UPDATE

SPECIAL | WATER POST-2015
INTERVIEW | Board Member Claudio Caponi
RESEARCH | PEARL: protecting coastal communities
COLUMN | The Misery of Mathematistry
Dear Readers,

I am happy to announce to you that the longstanding cooperation between UNESCO and the Netherlands in the establishment and further development of our Institute was renewed last December. By renewing this commitment, the Netherlands pledged to continue the base subsidy support for the Institute for the period 2014–2016 with an automatic extension until 2018, provided that the Institute successfully passes its mid-term evaluation. This is exciting news because the need for more trained professionals will only continue to increase dramatically in the coming years.

It is therefore a wonderful opportunity to celebrate with you that our 150th PhD fellow will soon graduate in March. Adrian Almoradie from the Philippines will join our 150 PhD alumni community with his research on ‘Virtual Environments for Stakeholder Participation in River and Flood Management’. Our PhD programme, jointly implemented with partner universities, is an excellent basis for the establishment of the Graduate School on Water and Development. The Graduate School is an essential element of an updated approach to the Global Campus. This initiative has been adopted at a recent session of the Institute’s Governing Board and will function as an international (partly virtual) school cooperating with various academic institutions in the world. The Institute will concentrate on strengthening its current partnerships and networks to achieve the principal objectives of the Global Campus initiative further, thereby increasing the impact of our academic programmes with partners worldwide. The Governing Board decided to ‘upscale’ the current PhD model of cooperating with Dutch universities. This encompasses the implementation of joint PhD programmes with renowned universities worldwide based on the national legislation of the country of each partner university.

Another way that the Institute strives to increase impact is by improving access to its specialist knowledge by increasing the number of OpenCourseWare courses, but also by launching initiatives such as the Graduate Professional Diploma Programme. This is meant for water professionals who wish to further specialize or re-direct their current career at a more flexible pace, and at much lower cost. You can read more about the GPDP and the recipient of the first diploma in this issue of UPDATE Magazine. Throughout the rest of this issue you will get an insight into the work of the Institute in the Post-2015 SDGs discussions and how actively involved the Institute remains in the ongoing debate. We played a key role in drafting a number of recommendations resulting from conferences and symposia held last year devoted to defining the new goals. The 5th Delft Capacity Development Symposium ‘From Rio to Reality’ in May, for instance, fed into the October Budapest Water Summit, bringing together key people at the political and technical level, paving the way towards the 7th World Water Forum in Daegu, Korea. We have always emphasized the need to develop Climate Adaptive Water Management, the protection of aquatic ecosystems, transboundary water issues and above all capacity development for the benefit of developing countries and countries in transition. SMARTer goals need to be defined, but more importantly, we need to act upon achieving them.

Professor András Szöllösi-Nagy
Rector, UNESCO-IHE

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Please make sure your postal and email contact details are up-to-date to receive regular news updates from your alma mater. Update online www.unesco-ihe.org/alumni or send an email to Maria Laura Sorrentino, Alumni Officer, m.sorrentino@unesco-ihe.org.

N.B. We respect your privacy at all times and will never share your information with others without your consent.

ARE YOUR DETAILS STILL CORRECT, HAVE THEY CHANGED OR DO YOU WISH TO END YOUR SUBSCRIPTION?
Send an email to update@unesco-ihe.org

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The Editorial Committee encourages editorial contributions from readers. The sections known as The Column, Op-Ed and Report from the Field are intended to provide a platform for such contributions. Please note that editorial sections are subject to change.

UPDATE Magazine is interested in hearing more from the Institute’s alumni, especially about projects they are currently undertaking and the organizations to which they are affiliated. Please send your updates to the editor by sending an email to update@unesco-ihe.org.

ABOUT UNESCO-IHE
UNESCO-IHE is the largest international graduate water education facility in the world and is based in Delft, the Netherlands. The Institute confers fully accredited Master of Science degrees, and doctoral degrees in collaboration with partners in the Netherlands. Since 1957, the Institute has provided graduate water education and training to more than 14,300 water professionals from over 160 countries, the vast majority from the developing world. Find out more: www.unesco-ihe.org.

ABOUT THE MAGAZINE
UNESCO-IHE Institute for Water Education produces a biennial magazine called UPDATE. We print 15,000 free copies per issue, which are sent to our counterparts across the world. UPDATE features institutional information related to water education, research and capacity development activities undertaken by UNESCO-IHE, its alumni and partners.

ABOUT THE PAPER
We try to make every issue of UPDATE Magazine as eco-friendly as possible. The paper used to make this UPDATE is produced by Sappi and is one of the Triple Star papers delivered to us by Papyris. The paper is PEFC certified and carries the FSC MIX label. PEFC stands for the Programme for the Endorsement of Forest Certification and is an independent, nonprofit, non-governmental organization that works with forest managers, paper and timber companies and their external certifiers to assure that the world’s forests are managed sustainably for the benefit of future generations. FSC MIX meets the standards set by the Forest Stewardship Council to promote responsible forest management. At least 70% of the fibers comes from FSC-certified forestry.

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Interview with board member Claudio Caponi

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ABOUT THE COVER
The cover photo shows a mother fetching water at the local community’s water point in Sagar, an island on the continental shelf of the Bay of Bengal, India. Photographer Nick Chudeau was working with a team of engineers and social scientists, to monitor and evaluate the financial, technical and social sustainability of WASH services in underprivileged rural areas of West Bengal. He is an international development professional specializing in WASH. Follow Nick on Twitter @nchudeau and see more photos on www.nickchudeau.com.
WELCOMING NEW COHORT MSC STUDENTS

At the recent academic opening in October, Rector András Szöllös-Nagy welcomed 225 new MSc students from 53 different countries (class of 2013–2015). Special guest speaker Joost Notenboom of auditing firm KPMG gave an inspiring talk about his 20-month bicycle journey, which brought him from Alaska to Antarctica covering a distance of 30,000 km. The project raised awareness and funds for clean drinking water. Earlier in April, 111 new Masters of Science students from 49 countries received their degree at the awarding ceremony (class of 2011–2013). Dr. Fritz Holzwarth, UNESCO-IHE Governing Board Chairperson and Deputy-Director General of the Ministry of Environment, Nature Protection and Nuclear Safety in Germany addressed the newly graduated professionals with a heartwarming personal story of when he was given a weather station at age nine. The device triggered his fascination for forecasting. Organization then addressed the newly graduated graduates before keynote speaker Michel Jarraud, Secretary-General of the World Meteorological.

NEW UNESCO-IHE WEBSITE LAUNCHED

We are proud to inform you that UNESCO-IHE Institute for Water Education has recently renewed its website. The pages now have a very different look and feel that matches our new corporate identity. One of the main improvements is the possibility to apply online for all educational offerings, including the Msc programmes. The simplified navigation quickly directs students, researchers and other members of the water community to the information they seek. The new ’People’ section presents the expertise of UNESCO-IHE staff and PhD fellows, who can be contacted by clicking on their personal profile pages. The ’Alumni’ and ’Students’ sections show news relevant to alumni, and give an impression of student life at UNESCO-IHE. The website is fully responsive and optimized for use on smartphones and tablets as well. A monthly online newsletter was also created to keep everyone up-to-date on the Institute’s educational, research and capacity development activities. Subscribing can be done by entering a valid email address at the bottom right of any UNESCO-IHE web page.

Visit www.unesco-ihe.org

PARTNERSHIPS

Partnerships add value to many of UNESCO-IHE’s activities and are essential for linking global knowledge to local sector agendas, and for improving North–South and South–South collaboration. Nine new partnership agreements have been signed since the last issue of UPDATE Magazine was published in December 2012 with organizations across the globe. Also, the existing agreements with the WaterNet Trust and Eidgenössische Anstalt für Wasserversorgung, Abwasserreinigung und Gewässerschutz (EAWAG) were extended.

23 MARCH 2013
Eastern Nile Technical Regional Office (ENTRO)
Goals: Development an implementation of courses for the Eastern Nile region, conduct collaborative research and capacity development projects and exchange of data.
Contact: Mohammed Yasir,
y.mohamed@unesco-ihe.org

27 MARCH 2013
Organisation of American States (OAS)
Goals: OAS covers part of the tuition cost for up to four online sanitary engineering professional courses.
Contact: Hector Garcia,
h.garcia@unesco-ihe.org

1 MAY 2013
University of Arizona
Goals: collaboration in (joint) education and research projects on arid zone water resources and drought management.
Contact: Laszlo Hayde,
l.hayde@unesco-ihe.org

INVESTING IN LAND AND WATER

A research consortium led by UNESCO-IHE was awarded funding for the implementation of a research project within the CoCooN programme. The project ‘Investing in land and water: turning new climate finance mechanisms into tools for cooperation’, will be led by Charlotte de Fraiture, Professor of Hydraulic Engineering for Land and Water Development. One of the main objectives of this research project will be analyzing positive and negative impacts of climate finance mechanisms on conflict and cooperation. It will also assess the dynamics and causes of these conflicts and cooperative efforts. In addition, the research will provide policy recommendations for more sustainable and collaborative outcomes. And finally, it will apply lessons learned in designing new climate finance mechanisms. The CoCooN programme consists of six research projects that will run for a maximum of five years. The main focus is on conflict and cooperation in the management of climate change in countries in Africa, Southeast Asia and South America.

18 MARCH 2013
University of Arizona
Goals: Agreement to pursue training of randwater employees in MSc and PhD programmes of IHE, joint project submissions, regular short courses and tailor made trainings.
Contact: Nemanja Trifunovic,
n.trifunovic@unesco-ihe.org

18 MARCH 2013
Eastern Nile Technical Regional Office (ENTRO)
Goals: Development an implementation of courses for the Eastern Nile region, conduct collaborative research and capacity development projects and exchange of data.
Contact: Mohammed Yasir,
y.mohamed@unesco-ihe.org

1 MAY 2013
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Goals: collaboration in (joint) education and research projects on arid zone water resources and drought management.
Contact: Laszlo Hayde,
l.hayde@unesco-ihe.org

www.unesco-ihe.org

Contact: Mohammed Yasir,
y.mohamed@unesco-ihe.org
WISE USE OF WETLANDS

The Secretariat of the Ramsar Convention on Wetlands and the Charles Sturt University (Australia) signed an agreement with UNESCO-IHE to establish the Ramsar Chair for the ‘Wise Use of Wetlands’. The professor appointed to the Ramsar Chair will collaborate with national and international organizations and experts to contribute to UNESCO-IHE’s work and the Ramsar Convention’s mission of promoting the conservation and wise use of wetlands. The Chair will lead teaching modules, supervise PhD and MSc students, help partner organizations develop traditional and online training, and facilitate publications relevant to wetland research and conservation. “The Ramsar Chair is a position that will strengthen the impact and information flow from wetland research. It will help us carry out more useful training on wetland management,” said the Ramsar Convention’s Secretary General Christopher Briggs. UNESCO-IHE Professor of Aquatic Ecosystems, Ken Irvine, elaborates: “This new Chair will help us conduct robust research into better understanding of the ecology and management of wetlands.”

k.irvine@unesco-ihe.org

AXA FUNDS CHAIR IN CLIMATE CHANGE IMPACTS AND COASTAL RISKS

A new chair in Climate Change Impacts and Coastal Risks has been established at UNESCO-IHE since 1st January 2014 following a successful proposal by Dr. Rosh Ranasinghe to the AXA Research Fund. “The AXA research fund is one of the world’s very few schemes that provides support for fundamental scientific research geared towards risk mitigation. My main research interest is in the area of climate change and coastal risk, which aligns perfectly with the environmental risks core research areas that the Fund supports,” Dr. Ranasinghe explains. The chair will generate new fundamental scientific knowledge and formulate groundbreaking theoretical and modelling concepts, which will enable the development of innovative climate change driven coastal risk assessment methods that are underpinned by sound science.

r.ranasinghe@unesco-ihe.org

IMPROVING WATER SAFETY AND SECURITY IN MARA RIVER

The Mau Mara Serengeti Sustainable Water Initiative (MaMaSe) was recently awarded an 8 million Euro grant by the Dutch embassy in Nairobi, Kenya. The four-year project will improve water safety and security in the Mara River Basin in support of structural poverty reduction, sustainable economic growth, and conservation of the basin’s forest and rangeland ecosystems. This will be done through a broad-based, basin-scale public-private-partnership designed to empower people and promote self-reliance. A single, well-coordinated initiative will enable the basin-scale interconnection of knowledge, policies, institutions, markets, and good practices that is required. It will also provide a platform for the engagement of new partners (Kenyan and international) and a systematic expansion of activities that further benefit the basin and its people. The four-year project started on 1 January 2014 and is led by UNESCO-IHE. Consortium partners include Egerton University, GIZ, HSBC Bank, ITC/TU Twente, Kenya Water Resources Management Authority, Mara farming, Waterschap Brabantse Delta, SNV, Wageningen UR and WWF Kenya.

