

ANNUAL REPORT

UNESCO-IHE
Institute for Water Education



2009



UNESCO-IHE is the largest international post-graduate water education facility 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. Over 100 PhD fellows are currently enrolled in water-related research. The Institute carries out numerous research and capacity development projects throughout the world.

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 building 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 issues and challenges faced by many countries around the world.

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RECTOR'S STATEMENT

WINDS OF CHANGE BLEW THROUGH THE INSTITUTE IN THE REPORTING PERIOD

After successfully serving as founding Rector of UNESCO-IHE for six years, Professor Richard Meganck retired in the middle of the year. Once again, I would like to take this opportunity to thank him for his dedication and leadership. Many important initiatives were started during his tenure. Those initiatives already bear fruits now or will in the near future. One of them doubtlessly is the full SENSE review the Institute was subject to over the past two years.

When the Director-General of UNESCO nominated me to become Rector last August, I made it a personal commitment to travel from Paris to Delft as soon as possible. (I served in Paris for some time as Secretary of UNESCO's International Hydrological Programme.) New challenges awaited me when I joined the Institute on 15 September. Already on the following day, the external evaluation committee of the SENSE Research School held its concluding meeting. They wanted to hear from the Rector what his views and plans were. In no time, I found myself in the hot seat. "In which directions do you want to take the Institute? What are the research priorities and how do you plan to establish them? Is this the right organisational structure or do you need to adapt to changes that have taken place? If so, how do you plan to do that?" These were some of the 'easy' questions asked. Luckily, I escaped with my feet dry. However, this encounter triggered some fresh thinking about the need to find new adaptation strategies for the decade ahead. The SENSE visit was, therefore, very productive. We are all thankful to the Committee for the excellent job done and for showing us a mirror as to what we are and what our current position is in the field of research. It is heartening to note that the Institute came out with an excellent report card.

We indeed have a very special place under the sun, since the people whom we are to serve are the ones who need water and sanitation services the most. Our niche, as a United Nations entity, is to help people in the developing world to help themselves achieve the Millennium Development Goals. Our niche is to help and empower them with knowledge through and by water research, education and capacity development. Our niche is to do all this through partnership and cooperation in a coordinated fashion. It is a pleasure to report that things are moving in the right direction in this regard. We completed the first year of partnership programmes, DUPC, with a growing network of partners in developing countries. We have enlarged the scope of cooperative arrangements with UNESCO Category 2 water centres, with a number of major universities, such as the Beijing Normal University in China, Wageningen University in the Netherlands and the University of Khartoum in Sudan. We were able to secure fellowships for over 200 new MSc students. For the

first time we have crossed the threshold of having more than 100 PhD participants. We have started the implementation of the refurbishment plan; some parts of the building have already gone through the necessary face-lift. And as you will see in this report, we have reached a positive financial balance as well, enabling us to replenish our reserves.

In November, a milestone meeting of the Governing Board was held. The Board adopted a major decision to start with the development of a new comprehensive strategy for the 2010-2020 period. The Board also decided to expand the activities and impact of the Institute in order to meet the challenges ahead. To this end processes were started including everyone at the Institute. We continued to have excellent working relations with members and leaders of both the UNESCO-IHE Governing Board and the IHE Foundation Board, respectively. Likewise, our relations with relevant authorities of our host country are outstanding. We are thankful for the continued, and increased, support of the Dutch Government. The City of Delft has also helped us in many regards.

Even though we are doing fine, we must stay alert to make sure that development in places where it is needed most, does not suffer from unnecessary cutbacks due to the current global economic situation. Assuming that global peace will be preserved, it is water that is likely to be the issue of the 21st century. It is water that is the principal vector of the impacts of climate variability and change. It is water that causes and carries most of the diseases. It is water that causes the most damage through disasters and it is water that three billion people share in a transboundary context. And it is the developing countries and countries in transition that are lacking water and water services for their sustained development. It is in these areas, therefore, where the Institute is needed the most.

We need to expand our impact and reach out. As you may know, due to resource scarcities, only one out of ten qualified students was admitted to the Institute last year. Nine are still out there, unserved. Clearly, we must change this. Alone, however, we cannot achieve this change. We need your help in doing this together.

With these thoughts, it is my great pleasure to present to you the 2009 Annual Report of the UNESCO-IHE Institute for Water Education.

Professor András Szöllösi-Nagy, PhD, DSc
Rector

2009 AT A GLANCE

UNESCO-IHE IN NUMBERS

- 157 full-time equivalents, 53% academic and 47% supporting staff
- 4 Water and Environment related Master's Programmes with 15 specialisations
- 199 new MSc participants
- 172 MSc degrees awarded
- 105 registered PhD fellows
- 13 PhD graduations, 2 with distinction
- 221 professionals in 39 regular short courses
- 331 participants in 14 online courses
- 340 professionals in 19 tailor-made training courses
- 2 refresher seminars held for alumni
- 298 scientific publications
- 146 capacity development projects

Total turnover of €31 million, overall positive result of €180,000



EDUCATION

- Fifteen new online course modules were developed jointly with partner institutes.
- The first online courses received ECTS points.
- The Basic Teacher Qualification training courses commenced, 15 academic staff enrolled.
- The double degree programme in Urban Water Engineering and Management with the Asian Institute of Technology in Thailand started.
- Egerton University in Kenya took over four months of the Limnology and Wetland Ecosystems specialisation.
- The design of joint programmes with Kwame Nkrumah University of Technology (Ghana), Universidad del Valle (Colombia), University of Sao Paulo (Brazil) and Ain Shams University (Egypt) was started.
- Two Erasmus Mundus proposals for joint MSc and PhD programmes were approved.





RESEARCH

- There were a record number of registered PhD fellows.
- There were a record number of PhD graduations, of which two with distinction.
- Two new cores of 'Water Supply Engineering' and 'Sanitary Engineering' were established.
- The Dutch SENSE research school positively evaluated the Institute's research.
- Within the SWITCH research project, 9 PhD and 12 MSc participants were active at UNESCO-IHE, and SWITCH-in-Asia was launched. The SWITCH Global CityWater Futures Summit was held at the Institute.
- The PRoACC post-doctoral research programme on climate adaptation started.
- The internal UNESCO-IHE Partnership Research Fund (UPaRF) funded 10 large and 11 small projects with about € 3.8 million, involving 38 partner institutes from 25 countries.
- A first-ever UPaRF call was organised in which partners could submit proposals as lead agencies.
- A renewed MoU with Wageningen University was signed.



CAPACITY DEVELOPMENT

- At the 5th World Water Forum, the Institute coordinated the topic on 'Education, Knowledge and Capacity Development', and co-convened a session on 'Strengthening the Capacities of Local Organisations and People'. UNESCO-IHE contributed the paragraphs on 'Knowledge & Capacity Development' to the third World Water Development Report, launched at the forum.
- The 'Training and capacity building for the water and wastewater sector in Iran' project trained a total of 3000 people, organised fieldtrips for close to 400 senior sector staff, and developed 60 one-week training course curricula on water supply and sanitation.
- Several large-scale capacity development projects started, including the NPT Ethiopia project and the Lake Victoria Water and Sanitation Initiative.





'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. Through this framework, UNESCO-IHE aims to further strengthen its relevance and connectivity to the water sector from the international to the local level. This dynamic partnership provides for a strong coalition of water sector institutes, which join forces and mutually strengthen each other to serve the water sector better.

PARTNERSHIPS AND NETWORKS





In 2009, the Institute has made considerable 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. A double degree programme in Urban Water Engineering and Management started with the Asian Institute of Technology in Thailand, and two other joint programmes are being developed. Egerton University (Kenya) took over four months of the Limnology and Wetland Ecosystems specialisation that is jointly given with the Mondsee Institute for Limnology (Austria). The existing joint programmes with Hohai University (China), Sriwijaya University (Indonesia), and Dundee University (UK) were continued, while the planned shared programmes with Kwame Nkrumah University (Ghana), Universidad del Valle (Colombia), University of Sao Paulo (Brazil), Ain Shams University (Egypt), and Algarve University (Portugal), among others, moved closer to realisation. The Education chapter has more information on these programmes.

In 2009, lecture material for fifteen **new online course modules** were developed jointly by teams from UNESCO-IHE and partner institutes. These modules will be shared among the partners in an online educational environment. In 2009, UNESCO-IHE 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 world water sector and combining the strengths of the different partner institutes. In 2009, UPaRF allocated funding for ten new large research projects involving a total of 34 partner institutes from 22 countries. Another eleven smaller research projects were started with a total of 13 partner Institutes from twelve countries. In 2009, a special call was organised for the first time in which partners could submit proposals as lead agencies. Seven post-doc researchers from partner institutes were recruited for a dedicated research programme on adaptation to climate change in the Mekong river basin.

Ties with UNESCO were further intensified. The Institute hosted the United Nations Inter-Agency Annual Meeting on Knowledge Sharing and Information Management. UNESCO-IHP's 'From Potential Conflict to Cooperation Potential' programme played a vital role in the delivery of the MSc specialisation in Water Conflict Management, in which UNESCO's Centre for Water Law, Policy and Science at Dundee is also involved. The Institute organised the UNESCO Water Education regional workshop for North America and Europe. At the 5th World Water Forum, UNESCO-IHE co-coordinated the topic on Education, Knowledge and Capacity Development, which fell under the UNESCO-coordinated theme. The third World Water Development Report - presented at the forum - contained the Knowledge & Capacity Development paragraphs that were contributed by UNESCO-IHE. The Institute collaborated and developed joint activities with various water centres of UNESCO. Examples are the International Centre for Water Hazard and Risk Management (Japan), HidroEx Institute for Applied Water Science (Brazil), and the University of Dundee's UNESCO Centre for Water Law, Policy and Science (UK).



UNESCO-IHE has bilateral partnership agreements with more than 40 public and private organisations in support of shared interests in education, research and capacity building. The following Institutional Agreements were signed in 2009:



Wageningen University, The Netherlands

Signed: February 2009

Goal: Collaboration in the joint supervision and promotion of PhD-fellows.

Water Board 'Stichtse Rijnlanden', The Netherlands

Signed: February 2009

Goals: Making the knowledge, experience and skills with regard to water management accumulated by the Water Board available to individuals and organisations working the water sector worldwide. This is to be achieved through involvement of the Water Board in regular and tailor-made training organised by UNESCO-IHE, and through cooperation in research at the MSc and PhD level.

University of Khartoum, Sudan

Signed: March 2009

Goals: Collaboration in short courses, research and capacity development projects, and training of staff from the University of Khartoum at UNESCO-IHE.

BILATERAL PARTNERSHIPS

Cap-Net, South Africa

Signed: July 2009

Goals: Joint capacity building activities such as the implementation of training-of-trainers programmes, the development of lecturing tools, case studies, lecture notes etc. in the areas of water utility management, river basin management, adaptation to climate change and water resources assessment.

International Spate Irrigation Network, The Netherlands

Signed: July 2009

Goals: Cooperation in research, capacity building, and the organisation of seminars in the field of flood-based irrigation.

Beijing Normal University, China

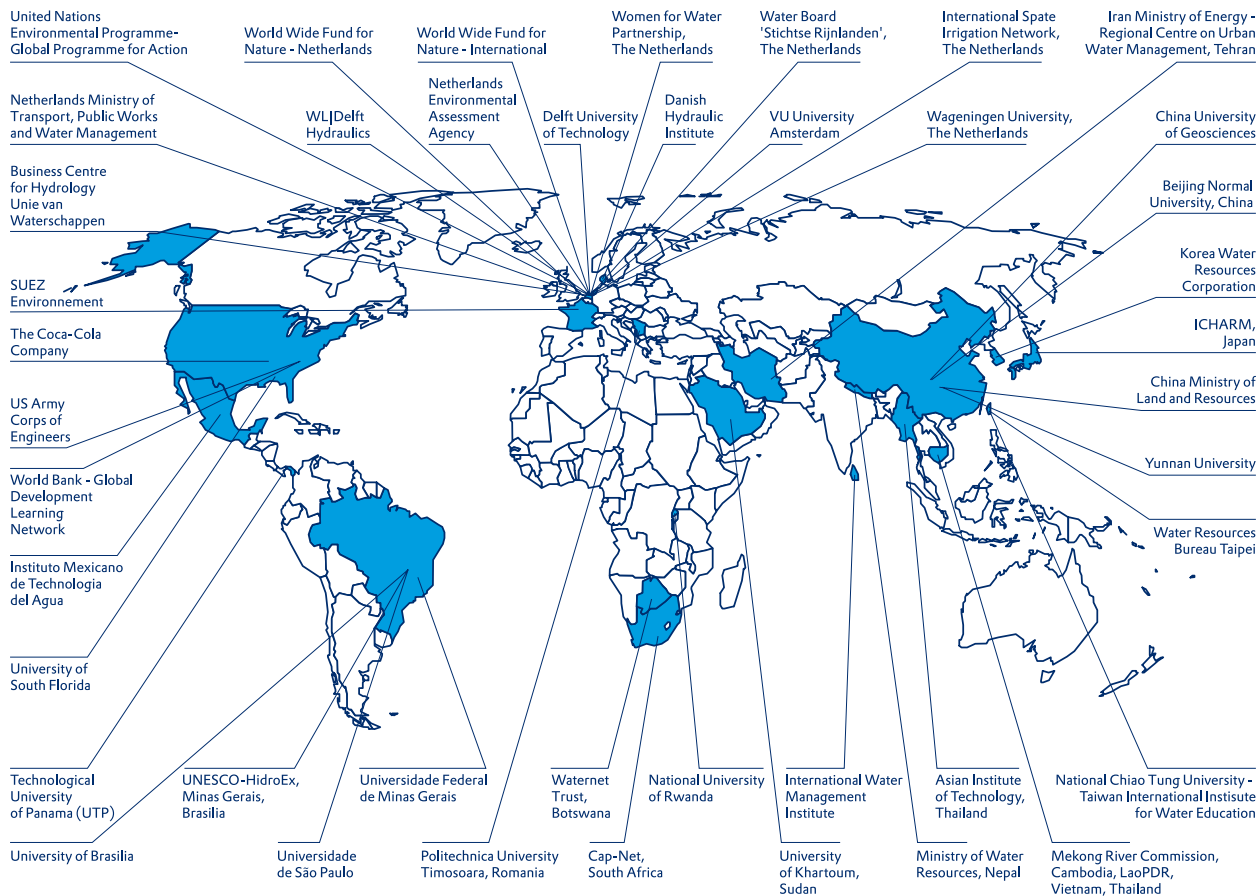
Signed: October 2009

Goals: Promotion of academic cooperation between both institutions, including the exchange of students and staff for joint research and learning. The ambition is to develop a joint PhD programme, also involving the Chinese Education Council.

Women for Water Partnership, The Netherlands

Signed: November 2009

Goals: Cooperation in the fields of capacity development, sustainable development and knowledge transfer related to IWRM and equity mainstreaming. The cooperative alliance will aim at enhancing women's participation and "practice on the ground" components in the education programmes of UNESCO-IHE and its academic partners.



