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CONTENT

ORGANIZING INSTITUTIONS

The International Water Association (IWA)

the international water association

The International Water Association is an open yet ordered platform in which both innovators and adopters of new technologies and approaches can generate creative friction. It is a place for diffusion, benchmarking and evidence.

The Inter-American Development Bank (IDB)

IDB
Inter-American Development Bank

The Inter-American Development Bank (IDB) is devoted to improving lives. Established in 1959, the IDB is a leading source of long-term financing for economic, social and institutional development in Latin America and the Caribbean. The IDB also conducts cutting-edge research and provides policy advice, technical assistance and training to public and private sector clients throughout the region.

ESPOL University

The Escuela Superior Politecnica del Litoral was created in Guayaquil on 29th October, 1958 given the high demand of different sectors that required specialized education that contributes to the socio-cultural and economic development of the area. ESPOL ranks #801 among the best universities around the world, and #64 among the best universities in Latin America, according to the QS Rankings 2019.

Cecilia Paredes, Ph.D.

Rector

Paúl Herrera, Ph.D.

Vice-rector

Ghent University

Ghent University is a top 100 university and one of the major universities in Belgium. Our 11 faculties offer a wide range of courses and conduct in-depth research within a wide range of scientific domains. We are also the first European university in the Songdo Global University Campus in South Korea.

Rik Van de Walle, Ph.D.

Rector

Mieke Van Herreweghe, Ph.D.

Vice-rector

WELCOME

On behalf of the International Water Association, welcome to the first IWA-IDB Innovation Conference! We look forward to working with and learning from our colleagues in IWA and IDB, and are especially pleased to welcome those who may not have attended an IWA event in the past. Our focus will be on how we can work together to address the serious water issues that confront us in cities, agriculture, and industry. The urgency of these problems demands our attention, our commitment, our creativity, and a willingness to collaborate across boundaries of geography, sector, and expertise. We value your ideas, and we thank you for coming.

Cheryl Davis, Peter Goethals, Luis Domínguez and Sergio Campos

We thank all participants of the IWA-IDB Innovation Conference for sharing their vision and expertise!

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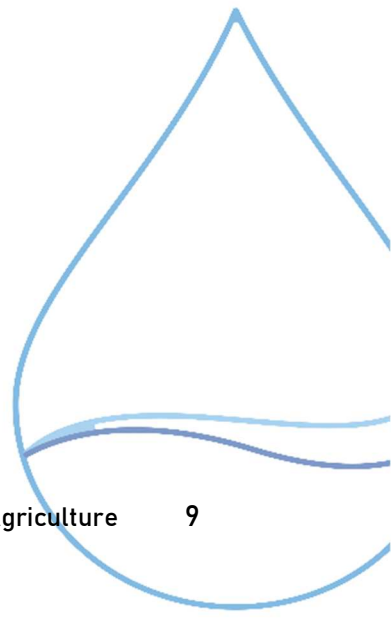

OVERVIEW TECHNICAL SESSIONS

Monday 30 September

07h30-08h30	Conference registration at ESPOL			
08h30-10h00	Plenary Session 1 (Main Auditorium)			
10h00-10h30	Health break			
10h30-12h00	INNOVATION TRACK Auditorium 1	INDUSTRY TRACK Auditorium 2	CROSS-CUTTING TRACK Auditorium 3	
	New Approaches for Financing *Sudhir Murthy (IWA, USA)*	Water Use Challenges and Solutions in the Extractive Industries - Management and Operations *Cheryl Davis (IWA SG SWS, USA)*	Connecting Watersheds and Coastal Urban Areas Under Climate Change Influence *Luis Dominguez (ESPOL, Ecuador)*	
12h00-13h30	Lunch			
13h30-15h00	INNOVATION TRACK Auditorium 1	INDUSTRY TRACK Auditorium 2	CROSS-CUTTING TRACK Auditorium 3	CITY TRACK Auditorium 4
	Connecting Society with Water *Javier Grau (IDB, Ecuador)*	Water Use Challenges and Solutions in the Extractive Industries – Water Quality and Environment *Alvaro Hernandez (CODELCO, Chile)*	Education for Climate Change Adaptation and Mitigation *Petra Schneider (Magdeburg-Stendhal University, Germany)*	Regenerative Water and Sanitation Services *José Porro (Cobalt Water, USA)*
15h00-15h30	Health break			
15h30-17h00		INDUSTRY TRACK Auditorium 2	CROSS-CUTTING TRACK Auditorium 3	CITY TRACK Auditorium 4
		Treatment of Industrial Wastewater *Val Frenkel (Greeley and Hansen, USA)*	Analytical Tools to Support Water Stewardship *Oliver Maennicke (IWA SG SWS, Austria)*	Integrating Water in City Planning and Design *Paula Kehoe (SFPUC, USA)*
17h00-17h10	Power break			
17h10-18h00	AGRICULTURE TRACK Auditorium 1	INDUSTRY TRACK Auditorium 2	CROSS-CUTTING TRACK Auditorium 3	
	Efficient Water Use in Aquaculture *Luis Dominguez (ESPOL, Ecuador) and Yahira Piedrahita (ESPOL, Ecuador)*	Financing Sustainable Use of Water by Industry *Cheryl Davis (IWA SG SWS, USA)*	Amazon Fires *Peter Goethals (Ghent University, Belgium) and Dave Archambault (CNAIS, USA)*	

Tuesday 01 October

07h30-08h30	Conference registration at ESPOL		
08h30-10h00	Plenary Session 2 (Main Auditorium)		
10h00-10h30	Health break		
10h30-12h00	INNOVATION TRACK Auditorium 1	CITY TRACK Auditorium 2	CROSS-CUTTING TRACK Auditorium 3
	Innovations in Water Treatment *Val Frenkel (Greeley and Hansen, USA)*	AquaRating as Model to Improve Water Utilities Performance Globally *Corinne Cathala (IDB, USA)*	Public Engagement and Communication *Paula Kehoe (SFPUC, USA)*
12h00-13h30	Lunch		
13h30-15h00	INNOVATION TRACK Auditorium 1	CITY TRACK Auditorium 2	CROSS-CUTTING TRACK Auditorium 3
	Innovation Event with ISLE *Victor Arroyo (ISLE, Ecuador)* *Francisco Cubillo (IDB, Ecuador)* *Marcello Basani (IDB, Ecuador)*	Connecting Watersheds and Urban Areas *Hugo Contreras (The Nature Conservancy, Mexico)*	Integrated Modelling to Support Sustainability *Wout Van Echelpoel (Ghent University, Belgium)*
15h00-15h30	Health break		
15h30-17h00	INNOVATION TRACK Auditorium 1	INDUSTRY TRACK Auditorium 2	CROSS-CUTTING TRACK Auditorium 3
	Innovation Event with ISLE *Victor Arroyo (ISLE, Ecuador)* *Francisco Cubillo (IDB, Ecuador)* *Marcello Basani (IDB, Ecuador)*	Incentives, Barriers, Challenges and Opportunities for Sustainable Use of Water by Industry *Cheryl Davis (IWA SG SWS, USA)*	Innovations in Water System Monitoring I *Stijn Bruneel (Ghent University, Belgium)*
17h00-17h10	Power break		
17h10-18h00	CROSS-CUTTING TRACK Auditorium 1	INDUSTRY TRACK Auditorium 2	CROSS-CUTTING TRACK Auditorium 3
	Smart Technologies to Attain Sustainable Water Resources Management *Daniel Ochoa (ESPOL, Ecuador)*	Industry and the Circular Economy *Cheryl Davis (IWA SG SWS, USA)*	Innovations in Water System Monitoring II *Stijn Bruneel (Ghent University, Belgium)*

Wednesday 02 October

07h30-08h30	Conference registration at ESPOL			
08h30-10h00	Plenary Session 3 (Main Auditorium)			
10h00-10h30	Health break			
10h30-12h00	INNOVATION TRACK Auditorium 1	CITY TRACK Auditorium 2	CROSS-CUTTING TRACK Auditorium 3	CROSS-CUTTING TRACK Room 1
	Technology Selection Approaches *Will Sarni (Water Foundry, USA)*	Incentives for Water-wise Cities *Rui Marques (University of Lisboa, Portgual))*	Concepts and Strategies to Meet the UN Sustainable Development Goals *Oliver Maennicke (IWA SG SWS, Austria)*	Statistical Sampling: One Tool to Guide Sound Water Management Decisions *Juliana Jimenez Valencia (Instituto Oswaldo Cruz, Brazil*
12h00-13h30	Lunch			
13h30-15h00	INNOVATION TRACK Auditorium 1	AGRICULTURE TRACK Auditorium 2	INDUSTRY TRACK Auditorium 3	
	Circular Economy and Sustainable Technologies *María Eugenia de la Pena (IDB, Ecuador)*	Environmental Impact Assessment of Agriculture *Long Ho (Ghent University, Belgium)*	Sustainable Use of Water by the Industry: What Does 'Good' Look Like? *Cheryl Davis (IWA SG SWS, USA)*	
15h00-15h30	Health break			
15h30-16h30	Plenary Session 4 (Main Auditorium)			
	Call for Action *Cheryl Davis (IWA SG SWS, USA)* *Marcello Basani (IDB, Uruguay)* *Luis Domínguez (ESPOL, Ecuador)* *Oliver Maennicke (IWA SG SWS, Austria)* *Peter Goethals (Ghent University, Belgium)*			
16h30-16h45	Start of the National Chapter *Luis Domínguez (ESPOL, Ecuador)* *Indira Nolivos (ESPOL, Ecuador)*			
16h45-17h45	IDBs Ideas in Action *Sergio Campos (IDB, Bolivia)*			
17h45-18h00	Closing of the Conference *Cheryl Davis (IWA SG SWS, USA)*			

DETAILED CONFERENCE PROGRAM

Monday 30 September

08h30 – 10h00 | MAIN AUDITORIUM
PLENARY SESSION 1

08:30 – 08:40 **Opening of the Conference**
Peter Goethals (Ghent University, Belgium)
Luis Domínguez (ESPOL, Ecuador)

08:40 – 09:10 **Welcome**
Cecilia Paredes (ESPOL, Ecuador)
Cheryl Davis (IWA Specialist Group Sustainability in the Water Sector, USA)
Fernando Quevedo (IDB, Ecuador)

09:10 – 10:00 **Technology-augmented River Basins**
Peter Goethals (Ghent University, Belgium)

Innovation in the Water Sector
Sudhir Murthy (IWA, USA)

Water and Sanitation in Latin America
Sergio Campos (IDB, Bolivia)

Emerging Technologies for Water Management
Will Sarni (Water Foundry, USA)

10h30 – 12h00 | AUDITORIUM 1
NEW APPROACHES FOR FINANCING

It is estimated that in the Latin American and the Caribbean region the capital cost to comply with SDGs 6.1 and 6.2 is US $ 14 billion per year, which is equivalent to 12% of the resources needed worldwide. To this must be added the challenges and the resources linked to the improvement in the management of water resources, urban drainage and solid waste, with challenges associated with the elimination of waste at the household level. It is increasingly apparent that leveraging conventional economic-financial resources will not achieve these goals. Fortunately, there are interesting new modality for financing that can be considered innovative. Some of these will be presented and discussed in this interactive session.

Chaired by: Sudhir Murthy (IWA, USA)

Innovative Public-private-civil Society Partnerships to Increase Impact in Water Security: The Case of the Water Funds
Hugo Contreras (The Nature Conservancy, Mexico)

New Approaches for Financing - Fondo de Agua de Guayaquil para la Conservacion de la Cuenca del Río Daule
Giovanni Ginatta (Fondagua, Ecuador)

Resilience Bonds - A Conditional Payment Approach to Financing Resilient Water Projects
Saul Kinter (DC Water, USA)

Connecting Microfinance with Water and Sanitation in Homes
Mercedes Castro Garcia (Agualimpia, Peru)

Blockchain in Microfinance - Promoting Financial Inclusion & Lowering Costs in Microfinance
Caroline Pflueger (BanQu, USA)

Other Parallel Sessions:

Auditorium 2	Water Use Challenges and Solutions in the Extractive Industries – Management and Operations	p. 15
Auditorium 3	Connecting Watersheds and Coastal Urban Areas Under Climate Change Influence	p. 16

10h30 – 12h00 | AUDITORIUM 2

WATER USE CHALLENGES AND SOLUTIONS IN THE EXTRACTIVE INDUSTRIES – MANAGEMENT AND OPERATIONS

Extractive industries (e.g. mining and oil and gas extraction) have multiple water supply and water quality effects, both during and following operation of facilities. In addition, unsafe structures can result in huge impacts to ecosystems and communities. This session will focus on the management decisions that need to be made to avoid negative economic, environmental, and community impacts.