m.mcclain@unesco-ihe.org

27 MAY 2013
University of Atacama, Chile
Goals: Collaboration in MSc in water supply engineering with focus on desalination at Univ Atacama, capacity development for the centre for desalination and water reuse, staff exchange, short courses and laboratory setup.
Contact: Sergio Salinas, s.salinas@unesco-ihe.org

9 JANUARY 2013
University of Amsterdam (UvA)
Goals: PhD promotions arrangements, joint research and education activities and exchange of staff.
Contact: Klaas Schwartz, k.schwartz@unesco-ihe.org

25 APRIL 2013
World Meteorological Organization (WMO)
Goals: cofinancing of 2 to 3 MSc fellowships per year to selected candidates covering costs of living, return ticket, insurance, book allowance and thesis allowance.
Contact: Ioana Popescu, i.popescu@unesco-ihe.org

25 APRIL 2013
National Water Authority (ANA), Nicaragua
Goals: support to MSc research in Nicaragua and possible support to full or partial PhD research for Nicaraguan citizens.
Contact: Jochen Wenninger, j.wenninger@unesco-ihe.org

05 JUNE 2013
National Secretariat for Higher Education, Science, Technology & Innovation of Ecuador (SENECYT)
Goals: Letter of Intent initiates a process of dialogue focused on the establishment of points of common interest in the fields of education, science, technology and innovation, in order to formalize a relationship of mutual cooperation and benefit through an MoU.
Contact: Damir Brdjanovic, d.brdjanovic@unesco-ihe.org
“Targeted global learning enables professionals to bring developed-country benefits to water-related issues back in their home country.”
How are global organizations using and sharing expertise and education?
There was discussion at a recent meeting of UN Water on how to better apply energy and knowledge from academic institutions to increase levels of professionals working with water issues across sectors. Much more can be done to develop the potential of our educational resources to accomplish the UN goals. It’s in my own professional interest, as I’m responsible for contributing my organization’s point of view in guiding academic activities together with governments and private sectors. Working more smoothly through bureaucratic obstacles is something that will help us have better overall relations between organizations, institutions and professionals in the field. This particularly applies to coordinating efforts and goals between our 191 member countries. The WMO has one of the first and only working agreements with UNESCO-IHE regarding fellowships. Other UN agencies should take note of how their institutes can be more closely involved in such partnerships, because this is truly unique in its mission. Its global campus concept makes the most of knowledge value by creating a clear channel for sharing expertise in areas of the world where it’s most needed.

What are your experiences in knowledge versus application?
I saw the power of applied academics first-hand early in my career as director of hydrology and meteorology at the Ministry of the Environment in Venezuela in 1990. When I arrived, the staff of about 200 technicians and observers had not received any substantial training in nearly 20 years. We established a programme with universities so that our staff members could attend courses as residents. The staff was transformed from a skeptical patch of people with little motivation to be part of a group that worked closely and effectively together. We didn’t have enough funds to boost staff motivation by raising salaries; so we tried do so through education, and it worked. Even so, management trends after my departure focused mainly on technology and equipment, and left beneficial training behind. There’s still been some progress, but I think much more could have been done from what was started through focusing on continuing education.

Are we bridging gaps between countries?
Targeted global learning enables professionals to bring developed-country benefits to water-related issues back in their home country. World organizations have had the tendency over the last decades to send consultants to introduce new technology in areas that needed it as a solution to solving water problems, but little attention has been given to capacity development for the people who work and live in these areas. It’s a short-term vision where large sums of money are being spent on the best equipment to seek instant results in under-developed areas. It doesn’t work; it never works. It’s simply not sustainable. After the experts install the equipment, political or other priorities may change, and then these experts leave for other areas. The result is a country or region left with technology that they are not able to manage effectively. Developing countries cannot afford to refuse equipment, but they should demand proper training and capacity development to ensure sustainable results.

What are effective ways to intervene in development?
The approach of having an international institute in the Netherlands that educates more than 300 people a year is one of the best ways of solving water issues in the long term. It’s the right approach to not only close the gaps between countries, but keep them from becoming
People at local levels should be equipped with the knowledge to solve problems with their own minds and capacity for innovation, even through the use of distance learning, if that’s what it takes. It is always difficult to get all the stakeholders in one location. The Pacific islands is an example where stakeholders who have interest in developing hydrology skills, but located are geographically far away but have an increased interest in developing hydrology skills. By sharing the lectures virtually, respected professors are able to connect with people who are not able to attend the classrooms physically.

How does climate change fit into water resource management?
The effects of climate change will alter much of what we are facing today, and shape our approach to developing sustainable systems of water resources. Water issues cannot stand alone in adaptation, and should be a priority. Some ‘climate change adaptation projects’ are actually counter-productive because they do not take an integrated approach to management across broad sectors. Integrated planning for a future that is already changing our landscapes must become part of normal thinking. I think more people are realizing this, and that’s a positive sign.

Are climate change experts from different countries sharing the right information?
Water resource managers in recent years have not sufficiently changed their approach based on climatology predictions, either because they have not received relevant information or because data was not presented in an understandable format. The WMO programme on a Global Framework for Climate Services aims to create more fluid and understandable communication. It is designed to sharpen climate-risk management by sharing information with decision-makers, including following up to ensure understanding. By bringing resources together into national plans based on collective international expertise we will better be able to give ourselves and our grandchildren a better chance. This is of course necessary along with continued political support. Leaders from developed and underdeveloped countries need to have a clear picture of what is happening and what is to come, along with a globally focused cooperation with their counterparts. When the political decision-makers are in better harmony, we are all in a better position to accomplish long-term goals.

What is your best-case vision of UNESCO-IHE, the UN, governments and other organizations working together 20 years in the future?
It would be great to wake up in 2033 and see the UNESCO-IHE Global Campus graduating 2,000 students per year from developing countries in MSc and PhD programmes in several languages. We can imagine all UN Agencies using this great resource to assist in capacity development in their own constituencies, and international financing institutions supporting the development of new programmes under its framework, by using existing capacities instead of developing short-lived initiatives. Finally, it would be good to see more developing countries with sufficient human resources and education making the best possible use of development aid offered by wealthy countries who are interested in helping them find their own route to the sustainable development of their water resources.

All of the above may seem utopian and even naive, but anyone would have a difficult time convincing me that we would be in better shape by following what I would call the ‘cynical business-as-usual scenario’ of the last few decades.

**GOVERNING BOARD**
The Governing Board comprises representatives of ministries, universities and the private sector, all appointed by the Director-General of UNESCO. The Board is responsible for the programme and activities of UNESCO-IHE and ensures that these contribute to the broader UNESCO policies and strategies established by the General Conference. The Board is chaired by Fritz Holzwarth, Deputy-Director General of the German Ministry of Environment, Nature Protection and Nuclear Safety.

**IHE DELFT FOUNDATION BOARD**
The IHE Delft Foundation Board owns the buildings and facilities that UNESCO-IHE uses, and employs most of UNESCO-IHE’s staff. This Board is responsible for safeguarding the continuity of the Institute’s operations by overseeing the finances and ensuring proper embedding of the Institute in the Dutch legal systems. The Foundation Board is chaired by Wim Deetman, Dutch politician and statesman, and former Minister of Education and Mayor of The Hague.
The Misery of Mathematistry or the Beauty of Simplicity

I must begin by confessing my passionate love for mathematics. Math is a wonderful language that allows going beyond disciplinary boundaries and across countries. Over history, math has been the most appropriate language to express scientific intuitions with elegant simplicity. I have always been astonished by powerful minds, from Isaac Newton, who invented calculus to formulate his physical concepts, to Paul Dirac, who developed the delta function to explain the behaviour of elementary particles. Unfortunately, the growing availability of computational power has facilitated a current tendency towards what George Box called “mathematistry”: the abuse of complicated mathematics to build over-sophisticated models for the sake of it. This trend is also associated to the growing focus on over-fitting data and getting precise numbers.

I argue that mathematistry is not only useless, but also a potential obstacle to scientific progress. Examples of mathematistry are the over-sophisticated model cascades currently used to simulate the impacts of climate change on water resources. This approach has become very popular, mainly because its top-down implementation is very straightforward: scenarios to climate models to downscaling to hydrological response. To run simulations, we can even switch off our brains as long as powerful computers are available! However, this approach is affected by remarkable uncertainty and often fails to provide useful information for decision makers. Also, it makes most modellers unable to explain why a certain hydrological response is simulated by these models.

In the old times, math served scientific minds to formulate concepts, laws and theories with elegant simplicity. Nowadays, math is being abused to build over-sophisticated models, which are not only useless, but also preventing us to think and advance our understanding. Hence, I hope we will shut down our computers (from time to time) and switch on our brains (more often) to seek simple, elegant equations and explain the fundamental processes determining the dynamics of our world.
Cooperation and knowledge-sharing in Ethiopia

By Susan Graas

UNESCO-IHE embarked on a capacity development project to facilitate such synergies from 2009 – 2012 by leading initiatives to promote the sharing of research by Ethiopian universities with the goal of strengthening water sector organizations on integrated river basin management (IRBM). The Nuffic NPT project ‘Strengthening Ethiopian Universities in Integrated River Basin Management’ connected eight Ethiopian universities and a consortium of collaborating institutions to enhance their cooperation with water sector organizations in the country, and ultimately create foundations for partnerships that continue today.

Strengthening Ethiopian universities
At the onset of the project, the eight universities were enthusiastic over opportunities to raise levels of qualified staff, increase capacity and funding for Demand Driven Action Research (DDAR), and facilitate more hands-on practice in integrated river basin management. It was decided that three universities would develop an MSc programme on IRBM, and all universities would be supported through improving their existing water education, with a special focus on developing Ethiopian case studies and innovative teaching methods.

Working together
The University Water Sector Partnership (UWSP) was created as part of the project in September 2009 to establish a solid link between Ethiopian universities and water sector organizations. The UWSP has grown to more than 500 partners, and continues to function as a network that coordinates a range of water-related activities:

- Enabling exchange of information through annual meetings for stakeholders to network on water issues in Ethiopia
- Enabling dissemination of published and grey materials that update the state of the art in the water sector
- Establishing a website and newsletter for updates on progress and contact information
- Organizing DDAR programmes with partners
- Facilitating MSc fellowships and short-term courses

Effective joint effort
To enhance collaboration and strengthen partnerships, the universities initiated short-term trainings for water professionals and conducted joint research projects. Encouraging further collaboration, a competitive research grant facility was created to fund DDAR. Staff from the partner universities took the lead in the DDAR projects in close operation with water sector organizations. Seven projects were successfully implemented that addressed real-world problems, and a portion of the DDAR grant was used for regular meetings of the research team with water sector organizations and other stakeholders. The DDAR projects established productive relationships between the universities and water sector organizations, resulting in ongoing combined efforts. For example, the Abay River Basin Authority has made contributions to the Bahir Dar University research project and follow-up research activities are expected. Additionally, Arba Minch University has been asked to deliver a targeted training for pastoralists by a Regional Water Bureau in Ethiopia. Bringing together actors in these sectors has improved skills in writing research proposals and conducting research in IRBM. New opportunities have emerged for project findings to be presented and further developed by UWSP members.

The way forward
The initial project came to a successful conclusion in June 2012, and a roadshow that followed presented results of the initiative at each partner university. A knowledge base that included reports, videos and course materials was distributed to the wider community in the regions where the eight partner universities are located. Building on these accomplishments, participants enthusiastically discussed their intentions to carry working partnerships forward and the need to continue the UWSP. Government offices from Ethiopia and the Netherlands have expressed support for the UWSP in ensuring the sustainability of these combined efforts. Moreover, additional funding is currently being sought for DDAR projects, short-term trainings and facilitation of MSc fellowships.

From January 2014 onwards Arba Minch University and UNESCO-IHE embarked on a new capacity development project to strengthen Ethiopian Universities in Small Scale Irrigation. This NICHE Capacity Building project will develop capacity of teaching staff and improve the curricula on irrigation for Arba Minch University and the other participating Ethiopian Universities and support the UWSP further.

