ANNUAL REPORT

UNESCO-IHE
Institute for Water Education

2010

UNESCO-IHE is the largest international post-graduate water education facility and research in the world. The institute confers fully accredited MSc degrees and promotes PhDs. Since 1957 the Institute has provided post-graduate education to more than 14,500 water professionals from 162 countries, the vast majority from the developing world. Just under 130 PhD fellows are currently enrolled in water-related research. The Institute carries out numerous research and capacity development projects throughout the world.

The Institute encourages its alumni community members to actively engage in knowledge and information exchange. Alumni reach senior positions in their home countries and become nationally and internationally recognised 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, consisting of alumni, guest lecturers, experts and renowned centres of knowledge, together providing a vast source of expertise to the sector.

UNESCO-IHE is at the centre of a vast international network of water-related institutions, and functions as an interface between knowledge networks and centres, public and private sector organisations, 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 organisations and individuals worldwide.

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 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 organisations, knowledge centres and other institutions active in the fields of water, the environment and infrastructure, in developing countries and countries in transition.

UNESCO-IHE centres its education, research and capacity development programmes around Water Security, Environmental Integrity, Urbanisation, Water Management and Governance, Information and Communication Systems, as well as in the emerging areas of Conflict Management and Climate Adaptation. Through each of these themes, the Institute addresses the major issues and challenges faced by many developing countries and countries in transition.

CONTENTS

RECTOR'S STATEMENT

Water is the element that connects all the Millennium Development Goals and even offers the possibility to open up a renewed dialogue on climate change. Meeting the global challenges requires a strong foundation of knowledge to enable well-informed decision-making and improve water management practices.

Water experts of the future - independent of whether their background is in engineering, earth and natural sciences or social sciences - should be equipped with the knowledge, skills and understanding that enable them to cooperate with other disciplines.

The future education of UNESCO-IHE is to be characterised by a consistent application of innovative, learner-centred didactical approaches to produce graduates who become these water experts. Thus, the Institute aims to offer innovative, internationally appealing global water education programmes, while at the same time pursuing enhanced and effective cooperation with its partner institutions to create new international learning alliances.

This new generation of water professionals is able to explore insights into water problems from many different perspectives, and contribute to the development of creative, integrated and sustainable solutions. Thus, they have all the competencies needed to become water leaders rather than followers. Solid knowledge and understanding of one discipline as well as cognitive competencies outside that discipline blended with functional, personal, values/ ethical and meta-competencies are to be acquired by students.

UNESCO-IHE has a key task to transfer knowledge and research in achieving the world's development goals over the next decade. We must all recognise that there is a definite and strong need to develop, strengthen and maintain local and regional capacities to conduct professional training, academic education and research in water-related subjects.

With this in mind, 2010 proved to be a decisive year for UNESCO-IHE. In order to significantly increase the impact of the Institute, the 'Comprehensive Strategy for UNESCO-IHE 2010-2020' was developed. The strategy was established through a wide and transparent consultation process with the involved stakeholders, and the decade-long strategic plan was approved by the UNESCO-IHE Governing Board. The plan comprises two major elements. Firstly, the scope of the Institute will be amplifyed by establishing a global campus in Asia, Latin America and Africa. Not only do most water challenges exist in these regions, a global campus will also enable UNESCO-IHE to better understand local needs and react more swiftly to requests coming from local partners and stakeholders.Secondly, expanding the programmes that deal with Water Governance, and increasing the Social Sciences slant allows the Institute to cover all principles relating to current and future water challenges.

The Governing Board approved striving towards the goal of having Ius Promovendus - the right of independently granting doctoral degrees - as soon as possible. This would allow the development of joint PhD programmes with various leading universities of the world, and increase the Institute's financial stability. It would also enable the Institute to directly involve PhD programmes in international cooperation schemes.

The Institute continued to expand its cooperative network with various institutions involved in water education. Also, six new bilateral agreements were signed with Egerton University, the Egyptian Ministry of Water Resources and Irrigation, the Deutsche Wasserhistorische Gesellschaft, Deltares, the International Water Association and Hohai University. The Institute closed the year with a positive balance and continued its refurbishment plans according to schedule.

I look forward to another year of continued collaboration in jointly undertaking the many exciting challenges ahead. It is my pleasure to present you with the 2010 Annual Report of the UNESCO-IHE Institute for Water Education.

Professor András Szöllösi-Nagy, PhD, DSc
Rector

Regretfully, Professor Henk Vonhoff - Chairman of the IHE Foundation Board since 2003 when the UNESCO-IHE Institute for Water Education came into existence - passed away in July. He was a man with an engaging personality, an eloquent speaker and debater.

2010 AT A GLANCE

UNESCO-IHE IN NUMBERS

- 161 full-time staff equivalents, 54% academic and 46% supporting staff

- 4 Water and Environment related Master's Programmes with 19 specialisations

- 176 new MSc students
- 173 MSc degrees awarded
- 129 registered PhD fellows
- 7 PhD graduations
- 307 professionals in 49 regular short courses
- 237 participants in 16 online courses
- 434 professionals in 26 tailor-made training courses
- 2 refresher seminars held for alumni

- 356 scientific publications
- 143 capacity development projects

Total turnover of just under € 30 million, overall positive result of € 20,000

EDUCATION

- The University Teacher Qualification training courses for academic staff continued, 5 staff members received their UTQ, and 23 enrolled
- Joint Master programmes started in Hydroinformatics with Universidad del Valle in Colombia and Ain Shams University in Egypt.
- Joint Master programmes started in in Water Supply Engineering and Sanitary Engingeering with Universidad del Valle in Colombia and Kwame Nkrumah University of Science and Technology in Ghana
- A Joint Master programmes started in Land and Water Development with the Asian Institute of Technology in Thailand.
- UNESCO-IHE's first Erasmus Mundus MSc programme in 'Ecohydrology' started for the first time in a consortium with the University of Algarve in Portugal as lead organisation.
- Two Erasmus Mundus programmes in 'Environmental Technology and Engineering' and 'Flood Risk Management' were prepared to start in 2011, the latter with UNESCO-IHE as lead organisation.
- The design of joint programmes with Haramaya University (Ethiopia) and HoHai University (China) moved closer to realization.
- Fifteen online course modules were under development with partner institutes.
- The Moodle open source learning environment was adopted as the Institute's virtual learning environment.

INSTITUTIONAL DEVELOPMENTS

- A 'Comprehensive Strategy for UNESCO-IHE 2010-2020' was developed and approved by the Governing Board. Internal changes will encourage interdisciplinary work and strengthen academic leadership. External development include the formation of a global campus, intensifying UNESCO-IHE's cooperation with academic partners.
- The refurbishment continued; the facilities for educational activities were completed, including designated areas for problem-based learning, group and individual work, and modernised classrooms with flexible furniture and electronic whiteboards.

RESEARCH

- There was a record number of registered PhD fellows.
- A joint research group on the Governance of Large Water Works was established with the Delft University of Technology.
- A new wastewater treatment lab with state-of-the-art experimental bio-chemical wastewater treatment equipment was opened.
- The PRoACC and ACCION post-doctoral research programme had a total of 14 active post-docs.
- The internal UNESCO-IHE Partnership Research Fund (UPaRF) funded 7 partner-led research projects involving 13 partners with about €1.9 million.
- Within the SWITCH research project, 9 PhD and 11 MSc participants were active at UNESCO-IHE. SWITCH co-organized the conference 'Sustainable Water Management in Cities: Engaging Stakeholders for Effective Change and Action' in Zaragoza (Spain).

CAPACITY DEVELOPMENT

- The first concept note was developed for establishing a global campus in Asia, Latin America and Africa were taken, through which UNESCO-IHE will further intensify its cooperation with academic partners throughout the world.
- During the Partnership Conference on Joint Educational Programmes held in Delft, a Vision Statement on Strengthening Collaboration in Water Education, Research and Capacity Development was signed by 18 universities.
- The 'Training and capacity building for the water and wastewater sector in Iran' project ended, trained a total of over 3500 people, organised fieldtrips for close to 400 senior sector staff , and developed 100 one-week training course curricula on water supply and sanitation.
- Five NICHE projects were granted: two in South Africa, two in Mozambique and one in Yemen.
- The longer-term cooperation with HydroEx (Brazil) to develop their capacities in water education and research.

PARTNERSHIPS AND NETWORKS

'Working in partnership' has evolved into the overarching operational principle of the Institute. It cuts across all core activities, be it education, research or capacity building. The collaborative activities take place in the framework of the UNESCO-IHE Global Partnership for Water Education and Research: a strong coalition of water sector institutes, which join forces and mutually strengthen each other to better serve the water sector. Through this partnership UNESCO-IHE will be able to further strengthen the content and relevance of its education and research agenda addressing the full range of both global and local water sector issues.

In 2010, the Institute continued to make ample progress in developing and implementing joint education programmes with partner institutes, based on a Credit Transfer System, with students conducting part of their studies at different locations. In June 2010, the rectors and programme managers of 18 universities assembled in Delft to formulate a '**Vision Statement on Strengthening Collaboration in Water Education, Research and Capacity development**', with a strong focus on the delivery of joint educational programmes. The vision firmly establishes the need and potential for such programmes (MS, PhD, post-doc level) and recommends an operational framework for establishing the programmes.

Joint Master's programmes started in 'Water Supply Engineering' and 'Sanitary Engingeering' with Universidad del Valle and Kwame Nkrumah University of Science and Technology (Ghana), in 'Hydroinformatics' with Universidad del Valle (Colombia) and Ain Shams University (Egypt), and in 'Land and Water Development' with the Asian Institute of Technology (Thailand).The Erasmus Mundus programme in 'Ecohydrology' started running, and is given with a consortium of partners consisting of the University of Algarve (Portugal), University of Kiel (Germany), University of Lodz (Poland) and the University of la Plata (Argentina).

The **existing joint Master's programmes** with the Asian Institute of Technology (Thailand), Hohai University (China), Sriwijaya University (Indonesia), and Dundee University (UK) were continued, while the planned shared programmes with Haramaya University (Ethiopia) and Hohai University (China) moved closer to realisation. Preparations were made for two Erasmus Mundus programme to be delivered in 2011. The Erasmus Mundus Master's programme in 'Flood Risk Management' will be given in a consortium with Technical University of Dresden (Germany), Technical University of Catalonia (Spain) and the University of Ljubljana (Slovenia) and the Erasmus Mundus Master's programme in 'Environmental Technology and Engineering' will be offered in a consortium with Ghent University (Belgium) and Institute of Chemical Technology Prague (Czech Republic). The Education chapter has more information on these programmes.

In 2010, lecture material for more than fifteen new **online course modules** were being developed jointly by teams from UNESCO-IHE and partner institutes. These modules will be shared among the partners in an online educational environment. UNESCO-IHE has adopted the Moodle open source learning environment to facilitate the collaborative educational activities.

The UNESCO-IHE Partnership Research Fund (**UPaRF**) was established in 2008, with the aim of increasing the output of development-relevant research on contemporary issues in the water sector and combining the strengths of the different partner institutes. In 2010, UPaRF allocated new funding for seven small scale research projects involving a total of 13 partner institutes. The UPaRF portfolio now contains a total of 37 research projects with 70 partner institutes in 37 countries. Of the 70 partner institutes, there are 44 universities/research institutes and 11 water sector organisations from developing countries and some 15 institutes from developed countries. The Chapter on Research has more information on these programmes.

Ties with **UNESCO** continued to be intensified. The Institute developed joint activities with various water centers of UNESCO. The MSc specialisation in Water Conflict Management is given together with UNESCO-IHP's 'From Potential Conflict to Cooperation Potential' programme and UNESCO's Centre for Water Law, Policy and Science in Dundee. The Institute and the International Centre for Water Hazard and Risk Management (ICHARM, Japan) jointly gave Climate Change courses at both institutes, exchanging staff from Japan to teach at UNESCO-IHE, and vice versa. The long-term cooperation with HidroEx Institute for Applied Water Science (Brazil) was kicked-off, and a work plan for 2011 - 2014 was finalized, which will aim to strengthen the capacity of HidroEx in water education and reseach, to ultimately achieve a UNESCO Category II status. Also, a short course on the History of Water Management was jointly organized with UNESCO-IHP.

UNESCO-IHE has bilateral partnership agreements with more than 50 public and private organisations in support of shared interests in education, research and capacity building. The following Institutional Agreements were signed in 2010:

Bilateral Partnerships

Egerton University, Kenya

Signed: April 2010

Goal: Run a joint MSc programme in Limnology and Wetland Ecosystems, upgrade research facilities at Egerton University, cooperation in MSc research, PhD supervision and regional capacity development projects.

Egyptian Ministry of Water Resources and Irrigation, Egypt

Signed: May 2010

Goal: Share information and knowledge on IWRM with people working in the water sector of Egypt, the Nile basin, and the Middle-East region. The focus is on people working with the MWRI, its research institutes, and Egyptian universities. Foreseen activities include a training needs assessment for the entire sector, curriculum development for water programmes at Egyptian universities, and staff development through UNESCO-IHE's degree and non-degree courses.

Deutsche Wasserhistorische Gesellschaft (DWhG), Germany

Signed: June 2010

Goal: Exchange information, joint research and developing/implementing short courses on the history of water management.

Deltares, The Netherlands

Signed: August 2010

Goal: Joint research, guest lecturing by Deltares' staff in UNESCO-IHE's educational programmes, sharing of staff, joint acquisition of capacity development and research projects, and sponsoring of MSc and PhD research.

International Water Association (IWA), United Kingdom

Signed: September 2010

Goal: Intensify participation of IWA's experts in UNESCO-IHE's online and short courses, setting-up and managing a fellowship fund to support students from developing countries in attending UNESCO-IHE's water and sanitation courses, cooperating in capacity development needs assessments, dissemination activities and benchmarking activities.