Chaired by: Cheryl Davis (IWA Specialist Group Sustainability in the Water Sector, USA)

Dimensions of Water Management in Extractive Industries
Petra Schneider (Magdeburg-Stendhal University, Germany)

Mining and Water
Alvaro Hernandez (CODELCO, Chile)

Administración del Recurso Agua en las Operaciones Mineras de HEC
Elvira Tovar & Christian Ayala (HOLCIM, Chile)

Environmental Management in a Large-scale Mine: Case Study of Fruta del Norte
María Cristina Acosta (Lundin Gold, Ecuador)

Water Footprint in the Oil Industry - A Study of the Use and Consumption of Water in an Oil Drilling Rig
Richard Chango Valverde (Universidad San Francisco de Quito, Ecuador)

Other Parallel Sessions:

Auditorium 1	New Approaches for Financing	p. 14
Auditorium 3	Connecting Watersheds and Coastal Urban Areas Under Climate Change Influence	p. 16

10h30 – 12h00 | AUDITORIUM 3

CONNECTING WATERSHEDS AND COASTAL URBAN AREAS UNDER CLIMATE CHANGE INFLUENCE

The workshop is a special venue where selected conference participants will conform a panel discussion about challenges for an integrated hydroclimatic risk management strategy for cities located in deltas. Its aim is to bring together the vision of decision makers, water professionals and academia for the discussion of strategies to increase urban resilience to hydroclimatic risks.

The goal of this workshop is to review existing and potential multi-sectoral plans (national, regional, and international) for integrating hydroclimatic risk at the watershed and urban scales. Particular attention will be paid to the integration of open data structure solutions to generate synergy between the water resources management strategy at watershed level and the hydroclimatic risk reduction at urban scale.

Chaired by: Luis Domínguez (ESPOL, Ecuador)

Aplicación del modelo de la "Hélice Quíntuple" para Resiliencia Climática
María del Pilar Cornejo-Rodriguez (ESPOL, Ecuador)

Connecting Watersheds and Coastal Urban Areas Under Climate Change Influence: Towards the Integration of Hydro Climatic Risks for Delta Cities and Watershed Management
José Luis Santos (EMAPAG, Ecuador)

Panel discussion with:

María del Pilar Cornejo-Rodriguez (ESPOL, Ecuador)

Diego Guzmán (INAMHI, Ecuador)

José Luis Santos (EMAPAG, Ecuador)

Angel Valdiviezo (Gestión de Riesgos y Emergencias, Ecuador)

Other Parallel Sessions:

Auditorium 1	New Approaches for Financing	p. 14
Auditorium 2	Water Use Challenges and Solutions in the Extractive Industries – Management and Operations	p. 15

13h30 – 15h00 | AUDITORIUM 1
CONNECTING SOCIETY WITH WATER

By 2015, most of the countries in Latin America and the Caribbean had reached the Millennium Development Goals on water and sanitation. The Sustainable Development Goals (SDG 6.1.1, SDG 6.2.1 and SDG 1.4.1) establish more ambitious goals, introducing the concept of "securely managed" services. According to these new parameters, base coverage figures for Latin America and the Caribbean are reduced to 65% (water) and 23% (sanitation). This represents 220 million people without access to safe water services, and more than 480 million without access to safe sanitation. Only by leveraging economic-financial resources in conventional programs and adapting traditional management models, it will not be possible to achieve these goals. Sectorial actors need to develop innovative models of synergistic collaboration between government, civil society and the private sector.

Chaired by: Javier Grau (IWA, USA)

Container-based Sanitation in Urban Haiti – Protecting Water Resources with Smart Sanitation
Sasha Kramer (SOIL, Haiti)

Adaptando Soluciones de Provisión de Agua y de Saneamiento en Zonas Rurales Dispersas de Bolivia para Aumentar su Accessibilidad a Mujeres y Grupos Vulnerables
Nestor Meneses (MMAyA, Bolivia)

Impact-focused Education for Sustainability Innovation
María José Ayala (USFQ, Ecuador)

Disruption of the Water Distribution Scheme by Water Tankers in the Community of Monte Sinaí – Guayaquil, Ecuador
David Cortez (Interagua-Veolia, Ecuador)

Innovación desde el Intra-emprendimiento para el Uso del Recurso Hídrico en Vínculo con la Sociedad
Gabriela Maldonado (ESPOL, Ecuador)

Other Parallel Sessions:

Auditorium 2	Water Use Challenges and Solutions in the Extractive Industries – Water Quality and Environment	p. 18
Auditorium 3	Education for Climate Change Adaptation and Mitigation	p. 19
Auditorium 4	Regenerative Water and Sanitation Services	p. 20

13h30 – 15h00 | AUDITORIUM 2

WATER USE CHALLENGES AND SOLUTIONS IN THE EXTRACTIVE INDUSTRIES – WATER QUALITY AND ENVIRONMENT

Extractive industries can have harsh long-term effects on the environment, water quality, and communities, both during and following their operation. Rehabilitation of environments and water supplies adversely affected by both operations and facilities (e.g., the dams constructed to hold toxic effluent from mining operations) can be both complex and expensive. This session will focus on environmental, water quality, and community impacts and their remediation.

Chaired by: Alvaro Hernandez (CODELCO, Chile)

Towards Community Based Natural Resources Management: A Case of River Sand Mining in the Rural Villages of the Eastern Cape, South Africa
Andisiwe Bango (Sisulu University, South Africa)

Prokaryotic Diversity During the Removal of Copper and Zinc in a Bioreactor with a Limestone Pre-column System
Aracely Zambrano (USFQ, Ecuador)

Pollution of Rivers by Artisanal Mining Activities and Use of Bioremediation Techniques for Heavy Metal Reduction. Case Study: Ponce Enriquez – Ecuador
Paola Almeida Guerra (ESPOL, Ecuador)

Balance Scorecard Apply to an Integrated Watershed Restoration Proposal in a Mine Polluted Area
Alby Aguilar Pesantes (Universidad de Léon, Spain)

Monitoring Freshwater Quality of a Large-scale Mining Watershed: The Need for Integrated Approaches
Daniel Mercado Garcia (Ghent University, Belgium)

Other Parallel Sessions:

Auditorium 1	Connecting Society with Water	p. 17
Auditorium 3	Education for Climate Change Adaptation and Mitigation	p. 19
Auditorium 4	Regenerative Water and Sanitation Services	p. 20

13h30 – 15h00 | AUDITORIUM 3
EDUCATION FOR CLIMATE CHANGE ADAPTATION AND MITIGATION

Innovation occurs on a daily basis as a response to practical (and sometimes philosophical) issues, fed by a range of high- and low-potential ideas. However, knowledge on what works and what doesn't often remains within a limited group of people, impeding progress at various scales. With this in mind, it is utterly clear that education and capacity building are of invaluable importance, especially when considering the rate of current climate change and the nature of future challenges we will have to change at both local and global scale. Education is the key in moving forward as a society facing a single, global challenge.

Chaired by: Petra Schneider (Magdeburg-Stendhal University, Germany)

Evaluating the Performance of SHETRAN Simulating a Complex Medium Size Catchment
Josue Brito (UCuenca, Ecuador)

E-learning and MOOCS for Water Policy and Management
Peter Goethals (Ghent University, Belgium)

Curricula Development and Adaptation Related to Water and Climate
Luis Domínguez (ESPOL, Ecuador)

How to Better Engage Students to Improve Water Resource Management
Steve Lyon (Ohio State University, USA)

Other Parallel Sessions:

Auditorium 1	Connecting Society with Water	p. 17
Auditorium 2	Water Use Challenges and Solutions in the Extractive Industries – Water Quality and Environment	p. 18
Auditorium 4	Regenerative Water and Sanitation Services	p. 20

13h30 – 15h00 | AUDITORIUM 4
REGENERATIVE WATER AND SANITATION SERVICES

The lack of safe and reliable water supply affects more than 800 million people worldwide, and over 2.5 billion people lack adequate sanitation The lack of safe and reliable water supply affects more than 800 million people worldwide, and over 2.5 billion people lack adequate sanitation services. This combined with increased urbanization, climate change, pollution and inadequate financing creates unprecedented challenges to the provision of water and sanitation services. To address these challenges an approach of regenerative services which includes ensuring sustainable practices of utilities which can be supported by tools to upgrade the efficiency and capacity of drinking water and wastewater utilities. Furthermore, a holistic approach to managing water and sanitation service includes designs that support a circular economy which mean implementing reuse and recovery, and the application of closed-loop decentralized systems. These efforts can support the aim of ensuring public health and sustaining all needs while protecting the quality and quantity of water resources.

Chaired by: José Porro (Cobalt Water, USA)

Low-carbon Water Utility Case Studies in Peru
Geraldine Canales (GIZ, Peru)

Bioelectrochemical Peroxide Production for Water Disinfection
Suanny Mosquera Romero (Ghent University, Belgium)

Ultrafiltration, a Cost-effective Solution for Surface-water Potabilization
Mariela Cuartucci (Fluence, Argentina)

Emerging Pollutants Removal from Water Using Vetiver (*Chrysopogon zizanioides*)
Miriam Checa (ESPOL, Ecuador)

Panel discussion with:

Paula Kehoe (SFPUC, USA)

José Luis Santos (EMAPAG, Ecuador)

Other Parallel Sessions:

Auditorium 1	Connecting Society with Water	p. 17
Auditorium 2	Water Use Challenges and Solutions in the Extractive Industries – Water Quality and Environment	p. 18
Auditorium 3	Education for Climate Change Adaptation and Mitigation	p. 19

15h30 – 17h00 | AUDITORIUM 2
TREATMENT OF INDUSTRIAL WASTEWATER

Effective treatment of the effluent from industrial processes is generally more complex and also of even greater environmental and public health consequences than the treatment of residential wastewater because of the dangerous substances contained in the effluent. This session will provide an overview of issues relating to treatment and beneficial use of wastewater from industrial processes.

Chaired by: Val Frenkel (Greeley and Hansen, USA)

Approaches and Technologies for Industrial Wastewater Reuse
Val Frenkel (Greeley and Hansen, USA)

Best Available Technologies for Industrial Wastewater Management
Maria Concetta Tomei (IRSA-CNR, Italy)

Use of Wetlands to Treat Industrial Wastewater
Florent Chazarenc (IRSEA, France)

Industrial Wastewater Discharges in the Cuenca Basin
Ana Carolina Iniguez (Industrial Wastewater Discharge Department, Ecuador)

Inactivation of Contaminants of Emerging Concern by Visible Light Photocatalysis: Potential Applications in Advanced Water Treatment
Poojesh Bertram-Mohammadi (Ernst-Abbe University, Germany)

Other Parallel Sessions:

Auditorium 3	Analytical Tools to Support Water Stewardship	p. 22
Auditorium 4	Integrating Water in City Planning and Design	p. 23
Room 1	Discussion on the Call for Action – Innovation Track	p. 24

15h30 – 17h00 | AUDITORIUM 3
ANALYTICAL TOOLS TO SUPPORT WATER STEWARDSHIP

'Stewardship is about taking care of something that we do not own. Good water stewards recognize the need for collective responses to the complex challenges facing the water resources we all rely on.' (Alliance for Water Stewardship). During the last decade a vast body of knowledge on water stewardship has been developed to address the sustainable use of water. This session will provide an overview of various tools, their application, outcome expectations and it will help to understand inter-linkages between tools and thought leaders occupying this space. There is no one-size-fits-all-tool but the collective provides a helpful toolbox for action.

Chaired by: Oliver Maennicke (IWA Specialist Group Sustainability in the Water Sector, Austria)

WWF Water Risk Filter: Explore Assess, Value, Respond
Alexis Morgan (WWF Germany, Canada)

WAVE (Water and Value Tool)
Will Sarni (Water Foundry, USA)

The Water Action Hub: Connect to Water Stewardship Projects around the World
Jason Morrison (CEO Water Mandate, USA)

The Alliance for Water Stewardship: A Network, the Standards and its Application
Carla Toranzo (Alliance for Water Stewardship, Peru)

Water Dialogue on Making Water a Priority in Your Boardroom
Paulo Viveros (Nestle, Ecuador)

Panel discussion with:
Ursula Antunez (SGS, Peru) & Jens Hoenerhoff (DEG, Germany)

Other Parallel Sessions:

Auditorium 2	Treatment of Industrial Wastewater	p. 21
Auditorium 4	Integrating Water in City Planning and Design	p. 23
Room 1	Discussion on the Call for Action – Innovation Track	p. 24

15h30 – 17h00 | AUDITORIUM 4
INTEGRATING WATER IN CITY PLANNING AND DESIGN

Half of humanity now lives in cities and, within two decades, nearly 60% of the world's population -5 billion people- will be urban dwellers. Due to rapid urbanization, cities face a growing demand for water and sanitation services. To meet this demand, cities are going deeper and further, which leads to over-exploitation of water resources. Integrating urban planning with the management, protection and conservation of the total urban water cycle water can enable innovation, social cohesion, creativity and culture. Some of the actions that can be taken include optimising the use of alternative water sources, design of green spaces for water retention and flood mitigation as well as improved liveability, and overall integration of green infrastructure across the city. This all requires municipal support and buy-in for sustainable water use.

