
<b>Rwanda</b>	Consolidation & upgrading of education & research within Water Resources at NUR	Nuffic-NICHE	Univ. of Zimbabwe, Dept of Civil Engineering	01-10-11	30-09-15
	Rwanda Integrated Water Security Program (RIWSP)	USAID	FIU, Winrock, Care, World Vision and Water Aid	01-06-11	30-06-16
<b>South Africa</b>	Capacity Building for Integrated Water Resources Management in South Africa.	Nuffic-NICHE	IRC, ITC	15-09-10	15-09-14
	Enhancing institutional capacity in water and waste water treatment	Nuffic-NICHE	NHL, SWO, TU Delft, WWN	01-09-10	31-08-14
<b>Sri Lanka</b>	Centre of excellence for Adaptation to Climate Change-Sri Lanka	DUPC		01-04-10	01-04-14
<b>United Republic of Tanzania</b>	Human Resources and Organization Development in the Water Sector	EC-EuropeAid	IRC, ICLEI	01-05-09	31-07-11
<b>Viet Nam</b>	Institutional CB for the Centre of Water Management and Climate Change	Nuffic-NICHE	Deltares and Univ. van Waterschappen	01-10-11	01-10-15
	Advanced training in modeling and information management applications.	EVD	Vietnam Nat'l University, Can Tho University, Royal Haskoning	15-05-10	15-05-11
<b>Yemen</b>	Strengthening Research Capacity in Yemen's water sector	Nuffic-NICHE	WaterWatch, CSIRO, Cairo University, Wageningen University	01-01-11	31-12-14
<b>Various Countries</b>	Collaborative knowledge sub-network to improve groundwater resources management	USAID	Univ. Arizona, Oregon State Univ., FIU, IGRAC	01-09-11	30-09-13

TAILOR-MADE TRAINING					
COUNTRY	TITLE	FUNDING	PARTNERS	START	END
Various Countries	Capacity development for Performance Improvement of Water Utilities	EC-EuropeAid	IWA, WaterNet, NWSC, DAWASCO, WaterAid, EWSA, RWASEF, RVWSB, SANA, AfWA	01-03-12	28-02-17
	Flood Hazard and Vulnerability Assessment	UNDP		01-11-10	01-03-12
	Anticipating and resolving flood issues, differences and disputes.	MRC		01-04-10	01-04-11
	IWRM in the Aral Sea Basin	DGIS-DUPC		01-01-09	31-12-12
	ENPI (European Neighbourhood Policy Instrument) Mediterranean Environmental. Programme.	EC-EuropeAid		01-11-09	31-10-12
	Capacity Building project at WASA/WITSS	EC-Edulink	WASA, University of the West Indies, COSTAAT, Univ. of Guyana	01-01-09	01-01-12
	Netherlands and Western Balkans Environmental Network	EKN	VU, WUR, LeAF	01-10-08	31-05-11
Ethiopia	DSS in RBM	Nuffic	Nile Basin Initiative-Water Resources Planning and Management Project	15-10-11	01-12-11
Indonesia	Integrated Flood Management II Module Development	DGIS-DUPC		11-10-11	11-10-12
	Blended Wetland Management Planning Course	RWS		01-05-10	30-04-11
Mozambique	Management of Climate Change Related Risks in Coastal Lowlands	Nuffic	Eduardo Mondlane University	15-10-11	01-12-11
Netherlands	Arsenic Removal with Ferritin	Biaqua/ ICOS Capital		20-08-10	20-01-11
	The Water Channel	DGIS-DUPC		01-05-09	31-12-11
Sudan	Tailor Made Training in Netherlands on Sanitation	SWA		01-03-11	30-05-11
Tunisia	Solid Waste Management course	AfDB		26-09-11	29-09-11
United Arab Emirates	Libra role play: IWRM for AWA course on Climate Change & Sustain Land-Water Management	WB		02-10-11	04-10-11
United States of America	IRES: Sustainable clean water technologies for the UN's MDGs	NSF		01-05-09	30-07-11
Zambia	Serving more with less	Nuffic	Univ. of Zambia, Lusaka Water and Sewerage Co.	01-10-11	30-11-11
Various Countries	Stimulating Local Innovation On Sanitation Urban Poor In SS Africa & SE Asia	BMGF		01-07-11	30-06-16
	Erasmus Mundus Masters Course in Ecohydrology	EC-Erasmus Mds	Univ. Lodz (Poland), Univ. Kiel Germany), Univ. La Plata (argentina)	01-09-10	31-08-17
	Erasmus Mundus Masters Course in Flood Risk Management	EC-Erasmus Mds	University Dresden, UP Catalonia, Ljubljana University	01-09-10	31-12-17