More information:
www.universitywatersectorpartnership.org
A research consortium of 24 partners led by UNESCO-IHE has been awarded funding for the implementation of its research proposal within the FP7 programme, as part of ‘Coasts at threat in Europe: tsunamis and climate-related risks’. Entitled ‘Preparing for Extreme And Rare events in coastal regions’ (PEARL), the research project will be led by Dr. Zoran Vojinovic.

Research Goals
The impacts of climate change, population growth and urbanization are bringing some of the greatest challenges of our time. One of the most powerful storms in history, Super Typhoon Haiyan, devastated the Philippines in November 2013, killing around 6000 people. The same storm has also had significant impacts in Vietnam and China. The need to respond to such challenges reinvigorates the significance of adaptation for sustainable development.

The main goal of PEARL is to develop adaptive, sociotechnological risk management strategies and measures to protect coastal communities against extreme hydro-meteorological events, minimizing social, economic and environmental impacts and increasing the resilience of coastal communities. PEARL brings together world-leading expertise in hydro-engineering and in risk reduction and management services to pool knowledge and practical experience. The aim is to develop more resilient and adaptive risk management solutions for coastal communities, focusing on present and projected extreme hydro-meteorological events.

The project will examine seven case studies from across the EU and five case studies outside the EU (two case studies from the Caribbean and three from Asia) to develop a holistic risk reduction framework that can facilitate multi-stressor risk assessment, identify risk cascading processes and strengthen risk governance by enabling an active role for key actors.

Jointly executed by 24 partners, this four year research project (2014 – 2018) will be clustered around seven work packages:
1. understanding formation of vulnerabilities and risk in coastal regions
2. understanding formation of hazards under extreme events
3. holistic and multiple risk assessment
4. flood early warning systems for coastal regions
5. decision support and policy development for strengthening resilience of coastal regions
6. case studies
7. dissemination and communication

More specifically, PEARL aims to progress beyond the state of art in a series of domains. For instance, a holistic risk governance approach will be developed based on co-evolutionary complex systems analysis. The scope of risk assessment will be broadened by incorporating aspects such as social justice and social contracts into the analysis, while investigating issues of risk evolution for the complete socio-technical system of the coastal regions. PEARL will also seek to improve knowledge and understanding of how vulnerabilities and risks form in coastal regions.

New concepts and tools will be developed for strategic and operational planning purposes, event prediction, forecast and early warning technologies to management of critical infrastructures (e.g. ports, drainage systems, flood defences or coastal barriers). Such advances will include:
- improving existing, physically based computational models and developing novel multi-scale concepts and tools for modelling combinations of hazards to coastal areas related to atmospheric conditions, storm surges, waves, pluvial and fluvial processes;
- advancing the technological potential of early warning systems (real-time data assimilation, uncertainty quantification for extreme events, increased computational speed in state-of-the-art modelling tools) in order to achieve sufficient lead times for emergency actions;
- improving the stakeholder engagement process for the purposes of developing risk management roadmaps and supporting this process with novel concepts and tools from both social research and ICT technologies (e.g. collaborative modelling and learning & action alliances platform, agent-based and cellular automata models, and serious gaming);
- adaptive and resilient strategies will also be developed that utilize structural and non-structural measures, implement ecosystems-based approaches and promote active stakeholder participation.

More information:
www.pearl-fp7.eu

CONTACT
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The well-being of about 5 billion people depended on the water resources of our planet in the last decades of the 20th century, when the UN Millennium Development Goals (MDGs) were being drafted and discussed. It’s a sobering thought to consider now that the number of people sharing the same level of water resources in 2030 is projected to grow to more than 8 billion.
There has been encouraging progress in reaching the water-related MDG targets, achieving a 50% reduction in the number of people without access to safe drinking water and basic sanitation. But as the target date for this first set of goals nears in 2015, member countries of the UN are working to agree on a new set of Sustainability Development Goals (SDGs). The discussion on the SDGs resulted from the RIO+20 Conference on Sustainable Development in June 2012, and their overall purpose is to build on the advancements that have been made, as well as focusing on unfinished business from the MDGs. For example, even though more than 2 billion people gained access to improved drinking water sources between 1990 and 2010, there are still approximately 2.5 billion people – primarily in developing countries – without access to improved sanitation facilities.

Governments, educational institutions and sector professionals are now coming together, hoping to build the SDGs as a new instrument to pick up where the MDGs left off and carry populations toward a future with increased confidence in the availability of global water resources. Many sector professionals and academics envision an ideal system in which water issues are not only a clear and independent goal, but also a part of an integrated approach that includes areas related to food, security, public health and climate change. It must be a comprehensive effort that covers related areas and the water cycle itself. The Representative of Hungary to the United Nations, Csaba Kőrösi, said in an interview, “We need to expand our activities to take the whole water cycle into account: from access to clean water, to where it’s coming from, to where it’s going, and to the state of the natural environment that is providing the water for us.”

Who’s taking the lead in capacity building?

Last May, about 220 participants from 60 countries gathered at the Delft Symposium on Water Sector Capacity Development at UNESCO-IHE. The theme of the Symposium, which meets about every five years, was ‘Who’s taking the lead in knowledge and capacity development?’ The participants used the meeting to discuss the SDGs, targets for progress, and the intended scope to include all countries, in preparation for further development and discussion of goals at the Budapest Water Summit held in October.

One common view at the Symposium was that not enough emphasis had been placed on capacity development as a central component of the SDGs. Without a coordinated flow of efforts and expertise from governments, sector professionals and educational institutions, energy spent on water projects could be lost due to mismanagement and low competence levels. Education alone does not equate to capacity development, because training only targets individuals. Many students who receive training return to organizational settings that have not evolved, and are then limited in their ability to apply new knowledge.

Workshops and meetings at the Symposium focused on ways to address this by embedding principles of capacity development in the SDGs. Dr Uta Wehn de Montalvo, who led the organization of the Symposium, provided information on capacity development efforts: “Reaching agreement on the SDGs is a challenge in itself, but it’s important to ensure that targets are not only met once, but see that actual levels of reaching the goals is sustained. This relies highly on the capacity development activities that should accompany the programs involved.” Moving forward from the Symposium, capacity development remains an area that should receive more attention.

…water has to be a part of sustainable development across the entire post-2015 agenda”
Development, research and education.

Data collection and assessment, capacity areas of climate change resources management, Professor Szöllösi-Nagy also pointed out that indicators to understand current progress. Of the SDGs provides an opportunity to bring broader political acceptance, but development lacked some clarity of targets, perhaps for to define them. “It is apparent that the MDGs measurable, applicable, realistic and time-

UNESCO-IHE, stressed the importance of Professor András Szöllösi-Nagy, Rector of UNESCO-IHE, said knowledge and capacity,” saying that if these areas are not well facilitated, “money and natural resources alone will not help us.” In addition to increasing functional capacities across the complete range of water sector actors, defining measurements and indicators is vital so the larger global community can understand what progress is being made.

Professor András Szöllösi-Nagy, Rector of UNESCO-IHE, stressed the importance of having definable targets as part of SDG goals: “We need much more specific goals: measurable, applicable, realistic and time-bound. One of the biggest challenges is how to define them.” It is apparent that the MDGs lacked some clarity of targets, perhaps for broader political acceptance, but development of the SDGs provides an opportunity to bring more countries on board in establishing better indicators to understand current progress.

Professor Szöllösi-Nagy also pointed out that well-defined targets should be established on areas of climate change resources management, data collection and assessment, capacity development, research and education. SDG targets also need to be applicable and understandable in various socio-cultural environments. Discussing observations to see if the targets are being met, Professor Szöllösi-Nagy said, “More international assessment of how water sector issues are evolving is needed. The number of ground observations has decreased over past years. There is technology such as remote sensing and satellite hydrology, but we need more concentrated international assessment and data sharing in universally understandable formats. If you can’t measure it, you can’t manage it.”

Changing weather—changing minds

The effects of climate change on resource management and implementation will have a major influence on which goals will remain relevant in years to come and how they will be realized. It should therefore be unsurprising that climate changes are in some ways shaping the discussions surrounding the SDGs. Even though international media reports have nearly numbed some people’s perception of the issue, the reality is that effective adaptation is needed in order to minimize the impact of hydrological extremes to be able to consider larger concepts of sustainability.

Data and measurements experience fluctuations due to natural extremes, and it is important to take this factor into account in future policy planning. Established SDGs serve not only as goals for development, but also as preparedness benchmarks to ensure efficient resource use. Professor Szöllösi-Nagy further illustrated their place in improved communication and data sharing in mitigating risks of hydrological phenomena. There is a tendency to cut back on spending on hydrological services in times of economic crisis; as a result, governments are then left looking at each other when the big (climate-driven) flood comes. Predictions could be made, information could be shared more effectively, and resource management strategies could be implemented.”

Reaching agreement with 193 UN countries is not an easy task, by definition. The Budapest Water Summit offered an opportunity for political, scientific and technical stakeholders to pose recommendations to the UN General Assembly for the post-2015 development agenda. Ambassador Körösi is optimistic on the ultimate development and implementation of the SDGs: “It has never been a question of if we can achieve the SDGs or a vision of the future. The big question will be what the content of this vision will be, and how far are we willing to compromise and how ambitious we can be.” All negotiations to reach a large political agreement require compromise, but Ambassador Körösi added that it should be clear that any such trade-offs will need to serve science, society, and the economy—and should not take place at the expense of one another. Working agreements should also be sustainable in ensuring that educational institutions like UNESCO-IHE play a constant advisory role.

Shared feeling of ownership

Having all stakeholders participate in negotiations is essential to realize long-term improvements in the water sector that can be effectively integrated into other vital areas of human activity. Agreements that are proposed by representatives of governments actively participating in the process will benefit from a shared feeling of ownership when these representatives return to their home constituencies to introduce SDG plans. Ambassador Körösi noted the importance of continued economic growth among countries to support development goal ambitions. Achieving this stability is a complex endeavour as social models change over time, with more people living in urban areas. Policies to address long-term threats and concerns will still need to be compatible with short-term political agendas.

“The Budapest Summit is an important step in getting the political community to adopt the notion that water has to be a part of sustainable development across the entire post-2015 agenda,” said Professor Szöllösi-Nagy. Considerable consensus still remains to be achieved, but momentum is building on having applicable world-wide SDGs and clear target indicators. With 40% of the world’s population projected to face water shortages by 2030, UN Secretary-General Ban Ki Moon referred to these global efforts as the most important enterprise of the UN at this time. Speaking on the scope and importance of this opportunity, Ambassador Körösi summed up the essence: “It’s an interesting time; having participation from all stakeholders will design not a revolution, but a calculated evolution.”
Contributing to the SDGs

Water as a potential source for cooperation is an excellent basis to build cooperation across divides, be them political or disciplinary. Defining new goals for the future is important, but there is still unfinished business related to the water and sanitation, and water supply Millennium Development Goals. We need to continue our efforts although new water challenges emerge. Here are some of our continued efforts in meeting those challenges.

CAPACITY DEVELOPMENT

Improving sanitation with the Gates Foundation

Together with the Bill and Melinda Gates Foundation, UNESCO-IHE researchers are developing innovation in the field of sanitation to bring improved sanitation outcomes and achieve the UN Millennium Development Goals (MDGs). Professor Damir Brdjanovic and the project team have developed a project that supports this goal titled, “Stimulating Local Innovation on Sanitation for the Urban Poor in Sub-Saharan Africa and South East Asia (SaniUP).”

MEASUREMENTS

A civil way of improving water data processing

Speaking about identifying progress in the MDG process Professor András Szöllösi-Nagy, Rector at UNESCO-IHE, said, “Capacity building is not only in terms of human capacities, but covers the entire chain, starting from water-related observations on the ground. The number of these observations recorded and the data produced and shared is an issue of concern.”

CLIMATE CHANGE

Taking up the fight against climate change

Climate change is presenting increasing challenges for our planet in terms of our ability to deal with extreme weather events that are taking place in cities and farmlands around the world. As a means of finding innovative solutions UNESCO-IHE research is currently working on the ‘Relative Sea Level Rise Scenarios’ research initiative, aimed at equipping the current population and future generations located in Tamil Nadu, India with greater information about the likely impact on sea level rises.