Chaired by: Paula Kehoe (SFPUC, USA)

Planning the Cities of Futures in LIC
Victor Faria (CEDAE, Brazil)

Nature-based Solutions for Sustainable Urbanisation: The Water Perspective
Petra Schneider (Magdeburg-Stendhal University, Germany)

Creating Robustness through Green Blue Water Concepts and the Functional Improvement of Spaces
Krista Decat (Aquafin, Belgium)

Guayaquil: Un Modelo de Gestión Sostenible y Sustentable
Andres Mendoza Paladines (EMAPAG, Ecuador)

A Sustainable Urban Drainage System for a Coastal City in Ecuador
Indira Nolivos (ESPOL, Ecuador)

Other Parallel Sessions:

Auditorium 2	Treatment of Industrial Wastewater	p. 21
Auditorium 3	Analytical Tools to Support Water Stewardship	p. 22
Room 1	Discussion on the Call for Action – Innovation Track	p. 24

15h30 – 16h30 | ROOM 1
DISCUSSION ON THE CALL FOR ACTION – INNOVATION TRACK

It is estimated that the global costs of achieving the Sustainable Development Goals targets 6.1 and 6.2 is approximately $114 billion per year, which is three times the historic spending on extending services to the underserved. Of this, Sub-Saharan Africa accounts for 31 percent of the global costs of meeting the targets ($35.5 billion per year), followed by Southern Asia with 22 percent ($24.5 billion per year), Eastern Asia with 14 percent ($15.9 billion per year), Latin America and the Caribbean with 12 percent ($14.0 billion per year), and Southeastern Asia with 9 percent ($10.4 billion per year).

If we focus on Latin America and the Caribbean, by 2015 most of the countries in this region had reached the Millennium Development Goals on water and sanitation. On average, the region achieved 95% coverage of water services and 83% of sanitation. However, using the more ambitious parameters of the Sustainable Development Goals, which introduce the concept of "securely managed" services, base coverage figures are reduced to 65% (water) and 23% (sanitation). This represents 220 million people without access to safe water services, and more than 480 million without access to safe sanitation.

It is recognized that traditional economic, financial, technological and management strategies are not adequate to achieve these goals. The sector needs to rapidly identify and scale innovative technologies, financing/funding business models, partnerships and public policies to ensure universal access to equitable safe drinking water and sanitation services throughout the region. It is crucial to rapidly create and implement innovation tools, platforms and programs for the private and public sector to scale solutions.

For more information, go to page 68.

Chaired by: Marcello Basani (IDB, Uruguay)

Other Parallel Sessions:

Auditorium 2	Treatment of Industrial Wastewater	p. 21
Auditorium 3	Analytical Tools to Support Water Stewardship	p. 22
Auditorium 4	Integrating Water in City Planning and Design	p. 23

17h10 – 18h00 | AUDITORIUM 1
EFFICIENT WATER USE IN AQUACULTURE

Water is for sure the most important resource for the production of animal protein in aquaculture. Most of the time, aquaculture entirely relies on water obtained from surface water bodies (rivers, lakes, estuaries) and a lot of efforts are made in order to attain a good water quality for a successful production. Nevertheless, external factors threat the activity. Water and sediment pollution in water bodies can deteriorate the water quality conditions of the source, compromising the quality of the production in terms of food safety and potentially affecting the market that has become more restringing in terms of regulation. In Latin American Countries, shrimp production is probably one of the biggest sectors of aquaculture with a significant contribution to local economies. Urgent actions are required in order to promote sustainable aquaculture practices that can protect the sector and reduce its impact in the environment.

Chaired by: Luis Domínguez (ESPOL, Ecuador) & Yahira Piedrahita (ESPOL, Ecuador)

Water Use in Aquaculture
Rodrigo Angulo (Interagua-Veolia, Ecuador)

"On the Water AI" to Improve Water Use Practices in Shrimp Farms
Daniel Ochoa (ESPOL, Ecuador)

Other Parallel Sessions:

Auditorium 2	Financing Sustainable Use of Water by Industry	p. 26
Auditorium 3	Amazon Fires	p. 27
Room 1	Discussion on the Call for Action – Cities Track	p. 28

17h10 – 18h00 | AUDITORIUM 2
FINANCING SUSTAINABLE USE OF WATER BY INDUSTRY

Financing institutions can play a key role in encouraging sustainable use of water by industry by offering financial support for projects that will make industrial water use more sustainable (e.g., treatment of industrial wastewater prior to its discharge to water bodies). In this session, participants will discuss (1) financing support currently available for projects to support more sustainable use of water by industry; (2) barriers to use of those resources; and (3) whether additional financing support is needed.

Chaired by: Cheryl Davis (IWA Specialist Group Sustainability in the Water Sector, USA)

The Green Lines Initiative
Santiago Vicencios & Carolina Landin (Produbanco, Ecuador)

Other Parallel Sessions:

Auditorium 1	Efficient Water Use in Aquaculture	p. 25
Auditorium 3	Amazon Fires	p. 27
Room 1	Discussion on the Call for Action – Cities Track	p. 28

17h10 – 18h00 | AUDITORIUM 3
AMAZON FIRES

The fires in the Amazon Rain Forest are a hot topic among world leaders as awareness on its unique value and provided ecosystem services has increased. Local populations and ecosystems have been affected, while long-term consequences on the global climate remain uncertain. Disturbances at such a scale demand an international reply, consisting of political cooperation, social interaction and scientific knowledge. It is expected that, due to this regional (and maybe even global) disturbance of the water cycle, other ecosystems (e.g. the Pantanal) are at risk.

The session consists of a moderated discussion with the audience on the recent increase in burning activity within the Amazon rain forest.

Chaired by: Peter Goethals (Ghent University, Belgium) & Dave Archambault (CNAIS, USA)

Other Parallel Sessions:

Auditorium 1	Efficient Water Use in Aquaculture	p. 25
Auditorium 2	Financing Sustainable Use of Water by Industry	p. 26
Room 1	Discussion on the Call for Action – Cities Track	p. 28

17h10 – 18h00 | ROOM 1
DISCUSSION ON THE CALL FOR ACTION – CITIES TRACK

Former Secretary General of the UN Ban Ki-moon stated that: The battle for sustainability will be won or lost in cities. Cities are the economic hubs of our society and while they are rapidly expanding the water resources, they rely on are under increasing pressure. We need to find ways to do more with less. The SDGs are a bold call for the promotion of sustainable urban water management for safer, more inclusive and resilient cities. To achieve this we need to harness the power of collaboration with adapted governance, engagement of stakeholders and active citizen involvement.

This track is based around the IWA Principles for Water Wise Cities which aim to help city leaders ensure that everyone in their cities has access to safe water and sanitation, that their cities are resilient to floods, droughts and the challenges of growing water scarcity, and that water is integrated in city planning to provide increased liveability, efficiencies, and a sense of place for urban communities. The Principles are a tool for to mobilise decision makers across departments, sectors, and institutions around sustainable urban water management. The Principles along with the Action Agenda for Basin-Connected Cities also offer a framework to structure the dialogue and action needed.

The 17 principles are grouped into four categories:

1.Regenerative water services: including replenishing water bodies and their ecosystems, reducing the amount of water and energy used, recovering energy, nutrients and other materials from water, and increased efficiencies by integrating water services with other services.

2.Water sensitive urban design: including designing urban spaces to reduce flood risks, enhance liability with visible water, and modify and adapt urban materials to minimise environmental impact.

3.Basin connected cities: including planning to secure water resources and mitigate drought, protect the quality of water resources and prepare for extreme events. Also see the Action Agenda for Basin-Connected Cities

4.Water-wise communities: including empowering citizens, increasing professional awareness of water and enabling policy makers to take water-wise action.

These are reflected in this track along with management tools for water utilities (e.g. AquaRating) which connects and demonstrates a practical example of the building blocks highlighted in the Principles (Vision, Governance, Knowledge & Capacity, Implementation Tools and Planning Tools).

For more information, go to page 70.

Chaired by: Oliver Maennicke (IWA Specialist Group Sustainability in the Water Sector, Austria)

Other Parallel Sessions:

Tuesday 01 October

08h30 – 10h00 | MAIN AUDITORIUM
PLENARY SESSION 2

08:30 – 08:40 **Opening of the Conference**
Peter Goethals (Ghent University, Belgium)
Luis Domínguez (ESPOL, Ecuador)

08:40 – 10:00 **Sustainable Use of Water by Industry: How Can We Save Us from Ourselves?**
Cheryl Davis (IWA Specialist Group Sustainability in the Water Sector, USA)

Current State of Play and Future of Corporate Water Stewardship
Jason Morrison (CEO Water Mandate, USA)

Water is a Source of Life, Not a Resource
Dave Archambault (Center for Native and Indigenous Studies, USA)

From a Trickle to a Flood: How Emergent Innovative Approaches Can Scale Water Stewardship
Alexis Morgan (WWF Germany, Canada)

10h30 – 12h00 | AUDITORIUM 1
INNOVATIONS IN WATER TREATMENT

Clean water is a valuable good for industry, society and nature, yet is predicted to become (even more) scarce in the future. Circular thinking and efficiency improvements provide useful steps in preserving the global water supplies and benefit a more sustainable economy. A major element in the 'circular thinking' aspect is to mitigate (or even undo) the changed state of water used in any type of anthropogenic activity. First steps in the impact reduction of domestic wastewater have been made decades ago by the implementation of the Activated Sludge treatment system. However, current and future conditions challenge us to rethink existing treatment technologies and improve their efficiencies to support more circular and sustainable water use.

Chaired by: Val Frenkel (Greeley and Hansen, USA)

First Municipal Seawater Desalination Plant in Ecuador: Challenges and Solutions
Val Frenkel (Greeley and Hansen, USA)

Domestic Wastewater Treatment with Native Microalgae-Bacteria Consortia from the Ecuadorian Amazon and the Galápagos Islands
Ana Cardenas-Orrego (USFQ, Ecuador)

Analysis of Pre-treatments Performance at WWTP Systems in Cuenca City
Veronica Rodas (ETAPA, Ecuador)

Assessment of the Electric Energy Demand for Different Aeration Regimes in Aerobic Wastewater Treatment
Christine Van der heyden (HOGent, Belgium)

Proposals for Improving the Operation of Domestic Wastewater Treatment Plants that Allow Reducing the Contamination of Lake Titicaca – Peru Sector
María Isabel Medrano Sanchez (CONCYTEC, Peru)

Other Parallel Sessions:

Auditorium 2	AquaRating as Model to Improve Water Utilities Performance Globally	p. 31
Auditorium 3	Public Engagement and Communication	p. 32
Room 1	Discussion on the Call for Action – Industry Track	p. 33
Room 2	Discussion on the Call for Action – Cross-cutting Track	p. 33

10h30 – 12h00 | AUDITORIUM 2
AQUARATING AS MODEL TO IMPROVE WATER UTILITIES PERFORMANCE GLOBALLY

The international experience indicates that major improvements in water utilities can be achieved through: (i) reduction of water losses through well-designed performance-based contracts; (ii) improvement in commercial management, invoicing and collection and cost recovery processes; (iii) increase in labor productivity since labor cost can often represent a high percentage of operating costs (approximately 35%) in water utilities; and (iv) efficient use of energy (which represents usually 30 to 40% of operating costs.

The AquaRating was jointly designed by the Inter-American Development Bank (IDB) and the International Water Association (IWA) and intends to cover all aspects associated with the efficient management of water utilities with 8 areas of evaluation, a set of 60 indicators as well as 52 groups of good practices. The Aquarating has been implemented in over 80 utilities throughout the world and the session will include innovative cases of implementation in the region as well as in other parts of the world as well as results of benchmarking exercises and the many ways AquaRating has been implemented in the countries.

Chaired by: Corinne Cathala (IDB, USA)

AquaRating, Cases and Models of Implementation
Francisco Cubillo (Consultant, Spain)
Corinne Cathala (IDB, USA)
Federico Perez Penalosa (Consultant, USA)

The Virtuous Cycle of AquaRating in AySA
Lucila Giles Storti (AySA, Argentina)

The Multiplier Effect of AquaRating in Bolivia
Humberto Claure (EPSAS, Bolivia)

Other Parallel Sessions:

Auditorium 1	Innovation in Water Treatment	p. 30
Auditorium 3	Public Engagement and Communication	p. 32
Room 1	Discussion on the Call for Action – Industry Track	p. 33
Room 2	Discussion on the Call for Action – Cross-cutting Track	p. 33

10h30 – 12h00 | AUDITORIUM 3
PUBLIC ENGAGEMENT AND COMMUNICATION

Engaging with the community is critical to water and sanitation services. Awareness and participation in water conservation programs, watershed protection programs and pollution prevention can assist utilities with meeting water supply and protection programs.