POLICY DEVELOPMENT					
COUNTRY	TITLE	FUNDING	PARTNERS	START	END
Colombia	Agua 2011 conference	DGIS		15-11-11	18-11-11
Netherlands	Water related climate change adaptation: a south-north dialogue on knowledge	DGIS-DUPC		01-01-11	01-09-11
	Water Governance Centre Contributions	WGC		01-06-11	31-12-12
	The Water Channel The Next Wave	IFAD	MetaMeta, Nymphaea, The Water Channel	01-01-11	31-12-11
South Africa	Documentary on contested water rights in post apartheid south Africa	DGIS-DUPC		01-06-11	31-05-11
Various Countries	Global Water Education Needs Survey	UNESCO		01-05-10	01-06-11
	Managing Adaptive Responses to changing floodrisk in the North Sea Region	EC-Interreg	Waterschap Hollandse Delta, Rijkswaterstaat, DG-Water, WL-Delft, Dura Vermeer, University of Sheffield, etc.	01-01-08	01-04-11
	ADB - UNESCO-IHE Knowledge Partnership Agreement	AsDB		07-11-11	30-04-14
	DGIS & UNESCO-IHE Programmatic Cooperation	DGIS		01-01-08	31-12-12

RESEARCH AND DEVELOPMENT					
COUNTRY	TITLE	FUNDING	PARTNERS	START	END
Australia	Climate Change Adaptation Research Grants Program	DCC		01-01-11	31-12-12
	Stakeholder Risk Perception Framework	Monash Univ.		15-02-10	31-05-11
Bangladesh	Morphological Modelling of Mehna Estuary	DGIS-DUPC		01-04-11	01-11-12
Belgium	Sand dynamics project Flanders coast	IMDC	Waterloopkundig Lab.	01-08-10	01-08-12
China	Sediment Alluvial Process in Wave-current Boundary Layer	NWO-NSFC		01-12-11	01-12-15
Colombia	Operational Flood Forecasting Warning and Response for Multi Scale Flood Risks	DGIS-UPaRF	DPAE, Cinara, Univalle, Deltares, NOAA	01-10-09	31-12-13
Ethiopia	Consultancy Constructed Wetland Ziway	National Government		15-08-11	15-09-11
Georgia	Integrated Natural Resources Management in Watersheds of Georgia	USAID		01-12-10	30-09-14
Germany	Evaluation of River Engineering & Sediment Management Concept Tidal River Elbe	WVS and HPA		10-12-10	30-07-11
India	Natural water systems and treat technologies to cope w/ water shortages, India	EC-FP7-Coop.	UJS, NIH, IITR, AU, AJD, KWB, BRGM, CEMDS, HTWD, CSIRO, IWMI	10-11-11	11-12-14
Netherlands	Innovative Remote Sensing Monitoring tools and methods for coastal processes	Deltares		31-10-11	31-12-11
	Interne & externe leerprocessen Ruimte voor de Rivier	Programma Ruimte voor de Rivier		01-01-10	31-12-13
	IWRM-NET IMPACT	Leibniz Institut		15-11-10	30-08-12
	Anaerobic Methane Oxidation	Wageningen University		01-06-10	12-01-11
	Climate Proof Cities	Kennis voor Klimaat	TU Delft, Deltares, WUR, KWR	01-10-10	01-10-14
	Novel Methodologies for Evaluation of Fouling of Desalination Membranes	WRF		01-08-09	01-05-12
	A novel bioprocess coupling wastewater treatment	EC-FP7-People		01-03-10	28-02-12