Hohai University, China

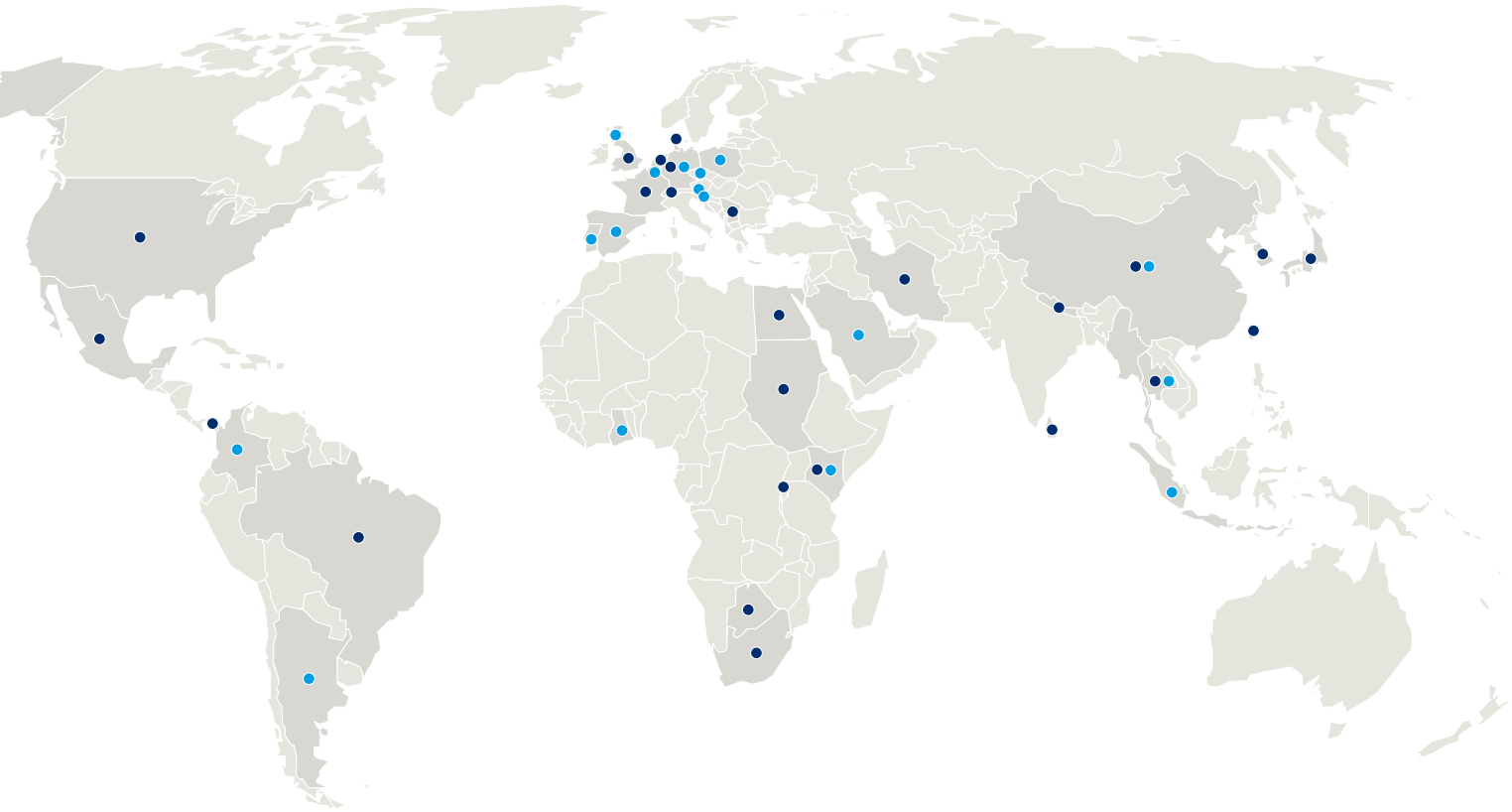
Signed: November 2010

Goal: Implement three joint MSc specialisations in 'Hydroinformatics', 'Coastal Engineering and Port Development', and 'Hydrology and Water Resources'.

The last year of the second phase (2007-2010) of the MoU with the Dutch Ministry of Transport, Public Works and Water Management (V&W) was in 2010. Activities included sponsoring of research activities and special projects relevant to both UNESCO-IHE and the Ministry. Examples of such activities are sponsorship of MSc and PhD participants in coastal zone management, agricultural water management, flood management including early warning systems, to mangrove ecosystems.

Among the projects facility, it is worth mentioning the organization of a Study Tour for 20 officials from the Ministry of Water Resources of China and the organization of a joint conference on Legal and Institutional aspects of Water Management in Indonesia.

The Ministry expressed interest in a the third phase of the MoU, planned for 2011-2014, with an increased level of cooperation on topics in the Water Mondiaal program of the Dutch National Water Plan).



MoU & Joint MSc Programme Partners

North America
- Instituto Mexicano de Technologiadel Agua, Mexico
- The Coca-Cola Company, USA
- University of South Florida, USA
- Army Corps of Engineers, USA
- World Bank – Global Development Learning Network, USA

South America
- Technological University of Panama, Panama
- UNESCO-HidroEx, Minas Gerais, Brazil
- Universidade de São Paulo, Brazil
- Universidade Federal de Minas Gerais, Brazil
- University of Brasilia, Brazil

Asia
- Asian Institute of Technology, Thailand
- Beijing Normal University, China
- China Ministry of Land and Resources, China
- China University of Geosciences, China
- Hohai University, China
- ICHARM, Japan
- International Water Management Institute, Sri Lanka
- Iran Ministry of Energy -Regional Centre on UrbanWater Management, Iran
- Korea Water Resources Corporation, Korea
- Mekong River Commission, Cambodia, Laos, Vietnam, Thailand
- Ministry of Water Resources, Nepal
- National Chiao Tung University - Taiwan International Institute for Water Education, Taiwan of China
- Water Resources Bureau Taipei, Taiwan of China
- Yunnan University, China

Europe
- Business Centre for Hydrology Unie van Waterschappen, The Netherlands
- Danish Hydraulic Institute, Denmark
- Delft University of Technology, The Netherlands
- Deltares, The Netherlands
- Deutsche Wasserhistorische Gesellschaft (DWhG), Germany
- International Spate Irrigation Network, The Netherlands
- International Water Association (IWA), United Kingdom
- Netherlands Environmental Assessment Agency, The Netherlands
- Netherlands Ministry of Transport, Public Works and Water Management, The Netherlands
- Politechnica University Timosoara, Romania
- SUEZ Environnement, France
- United Nations Environment Programme-Global Programme for Action, The Netherlands
- VU University Amsterdam, The Netherlands
- Wageningen University, The Netherlands
- Water Board 'Stichtse Rijnlanden', The Netherlands
- WL|Delft Hydraulics, The Netherlands
- Women for Water Partnership, The Netherlands
- World Wide Fund for Nature – International, Switzerland
- World Wide Fund for Nature – Netherlands, The Netherlands

Africa
- Cap-Net, South Africa
- Egerton University, Kenya
- Egyptian Ministry of Water Resources and Irrigation, Egypt
- National University of Rwanda, Rwanda
- University of Khartoum, Sudan
- Waternet Trust, Botswana

Partners with running joint programmes (MSc level) in 2010
- Ain Shams University, Egypt
- Asian Institute of Technology, Thailand
- Austrian Academy of Sciences, Austria
- Dundee University, School of Natural Resources, Law, Policy and Management, Scotland,
- Egerton University, Kenia
- HoHai University, China
- Kwame Nkrumah University of Science and Technology, Ghana
- Mondsee University of Limnology, Austria
- Sriwijaya University, Indonesia
- Universidad del Valle, Colombia
- University of Algarve, Portugal *
- University of Kiel, Germany *
- University of la Plata, Argentina *
- University of Lodz, Poland *

Partners with planned joint programmes (MSc level) in 2011
- Ghent University, Belgium *
- Haramaya University, Ethiopia
- Institute of Chemical Technology Prague, Czech Republic *
- Technical University of Catalonia, Spain *
- Technical University of Dresden, Germany *
- University of Ljubljana, Slovenia *

* 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 nineteen specialisations, a PhD programme, a post-doctoral progamme, short and online courses, and tailor-made training courses.

In 2010, **176 MSc** started their programme, which is a slight drop compared to last year. This can be attributed to the fact that 22 fewer NFP scholarships were received than in the previous year, while the number of applications increased further. The amount of students with funding from other sources remained steady. The professionals participanting in short courses rose by 39% to 307, while those in tailor-made training courses rose by 28% to 434.

The effort to increase **integration, efficiency and flexibility** of UNESCO-IHE's MSc programmes continued in 2010. At the start of the MSc programmes in October, the Environmental Science, Municipal Water and Infrastructure and Water Management programmes integrated a lot in their first four modules, eliminating the overlap of subject matter taught in different modules in the same period.

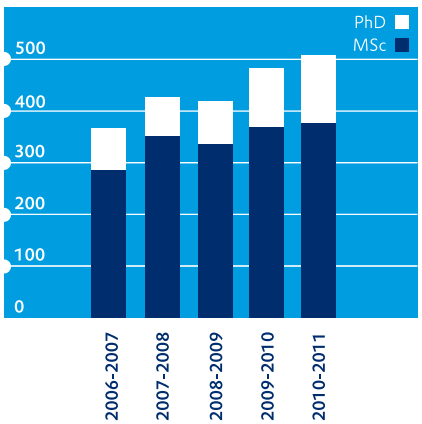
The Institute progressed with developing and conducting **educational activities in collaboration** with partner institutes. This is done in the framework of making water education more accessible and affordable for increasing numbers of students, and further developing the capacity of water education worldwide.

Joint programmes that started running in 2010 were 'Hydroinformatics' with Universidad del Valle (Colombia) and Ain Shams University (Egypt), 'Water Supply Engineering' and 'Sanitary Engingeering' with Universidad del Valle (Colombia) and Kwame Nkrumah University of Science and Technology (Ghana), and 'Land and Water Development' with the Asian Institute of Technology (Thailand). The Erasmus Mundus Master's programme 'Ecohydrology' was offered for the first time in a consortium with the University of Algarve (Portugal), University of Kiel (Germany), University of Lodz (Poland) and the University of la Plata (Argentina).

Discussions were conducted with several partner institutes to look at the **feasibility of starting additional joint programmes** in 2011 and beyond. Most of them concern the decentralised delivery of existing specialisations offered in Delft. This is the case for 'Agricultural Water Management for Arid and semi-arid Climates' with Haramaya University (Ethiopia), Hydrology and Water Resources with Hohai University (China). Also, in 2011, the first ever Erasmus Mundus Master's programme that UNESCO-IHE will lead, namely 'Flood Risk Management' will be delivered in a consortium with Technical University of Dresden (Germany), Technical University of Catalonia (Spain) and the University of Ljubljana (Slovenia). The Erasmus Mundus programme in 'Environmental Technology and Engineering' will be offered in a consortium with Ghent University (Belgium) and Institute of Chemical Technology Prague (Czech Republic).

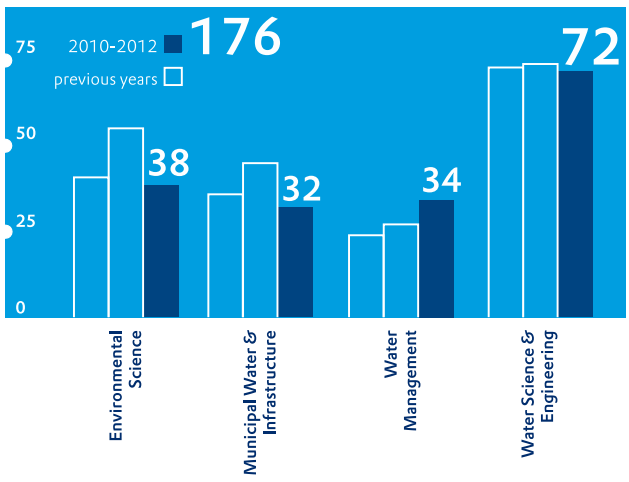
NUMBER OF DEGREE PARTICIPANTS

Participants | Academic year



NUMBER OF MSC PARTICIPANTS

Participants | Academic period



EDUCATION

Also, in 2010 four of UNESCO-IHE's **short courses** - Lake Ecology, Stream and River Ecology, Tropical Wetlands for Water Quality, and Fisheries and Aquaculture - were organized in collaboration with - and hosted by - Egerton University in Kenia.

Almost all of UNESCO-IHE's online courses were made available through the **Moodle** open source platform - UNESCO-IHE's virtual learning environment. Videos of (guest) lectures can be streamed to Moodle, allowing them to be incorporated into the Institute's educational products. Also, Moodle training was given to partners with whom UNESCO-IHE had collaborative educational activities in 2010.

Internal arrangements were made to start with a new **Education Bureau** as per January 2011. The Education Bureau will coordinate and administrate all educational programmes and provide a Quality Management framework, as well as guide the process of educational innovation - including aspects of flexibility and cooperation with partners. A part-time Interim Director Academic Affairs was appointed to guide the process of establishing the Education Bureau. The position of Vice Rector Academic Affairs will follow up the Interim Director position, with the main responsibility to assure the quality of the Institute's education and research and determine their strategic directions.

In the framework of **quality assurance of joint master programmes**, a policy on human resources requirements for double degree programmes was written, containing guidelines on the quality of academic staff, student-staff ratio, competencies and training of academic staff members. Also, a policy was written on Examination Requirements for programmes which are developed in cooperation with one or several higher education institutions.

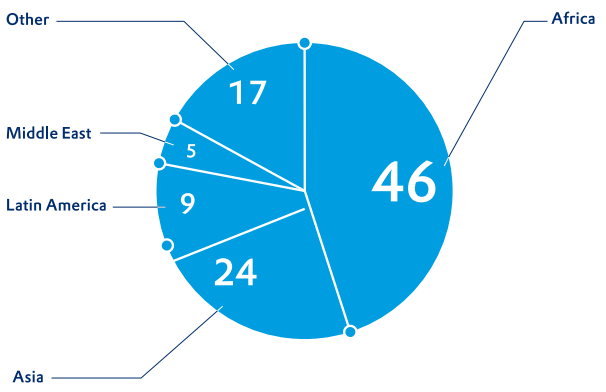
UNESCO-IHE organised two **refresher seminars** for its alumni. The seminar entitled 'Flood Based Farming as Part of River Basin Water Management' was held in Ethiopia, whilst the seminar 'Participatory Management of Flood Risk in Changing Climate' was given in Nepal.

During the **Partnership Conference on Joint Educational Programmes** held at the Institute in June, a Vision Statement on Strengthening Collaboration in Water Education, Research and Capacity Development was formulated and signed by representatives of 18 partner universities. This Vision Statement establishing the need and potential of the delivery of joint educational programmes, recommending an operational framework for establishing such programmes.

UNESCO-IHE's MSc programmes are accredited by the Dutch - Flemish Accreditation Organisation (NVAO) until 2013. In view of the **re-accreditation** in 2013, the Institute opted for an institutional accreditation according to the new NVAO Accreditation Framework. The institutional accreditation allows for more flexibility in case the Institute wishes to offer more MSc programmes or to register some of the (joint) specializations independently.

REGIONAL DISTRIBUTION OF PARTICIPANTS ACADEMIC YEAR 2010-2011

Percentage



EDUCATION

The Institute deployed an improved and more consistant methodology for the **evaluation** of course modules. This new system consists of online module surveys for the course participants and digital evaluation reports for the academic staff.

'Post Masters extensions' allow former MSc student to remain at the Institute after graduation to increase the output of their research by, for example, preparing a scientific publication, writing a project proposal, or developing a case. In 2010, 32 students were accepted for - and made use of - the post Masters extensions facilities.

A novelty in 2010 was the decision that all Programme Committees will have a **student representative**, as per 1 January 2011. The student representative will give feedback on the structure and content of the MSc programme, and shall serve for a period of one calendar year.

MSc Programmes and Specialisations 2010

MSc PROGRAMME IN ENVIRONMENTAL SCIENCE	
Environmental Planning and Management	**Db**
Environmental Science and Technology	**Db**
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 Enhanced Land and Water Productivity	**Jdd**
Ecohydrology	**Jem**
Hydraulic Engineering and River Basin Development	**Db**
Hydraulic Engineering - Coastal Engineering and Port Development	**Db | J**
Hydraulic Engineering - Land and Water Development	**Db | Jdd**
Hydroinformatics - Modelling and Information Systems for Water Management	**Db | J | Jdd**
Hydrology and Water Resources	**Db**
Integrated Lowland Development and Management Planning	**Jdd**

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

In July, the **Erasmus Mundus** Grant Committee selected UNESCO-IHE's proposal on a new Masters programme on Flood Risk Management for funding. UNESCO-IHE will be leading a consortium with the Technical University of Dresden (Germany), Technical University of Catalonia (Spain) and University of Ljubljana (Slovenia). Associated members include the European hydraulics laboratories of DHI (Denmark), Deltares (The Netherlands) and HR Wallingford (UK), and key national organisations responsible for flood management, including Rijkswaterstaat (The Netherlands) and ICHARM (Japan). All these partners bring their specific complementary expertise in flood risk management to the programme.