A partnership seminar was hosted by UNESCO-IHE to disseminate information about the MoU with the **Dutch Ministry of Transport, Public Works and Water Management (V&W)**. Activities under the MoU are in line with V&W's international scope. They aim at knowledge sharing, especially with delta countries. At the seminar, collaboratively generated past projects were evaluated, and future project ideas were generated.

A joint PhD research programme with the Yellow River Conservancy Commission on North China and the Yellow River was launched, supporting three PhD studies. One of these PhD studies is entitled 'Parameterisation of surface and subsurface runoff hydrological processes in land surface models with emphasis on north China and the Yellow River basin,' and aims to improve the representation of surface and subsurface hydrological runoff processes in land surface parameterisation schemes. Other projects and activities undertaken in 2009 in the framework of the MoU were the Research MSc on Climate Change Impact on Mangroves, funding for MSc students by V&W and the Yangtze and Yellow River Commissions, and collaboration in the double degree programme on lowlands between UNESCO-IHE and Sriwijaya University, Indonesia.

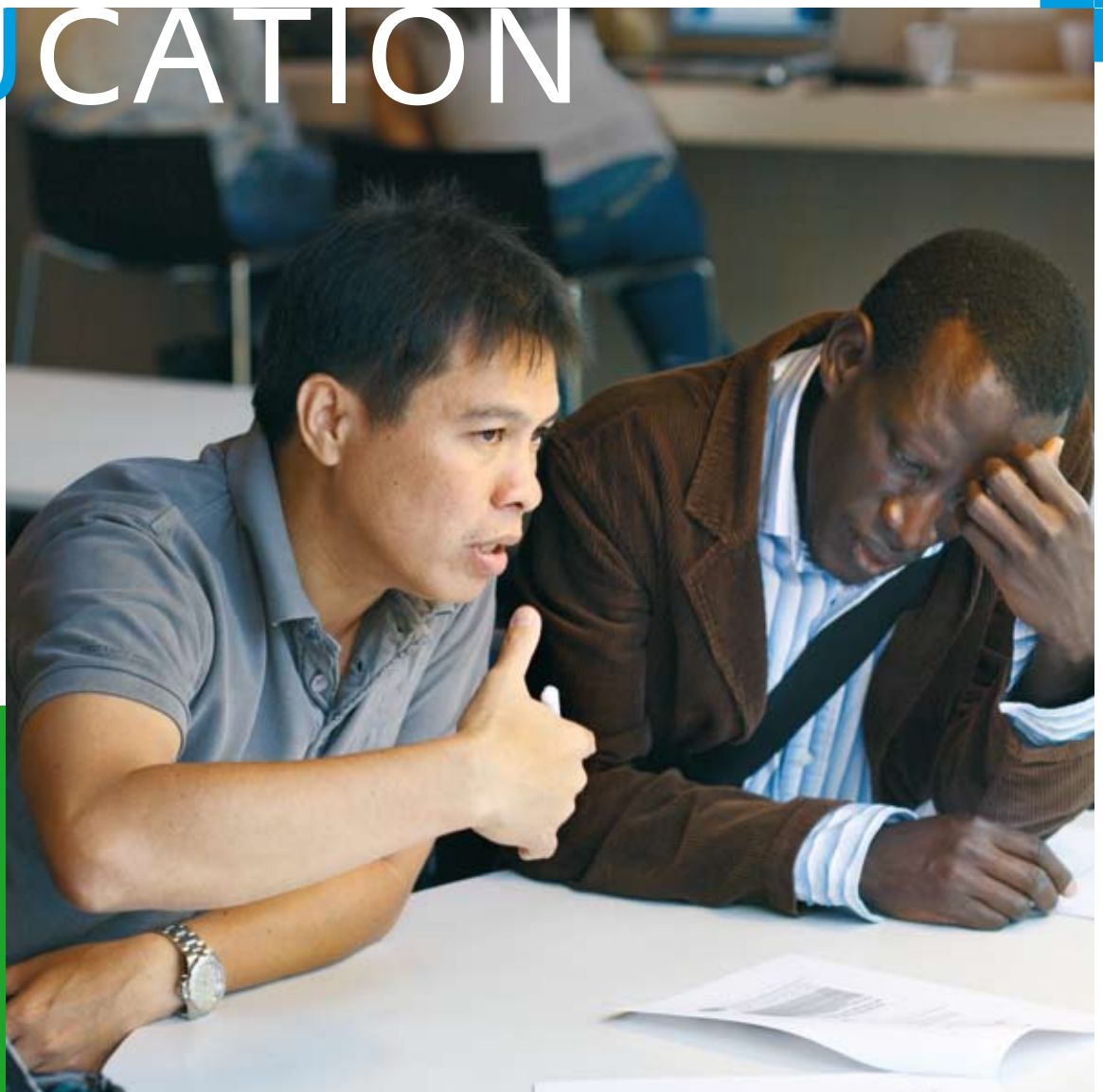
Cooperative activities under the MoU are expected to grow in the near future. In particular, 'Water Mondiaal,' the international agenda of the Dutch National Water Plan, will lead to new initiatives in Indonesia, Bangladesh, Vietnam, Egypt, and Mozambique. The MoU will be evaluated for renewal in 2010.



UNESCO-IHE offers a wide range of accredited educational programmes for engineers, 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 fifteen specialisations, a PhD programme, short and online courses, and tailor-made training courses.

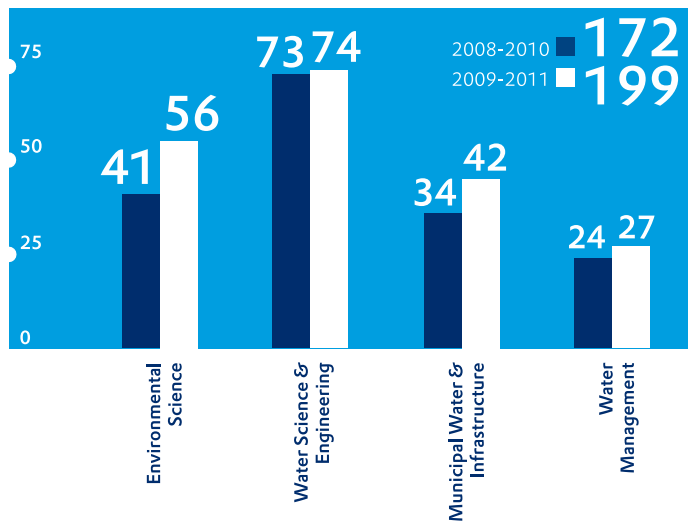
EDUCATION



The Institute's number of students in all educational programmes went up as compared to 2008. The number of MSc participants starting their programme went up by 15%. There were 331 participants in online courses in 2009, compared to 168 in 2008.

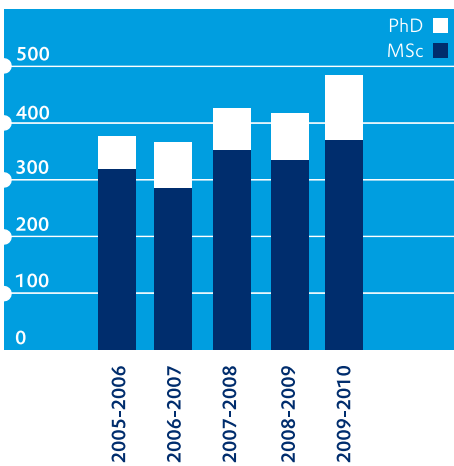
NUMBER OF MSc PARTICIPANTS

Participants | Academic period



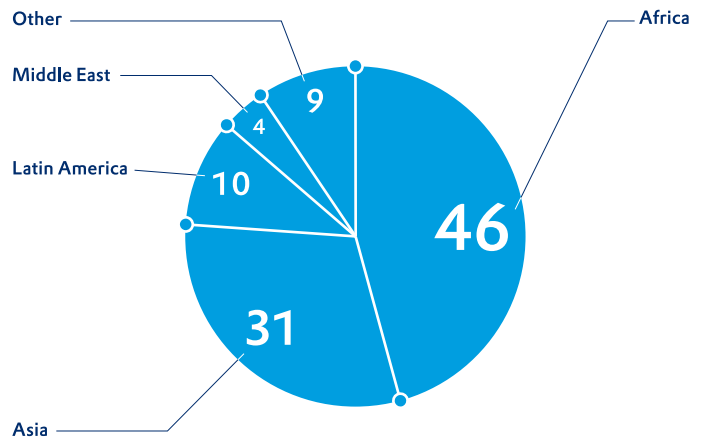
NUMBER OF DEGREE PARTICIPANTS

Participants | Academic year



REGIONAL DISTRIBUTION OF PARTICIPANTS ACADEMIC YEAR 2009-2010

Percentage





In 2009, in an effort to increase **integration, efficiency and flexibility** of the MSc programmes, the organisational aspects of sharing electives across specialisations were resolved. This includes the sharing of common modules at the start of the programme, and a wider range of electives later on in the year. The process is due to start in 2010, allowing MSc participants to follow a programme more tailored to their educational needs.

Lecture material for 15 new **online course** modules were developed jointly with partner institutes. In 2009, the first two online courses received European Credit Transfer System points; more online courses will follow. This enables participants to use the credits for a full Master programme.

The double degree programme in Urban Water Engineering and Management with the **Asian Institute of Technology** in Bangkok was launched in October 2009, replacing the Delft-based Integrated Urban Engineering specialisation. Worldwide, this is the first specialisation in urban water management that covers the whole water cycle, addressing engineering, management and institutional aspects.

UNESCO-IHE made significant investments in 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. This also allows for the capacity of water education worldwide to be further developed.

EDUCATION

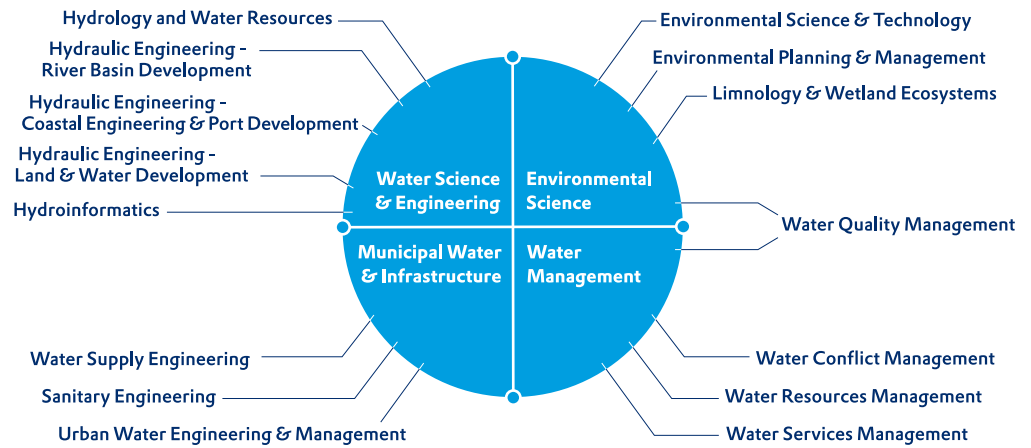
In 2009, **Egerton University** in Kenya took over four modules of the joint specialisation on Limnology and Wetland Ecosystems. For years, this specialisation had been offered jointly by UNESCO-IHE and the Austrian Academy of Sciences, but the capacity of staff at Egerton University was strengthened so that they can now take over the modules on 'Lake Ecology', 'Stream and River Ecology', 'Wetlands for Water Ecology', and 'Fisheries and Aquaculture'.

The two-year double degree Master of Science programme on Integrated Lowland Development and Management Planning was set up in 2007 by UNESCO-IHE in collaboration with **Sriwijaya University** in Indonesia. In October 2009, the first group of participants graduated from the double degree programme, consisting of ten students originating from Indonesian Ministries and government services at the national, provincial, district and municipal levels. The second group of participants also consists of ten students and started in February 2009.

In 2009, discussions were conducted with several **partner institutes** to look at the feasibility of starting additional joint programmes in 2010 and beyond. Most of them concern the decentralised delivery of existing specialisations offered in Delft. This is the case for Hydroinformatics with Universidad del Valle (Colombia) and Ain Shams University (Egypt), for Water Supply and Sanitation with Universidad del Valle and Kwame Nkrumah University of Technology (Ghana), and Land and Water Development with AIT (Thailand). A new programme in development is the MSc in Ecohydrology with the Algarve University (Portugal). This programme was submitted to the EC Erasmus Mundus programme and positively evaluated.



MASTER PROGRAMMES AND SPECIALISATIONS OFFERED IN 2009



The hours available for the Quality Manager position were expanded, and a new staff member was hired to ensure the maintenance of **academic standards** and enhance the professional reputation and accreditation of the Institute. A Quality Assurance Plan was developed with the main recommendations: to improve and automate satisfaction surveys of educational programmes, to ensure copyright clearance in the lecture materials used at the Institute, and to develop a systematic approach to set up joint and double degree programmes. This plan was approved by the Governing Board in November.

Additionally, for Quality Management purposes, as well as guiding the process of education innovation - including aspects of flexibility and cooperation with partners - the Institute developed Terms of Reference (ToR) for an **Educational Bureau**. The Institute's Board approved the ToR in November. This bureau will comprehensively support the development and assure the quality of educational programmes.

The **Moodle open source learning environment** was chosen as the platform on which all future educational activities will operate. This aids the facilitation of collaborative educational activities between partners by eliminating difficulties over time and space.

UNESCO-IHE organised two **refresher seminars** for its alumni. The seminar entitled 'The Ecology of Livelihoods in African Wetlands' was held in Kenya, whilst the seminar 'Disaster Management of Urban Water Systems under Climate Change' was given in Thailand.