Chaired by: Paula Kehoe (San Francisco Public Utilities Commission, USA)

Water Efficiency in Cities: An Interaction Between Awareness, Technology, Costs and Consumption: Case Study London
Daniela Flor (USFQ, Ecuador)

Community Strategies for Water Supply and Conservation of Water Recharge Areas, Through Public-private Partnerships and Financial Conservation Mechanisms
Andrés Córdova (CARE, Ecuador)

Authentic Engagement with Indigenous Peoples in Decision-making on Water Issues
Dave Archambault (Center for Native and Indigenous Studies, USA)

Constructing a Gold Mine: Achievements and Challenges in Community Engagement
Nathan Monash (Lundin Gold, Ecuador)

Other Parallel Sessions:

Auditorium 1	Innovation in Water Treatment	p. 30
Auditorium 2	AquaRating as Model to Improve Water Utilities Performance Globally	p. 31
Room 1	Discussion on the Call for Action – Industry Track	p. 33
Room 2	Discussion on the Call for Action – Cross-cutting Track	p. 33

10h30 – 11h30 | ROOM 1
DISCUSSION ON THE CALL FOR ACTION – INDUSTRY TRACK

Recognizing the commitment of the international community to the 2030 Sustainable Development Goals and, in particular, Goal 6 to ensure availability and sustainability of water and sanitation for all, Goal 12 to ensure sustainable consumption and production patterns and Goal 17 which calls for the development of multi-stakeholder partnerships.

Hearing the call of the United Nations - World Bank High Level Panel on Water that the world can no longer take water for granted and that individuals, communities, companies, cities and countries need to better understand, value and manage water. In particular, that water-using industries embrace water stewardship, strengthen collaboration and participate in IWRM.

Understanding that industry is a major user of water, accounting for some 20% globally and up to 50% in some countries and that, it's activities disproportionately impact on water quality and water availability for communities and the environment at a time when demand for water is expected to exceed supply in many parts of the world.

Fulfilling our commitments to healthy water, healthy communities, a healthy environment, and protection of both humans and eco-systems from climate change will require rapid and significant changes to how water is used by industry.

For more information, go to page 72.

Chaired by: Cheryl Davis (IWA Specialist Group Sustainability in the Water Sector, USA)

10h30 – 11h30 | ROOM 2
DISCUSSION ON THE CALL FOR ACTION – CROSS-CUTTING TRACK

Many water challenges cannot be solved within one sector of water users, and even not merely in the water system itself. Insights and cooperation overarching different components of the environment and society are needed, and therefore cross-cutting approaches and actions are needed.

For more information, go to page 76.

Chaired by: Peter Goethals (Ghent University, Belgium)

Other Parallel Sessions:

13h30 – 15h00 | AUDITORIUM 1
INNOVATION EVENT WITH ISLE

The water sector is undergoing rapid technological advancements and there are great efficiencies to be gained. However, frequently, technology selection on water systems follows biased criteria, operators should be aware of the most appropriate technological options to achieve their operational goals while complying with existing regulations.

Updated information of available technologies will allow the right selection of solutions guided by regulatory requirements, user needs and cost-effectiveness. A better understanding of the capital, maintenance and operation costs of the different technologies would help operators to select lower cost technologies.

The Technology Approval Group (TAG) is a global innovation forum of the world's leading water utilities, developed by Isle to accelerate technology adoption by engaging technology developers and utilities during the different stages of development and also by leveraging external investment from venture capital investors. To date Isle has held TAG meetings in Europe, North America, Brazil, Singapore and Australia with several other new territories on the horizon. IDB is exploring the opportunity to organize a TAG to support innovation among utilities in Latin America.

This seminar will bring 6 technologies, selected for the opportunity they represent to help utilities in the region to overcome the challenges they are facing, on reducing non-revenue water, increase wastewater treatment with a circular economy approach and to be energy efficient.

This session consists of a workshop open to all water and sanitation utilities and is open to all conference attendants.

Chaired by: Victor Arroyo (ISLE Utilities, Spain), Francisco Cubillo (IDB, Ecuador)
& Marcello Basani (IDB, Uruguay)

With participation from:

AYSA	*EPM*	*EPMAPS*	*ESBBIO*
SABESP	*SEDAPAL*	*SFPUC*	*Veolia*

Other Parallel Sessions:

13h30 – 15h00 | AUDITORIUM 2
CONNECTING WATERSHEDS AND URBAN AREAS

Over 1.4 billion people currently live in river basins where the use of water exceeds minimum recharge levels, leading to the desiccation of rivers and depletion of groundwater. Increasing water scarcity and climate change impacts, coupled with rising demand and competition between multiple users such as cities, industry, agriculture and the environment, are putting unprecedented pressure on river basins worldwide. By proactively taking part in basin management, the city secures water, food and energy resources, protects water quality, and increases resilience to extreme events. There are many tools and approaches that can provide mechanisms for improved sustainability in the wider catchment on which a city relies including water funds, water stewardship and multi-stakeholder platforms.

Chaired by: Hugo Contreras (The Nature Conservancy, Mexico)

La Gestión Integrada de los Recursos Hídricos (GIRH) – Conceptos y Ejemplo Francés
Antinea Garcés (AFD, France)

Water Funds as Mechanisms for the Implementation of Watershed Approaches for Cities
Giovanni Ginatta (Fondagua, Ecuador)

Adoption of Watershed Management by a Water Utility
Peter Goethals (Ghent University, Belgium)

Water Stewardship & Cities – Finding Innovative Approaches to Link Resilience and WWF's Cities Agenda
Alexis Morgan (WWF Germany, Canada)

Connecting Watersheds and Urban Areas
José Luis Santos (EMAPAG, Ecuador)

Other Parallel Sessions:

Auditorium 1	Innovation Event with ISLE	p. 34
Auditorium 3	Modelling to Support Sustainability	p. 36
Room 1	Discussion on the Call for Action – Agriculture Track	p. 37
Room 2	Young Water Professionals Get-together	p. 37

13h30 – 15h00 | AUDITORIUM 3
MODELLING TO SUPPORT SUSTAINABILITY

Proper (eco)system management relies on in-depth knowledge of processes, interactions, properties and disturbances. A combination of these elements helps in understanding the system under study by developing descriptive and predictive models to create either new hypotheses or investigate potential scenarios. As more elements are included within the model, more complex scenarios can be developed and investigated for their effect on the system's functioning.

Chaired by: Wout Van Echelpoel (Ghent University, Belgium)

Integrated Ecological Modelling of the Cuenca River Basin
Rubén Jerves Cobo (UCuenca, Ecuador)

Developing Hydrological Models for the Management of the Water Resources of Andean Catchments
Raúl Vazquez (UCuenca, Ecuador)

Hydrodynamic Analysis of a Stormwater System for Decision-making Process: The Duran Case Study
David Matamoros (ESPOL, Ecuador)

Estimation of the Demand and Supply of Water in a Micro-watershed. Case Study: El Tigre Stream
Diana Ospina Mora (Free University of Colombia, Colombia)

Spatially-explicit River Basin Models for Cost-benefit Analysis of Land-use Optimization
Jawad Ghafoor (Ghent University, Belgium)

Other Parallel Sessions:

Auditorium 1	Innovation Event with ISLE	p. 34
Auditorium 2	Connecting Watersheds and Urban Areas	p. 35
Room 1	Discussion on the Call for Action – Agriculture Track	p. 37
Room 2	Young Water Professionals Get-together	p. 37

13h30 – 14h30 | ROOM 1
DISCUSSION ON THE CALL FOR ACTION – AGRICULTURE TRACK

Agriculture remains the main water consuming sector. Therefore, solutions in this sector are needed to make water use more efficient and moreover reduce the impacts on water resources, by reduced contamination and overexploitation. Increased insights in environmental resources and their functioning (optimal locations for particular types of agricultural production, water system functioning, disaster preparedness and avoidance), new technologies, sustainable farming practices, enhanced agricultural policies and regulations can lead to both a better environmental situations and socio-economic conditions of actors in this key sector of human society.

For more information, go to page 75.

Chaired by: Luis Domínguez (ESPOL, Ecuador)

13h30 – 14h30 | ROOM 2
YOUNG WATER PROFESSIONALS GET-TOGETHER

The International Water Association (IWA) invests in Young Water Professionals, by empowering them within the association and the water sector. Young members are able to build their career in this network, by connecting and contributing (work with peers internationally) to the water sector, and through this build their network, develop professionally, and gain profile.

This session will introduce the IWA Young Water Professionals program and the opportunities and steps to set up a local chapter in Ecuador. The main objective of this session is to discuss the professional development and career needs of Ecuadorian young water professionals (aged 35 or younger) and identify local champions among attendees that would like to bring ideas forward to initiate an IWA Young Water Professional chapter in Ecuador.

Chaired by: Oliver Maennicke (IWA Specialist Group Sustainability in the Water Sector, Austria) &

Ariana Bravo Matamoros (ESPOL, Ecuador)

Other Parallel Sessions:

Auditorium 1	Innovation Event with ISLE	p. 34
Auditorium 2	Connecting Watersheds and Urban Areas	p. 35
Auditorium 3	Modelling to Support Sustainability	p. 36

15h30 – 17h00 | AUDITORIUM 1
INNOVATION EVENT WITH ISLE

The water sector is undergoing rapid technological advancements and there are great efficiencies to be gained. However, frequently, technology selection on water systems follows biased criteria, operators should be aware of the most appropriate technological options to achieve their operational goals while complying with existing regulations.

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AYSA	*EPM*	*EPMAPS*	*ESBBIO*
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Other Parallel Sessions:

Auditorium 2	Incentives, Barriers, Challenges and Opportunities for Sustainable Use of Water by Industry	p. 39
Auditorium 3	Innovation in Water System Monitoring I	p. 40

15h30 – 17h00 | AUDITORIUM 2
INCENTIVES, BARRIERS, CHALLENGES AND OPPORTUNITIES FOR SUSTAINABLE USE OF WATER BY INDUSTRY

Although concepts and technologies exist to support sustainable use of water by industry, a major question is how to motivate industry to make the investments and operational changes required for sustainable water use, in view of the fact that water is often cheap, water use and the water quality of effluent are often poorly regulated, and businesses may lack both funding and a business case for modifying their water use. In this session, this will be addressed in terms of how the organizational ecosystem in which industry operates can be modified through collaboration of educators, researchers, government policy-makers and regulators, funding institutions, non-profit organizations, and industry itself to change the way water is used.

Chaired by: Cheryl Davis (IWA Specialist Group Sustainability in the Water Sector, USA)

Can We Address the World's Water Crises Without First Changing the Attitudes of Regulators, Water Providers and Customers?

Michael Spencer (Monash University, Australia)

Panel discussion with:

Jason Morrison (CEO Water Mandate, USA)

Petra Schneider (Magdeburg-Stendhal University, Germany)

Jens Hoenerhoff (DEG, Germany)

Wilson Loor (ABInbev, Ecuador)

Alexis Morgan (WWF Germany, Canada)

Juan Pablo Mariluz (National Water Authority, Peru)

Jimmy Andrade (CEMDES, Ecuador)

Juan Pablo Corredor (Coca Cola, Ecuador)

Other Parallel Sessions:

Auditorium 1	Innovation Event with ISLE	p. 38
Auditorium 3	Innovation in Water System Monitoring I	p. 40

15h30 – 17h00 | AUDITORIUM 3
INNOVATION IN WATER SYSTEM MONITORING I

Data becomes more and more important when managing (eco)systems and developing management plans that span several years. However, conventional techniques tend to be time-consuming, intrusive, destructive and/or costly, which often causes data collection to be considered in a stepmotherly way. More and more innovative monitoring techniques are now becoming available to gather data in non-destructive, high-frequency and integrative manner, lowering the historical barriers of the conventional techniques.

Chaired by: Stijn Bruneel (Ghent University, Belgium)

Control and Monitoring of Human Consumption Water in Rural Zones. Case Study San Isidro Area - Cómbita, Boyacá - Colombia
Diana Ospina (Free University of Colombia, Colombia)

The Structuring Role of Three Types of Macrophytes on the Planktonic Communities of Lake San Pablo, a Tropical Freshwater Andean System in Northern Ecuador
Francisco Caicedo (UTN, Ecuador)

Patterns of Brachyura Larval Assemblages Support Highly Variable Hydrographic Conditions in Mangroves of the Gulf of Guayaquil's Inner Estuary
José Pontón Cevallos (ESPOL, Ecuador)

Invasive Species in the Ecuadorian Andes: *Procambarus clarkii*, Humans and Environmental DNA
Lenin Riascos (UTN, Ecuador)

Quantifying and Reducing Uncertainty of Passive Acoustic Telemetry Data from Riverine Fish
Stijn Bruneel (Ghent University, Belgium)

Other Parallel Sessions:

Auditorium 1	Innovation Event with ISLE	p. 38
Auditorium 2	Incentives, Barriers, Challenges and Opportunities for Sustainable Use of Water by Industry	p. 39

17h10 – 18h00 | AUDITORIUM 1
SMART TECHNOLOGIES TO ATTAIN SUSTAINABLE WATER RESOURCES MANAGEMENT

Data becomes more and more important when managing (eco)systems and developing management plans that span several years. With data being shared more often and being collected in a faster, non-destructive and more integrated manner, technologies to process this data develop too.