During the 2-year programme students start at the Technical University of Dresden, where they complete their first semester with courses on hydro-meteorological processes, global change and its impact, flood risk management and GIS. Then, the students move to UNESCO-IHE for their second semester with courses on modelling for planning, forecasting, control and decision support, hazard mapping, ICT, and fluvial flooding and urban flood disasters. Subsequently, the students move to the Technical University of Catalonia to follow the first part of their third semester with courses on hazards due to flash floods, debris flow, coastal flooding, and climate change. The last part of the third semester is hosted by the University of Ljubljana with courses on spatial planning, and socio-economic and institutional framework of flood risk management. Each semester provides a number of electives, and there are international fieldtrips. Finally, the students carry out thesis work at one of the institutes of higher education or with an industrial partner.

Graduates will become flood risk professionals with a broad vision of the processes occurring in river basins and in coastal zones at different spatial and temporal scales. The will be able to master the links between systems, processes and natural and socio-economic constraints for all the aspects of the water cycle. Successful candidates receive MSc degrees from the Technical University of Dresden, UNESCO-IHE and the Technical University of Catalonia, Barcelona.

RESEARCH

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 2010 are in Annex 4 | Projects.

UNESCO-IHE centers its education, research and capacity development programmes around Water Security, Environmental Integrity, Urbanisation, Water Management and Governance, 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.

In 2008, the programmatic cooperation with DGIS began. A large part of this collaboration entails research connected to capacity development, and to this end the internal **UNESCO-IHE Partnership Research Fund** (UPaRF) was founded. Besides financial resources from the DGIS collaboration, UPaRF also contains base funding from the Dutch Ministry of Education and Science. This fund stimulates interdisciplinary and cross-core research projects, and focuses on the themes of: integrated management of water supply and sanitation, sustainable management of aquatic ecosystems and land use, water allocation and decision processes in river basins and mitigation of and adaptation to climate change. In 2010 UPaRF launched a Call for Proposals for Small Size Research Projects specifically intended for partner institutes of UNESCO–IHE. This call resulted in seven proposals receiving a grant ranging from € 25,000 to € 35,000. The total requested funding for the seven projects amounts to € 194,600. Seventy partner institutes from 37 countries are involved in the UPaRF's collaborative research efforts.

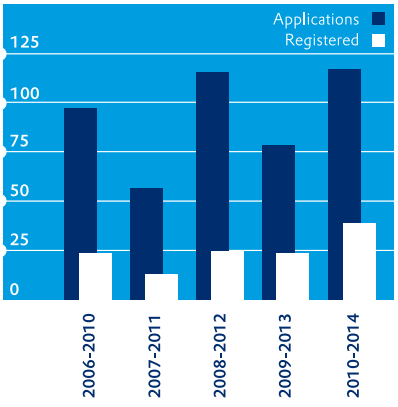
As a result of UPaRF funding, the Institute was able to substantially expand its research portfolio. As a consequence, the number of **registered PhD fellows increased** again in 2010. More information on the 7 PhD graduations and on the 129 registered PhD fellows can be found in Annex 3 | PhD Fellows.

Although UPaRF was a very important programme to develop research at the Institute, UNESCO-IHE remained very active in other **research programmes** as well. In 2010, the Institute's research activities were also funded by agencies including the European Commission, NWO-WOTRO, USAID, DG Water and SenterNovem.

In 2010 a joint research group on the **Governance of Large Water Works** was established with the Delft University of Technology. This research group will study how large infrastructures are operated & managed, a currently under-researched subject of high societal and environmental relevance.

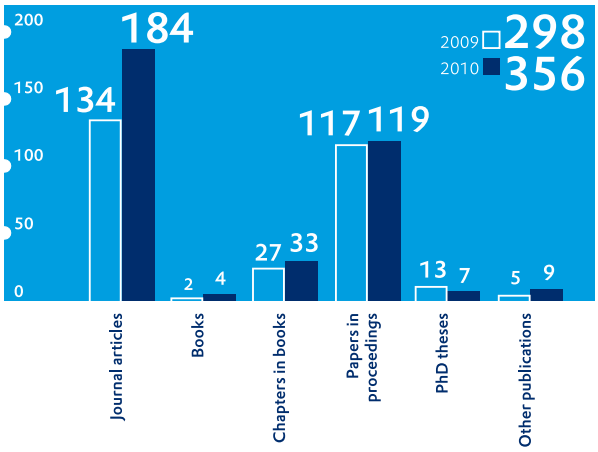
The number of scientific **publications** produced by the Institute's academic staff continued to grow. This year, the increase in the number of journal articles was especially notable, with a total of 184 in peer-reviewed journals. A complete list of publications is located in Annex 6 | Publications.

NUMBER OF PHD APPLICATIONS AND ADMITTED PHD STUDENTS



RESEARCH OUTPUTS

Outputs | Year



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.

Water Security

The **Flood Resilience Group** - a multidisciplinary research group affiliated with both UNESCO-IHE and Delft University of Technology - published a text book on Urban Flood Management. The project 'Urban Flood Management in Dordrecht' was successfully completed with the establishment of a learning alliance, and with an endorsed design to build in the flood area. Work is continued on establishing Learning Alliances with other cities, such as Melbourne and Bombay, based on the successful Learning Alliances in Dordrecht and Rotterdam.

The new project Modeling Hydrodynamics, Sediments and Ecology in the San Fransisco Bay **(CASCaDE II)**, funded by the US Geological Survey, was approved. CASCaDE II refines and extends the modeling capabilities of a prior project, where a set of linked models were built to assess Delta ecosystem response to climate change, in order to develop a holistic view of the Bay-Delta-River-Watershed system. With a new state-of-the-art hydrodynamic and sediment model at its core, this project assesses possible futures of the Delta under scenarios of climate and structural change, and gives science-based information to support the goals of water supply and ecosystem protection.

In the **Ecohydrology Erdos China** project a research catchment was instrumented to monitor the complete hydrological cycle and its interactions with ecosystems, including groundwater & surface water interaction, and water & ecosystem interaction. The installation of a river discharge measurement gages station was completed, as well as the installation of a sap flow system to measure the water use of trees. The results will provide a scientific base for sustainable water resources management and ecosystem projection in the cold semi-arid Erdos plateau of China.

UNESCO-IHE was active in a number of studies on **climate change impacts**, including the USGS-funded project on the effects of sea level rise on wave attenuation on wetlands in San Francisco Bay (Corte Madera area), and a new project on climate change effects on seasonally closing tidal inlets in Sri Lanka and Thailand in collaboration with CSIRO (Australia), Deltares (The Netherlands), AIT (Thailand), the University of Peradeniya and the University of Moratuwa (Sri Lanka, and on climate change Impacts on Australian coasts, funded by Australian government (visiting postdoc research).

Model development and validation remains an important aspect of the Institute's coastal engineering and port development activities. The development of the open source XBeach model was tested against field data on the Ningaloo Reef in Western Australia. Work continued on modelling the long-term morphological development of estuaries and tidal inlets, such as Western Scheldt, Marsdiep and Ameland inlet in the Netherlands, the San Francisco and San Pablo bays in the US, and 2 PhD studies for the Yangtze Estuary (China). A new unstructured grid model system developed by Deltares (The Netherlands) was tested for the San Francisco Bay and Sacramento and San Joaquin Delta.

Urbanisation 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 minimising the impact on the environment.

Urbanisation

The **SCUSA** research project aims to develop socially, environmentally and financially sustainable sanitation systems for urban slums in Sub-Saharan Africa with partners Makerere University and the Kampala City Council, both in Uganda. In 2010, one PhD fellow was working in the project, supported by several students' MSc research. Several articles were published in peer-reviewed journals, and around twenty presentations were given. The researchers from the participating institutes will collaborate on the development of sustainable sanitation systems, and share results within the region.

A new **wastewater treatment lab** was established in November 2010, using mostly second hand equipment and an entrepreneurial financing model. The project is carried out under the framework of the SALINE research project and was financed by UNESCO-IHE and Prof. Ekama from the University of Cape Town, whose final co-financing made the project possible. The new lab provides ten research stations with state-of-the-art experimental bio-chemical wastewater treatment equipment for MSc, PhD and post-doc sanitary engineering students.

UNESCO-IHE was granted EC grants though EuropeAid to carry out two projects in **Cuba** on adapting to climate change and mitigating water scarcity by innovative urban water management, and on strengthening the Cuban food production and aquaculture sector through resources optimization and recovery. These projects will start and are envisaged to contribute to reduce water scarcity in Cuba, as well as to increase food security through the recovery and optimisation 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 education.

The **AQUASENSE** project was completed in 2010, with the successful testing of the prototype of a device for the analysis of macro-physical chemical parameters and trace metals in a range of water compositions from fresh to waste water. This innovative tool developed within the project, can be used as a field device, or for remote stand-alone monitoring. Use of this tool will improve the implementation and policing of water related legislation.

On the subject of **arsenic removal**, three projects started in 2010. The AsRem Serbia research project on arsenic removal includes a field demonstration in Serbia. A pilot plant, based on UNESCO-IHE's innovative arsenic removal technology became fully operational in Subotica. The project Long Term Strategy for Water Supply of Vojvodina, Serbia, started in 2010, in which UNESCO-IHE is leading a consortium. The project provides strategic advice to the government of Serbia on long-term strategies for the future water supply of the Vojvodina province, where the groundwater is heavily contaminated with arsenic. AsRem Ferritine is a lab research project on arsenic removal by adsorption on ferritin based adsorbent.

RESEARCH

Environmental Integrity recognises 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.

Environmental Integrity

ECOLIVE is a research project that develops approaches for conserving papyrus wetlands so that their natural functions are protected while poor rural populations can rely on their livelihoods services. The project develops a transdisciplinary analytical framework that facilitates participation of stakeholders, and create new knowledge in an integrated framework aiding towards achieving policy goals of poverty reduction and ecosystem conservation. In 2010, three PhD fellows started their fieldwork on the hydrology, ecology and socio-economics of Nyando wetland, Kenya. Nine MSc students were active in the project, of which six at UNESCO-IHE. Two stakeholder fora were held in Kisumu (Kenya) with stakeholders from the Nyando wetlands. Partners in the project are Egerton University (Kenya), VIRED International (an environmental NGO based in Kisumu, Kenya) and the University of Amsterdam (The Netherlands).

In the **SOWACOR** project funded by the King Abdullah University of Science and Technology, metal removal by microorganisms is studied, developing processes that can be applied for the removal and recovery of metals from contaminated groundwater or wastewater. The project identifies and describes the different mechanisms underlying metal removal by microorganisms, such as biosorption, bioaccumulation and bioprecipitation. In 2010, metal removal experiments were done with both growing and inactive microbial cells and the metal removal was optimised in 'high-yield' bioreactors. The formed metal-biomass particles were characterised using XANES at the ESRF cyclotron facility in Grenoble. In addition, leaching of the bound metals was investigated in a novel anaerobic bioleaching process.

The first cohort of the Erasmus Mundus **ETECOS3** - Joint Doctorate Environmental Technologies for Contaminated Soils, Sediments and Solid Waste - started in 2010. This new EC funded program combines training though research with training though education, and results in a European PhD degree in Environmental Technology, issued jointly by University of Cassino (Italy), University Paris-Est (France) and UNESCO-IHE. The enrolled students carry out laboratory research on trace metal dosing to anaerobic reactors, anaerobic oxidation of methane coupled to sulfate reduction, biological removal of selenium from wastewaters and bioremediation of gypsyferous soils.

Throughout the year, eight talks under the **UNESCO-IHE Water Colloquium series** were held. The Water Colloquium series, established in 2008, present gems within the Institute's research projects and programmes, to enhance interdisciplinary cooperation as well as increase the integration of research by stimulating inter-core and inter-department collaborations at UNESCO-IHE.

Removal of Organic Micropollutants From Water During Soil Passage
by Saroj Sharma

Observing the Himalayas From Satelites - Are They Melting Faster?
by Shreeedhar Maskey

Resource Recovery in Sanitation
by Mariska Ronteltap

Urban Hydroinformatics
by Zoran Vojinovic

Flood Modelling and Management
by Giuliano Di Baldassarre

Innovative Capacity Development for Improved Water and Sanitation Delivery in Small Towns around Lake Victoria
by Maarten Blokland

Results of the SCUSA Project
by Jan Willem Foppen

Quantitative Microbial Risk Assessment for Integrated Urban Water Management in Accra
by Peter van der Steen

RESEARCH

Information and Communication Systems addresses the opportunities provided by advances in information and communication technologies for monitoring and acquiring data, 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.

Information & Communication Systems

The Grant Agreements of the EC FP7 funded project Knowledge-based approach to develop a cULTUre of Risk prevention in Europe **(KULTURisk)** were signed in 2010. KULTURisk is a € 4.4 million collaborative project, coordinated by UNESCO-IHE, which aims to develop a culture of risk prevention through a knowledge-based approach, whereby the socio-economic benefits of risk prevention techniques are assessed and that knowledge transferred to policymakers and practitioners. To this end, KULTURisk will review state-of the-art approaches and strategies to prevent water-related risks, evaluate the costs and benefits of methodical and structured use of risk prevention options compared to traditional post-disaster recovery costs, and use the results to efficiently educate the public and train professionals in risk prevention. The actual start will be in 2011.

The **Lenvis** research project aims to create an innovative collaborative decision support network - integrating environmental and health issues - by connecting existing systems and services in a European-wide mesh of collaborating environmental services. User involvement is a key element of Lenvis. An environmental portal was developed for the province of Noord Brabant, on which the user can find information on bathing water quality, and give feedback on the quality at a specific site. The website was tested with Dutch users in August 2010.

The work under the **Development of a Decision Support System (DSS) for Wastewater Decision Making** project kicked off in 2010. The project develops a DSS that can be applied by water and industry professionals, as well as the Asian Development Bank officers in evaluating wastewater management options concerning pipe network systems and wastewater treatment facilities. The basic functionality of the DSS was developed; future effort will entail the enhancement of its capabilities and development of further functionality.

The EC FP7 project Merging hydrological models and EO data for reliable information on Water **(MyWATER)** received funding in 2010. It will implement a new information platform which integrates data from three scientific research areas – earth observation, meteorology and catchment modelling – to better access hydrological processes. It will develop and validate data-models approaches to supply access to multiple sources of data, in view of obtaining reliable information on watershed water availability and quality in different environments and with different technologic support.

Water Management & Governance

The project In Search of Sustainable Catchments and Basin-wide Solidarities; Transboundary Water Management of the **Blue Nile River Basin**, identifies and analyzes the factors contributing to sustainable practices in upstream catchments and investigates how this knowledge can be used for integrated river basin management. Project partners are Addis Ababa University (Ethiopia), University of Khartoum (Sudan), and the International Water Management Institute. In 2010, the project has grown to ten full-time researchers. Because of additional NFP/ NPT funds, the project became more balanced in terms of gender and nationality. It is notable that professional contacts between the universities and water ministries of both countries are excellent, despite the rising pressures in the region.