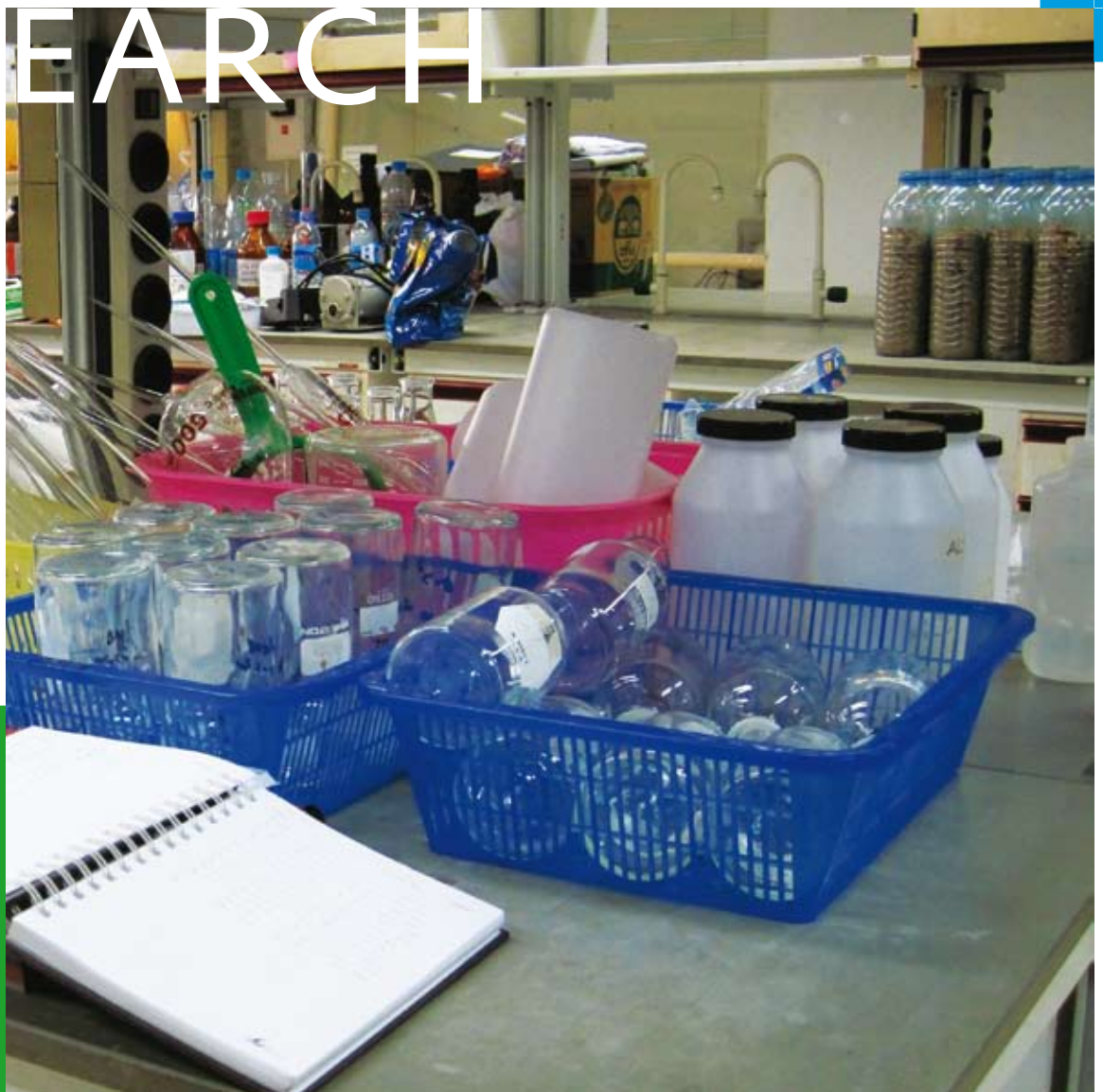
The second batch of participants in the **Water Conflict Management specialisation** (WCM) of the MSc programme in Water Management commenced their studies in October 2009. The WCM specialisation provides participants the opportunity to familiarise themselves with the theoretical background of scientific, legal and institutional aspects of water management, giving them a range of tools to apply the acquired knowledge, critically assess the different functions of existing water resources systems, and more effectively design comprehensive policies and strategies for water.

Participants come from various disciplines dealing with local, national and international water management, including water managers as well as experts in institutional and legal international relations. The specialisation breaks away from the traditional disciplinary approach. Two modules within the specialisation are also available as a short course - one on negotiation, another on mediation. They are in high demand. The specialisation is given in collaboration with the University of Dundee in the UK, the Clingendael Institute of International Relations in The Hague, and UNESCO's PCCP programme.



UNESCO-IHE centres its education, research and capacity development programmes around Water Security, Environmental Integrity, Urbanisation, Water Management and Governance, Information and Communication Systems. These themes, and how they relate to the Institute's cores and research lines, are presented in Annex 5 | Research Themes. 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. Annex 4 | Projects contains a complete list of projects started, ongoing or finished in 2009.

RESEARCH



In 2008, the programmatic cooperation with DGIS began. A large part of this collaboration entails research, and to this end the internal **UNESCO-IHE Partnership Research Fund (UPaRF)** was founded. Besides financial resources from the DGIS collaboration, UPaRF also contains some 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. The 2009 UPaRF call delivered 30 pre-proposals, of which 10 full proposals were funded in the end. A first call for partner-driven projects resulted in 18 accepted proposals, of which 11 received funding. A total of about €3.8 million was awarded to these research projects in 2009. 38 institutes from 25 countries are involved in the 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 2009. More information on the 13 PhD graduations - two of whom were awarded a degree with distinction - and on the 105 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 2009, the Institute's research activities were also funded by agencies including the European Commission, NWO-WOTRO, US Army Corps of Engineers, and the World Wide Fund for Nature.

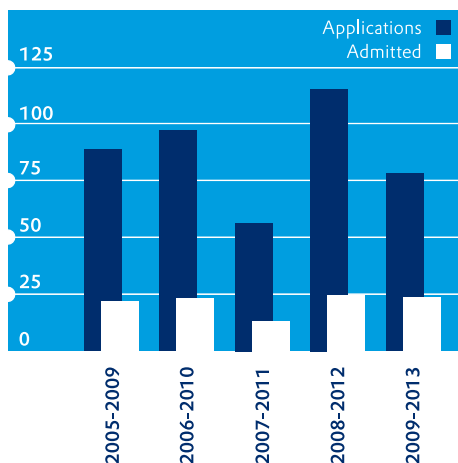
The **SENSE Research School** for Socio-Economic and Natural Sciences of the Environment is a joint venture of the environmental research institutes of selected Dutch universities. SENSE strives to be a high-quality school

for researchers, where disciplinary and multidisciplinary approaches are developed and taught for the support of scientifically based and effective environmental policies. UNESCO-IHE is a full member of the SENSE research school, and the SENSE Review Committee visited the Institute in September 2009 to carry out an audit of the research activities of the academic cores. This audit was based on self-evaluations that the cores prepared earlier in the year, and the outcome of the review was positive.

The number of **scientific publications** produced by the Institute's academic staff continued to grow. After a number of consecutive years in which the number of journal articles increased substantially, this number stabilised in 2009. This year, the increase was in the number of papers in proceedings, which is an illustration of the Institute's efforts to disseminate results among diverse audiences throughout the international water arena. A complete list of publications is located in Annex 6 | Publications.

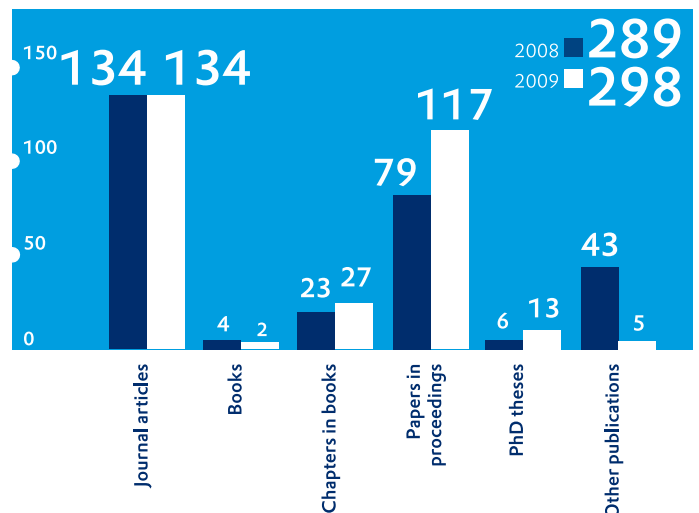
To **strengthen the recognition for sanitation** as one of the important elements of achieving the MDGs, and to stimulate research activities related to the subject, the two new core groups of 'Water Supply Engineering' and 'Sanitary Engineering' were created. This replaces the structure in which there were cores for 'Sustainable Urban Infrastructure' and 'Urban Water Supply and Sanitation'. A Professor of Sanitary Engineering and a part-time Professor of Environmental Wastewater Engineering were appointed. A professor to chair the Water Supply Engineering core is still being recruited.

NUMBER OF PHD APPLICATIONS AND ADMITTED PHD STUDENTS



RESEARCH OUTPUTS

Outputs | Year



RESEARCH

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.

The EC-sponsored research project entitled '**Increasing Water Management and Productivity in the Tiham**, Republic of Yemen' analysed the technical structure and institutional setting of the 20,000-hectare Wadi Mawr spate irrigation system. A strategy was developed for establishing Water Users Associations (WUAs). Ten pioneer WUAs were established, and local staff continued with the establishment of 15 more WUAs based on the experience gained from the pilots.

Development continues on the **XBeach** open source modelling system for predicting storm impacts in complex situations, including dune erosion, flooding, and breaching of barrier islands. The system was tested extensively, and is now accepted as an advanced tool for predicting storm impacts on coastal zones. The US Geological Survey and Deltares are involved in the further development of the system. Because of its open nature, it is readily used in research projects, such as MICORE, a large EU project that develops probabilistic mapping of the morphological impact of marine storms, and produces early warning and information systems to support long-term disaster reduction, but also in assessing coastal hazards in Australia, including coral reef environments.

WATER SECURITY

In 2009, preparations for the implementation of the **PRoACC** post-doctoral research programme commenced. This project focuses specifically on the challenges posed on the water sector by climate change, and concentrates on the Mekong River basin area. Seven post-docs were selected and will start their research in April 2010 for a period of 18 months. This project entails multidisciplinary cooperation with many educational and institutional partners in the Mekong countries.

The **EXACT** project 'Small-scale Water Treatment and Artificial Recharge', which had a total budget of €2.3 million and was funded by DGIS, was concluded in 2009. The principal partners within the project were the Ministry of Water and Irrigation of Jordan, the Palestinian Water Authority and the Israeli Water Authority. In the water treatment portion of the project, the following was achieved: a demonstration-scale pilot plant for iron removal from groundwater at Baqa (Jordan) is in operation, a demonstration-scale pilot plant for chromium removal in Holon (Israel) is also in use, and the rehabilitation of a slow sand filter at the Aqbat Jabar water treatment plant (Palestine) was completed. Concerning artificial recharge, the following was achieved. In Jordan, four artificial recharge dams were completed and monitoring started. In Palestine, tender documents for the construction of an artificial recharge dam were prepared; the offers from four contractors will be evaluated in April 2010.

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 research project '**Low Cost Drinking Water Treatment**' studies indigenous materials for surface and groundwater treatment, and includes one PhD study and a total of eight MSc studies. Partners in the project include Makerere University (Uganda) and KNUST (Ghana). A partner workshop was conducted at the Institute to discuss the progress of the project and come up with future project proposals. In 2009, the PhD study on fluoride removal commenced, and two MSc studies were completed - one on fluoride removal, and one on sand filtration.



The '**Alexandria Lake Maryut Integrated Management** project' was concluded in 2009. UNESCO-IHE provided support in the development of mathematical models of the hydrodynamic and ecosystem dynamics in the lake, aimed at promoting a sounder and more sustainable development pattern in the coastal zone of Alexandria. During a final meeting in Alexandria, results were shared and the models were handed over to the Egyptian Environmental Affairs Agency and the National Authority for Remote Sensing and Space Sciences, where they will be installed for central use in the newly established management and monitoring unit.



Slums have a large impact on eutrophication of freshwater resources, with enormous economical consequences.

The **SCUSA** project aims to develop socially, environmentally and financially sustainable sanitation systems for urban slums in Sub-Saharan Africa. Partners involved are Makerere University and the Kampala City Council, both in Uganda. In 2009, three PhD students finalised their PhD proposals, and presented them at the WaterNet conference in Uganda. UNESCO-IHE hosted a seminar in which all partners discussed the SCUSA project. Several articles were published in peer-reviewed journals. Two smaller UPaRF funds were granted to the partners, allowing for the involvement of KNUST in Ghana and the University of Dar es Salaam in Tanzania, and adding to the research funds. The researchers from the participating institutes will collaborate on the development of sustainable sanitation systems, and share results within the region.

The EC FP6 project **SWITCH**, on sustainable urban water management in the city of the future, focused on integration and dissemination with research, demonstrations and training activities in 13 global cities. The 4th Scientific Meeting and Global CityWater Futures Summit was held at the Institute in October. Scientists shared their findings with practitioners in the water sector, and identified future research needs. PhD work was ongoing in 2009, including nine PhD fellows at UNESCO-IHE, and about 40 in the consortium as a whole. The PhD research was supported by 12 MSc participants at UNESCO-IHE. Four did their research in SWITCH demonstration cities. SWITCH-in-Asia, a UNESCO initiative to set up a network of cities in the Asian region based on the concept of SWITCH, was launched with a workshop in Jakarta in December. Other noteworthy activities in 2009 included special sessions at the Singapore International Water Week and at the 5th World Water Forum held in Istanbul, and presentations at the Stockholm Water Week and the ICLEI World Congress in Canada. The five-year project on integrated urban water management has a €24 million budget to build capacity of local governments through the learning alliance approach in various locations in the world. In total, 32 partners are involved in the research and demonstration activities.

The **SALINE** project that started in 2009 investigates the potential of use of seawater and brackish water for sanitation. This could decrease the city's demand for freshwater by 30% or more. Within this project, the pioneer in innovative demonstration of large-scale use of seawater in urban sanitation is Hong Kong. The city reveals the enormous potential of seawater as a source for toilet flushing and other non-potable uses in freshwater-poor urban coastal areas. As many large cities are located at the coast or in areas rich with brackish groundwater, use of saline water in sanitation may be one of the feasible options to reduce the stress on freshwater resources.

In September, the **Natsys** project started. This project deals with natural systems for wastewater treatment and reuse and focuses on technology adaptation and implementation in developing countries. Three PhD fellows were identified, and the construction of pilot plants at Birzeit University (Palestine) and UniValle (Colombia) was completed. The three PhD fellows and 12 MSc students will run experiments at these pilot plants.

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

In 2009, the interdisciplinary research programme **ECOLIVE** started. The programme is the result of joint collaboration between UNESCO-IHE, the University of Amsterdam Egerton University (Kenya), and VIRED International (Kenya). ECOLIVE consists of one post-doctoral and three PhD researchers, who will investigate the hydrological, ecological and social aspects of papyrus wetlands used for livelihoods support.

In the **SOWACOR** project funded by the King Abdullah University of Science and Technology, metal removal by microorganisms is studied, developing a process 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 2009, metal removal experiments were done with both growing and inactive microbial cells, and the formed metal-biomass particles were characterised. In addition, metal removal in 'high-yield' bioreactors were optimised.

The **MaraFlows** project initiated by UNESCO-IHE started; this research project investigates one of East Africa's most iconic rivers, the Mara, which meanders through Serengeti National Park and is a lifeline to the millions of migrating animals in the Mara-Serengeti Ecoregion. The Mara is also the principal source of water for nearly a million impoverished people, who rely on the river to meet domestic needs and enable development. UNESCO-IHE researchers have partnered with Kenyan and Tanzanian institutions to investigate how natural ecological processes in the river purify water, vitalise fisheries, and provide other essential services to people and wildlife in the basin. By linking to major development programmes in the basin, MaraFlows aspires to conduct cutting-edge research to enable sustainable development that simultaneously preserves one of Earth's great natural treasures.