POLITICAL AGREEMENT

Measuring our water footprint

A water footprint describes how much water is consumed by an individual, community or business through the entire supply chain of products or activities that require any use of water. The water footprint of a 150-gram soy burger produced in the Netherlands is about 160 litres, while a beef burger is about 1,000 litres. By measuring a water footprint it is possible to provide information that can be used to balance global water resource management, similar to that of a carbon trading system.
This research project has been made possible through a US$8 million grant to UNESCO-IHE from the Bill and Melinda Gates Foundation as part of their Water, Sanitation, and Hygiene strategy aimed at finding solutions for the urban poor in these regions. Project activities are centered around five themes: smart sanitation for slums and informal settlements; emergency sanitation following disasters; resource recovery oriented decentralized sanitation; low cost wastewater collection and treatment; and fecal sludge management.

The scale of the project is significant with Professor Brdjanovic stating that “this is probably the largest research and postgraduate education project targeting sanitation for the urban poor ever conducted,” adding that “it’s also one of the major capacity development projects in sanitation, directly contributing to the MDGs.” Knowledge and capacity-related project output will include five post doctoral fellows, 20 researchers, 20 PhD degrees, 20 PhD theses and up to 60 educated professionals to the Master’s level. General projected outcomes include enhancement of research capacity and facilities of partner institutions, establishment of an international academic network on pro poor sanitation and the development of prototypes and practical applications of innovation in sanitation for the urban poor.

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The WeSenseIt project is a citizen-based water observation system that allows residents, professionals and non-professionals to add to the chain by collecting, evaluating and communicating data. In doing so, citizens become stakeholders, bringing them closer to water and environmental issues that affect the local communities in which they live. As a partner in WeSenseIt, UNESCO-IHE contributes its collective expertise in flood forecasting, use of mobile devices in water management, support systems, as well as governance, knowledge sharing and social innovation. The project connects the expertise of UNESCO-IHE researchers with 13 European partners in academic research and industry in the four-year effort that is funded by the Seventh European Framework Programme. The project objectives include collection of non-structured environmental data through a range of means, development of descriptive and predictive models, ability for two way feedback and exchange of environmental knowledge and expertise, and evaluating the extent to which information can be shared with governments, professionals and researchers. The project is geared towards the creation and deployment of a system that will assist local residents, emergency officials and policymakers to communicate, discuss, monitor and intervene in water-related services and areas of common concern.

Read more about the WeSenseIt project on page 22

Researchers Ali Dastgheib, Rosh Ranasinghe and their team are working in partnership with the Asian Development Bank in their “Climate Adaptation through Sub-Basin Development Programme” with the goal of enhancing the area’s resilience to the effects of climate change. The main objectives of the project include development of integrated programmes and infrastructure for managing groundwater, surface water and salinity; establishment and strengthening of the institutions and systems and implementing sustainable agriculture systems. The team published their report last June with an analysis of the development of sea-level-rise scenarios that are linked to climate change. The data address current conditions and projections for local sea level rise by the year 2100. The findings can also be applied to changes in sea levels that are associated with extreme weather events, which are being witnessed on a more varied scales and in more locations. The outcomes of the research programme have the potential benefits that include improved drainage facilities, installing flood control measures and land use strategies to mitigate the potential impacts of climate change in the area.

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A wide range of institutions use this assessment process to identify locations where water footprints have the largest impact, and then address ways to reduce those impacts. Many countries have a larger water footprint because they import products that are most water intensive from exporting countries that may not have effective water policy governance for conservation and distribution. Uneven trade can therefore put pressure on these exporting regions. As a Founding Partner, UNESCO-IHE launched the Water Footprint Network in 2008, where Professor Arjen Hoekstra was credited with the basis for the concept and methodology, taking into consideration the timing and location of water use. Additional development of the Network took place at the University of Twente, in the Netherlands. Partnerships include educational institutions, governments, businesses, the private sector and UN organizations. The Network’s mission is to transition towards sustainable, fair and efficient use of freshwater resources worldwide, clear communication between sector actors and governments, supporting institutions in implementing footprint use and developing guidelines that lead to more effective water governance.

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Learning can benefit from change management strategies

By Silas Mvulirwenande

In order to increase performance across sectors in meeting a growing range of global water challenges, there is a clear general need for increased competency amongst professionals and institutions. Over recent decades, a steady rise in knowledge and capacity development (KCD) has brought progress, but challenges remain as to how to conduct the most effective KCD interventions to improve sector competences.

From my research experience on KCD in Sub-Saharan Africa, I believe that KCD interventions should first and foremost be viewed as learning processes if they are to make real and sustainable changes in professional competences. Furthermore, the complexity of learning processes (bringing together cognitive, emotional, and environmental experiences) suggests that KCD should be conducted within a wider perspective of change management. Quite simply, we recognize that learning new skills and knowledge is a basic change in mindset and/or a departure from a previous method of operation.

Under such a perspective, KCD involves communication strategies to inform beneficiaries about a desired change in sector practice or theory. Increased clarity of communication helps avoid potential confusion and distrust that may normally be associated with changes in established thinking. Situations of such change-related ‘shock’ are found in corporate transitions in which change management has not been properly facilitated.

Since the core notion of change involves a loss in one form or another, KCD interventions under the change management approach include mechanisms to help people through what is known as the ‘loss curve’. Viewed from this perspective, as people react differently to a proposed change, KCD dispels unrealistic expectations and accommodates participants’ reactions. This creates a sense of inclusion and fosters ownership. For example, KCD interventions provide room for participants to make deliberate choices and then experience the consequences of their choices – which in turn allows applied learning to occur. This helps people to identify with the change taking place, relating it to some aspect of themselves. Coaching follows to ensure substitution or replacement of any losses incurred through change, and to ease potential concerns about change.

Positive results using change-management principles have been seen at Uganda’s National Water and Sewerage Corporation, with increases in performance and overall capacity since programmes were initiated in 1998. By routinely embedding change management in learning theories, we can also add value to KCD programmes at institutions like UNESCO-IHE. As a result, learners benefit when systemic methods facilitate a more cohesive approach to the development of competences and new functional applications.

In UPDATE there is freedom of expression and opinion. We aim to encourage discussions on water issues through relevant opinion pieces that need to be expressed complete and clear content wise. It should also be clear whose opinion the article represents.

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The longest river in the world, the Nile is shared by eleven countries, flowing across various national, cultural, linguistic, religious and historical boundaries. These differences, and the increasing dependence that member countries place on the Nile, have led to a source of potential dispute and conflict.

The population of the Nile Basin is expected to double to more than 300 million by 2040, with countries that rely on the Nile River eager to provide their growing populations access to safe drinking water, adequate sanitation, electricity and other services. In response, member countries sought in 1999 to establish a framework of collaboration through the development of the Nile Basin Initiative. The framework acts as a necessary means of building consensus between member nations by tackling the challenges facing the health and sustainable development of the Nile and the people who rely on it for their livelihoods. Additional support came in 2002 with the Nile Basin Capacity Building Network, a process that was developed by UNESCO-IHE with funding from the Dutch government. It complements the Nile Basin Initiative by providing an informal support network for water professionals in the region. Offering significant expertise and experience, it has 48 signatories, including governments, water authorities and research institutes, UNESCO, the World Bank and the Nile Basin Initiative.

Collaborative working environment
Since its formation, thirteen research groups have already been established in six clusters to address such topics as hydropower, environmental aspects, geographical information systems and modelling, river morphology, flood management and river structures. Each cluster is also assigned a scientific advisor from UNESCO-IHE and its partner, the Faculty of Geo-information Science and Earth Observation at the University of Twente. Much has been achieved since the network’s inception, with Jan Luijendijk, Programme Manager at UNESCO-IHE highlighting that “the Nile Basin Capacity Building Network has brought together over 600 water professionals from the basin in a trustful, stimulating and collaborative working environment where the sharing of local knowledge and experiences has led to better overall solutions for key water challenges in the Nile.”

Common challenges
The Network’s efforts have been further enhanced through the completion of 24 research projects. These projects were implemented by scientists working locally and regionally, demonstrating the common challenges that can be solved collectively. Some of these research themes have already given member countries improved insight into the Nile River, flood control solutions, improved water quality testing, and helped assess the potential for small-scale hydropower.

Beyond river engineering
Whilst progress to date has been significant, a skill gap remains concerning the level of water education, which is currently inadequate to meet the problems that exist. The Nile Basin Capacity Building Network aims to broaden the scope of the research through collaboration, moving beyond river engineering to include a focus on improving regional water education from a scientific perspective.

Enhanced regional approach
In light of the focus on closer collaboration, it has become increasingly clear that all Nile-dependent countries need to take a more regional approach in solving the challenges that are present across national borders. An enhanced regional approach will enable member countries to deal more effectively with issues such as food security, environmental degradation, adaptation to climate change, wetlands and ecosystem management, water quality management and flood and drought management.

The efforts of UNESCO-IHE have laid the platform for Nile member countries to come together in a trusted environment to focus their energy on seeking greater agreement and consensus for the benefit of all member states. Greater collaboration continues to be the most effective way for member countries to improve the flow-on benefits to its population while guaranteeing the long-term health and outlook of the Nile River Basin.

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Fatima Mussá wins award at Waternet Symposium

MSc Alumna Fatima Mussá won the first prize for her work in the Hydrology category and was also the runner up against all the research papers presented at the 14th Waternet Symposium held in Dar-Es-Salaam, Tanzania, at the end of October. The focus of Fatima’s paper was on the study of trends in dry extremes of precipitation and discharge conducted in the Crocodile River catchment, a sub-catchment of the Incomati basin located in South Africa. Her research used different methods to analyze trends in dry extremes of precipitation and discharge.

http://ow.ly/sdrzl
Michael Mutale wins first Alumni Award

Alumnus Michael Mutale from Zambia is the winner of the first Alumni Award. Mutale was honoured for his efforts to empower water experts in decision making processes, his dedication to improving quality of life in Southern Africa.

Mutale is currently the Executive Secretary at the Zambezi Watercourse Commission (ZAMCOM) and Coordinator of the Global Water Partnership for the Southern African Regional Technical Committee. His efforts were instrumental in the creation of ZAMCOM, the ZAMCOM agreement and the SADC Protocol on Shared Watercourses. Furthermore, he actively promoted the exchange of thematic information on water resources management in Africa. In front of a full room of guests and a new cohort of MSc students, Michael Mutale gave an inspiring acceptance speech. “It’s almost 20 years ago when I graduated from UNESCO-IHE, then known as IHE-Delft. By receiving this award, my family and I have become ambassadors of UNESCO-IHE and I commit to use any platform at my disposal to promote the Institute as a centre of excellence in water education to family and friends. I trust that today’s award will inspire other alumni to do what they can for this great institute.”

NOMINATE AN ALUMNUS FOR 2014

The UNESCO-IHE Alumni Award is given annually to an alumnus who can show an outstanding contribution to water management and proves to be a role model for their peers. Nominate someone or yourself for the 2014 Alumni Award: http://www.unesco-ihe.org/alumni-award.

Passion for sustainability

New Zealander Jim Bradley studied at the Institute forty years ago. His passion for sustainable development, and his people and leadership skills, launched Jim’s leadership career in the water field and he has never looked back.

He has been an advocate and frequent keynote speaker for using an integrated approach to enhance sustainable approaches to water management. “In 1972 and 1973 I was fortunate to attend IHE Delft, as it was then called, where I undertook the Sanitary Engineering (European) course. As a young graduate engineer the course was brilliant for both my professional and personal development. Having a range of local and international lecturers, undertaking technical field trips and working with people from many nationalities laid a substantial foundation for my professional growth and my passion for sustainable development in the wider water field. Given my passion for sustainability I spent my career developing and communicating the importance of sustainable approaches to water and wastewater management. My enthusiasm and ability to translate engineering into “non-engineering speak” has allowed me to drive the sustainability agenda in New Zealand and become an acknowledged leader nationally and internationally. This has been recognized in New Zealand through the receiving of the Award for Sustainability and Cleaner Production and the William Pickering Engineering Leadership Award. What I have learnt in my career is to see how water fits into the bigger picture in an integrated way and not just focus on technological solutions.”

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How to reduce eutrophication caused by slums?

Results from 4 years of research in Bwaise III slum in Kampala, Uganda

By Jan Willem Foppen | Photos by Philip Nyenje, Alex Katukiza

Eutrophication is the process whereby water bodies, such as lakes and rivers, become enriched by nutrients such as nitrogen and phosphorus such that it can be harmful to human health. This problem has emerged as a leading cause of water quality impairment, which can lead to hypoxia (oxygen depletion) and harmful algae blooms, potentially destroying aquatic life.