Chaired by: Daniel Ochoa (ESPOL, Ecuador)

Drones and 3D Modelling for Water Resources Management
Philippe De Maeyer (Ghent University, Belgium)

Smart City: The Smart Guasmo Initiative in Guayaquil
Juan Bernal (Interagua, Ecuador)

Designing the RESCLIMA Platform to Improve Urban Climate Resilience in Duran City
Daniel Ochoa (ESPOL, Ecuador)

Transitions to Utility of the Future with Intelligent Water Management for a Coastal City in Ecuador
Juan Vicuña Reyes (Greeley and Hansen, Ecuador)

Other Parallel Sessions:

Auditorium 2	Incentives, Barriers, Challenges and Opportunities for Sustainable Use of Water by Industry	p. 42
Auditorium 3	Innovation in Water System Monitoring II	p. 43

17h10 – 18h00 | AUDITORIUM 2
INDUSTRY AND THE CIRCULAR ECONOMY

A key requirement for sustainable water use is for the water outputs of different parts of the economy to become safe and usable inputs for others. This session will include a keynote that provides the context of our evolving understanding of the operational meaning of sustainable use of water, as well as presentations on how more sustainable use of water by industry can contribute to a circular economy.

Chaired by: Cheryl Davis (IWA Specialist Group Sustainability in the Water Sector, USA)

The Role of Industry in Supporting a Circular Economy
Stijn Speelman (Ghent University, Belgium)

Towards Resource Recovery from Industrial Wastewater Treatment
Maria Concetta Tomei (IRSA-CNR, Italy)

Resource Recovery from Industrial Wastewater
Florent Chazarenc (IRSEA, France)

Diseño de Sistemas de Tratamiento de Aguas Residuales para Optimizar la Reutilización y Recuperación: Proyecto Vindobona, Quito, Ecuador
Luis Goméz Ávila (EPMAPS, Ecuador)

Other Parallel Sessions:

Auditorium 1	Smart Technologies to Attain Sustainable Water Resources Management	p. 41
Auditorium 3	Innovation in Water System Monitoring II	p. 43

17h10 – 18h00 | AUDITORIUM 3
INNOVATION IN WATER SYSTEM MONITORING II

At the one hand, the challenges we are facing today will most likely be similar to the challenges we will face tomorrow, but on the other hand, new challenges may arise due to pressures arising from population increase and climate change. Since, data collection is a crucial step in the process of gaining knowledge and proposing solutions, existing water system monitoring should be optimized, but at the same time new approaches should be welcomed to deal with existing and new challenges respectively. Finding this balance between renovation and innovation of water system monitoring is key to tackle problems related to water use worldwide.

Chaired by: Stijn Bruneel (Ghent University, Belgium)

Greenhouse Gas Emissions from the Integrated Urban Wastewater Systems in Cuenca
Long Ho (Ghent University, Belgium)

Monitoring of High Mountain Lakes in Riobamba
Patricio Lozano (ESPOCH, Ecuador)

Using Chemometric Methods to Identify an Adequate Biotic Index for Monitoring the Paute Basin
Raúl Vazquez (UCuenca, Ecuador)

Other Parallel Sessions:

Auditorium 1	Smart Technologies to Attain Sustainable Water Resources Management	p. 41
Auditorium 2	Incentives, Barriers, Challenges and Opportunities for Sustainable Use of Water by Industry	p. 42

Wednesday 02 October

08h30 – 10h00 | MAIN AUDITORIUM
PLENARY SESSION 3

08:30 – 08:40 **Opening of the Conference**
Peter Goethals (Ghent University, Belgium)
Luis Domínguez (ESPOL, Ecuador)

08:40 – 10:00 **The Role of the Water-Energy-Food Nexus in Industrial Applications**
Petra Schneider (Magdeburg-Stendhal University, Germany)

Sustainable Water Use by Cities: Combining Technology with Cooperation
Paula Kehoe (San Francisco Public Utilities Commission, USA)

Approach to Encouraging Sustainable Water Use
Juan Pablo Mariluz Silva (Autoridad Nacional del Agua, Peru)

Young Water Professionals – Making a Difference in Global Water Management Challenges
Oliver Maennicke (IWA Specialist Group Sustainability in the Water Sector, Austria)

10h30 – 12h00 | AUDITORIUM 1
TECHNOLOGY SELECTION APPROACHES

Clean water is a valuable good for industry, society and nature, yet is predicted to become (even more) scarce in the future. Circular thinking and efficiency improvements provide useful steps in preserving the global water supplies and benefit a more sustainable economy. A major element in the 'circular thinking' aspect is to mitigate (or even undo) the changed state of water used in any type of anthropogenic activity. First steps in the impact reduction of domestic wastewater have been made decades ago by the implementation of the Activated Sludge treatment system. However, current and future conditions challenge us to rethink existing treatment technologies and improve their efficiencies to support more circular and sustainable water use.

Chaired by: Will Sarni (Water Foundry, USA)

Panel Discussion with:

Will Sarni (Water Foundry, USA)

Cheryl Davis (IWA Specialist Group Sustainability in the Water Sector, USA)

Gabriela Maldonado (EPMAPS, Ecuador)

José Porro (Cobalt Water, Chile)

Milene Aguiar (AcquaConsult, Brazil)

Other Parallel Sessions:

Auditorium 2	Incentives for Water-wise Cities	p. 46
Auditorium 3	Concepts and Strategies to Meet the UN Sustainable Development Goals	p. 47
Room 1	Statistical Sampling: One Tool to Guide Sound Water Management Decisions	p. 48

10h30 – 12h00 | AUDITORIUM 2
INCENTIVES FOR WATER-WISE CITIES

The international experience indicates that major improvements in water utilities can be achieved through: (i) reduction of water losses through well-designed performance-based contracts; (ii) improvement in commercial management, invoicing and collection and cost recovery processes; (iii) increase in labor productivity since labor cost can often represent a high percentage of operating costs (approximately 35%) in water utilities; and (iv) efficient use of energy (which represents usually 30 to 40% of operating costs.

The AquaRating was jointly designed by the Inter-American Development Bank (IDB) and the International Water Association (IWA) and intends to cover all aspects associated with the efficient management of water utilities with 8 areas of evaluation, a set of 60 indicators as well as 52 groups of good practices. The Aquarating has been implemented in over 80 utilities throughout the world and the session will include innovative cases of implementation in the region as well as in other parts of the world as well as results of benchmarking exercises and the many ways AquaRating has been implemented in the countries.

Chaired by: Rui Marques (University of Lisboa, Portugal)

Innovation & Digital Transformation

Sergio Campos (IDB, Bolivia)

Panel discussion with:

José Luis Santos (EMAPAG, Ecuador)

Pierre Brunet (Nova Veolia, France)

Eva Martinez Días (AQUALIA, Spain)

Other Parallel Sessions:

Auditorium 1	Technology Selection Approaches	p. 45
Auditorium 3	Concepts and Strategies to Meet the UN Sustainable Development Goals	p. 47
Room 1	Statistical Sampling: One Tool to Guide Sound Water Management Decisions	p. 48

10h30 – 12h00 | AUDITORIUM 3
CONCEPTS AND STRATEGIES TO MEET THE UN SUSTAINABLE DEVELOPMENT GOALS

Engaging with the community is critical to water and sanitation services. Awareness and participation in water conservation programs, watershed protection programs and pollution prevention can assist utilities with meeting water supply and protection programs.

Chaired by: Oliver Maennicke (IWA Specialist Group Sustainability in the Water Sector, Austria)

Identifying Key Factors of Ecosystem Valuation, Functioning and Production to Support Water Management
Rudy Vannevel (Flemish Environment Agency, Belgium)

Sustainability of Lakes and Reservoirs in Relation to the Sustainable Development Goals (SDGs)
Long Ho (Ghent University, Belgium)

An Operational Framework for Urban Vulnerability to Floods on the Guayas Estuary Coast: The Duran Case Study
María del Pilar Cornejo Rodriguez (ESPOL, Ecuador)

Marginal Urban Areas Struggle for Attaining Safe Drink Water in Central Ecuador
Ana María Núñez Torres (HYDROARCH-IPA, Ecuador)

Alliance for Water Stewardship: A Corporate Action Framework Towards SDG6 in LAC
Carla Toranzo (Alliance for Water Stewardship, Peru)

Powerful Plants for Watery Wetlands: Key Issues for Implementing Artificial Multipurpose Wetlands
Wout Van Echelpoel (Ghent University, Belgium)

Other Parallel Sessions:

Auditorium 1	Technology Selection Approaches	p. 45
Auditorium 2	Incentives for Water-wise Cities	p. 46
Room 1	Statistical Sampling: One Tool to Guide Sound Water Management Decisions	p. 48

10h30 – 12h00 | ROOM 1

STATISTICAL SAMPLING: ONE TOOL TO GUIDE SOUND WATER MANAGEMENT DECISIONS

Engaging with the community is critical to water and sanitation services. Awareness and participation in water conservation programs, watershed protection programs and pollution prevention can assist utilities with meeting water supply and protection programs.

Chaired by: Juliana Jimenez Valencia (Instituto Oswaldo Cruz, Brazil)

Other Parallel Sessions:

13h30 – 15h00 | AUDITORIUM 1
CIRCULAR ECONOMY AND SUSTAINABLE TECHNOLOGIES

Clean water is a valuable good for industry, society and nature, yet is predicted to become (even more) scarce in the future. Circular thinking and efficiency improvements provide useful steps in preserving the global water supplies and benefit a more sustainable economy. A major element in the 'circular thinking' aspect is to mitigate (or even undo) the changed state of water used in any type of anthropogenic activity. First steps in the impact reduction of domestic wastewater have been made decades ago by the implementation of the Activated Sludge treatment system. However, current and future conditions challenge us to rethink existing treatment technologies and improve their efficiencies to support more circular and sustainable water use.

Chaired by: Maria Eugenia de la Pena (IDB, Ecuador)

Diversifying the Water Supply Portfolio to Ensure a Sustainable Water Future
Paula Kehoe (San Francisco Public Utilities Commission, USA)

Reuse of Treated Wastewater in Monterrey, Mexico
Florentino Ayala Vazquez (Agua y Drenaje de Monterrey, Mexico)

City Water Resilience Approach (CWRA): Governance for Water Resilience
Ricard Giné Garriga (SIWI, Sweden)

Improving Quality of Life in the Ecuadorian Andes: A State of the Art WWTP Design for Wastewater Sanitation
Juan Vicuña Reyes (Greeley and Hansen, Ecuador)

Other Parallel Sessions:

Auditorium 2	Environmental Impact Assessment of Agriculture	p. 50
Auditorium 3	Sustainable Industrial Water Use: What Does 'Good' Look Like?	p. 51

13h30 – 15h00 | AUDITORIUM 2
ENVIRONMENTAL IMPACT ASSESSMENT OF AGRICULTURE

Water is for sure the most important resource for the production of animal protein in aquaculture. Most of the time, aquaculture entirely relies on water obtained from surface water bodies (rivers, lakes, estuaries) and a lot of efforts are made in order to attain a good water quality for a successful production. Nevertheless, external factors threat the activity. Water and sediment pollution in water bodies can deteriorate the water quality conditions of the source, compromising the quality of the production in terms of food safety and potentially affecting the market that has become more restringing in terms of regulation. In Latin American Countries, shrimp production is probably one of the biggest sectors of aquaculture with a significant contribution to local economies. Urgent actions are required in order to promote sustainable aquaculture practices that can protect the sector and reduce its impact in the environment.

Chaired by: Long Ho (Ghent University, Belgium)

Tecnificación del Riego en el Canal Mocha Huachi: Relaciones de Poder y Desigualdad Persistente en la Distribución de Derechos
Juan Acuña (Universidad Central del Ecuador, Ecuador)

Distribution of Agricultural Pesticides in the Freshwater Environment of the Guayas River Basin
Arne Deknock (Ghent University, Belgium)

Forecasting the Effects of Elevated Nutrient Levels on Vulnerability to Invasions: Traits versus Observations
Wout Van Echelpoel (Ghent University, Belgium)

Bayesian Belief Network Model as a Trade-off Tool to Estimate Ecosystem Services: Case Study of the Guayas River Basin, Ecuador
Gonzalo Villa Cox (ESPOL, Ecuador)

Training in Water Resources: Example of a MOOC on Irrigation Efficiency
Guido Wyseure (KULeuven, Belgium)

Other Parallel Sessions:

Auditorium 1	Circular Economy and Sustainable Technologies	p. 49
Auditorium 3	Sustainable Industrial Water Use: What Does 'Good' Look Like?	p. 51

13h30 – 15h00 | AUDITORIUM 3
SUSTAINABLE INDUSTRIAL WATER USE: WHAT DOES 'GOOD' LOOK LIKE?