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 five-year EC-funded project '**Integrated Flood Risk Analysis and Management Methodologies**' was completed in 2009. Its focus was on the strategies for sustainable flood mitigation and defense in the context of global change and societal advance. At UNESCO-IHE, novel methods of building predictors of model uncertainty (based on computational intelligence techniques) were developed and tested, and the developed software is being used in other projects. A PhD thesis on the subject was successfully defended. Several peer-reviewed publications and more than a dozen conference presentations were published. A web-based platform for knowledge dissemination, eFlood, has been developed as well, which is currently used for education.

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. The overall design for the Lenvis network, covering functional, architectural and technical aspects, was elaborated by project partners in 2009, and will be used for software development. As user involvement is a key element of Lenvis, the Province of Noord Brabant in cooperation with HydroLogic and UNESCO-IHE organised a working conference entitled 'Environment, health and water security' in the Netherlands in May. The workshop allowed professional users of environmental and health data in the Netherlands to exchange knowledge amongst themselves and with the public on their requirements concerning data exchange. The results will be incorporated in Lenvis.

Two online courses - 'Flood Modelling for Management' and 'Decision Support for River Basin Management' - piloted the 'Personal Development Planner' and 'LearnWeb2.0' tools of the **TenCompetence** digital infrastructure for life-long competence development. The TenCompetence project integrated these tools within a portal environment. The experiences of the participants were captured through an online pre- and post-learning experience questionnaire, in which the different aspects of this dynamic learning environment were researched. The results of the pilot were published in an article and discussed during a November conference in Manchester on 'Rethinking Learning and Employment at a time of economic uncertainty'.

Water Management and Governance identifies the multi-disciplinary nature of water management and 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 behavioural sciences including law, politics and institutional development and management.

In the **Pro-Poor Benchmarking** research project started in October, conventional benchmarking of the performance of water and sanitation providers will be enriched by a new perspective that assesses their ability and the related practices to provide services to the urban poor. The project will involve about 15 MSc students and at least one PhD student, and brings together 12 knowledge institutes, water and sanitation providers, and regulators from Brazil, Ghana, Iran, Uganda and Zambia.

WATER MANAGEMENT & GOVERNANCE

The **WeTwin** project is referred to as a twinning project because it matches up study sites - two in Europe, three in Africa and one in Latin America - to exchange expertise on wetland and river basin management. In 2009, two twinning workshops were held in Mali & Ecuador where the partners networked and exchanged knowledge on management of wetlands and river basins. One PhD and three MSc studies took active part in the project and contributed data models to a comparative study of management practices at the non-EU sites.

The ultimate aim of the **Blue Nile** project - started in 2009 - is to establish a permanent research facility for knowledge institutions in countries of the Horn of Africa. A consortium of seven universities and academic institutes was formed to guide the research of one post-doc and seven PhDs in the fields of 'soil and water conservation technology', 'up-scaling hydrological impacts', 'valuation technology', and 'institutional arrangements'. Emphasis will be given to action research, stakeholder participation and dissemination and application of research results.

The research project '**Upscaling small scale land and water system innovations in dryland agro ecosystems for sustainability and livelihood improvements**' (SSI 2) studies the physical and social impact of water use by farmers upstream on the water availability downstream, and advises local water users on sharing their resources. Research is carried out with the University of Dar es Salaam (Tanzania) and the University of KwaZulu Natal (South Africa). In 2009, one PhD fellow started his programme. Two workshops about the use and sharing of water were held in Tanzania, where local stakeholders used the river basin game to learn about upstream/downstream implications.

In the framework of the **Delft Cluster** research programme, UNESCO-IHE participated in the 'Safety against flooding' project. This project developed novel methods of hydrologic modelling, combining simulation and data-driven approaches, and improved methods for using chaos theory for forecasting ocean surges. In the Delft Cluster 'Morphology of the North Sea' research project, methods of computational intelligence were developed to improve the accuracy of numerical models used to predict sedimentation in rivers and oceans.

The **EnviroGRIDS** research project started in April, and aims at the development of an integrated catchment observation and system for the Black Sea Region, together with 26 education and research partners. Within the project, new infrastructure for observing environmental data will be developed, and will be used to develop parallelised (gridified) environmental models.

Knowledge and Capacity Development (KCD) is a relatively new research subject at the Institute. It results from the recommendations of the International Symposium on 'Water for a Changing World, Enhancing Local Knowledge and Capacity' held at the occasion of the Institute's 50th anniversary in 2007. Capacity development is a frequently used term, but its meaning can range from education to institutional development. KCD research deals with understanding the theory behind capacity development, and aims to develop a common understanding of the term.

In 2009 the research on KCD at UNESCO-IHE resulted in the publication 'Capacity Development for Improved Water Management' written for the World Water Forum in Istanbul in March. Also, the research proposal of the first PhD student in KCD was approved by the Academic Board in June, and deals with the role of higher education in KCD. Subjects covered in the PhD research are the difference between international versus local education for capacity development at the individual level, and how this influences capacity development in the institutional environment. The result of this research can be directly applied to UNESCO-IHE's educational activities and partnerships.

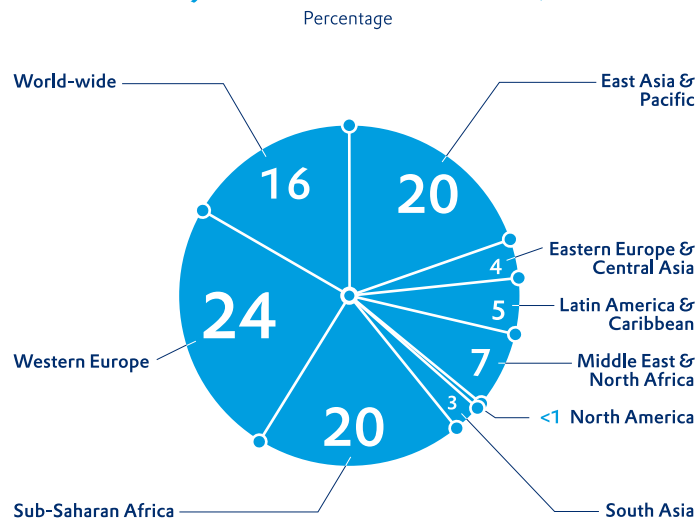


CAPACITY DEVELOPMENT



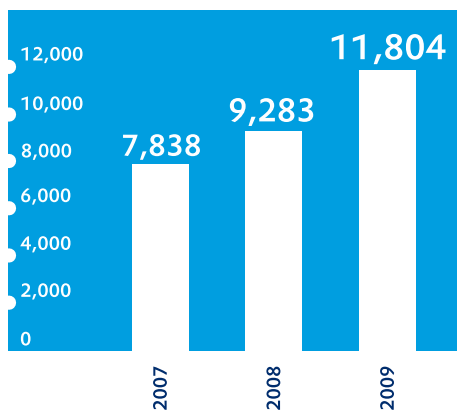
UNESCO-IHE provides capacity development services to knowledge institutes and water sector organisations around the world. Through these operations, the Institute increases its global impact and helps to build sustainable organisations that are equipped to properly manage water resources and deliver water services to all communities. Services include institutional development projects, tailor-made training and policy advice.

PROJECTS PER REGION IN 2009



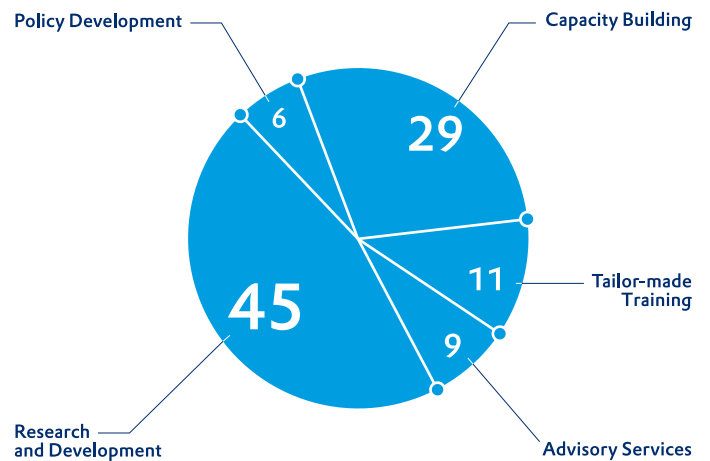
PROJECT TURNOVER

Euro x 1000 | Year



PROJECT PER TYPE IN 2009

Percentage





The project '**strengthening IWRM in Mongolia**' - started in 2009 - is jointly implemented by Deltares, Haskoning, UNESCO-IHE and local counterparts on behalf of the Mongolian Ministry of Nature and Environment. UNESCO-IHE is responsible for the capacity development component, which addresses capacity building for water professionals through short courses, study tours and on-the-job training. The Institute is also helping three Mongolian Universities to set 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.

In 2009, UNESCO-IHE continued to strengthen the **CKNet-INA network** of Indonesian universities through the NPT-funded project. Activities included the organisation of an open network conference on the main theme of Integrated Flood Management, and the delivery of courses on various subjects including Gender Mainstreaming in IWRM, Integrated Flood Management, Urban Drainage Program and Planning for East Indonesia.

The project on satellite-based water monitoring and flow forecasting system for the **Yellow River Basin in China** was successfully completed. At the evaluation workshop in March, final results on the implementation of the system were presented to the Yellow River Conservancy Commission, the Ministry of Water Resources and representatives from other river basins and academia.

The capacity development project '**Improving municipal wastewater management in coastal cities in ACP countries**' - implemented with UNEP/GPA - ended in September. In collaboration with national and local governments and local academic institutions, more than 1000 experts from 30 countries received training in wastewater management in the three years of the project.

The total **project turnover** in 2009 was €11.8 million. Capacity building and research projects together represent the majority of UNESCO-IHE's projects (respectively 43% and 36%). Both capacity building and research projects showed an increase in turnover respectively from €4.4 million in 2008 to €5.1 million in 2009 and from €2.6 million in 2008 to €4.3 million in 2009. The complete overview of projects in which UNESCO-IHE was involved in 2009 is presented in Annex 4.

CAPACITY DEVELOPMENT

A second group of students from the Nile Basin - ten participants, each from a different country - joined the Hydroinformatics MSc specialisation. A customised module focusing on decision support systems was developed and delivered to the group. Their study was supported by the **Nile Basin Initiative** as part of their capacity development activity in the region.

In collaboration with the **Sparte Irrigation Network** and MetaMeta, a tailor-made training was given in Ethiopia for 30 water professional government officials from 11 provinces in Ethiopia. The training course encompassed a two-week practical, solution-oriented programme. The Soil Water Accounting Model (SWAM) - developed at the Institute - was introduced for the first time in a training course.

The first phase of the project '**Anticipating and Resolving Flood Issues, Differences and Disputes in the Lower Mekong Basin**' was concluded in 2009. 15 high-level decision makers visited key water organisations in Northwest Europe to share experiences about transboundary water management, and 35 mid-level professionals attended a programme consisting of three training courses and a visit to the Yangtze River in China. Staff of national universities attended the latter programme to prepare them to take over part of the training in later phases, further strengthening the budding regional academic partnership.

The World Bank sponsored '**training and capacity building for the water and wastewater sector in Iran**' project saw a 50% increase in scope and budget. This brought the total number of people trained within the project well over 3000, and the number of senior sector staff exposed to West European practices close to 400. Also, the Institute developed 60 one-week training course curricula on water supply and sanitation, which can be used for future trainings courses.

The two-year project '**Partnership for education and research in water and ecosystems interaction**' started in 2009. An inception workshop was held at the China University of Geosciences (CUG), Beijing in November. The project researches a catchment in the Erdos Plateau of Central China, around which subject it will organise various training courses. The budget of €550,000 is financed by the Asia Facility for China programme of the Dutch government. Two PhD students will participate in a sandwich construction between UNESCO-IHE and CUG. The ultimate aim of the project is to establish a long-term partnership in joint PhD research and staff exchange with CUG, Hohai University and China Geological Survey.





The **Lake Victoria Water and Sanitation Initiative**, started in September, aims to improve water and environmental sanitation in ten small- and medium-sized towns on the shores of the lake. The project includes both investments in infrastructure and capacity development, of which the latter will focus on strengthening local stakeholders.

The **NPT Ethiopia** project, started in March 2009, 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.

NEWEN is a programme that started at the end of 2008. The project contributes to the improvement of the environmental situation in the Western Balkan region by developing a network of universities in the region and strengthening environmental capacity development at these universities. In 2009, 13 students from the Balkan countries came to the Institute to commence their Master programmes. A tailor-made training course on Hazardous Waste Management was held at UNESCO-IHE, and an online course on Technology Selection for Sanitation and Municipal Waste Water Management in the Western Balkan was developed and offered for the first time. Partners are six universities in the Western Balkans and four universities/ institutes in the Netherlands.

The project '**Master Plan for Capacity Development for the Ministry of Public Works**' in Indonesia started in 2009, and is the follow-up to a similar 'Partners for Water' project. Changes in the water sector during the last decade have led to an immense shortage of capable staff at the Ministry of Public Works. The project aims to identify the capacity gap, both in quantitative and qualitative terms, between the available staff employed by the Directorate-General of Water Resources and the staff needed to fulfil present and future tasks. The crucial part of the study is to develop a conceptual and organisational framework for a special human resource development unit within the Directorate-General responsible for the planning, preparation and implementation of all human resource capacity development programmes. The new unit is scheduled to become active in the fall of 2010.

The **NPT project in Water Resources and Environmental Management (WREM)** started in 2006. It is illustrative of one of UNESCO-IHE's capacity building projects with an integrative approach. The project aims to contribute to poverty alleviation and sustainable socio-economic development in Rwanda by promoting driven-oriented research related to water resources and environmental management. To achieve this, the WREM project focuses on the development of academic and professional expertise at the National University of Rwanda (NUR) in Butare. The local water sector was involved in the project by matching up the sector's research needs to researchers in the programme, and by holding positions in the programme's steering committee.