To combat this problem, the UNESCO-IHE Partnership for Research funded a four year research project to address the Sanitation Crisis in Unsewered Slum Areas (SCUSA) that took place from 2009 – 2013. The main aim of the research project was to identify low cost integrated sustainable sanitation solutions by implementing better excreta and greywater management in a typical slum area thereby reducing the stream of nutrients from the slum entering the downstream catchment and causing severe eutrophication.

Greywater contamination at slum site

The project used a demonstration site named Bwaise III slum that was located in Kampala, Uganda, where some important findings were reported. At least 50 per cent of the surface water present in Bwaise was greywater/wastewater (from household sources such as the kitchens, laundries and bathrooms) with very high nitrogen and phosphorus levels. The estimated greywater volume being discharged from the slum was around 200-300 mm annually, which was in the same range as the annual precipitation excess (precipitation minus evapotranspiration) of around 300 mm. Only a fraction of these greywater concentrations are required to cause eutrophication.

Realizing the importance of preventing greywater from entering the surface water in Bwaise, we decided to construct a greywater filter to reduce the contamination. A number of filtering tests with locally available and affordable filter materials were conducted in the laboratory of Makerere University. The testing produced a two-step crushed lava rock filter unit that was designed and implemented by a household in the Bwaise III slum in Kampala with testing showing the removal efficiency of COD, TP and TKN to be 91%, 60% and 69%, respectively. The two-step filter was a success with the removal of E. coli, Salmonella spp. and total coliforms being 3.9, 3.5 and 3.9, respectively.

Faecal sludge

The majority of sanitation facilities in the slum are the so-called “raised pit” latrines. These latrines are raised to avoid contact with the very shallow groundwater (located 10-50 cm below the surface). We assessed the effect of faecal sludge in the cesspits, both below and above the ground. Underground, in the shallow aquifer, we found significant pollution to groundwater originating from pit latrines. However our results indicated that in Bwaise III, pit latrines were very effective for the removal of sanitary contaminants. Next, we installed groundwater observation wells in and around Bwaise slum to study groundwater flow and groundwater quality. Groundwater appeared to be contaminated with high EC values, and high concentrations of Cl, alkalinity and ammonium (NH4), whilst to our surprise, o-PO4 was generally absent. It was identified that the contaminants originated from greywater and wastewater leaking out of the pit latrines.

A serious health hazard

Realizing that most of the surface waters in the area was diluted greywater mixed with some faecal sludge, we tested the pathogenic viral load in various surface waters, groundwaters, and springs used for drinking water. Worryingly our results indicated that various pathogenic viruses (rotavirus, adenovirus, hepatitis-A) were present in the slum environment, and that their concentrations were rather high. With this data, a quantitative microbial risk assessment (QMRA) was carried out. We found that the total disease burden was a staggering 9,549 disability-adjusted life years (DALYs) per year. The highest disease burden was 5,043 DALYs per year which was attributable to exposure from bacteria and viruses in the open drainage channels, representing 53% of the total disease burden. To put this into perspective, the WHO (World Health Organization) tolerable risk is 0.000001 DALYs per person per year.
Commercial value of faecal sludge
Currently faecal sludge has no value for slum dwellers, manual emptiers, or truck emptiers. However, we are convinced that a change in this attitude is part of the solution. Firstly in relation to achieving a reduction of sanitary contaminants discharging the slum, and secondly to achieve a more productive and healthy slum environment. Recent research showed that the conversion of faecal sludge, via the process of hydrothermal carbonization (HTC), also known as wet coalification results in a black carbon type of product. When added to simple sand columns, we were able to remove large quantities of cadmium, a toxic metal ion. HTC was also able to drastically reduce Escherichia coli concentrations in water, which was passed through columns composed of HTC mixed with sand in set-ups in the laboratory. Although more research has to be done, perhaps HTC is a good example of adding value to faecal sludge. Another example is that in related work, one of the project members found that the caloric value of faecal sludge harvested from cesspits in slums was higher than of coffee husks used to fuel ovens for the tile baking industry. In a follow-up experiment, and to demonstrate the value of faecal sludge, a so-called kiln or oven was constructed to dry faecal sludge for the production of tiles. This is an example where faecal sludge can be converted into a valuable commodity and cost effective way that faecal sludge can be used for industrial processes.

Recommendations for Interventions
Based on our research, we think that in the case of Bwaise III slum, there are a number of ways forward, which aim to reduce pollution downstream in the catchment in a cheap and sustainable way. These are:

• To actively treat greywater originating from households through a SCUSA add-on research project, which aims to develop and apply a greywater management strategy, which can and will be implemented in slums in Kampala in Uganda, and, subsequently, in a number of slums in Sub-Saharan Africa.

• Legalizing the work of the manual cesspit emptying organisations in preventing contamination of faecal matter entering the drains.

• Implementation of a national program delivered by public entities like KCCA to keep drainage free from solid waste.

• The conversion of faecal sludge into a valuable commodity.

Our scientific output
In the last few years, we have produced a lot of scientific output. For details, please check the SCUSA website on www.unesco-ihe.org/scusa.
As of October 2012, the WeSenseIt project is developing citizen-based observatories of water, which will allow citizens and communities to become active participants in information capturing, evaluation and water governance.

UNESCO-IHE and 13 partners from six European countries are exploring new ways to capture information about the water cycle by actively involving citizens. This ‘citizen observatory of water’ is being initiated and tested in three European catchments, namely Bacchiglione (Italy), Doncaster (United Kingdom) and Delfland (the Netherlands). The project is currently running and lasts for a total of 48 months, with a budget of 6.9 MEuro - of which 5.4MEuro is funded by the 7th Framework Programme of the European Commission. It will allow citizens to capture hydrological data using mobile apps and physical sensors that can connect to portable devices like smartphones and tablets. Relevant information is also extracted from the interaction of citizens via digital social media sites such as Twitter and Facebook. The project concept is based on the initial findings of the PhD thesis of Leonardo Alfonso, carried out at UNESCO-IHE and finalized in 2010.

Why should citizens be involved?

Current technological advances have allowed citizens to carry powerful mobile devices that have location capabilities and the potential to connect to sensors. Given the large diffusion of these devices, citizens can complement the insufficient density and resolution of data collected by traditional monitoring networks. This is particularly helpful during critical events such as floods or droughts. But the involvement of citizens can also promote an active role for local communities to understand and take better care of the environment. Citizens who participate in information capturing and evaluation can also provide feedback. This allows for an exchange of environmental knowledge between citizens and authorities, which improves decision-making and planning.

UNESCO-IHE staff involved in the project team include Leonardo Alfonso, Lecturer in Hydroinformatics, Uta Wehn de Montalvo, Senior Lecturer/ Researcher in Capacity Development and Dimitri Solomatine, Professor in Hydroinformatics and Arnold Lobbrecht, former Associate Professor in Hydroinformatics. Together with three PhD fellows attached to the Project they form an interdisciplinary team. PhD fellow Juan Carlos Chacón is working on methods to optimally design new generations of monitoring networks that include sets of dynamic sensors capturing data with diverse spatial and temporal characteristics, while PhD fellow Maurizio Mazzoleni is investigating methods to incorporate the heterogeneous data collected via the citizen observatories into hydrological and hydraulic models. Jaap Evers, Lecturer in River Basin Governance and Maria Rusca, Senior Lecturer in Management and Organization of Sanitation, are carrying out baseline studies of citizen participation in water governance for the Dutch and Italian cases. During the first year of the WeSenseIt project, the Institute has advanced in these topics, coordinated the Dutch case study, and installed several sensors, including two sensors placed in the UNESCO-IHE garden.

Impact and development potential

It is expected that the citizen observatories of water can extend the knowledge base of interactions between the natural environment and human activities. They can support emergency services and policy makers to manage environmental risks such as floods and droughts. In addition, by enabling citizens to feed their own observations, experience and expertise into decision making processes, citizen observatories have the potential to improve water governance in terms of transparency and accountability. For these reasons, the WeSenseIt project is also of interest to low-income countries where the lack of data availability is a common problem (weak monitoring network infrastructures) and where environmental threats such as climate change are likely to have a stronger effect.

More information:

www.wesenseit.com

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Improving performance and strengthening capacities in East African utilities

By Maarten Blokland | Photography by Maarten Blokland

The EU-funded project Capacity Development for Performance Improvement of Water Utilities in Secondary Urban Centres in East Africa (CAPIWUA) contributes to improving water governance and management of water resources and to the sustainable development and maintenance of water infrastructure. Beneficiary countries include Uganda, Kenya, Tanzania and Ivory Coast. The project is currently in its 3rd year and ends in 2016.

Themes
CAPIWUA addresses the three main themes of governance and management, revenue collection and pro-poor services provision. Results will improve governance through increased participation, transparency and accountability, responsiveness, equity and inclusiveness. The project will benefit from multi-country exchanges and, by virtue of its impact and visibility, is expected to have an effect on national policies in the three thematic areas: governance and management, revenue enhancement and services provision to the poor.

Partners
Beneficiary partners include the National Water and Sewerage Corporation (NWSC) in Uganda, Rift Valley Water Services Board (RVWSB) in Kenya, Dar es Salam Water and Sewerage Corporation (DAWASCO) in Tanzania and African Water Association (AfWA) in Ivory Coast. Implementing partners include the International Water Association (IWA) in the UK and WaterNet in the Netherlands. Supporting partners include Sustainable Aid in Africa International (SANA) in Kenya and Water Aid in Tanzania.

Approach
During the first year project year, programmes were initiated to further build capacities to improve deficient performance in three thematic areas of water utilities: governance and management, revenue enhancement and non revenue water control and pro-poor services provision. Deficient performance was brought out by identifying and setting the initial values of related indicators to assess the baseline (zero) starting point. Capacity development intervention programmes were implemented to bridge the performance and capacity gaps.

In the second project year, several tailored thematic work packages were identified. Tough choices had to be made to prioritize the most urgent and most cost-effective tasks per utility. The role of UNESCO-IHE in this project is to help guide the process and challenge people to substantiate these choices, but also to ensure that the input and the value thereof is equal amongst all partners. It is a complicated process in which many factors need to be taken into account where it concerns levels of management, hierarchy and ownership within each respective company. These results were presented at the IWA 3rd Development Congress in Nairobi in the fall.

The partners are currently working on a year plan for the third project year that will soon commence. The pro-poor units will soon be implemented and already lead to substantial performance improvement. Initial improved individual and organizational capacities will also increase and be used to improve performance. "We do not expect miracles, we just want to show that it can be organized and implemented differently in a pilot area. New knowledge can be inserted more effectively and more efficiently. This concept can then be upscaled and also implemented in other organizations.

More information:
http://capiwua.unesco-ihe.org

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ABOUT THE ACP-EU WATER FACILITY
The CAPIWUA project is funded within the framework of the ACP-EU Water Facility. An allocation of €200 Million from the 10th European Development Fund (EDF) has been allocated to the Water Facility, created to deliver and leverage investments in water and sanitation services in sub-Saharan Africa, the Caribbean and the Pacific. With these investments the ACP-EU contributes to improving water governance and management of water resources and to the sustainable development and maintenance of water infrastructure.
UNESCO-IHE front runner in issuing joint degrees

The Accreditation Organisation of the Netherlands and Flanders (NVAO) approved the transformation of four existing joint Master specializations into Joint Degree specializations, allowing UNESCO-IHE and its partners to issue joint degrees starting in 2014. This development makes UNESCO-IHE a frontrunner in offering joint degrees, particularly with partners outside the Netherlands. This positive response by NVAO was given in the framework of its decision to approve reaccreditation for UNESCO-IHE’s four Master programmes, to which these specializations belong. The NVAO assessment committee judged the programmes on intended learning outcomes, teaching and learning environment and achieved learning outcomes. Each joint degree specialization has its own examination regulations agreed between the partners, and will be managed by Joint Management Committees.

First Erasmus Mundus Joint Doctorate PhD Degree awarded

Ms. Pimluck Kijjanapanich successfully presented and defended her PhD thesis in November entitled ‘Sulfate Reduction for Remediation of Gypsiferous Soils and Solid Wastes’. She thus became the first recipient of the Erasmus Mundus Joint Doctorate Programme degree. Kijjanapanich followed the Erasmus Mundus Joint Doctorate Programme: Environmental Technologies for Contaminated Solids, Soils and Sediments (ETeCoS3). ETeCoS3 is a multidisciplinary and intersectorial consortium coordinated by the University of Cassino, composed of 3 partner organizations: University Cassino in Italy, University Paris-Est in France and UNESCO-IHE.