Experimental Investigation of Water Fluxes Using Isotopes	IAEA		01-10-08	01-04-11	
Saudi Arabia	Center for Soil, Water and Coastal Resources	KAUST-GRP	Many other partners	01-01-09	31-12-11
Serbia	Comparative and Strategic Analysis for Future Water Supply of Vojvodina	EVD	Royal Haskoning, Vitens, Aqua Delft	01-02-10	31-07-11
	Arsenic Removal from Drinking Water	SenterNovem	TU Delft, Vitens, Haskoning, 2 Serbia Water Supply companies	01-08-10	31-07-13
United Republic of Tanzania	Development of Resilient Agro landscapes to Climate Change in Tanzania	DGIS-UPaRF	Sokoine University of Agriculture	01-10-10	01-07-12
United States of America	Master of Science Programme	Government of North America		01-01-10	31-12-11
Uzbekistan	Assessment of applicability of an equitable and sustainable financing model	DGIS-UPaRF	AIT	01-07-10	01-07-12
Zimbabwe	Emerging Alternative Institutional Forms for Managing Domestic Water	DGIS-UPaRF	Univ. of the Western Cape	01-10-10	01-07-12
Various Countries	Constructed wetlands with tropical plants for the treatment of landfill leachate	DGIS-UPaRF	University of Sao Paulo	01-10-10	01-08-11
	Tropical Constructed Wetlands for Wastewater Treatment	DGIS-UPaRF	Bangladesh University of Engineering & Technology	01-09-10	01-09-11
	Integrating Social and Natural Systems in Enhancing Environmental Sustainability	DGIS-UPaRF	Univ. of Cape Town, Polytechnic of Namibia	01-10-10	01-07-12
	Step Chlorination for Improving Drinking Water Disinfection System	DGIS-UPaRF	Birzeit University, KNUST	01-10-10	01-07-12
	Improved Drought Early Warning and Forecasting.	EC-FP7-Coop.		01-11-10	01-11-13
	Adaptive and integrative tools and strategies on natural resources management.	EC-FP7-Coop.		01-03-11	01-03-14
	Merging Hydrologic models and EO data for reliable information on Water	EC-FP7-Coop.	AUT, Hidromod, IST, CPTEC, JRC, Skysoft, UEM	01-01-11	31-12-13
	Knowledge-based approach to develop a prevention culture of water Risk	EC-FP7-Coop.	UniBs, ECMWF, UniLj, WSL, CORILA, KCL, JRC, AAWA, UniBris, Willis	01-01-11	31-12-13
	Hydrologic Impacts of Land Use and Landcover changes - Kilombero River Basin	DGIS-UPaRF	UDSM	10-01-09	11-12-11
	Conserving Eco-Hydrological functions through payment for watershed services	DGIS-UPaRF	CLAS-UMSS, FNB, VU Amsterdam	01-09-09	31-08-13
	Benchmarking for Pro-poor Water Services Provision	DGIS-UPaRF		01-09-09	31-12-12
	Hydropower-to-environment water transfers in the Zambezi Basin	DGIS-UPaRF	Waternet, Swiss Federal Inst of Tech, Eduardo Mondlane Univ., WWF	14-09-09	01-01-14
Adaptation to Climate Change impacts on the Nile River Basin	DGIS-UPaRF	Univ. Dar Es Salaam, Makerere Univ. Addis Ababa Univ. Univ. of Nairobi, NBCBN, HRI	01-10-09	31-03-11	