NUR's academic staff were trained through short courses - some on the subject of curriculum development - and through MSc and PhD programmes. During the staff training component of the project, six NUR staff received their MSc degree, of whom five studied at UNESCO-IHE. Five NUR staff are in various phases of their PhD programme at UNESCO-IHE, dealing with various

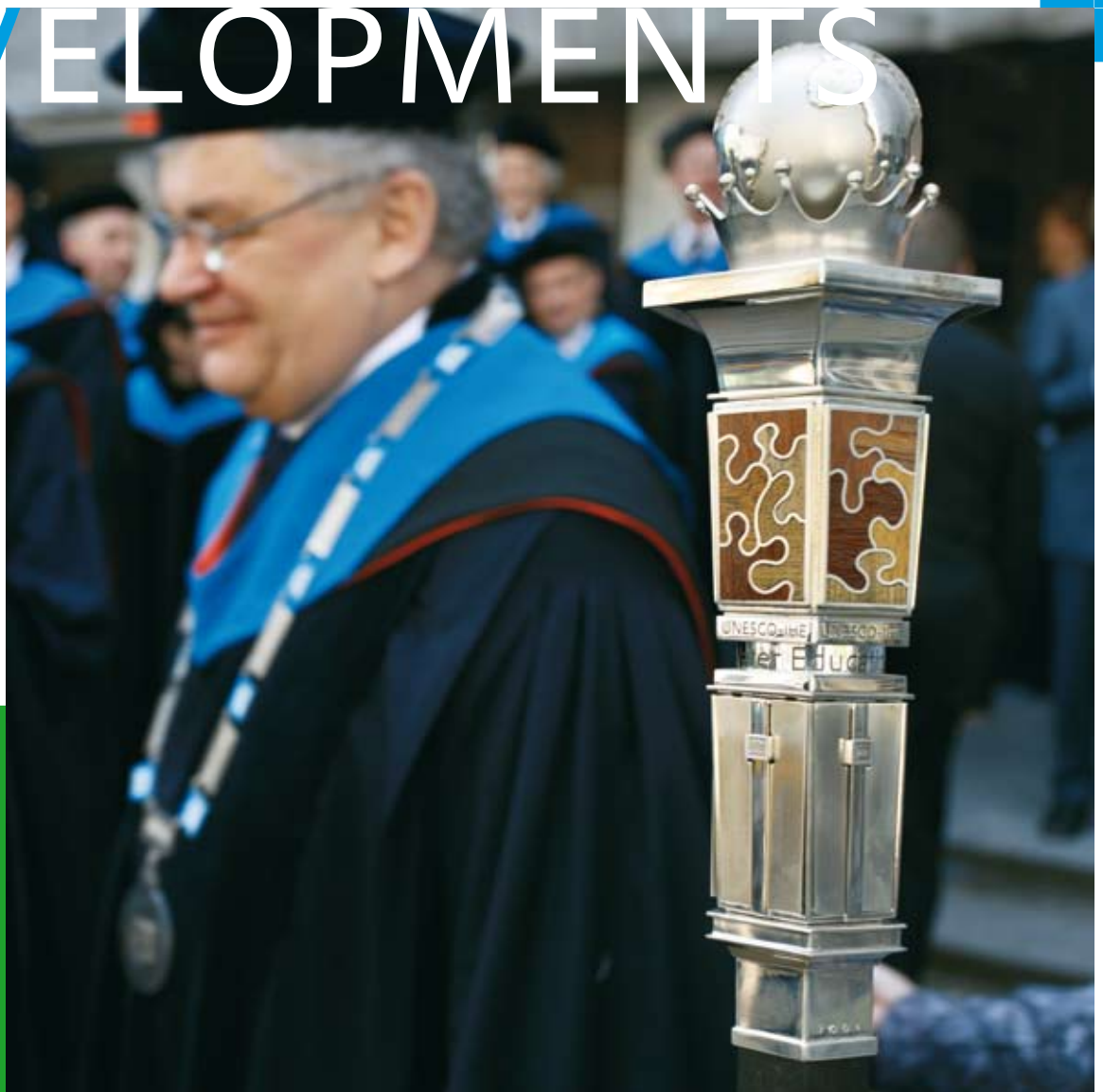
cross-cutting themes. An MSc programme in WREM was created at NUR, and the first 20 students started this programme in 2006. An interdisciplinary research group was established at the University, and its research agenda formulated. Didactic, laboratory and library facilities and materials at WUR were upgraded, resulting in better research facilities for the broader academic community.

In 2009, the activities in this project included the successful completion of the second group of MSc students, and the implementation of research activities through research workshops and PhD research. An internal assessment of the project achievements was made, including an alumni tracer survey. A Project Steering Committee Meeting was held in December, followed by a scientific closing seminar in collaboration with the Nile Basin Capacity Building Network.





ORGANISATIONAL DEVELOPMENTS





PERSONNEL AND ORGANISATION

Halfway through the year, there was a **change in leadership** at the Institute. After six years of dedicated service as Rector of the Institute, Prof. Richard Meganck retired. Prof. András Szöllösi-Nagy succeeded him as Rector. Prior to his appointment at UNESCO-IHE, Prof. Szöllösi-Nagy was Director of the Division of Water, Secretary of the International Hydrological Programme and Deputy Director-General of the Natural Sciences Sector of UNESCO.

In November, Prof. Szöllösi-Nagy presented his **Inaugural Address** entitled: 'Learn from your errors - if you can! Reflections on the value of hydrological forecasting models.' During this special academic session, he was formally installed as the new Rector.

On 31 December 2009, **staff** equalling 157 full-time equivalents (FTE) were employed by UNESCO-IHE, of whom 53% were academic and 47% supporting staff. Sickness levels at the Institute in 2009 were below the national average for most departments, and lower than the previous years.

Staff development activities in 2009 included the commencement of the Basic Teacher Qualification (BTQ) training programmes. Six junior and nine senior academic staff members took part in the programme. It is expected that the first staff members will receive their BTQ in 2010.

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

Policies in the field of **employee benefits** worked on and developed in 2009 include the commuting policy, the missions abroad policy, incidents response policy, and emeritus and departing staff policies.

STUDENT AND EDUCATIONAL AFFAIRS

In October 2009, a **new batch of participants** in the 18-month Master of Science programme started their studies. The number of new MSc participants was 15% higher than in 2008. The number of non-degree course participants more than doubled as compared to last year.

In 2009, the **Library** started various projects to increase accessibility to its collections. The entire collection of PhD dissertations became electronically available on the Institute's open access repository, hosted by the Delft University of Technology Library at <http://repository.tudelft.nl/ihe>.

After an extensive evaluation of available cataloguing software packages, the Library started migrating to new **cataloguing software** from OCLC, due to be completed in 2010. From then on, the Institute will be able to present its collections to a worldwide audience on the Institute's library web pages, and through WorldCat at <http://www.worldcat.org>. This will increase traffic on the UNESCO-IHE website and promote the UNESCO-IHE brand to an international audience of scholars.





COMMUNICATION AND MARKETING

A positive and steady development is that growing numbers of water professionals have demonstrated an interest in the training and education offered by UNESCO-IHE. In 2009, the **number of applications** for short courses doubled and those for the MSc programme rose by over 15% as compared with 2008. The bottleneck in the actual growth of the number of students is the **limited availability of fellowships**. With 60% of the MSc fellowships coming from the Netherlands Fellowship Programme (NFP), there is an evident need to mobilise support from other UNESCO Member States. This challenge was taken up in 2009 and will require continued efforts in the coming years. The launch of an IWA/UNESCO-IHE Fellowship Fund at the IWA first Development Congress on Water and Sanitation Services in 2009 was one of the concrete measures taken to address this challenge. The fund is meant to pay for the studies of high potential employees involved in water supply and sanitation who are nominated by their employers.

UNESCO-IHE organised and hosted several **international events** in 2009. The UNESCO Water Education regional workshop for North American and Europe took place in February. Participants took stock of best practices and developed recommendations for more efficient water education at all levels. In September, the UN community of librarians was invited for the United Nations Inter-Agency Annual Meeting on Knowledge Sharing and Information Management. This event catalysed the development of knowledge management networks and stimulated innovative approaches to knowledge dissemination. In October 2009, the SWITCH Global CityWater Futures Summit on sustainable water management in the city of the future was organised at UNESCO-IHE. The event brought together water managers, urban planners, regulators, NGOs, donor agencies, as well as policy makers from cities around the world to share ideas and experiences on urban water management with a global network of scientists. The 3rd International Congress on Biotechniques for Air Pollution was hosted at the Institute at the end of September 2009.

The Institute played an active role in the **5th World Water Forum** in Istanbul, held in March. At the Forum, UNESCO-IHE coordinated the topic on Education, Knowledge and Capacity Development, and - together with the Women for Water Partnership and IRC - convened a session on Strengthening the Capacities of Local Organisations and People. Other sessions co-convened by UNESCO-IHE addressed the impact of food market measures on rural development, design criteria for extreme events in the context of climate change, and problem-solving research in the WASH sector. The forum also saw the launch of the third World Water Development Report, for which UNESCO-IHE contributed the paragraphs on Knowledge & Capacity Development. Some of the other main international forums in which the Institute actively contributed in 2009 included the Singapore International Water Week held in June, and the Stockholm World Water Week held in August.

A novelty in UNESCO-IHE's communications was the Institute's presence in **social media**. These communication channels were used to promote events such as the SWITCH Global CityWater Futures Summit and to generate debate on the various topics addressed at the conference. Social media were also effectively used to intensify the interactions with **alumni** and new and existing participants. Several platforms emerged on which alumni share experiences and maintain both social and professional dialogues. Other targeted actions to strengthen the ties with alumni were the publication of quarterly alumni e-newsletters, the introduction of merchandising articles, the redefinition of alumni discounts, and the development of a farewell package for students who completed their studies.



In the Netherlands, UNESCO-IHE participated in the **Dutch Delta Design 2012** initiative. The Institute advocated the need for first-class water education in the Netherlands and submitted a proposal to stimulate further cooperation between alumni and the Dutch water sector. In **Delft**, the Institute intensively worked together with the municipality, the water board, Delft University of Technology, Deltares and TNO on setting up pilot research projects for innovative solutions to local water problems under the 'Delft Blue Technology' initiative. The same parties also joined forces in a feasibility study for the establishment of a **Water Centre** in Delft.

IT

In 2009, a start was made with the restructuring of the **IT group**. A multi-year plan was made to lay the foundation for technical and organisational developments, and a new staffing plan was developed. Tasks were redefined and a training plan for all IT staff was made.

The Institute chose the **Moodle open source** platform as its virtual learning environment on which all future educational activities will operate. The technical requirements for implementing Moodle were completed and a pilot was run successfully, leading to the deployment of the first Moodle modules.

In 2008, a pilot was held with the provision of **laptop computers** for 40 MSc participants. As a result of the evaluation of this pilot, all new MSc participants were provided with laptops to stimulate and facilitate new ways of learning.

FACILITY MANAGEMENT

The plan for the **refurbishment** of all the Institute's facilities was finalised in March. Construction work started halfway through the year, and included installations, the exterior and interior of the building, and offices and study spaces. The renovation of the Oude Delft 91 building was completed in December. The total process is expected to be completed at the end of 2011.

The objective of the refurbishment is to allow staff and PhD fellows from the same academic departments to be housed together. **Flexible workspaces** are included in the plans for the academic departments, allowing guest lecturers, researchers and other temporary academic staff to be accommodated. In the Westvest building - the building where educational activities such as lectures, classes and lab work take place - designated areas for problem-based learning, group work and individual work are envisaged, as well as **modernised classrooms**.



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. This income was much lower than in the previous years due to the departure of the in-house partners IRC, NWP and CPWC. The space they occupied was required to bring all departments and the growing number of PhD fellows back into the main building of UNESCO-IHE.

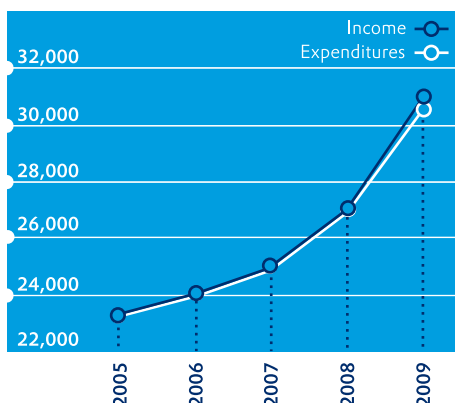
The subsidy from the Ministry of Education was increased by €1.5 million per year as a result of the renewed operational agreement between the Ministry of Education and UNESCO, signed mid-2008. The funding increase is in support of innovation of education, co-funding of research and compensation for (non-billable) work done for UNESCO. In this context, the following important activities were undertaken in 2009: a) the start of the refurbishment of the building, b) the drafting of a comprehensive IT strategy, c) the development of about 13 joint MSc specialisations (in different stages of establishment) and d) the organisation of a UN Water Education seminar. The Institute's research programme was further strengthened by e) the increase in the number of registered PhD participants (to 104) and f) the co-funding of 16 large research projects through the UPaRF facility. These projects accounted for a total expenditure of € 780,000 in 2009.

The tuition fee income increased significantly ($\pm 15\%$) due to an increase in the intake of MSc participants (+9% in student years) and a 25% increase in the intake of PhD fellows. At the same time, education-related expenditures increased by $\pm 20\%$ due to the increase of the number of participants and related fellowship costs.

Project income from research, non-degree courses and capacity development projects in 2009 was $\pm 17\%$ higher than in 2008, but direct project costs (programme expenditures) also increased by $\pm 15\%$. This resulted in a net project fee income improvement of $\pm 11\%$. The top 10 largest projects were SWITCH (EC), Delft Cluster #15 (BSIK/Internal Research Fund-IRF), TCBWWI (WB Iran), various DGIS/UNESCO-IHE Partnership Cooperation activities (DGIS/IRF/third parties), SOWACOR (Saudi government/Utrecht University), Blue Nile hydro solidarities (WOTRO/DGIS/IRF) which accounted for just over 50% of the fee income. Some 29% was generated through projects co-funded by the programmatic cooperation agreement with DGIS, which includes contributions from various third parties and IRF. About 50% of the net project income was paid for by Dutch governmental sources (DGIS, OCW, RWS, NUFFIC, SenterNovem, etc.), 17% from EC funds, and 33% from other national and international sources.

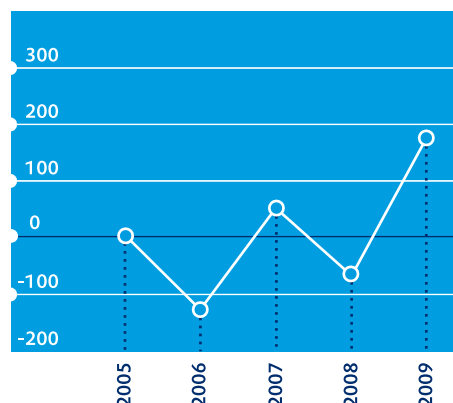
INCOME AND EXPENDITURES

Euro x 1000 | Academic year



OVERALL FINANCIAL RESULTS

Euro x 1000 | Academic year



UNESCO-IHE operations in 2009 showed an increase in both revenues and expenditures as compared to 2008. The total turnover increased to just under €31 million. The overall result shows a modest surplus of €180,000. This corresponds to an operational result against turnover of approximately 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 2009, there was a marked increase ($\pm 10\%$) in the non-programme expenditures, mainly as a consequence of the increase in staff salary costs, uncollectable debts and costs of management (hired services) for IT development and for the refurbishment of the building.

The staff and management costs increased in line with the Collective Labor Agreement (CAO) of Dutch Institutions for Higher Education, and because of an increase in the average number of staff (from 143.5 FTE in 2008 to 148.3 FTE in 2009). The overall costs for operation and maintenance of the building and facilities increased by $\pm 10\%$ due to costs related to the IT development and facility refurbishment activities. Education-related costs decreased strongly by $\pm 23\%$ due to fewer unfunded fellowships, the higher occupancy rate of student housing and adjusted payment policies for student housing.

Acquisition and marketing costs were significantly higher ($\pm 19\%$) than in 2008. This was due to the high number of special events in 2009. These included the organisation of a water education seminar in the context of a UNESCO-wide consultation process, farewell and welcome events at the occasion of the departure and arrival of the former and new Rectors, and the participation in several activities related to the 5th World Water Forum in Istanbul, Turkey.