Storytelling: bridging the gap between science and society

A five-day Water Communications Summer Course was held at UNESCO-IHE in September. The course focused on storytelling and the effective use of media as a way of furthering public understanding and appreciation of water issues and research. The interaction between MSc students, mid-career water professionals with different backgrounds, resulted in an effective way of learning from each other’s perspectives and information needs. The main goal of the UNESCO-IHE Summer Courses is for water professionals to develop a ‘broader scientific view’. Professional BBC broadcaster, Turan Ali, led one of the workshops on effective storytelling. He enabled participants to convince people of the relevance and value of new information, skills and attitudes through the power of telling stories. At the end of the course the students also understood how collaboration between different stakeholders can help increase public awareness on important water issues. “I now have a clear understanding of the relative strengths of the different available media (traditional, new and social media) – alone and in combination (cross-media),” a participant said. The course was organized in collaboration with the Radio Netherlands Training Centre and process facilitator and trainer Iro Evangelou and will soon be developed into an OpenCourseWare course available on http://ocw.unesco-ihe.org.

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Launch first Graduate Professional Diploma Programme in Sanitation and Sanitary Engineering

On 12 February 2014, UNESCO-IHE awarded the first Graduate Professional Diploma to Tomislav Horvat from Croatia, on the occasion of the Croatia - EU Water Day networking event, organized by the Dutch embassy in Zagreb and the Netherlands Water Partnership.

The Graduate Professional Diploma Programme (GPDP) was launched in 2013 to offer better access to the Institute’s specialist knowledge, and increased flexibility to water professionals who wish to specialize further, or re-direct their current career. To qualify for the diploma, participants successfully complete a set of modules tailored to their needs in a personal study plan, either online or face-to-face in Delft. The online courses can be followed part-time, without interrupting a day-time career, at much lower cost.

The programme receives fellowship support from the Bill and Melinda Gates Foundation and the Organisation of American States, among others. Immediately after the launch of the programme a contract was signed with the National Water Supply and Drainage Board of Sri Lanka, enrolling 20 of its staff in the Programme.

In this initial phase, GPDP is restricted to the field of Sanitary Engineering and Sanitation. Over time, it will be possible to study for the Diploma in other fields as plans are underway for additional GPDPs in Water Supply Engineering, Water Treatment Technology, Urban Water Networks, Flood Risk Management and Cleaner Production and Residuals Management. In the meantime ideas for collaboration are being developed with partners in South Africa, India, Brazil and Uganda among others.

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MSc Water Management offers study profiles

Within the MSc programme in Water Management, students will be able to compose their own study trajectory as of the 2014 – 2016 academic period onwards. The aim of maximising flexibility in the Water Management programme and career-oriented advice provided in that context is to improve students’ learning experience, thus increasing the impact of their education on the water sector.

The taught part of the programme starts with the foundation phase in which students are exposed to the different disciplines in the water management domain, and concludes with an integration phase that ensures that students get hands-on experience with integrated approaches and multidisciplinary collaboration.

Between the foundation and integration phase, students can compile a study profile from a wide range of available courses and thesis research topics to ensure that the educational programme is fully aligned with their professional needs. Professional coaches will guide them in selecting a suitable tailor-made study profile by reflecting on their knowledge, skills and career options. The coaches know a great deal about the needs of the water sector in various parts of the world. Students’ employers will also be consulted in the guiding process.

Students can opt for one of the four thematic study profiles: water resources management, water services management, water conflict management, or water quality management.

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CELEBRATING 20-YEARS WITH CINARA, COLOMBIA

The Institute recently celebrated 20 years of collaboration with Cinara in Colombia. Cinara is a Research and Development Institute in Water Supply, Environmental Sanitation and Water Resources Conservation, based at the Faculty of Engineering at the Universidad del Valle in Cali, Colombia. It is widely recognized within the water supply and environmental sanitation sector in Colombia, as well as in other Latin American countries. The Institute has become a virtual information and training center in the region. During his visit to Delft to attend a short course, Dr. Miguel Peña, Director of Cinara, said that in 20 years a number of successful projects, dozens of trained staff, the exchange of professional academic staff, useful education products, but also presentations at international conferences and numerous scientific and academic cooperation and publications can be counted as successful results of this collaboration. UNESCO-IHE assisted in the development of the Sanitary Engineering programme, for instance, that has now developed into a doctoral programme.

Miguel Peña
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DELT | JUNE

COOPERATION FOR GREEN CITIES IN SECURE RIVER BASINS

The 2nd Asia-Netherlands Water Learning Week organized by ADB and UNESCO-IHE in June, brought leaders together in Delft in dialogue and knowledge sharing on ‘Building Cooperation for Green Cities in Secure River Basins’. Participants contributed project case studies from Asia and learnt from cases and experiences from the Netherlands in an intensive programme focusing on how to leverage results from collaborative approaches in water investment projects for cities and river basins. Five project teams of ADB-financed projects in Bangladesh, India, Indonesia, the People’s Republic of China, and Viet Nam shared their experiences with the Dutch in an intensive programme focusing on how to leverage results from collaborative approaches in water investment projects for cities and river basins. The programme built on the successful experience of the 1st Asia-Netherlands Water Learning Week held in 2012, in which more than 30 Asian water leaders compared experiences with colleagues in the Netherlands in making smart choices for water security and green growth. The Week was organized as part of the knowledge partnership between ADB and UNESCO-IHE, which supports ADB’s water operations in its developing member countries by providing expert guidance during project preparation and implementation, to develop and implement education, training and capacity development, and to support knowledge networking programmes among clients, partners, and Knowledge Hubs.

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THE HAGUE | SEPTEMBER

WATER SECURITY AND PEACE CONFERENCE

The Water Diplomacy Consortium (WDC) organized a high level international working conference on Water Security and Peace in November. The conference presented and discussed the role of negotiation, mediation and conciliation in evidence-based cases of water diplomacy. Experts shared perspectives and solutions focused on creating a better understanding water diplomacy capabilities, particularly among water resource specialists, planners, and diplomats; initiating an international hub of experts to better resolve water related conflicts; formulating an agenda on water diplomacy capability development. Participants included relevant water experts, water diplomats and policy makers as well as political leaders. UNESCO-IHE had a substantial role in this event in various sessions on improving dialogue, transboundary water management issues, and international water law in water diplomacy.

More info: http://ow.ly/s4TCy

MANILA | DECEMBER

ADB AND UNESCO-IHE DEVELOP DECISION SUPPORT SYSTEM

Over 50 planners, engineers and middle managers from Bangladesh, Bhutan, Indonesia, Mongolia, Myanmar, Philippines, Sri Lanka and Viet Nam attended a 2-day training on the use of Wastewater Management Expert Decision Support System (WAMEX) convened by the Asian Development Bank (ADB) at its Headquarters in Manila in December. ADB staff also attended. The training was delivered by Dr Zoran Vojinovic who has been leading the development of the WAMEX tool since 2009. ADB, together with UNESCO-IHE, is developing WAMEX as a freeware that aims to help decision-makers and planners develop options for addressing various scenarios related to wastewater management. This software is useful for the planning of new systems, upgrading of existing systems and preparing budgets and cost assessment. It also allows users to build their own “what-if” scenarios, enabling them to explore many different schemes and options. The freeware includes a list of conventional and emerging technologies consistent with ADB’s thrust of promoting innovations in wastewater. It also has an intuitive built-in GIS functionality that enables users to set up and assess different wastewater reticulation options and find their optimal solutions. The training was designed

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http://ow.ly/s4TCy
RWANDA | JULY
WETLANDS: WISE USE, SMART PLANS
The International Forum on ‘Wetlands: Wise Use, Smart Plans’ was held in Kigali, Rwanda. Over 100 participants, the vast majority from 23 African countries, participated in addressing contemporary themes of wetland management and capacity development. The Forum was jointly organized by UNESCO-IHE, the Rwanda Environmental Management Authority and the Ramsar Convention Secretariat. The discussions were geared towards developing more effective wetland policies within the framework of integrated water resources management, addressing the need for both economic development and environmental integrity. Forum outputs included new initiatives for policy, research and capacity development for wetlands. The Forum identified major issues for successfully linking policies with sustainable use of wetlands and developing new initiatives for capacity development in support of knowledge exchange on wetlands. In addition, partners established connections for future initiatives on wetland policy, research and capacity development. Wetlands support the livelihoods of millions of people through clean drinking water, food, building materials, medicine, and other products.

More information: wetlands.unesco-ihe.org

DFLT | APRIL
UN WATER TALKS: WMO ON GLOBAL CLIMATE CHANGE
Michel Jarraud, Secretary-General of the World Meteorological Organization (WMO) and Chairperson of UN-Water, spoke at the UN Water Talks event on 24 April. He reflected on global climate change issues, humanitarian implications, adaptation and development needs as well as WMO’s role and response regarding these issues. The UN Water Talks is a public event in cooperation with the City of Delft and the Delft Water Board. The lecture series is a forum where (water) professionals studying at UNESCO-IHE meet leaders of the UN-system. Both share their vast experience, particularly with respect to environmental and developmental issues related to water in an open discussion and dialogue on a variety of world issues, centered around water, urbanization, food, population growth, climate change, peacebuilding and conflict resolution.

un-water-talks.unesco-ihe.org

FIRST INTERNATIONAL WATER INTEGRITY FORUM
Corruption in the water sector puts safe access to water at risk, can lead to conflicts and hampers the achievement of the MDGs. To address these challenges and take action on promoting water integrity, the Water Integrity Network, UNESCO-IHE and the Water Governance Centre convened the first ever Water Integrity Forum in June. Over 120 water and integrity experts from 75 international organizations, government agencies, research institutes, companies and NGOs attended the event. Participants took stock of existing efforts, shared tools and innovative methods to fight corruption, and built alliances to address the integrity challenges in the sector. The Forum closed successfully with the announcement of a joint political effort to put water integrity on the global development agenda and the release of the Delft Statement on Water Integrity. Key action points include calls for free and accessible data, inclusive multi-stakeholder processes and a universal code of conduct for the water sector. UNESCO-IHE will include water integrity in its capacity development and training programmes. The Statement and Forum report were received with great interest at the Stockholm Water Week, where also the implementation process of the Statement action points was launched by WIN, UNESCO-IHE, SIWI, GIZ, GWP and IWMI.

More information: www.waterintegrityforum.org
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LISBON | JUNE
PARTICIPATION IN LISBON ROTARY CONVENTION
The annual Rotary International Convention was held in Lisbon, Portugal. UNESCO-IHE representatives attended the event, staffing a booth to give Rotarians more information about the strategic partnership between the Institute and Rotary International, and the role that local Rotarians play in this partnership. UNESCO-IHE is one of the partners in the Rotary Packaged Grants Program, which provides 16 grants (2013 – 2015 cohort) for water professionals to follow an MSc programme at UNESCO-IHE. In order to receive a grant, the water professionals partner with a local Rotary club during their application procedure. They continue to cooperate with Rotary upon returning to their home country after graduation, applying their knowledge through their involvement in Rotary projects. Students from the 2011 – 2013 cohort will soon graduate at the end of April 2014.

www.unesco-ihe.org/rotary-scholarships-water-and-sanitation-professionals

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Addressing environmental problems through ecohydrology

“The creation of this Chair in Ecohydrology comes at a strategic moment, as the Institute envisions increased networking in education and research and the development of global research and innovation agendas,” Prof. Michael McClain said at his inaugural address “Applying Ecohydrology to Enhance Water Resource Development and Management” in June. As first holder of the Chair in Ecohydrology he shared his vision for the future and how this integrates within the existing work of the Institute.

Ecohydrology is being applied to address environmental problems worldwide, but the science holds special promise for addressing needs in the developing world. This is of course a prime motivation for the creation of this new Chair within the Institute and can enhance efforts to balance the needs of water resources development and environmental sustainability in Africa.

The role of this Chair, and potentially other new interdisciplinary Chairs, should be to foster research across the institution, lead efforts to synthesize greater understanding from the combination of efforts, promote incorporation of this new knowledge into educational and capacity development activities, and facilitate the communication to the outside world.