The risk-based operational water management for the **Incomati River Basin** project was started in 2010. South Africa's Water Research Commission provided additional funds to one of the local partner universities. The project is done in collaboration with with Eduardo Mondlane University, Komati Basin Water Authority and the University of Kwazulu-Natal, and aims at collaboration to improve water scarce rivers.

The proposal for the EC-FP7 funded project Africa at a Meso-scale: Adaptive and Integrated Tools and Strategies for Natural Resources Management **(AFROMAISON)** was approved. The challenge of AFROMAISON is to provide a holistic toolbox and operational framework for Integrated Natural Resource Management that can be applied in a variety of environmental and socio-economic conditions in Africa. UNESCO-IHE will work in close cooperation with partners and stakeholders on tools for spatial planning, covering tools for negotiation on alternative land uses (tradeoff analysis, multi-criteria) and spatially-explicit impact assessment.

The **Power2Flow** research project is implemented together with Eduardo Mondlane University (Mozambique), WaterNet Trust Southern Africa (South Africa), and the Swiss Federal Institute of Technology (Switzerland). Power2Flow analyzes the reallocation of water between the hydropower sector and the environment in the Zambezi basin. In 2010, one PhD fellow started her fieldwork together with the University of Zimbabwe. An economic model - demonstrating how all the hydropower plants in the region could cooperate - was built, resulting in several publications. This basin offers an opportunity, through the existence of organized stakeholders (power authorities, power companies, and environmental NGOs) to influence both the operation of existing dams and the design of new ones.

RESEARCH

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.

During the year, the work on the DUPC financed **PROBE** project gained momentum. Three MSc students graduated from UNESCO-IHE; a further eight MSc students - of which three at UNESCO-IHE - started their research. In addition, two PhD students, one at Universidade de São Paulo (Brazil) and one at Makerere University (Uganda) prepared their research proposals. The number of partners in the project increased from nine to 15. Additional funds were allocated, allowing the participation of two new academic partners. The project was presented during the IWA World Congress in September 2010 in Montreal, Canada.

The DUPC financed **Partnerships** project seeks to analyze the functioning of partnerships, and involves in-depth case studies of different forms of partnerships. Two MSc theses were completed within the project and a further six MSc students initiated their research at the Institute. Papers were presented at the International Water History Association Conference in Delft, the Netherlands and at the WaterNet Symposium in Victoria Falls, Zimbabwe.

At UNESCO-IHE, post-doctoral climate change research is gaining momentum. In 2010, two large interdisciplinary research programmes with a similar set-up were active.

The interdisciplinary research Programme on Adaptation to Climate Change (**PRoACC**) with a special focus on the Mekong River Basin started with an inception workshop at UNESCO-IHE in April 2010. ProACC is a post-doctoral fellowships programme that researches the challenges of adapting to climate change from different water-related perspectives. The programme consists of eight post-docs who undertake their research under the guidance of a supervision team including a mentor from UNESCO-IHE and one from a partner institute. Partners that collaborate in this project are the Asian Institute of Technology (Thailand), Mekong River Commission, Changjiang River Scientific Research Institute and the Chinese Academy of Science (all in China), Southern Institute of Water Resources Research, the Vietnam Institute of Meteorology, Hydrology and Environment and the Water Resources University, Can Tho University (all in Vietnam).

The research programme Adaptation to Climate Change Impacts on the Nile River Basin (**ACCION**) develops a probabilistic framework encompassing best practices, uncertainty analysis tools and supportive modelling facilities for adaptation strategies for water resources management in the Nile basin region. In October a mini-symposium on Global Change Modeling for the Water Resources of the Nile was held to bring together researchers working on this subject. In 2010, there were six post-doctoral researchers within the ACCION programme, guided by both UNESCO-IHE and the partner institutes. Partners collaborating in the project are Nile Basin Capacity Building Network for River Engineering (Egypt), Addis Ababa University (Ethiopia), Makerere Universtity (Uganda), University of Dar es Sallam (Tanzania), and University of Nairobi (Kenya).

CAPACITY DEVELOPMENT

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

In 2010, UNESCO-IHE considerably expanded its portfolio on **NICHE** capacity development projects. Five new projects were granted: two in South Africa, two in Mozambique, and one in Yemen.

The inception phase of the four-year project Enhancing Institutional Capacity in Water and Waste Water Treatment was completed, with UNESCO-IHE as the lead partner. The project will enhance the capacity at the Tshwane University of Technology (South Africa), and develop a Post Graduate Diploma Programme in Water Service Management and a Higher Certificate- and Advanced Certificate Programme in (Waste) Water Treatment Technology.

The project Capacity Building for Integrated Water Resource Management in South Africa with Cape Peninsula University of Technology and the University of the Western Cape also completed its inception phase, with Wageningen University as the lead partner.

The four-year project Introduction of Water & Sanitation Curricula at the Universidade Eduardo Mondlane, Mozambique will be led by Delft University of Technology. The project will support the establishment of the Water and Sanitation programme at the communal school for rural development (ESUDER) in Vilanculos.

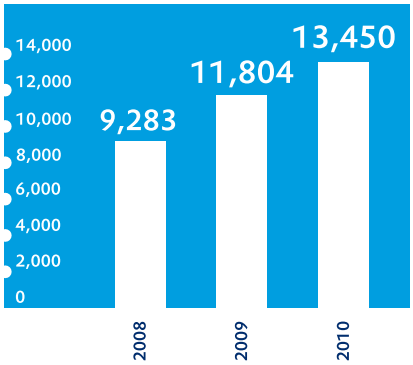
The University Zambeze Capacity Building Project is led by Hanze University Groningen. The objective is to Strengthen recently created public University Zambezi (Mozambique) in order to provide input for better education to deliver qualified well-trained professionals in the fields of Engineering and Health sciences.

The project Strengthening the Research Capacity of the Water Sector in Yemen includes joint staff research, two PhD fellows, 20 local MSc students and 20 small pilot projects. The MSc programme in Integrated Water Resources Management at the Water and Environment Center (WEC) in Sana'a University will be upgraded, and WEC's position as the regional center of excellence for research and education in water and environment will be strengthened.

The total project turnover in 2010 was €13.45 million, including the internal DUPC fund - DGIS UNESCO-IHE Programmatic Cooperation. 'Institutional strengthening' and 'research' projects again represent the majority of UNESCO-IHE's projects (respectively 40% and 45%). Both 'institutional strengthening' and 'research' projects showed an increase in turnover, from €5.1 million in 2009 to € 5.4 million in 2010, and from €4.3 million in 2009 to € 6 million in 2010 respectively. The complete overview of projects in which UNESCO-IHE was involved in 2010 is presented in Annex 4.

PROJECT TURNOVER

Euro x 1000 | Year



CAPACITY DEVELOPMENT

In 2010, the two-year Training and Capacity Building for the Water and Wastewater Sector in Iran **TCBWI** project ended. In collaboration with the Power and Water University of Technology in Tehran (Iran), over 100 one-week courses were delivered in Iran for more than 3500 professionals in water and wastewater technologies, planning and management. Also, almost 400 Iranian seniors were exposed to European practices during 24 study tours for technical and financial specialists and general managers. These tours consisted of technical visits to Dutch, German, French, Belgian and Luxemburg water and wastewater companies.

The project Training and Capacity Development for Improved Water and Sanitation Delivery in Towns around the **Lake Victoria Basin** operating under the Lake Victoria Region Water and Sanitation Initiative was continued. The issues around poor service delivery and the related capacity deficiencies in ten towns were identified and a total of 21 capacity development interventions were prepared, of which ten by UNESCO-IHE. Training and coaching of local facilitators was carried out, and a total of 100 capacity building events are now being implemented for a targeted 3000 participants representing all stakeholder groups from the ten towns around the lake.

The Capacity Building for Water Programs in Higher Education in the Caribbean **CAPCAR** project assists Caribbean universities on developing their water curricula at the BSc and MSc levels. In the framework of the staff development component, three staff members from local universities followed an MSc at UNESCO-IHE. Assessment reports on university policies, curriculum development, and the delivery of training materials were produced. Discussions began on enhancing water research in the Caribbean. Partners in the project are the University of the West Indies, University of Guyana and the College of Science, Technology and Applied Arts of Trinidad & Tobago.

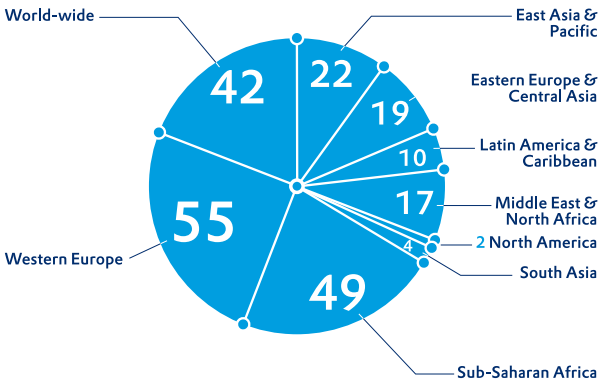
In February, representatives from UNESCO-IHE travelled to Brazil to kick off the long term cooperation between UNESCO-IHE and **HidroEx**, the recently established UNESCO Category II Centre for Education, Capacity Building and Applied Research in Water. UNESCO-IHE plays a central role in strengthening the capacity of HidroEx in water education and research. Toward that goal a work plan for 2011 - 2014 was finalized when representatives from HidroEx visited the Institute toward the end of the year.

In the Middle East, the Small Scale Water Treatment Facilities for Domestic Use and Artificial Recharge with Surface Water (EXACT) project contributes to improved water supply. In 2010, a field demonstration pilot plant for chromium removal based on an innovative UNESCO-IHE technology was demonstrating highly efficient performance operation in Holon, Israel. Two demonstration scale plants were in operation and provided drinking water from the Al Qilt spring to more than 15.000 people in two refugee camps. Support to the upgrading of the Aqbat Jaber drinking water treatment plant in Jericho, the West Bank continued. An MSc study under the project was completed at Birzeit University.

The new two-year project **Flood Risk Assessment for Eleven Caribbean Islands** evaluates flood hazards an vulnerabilities due to inland as well as coastal flooding (flash floods, coastal storm surges, and tsunamis). The project covers data collection, modeling, GIS mapping and the development of pilot early warning systems for disaster management. The Institute has a dual role in the project: the execution of work on St. Maarten, and the review of work undertaken by other parties on the other islands. On St. Maarten, data collection was completed; NASA supported this by providing access to satellite data for bathimetry mapping.

PROJECTS PER REGION IN 2010

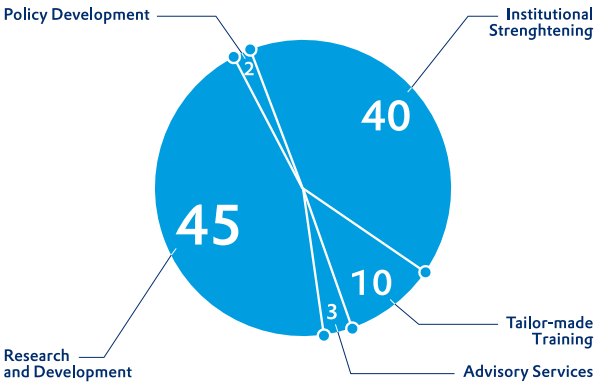
Percentage



The project Knowledge Networks for the Nile Basin, the second in a series of projects to establish and strengthen the Nile Basin Capacity Building Network **NBCBN** in the field of River Engineering, was concluded in in 2010. In November, NBCBN organized a regional conference on 'Sustainable Solutions for Strengthening the Capacity of the Nile Water Professionals' in Cairo (Egypt), to disseminate and share research outputs of the second phase, to discuss the future strategic plan of the network (2011-2015), and to extend cooperation with more partners on both regional and international levels. An important recommendation of the conference was to gradually shift the network's focus from River and Hydraulic Engineering to include other water-related subjects, and broaden the initial focus of applied research with education and training. As the Applied Training Programme of the Nile Basin Initiative (NBI) closed in 2009, the NBCBN currently the only Capacity Development programme in the Nile basin. Thus, a more structural cooperation will be formed between NBI and NBCBN, starting with an exploratory meeting in the beginning of 2011.

PROJECT PER TYPE IN 2010

Percentage



CAPACITY DEVELOPMENT

With the successful training course on water quality monitoring and management at the National Water Resources Institute (Nigeria) in June 2010, the 3-year project **Consultancy services for senior management training for water quality monitoring - Nigeria** came to an end. In this project, a total of 28 senior managers from the the Nigerian Federal Ministry of Agriculture and Water Resources were trained.

The 3rd **CKNet-INA** Open Network Conference held in Jakarta in December marked the start of a new phase for the network. UNESCO-IHE's five year lead role in supporting the development of the new knowledge network of ten leading universities in Indonesia ended. The network focuses on delivering services to enhance the capacity of the water, environment and infrastructure sector in Indonesia. Twenty-one new members requested to become a member of CKNet-INA. The local consultancy firm PT IHE Indonesia will take over the coordination of the project, by hosting the CKNet-INA Network-Secretariat. UNESCO-IHE will continue to provide backstopping activities.

The **NPT Rwanda** project in Water Resources and Environmental Management (WREM) was successfully closed. An expected spin-off of the project is a 2nd phase starting in 2011. In 2010, activities included the graduation of the third batch of students in the locally established MSc programme. The project promoted demand-driven research and developed academic and professional expertise at the National University of Rwanda (NUR), through short courses, MSc and PhD programmes.

The **NPT Ethiopia** project supports emerging River Basin organisations in Ethiopia and establishes a partnership between universities and water sector organisations in the country. It develops an IRBM Masters curriculum for eight universities, and strengthens the capacity of current demand-driven research together with water sector organisations. In 2010, three proposals were developed for demand driven applied research projects together with local universities and the regional water sector. The MSc level IWRM curriculum of three universities was validated.

In the **EU-China River Basin Management Programme** for high and medium level officials four trainings including study tours were given in Europe for about 50 staff from the China Ministry of Water Resources, the Ministry of Environmental Protection and the Yellow River Conservancy Commission. Subjects covered in these trainings were integrated water resources management lessons learnt in the EU, climate change and water quality improvement.

In the World Bank sponsored project **strengthening IWRM in Mongolia**, UNESCO-IHE is responsible for the capacity development component. In 2010, the first training courses were conducted, and a Mongolian university team visited the Institute for a curriculum training event in July. These training courses will aid three Mongolian Universities in setting up a joint Master programme in Integrated Water Resource Management with the purpose of enabling Mongolia to train its own water professionals in the longer term.

The 4-year project 'Development of a joint Indonesian-Dutch Water Quality Education and Research Centre for East Indonesia' was closed with a dissemination workshop held in Manado, Sulawesi, Indonesia. In the project two groups of 20 Indonesian staff were trained on the topics of Water Treatment and Distribution, and Water Quality Management (WQM). Two students of the University Sam Ratulangi **(UNSRAT)** in Manado successfully completed the WQM specialisation under UNESCO-IHE's Environmental Science and Water Management MSc Programmes. These students played a key role in setting up an MSc Programme in WQM at UNSRAT.