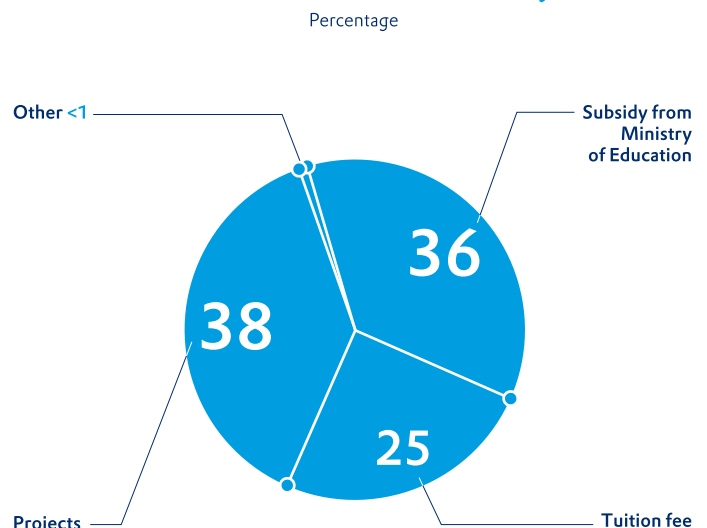
General costs were almost three times higher as compared to last year, which is mainly due to a one-time €620,000 for the outsourced management of the refurbishment and IT management. The second main cause is an allocation of €311,000 to the reserves for uncollectible debts, which can mainly be attributed to long-outstanding payments for fellowships.

BALANCE SHEET

The balance sheet shows an income/expenditure ratio of 10/90 between equity and borrowed capital which corresponds to a solvency of 10%. The solvency ratio in 2009 is still far from the targeted percentage. This was expected and the improved subsidy arrangement and multi-year programmatic funding contract with DGIS give an opportunity to improve the solvency ratio in the coming years.

The borrowed capital includes provisions and current liabilities. In the current liabilities, reservations have been made for leave hours, holiday bonuses and the cost of one term of payment for the lease of the building. The provisions include a wide array of items including jubilee payments to staff and long-term building maintenance in accordance with the lease contract. The current ratio is at a level of 1.07 (was 1.13 in 2008), which means that in the short term the Institute remains creditworthy. 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 2009



FINANCIAL REPORT



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

| | 2009 | 2008 |
|---|---------------|---------------|
| Income | | |
| Subsidy from the Ministry of Education | 11,012 | 9,872 |
| Tuition fee | 7,901 | 6,856 |
| Projects | 11,746 | 10,057 |
| Others | 222 | 362 |
| Total income | 30,881 | 27,147 |
| Programme expenditures | | |
| Tuition fee (stipends, guest lecture, etc.) | 5,213 | 4,330 |
| Projects | 7,896 | 6,871 |
| Total programme expenditures | 13,109 | 11,201 |
| Non-programme expenditures | | |
| Staff and management | 11,313 | 10,565 |
| Buildings | 2,440 | 2,302 |
| Facilities | 1,264 | 1,099 |
| Education-related costs | 1,403 | 1,665 |
| Acquisition and marketing | 348 | 292 |
| General costs | 1,218 | 410 |
| Interest | -289 | -242 |
| Total non-programme expenditures | 17,697 | 16,091 |
| Operating result | 75 | -145 |
| Extraordinary charges/Appropriations from Fellowship Trust Fund | 106 | 76 |
| Overall result | 181 | -69 |

BALANCE SHEET (amounts in €000s)

| | 31 DECEMBER 2009 | 31 DECEMBER 2008 |
|-------------------------------|------------------|------------------|
| Assets | | |
| Fixed assets | 2,045 | 1,735 |
| Accounts receivable | 3,004 | 2,428 |
| Cash and banks | 14,559 | 12,632 |
| Total | 19,608 | 16,795 |
| Equity and liabilities | | |
| Equity | 1,611 | 1,431 |
| Fellowship Trust Fund | 264 | 369 |
| Provision | 1,333 | 1,695 |
| Current liabilities | 16,400 | 13,300 |
| Total | 19,608 | 16,795 |

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 2009, the FTF provided financial support to eight students; the names and countries of origin of the students are listed in the adjoining Financial Statement. All eight students were enrolled in MSc studies; three of them graduated in 2009, and four started their studies in October 2009.

The 'Zeeland werkgroep' continued to donate to the FTF, as did 'SUEZ Environnement'. Although the Coca Cola Company sponsored participants in earlier years, it was the first year in which their support was routed through the FTF. Individual donations by staff members and others added up to over €2750.

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

| | |
|---|----------------|
| Fund on 1 January 2009 | 368,957 |
| Gifts | |
| SUEZ, France | 38,517 |
| Zeeland werkgroep | 30,000 |
| Coca Cola | 114,000 |
| Christmas contribution staff 2008 | 980 |
| Christmas contribution staff 2009 | 700 |
| Fortieth wedding celebration gifts Pieter de Laat N. Peters, Delft | 1,015 |
| Interest | 10,146 |
| Total | 195,408 |
| MSc Fellowships | |
| Chipili Chabu Chikamba, 2007/2009, Zambia | 39,656 |
| Negash Adugna Tekalgne, 2007/2009, Ethiopia | 38,195 |
| Ennie Muchelemba, 2007/2009, Zambia | 40,013 |
| Herry Rachmadyanto, 2008/2010, Indonesia | 38,517 |
| Mohammad Saif Uddin, 2009/2011, Bangladesh | 30,000 |
| Nirajan Dhakal, 2009/2011, Nepal | 38,000 |
| Shukupala Mohammed Ahmed, 2009/2011, Ethiopia | 38,000 |
| Kayondo Charles, 2009/2011, Uganda | 38,000 |
| Total | 300,381 |
| Fund on 31 December 2009 | 263,984 |



ANNEXES

ANNEX 1 | EDUCATIONAL STATISTICS

| REGISTERED DEGREE PROGRAMME PARTICIPANTS FOR THE ACADEMIC YEAR 2009-2010 | | | | | | | | | | | |
|--|-------------------|-----------------|------------|------------------|------------|---------------|-------------|-----------|------------|------------|------------|
| | 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 2008-2010 | 76 | 0 | 96 | 76 | 43 | 18 | 6 | 29 | 56 | 116 | 172 |
| - Water Science and Engineering | 26 | 0 | 47 | 29 | 24 | 7 | 6 | 10 | 18 | 55 | 73 |
| - Water Management | 10 | 0 | 14 | 11 | 7 | 2 | 0 | 4 | 6 | 18 | 24 |
| - Environmental Science | 25 | 0 | 16 | 21 | 5 | 5 | 1 | 9 | 18 | 23 | 41 |
| - Municipal Water and Infrastructure | 15 | 0 | 19 | 15 | 7 | 4 | 2 | 6 | 14 | 20 | 34 |
| MSc programmes 2009-2011 | 112 | 2 | 85 | 97 | 70 | 16 | 9 | 7 | 80 | 119 | 199 |
| - Water Science and Engineering | 33 | 1 | 40 | 26 | 34 | 7 | 6 | 1 | 24 | 50 | 74 |
| - Water Management | 20 | 0 | 7 | 14 | 10 | 2 | 0 | 1 | 13 | 14 | 27 |
| - Environmental Science | 37 | 1 | 19 | 36 | 13 | 5 | 1 | 1 | 29 | 27 | 56 |
| - Municipal Water and Infrastructure | 22 | 0 | 20 | 21 | 13 | 2 | 2 | 4 | 14 | 28 | 42 |
| PhD programmes 2009 | 22 | 0 | 83 | 45 | 31 | 15 | 5 | 8 | 29 | 76 | 105 |
| Total | 210 | 2 | 264 | 218 | 144 | 49 | 20 | 44 | 165 | 311 | 476 |
| Percentage | 44.1 | 0.4 | 55.5 | 45.8 | 30.3 | 4.2 | 10.3 | 9.2 | 34.7 | 65.3 | |

ANNEX 2 | SHORT COURSES

| REGULAR SHORT COURSES | | |
|--|---------------------|--------------------|
| COURSE | DATE | TOTAL PARTICIPANTS |
| Advanced Water Treatment Technology | 06/04/09 – 24/04/09 | 5 |
| Applied Groundwater Modelling | 15/06/09 – 03/07/09 | 10 |
| Aquatic Ecosystems: Processes and Applications | 15/06/09 – 03/07/09 | 3 |
| Cleaner Production and the Water Cycle | 27/04/09 – 15/05/09 | 4 |
| Climate Change in Integrated Water Management | 07/09/09 – 18/09/09 | 9 |
| Conventional Surface Water Treatment | 09/02/09 – 27/02/09 | 1 |
| Decentralised Water Supply and Sanitation | 06/07/09 – 24/07/09 | 8 |
| Environmental Engineering | 02/03/09 – 20/03/09 | 1 |
| Environmental Monitoring and Modelling | 06/04/09 – 24/04/09 | 5 |
| Environmental Planning and Implementation | 06/04/09 – 24/04/09 | 6 |
| Environmental Policy Making | 02/03/09 – 20/03/09 | 2 |
| Environmental Systems Modelling | 08/06/09 – 26/06/09 | 10 |
| Financial Management of Water Organisations | 27/04/09 – 15/05/09 | 5 |
| Groundwater Exploration and Monitoring | 06/04/09 – 24/04/09 | 5 |
| Groundwater Resources and Treatment | 02/03/09 – 20/03/09 | 3 |
| Integrated Coastal Zone Management | 14/04/09 – 24/04/09 | 5 |
| International Port Seminar | 20/04/09 – 08/05/09 | 16 |
| Managing Water Organisations | 15/06/09 – 03/07/09 | 7 |
| Membranes in Drinking & Industrial Water Treatment | 05/10/09 – 09/10/09 | 7 |
| Modelling of Activated Sludge Wastewater Treatment | 06/05/09 – 15/05/09 | 4 |
| Negotiation and Mediation for Water Conflict Management | 06/04/09 – 24/04/09 | 2 |
| Public/Private Partnerships in the Water Sector | 06/07/09 – 24/07/09 | 9 |
| Remediation and Handling of Contaminated Sediments | 07/09/09 – 11/09/09 | 4 |
| River Basin Modelling | 06/04/09 – 24/04/09 | 3 |
| Service Oriented Management of Irrigation Systems | 06/04/09 – 24/04/09 | 5 |
| Solid Waste Management and Engineering | 06/07/09 – 24/07/09 | 12 |
| Spate Irrigation and Water Management under Drought and Water Scarcity | 07/09/09 – 18/09/09 | 3 |
| Sustainable Wastewater Treatment and Reuse | 06/04/09 – 24/04/09 | 3 |
| Urban Flood Modelling and Disaster Management | 27/04/09 – 15/05/09 | 4 |
| Urban Water Systems Modelling | 15/06/09 – 03/07/09 | 8 |
| Water and Environmental Law and Institutions | 27/04/09 – 15/05/09 | 2 |
| Water Quality Assessment | 09/02/09 – 27/02/09 | 7 |
| Water Resources Planning | 02/03/09 – 20/03/09 | 4 |
| Water Transport and Distribution I | 15/06/09 – 03/07/09 | 5 |
| Water Transport and Distribution II | 06/07/09 – 24/07/09 | 4 |
| Water Treatment Processes and Plants | 27/04/09 – 15/05/09 | 15 |
| Watershed and River Basin Management | 06/07/09 – 24/07/09 | 11 |
| Wetlands for Water Quality | 02/03/09 – 20/03/09 | 1 |
| World History of Water Management | 14/09/09 – 18/09/09 | 3 |
| Total | | 221 |

ONLINE COURSES

| COURSE | DATE | TOTAL PARTICIPANTS |
|--|---------------------|--------------------|
| Integrated Coastal Zone Management | 01/03/09 – 01/07/09 | 7 |
| Sanitation-related Urban Groundwater Pollution | 01/03/09 – 01/07/09 | 12 |
| Ecological Sanitation | 02/03/09 – 01/06/09 | 20 |
| Water Quality Assessment | 02/03/09 – 30/06/09 | 10 |
| Integrated River Basin Management | 02/03/09 – 03/07/09 | 22 |
| Constructed Wetlands for Wastewater Treatment | 02/03/09 – 03/07/09 | 14 |
| Water & Environmental Law and Policy | 02/04/09 – 15/07/09 | 11 |
| Decision Support Systems in River Basin Management | 11/05/09 – 03/07/09 | 105 |
| Flood Modelling for Management | 27/05/09 – 24/07/09 | 65 |
| IWRM as a Tool for Adaptation to Climate Change | 01/09/09 – 11/12/09 | 27 |
| Cleaner Production & the Water Cycle | 01/09/09 – 31/12/09 | 3 |
| Solid Waste Management & Engineering | 01/09/09 – 31/12/09 | 9 |
| Water Transport and Distribution | 04/09/09 – 26/02/09 | 15 |
| Wetland Management | 05/10/09 – 01/02/09 | 11 |
| Total | | 337 |

REGIONAL REFRESHER SEMINARS

| COUNTRY | COURSE | DATE |
|----------|---|---------------------|
| Kenya | The Ecology of Livelihoods in African Wetlands | 24/08/09 – 28/08/09 |
| Thailand | Disaster Management of Urban Water Systems under Climate Change | 23/11/09 – 28/11/09 |

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 2009 are listed in Annex 4 - Projects.

| PROMOTIONS IN 2009 | | | | |
|-------------------------|--------------------|-------------|-------------------------|--|
| NAME | PROMOTION DATE | COUNTRY | PROMOTOR | TITLE THESIS |
| Mr. H.P. Ritzema | January 16, 2009 | Netherlands | Schultz | Drain for Gain: Making water management worth its salt. Subsurface drainage practices in irrigated agriculture in semi-arid and arid regions |
| Ms. M. Mul | February 6, 2009 | Netherlands | Savenije/ Uhlenbrook | Understanding Hydrological Process in an Ungauged Catchment in Sub-Saharan Africa |
| Mr. M. Schouten | April 17, 2009 | Netherlands | van Dijk | Strategy and Performance of Water Supply and Sanitation Providers, Effects of Two Decades of Neo-Liberalism |
| Mr. G.R. Lesser | June 4, 2009 | New Zealand | Roelvink | An Approach to Medium-Term Coastal Morphological Modelling |
| Mr. C.M. Lopez Vazquez* | June 15, 2009 | Mexico | Gijzen/ Loosdrecht | The Competition between Polyphosphate-Accumulating Organisms and Glycogen-Accumulating Organisms |
| Ms. Li Hong* | June 29, 2009 | China | Mynett | Spatial Pattern Dynamics in Aquatic Ecosystem Modelling |
| Mr. G.A. Corzo Perez | September 4, 2009 | Colombia | Solomatine | Hybrid Models for Hydrological Forecasting: Integration of Data-driven and Conceptual Modelling Techniques |
| Mr. D.L. Shrestha | September 28, 2009 | Nepal | Price/ Solomatine | Uncertainty Analysis in Rainfall-Runoff Modelling: Application of Machine Learning Techniques |
| Ms. A.M. Lamei | October 13, 2009 | Egypt | vd Zaag | A Technical Economic Model for Integrated Water Resources Management in Tourism Dependent Arid Coastal Regions; the Case of Sharm El Shiekh, Egypt |
| Mr. R. Buamah | October 28, 2009 | Ghana | Schippers | Adsorptive Removal of Manganese, Arsenic and Iron from Groundwater |
| Mr. S.J. van Andel | November 3, 2009 | Netherlands | Price | Anticipatory Water Management, Using Ensemble Weather Forecasts for Critical Events |
| Ms. D.W. Nazar | November 26, 2009 | Palestine | Gijzen/ vd Zaag | From Water Scarcity to Sustainable Water Use in the West Bank, Palestine |
| Mr. N. Jung | December 7, 2009 | Korea | Price | Eco-hydraulic Modelling of Eutrophication for Reservoir Management |