**RESEARCH AND DEVELOPMENT**

COUNTRY	TITLE	FUNDING	PARTNERS	START	END
Various Countries	Environmental Flows for People and Ecosystems in the Mara River Basin	DGIS-UPaRF	UDSM, Egerton, SUA, JKUAT, FIU, WWF	01-08-09	31-07-13
	Natural Systems for Wastewater treatment and reuse:	DGIS-UPaRF		01-09-09	01-08-13
	Salt and Brackish Water as Second Quality Water for Urban Environment	IRF	Birzeit Univ., KWR, Hong Kong	01-10-09	31-12-13
	Adaptation to Global change in Agricultural practices	DGIS-UPaRF	AIT, DOI	01-09-09	30-08-13
	Climate change impacts on seasonally and intermittently open tidal inlets	DGIS-UPaRF	AIT, Univ. of Moratuwa, Univ. of Peradeniya, CSRO, FECT, Deltares	01-01-10	31-12-13
	Impact of Untreated Wastewater on natural Water Bodies: risk assessment	DGIS-UPaRF	Birzeit, WESI	01-05-10	30-04-14
	River basin twinning initiatives as a tool to implement EU water initiatives	EC-FP7-Coop.	VITUKI (coordinator), Soresma, PIK, BOKU	01-06-08	31-05-11
	Postdoctoral Research Programme on Adaptation to Climate Change	DGIS-UPaRF		01-03-09	01-04-11
	Decentralized Integrated Analysis and Enhancement of Awareness in Flood Risk	ERA-Net CRUE	Imperial College London	01-04-09	01-10-11
	Risk-based operational water management for the Incomati River Basin	DGIS-UPaRF	Mondlane University, KOBWA	01-01-09	31-08-13
	Localized environmental and health information services for all	EC-FP7-Coop.	Instituto superior tecnico, Project automation SPA, BICOCCA, Aria Technologies, Esaproject SP Zoo, Hidromod Modelacao em Engenharia, Noord-Brabant provincie, Comune di Bari	01-09-08	31-08-11
	Upscaling small-scale land and water system innovations in dry agro-ecosystems	DGIS-UPaRF	USDm, UKZN, IWMI, TUD, SEI, SU	01-09-08	31-08-12
	Zero chemical UF/RO system for Desalination	SenterNovem	Evides, Membrane Technology Group, Vitens	01-01-09	01-01-12
	Partnerships in the Water Supply and Sanitation Sector	DGIS-UPaRF	KNUST, SUEZ, VITENS, NWSC	01-09-08	31-05-12
	Low-cost drinking water treatment in developing countries	DGIS-UPaRF	Kwame Nkrumah University of Science and Technology, Makerere University	01-11-08	01-12-12
	Integrated approaches for sanitation in unsewered slum areas in Africa	DGIS-UPaRF	Makerere University, Kampala city council	01-09-08	31-08-12
	The Ecology of livelihoods in East African wetlands	DGIS-UPaRF	UvA, University of Nairobi, Egerton University, VIRED	01-09-08	31-08-12
	Sediment & sediment transport from reservoirs to estuaries	DGIS-UPaRF	NHRI, HRI, Deltares, SKLEC, Hohai	15-10-08	15-10-12
	Rehabilitation tech for degraded waters & integration in waterbody management	EC-FP7-Coop.	Politecnico di Torino, Univ. Sheffield, Recetox, Ben Gurion, University of Wageningen, University of Stuttgart (VEGAS), ISODETECT, Sapion Milieuvadvis, TU Delft, CTM Centre Technologic, HZM, GEUS	01-05-09	30-06-13
	Collaborative Management System on Watershed Vulnerability (eWaterAbility)	EC-FP7-Coop.	WMO, C3I, SWAT, EAWAG, JRC, IISD, UN-IIST, CERN, CRS4, Univ. of Geneva	01-04-09	31-03-13
In Search of Sustainable Catchments and Basin-wide Solidarities: Blue Nile	NWO-WOTRO	IWMI	01-07-08	30-06-12	
Sustainable Water management Improves Tomorrow's Cities' Health	EC-FP6	32 in total: UNESCO-IHE (lead), IRC and many others. PoWER partners: Universidad del Valle (Colombia), Kwame Nkrumah University of Science and Technology (Ghana).	01-02-06	31-01-11	
Flood Vulnerability Indices in low headed hydropower	EC-FP7-Coop.		28-02-08	28-02-12	