The Mekong basin floods annually bring local benefits like fertile agricultural grounds and abundant fish. On occasion these floods can also be devastating, causing casualties and damage. Fast paced basin developments - often with transboundary dimensions - further impact these risks and benefits. The Mekong Agreement 1995 and the **Mekong River Commission** (MRC) aim at providing an effective framework for transboundary cooperation. Addressing transboundary issues requires the participation of all stakeholders, including all levels of government, and interdisciplinary and interagency teams. The members of these teams often lack adequate knowledge of water management, conflict management, legal and institutional aspects, as well as technical tools to support management.

UNESCO-IHE implements the programme 'Anticipating and Resolving Flood Issues, Differences and Disputes in the Lower Mekong Basin' for the Mekong River Commission (MRC) together with local and international partner institutes and programmes, including UNESCO-PCCP. After a pilot phase, the second phase of the programme started in 2010 with a group of 30 mid-level professionals from the four Lower Mekong Countries and Myanmar. Their programme consisted of three training workshops, and a pilot study: a role play of three days in which participants representing MRC institutions resolve a transboundary issue by applying the principles of the Mekong Agreement 1995. They are supported by a set of administrative and technical tools.

The first training workshop on 'Water Resources Development and Flood Management in a Transboundary Context' took place at the Water Resources University in Ho-Chi-Minh City (Vietnam) and the second training on 'Transboundary Water Conflict Management and International Water Governance' at the Mekong Institute in Khon Kaen (Thailand). A third course will be given in 2011. A test of the pilot study was carried out with staff of national universities in the Mekong region at the Royal University of Phnom Penh (Cambodia). They also attended short courses at UNESCO-IHE, preparing them to take over part of the training in later phases and further strengthening regional academic partnerships.

ORGANISATIONAL DEVELOPMENTS

Personnel and Organisation

The Institute entered a process of reform. After a consultative process with staff members and external experts, the document '**Comprehensive Strategy for UNESCO-IHE 2010-2020**' was developed and discussed in the Governing Board in November. The implementation will kick-off in 2011, starting with the establishment of an Education Bureau. Further internal organisational changes are foreseen in both the academic and supporting departments, primarily to encourage interdisciplinary work and strengthen academic leadership. The most important external development will be the formation of a global campus, by which UNESCO-IHE will further intensify its cooperation with academic partners throughout the world.

In 2010, the **organizational structure** of the Institute changed as the IT group - formerly under the Central Services department - converted into the IT department. Arrangements were made for the establishment of the Education Bureau - comprehensively supporting the development and assuring the quality of educational programmes - as per January 2011. An interim Head of the Education Bureau - to supervise its installment and manage the day-to-day activities of the Bureau - was found internally.

Prof. Stefan Uhlenbrook was appointed as part-time **Interim Director Academic Affairs** in August, to strengthen the academic leadership as a third member of the Rectorate - until the UNESCO position of Vice Rector Academic Affairs has been recruited in cooperation with UNESCO-HQ. The latter will be responsible for the quality and determination of the strategic directions of the Institute's education and research.

The Institute continued its involvement in the project team '**Expats**', instituted by the Mayor of Delft. The project team advises the city on measures and investments to take to strengthen the appeal of the city for expats, and consists of larger international employers.

The most prominent **staff development** activity in 2010 was the University Teaching Qualification (UTQ) training programmes, a certification for lecturing at the university level. Five academic staff members received their UTQ diploma, and 23 started their UTQ training programme.

On 31 December 2010, staff equalling 161 full-time equivalents (fte) were employed by UNESCO-IHE, of whom 54% were academic and 46% supporting staff. Policies in the field of **employee benefits** worked on and developed in 2010 include an SDAS staff development policy review, an international relocation policy, diversity and gender policy, and trainee policy.

Communication and Marketing

A positive trend in 2010 was the tremendous **increase of applications** for UNESCO-IHE's educational offerings, with the largest increase of 142% in applications for regular short courses. There were also a 57% increase in PhD programme applications, a 30% increase in tailor made training course and a 6% increase in online course applications, illustrating a substantial demand for education in water related fields.

Throughout the course of 2010 a **renewed house style** was developed adding a fresh look and feel to the Institute's printed materials. A website redesign was prepared to launch in early 2011, with newly integrated features to further improve interactivity, user friendliness and content. The website layout increased visibility of dynamic graphic elements and social media links. A focus of the redesign was increasing news, events and research outputs on the homepage.

Visits were frequently organized for **high-level visitors**, including those from the World Water Council, Aramco from Saudi Arabia, the UNESCO-IHP Bureau, the Malaysian Minister of Natural Resources and Environment, Iranian study tour delegations and the Dutch Association of the United Nations.

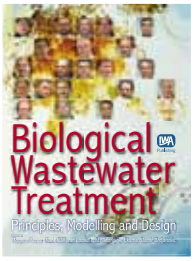
The **MSc programme evaluations** showed that most students come to know UNESCO-IHE through other alumni, their employers and by searching the Internet. The main reasons for choosing to study at UNESCO-IHE over other universities with similar programmes are the available scholarships, course content relevant to the students' needs, the social environment and international context, affiliation with UNESCO and swift responses from the admissions office.

The Institute continued to pro-actively interact with its stakeholders through a variety of **social media channels** including Twitter, LinkedIn, Facebook and various online communities related to water, the environment and sustainable development in general. In 2010 the Institute launched its own Facebook page where alumni, partners and new and existing participants are updated on the goings on at the Institute.

The Institute hosted several **international events** including many guest seminars by visiting professors and other dignitaries, the Seminar on Trends in Environmental Biotechnology and the Joint Education Conference. During the latter, 18 educational partners signed a vision statement on strengthening collaboration in water education, research and capacity development. UNESCO-IHE also took part in **events in other parts of the world** through various panel discussions, presentations and exhibitions, including the China Internal Education Exhibition and Fair, the Shanghai Water Forum, the Delta City of the Future competition, the African Water Association Seminar and Exhibition, IWA's World Water Congress and Exhibition, the United Nations Climate Change Conference (COP16), and Singapore International Water Week.

Of the 1800 applications for MSc programmes, 95 received **fellowships** from the Netherlands Fellowship Programme (NFP). The diversification of fellowship funding is fundamental. Efforts have been redoubled to develop fellowship programmes with relevant public and private organizations . Partnering with Southern universities in the delivery of education is part of these efforts.

There was an increase in collaboration with **UN Water Communicators** by taking part in joint communication efforts at Stockholm Water Week and the Sustainable Water Management in Cities Conference in Zaragoza, organized by SWITCH, the UN-Water Decade Programme on Advocacy and Communication and IRC International Water and Sanitation Centre.



The textbook 'Biological Wastewater Treatment: Principles, Modelling and Design' sold more than 1.000 copies and became one of IWA Publishing's **bestsellers**. The textbook is used in UNESCO-IHE's curricula as well as elsewhere.

Student and Educational Affairs

In October 2010, a **new batch of students** in the 18-month Master of Science programme started their studies. The number of new MSc students dropped slightly as compared to 2009, in direct relationship to the decrease in NFP fellowships. The number of non-degree course participants went up by 10% as compared to last year. Notable were the increase of participants in short courses (39%) and tailor-made training courses (28%).

In 2010, a system for **online applications** was used for the first time for short courses and online courses . The first Erasmus Mundus Programme of UNESCO-IHE, in Flood Risk Management, generated a vast amount of applications which were processed efficiently with the new system.

In October 2010 the new UNESCO-IHE **Library Catalogue** was launched, making it accessible through the Institute's website, visible on through WorldCat, and directly linked to PiCarta, the Dutch Union Catalogue. PiCarta is the gateway to the library collections of numerous Dutch University Libraries and the Royal Library of the Netherlands. The Catalogue contains all the bibliographical data of the library collection, abstracts and pdf's of master theses and PhD dissertations.

In 2010, the Library continued to **increase its collections**. A three year license agreement with Elsevier was signed to secure access to Science Direct and Scopus, expanded its holdings from 800 to over 2100 peer-reviewed journals. Scopus is the largest citation and abstracts database of peer-reviewed literature, available to staff and participants on the UNESCO-IHE network and portal. A license agreement with AGU was expanded and includes access to the complete Digital Library collection, expanding online access to additional journals.

IT

In 2010, the IT group was **converted into a department**, with its own representative in the Management Team.

A **Moodle expert** was attracted to the Institute to support the migration of all future educational activities to the Moodle open source platform - UNESCO-IHE's virtual learning environment. Moodle was used to deliver almost all the online courses in 2010. Also, videos from UNSCO-IHE's media server are now be streamed to Moodle.

All new MSc students and other participants spending time at the premises in Delft are currently provided with **laptops**. These connect to all the IT facilities via the wireless network, allowing for easier and new ways of learning.

Smartboards - interactive whiteboards - were introduced to the classrooms to stimulate new ways of learning. Staff members were trained in their use.

Facility Management

The **refurbishment** of all the Institute's facilities continued in 2010. Almost all of the Westvest building - the building where educational activities such as lectures, classes and lab work take place - was renovated. Designated areas for problem-based learning, group work and individual work, a new Meditation room, as well as modernised classrooms were put into use. The classrooms have flexible furniture and electronic whiteboards, aiding in an innovative learning experience.

The new layout of academic departments allow staff and PhD fellows to be housed together. It includes **flexible workspaces** for the accommodation of guest lecturers, researchers and other temporary staff. The total process is expected to be completed at the end of 2011.

FINANCIAL REPORT

INCOME

The income of the Institute originates from three main sources: The base subsidy of the 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 renting out conference facilities and student housing to third parties and the PhD graduation grant we receive from Dutch Universities.

The subsidy from the Ministry of Education was not indexed in 2010 and remained on the 2009 level due to a Dutch generic saving measure whereby all education subsidies were frozen. Since an index was foreseen in the operational budget, major adjustments had to be made to the workplan so as to secure a balanced result.

In 2010 follow up was given to:
- the refurbishment of the building, including the completion of two out of five phases, which stayed within budget;
- implementation of the IT strategy;
- the further development of about 16 joint MSc specializations (in different stages of establishment) including 3 new joint Masters' and one joint doctoral degree programme under the EC's Erasmus Mundus scheme and;
- the internal reform process leading to a new strategy for UNESCO-IHE towards 2020.
- The Institute's research programme was further strengthened by
  - the increase in the number of registered PhD participants and;
  - the co-funding of 17 research projects through the UPaRF facility.

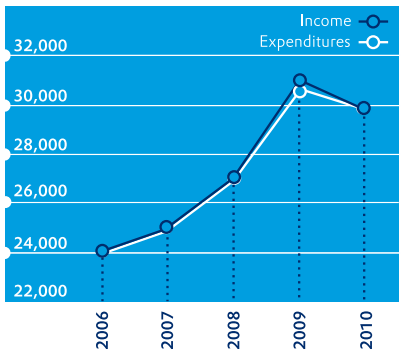
These projects accounted for a total expenditure of € 684,000 in 2010.

The tuition fee income increased markedly (±10%) due to an increase in the intake of MSc students in the 2009-2011 batch (+10% in student years). At the same time, education-related expenditures increased by ±8% due to the increase of the number of students and related fellowship costs.

Project income from research, non-degree courses and capacity development projects in 2010 was ±17% lower than in 2009, but direct project costs (programme expenditures) also decreased by ±22%. This resulted in a net project fee income improvement of ±2%. The top 10 largest projects accounted for just under 60% of the fee income. Some 15% was generated through projects co-funded by the programmatic cooperation agreement with DGIS, which includes contributions from various third parties and IRF. About 52% of the net project income was paid for by Dutch governmental sources (i.e. DGIS, OCW, RWS, NUFFIC, EVD, NWO, and SenterNovem), 17% from EC funds, and 30% from other national and international sources.

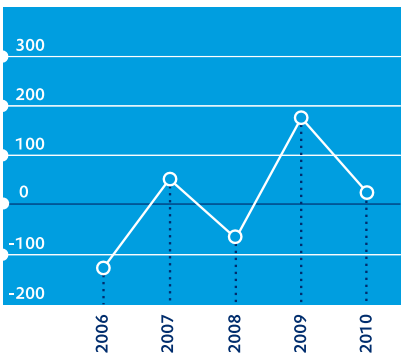
INCOME AND EXPENDITURES

Euro x 1000 | Academic year



OVERALL FINANCIAL RESULTS

Euro x 1000 | Academic year



UNESCO-IHE operations in 2010 showed a decrease, both in revenues and expenditures, as compared to 2009. The total turnover decreased to just under € 30 million. The overall result shows a modest surplus of € 20,000. This corresponds to an operational result against turnover of less than 1%. The main challenges remain to secure financing for fellowships and to replenish our general reserves to guarantee the continuity of our operations.

EXPENDITURES

UNESCO-IHE makes a distinction between programme expenditures and non-programme expenditures. Programme expenditures relate to the direct outputs of the main activities of the Institute, 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.

In 2010, there was a modest increase (±2%) in the non-programme expenditures, mainly as a consequence of the increase in staff salary costs and facility costs. There were also lower interests received and a reduced amount of general costs.

The staff and management costs increased due to a one-off payment in line with the negotiated Collective Labor Agreement (CAO) of Dutch Institutions for Higher Education, and because of an increase in the average number of staff (from 148.3 FTE in 2009 to 151.9 FTE) in 2010. The overall costs for operation and maintenance of the building increased by ±2%, in line with inflation. The costs for running the facilities increased with ±5% due to the costs related to the IT development and facility refurbishment activities. Education-related costs increased by ±3% due to the purchase of laptop computers for MSc participants. There were fewer unfunded fellowships.

Acquisition and marketing costs were modestly higher (±4%) than in 2009. This was due to an unforeseen contribution to the Water History Conference and more out of pocket expenditures related to the UN integration budget item. General costs were almost 40% less due to a decrease in the management of the refurbishment and IT, and a lower contribution to the reserves for uncollectible debts.

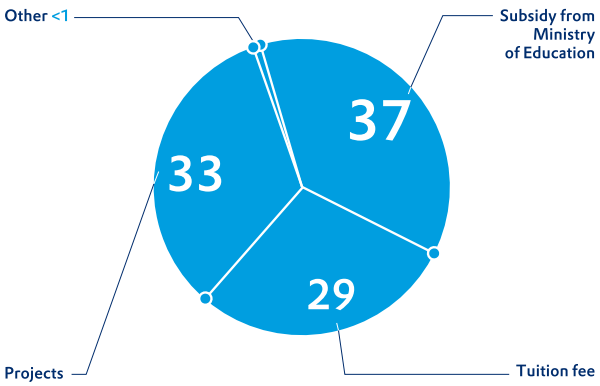
BALANCE SHEET

The balance sheet shows a ratio of 13/87 between equity and borrowed capital which corresponds to a solvency of 13%. The solvency ratio in 2010 is still far from the targeted percentage (20%). This was expected and the improved subsidy arrangement and multi-year programmatic funding contract with DGIS does give an opportunity to improve the solvency ratio in the coming years based on the expectation that the Dutch generic saving measures are a one year only measure.

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 include a wide array of items including jubilee payments to staff and long-term building maintenance in accordance with the lease contract. The provision reduced considerably due to finished repairs under the current refurbishment. The current ratio is at a level of 0.95 (was 1.07 in 2009), which means that in the short term the Institute remains creditworthy, although the ideal a ratio of 1 is not met. For the long-term financial sustainability of the Institute, the focus will be on increasing the financial reserves as foreseen in the current business plan.