* *with distinction*

REGISTERED PHD FELLOWS

| NAME | COUNTRY | PROMOTOR | WORKING TITLE THESIS |
|----------------------|-------------|-----------------------|--|
| Mr. Acheampong | Ghana | Lens | Biosorption of Copper, Arsenic and Cyanide from Goldmine Wastewater |
| Ms. Ahmed | Egypt | Uhlenbrook/Solomatine | Climate Change and its Impact on Ground Water in the Nile Delta |
| Mr. Alfonso Segura | Colombia | Price | Maximising information content from monitoring networks for optimal performance of water catchments |
| Mr. Ali | Sudan | Wright | In search of sustainable catchments and basin-wide solidarities, transboundary water management of the Blue Nile River Basin |
| Mr. Almoradie | Philippines | Solomatine | Virtual environments for stakeholder participation in river and flood management |
| Mr. Ansa | Ghana | Gijzen | Pathogen removal from wastewater |
| 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 | Improving nitrogen removal in algae 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. Bin Abdullah | Malaysia | Price | Web-based spatial decision support system for integrated urban water management |
| Ms. Bremere | Latvia | Schippers | Saving energy and ater by maximizing the conversion of membrane filtration system |
| 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. 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. 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 improved Land management practices on hydrology in Blue Nile River Basin / Up-scaling of Hydrological model |
| Mr. Gichamo | Ethiopia | Solomatine | Adaptive modelling in heterogeneous data environments |
| 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 | <i>under construction</i> |
| 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 |
| 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 |
| 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 |
| Ms. Kayoza | Tanzania | Vairavamoorthy | Integrated infrastructure for sustainable improvement of right-of-way safety in dynamic urban environments |
| Mr. Khatri | Nepal | Vairavamoorthy | Risk Assessment of Urban Water Systems for the City of the Future. |
| 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 (TUT) | An analysis of environmental capacity characteristics of heterogeneous traffic corridors |
| Mr. Li | China | Mynett | Multi-reservoir-based Flood Control and Management software system |

REGISTERED PHD FELLOWS

| NAME | COUNTRY | PROMOTOR | WORKING TITLE THESIS |
|-----------------------|-------------|--------------------|---|
| 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. Masih | Pakistan | Uhlenbrook | Hydrology and water balance analysis for sustaining food security and environmental services in Karkheh River Basin, Iran |
| 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 |
| Mr. Narrain | Germany | Wright | Computer modelling for the optimisation of low-head hydropower schemes |
| 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. 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 | <i>under construction</i> |
| 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 | Solomatine | 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 |
| Mr. Sekomo | Rwanda | Lens | Mechanisms of heavy metals removal in natural wastewater treatment systems " |
| 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. Smit | Netherlands | vd Zaag | Understanding persistence of soil erosion and siltation |
| Mr. Solomon | Ethiopia | Solomatine | Integrated urban water systems modelling |
| 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 | <i>under construction</i> |
| Mr. Wang | China | Uhlenbrook-Mynett | Coupling of meteorological models for hydrological predictions in the Yellow River |
| Mr. Wong | Malaysia | Uhlenbrook | Assessment and modelling of large-scale hydrological variability in Peninsular Malaysia |
| Mr. Yang | China | Uhlenbrook | Quantitative assessment of Groundwater and Surface water interactions in Erdos plateau, China |
| Mr. Ye | China P.R. | Roelvink | A generic morphodynamical model and its validation. |
| Ms. Yihun | Ethiopia | Schultz | Agricultural Water Productivity Optimization in a Water Scarce Semi-arid Region of Ethiopia |
| Mr. Zhou | China | Vairavamoorthy | <i>under construction</i> |
| Ms. Zhu | China | Mynett | Web-based virtual environment for decision support in water based system |

ANNEX 4 | PROJECTS

| CAPACITY DEVELOPMENT | | | | | |
|-------------------------------------|---|--------------------------------|--|--------|--------|
| COUNTRY | TITLE | FUNDING | PARTNERS | START | END |
| Brazil | Educational and administrative capacity building of Hidroex | National Government Brazil | | Jan-10 | Jun-10 |
| China | Groundwater in Beijing | Honor Power Foundation | | Jun-07 | Jun-09 |
| | Partnership for education and research in water and ecosystem interactions | EVD - Asia Facility China | Eijkkamp, China University of Geosciences (CUG), Beijing, Hohai University, Nanjing, Xi'an Center of Geological Survey | Nov-09 | Oct-11 |
| Colombia | Proposal for the development/improvement of the partnership UNESCO-IHE UNIVALLE | DGIS-DUPC | | Jan-09 | Dec-09 |
| Egypt | WATEN: Water Resources Management and Environmental Engineering Program | EC-Tempus | University of Aachen | Sep-06 | Aug-09 |
| | The National Water Resources Plan - Coordination Project | Ministry of Water Resources | CBI | Mar-09 | Dec-12 |
| Ethiopia | Capacity building in Integrated River Basin Management (IRBM) for HEIs to support RBOs | Nuffic-NPT | WUR, Meta-Meta, VU, IWMI | Mar-09 | Jun-12 |
| Ghana | Development Of Joint Masters Programme In Water Supply And Environmental Sanitation Between Knust And Unesco-Ihe | DGIS-DUPC | DCE, Kwame Nkrumah University | Oct-09 | Oct-10 |
| India | Jay O'Keeffe participation in a workshop in India in July 2009 | WWF | | Jul-09 | Jul-09 |
| Indonesia | Water Resources and Irrigation Management (WRIM) Capacity Building Network Project | Nuffic-NPT | P.T. IHE Indonesia, WUR | Nov-05 | Dec-09 |
| | Double Degree MSc Program on Integrated Lowland Management between UNESCO-IHE, UNSRI, Indonesia, BAPPENAS, NEC | NEC | UNSRI | Oct-06 | Oct-09 |
| | Development of Master of Science programme on Water Quality Management and Water Treatment at the UNSRAT University on Sulawesi | EVD - Indonesia facility | WLN | Aug-07 | Aug-10 |
| | Capacity Building on Waste Management & Sustainable Energy in Indonesia | EVD - Indonesia facility | BGP Engineers, Muhammadiyah University Malang, TNO, Afvalzorg NV | Oct-07 | Jun-09 |
| | Implementation of a Master Program for Staff of the Ministry of Public Works (Directorate General of Water Resources, DGWR) | WB - WSIMP | | Oct-07 | Apr-09 |
| Iran, Islamic Republic of | Training and Capacity Building for the Water and Wasterwater sector in Iran | WB | PWUT | Nov-07 | Jun-09 |
| Kenya | Module transfer of the Limnology program and Wetlands Ecosystem Specialisation to Egerton Univeristy | DGIS-DUPC | | Nov-08 | Dec-12 |
| Mongolia | Strengthening Integrated Water Resources Management in Mongolia for the Ministry of Nature and Environment (MNE) | DGIS | Deltaris, Haskoning, The Water Centre | Mar-09 | Dec-12 |
| Netherlands | SWAT Summer School 2009 | | | Sep-09 | Sep-09 |
| Rwanda | Rwanda NUR MSc Programme in Water Resources and Environmental Management | Nuffic-NPT | ITC, KNUST | Jan-06 | Apr-10 |
| Tanzania, United Republic of | Human Resources and Organisation Development in the Water Sector | EC-EuropeAid | IRC, ICLEI | May-09 | Jul-11 |
| Vietnam | Upgrading the Training Capacity in Coastal Engineering of the Hanoi Water Resources University, Phase 2 | EKN | DUT,CICAT(lead), WL | Oct-05 | Sep-09 |

CAPACITY DEVELOPMENT

| COUNTRY | TITLE | FUNDING | PARTNERS | START | END |
|-------------------|---|-------------|---|--------|--------|
| Various Countries | Technology enabled universal access to safe water | EC-FP6 | 21 partners including Kiwa, SINTEF, Riga Tech.Uni. EAWAG, NTNU, TZW, LNEC | Jan-06 | Jan-11 |
| | Knowledge Networks for the Nile Basin, Using the innovative potential of knowledge networks and CoP's in strengthening human and institutional research capacity in the Nile region | DGIS | 10 selected uiversities and ministries from Nile Basin Countries. PoWER partners: Hydraulic Research Institute (Egypt), Makarere University (Uganda). | Jan-06 | Jul-09 |
| | 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 and irrigation (Jordan); PoWER partner: Birzeit University (Palestinian Authority) | Jan-06 | Mar-10 |
| | EU-Medina Desalination Membrane-based Desalination: an Integrated Approach | EC-FP6 | Universita della Calabria, Italy; Kiwa, IWW, Ben Gurion University and others. | Dec-06 | Dec-09 |
| | 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-07 | Mar-10 |
| | Asian Pacific Water Forum - Capacity Development | AsDB | | Jun-07 | Jun-09 |
| | Anticipating and resolving flood issues, differences and disputes in the Lower Mekong Basin | MRC | | Aug-08 | Mar-09 |
| | Netherlands and Western Balkans Environmental Network | EKN | VU, WUR, LeAF | Oct-08 | May-11 |
| | UNESCO-IHE AIT Double Degree program | DGIS-DUPC | | Dec-08 | Dec-09 |
| | 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-09 | Jun-10 |
| | Collaboration WaterNet Phase IIB 2009 | DGIS / Sida | | Jan-09 | Dec-09 |
| | Capacity Building project at WASA/WITSS | EC-Edulink | WASA, University of the West Indies, COSTAAT, Univ. of Guyana | Jan-09 | Jan-12 |
| | "Global Water for Sustainability Program | USAID | WWF, World Vision | Mar-09 | Sep-09 |
| | IWRM short course for decision maers in MENA regions | UNU-EHS | IHP, DUK and UNW-DPC | Sep-09 | Oct-09 |

TAILOR-MADE TRAINING

| COUNTRY | TITLE | FUNDING | PARTNERS | START | END |
|--------------|---|---------------------------------|--|--------|--------|
| Brazil | Environmental Flow Assessment Workshop and Environmental Flow Methodology Conference | Soges SpA | | Sep-31 | Sep-09 |
| China | E-flows assessment training programme in China | WWF | | Jun-09 | Jun-09 |
| | Flood forecasting and monitoring - methods and technologies | W&W Holding BV | | Oct-09 | Nov-09 |
| Colombia | Establishing a joint programme in hydroinformatics at univalle and IHE | DGIS | | Jan-10 | Feb-11 |
| Egypt | Urban Development | Nuffic-NFP | Vitens, ITC, WUR, HIS | Dec-08 | Dec-09 |
| Ethiopia | Water Supply and Sanitation Tailor Made Training to Addis Ababa Water and Sewerage Authority (AAWSA) | Nuffic-NFP | | Aug-08 | Jun-09 |
| | Spate Irrigation Mission in Ethiopia | | | Feb-09 | Apr-09 |
| | Flood based farming as part of river basin management | Nuffic-NFP | Oromia Water Resource Bureau and Haramaya University | Feb-10 | Dec-10 |
| Indonesia | 4 MSc fellowships from PU in Municipal Water and Infrastructure | AsDB | | Oct-08 | May-10 |
| | TM Environmental Carrying Capacity and its application in spatial use management and environmental evaluation | Nuffic | | Feb-09 | Jun-09 |
| | TMT in financial management and irrigation | National Government | | Sep-09 | Oct-09 |
| | Short Course on Strategic Environmental Assessment and Environmental Impact Assessment | RWS | | Nov-09 | Jan-11 |
| | Blended Wetland Management Planning Course | RWS | | May-10 | Apr-11 |
| Netherlands | Development and Dissemination of a Simulation Game of a Water Utility | EVD | Vitens | Jan-09 | Dec-09 |
| | The Water Channel | DGIS-DUPC | | May-09 | Dec-09 |
| Nigeria | Tailor made training in Nigeria with a 'Water governance' character | WSSSRP | | Mar-09 | Apr-09 |
| Saudi Arabia | Tailor made training port planning and management University of King Abdul Aziz | National Government | | Sep-09 | Oct-09 |
| Sudan | Tailor made training in Water Quality (only Groundwater | UNESCO-Chair in Water Resources | | Sep-09 | Nov-09 |

| TAILOR-MADE TRAINING | | | | | |
|----------------------|---|---------------------|---|--------|--------|
| COUNTRY | TITLE | FUNDING | PARTNERS | START | END |
| Thailand | Disaster Management of Urban Water Systems under Climate Change - Modelling and Risk Assessment | Nuffic-NFP | AIT | Oct-09 | Dec-09 |
| Turkey | Study tour for 6 participants from the Ministry of Environment and Forestry of Turkey | National Government | | Nov-09 | Dec-09 |
| Various Countries | Water and Climate Training Network | DGIS-DUPC | | Aug-08 | Dec-09 |
| | Group Training for Water Resources Planning & Management project of Nile Basin Initiative | UNOPS | | Oct-08 | Apr-10 |
| | Online Course IRBM for Mekong River Commission participants | MRC | | Mar-09 | Aug-09 |
| | Environmental Flows Module Development | DGIS-DUPC | Universidad San Francisco de Quito, TNC, IUCN, Deltares | Mar-09 | Mar-10 |
| | MTEC Flood Risk Management and the Water Framework Directive | EVD - CROSS | Witteveen+Bos | Jan-10 | Jul-10 |

| POLICY DEVELOPMENT | | | | | |
|--------------------|--|-------------|--|--------|--------|
| COUNTRY | TITLE | FUNDING | PARTNERS | START | END |
| Mexico | IWA Development Congress Mexico | DGIS-DUPC | | Nov-09 | Dec-09 |
| Netherlands | Verwijderen Natuurlijk Organisch Materiaal (NOM) | SenterNovem | TUD and others | May-06 | May-10 |
| | Preparation of a Policy Note on Urban Sanitation | DGIS | | Sep-08 | May-09 |
| | WWF-V Water and Food | DGIS-DUPC | | Nov-08 | Jun-09 |
| | Urban Sanitation Conference 2009 | DGIS-DUPC | | Dec-08 | Sep-09 |
| Turkey | Preparing for Climate Change | PVW-II | Women for Water Partnership | Mar-09 | Apr-09 |
| Various Countries | Managing Adaptive Responses to changing floodrisk in the North Sea Region | EC-Interreg | Waterschap Hollandse Delta, Rijkswaterstaat, DG-Water, WL-Delft, Dura Vermeer, University of Sheffield, etc. | Jan-08 | Apr-11 |
| | Coordination of the World Water Forum topic 6.1 on 'Education and Capacity Development Strategies' | DGIS-DUPC | WWF, IRC, UNW-DPC | Jun-08 | Apr-09 |
| | Regional Workshop in Water Education | UNESCO-IHE | UNESCO-IHP | Nov-08 | Jun-09 |