ADVISORY SERVICES					
COUNTRY	TITLE	FUNDING	PARTNERS	START	END
<b>Benin</b>	Scan Water Sector of Benin	EVD		01-06-11	11-07-11
<b>Bonaire, St Eustatius and Saba</b>	Environment and Health characterization	I&M MoU		15-12-11	25-02-12
<b>China</b>	EU-China River Basin Management Programme: Member of the Program Advisory Group	EC	DHV	01-10-07	31-12-11
<b>Côte d'Ivoire</b>	Advice for immediate and future management of coastal erosion in Ivory Coast	National Government	Deltares	28-11-11	02-12-11
<b>Croatia</b>	Development and Application of Models and Guidelines	WB		01-07-10	01-11-11
<b>Dominican Republic</b>	Presentations to Instituto Nacional de Recursos Hidraulicos (INDRHI)	National Government		27-11-11	02-12-11
<b>Mozambique</b>	Water Mondial: Environmental Assessment for Multi sector development plan, Zambezi catchment	MICOA		22-06-11	01-11-11
<b>Netherlands</b>	Integratie van operationeel beheer bij het oplossen van de wateropgave part I	HH Rijnland		01-05-11	15-12-11
	Integratie van operationeel beheer bij het oplossen van de wateropgave part II	HH Rijnland		15-06-11	12-05-12
	Water Utility Simulation Game: Further development	DGIS-DUPC		01-05-11	30-10-11
	Urban Flood Management Dordrecht	LMW		07-07-07	07-09-11
<b>São Tomé and Príncipe</b>	Adaptation to Climate Change: Geomorphology and Coastal Adaptation Study	WB	Deltares	01-12-10	31-08-11
<b>Singapore</b>	Singapore Delft Water Alliance			01-07-11	01-04-12
<b>South Sudan</b>	Mission South Sudan Bilateral Support to the Water Sector	EVD		01-11-11	31-12-11
	Desk Study South Sudan Bilateral Support to the Water Sector	EVD - PwW	Deltares	15-08-11	15-09-11
<b>Sudan</b>	South Sudan Identification Mission	DGIS	Deltares	01-11-10	31-01-11
	Operationalize Delft FEWS software	ENTRO		27-06-10	10-12-15
<b>Turkey</b>	Transposition the WFD & advice on the org of the Min of Environment & Forestry, Turkey	Agentschap NL		01-02-11	01-04-11
<b>Various Countries</b>	Spate Irrigation for Climate Proofing, Rural Growth And Poverty Alleviation	IFAD	MetaMeta, Haramaya University, Sana'a University, HRS Min Irr and WR Sudan	11-01-11	30-09-15
	Scaling up micro irrigation systems in India, Madagascar and Honduras	Coopernic		01-09-09	31-12-11

DGIS Netherlands Ministry of Foreign Affairs

EC European Commission

IDB Inter-American Development Bank

IRF Internal Research Fund IHE

NUFFIC Netherlands Organisation for International Cooperation in Higher Education

NWO Nederlandse Organisatie voor Wetenschappelijk Onderzoek

RNE Royal Netherlands Embassy

SAIL Capacity building programme through NUFFIC

SENER SenterNovem, Agentschap voor duurzaamheid en samenwerking (of Ministry of Economic Affairs)

V&W Ministry of Transport, Public Works and Water Management

WB Worldbank



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RESEARCH LINES		
THEME	CORE	RESEARCH LINE
<b>Environmental Integrity</b>	Freshwater Ecosystems	Planning for integrated river basin management
		Wetland management
		Environmental water allocation
	Pollution Prevention and Resource Recovery	Cleaner production and pollution prevention
		Solid waste management
<b>Information and Communication Systems</b>	Hydroinformatics	Resource recovery (water, nutrients, minerals, energy, new materials)
		Ecotechnologies (anaerobic digestion, natural treatment systems, photobioreactors)
		Modelling paradigms, uncertainty and risk
		Systems engineering and optimisation
		Collaborative decision making and Internet-based computing
<b>Urbanisation</b>	Water Supply Engineering	Applications of integrated hydroinformatics systems in water management
		Water transport and distribution
		Ground water treatment
		Natural treatment systems
		Conventional water treatment technology
	Sanitary Engineering	Desalination & membrane related technology
		Advanced nutrient removal processes
		Activated sludge modeling
		Anaerobic wastewater treatment processes
		Resources-oriented sanitation
		Membrane bio-reactors
		Water/wastewater infrastructure asset management
		Optimization of wastewater collection and treatment components
		Integrated urban water infrastructure management
		<b>Water Management and Governance</b>
Strengthening and developing organisations		
Human resources development		
Water Resources Management	Bio-physical processes (efficient use)	
	Institutional dimensions (good governance)	
	Integrative properties (sustainable systems)	
Water Services Management	Institutional options for water and sanitation	
	Establishment and functioning of river basin organisations	
	Organisational change in the water sector	
	Strategic management of drinking water utilities	
	Equity and participation issues in water services management	
	<b>Water Security</b>	
Environmental impact of water-related projects		
Management of floods and droughts		
Flood resilience of urban areas		
Hydraulic Engineering - Coastal Engineering and Port Development		Integrated coastal modelling
		Performance and reliability of flood defence systems and coastal structures
		Integrated coastal zone management
		Port design
Hydraulic Engineering - Land and Water Development		Hydraulic structures and hydraulic systems
		Environmental impacts of hydraulic works
		Institutional aspects of system management
Hydrology and Water Resources		Integrated lowland development
		Global change impacts on hydrology and water resources
	Physical and biogeochemical processes of groundwater systems	
		Ecohydrology