SOURCES OF INCOME IN 2010

Percentage



FINANCIAL REPORT

STATEMENT OF INCOME AND EXPENDITURES (amounts in €000s)

	2010		2009	
Income				
Subsidy from the Ministry of Education	11,012		11,012	
Tuition fee	8,696		7,901	
Projects	9,738		11,746	
Others	378		222	
Total income		*29,824*		*30,881*
Programme expenditures				
Tuition fee (stipends, guest lecture, etc.)	5,632		5,213	
Projects	6,128		7,896	
Total programme expenditures		*11,760*		*13,109*
Non-programme expenditures				
Staff and management	11,774		11,313	
Buildings	2,499		2,440	
Facilities	1,321		1,264	
Education-related costs	1,452		1,403	
Acquisition and marketing	363		348	
General costs	765		1,218	
Interest	-122		-289	
Total non-programme expenditures		*18,052*		*17,697*
Operating result		**12**		**75**
Extraordinary charges/Appropriations from Fellowship Trust Fund		8		106
Overall result		**20**		**181**

BALANCE SHEET (amounts in €000s)

	31 DECEMBER 2010		31 DECEMBER 2009	
Assets				
Fixed assets	2,680		2,045	
Accounts receivable	3,431		3,004	
Cash and banks	8,930		14,559	
Total		*15,041*		*19,608*
Equity and liabilities				
Equity	1,631		1,611	
Fellowship Trust Fund	255		264	
Provision	113		1,333	
Current liabilities	13,042		16,400	
Total		*15,041*		*19,608*

FELLOWSHIP TRUST FUND

The UNESCO-IHE Fellowship Trust Fund (FTF) was created to raise funds from private and public organisations, 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.

In 2010, the FTF provided financial support to four students; the names and countries of origin of the students are listed in the adjoining Financial Statement. All four students were enrolled in MSc studies; one of them graduated in 2010, and three will continue their studies in 2011.

SUEZ Environnement continued to donate to the FTF. A small contribution was received through the library, who donated the penalty fees for books returned too late.

FINANCIAL STATEMENT FOR THE FELLOWSHIP TRUST FUND
(amounts in €)

Fund on 1 January 2010		*263,984*
Gifts		
SUEZ, France	80,560	
Contribution Library (from penalty fees)	431	
Interest	4,532	
Total		*85,523*
MSc Fellowships		
Gashaw Abuhay Damtaw, 2009/2011, Ethiopia	12,747	
Ina Krüger, 2008/2010, Germany	917	
Erizaldy Azwar, 2009/2011, Indonesia	40,280	
Juniferanne Natalina Brahmana, 2009/2011, Indonesia	40,280	
Total		*94,224*
Fund on 31 December 2010		*255,283*

ANNEXES

506

REGISTERED DEGREE PROGRAMME PARTICIPANTS FOR THE ACADEMIC YEAR 2010-2011

	SOURCE OF FUNDING			REGION OF ORIGIN					GENDER		TOTAL
	Full NFP	Co-financed NFP	Other	Africa	Asia	Latin America	Middle East	Other	Female	Male	
MSc programmes 2009-2011	**116**	**2**	**83**	**97**	**41**	**16**	**9**	**38**	**82**	**119**	**201**
- Water Science and Engineering	35	1	40	27	25	7	6	11	25	51	76
- Water Management	20	0	8	14	7	2	0	5	14	14	28
- Environmental Science	39	1	15	35	4	5	1	10	29	26	55
- Municipal Water and Infrastructure	22	0	20	21	5	2	2	12	14	28	42
MSc programmes 2010-2012	**95**	**0**	**81**	**77**	**49**	**15**	**8**	**27**	**65**	**111**	**176**
- 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
PhD programmes 2010	26	1	102	56	32	16	6	19	38	91	129
Total	237	3	266	230	122	47	23	84	185	321	506
Percentage	46,8	0,6	52,6	45,5	24,1	9,3	4,5	16,6	36,6	63,4	

ANNEX 2 | SHORT COURSES

21

307

REGULAR SHORT COURSES

COURSE	DATE	TOTAL PARTICIPANTS
Coastal Systems	11/01/10 – 29/01/10	1
Conventional Surface Water Treatment	08/02/10 – 26/02/10	4
Water Quality Assessment	08/02/10 – 26/02/10	11
Negotiation and Mediation for Water Conflict Management I	08/02/10 – 26/02/10	6
Coastal and Port Structures II	01/03/10 – 19/03/10	1
Constructed Wetlands for Wastewater Treatment	01/03/10 – 19/03/10	7
Environmental Engineering	01/03/10 – 19/03/10	6
Environmental Policy Making	01/03/10 – 19/03/10	1
Groundwater Resources and Treatment	01/03/10 – 19/03/10	3
Negotiation and Mediation for Water Conflict Management II	01/03/10 – 19/03/10	10
Advanced Water Treatment Technology	06/04/10 – 23/04/10	4
Environmental Monitoring and Modelling	06/04/10 – 23/04/10	4
Environmental Planning and Implementation	06/04/10 – 23/04/10	4
Financial Management of Water Organisations	06/04/10 – 23/04/10	7
Groundwater Exploration and Monitoring	06/04/10 – 23/04/10	3
Hydrological Data Collection and Processing	06/04/10 – 23/04/10	6
Integrated Asset Management Systems	06/04/10 – 23/04/10	3
River Basin Modelling	06/04/10 – 23/04/10	8
Service Oriented Management of Irrigation Systems	06/04/10 – 23/04/10	1
Resource Oriented Sanitation	06/04/10 – 23/04/10	3
Water Resources Planning	06/04/10 – 23/04/10	5
International Port Seminar	12/04/10 – 29/04/10	10
Integrated Coastal Zone Management	19/04/10 – 29/04/10	6
Cleaner Production and the Water Cycle	26/04/10 – 14/05/10	5
Tracer Hydrology and Flow System Analysis	26/04/10 – 14/05/10	2
Urban Flood Modelling and Disaster Management	26/04/10 – 14/05/10	4
Water and Environmental Law and Institutions	26/04/10 – 14/05/10	6
Water Transport and Distribution I	26/04/10 – 14/05/10	2
Modelling Wastewater Treatment Processes and Plants	03/05/10 – 14/05/10	3
Applied Groundwater Modelling	14/06/10 – 02/07/10	12
Aquatic Ecosystems: Processes and Applications	14/06/10 – 02/07/10	4
Environmental Systems Modelling	14/06/10 – 02/07/10	8
Flood Risk Management	14/06/10 – 02/07/10	7
Industrial Effluents Treatment and Residuals Management	14/06/10 – 02/07/10	5
Managing Water Organisations	14/06/10 – 02/07/10	14
Urban Water Systems Modelling	14/06/10 – 02/07/10	7
Water Treatment Processes and Plants	14/06/10 – 02/07/10	10
Decentralised Water Supply and Sanitation	05/07/10 – 23/07/10	8
Public-Private Partnerships in the Water Sector	05/07/10 – 23/07/10	5
Solid Waste Management	05/07/10 – 23/07/10	12
Water Transport and Distribution II	05/07/10 – 23/07/10	7
Watershed and River Basin Management	05/07/10 – 23/07/10	10
Remediation and Handling of Contaminated Sediments	30/08/10 – 03/09/10	5
Climate Change in Integrated Water Management	06/09/10 – 17/09/10	13
Spate Irrigation and Water Management under Drought and Water Scarcity	06/09/10 – 17/09/10	9
World History of Water Management	13/09/10 – 17/09/10	3
Membranes in Drinking & Industrial Water Treatment	22/11/10 – 25/11/10	6
GIS Modelling SWAT	01/11/10 – 12/11/10	7
GIS and Remote Sensing	01/11/10 – 12/11/10	19
Total		*307*

16

237

ONLINE COURSES

COURSE	DATE	TOTAL PARTICIPANTS
Service Oriented Management of Irrigation Systems	15/01/10 – 15/05/10	2
Flood Modelling for Management	01/03/10 – 10/05/10	7
Policy and Management in Developing Countries	01/03/10 – 21/06/10	30
Ecological Sanitation	01/03/10 – 02/07/10	10
Integrated Coastal Zone Management	01/03/10 – 02/07/10	7
Integrated River Basin Management	01/03/10 – 02/07/10	19
Biological Wastewater Treatment: Principles, Modelling and Design	22/03/10 – 25/07/10	31
Water & Environmental Law and Policy	01/04/10 – 14/07/10	8
Biological Wastewater Treatment: Principles, Modelling and Design	01/08/10 – 30/11/10	24
IWRM as a Tool for Adaptation to Climate Change	30/08/10 – 26/11/10	29
Public Private Partnerships	01/09/10 – 17/12/10	11
Cleaner Production and the Water Cycle	01/09/10 – 31/12/10	3
Constructed Wetlands for Wastewater Treatment	01/09/10 – 31/12/10	14
Solid Waste Management	01/09/10 – 31/12/10	11
Water Quality Assessment	01/09/10 – 31/12/10	12
Water Transport and Distribution I	06/09/10 – 25/02/11	19
Total		*237*

2

54

REGIONAL REFRESHER SEMINARS

SEMINAR	COUNTRY	DATE	TOTAL PARTICIPANTS
Flood Based Farming as Part of River Basin Water Management	Ethiopia	26/07/10 – 06/08/10	36
Participatory Management of Flood Risk in Changing Climate	Nepal	26/07/10 – 06/08/10	18
Total			*54*

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 2010 are listed in Annex 4 - Projects.

ANNEX 3 | PHD FELLOWS

7

PROMOTIONS IN 2010

NAME	PROMOTION DATE	COUNTRY	PROMOTOR	TITLE THESIS
Ms. Latteman	February 9, 2010	Germany	Amy	Development of an environmental impact assessment and decision support system for seawater desalination plants
Mr. Yangali Quintanil	February 9, 2010	Peru	Amy	Rejection of emerging organic contaminants by nanofiltration and reverse osmosis membranes: effects of fouling, modelling and water reuse
Mr. Wegen, van der	May 26, 2010	Netherlands	Roelvink	Modeling morpodynamic evolution in alluvial estuaries
Mr. Makurira	June 23, 2010	Zimbabwe	Savenije/ Uhlenbrook	Water productivity in rainfed agriculture, redrawing the rainbow of water to achieve food security in rainfed smallholder systems
Mr. Maeng	October 29, 2010	South Korea	Amy	Multiple objective treatment aspects of bank filtration
Mr. Alfonso Segura	November 16, 2010	Colombia	Price	Optimisation of monitoring networks for water systems
Mr. Paudel	November 17, 2010	Nepal	Schultz	An improved approach for the design and management of irrigation canals

REGISTERED PHD FELLOWS

NAME	COUNTRY	PROMOTOR	WORKING TITLE THESIS
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 its Impact on Ground Water in the Nile Delta
Mr. Ali	Sudan	Wright	Effects of erosion control practices in the upper Blue Nile River Basin on downstream sedimentation rates
Mr. Alfonso Segura	Colombia	Price	Optimisation of Monitoring Networks for Water Systems
Mr. Almoradie	Philippines	Solomatine	Virtual environments for stakeholder participation in river and flood management
Mr. Abel	Sudan	Amy	Assessment of soil aquifer treatment (SAT) for multiple contaminant removal and applicability in developing countries
Ms. Alvarez Mieles	Ecuador	Mynett	Ecological Modelling in Tropical Rivers and Wetlands
Mr. Arias Hidalgo	Ecuador	Mynett	Reducing uncertainty in coupled wetland-catchment models
Ms. Azab	Egypt	Price	Integration of GIS, Remote Sensing and Modelling for Water Quality Management in an Irrigated Watershed
Mr. Babu	Uganda	Gijzen	Effect of Algan Biofilm and Operational Conditions on Nitrogen Removal in Wastewater Stabilization Ponds
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. Betrie	Ethiopia	Mynett	Regionalization of models for large-scale water quality simulation
Mr. Bhatt	Nepal	Uhlenbrook	Integrated approach for global changes adaption in agriculture & water management practices in Koshi river basin of Nepal
Mr. Bin Abdullah	Malaysia	Price	Web-based spatial decision support system for integrated urban water management
Mr. Bin Ab Razak	Malaysia	Roelvink	Modeling of Headland Sediment Bypassing Process & Nearshore Evolution of Embayed Beach
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
Mr. Demessie	Ethiopia	Uhlenbrook	Past-present-future land use in the Blue Nile and impacts on hydrology
Mr. Dissanayake	Sri Lanka	Roelvink	The role of tidal inlets in coastal erosion
Ms. Donoso	Panama	Roelvink	Analysis of the upper ocean thermal structure of the eastern tropical Pacific: establishing correlations with precipitation in Latin America
Mr. Dejen	Ethiopia	Schultz	Overall Assessment of Irrigation Systems and Interventions for Enhancing Performance Water Saving and Sustinability in Ethiopia
Mr. Delipetrev	Macedonia	Solomatine	Decision Support System for Water Resources Management in the Republic of Macedonia: Case Study of Bregalnica River Basin
Mr. Duong	Viet Nam	Roelvink	Climate Change Impacts on Seasonally And Intermittently Open Tidal Inlets (CC-SIOTI)
Ms. Delos Reyes	Philippines	Schultz	Modernization Strategy for National Irrigation Systems in the Philippines: Linking Design, Operation and Water Supply
Mr. Ebrahim	Ethiopia	Mynett	Modelling groundwater flow and reactive contaminant transport of chlorinated solvents for assessing risk in a fuzz-probabilistic approach
Ms. Essandoh	Ghana	Amy	Soil aquifer treatment of wastewater: a framework for technology implementation in a developing country
Mr. Feyssa	Ethiopia	Lens	Anaerobic oxidation of methane by sulfate reduction
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
Mr. Ghasimi	Iran	Lens	Effect of trace metal dosing on anaerobic digestion
Mr. Gichamo	Ethiopia	Solomatine	Adaptive modelling in heterogeneous data environments
Mr. Guo Leicheng	China	Roelvink	Morphodynamic modeling of the river- and tide-dominated Yangtze Estuary, China: processes and mechanisms
Mr. Ha	South Korea	Amy	Optimization of the Ceramic Membrane filtration in Surface Water Treatment Applications
Ms. Halem van	Netherlands	Amy / v Dijk	Subsurface arsenic removal: sorption mechanisms and adaptation for rural drinking water supply
Ms. Hoang	Viet Nam	Mynett	*under construction*
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. Isunju	Uganda	v. Dijk	Socio-economic aspects of sustainable sanitation in slums
Mr. Jamil	Malaysia	Uhlenbrook	Modelling effects of land use changes on the hydrological regime in Peninsular Malaysia
Mr. Junaidi	Indonesia	Schultz	Optimisation of the Urban Drainage and Flood Protection of Padang City, Indonesia
Mr. Karimi	Iran	Lens	Nitrogen removal from aquaculture wastewater
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	*under construction*
Ms. Kayoza	Tanzania	Vairavamoorthy	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
Ms. Kijjanapanich	Thailand	Lens	Bioremediation of gypsiferous soils
Mr. Kilonzo	Kenya	Lens/Bauwens	Assessing the impacts of climatic changes on hydrology and water resources of the Mara river basin
Mr. Kiptala	Kenya	vd Zaag	Managing interdependencies: understanding tradeoffs and synergies in the Pangani river basin, Tanzania