A key requirement for sustainable water use is for the water outputs of different parts of the economy to become safe and usable inputs for others. This session will include a keynote that provides the context of our evolving understanding of the operational meaning of sustainable use of water, as well as presentations on how more sustainable use of water by industry can contribute to a circular economy.

Chaired by: Cheryl Davis (IWA Specialist Group Sustainability in the Water Sector, USA)

Philip Morris Brazil and Water
Felipe Bremm (Philip Morris, Brazil)

Towards and Efficient Use of Water in the Bottled Water Industry through Water Footprint Calculation
Dolores Gutierrez Cacciabue (Universidad Nacional de Salta, Argentina)

The First in the World Gold LEED Airport Water and Wastewater Concept Implemented at the Galapagos
Jorge Rosillo (Aeropuerto Ecológico de Galápagos, Ecuador)

A Preliminary Model for Engaging Industrial Clusters Based on Empirical Research in Two Industrial Parks in China
Michael Spencer (Monash University, Australia)

Sustainable Water Use in the Food and Beverage Processing Industry
Juan Pablo Corredor (Coca Cola, Ecuador)

Other Parallel Sessions:

Auditorium 1	Circular Economy and Sustainable Technologies	p. 49
Auditorium 2	Environmental Impact Assessment of Agriculture	p. 50

15h30 – 18h00 | MAIN AUDITORIUM
PLENARY SESSION 4

15:30 – 16:30 **IWA/IDB Call for Action**

Cheryl Davis (IWA Specialist Group Sustainability in the Water Sector, USA)
Marcello Basani (IDB, Uruguay)
Luis Domínguez (ESPOL, Ecuador)
Oliver Maennicke (IWA Specialist Group Sustainability in the Water Sector, Austria)
Peter Goethals (Ghent University, Belgium)

16:30 – 16:45 **IWA Closing of the Conference**

Official Start of the Ecuadorian National IWA Chapter and YWP Organisation
Luis Domínguez (ESPOL, Ecuador) & Indira Nolivos (ESPOL, Ecuador)

16:45 – 17:45 **IDB Closing of the Conference**

IDB Ideas in Action
Sergio Campos (IDB, Bolivia)

17:45 – 18:00 **Closing of the Conference**

Cheryl Davis (IWA Specialist Group Sustainability in the Water Sector, USA)

CONFERENCE CONTENT

Keynote Speakers

Monday 30 September

Cecilia A. Paredes
ESPOL, Ecuador

Bio

Cecilia is president of ESPOL and has, throughout her career, been responsible for a variety of mandates, including member of the Research Council and Production and Director of the Center for Research and Development of Nanotechnology. She has been active in research projects and laboratory implementation both in Ecuador and abroad (e.g. Belgium, USA). Additionally, Cecilia has presided the LACCEI and participated in international forums on Higher Education.

Peter Goethals
Ghent University, Belgium

Technology-augmented River Basins

Technologies such as weirs for flood control, hydropower dams for energy production, drinking water (and wastewater) treatment systems and irrigation equipment are widely used to guarantee the needed water, food and energy supplies, and avoid disease outbreaks. Emerging technologies such as innovative sensors, IoT, remote sensing and robotics can however lead to more reliable solutions. Nevertheless, one needs to start from the ecological functioning of river basins to efficiently implement these technologies as part of the sustainable development of river basins. This presentation will consequently merge recent insights from ecology and technology.

Bio

Peter Goethals is professor in applied water ecology and sustainable water management at Ghent University (Belgium). He focuses on innovation of monitoring, assessment and modelling methods to support decision-making in water management. Fittingly, Peter has long-standing cooperation with universities and governments in Latin-America, Africa and Asia within the framework of sustainability analysis of surface waters and river basins.

Sergio Campos
IDB, Bolivia

Water and Sanitation in Latin America

It falls in our generation to achieve universal access to water and sanitation as our generation will be judged on whether it was able to reach the 6th Sustainable Development Goal. Only with effective innovations we will be able to shorten times, limit costs and scale up solutions that will allow this. The big challenge is the need for water and sanitation utilities in a highly urbanized region to "embrace innovation". Our goal (WSA / IDB) is to help the utilities with creating the enabling conditions and “systematize” the incorporation of innovations and innovative practices.

Bio

Sergio Campos oversees the activities of the Water and Sanitation department, focusing on drinking water, sanitation and water resource management within 26 countries. Additionally, he manages both Aquafund and the Spanish Cooperation Fund for Water and Treatment in the Latin American and the Caribbean region. Sergio is related to a variety of initiatives (e.g. Lazos de Agua) and tools (e.g. AquaRating, Hydro-BID) as well as publications related to the WASH knowledge and communications agenda.

Sudhir Murthy
IWA, USA

Innovation in the Water Sector

Innovation happens on a daily basis and all around the world, but require global networks for their dispersion. Too often, innovative ideas are born do tackle specific problems without reaching other parties struggling with the same issue. Connecting water industries, utilities, researchers and professionals on a global scale gradually reduces this hurdle. Now, the ultimate goal is to transcend this barrier and turn it into a part of history.

Bio

Sudhir Murthy is Innovations Chief for DC Water, where he leads the development, implementation and continuous improvement of the Authority’s innovation strategy in coordination with the executive team and other stakeholders. He has been involved in improving the sustainability of the Blue Plains Advanced Wastewater Treatment Plant and in implementing new commercial processes within public utilities. Additionally, Sudhir is (co-)author of over 100 publications and 6 patents.

Will Sarni
Water Foundry, USA

Emerging Technologies for Water Management

The World Economic Forum has framed the opportunity for digital transformation in water and other sectors as the Fourth Industrial Revolution (4IR). 4IR in water is now enabling improved access to safe drinking water and water for other uses including industrial needs and ecosystem management. Digital technologies such as; the Internet of Things, Artificial Intelligence, remote sensing and augmented reality/virtual reality are scaling in the water utility, industrial and public sectors. The adoption of these technologies are also enabling the advancement of off-grid water supply and localized treatment solutions.

Bio

Will is an internationally recognized thought leader on water strategy and innovation, acting as sustainability and water strategy advisor to multinationals, water technology companies and NGOs for his entire career. He was a 2016 XPRIZE Bold Visioneer for the Safe Drinking Water Team and, additionally, founder of DOMANI and WetDATA.org. Currently, Will is a Board Member of FloWater, Project WET and Project Board Member of 10.10.10 and author of numerous books.

Cheryl Davis
IWA Specialist Group Sustainability in the Water Sector, USA

Sustainable Use of Water by Industry: How Can We Save Us from Ourselves?

Industrial water use, with its huge impacts on water supply, water quality, ecosystems, and communities exists not only because of the products and services desired by consumers, but also the need of companies and individuals to make money. Balancing these drives with the urgent need to protect our water and planet will require us to become much more focused, active, imaginative, and collaborative. Utilities, government policy-makers and regulators, educators, researchers, financial institutions, non-profit organizations, industry, and the public have both the opportunity and the obligation to investigate how we can jointly protect our shared long-term interests.

Bio

Cheryl's career covers three decades of water management at San Francisco Public Utilities Commission, including water supply, storage and treatment. She is co-founder of the Northern California Chapter of WateReuse, BASIC and BAYWORK, contributing to numerous publications. In addition to consulting work, Cheryl chairs the management committee of IWA's Specialist Group on Sustainability in the Water Sector.

Jason Morrison
Pacific Institute & CEO Water Mandate, USA

Generating Impact in the Water Sector

Over the last decade, recognition has grown that the business community can have significant, positive impact on sustainable water management. From its humble beginnings in the mid-2000s, corporate water stewardship has matured in terms of both breadth and depth. Mr. Morrison will review the evolution of water stewardship over that time period, and explore current spheres of innovation and examples of leading practice. He will also reflect on the long-term promise of water stewardship vis-à-vis the 2030 Sustainable Development Goals and Global Climate Action Agenda.

Bio

Jason oversees the Pacific Institute's activities and focuses on broadening and amplifying its reach and impact. Jason became Head of the CEO Water Mandate initiative after supporting it for over a decade with applied research, event organization, and other services. Additionally, Jason is co-founder of the Alliance for Water Stewardship, a global initiative for a freshwater certification program to advance responsible water practices by water providers and large-scale users.

Dave Archambault
Center for Native American and Indigenous Studies, USA

Water is a Source of Life, Not a Resource

Dave Archambault is a Senior Fellow for the First Peoples Worldwide which addresses the unique social and environmental impacts of development in indigenous communities, while preparing current and future leaders to meet the pressing social responsibility challenges facing today's businesses.
Dave will discuss the importance of water to indigenous peoples and why his tribe stood up against the United States Government and Corporate Interest.

Bio

Dave Archambault II - Former Chairman of the Standing Rock Sioux Tribe. Prior to taking office, the Chairman was an Indian Country Workforce Development Director at United Tribes Technical College, and he served on the Standing Rock Sioux Tribal Council, where he focused on economic development, renewable energy, and government reform. Dave also chaired the Mor-Gran-Sou and Sitting Bull College Boards.

Alexis Morgan
WWF Germany, Canada

From a Trickle to a Flood: How Emergent Innovative Approaches Can Scale Water Stewardship

This keynote will unpack how so-called 4th industrial revolution technologies are being combined with new forms of financing to help scale up the next generation of water stewards. Building on WWF's successes with leveraging big data, new technologies and bankable water solutions, this talk will highlight how we can scale up implementation efforts to solve our local and global water challenges.

Bio

Alexis leads WWF's global efforts on water stewardship, which includes supervising the Water Risk Filter, supporting market standardization, certification and guiding water value thinking. He helped to develop the global organization "Alliance for Water Stewardship" (AWS), has experience in cooperation with Global 500 companies and played a role in ISEAL, CDP, GRI and SASB, mainly due to his passion for developing innovative and systemic solutions to water challenges.

Wednesday 02 October

Petra Schneider
Magdeburg-Stendhal University, Germany

The Role of the Water-Energy-Food Nexus in Industrial Applications

The Nexus Approach goes beyond classical integrated water resource management approaches and addresses the circular use of water across industrial sectors. It offers resource efficiency approaches for different industrial sectors, particularly food and energy production. The topic will highlight how the Nexus approach is moving from a concept to realization.

Bio

Petra's professional experience comprises 25 years of focusing on water, waste and mining. She is professor for International Water Management and study course director for the master course "Ecological Engineering". Petra acted as key expert in numerous interdisciplinary international projects financed by the European Commission, World Bank, and Environmental Ministries of several countries, as well as the private sector.

Paula Kehoe
San Francisco Public Utilities Commission, USA

Sustainable Water Use by Cities: Combining Technology with Collaboration

The City of San Francisco has been very proactive in its water resource and drought planning, including diversifying its water supplies with groundwater, recycled water, onsite water recycling along with the use of advanced technology. However, sustainable municipal water use also requires collaboration—with customers, with other entities in the watersheds from which a city draws water, and even at the regional, national, and international level.

Bio

Paula is responsible for diversifying San Francisco's local water supply portfolio through the implementation of conservation, groundwater, and recycled water programs. Paula spearheaded San Francisco's landmark legislation allowing for reuse of alternate water sources in buildings.

Juan Pablo Mariluz Silva
Autoridad Nacional del Agua, Peru

The Certificado Azul: Peru's approach to Encouraging Sustainable Water Use

The Certificado Azul ('Blue Certificate') is a powerful tool as it recognizes the State of Good Practices within a company that efficiently manages the sustainable use of water. Thereby, it combines social and environmental responsibility of the company relying on water resources within the basin. This is translated in the development of a free application procedure by the National Water Authority, with participation being completely voluntary.

Bio

Juan has worked for more than 15 years in water resource management for the National Institute of Natural Resources of the Ministry of Agriculture and Irrigation. He is specialized in water resource indicators and coordinator of the Water Footprint Program Evaluation Committee of the National Water Authority. Juan participates in elaborating the water footprint study of the agricultural sector in Peru and contributes to the execution of different projects financed by the IDB, BM, SDC, GIZ and KOIKA.

Oliver Maennicke
IWA Specialist Group Sustainability in the Water Sector, Austria

Young Water Professionals: Making a Difference in Global Water Management Challenges

The presentation will provide an excursion on how young water professionals impact on developing water challenges of the Anthropocene. Shining some light on major shifts in technological advancement, communication and working styles that impact on wicked problem solving in a complex and interconnected environment.