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**DeSingel** International Arts Centre  
**Festival van Vlaanderen - OdeGand**  
**Gastprogrammering Het Muziektheater**  
**Handelsbeurs Concertzaal Gent**  
**Les Ballets C de la B**  
**Lucien den Arend** sculptor  
**Marjorie Ryerson** photographer and orchestrator  
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**Ap Verheggen** sculptor

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The UNESCO-IHE Honorary Fellowship award is bestowed in recognition of persons of distinction who have either made major contributions to the work of IHE or earned distinction for activities associated more widely with the context of IHE's mission.

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## ANNEX 9 | LIST OF ABBREVIATIONS

<b>AIT</b>	Asian Institute of Technology (Bangkok, Thailand)
<b>DGIS</b>	Directorate General of International Cooperation, Netherlands Ministry of Foreign Affairs
<b>DUPC</b>	DGIS - UNESCO-IHE Programmatic Cooperation
<b>DUT</b>	Delft University of Technology, The Netherlands
<b>DUWO</b>	Housing Corporation in Delft
<b>EC</b>	European Commission
<b>FP6 / FP7</b>	6 th / 7th Framework Programme (EC research programme)
<b>Fte</b>	Full-time equivalent
<b>ICT</b>	Information and Communication Technology
<b>IHP</b>	International Hydrology Programme (UNESCO)
<b>IWRM</b>	Integrated Water Resources Management
<b>JJWBGSP</b>	Joint Japan-World Bank Graduate Fellowship Programme
<b>KNUST</b>	Kwame N’Kruma University of Technology (Kumasi, Ghana)
<b>KOS</b>	Knowledge Innovation and Research Strategy (DGIS policy document)
<b>MDGs</b>	Millennium Development Goals
<b>MoU</b>	Memorandum of Understanding
<b>MSc</b>	Master of Science
<b>MT</b>	Management Team (of UNESCO-IHE)
<b>NBCBN-RE</b>	Nile Basin Capacity Building Network for River Engineering
<b>NFP</b>	Netherlands Fellowship Programme
<b>NICHE</b>	Netherlands Institutional Cooperation in Higher Education programme (NUFFIC)
<b>NUFFIC</b>	Netherlands Federation for International Cooperation in Higher Education
<b>NVAO</b>	Netherlands / Flemish Accreditation Organisation
<b>NWO</b>	Netherlands Organisation for Scientific Research
<b>NWP</b>	Netherlands Water Partnership
<b>OCW</b>	Netherlands Ministry of Education, Culture and Science
<b>PCCP</b>	From Potential Conflict to Cooperation Potential (UNESCO-IHP programme)
<b>PhD</b>	Doctor of Philosophy
<b>PoWER</b>	Partnership for Water Education and Research
<b>SENSE</b>	Socio-Economic and Natural Sciences of the Environment (Research School)
<b>SWITCH</b>	Sustainable Water Management Improves Tomorrow’s Cities Health (EC-sponsored project)
<b>TTIW</b>	Technological Top Institute – Water technology (Netherlands’ Government funded initiative)
<b>UN</b>	United Nations
<b>UNESCO</b>	United Nations Educational, Scientific and Cultural Organization
<b>UNESCO-IHE</b>	UNESCO-IHE Institute for Water Education
<b>UniValle</b>	Universidad del Valle (Cali, Colombia)
<b>UPaRF</b>	UNESCO-IHE Partnership Research Fund
<b>UTQ</b>	University Teaching Qualification (agreed standard for Dutch university teaching staff)
<b>VAT</b>	Value Added Tax
<b>V&amp;W</b>	Dutch Ministry of Transport, Public Works and Water Management
<b>WaterNet</b>	Capacity Building Network for IWRM (Southern and Eastern African Region)
<b>WOTRO</b>	Science Division within NWO



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