REGISTERED PHD FELLOWS

NAME	COUNTRY	PROMOTOR	WORKING TITLE THESIS
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. Lai ko an	China P.R.	v Maarsseveen	An analysis of environmental capacity characteristics of heterogeneous traffic corridors
Mr. Li	China	Mynett	Multi-reservoir-based Flood Control and Management software system
Ms. Liang	China P.R.	v Dijk	Financing and cost recovery of innovations in the urban water cycle in terms of different institutional and technological options
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
Ms. Lugwisha	Tanzania	Leentvaar	Wastewater management institutional performance and change
Mr. Lutterodt	Ghana	Uhlenbrook	Effects of surface characteristics of Escherichia coli on transport in saturated porous media
Mr. Mabiza	Zimbabwe	vd Zaag/Gupta	IWRM, institutions and livelihoods: cases and perspectives from the Limpopo River Basin
Mr. Maeng	South Korea	Amy	Multiple objective treatment aspects of riverbank filtration system
Mr. Makurira	Zimbabwe	Savenije	Smallholder water system innovations for upgrading rainfed agriculture in arid and semi-arid areas
Mr. Masese	Kenya	O'Keeffe	Spatio-temporal dynamics in organic matter and its influence on food web architecture in the tropical Mara river
Mr. Masih	Pakistan	Uhlenbrook	Hydrology and water balance analysis for sustaining food security and environmental services in Karkheh River Basin, Iran
Mr. Md. Ali	Malaysia	Solomatine	Flood Risk Mapping Under Uncertainty: Application to Sungai Johor Basin, Malaysia
Mr. Mburu	Kenya	Lens	Modelling studies for optimal design of horizontal subsurface flow constructed wetlands
Mr. Munir	Pakistan	Schultz	Role of sediment transport in operation and maintenance of supply and demand based irrigation canals
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. Mutikanga	Uganda	Vairavamoorthy	Decision Support Tools for Water Loss Management in Developing countries
Ms. Mwelwa	Zambia	Wright	Flow, morphology and vegetation in the Middle Zambezi: a Study of spatial and temporal scales
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
Mr. Oduro-Kwarteng	Ghana	van Dijk	Managing urban solid waste services: assessment of performance of private companies in five cities in Ghana
Mr. Ofosu	Ghana	vd Zaag/vd Giesen	Developing a catchment management strategy for sustainable irrigation development in the White Volta Sub-Basin
Mr. Orup	Uganda	Uhlenbrook	Surface water and groundwater interactions in the Pangani River basin, Tanzania
Mr. 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
Mr. Paudel	Nepal	Schultz	An improved approach for the design and management of irrigation canals.
Ms. Rogelis Prada	Colombia	Wright	*under construction*
Ms. Rongoei	Kenya	O'Keeffe	Wetland Ecosystem Integrity in Relation to Exploitation for Livelihoods in Nyando Wetlands, Kenya
Mr. Salifu	Ghana	Amy	Fluoride removal from drinking water
Mr. Salinas Rodriguez	Bolivia	Amy	Water characterisation and fouling prediction tools for Seawater Reverse Osmosis Systems
Mr. Sanchez Torres	Colombia	Mynett	The use of agent-based models for integrated urban water management
Ms. Sanz Galindo	Colombia	vd Zaag/Gupta	Developing conflict resolution as a policy tool for small and medium enterprises
Ms. Saraiva Okello	Mozambique	Uhlenbrook	*under construction*
Mr. Sekomo	Rwanda	Lens	Mechanisms of heavy metals removal in natural wastewater treatment systems "
Mr. Seyoum	Ethiopia	Price/Solomatine	Integrated urban water systems modelling
Mr. Siek	Indonesia	Solomatine	Predicting ocean surges: multi-models, computational intelligence, chaos and uncertainty
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 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	to be appointed	Low chemical consuming UF.RO for desalination
Ms. Uwamariya	Rwanda	Amy	Assessment of ground as source of drinking water in Rwanda
Mr. Uwimana	Rwanda	O'Keeffe	Rehabilitation of nutrient and sediment wetland ecosystem functions in 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	to be appointed	Anti-(bio)fouling strategy for integrated membrane systems
Mr. Waly	Egypt	Amy/Schippers	Minimize the use of chemicals in sea water reverse osmosis: impact on scaling & concentrate disposal
Mr. Wan Yuanyang	China	Roelvink	*under construction*
Mr. Wang	China	Uhlenbrook-Mynett	Coupling of meteorological models for hydrological predictions in the Yellow River
Mr. Welles	Netherlands	Brdjanovic	Impact of Salinity on the Biological Phosphorus Removal in Activated Sludge Systems
Mr. Wong	Malaysia	Uhlenbrook	Assessment and modelling of large-scale hydrological variability in Peninsular Malaysia

ANNEX 4 | PROJECTS

INSTITUTIONAL STRENGTHENING

COUNTRY	TITLE	FUNDING	PARTNERS	START	END
Brazil	Educational and administrative capacity building of Hidroex	National Government		Jan-14	Jul-14
China	Partnership for education and research in water and ecosystem interactions	EVD	Eijkelkamp, China University of Geosciences (CUG), Beijing, Hohai University, Nanjing, Xi'an Center of Geological Survey	Nov-13	Oct-15
Egypt	The National Water Resources Plan - Coordination Project	Min. of Water Resources	CBI	Mar-13	Dec-16
Ethiopia	Capacity building in Integrated River Basin Management (IRBM) for HEIs to support RBOs	Nuffic-NPT	WUR, Meta-Meta, VU, IWMI	Mar-13	Jul-16
Ghana	Development of Joint Masters Programme In Water Supply And Environmental Sanitation Between Knust And UNESCO-IHE	DGIS-DUPC	DCE, Kwame Nkrumah University	Oct-13	Oct-14
Indonesia	Development of Joint Master of Science programme on Water Quality Management and Water Treatment at the UNSRAT University on Sulawesi	EVD	UNSRAT, WLN	Aug-11	Aug-14
Kenya	Module transfer of the Limnology program and Wetlands Ecosystem Specialisation to Egerton Univeristy	DGIS-DUPC		Nov-12	Jan-17
Mongolia	Strengthening Integrated Water Resources Management in Mongolia for the Ministry of Nature and Environment (MNE)	DGIS	Deltaris, Haskoning, The Water Centre	Mar-13	Jan-17
South Africa	Capacity Building for Integrated Water Resources Management in South Africa.	Nuffic-NICHE	IRC, ITC	Sep-14	Sep-18
	Enhancing institutional capacity in water and waste water treatment	Nuffic-NICHE	NHL, SWO, TU Delft, WWN	Sep-14	Sep-18
Sri Lanka	Centre of excellence for Adaptation to Climate Change-Sri Lanka	DGIS-DUPC		Apr-14	Apr-18
Tanzania, United Republic of	Human Resources and Organisation Development in the Water Sector	EC-EuropeAid	IRC, ICLEI	May-13	Aug-15
Various Countries	Small Scale Water Treatment Facilities for Domestic Use and Artificial Recharge with Surface Water - Middle East	DGIS	Water Commission/mekorot Water Company (Israel); Min. of Water snd irrigation (Jordan); PoWER partner: Birzeit University (Palestinian Authority)	Jan-10	Apr-14
	Technology enabled universal access to safe water	EC-FP6	21 partners including Kiwa, SINTEF, Riga Tech.Uni. EAWAG, NTNU, TZW, LNEC	Jan-10	Jan-15
	A knowledge Network for solving real-life water problems in developing countries	EC-FP6	Dep. Architecture & Urban Planning, LeAF, SMI, IMTA, ENGREF, CSE, IIMA, RSPMU	Apr-11	Mar-14
	Netherlands and Western Balkans Environmental Network	EKN	VU, WUR, LeAF	Oct-12	Jun-15
	IWRM in the Aral Sea Basin	DGIS-DUPC		Jan-13	Jan-17
	Capacity Building project at WASA/WITSS	EC-Edulink	WASA, University of the West Indies, COSTAAT, Univ. of Guyana	Jan-13	Jan-16
	Lake Victoria Region Water and Sanitation Initiative: Training and Capacity Building Components of Utilities management and Urban Catchment management	UN-Habitat	SNV, FCM, GWA	Jan-13	Jul-14
	ENPI (European Neighbourhood Policy Instrument) Mediterranean Environment Programme	EC-EuropeAid		Nov-13	Nov-16
	Anticipating and resolving flood issues, differences and disputes in the Lower Mekong Basin' phase 2	MRC		Apr-14	Apr-15
Viet Nam	Advanced training in modeling and information management applications for water, environmental management and climate change adaptation issues	EVD	Vietnam Nat'l University, Can Tho University, Royal Haskoning	May-14	May-15
Various Countries	Flood Hazard and Vulnerability Assessment	UNDP		Nov-14	Mar-16

TAILOR-MADE TRAINING

COUNTRY	TITLE	FUNDING	PARTNERS	START	END
China	EU-CHINA River Basin Management Project	EU		Jun-14	Apr-15
	TM Course on Water Governance MWR China	RWS		Jun-14	Jul-14
	Tailor made training course for the Ministry of Water Resources	National Government		Sep-14	Dec-14
Colombia	Establishing a joint programme in hydroinformatics at univalle and IHE	DGIS		Jan-14	Feb-15
Egypt	Tailor made training course on Integrated Environmental Management in the Industrial Sector	EEAA		Apr-14	May-14
	"Tailor Made Training Course on Climate Change in Water Management	Unesco Office Cairo		Jul-14	Oct-14
Ethiopia	Flood based farming as part of river basin management	Nuffic-NFP	Oromia Water Resource Bureau and Haramaya University	Feb-14	Dec-14
Indonesia	4 MSc fellowships from PU in Municipal Water and Infrastructure	AsDB		Okt-12	May-14
	Short Course on Strategic Environmental Assessmet and Environmental Impact Assessment	RWS		Nov-13	Jan-15
	Blended Wetland Management Planning Course	RWS		May-14	May-15
	Legal and Institutional Aspects to Water Management in Indonesia	RWS	DHV Asia, PT-IHE, WB	Nov-14	Dec-14
Korea, Republic of	Tailor Made Training in River Engineering for K-Water	K-Water		Nov-14	Nov-14
Netherlands	Arsenic Removal with Ferritin	Biaqua/ ICOS Capital		Aug-14	Jan-15
	Mainstreaming spate irrigation in higher education	FAO	UNW-DPC	Sep-14	Okt-14
Sudan	TMT Sanitation Related Groundwater pollution	SWA		Mar-14	Apr-14
	Tailor Made Training in Water Quality Assessment	UNESCO-Chair in Water Resources		Oct-14	Jan-15
	Tailor Made Training Drinking Water Treatment Sudan	SWA		Dec-14	Dec-14
Tanzania, United Republic of	Catchment Modelling using free software and GIS data	UNESCO		Jul-14	Aug-14
United States	IRES: Sustainable clean water technologies for the UN's Millennium Development Goals - a partnership between UNESCO-IHE (Delft, Netherlands) and University of South Florida	NSF		May-13	Jul-15
Zimbabwe	Tailor made Training on Project Financial Management	WaterNet Trust		Apr-14	Sep-14
Various Countries	Group Training for Water Resources Planning & Manangement project of Nile Basin Initiative	UNOPS		Okt-12	May-14
	Environmental Flows Module Development	DGIS-DUPC	Universidad San Francisco de Quito, TNC, IUCN, Deltares	Mar-13	Mar-14
	MTEC Flood Risk Management and the Water Framework Directive	EVD	Witteven+Bos	Jan-14	Jul-14
	Erasmus Mundus Masters Course in Ecohydrology	EC-Erasmus Mundus	Univ. Lodz (poland), Univ. Kiel 9germany), Univ. La Plata (argentina0	Sep-14	Sep-21
	Erasmus Mundus Masters Course in Flood Risk Management	EC-Erasmus Mundus	University Dresden, UP Catalunya, Ljubjana University	Sep-14	Jan-22

POLICY DEVELOPMENT

COUNTRY	TITLE	FUNDING	PARTNERS	START	END
Netherlands	Verwijderen Natuurlijk Organisch Materiaal (NOM)	SenterNovem	TUD and others	May-10	May-14
	MoU between UNESCO-IHE and the Ministry of Transport, Public Works and Water Management of the Netherlands, 2007-2010	V&W	V&W	Jul-11	Jan-15
	DUPC WWDR4 Water Allocation Subject	DGIS-DUPC		Apr-14	Dec-14
	DUPC Edication Conference with Partner Institutes	DGIS-DUPC		May-14	Aug-14
Various Countries	Managing Adaptive Responses to changing floodrisk in the North Sea Region	EC-Interreg	Watershcap Hollandse Delta, Rijkswaterstaat, DG-Water, WL-Delft, Dura Vermeer, University of Sheffield, etc.	Jan-12	Apr-15
	DGIS & UNESCO-IHE Programmatic Cooperation	DGIS		Jan-12	Jan-17
	WWF Chair in Freshwater Ecosystems	WWF		Jan-14	Jan-15
	Global Water Education Needs Survey	UNESCO		May-14	Jun-15