| 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-08 | Dec-10 |
| Hungary | EU Life SUMANAS Project for Arsenic Removal in Hungary and Romania | SELOR | Vitens | Oct-07 | Nov-09 |
| Indonesia | Development pilot polder Semarang and Guideline Polder development | PVW-II | Witteveen + Bos | May-07 | Feb-09 |
| Netherlands | Delft Cluster Phase II: Preparation Urban Water Cycle | NL Gov. / BSIK | Delft Cluster partners | Apr-05 | Apr-09 |
| | Work plan 2006 under the MoU Water and Global Change | NEAA | | Dec-05 | Dec-09 |
| | Bio-availability of trace metals in anaerobic granular sludge reactors | EC-FP7-People | | Jul-07 | Jul-09 |
| | Experimental Investigation of Water Fluxes within the Soil-Vegetation System Using Isotopes to Improve Water Use Efficiency (WUE) | IAEA | | Oct-08 | Apr-11 |
| | Studie naar beheer uiterwaardverlaging Ewijkse Plaat | RWS | | Oct-08 | Mar-09 |
| | Delft 3D model for steady state overbank flow conditions | EPSRC | | Oct-07 | May-09 |
| | High Altitude Wetlands Project WWF - Research, data gathering and report writing | WWF | | Jan-09 | Jul-09 |
| | Long term morphodynamic modeling of tidal basins using process-based models (Waddenze) | DeltaRes | | Jan-09 | Dec-09 |
| | Morphological Acceleration factor Study | DeltaRes | | Oct-09 | Dec-10 |
| Colombia | Operational Flood Forecasting Warning and Response for Multi Scale Flood Risks in Developing Cities | DGIS-UPaRF | DPAE, Cinara, Univalle, Deltares, NOAA | Oct-09 | Oct-10 |
| Saudi Arabia | Center for Soil, Water and Coastal Resources | KAUST-GRP | Many other partners | Jan-09 | Dec-11 |
| Serbia | Comparative and Strategic Analysis for Future Water Supply of Vojvodina | EVD - CROSS | Royal Haskoning, Vitens, AquaDelft | Feb-10 | Jul-11 |
| Spain | Multi-stakeholder platform for interactive decision making in the Andarax River Basin | Agencia Andaluza Agua | Universidad de Almeria | Jan-09 | Dec-10 |
| United States | Modelling of hurricane impacts | USACE | TU Delft, WL | Mar-06 | May-09 |
| Vietnam | Re-hydrating the earth by sustainable, small-scale sub-surface water retention techniques, phase ii | PVW-II | Royal Haskoning, DUT, Westerfield Conservation | Sep-09 | Sep-09 |

RESEARCH AND DEVELOPMENT

| COUNTRY | TITLE | FUNDING | PARTNERS | START | END |
|-------------------|--|-------------------------|--|--------|--------|
| Various Countries | SWITCH - Sustainable Water management Improves Tomorrow's Cities' Health | EC-FP6 | 32 in total: UNESCO-IHE (lead), IRC and many others. | Feb-06 | Jan-11 |
| | TENCompetence | EC-FP6 | | Dec-06 | Dec-09 |
| | SWAT Development Activities | | | Jan-08 | Dec-10 |
| | Formal water rights in informal economies in the Limpopo and Volta | CPWF | IWMI | Jan-08 | Dec-09 |
| | Flood Vulnerability Indices in low headed hydropower | EC-FP7-Cooperation | | Feb-08 | Feb-12 |
| | River basin twinning initiatives as a tool to implement EU water initiatives | EC-FP7-Cooperation | Environmental Protection and Water Mangement Research Institute (VITUKI) HU (coordinator), Soresma BE, Potsdam Institute for Climate Change (PIK) DE BOKU Vienna AT, Mangement Research Institute | Jun-08 | May-11 |
| | In Search of Sustainable Catchments and Basin-wide Solidarities – Transboundary Water Management of the Blue Nile River Basin | NWO-WOTRO | IWMI | Jul-08 | Jun-12 |
| | Localised environmental and health information services for all | EC-FP7-Cooperation | Instituto superior tecnico BICOCCA, Aria Technologies, etc | Sep-08 | Aug-11 |
| | 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-08 | Aug-12 |
| | Partnerships in the Water Supply and Sanitation Sector | DGIS-UPaRF | KNUST, SUEZ, VITENS, NWSC | Sep-08 | May-12 |
| | Upscaling small-scale land and water system innovations in dryland agro-ecosystems for sustainability and livelihood improvements | DGIS-UPaRF | USDAM, UKZN, IWMI, TUD, SEI, SU | Sep-08 | Aug-12 |
| | Sediment, sediment transport from reservoirs to estuaries | DGIS-UPaRF | NHRI, HRI, Deltares, SKLEC, Hohai | Oct-08 | Oct-12 |
| | 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-08 | Dec-12 |
| | Hydrologic Impacts of Land Use and Landcover changes in the Kilombero River Basin Tanzania | DGIS-UPaRF | UDSM | Jan-09 | Dec-11 |
| | Risk-based operational water management for the Incomati River Basin | DGIS-UPaRF | Mondlane University, KOBWA | Jan-09 | Aug-13 |
| | Postdoctoral Research Programme on Adaptation to Climate Change – Special Focus on the Mekong River Basin | DGIS-UPaRF | | Mar-09 | Apr-11 |
| | Decentralised Integrated Analysis and Enhancement of Awareness through Collaborative Modeling and Management of Flood Risk | ERA-Net CRUE | Imperial College London | Apr-09 | Jan-11 |
| | Collaborative Management System on Watershed Vulnerability (eWaterAbility) | EC-FP7-Cooperation | WMO, C3I, SWAT, EAWAG, JRC, IISD, UN-IIST, CERN, CRS4, Univ. of Geneva | Apr-09 | Mar-13 |
| | 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-09 | Jun-13 |
| | Water Resources Management Instruments Implementation by Water Basin Committees | DGIS-UPaRF | Fundación Ecuaciencias, UNIVALLE | Aug-09 | Dec-10 |
| | Hydrogeochemical characterization of the presence of arsenic in Argentina, Ghana and Palestine | DGIS-UPaRF | Inst of Environmental and Water Studies, Birzeit University | Aug-09 | Dec-10 |
| | Permeable reactive barrier for remediation of acid mine drainage | DGIS-UPaRF | | Aug-09 | Dec-10 |
| | Impacts of variable oil prices on economic sustainability of water and wastewater facilities | DGIS-UPaRF | KNUST | Aug-09 | Dec-10 |
| | Allocation of groundwater to groundwater dependent ecosystems | DGIS-UPaRF | Makarere University | Aug-09 | Dec-10 |
| | Environmental flow regime in rivers as a tool for IWRM and RBM and climate change adaptation | DGIS-UPaRF | Birzeit University | Aug-09 | Dec-10 |
| | Intelligent Monitoring, control and Security of Critical Infrastructure Systems | COST | | Jul-09 | Jun-10 |
| | 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-09 | Dec-10 |
| | Environmental Flows for People and Ecosystems in the Mara River Basin | DGIS-UPaRF | UDSM, Egerton, SUA, JKUAT, FIU, WWF | Aug-09 | Jul-13 |
| | Optimization of water allocation between off-stream and in-stream competing demands | DGIS-UPaRF | UNPAR | Aug-09 | Dec-10 |
| | 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 - InnoWATOR | Evides, Membrane Technology Group, Vitens | Jan-09 | Jan-12 |

| RESEARCH AND DEVELOPMENT | | | | | |
|--------------------------|--|------------|--|--------|--------|
| COUNTRY | TITLE | FUNDING | PARTNERS | START | END |
| Various Countries | Benchmarking for Pro-poor Water Services Provision | DGIS-UPaRF | UDSM | Oct-09 | Nov-10 |
| | Natural Systems for Wastewater treatment and reuse: technology adaptation and implementation in developing countries | DGIS-UPaRF | | Sep-09 | Aug-13 |
| | 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-08 | Aug-12 |
| | 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-09 | Aug-13 |
| | Adaptation to Global change in Agricultural practices | DGIS-UPaRF | AIT, DOI | Sep-09 | Aug-13 |
| | 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-09 | Jan-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-09 | Mar-11 |
| | Financing sanitation in slums: whose responsibility? | | | | |
| | Salt and Brackish Water as Second Quality Water for Urban Environment | IRF | Birzeit Univ., KWR, Hong Kong | Oct-09 | Dec-13 |
| | Assessment of Charact of Wastewater flows from unsewered urban slums in African cities | DGIS-UPaRF | Kwame Nkrumah University of Science and Technology | Nov-09 | Nov-10 |
| | Climate change impacts on seasonally and intermittently open tidal inlets | DGIS-UPaRF | AIT, Univ of Moratuwa, Univ of Peradeniya, CSRO, FECT, Deltares | Jan-10 | Dec-13 |
| | Development of a tool for flexible model architecture in hydrological modeling | STITPRO | | Jan-10 | Dec-10 |
| | Membrane bioreactor technology with an EU perspective for advanced municipal wastewater treatment strategies for the 21st Century | EC-FP6 | Norwegian University | | May-09 |

| ADVISORY SERVICES | | | | | |
|----------------------|---|---------------------|---|--------|--------|
| COUNTRY | TITLE | FUNDING | PARTNERS | START | END |
| China | EU-China River Basin Management Programme: Membership of the Programme Advisory Group | EC | DHV | Oct-07 | Dec-11 |
| India | Ganga Environmental Flow Assessment, support to WWF India | WWF | | Jan-09 | Mar-09 |
| Indonesia | Master Plan for Capacity Development for Ministry of Public Works | WB | | Sep-09 | May-10 |
| Mozambique | Development and management of flood recession irrigation in Mozambique | PVW-II | CDP (leader), IHE Delft, Resilience | Apr-09 | May-09 |
| Netherlands | Modification to LIBRA as Role-Play for IWRM training | WB | | Aug-08 | Mar-09 |
| | Advice on water and environment | Nedworc foundation | | Jun-09 | Jun-09 |
| | Delft Spetterstad Fase 1 | HH Haaglanden | Deltares, Hoogheemraadschap Haaglanden, RO2 | | Mar-10 |
| Netherlands Antilles | Drainage Review for Valley Estate and Mary's Fancy | National Government | | Oct-08 | May-09 |
| | Second opinion on the review of the design of WWTP Illidgeroad in Philipsburg | National Government | | Nov-08 | May-09 |
| | Quick Scan Surface Water Quality | National Government | | Jan-09 | Apr-09 |
| | Flood modelling study of the joint stormwater catchment (Belle-Plaine) on St Maarten | National Government | | Apr-09 | Jan-10 |
| Various Countries | Facilitator 7th Annual Mekong Flood forum | MRC | | Oct-08 | Jul-09 |
| | Scaling up micro irrigation systems in India, Madagascar and Honduras | Coopernic | | Sep-09 | Dec-11 |
| | Facilitator 8th Annual Mekong Flood forum | MRC | | Oct-09 | Jul-10 |
| | Development of a Decision Support System for Selection of Sanitation Options | AsDB | | Dec-09 | May-10 |
| Vietnam | Strengthening Water Management and Irrigation Systems Rehabilitation | AsDB | | Apr-09 | Nov-09 |

DGIS Netherlands Ministry of Foreign Affairs

EC European Commission

IDB Inter-American Development Bank

IRF Internal Research Fund IHE

NUFFIC Netherlands Organisation for International Cooperation in Higher Education

NWO Nederlandse Organisatie voor Wetenschappelijk Onderzoek

RNE Royal Netherlands Embassy

SAIL Capacity building programme through NUFFIC

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

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

WB Worldbank

ANNEX 5 | RESEARCH LINES

| RESEARCH LINES | | |
|--|--|---|
| THEME | CORE | RESEARCH LINE |
| Environmental Integrity | Freshwater Ecosystems | Planning for integrated river basin management |
| | | Wetland management |
| | Pollution Prevention and Control | Environmental water allocation |
| | | Cleaner production and the water cycle |
| Information and Communication Systems | Hydroinformatics | Eco-technologies |
| | | Modelling paradigms, uncertainty and risk |
| | | Systems engineering and optimisation |
| Urbanisation | Water Supply Engineering | Collaborative decision making and Internet-based computing and learning |
| | | Water transport and distribution |
| | | Ground water treatment |
| | | Natural treatment systems |
| | Sanitary Engineering | Conventional water treatment technology |
| | | 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 |
| 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 | |
| Water Security | Hydraulic Engineering and River Basin Development | Equity and participation issues in water services management |
| | | Hydraulic structures and hydraulic processes |
| | | Environmental impact of water-related projects |
| | | Management of floods and droughts |
| | | Flood resilience of urban areas |
| | | Integrated coastal modelling |
| | Hydraulic Engineering - Coastal Engineering and Port Development | Performance and reliability of flood defence systems and coastal structures |
| | | Integrated coastal zone management |
| | | Port design |
| | | Hydraulic structures and hydraulic systems |
| | Hydraulic Engineering - Land and Water Development | Environmental impacts of hydraulic works |
| | | Institutional aspects of system management |
| | | Integrated lowland development |
| | Hydrology and Water Resources | Hydrology and Climate (hydrological processes and process-based modelling) |
| | | Physical and biogeochemical processes of groundwater systems |

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Eddy Akinyemi (*until 1.9.09*)
Nemanja Trifunovic (*per 1.9.09*)
Maarten Blokland (*per 1.11.09*)
Prof. Frank Sanders (TUD)

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CULTURAL AMBASSADORS

Artists, events and cultural institutions appointed as Cultural Ambassadors of UNESCO-IHE to call for good water management and advocate the urgent need for well-trained water managers throughout the world.

Catherine Massin performance/visual art/writing
DeSingel International Arts Centre
Festival van Vlaanderen - OdeGand
Gastprogramming 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

HONORARY FELLOWS

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

2004 W.J. Cosgrove
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

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.

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ANNEX 9 | LIST OF ABBREVIATIONS

| | |
|-------------------|--|
| AIT | Asian Institute of Technology (Bangkok, Thailand) |
| BTQ | Basic Teaching Qualification (agreed standard for Dutch university teaching staff) |
| 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 /7 th Framework Programme (research programme of the European Commission) |
| 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 |
| NICHE | Initiative for Capacity Building in Higher Education (Dutch Government programme) |
| 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) |
| TU Delft | Technical University of Delft, 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 |
| VAT | Value Added Tax |
| WaterNet | Capacity Building Network for IWRM (Southern and Eastern African Region) |
| WOTRO | Science Division within NWO |



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