Michael McClain, m.mcclain@unesco-ihe.org

STAFF NEWS

Vojinovic awarded ADB Water Champion

Zoran Vojinovic, Associate Professor of Urban Water Systems at UNESCO-IHE, has been nominated Water Champion by the Asian Development Bank for his work on developing a new approach for managing floods. Vojinovic is leading a team to undertake flood risk assessment and development of a disaster risk mitigation plan for the historic city of Ayutthaya in Thailand. The historic city of Ayutthaya, added to the World Heritage List in 1991, was subjected to an extreme flooding event in 2011, the worst flood Thailand has experienced in decades. In the project that began in March 2013, Zoran and his team will undertake flood risk assessment and develop a risk mitigation plan. “A special challenge in this project is the fact that we are dealing with intangible values of heritage sites. We are developing intricate one- and two-dimensional hydrodynamic models that capture the floodplain characteristics in the Ayutthaya region. Simultaneously, we are directing considerable efforts to determine how to combine tangible and intangible values into a common holistic framework for flood risk assessment,” Vojinovic elaborated.

ADB Water Champion: http://ow.ly/tjkk

Mynett Vice President Europe IAHR

Arthur Mynett, Professor of Hydraulic Engineering and Head of the Water Science and Engineering Department at UNESCO-IHE has long been contributing to the International Association for Hydro-Environment Engineering and Research (IAHR) in various capacities. Through his work as Professor also at the Delft University of Technology and the Chinese Academy of Sciences he has stimulated many young researchers from all over the world to contribute to IAHR’s regional and global conferences. His working experience of over 30 years with Delft Hydraulics enables him to convey the practitioners’ needs and promote that is done jointly with IAHR in international fora. Prof. Mynett is in charge of organizing the IAHR World Congress 2015 in the Netherlands. He believes that the future of IAHR is with the young generation of hydro-environment professionals, who deserve a prominent role within this association, but also sees a stronger role to the practitioners’ needs and promote that is done jointly with IAHR in international fora.

Di Baldassarre wins AGU Early Career Award

Giuliano Di Baldassarre, Senior Lecturer in Hydroinformatics Systems at UNESCO-IHE, received the 2012 Hydrologic Sciences Early Career Award from the American Geophysical Union (AGU). The award recognizes outstanding research, educational or other accomplishments such as societal impacts, wfor a scientist at an early career stage. He received his PhD in Environmental Engineering (summa cum laude) from the University of Bologna. Di Baldassarre obtained his PhD in Hydraulic Engineering from the Milano University of Technology and worked as a postdoctoral researcher at the School of Geographical Sciences of the University of Bristol before joining the Institute in 2009. He is known for his work in flood risk assessment having developed innovative methods for the observation, analysis and modeling of floodplains as human-water systems. The Hydrologic Sciences Early Career Award Committee cited his combined excellence in research, teaching, and student mentoring, in addition to the humanitarian aspects of his work on mitigating flood risk in developing countries in Africa.

Rector to serve on SEI Board

Rector, Prof. András Szöllösi-Nagy, will serve on the Board of the Stockholm Environment Institute from 2013 to 2017. The SEI is a prestigious independent international research institute that has been engaged in environment and development issues at local, national, regional and global policy levels for more than 20 years. It was established by the Swedish Government and aims to bring about change for sustainable development by bridging science and policy through the provision of integrated analysis that supports decision makers. The institute engages with academia, public policy decision-makers, media and NGOs in the North and South.

SEI believes that scientific insights can guide us through change and should inform decision-making and public policy, and that local knowledge and values are crucial in building sustainable lives. Their approach is often highly collaborative, and stakeholder involvement has always been at the heart of SEI’s work. Their projects help to build capacity and strengthen institutions to equip their partners for the long term.

http://sei-international.org
“Academics never retire, they just lose their faculties”

Jan Nonner, worked at UNESCO-IHE as Associate Professor of Hydrogeology, and recently retired from a 25-year long career. His colleagues and students remember him as a very dedicated man who checked all computations performed by his MSc students thoroughly to understand the results they were getting. For his lectures he used his own textbook ‘Introduction to Hydrogeology’, one of UNESCO-IHE’s best sold publications. In class he was most comfortable when using a blackboard and chalk. Jan was instrumental in capacity development and research projects that brought him to various countries, including Zimbabwe, Viet Nam and India. He acted as project leader in Yemen for the Sana’a University Support Project (SUS), in the Caribbean for the Cap Car Project and in the Middle East for the EXACT Peace Project. In China he chaired the steering committee of the China Groundwater Information Centre Project. This project has contributed towards the socio-economic development of China by maximizing the availability of renewable groundwater resources through having information on the groundwater situation in a timely manner.

Henk Lubberding, Senior Lecturer in Microbiology, retired after a period of 25 years at the Institute. Since 1988 he supervised and delivered 2500 students. During this time he has always kept detailed aggregated lists with the year, country, number, male/female ratio, background and performance of each student at various levels. Henk saw the Institute develop from an unorganized Institute to a far more streamlined operation. He felt that it lost a bit of the ad-hoc, last-minute improvisational charm, when everything would come together in the end. But he remained inspired to act as a bridge between north and south, further developing the capacities of colleagues in the Sector at the MSc level. Despite the changes in development cooperation, also in the Netherlands, the need for capacity development and training will always remain. He feels the diversity in countries represented at UNESCO-IHE is too limited and calls for more diversification to be able to really stay true to the mission of the Institute. Henk was instrumental in putting the course on microbiology on the map and worked closely with colleagues in the laboratory to give the course and the facilities the boost it deserved.

Jetze Heun, Associate Professor Water Management, retired in 2013 after a 38-year career, of which 25 with UNESCO-IHE. His main interest is in Water Resources Planning and Management, based on an academic background in civil engineering and land and water development. After 20 years of living abroad long-term in several countries, he continued with short-term missions for the Institute in amongst others Indonesia, Bangladesh, Egypt, Yemen, Ethiopia, Afghanistan, Sudan, Bangladesh, Yemen, Vietnam, Nepal, Zimbabwe and Malaysia. Jetze built up a great track record in his main interest in Water Resources Planning and Management, and recently retired from a 25-year long career in the Institute’s Programme on Capacity Development in Bonn and served the Netherlands Ministry of Transport, Public Works and Water Management since 1988 in his last position as Director Chief Inspector of the Water Management Inspectorate and Advisor of the Minister. He has extensive experience in Integrated Water Resources Management and acted as part-time Professor Integrated Water Resources Management at Wageningen University, Director of Water Pollution Control and International Relations and Director of Research at RIZA, the Dutch Institute for Inland Water Management and Water Pollution Control and head of the Delta Department at the Institute for Tidal Water Management. He was chairman and member of several working groups of the International Rhine and Meuse Committees, Netherlands representative in the International Committee on the Hydrology of the Rhine and member in several UNESCO working groups.
PUBLICATIONS

FLOOD-BASED FARMING FOR LIVELIHOODS IN ETHIOPIA
Authors: Mehari Haile, A., Demissie, A., Embaye, T. G., Getaneh, A., 2013
ISBN: 978-94-90792-02-2
http://ow.ly/sCpyy

UNFLOODING ASIA THE GREEN CITIES WAY
Authors: Zoran Vojinovic and Jingmin Huang
Publication Date: 15 Apr 2014
ISBN: 9781780406152
http://ow.ly/scPtV

FLOOD RISK: THE HOLISTIC PERSPECTIVE, FROM INTEGRATED TO INTERACTIVE PLANNING FOR FLOOD RESILIENCE
Author: Zoran Vojinovic
Publication Date: 15 Jun 2014
ISBN: 9781780405322
http://ow.ly/sdokC

FAecal Sludge Management Systems Approach for Implementation and Operation
Editors: Linda Strande, Mariska Ronteltap and Damir Brdjanovic
Publication Date: 15 May 2014
ISBN: 9781780404721
http://ow.ly/scPAD

WATER CHALLENGES OF URBANISATION VISION AND SCIENTIFIC PAPERS OF THE YOUNG SCIENTIST WORKSHOP AT THE INTERNATIONAL WATER WEEK AMSTERDAM 2011
Editors: Arnold Lobbrecht, Roland Price
ISBN: 9789073445277

PhD Publications in 2013

A record number of UNESCO-IHE PhD Fellows obtained their Doctoral Degree in 2013. 18 PhD Fellows from 13 different countries successfully defended their PhD thesis. The following PhD theses are all freely available http://repository.tudelft.nl/ihe/

Integrated Water Resources Management, Institutions and Livelihoods under Stress bottom-up perspectives from Zimbabwe
Collin Calvin Mabiza, Zimbabwe

Framework for Dynamic Modelling of Urban Floods at Different Topographical Resolutions
Solomon Seyoum, Ethiopia

Risk and Uncertainty Analysis for Sustainable Urban Water Systems
Krishna Bahadur Khatri, Nepal

Competences in Context: Knowledge and Capacity Development in Public Water Management in Indonesia and the Netherlands
Judith Kaspersma, the Netherlands

Adaptive Multi-Reservoir-Based Flood Control and Management for the Yellow River. Towards a next generation Software system
Shengyang Li, China

The Effect of riparian zones on nitrate removal by denitrification at the river basin scale
Hoang Nguyen Khanh Linh, Viet Nam

Web-based virtual environment for decision support in water based system
Zhu Xuan, China

Simultaneous Sulfate reduction and metal precipitation in an inverse fluidized bed reactor
Denys Villa Gomez, Mexico

Sulfate Reduction for Remediation of Gypserous Soils and Solid Wastes
Pimluck Kijjanapanich, Thailand

Water Resources Strategies to Increase Food Production in the Semi-Arid Tropics
David Love

Modelling groundwater systems. Understanding and improving groundwater quantity and quality management
Girma Ebrahim, Ethiopia

Adsorptive removal of heavy metals from groundwater by iron oxide based adsorbents
Valentine Uwamariya, Rwanda

The Removal of Faecal Coliforms in Waste Stabilization Pond Systems and Eutrophic Lakes
Ebenezer David Okwanning Ansa, Ghana

Modelling the future water infrastructure of cities
Arlex Sanchez Torres, Colombia

Sustainable gold mining wastewater treatment by sorption using low-cost materials
Mike Achepompong, Ghana

Experimental and modelling studies of horizontal subsurface flow constructed wetlands treating domestic wastewater
Njenga Mburu, Kenya

Sanitation in unsewered urban poor areas
Alex Katukiza, Uganda

Hans Komakech, Uganda
Smarter ways to see the future of climate impact on coastlines

By Rosh Ranasinghe | Photography by Palitha Baranasuriya

Predicting the impacts of climate change with greater accuracy can help bring more targeted adaptation to the front lines where changing conditions are already being felt: coastlines. Over the past four years, the Coastal Systems Engineering and Port Development (CSEPD) core of UNESCO-IHE has been engaged in research with a range of stakeholders to develop innovative modeling methods and tools to help frontline coastal managers and planners implement more informed and effective climate change adaptation strategies.

The Climate Change Impact on Coasts programme (CCIC) is led by Professor Rosh Ranasinghe, and has so far attracted approximately USD 2 million in support from international sources. This research on intelligent adaptation is spurring the development of sophisticated tools to measure future and present climate change effects:

- A scale-aggregated model for assessment of coastline change near inlets due to the combined effect of sea level rise and variations in rainfall and runoff. Model applications in Australia and Vietnam have shown that current techniques may be under-predicting potential climate change-driven coastline recession by up to 50%.
- An approach to determine economically optimal coastal setback line (EOSL) positions: by combining physics-based, probabilistic coastal recession modelling and risk modelling techniques, it becomes possible to determine the ideal coastal buffer zone width that would optimally balance erosion risk and potential earnings from investments. This is a valuable tool that helps coastal managers and planners make risk-informed and effective decisions. The approach has been successfully applied at Narrabeen Beach in Sydney. Other applications are planned in Sri Lanka, India, and several West European coasts.
- Mapping offshore wave conditions that have been modified by climate change: future wave projections have been derived along the coastlines of Eastern Australia, India, Sri Lanka, Thailand, and Vietnam, using dynamically downscaled wind output from climate models to drive state-of-the-art spectral wave models (WaveWatch3, SWAN, Mike21SW).

Other programme initiatives that are ongoing include: investigating potential climate change impacts on tidal inlets; quantifying uncertainties in coastal morphodynamic model results; assessing climate change-driven variations in alongshore sediment transport; quantifying the relative contributions of sea level rise and storm erosion to future coastline recession; and investigating future wave attenuation characteristics over the Great Barrier Reef in Australia.

Adaptation can become more efficient and effective when future conditions are accurately anticipated. The future-focused thinking and implementation of CCIC are moving forward in partnership with stakeholders that include DGIS, Australian Commonwealth government, World Bank and Asian Development Bank. The programme has so far resulted in 10 journal papers and supported two post-doctoral fellows, three PhD candidates, and six MSc research studies.