Bio

Oliver Maennicke is an engineer for water resources management and expert for corporate water risk and stewardship. During his time with WWF, he gained extensive international experience with large multi-national companies on assessing water risk and developing response strategies for direct operations and supply chains. Currently, Oliver is a consultant for water risk, stewardship and sustainability.

Conference Tracks

Innovation Track

It is estimated that the global costs of achieving the Sustainable Development Goals targets 6.1 and 6.2 is approximately $114 billion per year, which is three times the historic spending on extending services to the underserved. Of this, Sub-Saharan Africa accounts for 31 percent of the global costs of meeting the targets ($35.5 billion per year), followed by Southern Asia with 22 percent ($24.5 billion per year), Eastern Asia with 14 percent ($15.9 billion per year), Latin America and the Caribbean with 12 percent ($14.0 billion per year), and Southeastern Asia with 9 percent ($10.4 billion per year).

Cities Track

Cities are the economic hubs of our society and while they are rapidly expanding, the water resources they rely on are under increasing pressure. We need to find ways to do more with less. The SDGs are a bold call for the promotion of sustainable urban water management for safer, more inclusive and resilient cities. To achieve this we need to harness the power of collaboration with adapted governance, engagement of stakeholders and active citizen involvement. The Cities Track of the conference will aim at fostering discussions among different urban stakeholders to ensure that everyone in their cities has access to safe water and sanitation, that their cities are resilient to floods, droughts and the challenges of growing water scarcity, and that water is integrated in city planning to provide increased liveability, efficiencies, and a sense of place for urban communities, as reflected on the IWA Principles for Water-Wise Cities.

Industry Track

The Industrial Track of the conference will provide technical information on how industry can (1) use water in a more sustainable way and how the effects of unsustainable use can be mitigated and (2) help build bridges between the many sectors of society that have an impact on how water is used by industry (e.g. government policy-makers and regulators, non-profit associations, educators and researchers, financial institutions, and the public).

Agriculture Track

Agriculture remains the main water consuming sector. Therefore, solutions in this sector are needed to make water use more efficient and moreover reduce the impacts on water resources, by reduced contamination and overexploitation. Increased insights in environmental resources and their functioning (optimal locations for particular types of agricultural production, water system functioning, disaster preparedness and avoidance), new technologies, sustainable farming practices, enhanced agricultural policies and regulations can lead to both better environmental situations and socio-economic conditions of actors in this key sector of human society.

Cross-cuttingTrack

Many water challenges cannot be solved within one sector of water users, and even not merely in the water system itself. Insights and cooperation overarching different components of the environment and society are needed, and therefore cross-cutting approaches and actions are needed.

Technical Visits

To provide an additional practical aspect to the Innovation Conference, a selection of technical visits is scheduled on 03 October 2019 as official part of the Conference:

- Tour 1: Water Treatment System 'Pantanos Secos Artificiales'
- Tour 2: Wastewater Treatment Plant 'Las Esclusas' and Pumping Station 'La Pradera'

Each tour comprises a guided visit in English to the facilities and will allow participants to take pictures and videos. As safety is an important aspect within the mentioned facilities, participants are recommended to wear comfortable clothes and shoes (i.e. no high-heeled shoes or sandals) and will receive safety equipment on site.

Transportation, lunch and refreshments are included in the tour, with buses leaving from each hotel (Sheraton and Radisson) at 08:00 am.

Tour 1: Water Treatment System

The Water Treatment System 'Pantanos Secos Artificiales' benefits more than 120,000 inhabitants living in the neighbourhoods of Puerto Azul, Puerta al Sol, Portal al Sol, San Eduardo and Los Ceibos as well as the urbanisation Girasol and Renacer cooperatives, Jardines del Salado and Judicial Police.

The implementation of this work avoids that wastewater is discharged directly into Estero Salado by applying a unique treatment combination. Both aerobic and anaerobic bacteria are used and combined with plants in order to act as a biological system. Hence, symbiosis is obtained, providing a highly effective treatment that results in compliance with environmental standards.

Tour 2: Wastewater Treatment Plant & Pumping Station

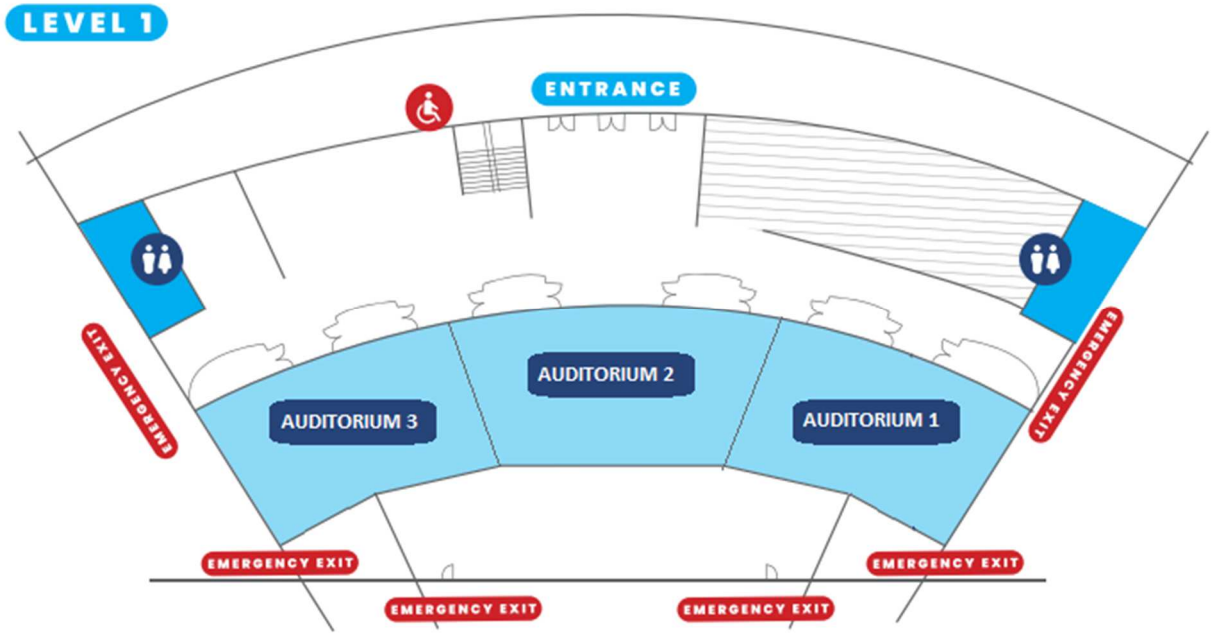
The objective of this project is to achieve universal sustainable access to sanitary sewer services in the Las Esclusas basin, south of Guayaquil, which, in addition to improving the conditions of the population of the project, will improve the environmental and ecological conditions of the water bodies of the city of Guayaquil.

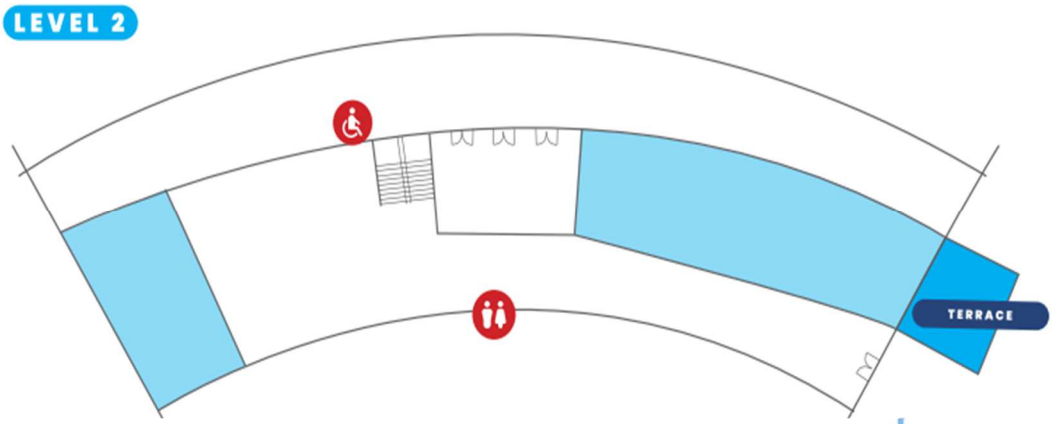
The proposed project covers an approximate area of 5,913 hectares and will benefit a population of 1,077,948 inhabitants of the southern sector of the city of Guayaquil. It includes the construction of La Pradera pumping station with its respective drive line to transport wastewater from the La Pradera basin to the head of the PTAR Las Esclusas.

GOOD TO KNOW

STEM Floor Plan

The conference takes place at the STEM building, located at ESPOL campus 'Gustavo Galindo'.





Shuttle service

Event organizers provide shuttle services between the event venue and the official hotels of the event. Participants staying in other hotels of the city are welcome to use this service. Buses will depart from HOTEL RADISSON and HOTEL SHERATON according to the following time schedule.

Departure from hotel			Departure from ESPOL	
HOTEL - ESPOL			ESPOL – HOTEL	
30 - SEP -19	7:00		30 - SEP -19	18:15
01 - OCT - 19	7:30		1 - OCT - 19	18:15
02 - OCT -19	7:30		2 - OCT -19	To be confirmed

Taxi services

Participants may use the taxi services recommended by the organizers. As a reference the taxi service should not cost more than 10USD from the event venue to the city center. Anyhow, we strongly advise you to request the travel cost in advance to the taxi driver or the call center of the company.

Taxi Paraiso is a local taxi company and can be reached via +593044631444 OR +593994267664. This company has yellow and differently-colored cabs.

Alternatively, Uber and Cabify are also available in Ecuador.

Take note: Most taxi drivers only accept cash!!!

Main addresses

ESPOL
Campus Gustavo Galindo
Km 30.5 Vía Perimetral – Building 12L

SHERATON – HOTEL
Plaza del Sol,
Av. Joaquín José Orrantia González

BANKERS CLUB
Edificio la Previsora
Malecón Simón Bolívar

RADISSON - HOTEL
Ciudadela Kennedy
Av. Gral. Francisco Boloña 503A y Calle Jorge Insua Hindro

For our Participants

On Sunday 29th, the registration desk is open from 17:00 – 20:00 in the Bankers Club.

During the conference, the registration desk is open from 8:00 – 16:00 in STEM.

Late registration for the technical visits are possible on Tuesday 1st of October.

The official language of the conference is English and all the sessions will have simultaneous translation.

If you wish to access to the simultaneous translation, you must present the "headphone credential".

Delegates can book extra tickets for social events at the registration desk. Subject to availability.

There will be professional photography and filming onsite throughout the congress. The images and videos may be used for post-congress reports, marketing and industry media. If you do not wish for your photo or video to be taken, please inform a staff member at the registration desk.

If you need copies or you need extra information: please go to the BUSINESS CENTER located upstairs.

At the registration desk you will receive your conference bag.

Planning to use social media while at the conference? Join the conversation:
Twitter: @IWAhq @IDB #waterwise #IWAIDBInnovation
www.facebook.com/internationwaterassociation
www.linkedin.com/company/international-water-association

Morning coffee, lunch and afternoon coffee are served throughout the conference.

For questions about accommodation, please go to the registration desk.

The official language in Ecuador is Spanish.

Most yellow cab drivers only speak Spanish.

The official currency in Guayaquil, as in the rest of Ecuador, is US dollar.

Guayaquil is a warm tropical city, don't forget your sun block!!

We strongly advise you use only official yellow cabs. Be alert to your personal belongings.

We advise the use of ATMs, which are located within the city center and in most hotels, as well as cash for personal payments.

The electricity plug types in Ecuador are American type and 110V.

Ecuador is in the UTC/GMT-5 time zone.

For our Presenters

Please, SEND your presentation as PDF-FILE to gsw19@ugent.be as soon as possible.

If you submitted your presentation prior to the conference, please go to the conference Business Centre and confirm that it has been loaded into the central system and assigned to the session where you will be speaking.

If you sent your presentation prior to the conference but want to modify it, you can do this at the Business Centre

If you did not submit your presentation prior to the conference, please visit the Conference Business Centre as soon as possible to upload your presentation.
A staff member at the Business Centre will assist you in making sure it is uploaded to the correct session.

Please arrive at your session at least 10 minutes before it is scheduled to begin and identify yourself to the session chair.

Presentations will be done from a single computer assigned to the sessions chairs with access to the central system.

Please respect the schedule of your session.

Limited WIFI will be available throughout the conference venue.

To access the WIFI, you will need a password, which will be advertised around the venue. The password will be valid during the whole conference.

Social Activities

Welcome Reception – Sunday 29 September

Participants of the IWA-IDB Conference, who have booked are welcome to join the welcome reception on Sunday 29 September, starting at 7:00 pm at the Bankers Club.