RESEARCH AND DEVELOPMENT

COUNTRY	TITLE	FUNDING	PARTNERS	START	END
Australia	Investigation of Climate Change Driven Variations in Wave Climate along the NSW Coast	DEC Australia through CSIRO		Dec-12	Dec-14
Australia	Stakeholder Risk Perception Framework	Monash Univ.		Feb-14	Jun-15
Belgium	Sand dynamics project Flanders coast	IMDC	Waterloopkundig Lab.	Aug-14	Aug-16
Colombia	Operational Flood Forecasting Warning and Response for Multi Scale Flood Risks in Developing Cities	DGIS-UPaRF	DPAE, Cinara, Univalle, Deltares, NOAA	Oct-13	Jan-18
Georgia	Integrated Natural Resources Management in Watersheds of Georgia	USAID		Dec-14	Oct-18
Germany	Evaluation of River Engineering and Sediment Management Concept for the Tidal River Elbe	WVS and HPA		Dec-14	Jul-15
Netherlands	Experimental Investigation of Water Fluxes within the Soil-Vegetation System Using Isotopes to Improve Water Use Efficiency (WUE)	IAEA		Oct-12	Apr-15
	Uncertainty in modelling	Cross-funding Floodsite		Mrt-13	Mrt-14
	Novel Methodologies for Evaluation of Fouling Reduction of Desalination Membranes	WaterResearch Foundation (WRF)		Aug-13	May-16
	Morphological Acceleration factor Study	DeltaRes		Oct-13	Jan-15
	A novel bioprocess coupling wastewater treatment with electricity production to remediate metal polluted aquatic environment	EC-FP7-People		Mrt-14	Feb-16
	Anaerobic Methane Oxidation	Wageningen University		Jun-14	Jan-15
	Climate Proof Cities	Kennis voor Klimaat	TUD, Deltares, WUR, KWR	Oct-14	Oct-18
	IWRM-NET IMPACT	Leibniz Institut		Nov-14	Aug-16
Saudi Arabia	Center for Soil, Water and Coastal Resources	KAUST-GRP	Many other partners	Jan-13	Jan-16
Serbia	Comparative and Strategic Analysis for Future Water Supply of Vojvodina	EVD	Royal Haskoning, Vitens, AquaDelft	Feb-14	Aug-15
	Arsenic Removal from Drinking Water	SenterNovem	TU Delft,Vitens, Haskoning, 2 Serbia Water Supply companies	Aug-14	Aug-17
Spain	Multi-stakeholder platform for interactive decision making in the Andarax River Basin	Agencia Andaluza Agua	Universidad de Almeria	Jan-13	Jan-15
Tanzania, United Republic of	Development of Resilient Agro landscapes to Climate Change in Tanzania	DGIS-UPaRF	Sokoine University of Agriculture	Oct-14	Jul-16
United States	Master of Science Programme	Government of North America		Jan-14	Jan-16
Uzbekistan	Assessment of applicability of an equitable and sustainable financing model for agricultural water services in the agricultural sector of Uzbekistan	DGIS-UPaRF	AIT	Jul-14	Jul-16
Zimbabwe	Emerging Alternative Institutional Forms for Managing Domestic Water in Zimbabwean Urban Areas	DGIS-UPaRF	Univ. of the Western Cape	Oct-14	Jul-16
Various Countries	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).	Feb-10	Feb-15
	SWAT Development Activities			Jan-12	Dec-14
	Flood Vulnerability Indices in low headed hydropower	EC FP7-Cooperation		Feb-12	Feb-16
	River basin twinning initiatives as a tool to implement EU water initiatives	EC-FP7-Cooperation	VITUKI, Soresma, PIK, BOKU	Jun-12	Jun-15
	In Search of Sustainable Catchments and Basin-wide Solidarities – Transboundary Water Management of the Blue Nile River Basin	NWO-WOTRO	IWMI	Jul-12	Jul-16
	Localised environmental and health information services for all	EC-FP7-Cooperation	Instituto superior tecnico, project automation, BICOCCA, Aria Technologies, Esaproject , etc	Sep-12	Sep-15
	Upscaling small-scale land and water system innovations in dryland agro-ecosystems for sustainability and livelihood improvements	DGIS-UPaRF	USDM, UKZN, IWMI, TUD, SEI, SU	Sep-12	Sep-16
	Partnerships in the Water Supply and Sanitation Sector	DGIS-UPaRF	KNUST,SUEZ, VITENS, NWSC	Sep-12	Jun-16
	Integrated approaches and strategies to address the sanitation crisis in unsewered slum areas in African mega cities	DGIS-UPaRF	Makarere University, Kampala city council	Sep-12	Sep-16
	The ecology of livelihoods in East African wetlands: wetland conservation and utilization in the context of local and global change	DGIS-UPaRF	UvA, University of Nairobi, Egerton University, VIRED	Sep-12	Sep-16
	Sediment,sediment transport from reservoirs to estuaries	DGIS-UPaRF	NHRI, HRI, Deltares, SKLEC, Hohai	Oct-12	Oct-16
	Low-cost drinking water treatment in developing countries: use of indigenous materials and affordable adsorbents	DGIS-UPaRF	Kwame Nkrumah University of Science and Technology, Makarere University	Nov-12	Dec-16
	Risk-based operational water management for the Incomati River Basin	DGIS-UPaRF	Mondlane University, KOBWA	Jan-13	Sep-17

RESEARCH AND DEVELOPMENT

COUNTRY	TITLE	FUNDING	PARTNERS	START	END
Various Countries	Zero chemical UF/RO system for Desalination:Development of the next generation zero chemical consuming UF/RO water treatment system for production of drinking and industrial water from salt and brackish waters	SenterNovem	Evides, Membrane Technology Group, Vitens	Jan-13	Jan-16
	Hydrologic Impacts of Land Use and Landcover changes in the Kilombero River Basin Tanzania	DGIS-UPaRF	UDSM	Jan-13	Dec-15
	Postdoctoral Research Programme on Adaptation to Climate Change – Special Focus on the Mekong River Basin	DGIS-UPaRF		Mrt-13	Apr-15
	Decentralised Integrated Analysis and Enhancement of Awareness through Collaborative Modeling and Management of Flood Risk	ERA-Net CRUE	Imperial College London	Apr-13	Feb-15
	Collaborative Management System on Watershed Vulnerability (eWaterAbility)	EC-FP7-Cooperation	WMO, C3I, SWAT, EAWAG, JRC, IISD, UN-IIST, CERN, CRS4, Univ. of Geneva	Apr-13	Apr-17
	Development of rehabilitation technologies for degraded waters and the integration of their impact in waterbody management	EC-FP7-Cooperation	Politecnico di Torino, Univ. Sheffield, Recetox, Ben Gurian, University of Wageningen, University of Stuttgart (VEGAS), ISODETECT, Sapion Milieuadvies, TUDelft, CTM Centre Tecnologic, HZM, GEUS,	May-13	Jul-17
	Intelligent Monitoring, control and Security of Critical Infrastructure Systems	COST		Jul-13	Jul-14
	Optimazation of water allocation between off-stream and in-stream competing demands	DGIS-UPaRF	UNPAR	Aug-13	Jan-15
	Impacts of variable oil prices on economic sustainability of water and wastewater facilities	DGIS-UPaRF	KNUST	Aug-13	Jan-15
	Development of an integrated low cost anaerobic/aerobic biological system for grey water treatment	DGIS-UPaRF	Sana'a University;Water and Environment Centre (WEC),	Aug-13	Jan-15
	Environmental flow regime in rivers as a tool for IWRM and RBM and climate change adaptation	DGIS-UPaRF	Birzeit University	Aug-13	Jan-15
	Hydrogeochemical characterization of the presence of arsenic in Argentina, Ghana and Palestine	DGIS-UPaRF	Inst of Environmental and Water Studies, Birzeit University	Aug-13	Jan-15
	Permeable reactive barrier for remediation of acid mine drainage	DGIS-UPaRF		Aug-13	Jan-15
	Water Resources Management Instruments Implementation by Water Basin Committees	DGIS-UPaRF	Fundación Ecuaciencias, UNIVALLE	Aug-13	Jan-15
	Allocation of groundwater to groundwater dependent ecosystems	DGIS-UPaRF	Makarere University	Aug-13	Jan-15
	Environmental Flows for People and Ecosystems in the Mara River Basin	DGIS-UPaRF	UDSM, Egerton, SUA, JKUAT, FIU, WWF	Aug-13	Aug-17
	Conserving Hydrological and Ecological functions through payment for watershed services, with special reference to South-central Bolivia	DGIS-UPaRF	CLAS-UMSS, FNB, VU amsterdam	Sep-13	Sep-17
	Benchmarking for Pro-poor Water Services Provision	DGIS-UPaRF		Sep-13	Jan-17
	Natural Systems for Wastewater treatment and reuse: technology adaptation and implementation in developing countries	DGIS-UPaRF		Sep-13	Aug-17
	Adaptation to Global change in Agricultural practices	DGIS-UPaRF	AIT, DOI	Sep-13	Aug-17
	Hydropower-to-environment water transfers in the Zambezi Basin: balancing eco-systems health with hydropower generation in hydropower dominated basins	DGIS-UPaRF	Waternet, Swiss Federal Inst of Tech, Eduardo Mondlane Univ, WWF	Sep-13	Jan-18
	Financing sanitation in slums: whose responsibility?	DGIS-UPaRF	UDSM	Oct-13	Dec-14
	Adaptation to Climate Change impacts on the Nile River Basin	DGIS-UPaRF	Univ. Dar Es Salaam, Makerere Univ. Addis Ababa Univ. Uni of Nairobi, NBCBN, HRI	Oct-13	Apr-15
	Salt and Brackish Water as Second Quality Water for Urban Environment	IRF	Birzeit Univ., KWR, Hong Kong	Oct-13	Jan-18
	Assessment of Charact of Wastewater flows from unsewered urban slums in African cities	DGIS-UPaRF	Kwame Nkrumah University of Science and Technology	Nov-13	Dec-14
	Development of a tool for flexible model architecture in hydrological modeling	STITPRO		Jan-14	Jan-15
	Climate change impacts on seasonally and intermittently open tidal inlets	DGIS-UPaRF	AIT, Univ of Moratuwa, Univ of Peradeniya, CSRO, FECT, Deltares	Jan-14	Jan-18
	Study of selection water problems in three delta cities within densely populated urban agglomerations.	DG water		May-14	Dec-14
	Impact of Untreated Wastewater on natural Water Bodies: integrated risk assessment	DGIS-UPaRF	Birzeit, WESI	May-14	May-18

RESEARCH AND DEVELOPMENT

COUNTRY	TITLE	FUNDING	PARTNERS	START	END
Various Countries	Study of selection water problems in three delta cities within densely populated urban agglomerations.	DG Water	Deltares, CPWC	May-14	Jan-15
	Tropical Constructed Wetlands for Wastewater Treatment	DGIS-UPaRF	Bangladesh University of Engineering & Technology	Sep-14	Sep-15
	Constructed wetlands with tropical plants for the treatment of landfill leachate	DGIS-UPaRF	Univeristy of Sao Paulo	Oct-14	Aug-15
	Integrating Social and Natural Systems in Enhancing Environmental Sustainability in the Middle Zambezi Valley	DGIS-UPaRF	Univ. of Cape Town, Polytechnic of Namibia	Oct-14	Jul-16
	Step Chlorination for Improving Drinking Water Disinfection System in Ghana and Palestine	DGIS-UPaRF	Birzeit Univ, KNUST	Oct-14	Jul-16
	Improved Drought Early Warning and FORecasting to strengthen preparedness and adaptation to droughts in Africa	EC-FP7-Cooperation		Nov-14	Nov-17
	Merging Hydrologic models and EO data for reliable information on Water	EC-FP7-Cooperation	AUT, Hidromod, IST, CPTEC, JRC, Skysoft, UEM	Jan-15	Jan-18
	"Knowledge-based approach to develop a prevention cULTUre of water related Risk"	EC-FP7-Cooperation	UniBs, ECMWF, UniLj, WSL, CORILA, KCL, JRC, AAWA, UniBris, Willis	jan-15	Jan-18
	Arsenic Removal for Drinking Water Production Susprise Proposal	SenterNovem	Vitens, TU Delft, Paques		

ADVISORY SERVICES

COUNTRY	TITLE	FUNDING	PARTNERS	START	END
Barbados	Studies for the preparation of the Barbados Coastal Risk Assessment and Management Program	IADB		Jun-14	Jan-15
China	EU-China River Basin Management Programme: Membership of the Programme Advisory Group	EU	DHV	Oct-11	Jan-16
Croatia	Development And Application Of Models And Guidelines To Facilitate Decision Making In The Extension Of Wastewater Treatment Plants (Wwtps) And To Increase Operational Efficiency Of Existing Wwtps	WB		Jul-14	Nov-15
Indonesia	Master Plan for Capacity Development for Ministry of Public Works	WB		Sep-13	May-14
Netherlands	Delft Spetterstad Fase 1	HH Haglanden	Deltares, Hoogheemraadschap Haaglanden, RO2	Jan-14	Mar-14
Netherlands Antilles	Flood modelling study of the joint stormwater catchment (Belle-Plaine) on St Maarten	National Government		Apr-13	Jan-14
Sao Tome And Principe	Adaptation to Climate Change: Geomorphology and Coastal Adaptation Study	WB	DeltaRes	Dec-14	Sep-15
Sudan	Operationalize Delft FEWS software for Flood Forecasting and Flood Early Warning System in Sudan	ENTRO		Jun-14	Dec-19
	South Sudan Identification Mission	DGIS-DUPC	Deltares	Nov-14	Feb-15
Turkey	Transposition of the Water Framework Directive and advice on the organisation of the Ministry of Environment and Forestry in Turkey	Agentschap NL		Feb-15	Apr-15
Various Countries	Scaling up micro irrigation systems in India, Madagascar and Honduras	EC-Coopernic		Sep-13	Jan-16
	Facilitator 8th Annual Mekong Flood forum	MRC		okt-13	jul-14
	Development of a Decision Support System for Selection of Sanitation Options	AsDB		dec-13	jun-14
YEMEN	Increasing Water Management and Productivity in the Tiham, Yemen	GOPA - Germany		mrt-14	aug-14

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 Wetenschappeljk Onderzoek
RNE	Royal Netherlands Embassy
SAIL	Capacity building programme through NUFFIC
SENTER	SenterNovem, Agentschap voor duurzaamheid en samenwerking (of Ministry of Economic Affairs)
V&W	Ministry of Transport, Public Works and Water Management
WB	Worldbank

49

RESEARCH LINES

THEME	CORE	RESEARCH LINE
Environmental Integrity	Freshwater Ecosystems	Planning for integrated river basin management
		Wetland management
		Environmental water allocation
	Pollution Prevention and Control	Cleaner production and pollution prevention
		Solid waste management
		Ecotechnologies (natural treatment systems, photobioreactors)
		Resource recovery (water, nutrients, minerals, energy)
Information and Communication Systems	Hydroinformatics	Modelling paradigms, uncertainty and risk
		Systems engineering and optimisation
		Collaborative decision making and Internet-based computing and learning
		Applications of integrated hydroinformatics systems in water management
Urbanisation	Water Supply Engineering	Water transport and distribution
		Ground water treatment
		Natural treatment systems
		Conventional water treatment technology
		Desalination & membrane related technology
	Sanitary Engineering	Advanced nutrient removal processes
		Activated sludge modeling
		Resources-oriented sanitation
		Membrane bio-reactors
		Water/wastewater infrastructure asset management
		Optimization of wastewater collection and treatment components
		Integrated urban water infrastructure management
Water Management and Governance	Capacity Building	Institutional analysis and reform processes
		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
Water Security	Hydraulic Engineering and River Basin Development	Hydraulic structures and hydraulic processes
		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
		Integrated lowland development
	Hydrology and Water Resources	Global change impacts on hydrology and water resources
		Physical and biogeochemical processes of groundwater systems
		Ecohydrology

ANNEX 6 | PUBLICATIONS

4

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33

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184

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119

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7

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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
Rotterdam Philharmonisch Orkest
Slagerij van Kampen
Troubleyn | Jan Fabre performing arts

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1999 Prof. M. Abu Zeid, PhD
1998 Prof. W.A. Segeren, MSc
1998 R. Moochtar, MSc
1996 Prof. J.W.M. la Rivière, PhD, MSc
1993 M.F. Strong, PhD
1992 Prof. J.C.I. Dooge
1990 Prof. L. Huisman, PhD, MSc
1985 Prof. L.J. Mostertman, MSc
1976 Prof. W.F.J.M. Krul
1968 Prof. J.Th. Thijssen, MSc

ANNEX 8 | UNESCO-IHE & NETHERLANDS ALUMNI ASSOCIATIONS

UNESCO-IHE alumni perform a vital role as 'ambassadors' to the world. The establishment and strengthening of the UNESCO-IHE Alumni Network is essential to promoting and facilitating knowledge dissemination, including the exchange of professional expertise and personal experience between alma mater as well as amongst Alumni. These independent Associations organise various activities in their country.

Prospective candidates are suggested to contact the local Alumni Association before they leave their own countries. UNESCO-IHE fervently encourages all its Alumni to partake in the Institute's aim to deepen and strengthen Alumni networking world-wide.

ARGENTINA

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

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