Innovative modeling methods and tools to help frontline coastal managers and planners

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Trang Duong from Viet Nam carrying out topographic surveys at Kalu river inlet in Sri Lanka as part of her PhD work under the DUPC funded CC-SIOTI project.
In every issue of UPDATE Magazine, we would like to share relevant online resources with you for use by water professionals and others interested in water-related teaching and reference materials and scientific research findings, sharing the best (and worst) practices from the field. Send an email to update@unesco-ihe.org if you wish to share websites, blogs, twitter feeds, networks or communities with our readers.

TEDxAMS presents SunGlacier
"Extreme weather needs extreme solutions," said Ap Verheggen, creative artist and UNESCO-IHE Cultural Ambassador. He presented his cool(E)motion and SunGlacier projects at a TEDx event organized in Amsterdam. "We live in an ocean of water; we just don’t see it. We may be swimming in a sea of solutions that we do not see."
http://www.ted.com/topics/water

OpenCourseWare launched
UNESCO-IHE launched its OpenCourseWare platform with four courses in Hydrology and Hydraulics, Urban Drainage and Sewerage, Ecological Sanitation and Computational Hydraulics.
The Institute supports open access to educational materials for the benefit of the international learners’ community and aims to make available all of its modules by 2017.
http://ocw.unesco-ihe.org

Growing Blue
Growing Blue was created by Veolia Water to tell the important story of how water is as essential to our economic and social growth as it is to ensuring healthy ecosystems and our natural environment. The site includes a blog and tools that show the impact that economic development, population growth and other factors have on water resources.
http://www.growingblue.com

Water under Pressure
"We never know the worth of water until the well is dry," a 17th century scholar once said. In the modern world concerns are raised about the risks and challenges of potential conflicts. Al Jazeera’s Inside Story tells the story of water security and peace following a two-day conference where analysts, negotiators and scientists gathered to discuss water diplomacy.
http://ow.ly/scNs8

Is the world getting saltier?
TheWaterChannel.tv Salinity Theme Page illustrates that ‘the world is getting saltier’ through a number of videos, webinars with experts, discussions and relevant articles. With climate change impacts and rising sea levels, saline sea waters are pushing harder to infiltrate our land and aquifers. Cities spend more on water treatment and supply. Join the lively debates and share your stories.
http://www.thewaterchannel.tv/saltyworld

The Water Network
The Water Network is the largest online knowledge network for water professionals. Driving innovative solutions to the world’s water crisis by connecting the experiences of professionals around the globe. This neutral platform enables users to share content, experiences, policies, and technologies. It accommodates institutions and professionals.
http://www.thewaternetwork.com
Innovative learning at the UNESCO-IHE Institute for Water Education equips professionals with the research, managerial and technical skills needed to deal with challenges in the fields of water, the environment and infrastructure in their countries. For the latest information on the above courses, including content, dates, duration and tuition fees, please see our website: www.unesco-ihe.org/education.

**MSc PROGRAMMES**

**MSc PROGRAMME IN ENVIRONMENTAL SCIENCE**
- Environmental Planning and Management
- Environmental Science and Technology
- Environmental Technology and Engineering
- Environmental Technology for Sustainable Development
- Limnology and Wetland Ecosystems
- Water Quality Management

**MSc PROGRAMME IN URBAN WATER AND SANITATION**
- Sanitary Engineering
- Urban Water Engineering and Management
- Water Supply Engineering

**MSc PROGRAMME IN WATER MANAGEMENT**
- Study Profile Water Conflict Management
- Study Profile Water Resources Management
- Study Profile Water Services Management
- Study Profile Water Quality Management

**MSc PROGRAMME IN WATER SCIENCE AND ENGINEERING**
- Ecohydrology
- Flood Risk Management
- Hydraulic Engineering and River Basin Development
- Hydraulic Engineering - Coastal Engineering and Port Development
- Hydraulic Engineering - Land and Water Development
- Hydroinformatics-Modelling and Information Systems for Water Management
- Hydrology and Water Resources

**SHORT COURSES 2014**

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Start date</th>
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<tr>
<td>Coastal Systems</td>
<td>13/Jan/14</td>
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<tr>
<td>Surface Water Treatment I (previously 'Conventional Water Treatment')</td>
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<tr>
<td>Urban Drainage and Sewerage</td>
<td>13/Jan/14</td>
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<tr>
<td>Water Economics</td>
<td>13/Jan/14</td>
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<tr>
<td>Asset Management</td>
<td>10/Feb/14</td>
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<tr>
<td>Conventional Wastewater Treatment</td>
<td>10/Feb/14</td>
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<tr>
<td>Negotiation and Mediation for Water Conflict Management I</td>
<td>10/Feb/14</td>
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<tr>
<td>Port Planning and Infrastructure Design</td>
<td>10/Feb/14</td>
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<tr>
<td>Surface Water Treatment II</td>
<td>10/Feb/14</td>
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<td>Water Quality Assessment</td>
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<td>Water Resources Assessment</td>
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<tr>
<td>Coastal and Port Structures</td>
<td>03/Mar/14</td>
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<tr>
<td>Constructed Wetlands for Wastewater Treatment</td>
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<tr>
<td>Data Driven Modelling and Real Time Control of Water Systems</td>
<td>03/Mar/14</td>
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<td>Environmental Engineering</td>
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<td>Groundwater Resources and Treatment</td>
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<tr>
<td>Managing Water Organizations</td>
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<td>Negotiation and Mediation for Water Conflict Management II</td>
<td>03/Mar/14</td>
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<tr>
<td>Resource Oriented Wastewater Treatment and Sanitation</td>
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<td>Tracer Hydrology and Flow Systems Analysis</td>
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<td>Water and Environmental Policy Making</td>
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<td>Anaerobic Wastewater Treatment</td>
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<td>Environmental Monitoring and Modelling</td>
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<td>Environmental Planning and Implementation</td>
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<td>Financial Management of Water Organisations</td>
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<td>Groundwater Data Collection and Interpretation</td>
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<td>Hydrological Data Collection and Processing</td>
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<td>Nanotechnology for Water and Wastewater Treatment</td>
<td>31/Mar/14</td>
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<tr>
<td>River Basin Modelling</td>
<td>31/Mar/14</td>
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<tr>
<td>Service Oriented Management of Irrigation Systems</td>
<td>31/Mar/14</td>
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<tr>
<td>Wastewater Treatment Plants Design and Engineering</td>
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<td>Water Resources Planning</td>
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<tr>
<td>Water Transport and Distribution</td>
<td>31/Mar/14</td>
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<tr>
<td>Advanced Water Treatment and Re-use</td>
<td>22/Apr/14</td>
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**SHORT COURSES 2014**

<table>
<thead>
<tr>
<th>Course Title</th>
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<tbody>
<tr>
<td>Cleaner Production and the Water Cycle</td>
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<tr>
<td>Integrated Coastal Zone Management</td>
<td>22/Apr/14</td>
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<tr>
<td>Integrated Hydrological and River Modelling</td>
<td>22/Apr/14</td>
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<tr>
<td>International Port Seminar</td>
<td>22/Apr/14</td>
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<tr>
<td>Introduction to River Flood Modelling</td>
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<tr>
<td>Modelling Wastewater Treatment Processes and Plants</td>
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<tr>
<td>Urban Flood Management and Disaster Risk Mitigation</td>
<td>22/Apr/14</td>
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<tr>
<td>Water and Environmental Law</td>
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<tr>
<td>Environmental and Global Change: Uncertainty and Risk Assessment</td>
<td>28/Apr/14</td>
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<tr>
<td>Wetlands for Livelihoods and Conservation</td>
<td>19/May/14</td>
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<tr>
<td>Applied Groundwater Modelling</td>
<td>10/Jun/14</td>
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<tr>
<td>Aquatic Ecosystems: Processes and Applications</td>
<td>10/Jun/14</td>
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<td>Flood Risk Management</td>
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<td>Industrial Efficient Treatment and Residuals Management</td>
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<td>Partnerships in the Water Sector</td>
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<td>River Restoration and Rehabilitation</td>
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<td>Urban Water Systems</td>
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<tr>
<td>Water Treatment Processes and Plants</td>
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<tr>
<td>Design of Hydropower Schemes</td>
<td>23/Jun/14</td>
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<tr>
<td>Advanced Water Transport and Distribution</td>
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<td>Data Analysis and Modelling for Aquatic Ecosystems</td>
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<td>Decentralised Water Supply and Sanitation</td>
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<tr>
<td>Faecal Sludge Management</td>
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<tr>
<td>IWRM as a Tool for Adaptation to Climate Change</td>
<td>30/Jun/14</td>
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<tr>
<td>Solid Waste Management</td>
<td>30/Jun/14</td>
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<tr>
<td>Urban Water Governance</td>
<td>30/Jun/14</td>
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<tr>
<td>Water Resilient Cities</td>
<td>30/Jun/14</td>
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<tr>
<td>Watershed and River Basin Management</td>
<td>30/Jun/14</td>
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<tr>
<td>World History of Water Management</td>
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<td>Small Hydropower Development</td>
<td>08/Sep/14</td>
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<td>Spate Irrigation and Water Mgmt under Drought and Water Scarcity</td>
<td>08/Sep/14</td>
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<tr>
<td>Morphological Modeling Using Delft3D</td>
<td>15/Sep/14</td>
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<tr>
<td>New Data Sources to Support Flood Modelling</td>
<td>15/Sep/14</td>
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<tr>
<td>River Basin Modelling using SWAT and PCRaster</td>
<td>15/Sep/14</td>
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<tr>
<td>Using Open Source Software for GIS and Hydrological Modelling</td>
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<tr>
<td>Membrane Technology in Drinking and Industrial Water Treatment</td>
<td>29/Sep/14</td>
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<tr>
<td>GIS and Remote Sensing Applications for the Water Sector</td>
<td>27/Oct/14</td>
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<tr>
<td>Where there is little data: How to estimate design variables in poorly</td>
<td>17 Nov/14</td>
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<td>gauged basins</td>
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*These short courses are NOT eligible for NFP fellowships.

**ONLINE COURSES 2014-2015**

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<thead>
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<th>Course Title</th>
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<tr>
<td>Biological Wastewater Treatment: Principles, Modelling and Design</td>
<td>06/Jan/14</td>
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<td>Urban Drainage and Sewerage</td>
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<td>Flood Modelling for Management</td>
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<td>Integrated Coastal Zone Management</td>
<td>03/Mar/14</td>
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<tr>
<td>Integrated River Basin Management</td>
<td>03/Mar/14</td>
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<tr>
<td>Service Oriented Management of Irrigation Systems</td>
<td>03/Mar/14</td>
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<tr>
<td>Water and Environmental Law and Policy</td>
<td>03/Mar/14</td>
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<tr>
<td>Water Quality Assessment</td>
<td>03/Mar/14</td>
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<tr>
<td>Ecological Sanitation</td>
<td>05/May/14</td>
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<td>Grey Water Management, Treatment and Use</td>
<td>05/May/14</td>
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<tr>
<td>Industrial Resource Management and Cleaner Production</td>
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<tr>
<td>Modelling Sanitation Systems</td>
<td>05/May/14</td>
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<tr>
<td>Constructed Wetlands for Wastewater Treatment</td>
<td>01/Sep/14</td>
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<td>Environmental Flows</td>
<td>01/Sep/14</td>
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<tr>
<td>Governance of Decentralised Sanitation Management in Developing Countries</td>
<td>01/Sep/14</td>
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<tr>
<td>Industrial Efficient Treatment</td>
<td>01/Sep/14</td>
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<td>Solid Waste Management</td>
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<tr>
<td>Decision Support Systems in River Basin Management</td>
<td>15/Sep/14</td>
</tr>
<tr>
<td>Water Transport and Distribution</td>
<td>19/Sep/14</td>
</tr>
</tbody>
</table>
UNESCO-IHE and the Delfland Water Board officially launched the use of the Join the Pipe water tap on the square in front of the Institute in Delft. With the placement of the water tap, Delfland sponsors a pump for a water well in Bangladesh that can provide clean drinking water to a local community. Students from Bangladesh attended the launching ceremony and look forward to visiting the project in Dhaka, the country’s capital city, upon completion of their MSc programme.

About Join the Pipe
Join the Pipe is a non-profit organization dedicated to a fair distribution of clean drinking water in the world. With the sale of sustainable water bottles, pitchers and drinking water taps, the foundation funds numerous water projects in Africa and Asia. In Western countries, the organization promotes drinking tap water to reduce the use of plastic bottles, thereby creating a greener environment.