Conference Dinner – Tuesday 01 October

A conference dinner is organized on Tuesday 01 October in the Sheraton hotel, if you booked, please join with us and enjoy in a relaxed social atmosphere and interact with interesting keynote speakers and other conference attendants

CALL FOR ACTION

Innovation Track

Introduction

It is estimated that the global costs of achieving the Sustainable Development Goals targets 6.1 and 6.2 is approximately $114 billion per year, which is three times the historic spending on extending services to the underserved. Of this, Sub-Saharan Africa accounts for 31 percent of the global costs of meeting the targets ($35.5 billion per year), followed by Southern Asia with 22 percent ($24.5 billion per year), Eastern Asia with 14 percent ($15.9 billion per year), Latin America and the Caribbean with 12 percent ($14.0 billion per year), and Southeastern Asia with 9 percent ($10.4 billion per year).

If we focus on Latin America and the Caribbean, by 2015 most of the countries in this region had reached the Millennium Development Goals on water and sanitation. On average, the region achieved 95% coverage of water services and 83% of sanitation. However, using the more ambitious parameters of the Sustainable Development Goals, which introduce the concept of "securely managed" services, base coverage figures are reduced to 65% (water) and 23% (sanitation). This represents 220 million people without access to safe water services, and more than 480 million without access to safe sanitation.

It is recognized that traditional economic, financial, technological and management strategies are not adequate to achieve these goals. The sector needs to rapidly identify and scale innovative technologies, financing/funding business models, partnerships and public policies to ensure universal access to equitable safe drinking water and sanitation services throughout the region. It is crucial to rapidly create and implement innovation tools, platforms and programs for the private and public sector to scale solutions.

Proposed Actions

1. Support innovators to develop solutions and strategies that are robust, adaptable and sustainable and have the capability to cope with uncertainties associated with global issues such as population growth and climate change. Promote innovation considering unique local contexts and challenges.
    a. Create reward initiatives for new innovations;
    b. Use/Create existing/new water innovation funds;
    c. Organize hackathon with young innovators at local level;
    d. Promote piloting, encouraging the application of best and sustainable technologies.
2. Exploit the full potential of the existing repository of technological innovations in the water and sanitation sector.
    a. Continuously update the list of technologies based on value, technological maturity and scalability;
    b. Reward technology innovation and adoption through recognition awards;
    c. Identify and strengthen the existing centers of innovation.
3. Create tools to promote a culture of innovation, as well as a community of empowered innovators within water and wastewater utilities.
    a. Create tools to facilitate scale innovation strategies;
    b. Organize regular Managers/CEO forums for innovation culture;
    c. Create profiling for innovators in the region and establish discussion groups.
4. Create platforms and market places where a wider ecosystem of innovators, investors, research foundations, NGOs, utilities and industry can interact and promote innovation and change in the water sector with the aim of increasing the speed and capacity for scaling adoption.
    a. Create open innovation platforms;
    b. Create and strengthen public-private partnerships to pilot and scale innovation.
5. Strengthen the community of sectoral innovation practitioners.
    a. Organize annual events and meetings on innovation (e.g., water tech hubs/accelerators, prize competitions, …);
    b. Develop courses and training materials;
    c. Integrate innovation in education and development programs of water professionals.
6. Provide, on an annual basis, an online inventory, or data base, of international initiatives, water research and innovative projects.
    a. Convene an annual event to ensure progress is made on all the action items identified and agreed upon;
    b. Engage all levels of the private sector, government and subject matter experts to support and promote innovations through innovation events to achieve strategic goals in the water sector.

Cities Track

Introduction

Former Secretary General of the UN Ban Ki-moon stated that: The battle for sustainability will be won or lost in cities. Cities are the economic hubs of our society and while they are rapidly expanding the water resources, they rely on are under increasing pressure. We need to find ways to do more with less. The SDGs are a bold call for the promotion of sustainable urban water management for safer, more inclusive and resilient cities. To achieve this we need to harness the power of collaboration with adapted governance, engagement of stakeholders and active citizen involvement.

This track is based around the IWA Principles for Water Wise Cities which aim to help city leaders ensure that everyone in their cities has access to safe water and sanitation, that their cities are resilient to floods, droughts and the challenges of growing water scarcity, and that water is integrated in city planning to provide increased liveability, efficiencies, and a sense of place for urban communities. The Principles are a tool for to mobilise decision makers across departments, sectors, and institutions around sustainable urban water management. The Principles along with the Action Agenda for Basin-Connected Cities also offer a framework to structure the dialogue and action needed.

The 17 principles are grouped into four categories:

1.Regenerative water services: including replenishing water bodies and their ecosystems, reducing the amount of water and energy used, recovering energy, nutrients and other materials from water, and increased efficiencies by integrating water services with other services.

2.Water sensitive urban design: including designing urban spaces to reduce flood risks, enhance liability with visible water, and modify and adapt urban materials to minimise environmental impact.

3.Basin connected cities: including planning to secure water resources and mitigate drought, protect the quality of water resources and prepare for extreme events. Also see the Action Agenda for Basin-Connected Cities

4.Water-wise communities: including empowering citizens, increasing professional awareness of water and enabling policy makers to take water-wise action.

These are reflected in this track along with management tools for water utilities (e.g. AquaRating) which connects and demonstrates a practical example of the building blocks highlighted in the Principles (Vision, Governance, Knowledge & Capacity, Implementation Tools and Planning Tools).

Proposed Actions

1. Promote and support endorsers of the Principles for Water Wise Cities highlighting their commitment and the actions taken towards a Water Wise Cities. This includes:
    a. Documenting and highlighting their endorsements and activities related to Water Wise Cities through the IWA and partner networks;
    b. Working with the signatories of the Principles for Water Wise Cities to integrate the Action Agenda Framework into their urban water planning;
    c. Empower IWA members and partners to localize the Principles for Water Wise Cities and the Action Agenda for Basin-connected Cities Framework and integrate into their planning, proposals, etc.
2. Champion mainstream Water-Wise systems and activate actors of change by:
    a. Engage key enablers which include decision makers and regulators;
    b. Promote thought leaders and champions of Water Wise Cities at leader focused forums on key topics;
    c. Connecting with city networks to integrate the Water Wise approach into the actions they undertake within their networks of cities.
3. Provide a platform and opportunities for continued knowledge sharing around Water Wise Cities through:
    a. The development of City and Basin Stories ;
    b. Dedicated sessions, tracks and forums at both IWA and non-IWA events;
    c. Online interactive sessions including webinars, online discussion (e.g. IWA-Connect). YWP online dialogues, etc.
4. Strengthen the community of stakeholders supporting the concept and practice of Water Wise Cities through:
    a. Learning and training material;
    b. Integration into education and development programs of water professionals;
    c. Exploring the concept of awards around water wise cities.

Industry Track

Introduction

Recognizing the commitment of the international community to the 2030 Sustainable Development Goals and, in particular, Goal 6 to ensure availability and sustainability of water and sanitation for all, Goal 12 to ensure sustainable consumption and production patterns and Goal 17 which calls for the development of multi-stakeholder partnerships.

Hearing the call of the United Nations - World Bank High Level Panel on Water that the world can no longer take water for granted and that individuals, communities, companies, cities and countries need to better understand, value and manage water. In particular, that water-using industries embrace water stewardship, strengthen collaboration and participate in IWRM.

Understanding that industry is a major user of water, accounting for some 20% globally and up to 50% in some countries and that, it's activities disproportionately impact on water quality and water availability for communities and the environment at a time when demand for water is expected to exceed supply in many parts of the world.

Fulfilling our commitments to healthy water, healthy communities, a healthy environment, and protection of both humans and eco-systems from climate change will require rapid and significant changes to how water is used by industry.

Proposed Actions

1. Understand water, value water and manage water within watersheds (HLPW).
    a. Increasing scarcity of water, compounded by pollution, over-consumption and damage to the ecological infrastructure that facilitates the water cycle means industry must develop a deeper understanding of water and its challenges;
    b. Water is traditionally under-valued as a community resource contributing to mis-use of this resource. In the future, water must be fully valued by industry to provide a strong rationale for better management;

   c. Price should encourage water conservation and effective management by being set at a level that reflects its true value to the long-term financial and social health of communities, as well as the environment;
   d. Water does not just come out of a tap. Industry must engage in water management with the watersheds where it operates through mechanisms such as Integrated Water Resources Management and Water Stewardship.
2. Collaborate, seek partnerships and build networks to address water issues with government, peers, civil society and communities.
   a. As the 2030 Water Resources Group noted in 2009, traditional demand-supply mechanism for facilitating investment in water are not working. Behavior change by water-users including industry must be part of the water toolbox;
   b. Industry cannot act alone. It must collaborate with government, peers, civil society and communities to develop new approaches that address demand as well as supply challenges and foster innovation;
   c. Current conditions, risks, and opportunities will be evaluated at aggregate (e.g., watershed) level where water resources are shared, through collaboration of multiple users and stakeholders;
   d. Encourage collaboration and shared projects between educational and research institutions, financial institutions, NGO's, policy-makers and regulators, industry, and the public to support use of new technologies and approaches.
3. Work with your supply chain and customers to build responsible water practices and eliminate activities that contribute to or increase water stress.
   a. Industry can be a powerful and influential force for change with suppliers and customers (industry supply chain). With strong commitment and leadership, companies can build strong alliances for change in their supply chain;
   b. Industry can lead by example, communicate their performance to peers through established networks and commit to standards of performance that set benchmarks for their suppliers and an example to customers;
   c. We will require reporting of needs assessments, action plans, and implementation by companies.
4. Think long-term, engage with partners beyond the fence-line act now.
   a. Water, like climate change, is an issue that requires long-term thinking and long-term action plans to understand and address water risks to our business and the communities where we live. We understand that and commit to it;
   b. Traditionally industry prefers to manage what it can control inside its plant or operation. Water creates new challenges that involve thinking and collaboration beyond the facility's gate;
   c. Address inequities that result in unsustainable industrial water use by populations with no viable financial options.
5. Foster and support incentives and distinctives that encourage best practices and discourage bad practices.

a. The traditional approach to market failure problems such as water is to apply taxes as disincentives for bad behavior and subsidies for good behavior. We will advocate and collaborate to achieve mechanisms that work effectively;
b. We will engage with incentives and disincentives and encourage others or adopt similar mechanisms in our supply chain where this is possible;
c. We will assess existing, potential, and long-term financial, social, and environmental impacts and opportunities for improvement in all locations and within all processes.

Agriculture Track

Introduction

Agriculture remains the main water consuming sector. Therefore, solutions in this sector are needed to make water use more efficient and moreover reduce the impacts on water resources, by reduced contamination and overexploitation. Increased insights in environmental resources and their functioning (optimal locations for particular types of agricultural production, water system functioning, disaster preparedness and avoidance), new technologies, sustainable farming practices, enhanced agricultural policies and regulations can lead to both a better environmental situations and socio-economic conditions of actors in this key sector of human society.

Proposed Actions

1. Increase the efficiency of water use via better crop selection and improved agricultural practices (tillage, irrigation, …).
2. Improved technologies.
3. Circular processes and economy as a basis for a more sustainably embedded society.
4. Production-use-waste chain analysis and geographical optimization.
5. New methods for training and education of the agricultural sector and its direct and indirect stakeholders (from providers of raw materials, processing industry to consumers).

Cross-cutting Track

Introduction

Many water challenges cannot be solved within one sector of water users, and even not merely in the water system itself. Insights and cooperation overarching different components of the environment and society are needed, and therefore cross-cutting approaches and actions are needed.

Proposed Actions

1. The integration (and sustainability) challenge: from 'giant baby-steps' to philosophical concepts.
    a. Many practical to very complex concepts have been setup. The nexus and SDG's concepts are the ones that try to find a balance between integration and complexity and can be key to get things done. Some strengths and challenges can be listed and discussed here.
2. Getting things done in a complex and highly dynamic world of actors, administration, culture.
    a. The complexity related to the diversity and numbers of actors from main users (cities, agriculture and industry) makes it very difficult to make progress. Key steps are for sure linked to reducing over abstraction and contamination, but getting these implemented needs vision, regulation and funding. Also, concepts like water stewardship can play a critical role to change the culture and make many actors move in the direction of more sustainable water use.
3. Communication and education.
    a. Who to communicate to, and how? A key question for many managers and policymakers involved in sustainable water resources exploitation. Social media open new doors and challenges. Also, education has here a (new) key role. Use of international networks is for sure a plus, but how to get this in place... and updated.

Education is also no longer a diploma-related activity, but life-long-learning and use of multimedia and e-tools is becoming a common practice.

4. Opportunities and challenges of emerging technologies.
    a. Smart technologies are becoming more and more part of water system monitoring and control. Enormous amount of water system data has moreover been collected. This leads to giant opportunities for improving water management, but also new challenges.

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