

2017 World Water Week: Seminars

Water in the circular economy: opportunities and challenges

We can no longer afford to embrace a linear water paradigm where water is used once and then discharged and where the economic value of water and associated wastes are not considered. A transition from a linear to circular economy paradigm for water and wastewater is essential to address our current and projected water challenges. These complex water challenges, such as water scarcity, water quality, and aging centralized infrastructure with inadequate funding mechanisms have resulted in negative impacts to economic development and business growth along with gender and income inequality.

The circular economy paradigm requires that the value of water and associated wastes are addressed which will, in turn, drive innovation in public policy, financing, business models and technology. This “one water” paradigm will proactively create value for both the private and public sectors in low, middle and high income economies and contribute to achieving the SDGs, in particular the targets for water (SDG 6.3) and sustainable production (SDG 12.5)

This seminar will address several critical questions to be addressed by researchers and stakeholders as we collectively transition to a circular water economy. These include: 1) what are the policy, technology and social barriers; 2) how do we quantify the value of moving from linear to circular economy strategies; 3) what are the legal and regulatory changes required; 4) what is the role of technology, including digital solutions, in accelerating this transition and tracking progress against the SDGs; 5) what are the financial and business models needed for this transition; and 6) what are the collective action frameworks needed to mobilize stakeholders to facilitate this transition.

Wastewater and health – managing risks, seizing opportunities

Over the past decade, drinking water quality management to protect human health has seen a paradigm shift: water safety planning represents an integrated risk assessment and management approach along the source-to-tap chain. With the incorporation of wastewater management among the SDGs (targets 3.9 and 6.3), sustainable development of water resources has come full circle. Now, preventive risk management must be extended to sanitation and wastewater management.

Catastrophic pollution events, such as accidents involving industrial wastewater, continue to jeopardize human health. Similarly, human and animal waste continue to pose microbial threats to human health. The magnitude of these effects and their distribution in the human population are determined by geography and infrastructure development, combined with people’s living conditions and behaviours. Risks may be modulated by climate change.

Health impact assessment (HIA) of proposed water and wastewater infrastructure can help safeguard and reap opportunities to promote human health “upstream”. Sanitation safety plans (SSPs) should govern wastewater management. Complementary approaches can help identify opportunities and address critical risks.

Extrapolating these upstream and integrated risk assessment trends into the future, the seminar aims to identify options for more in-depth, action-oriented analysis, and more effective impact assessment and safety planning, and asks: How can SDG action strengthen national policy and legal frameworks for HIA and SSPs? What institutional reform can ensure health-protective wastewater management (considering that “prevention better than cure” from the environmental, economic and social perspectives)? What research is needed to improve risk management in wastewater systems as part

of a circular economy? How does gender bias influence the way we deal with human health risks associated with wastewater management, and how can we eliminate this bias?

Can new financing for resources recovery reduce the wastewater crisis?

Resource Recovery and Reuse (RRR) will be an important strategy to achieve several SDGs concerning environmental and human health, food security, waste and rural-urban linkages (SDGs 2, 3, 6, 11, 12, and 15). Once the decision is made for a new wastewater or faecal sludge treatment facility, the question is how to prioritize technology options in terms of costs, benefits and local capacities. How should financing and management mechanisms, and business models be designed to ensure services are sustainable and limited public resources are leveraged?

Wastewater treatment is mostly financed through public resources, with a few cases funded privately. Most investments respond to societal demands and a need to comply with rigid effluent thresholds without consideration to opportunities for resource extraction and improvement in efficiencies. Although full cost recovery is generally seldom, RRR can be instrumental for narrowing the financial gap.

This seminar will seek to explore new financing and business models, policy instruments and market conditions for RRR contributions from implementing agencies and research on the business side of wastewater treatment. It will discuss new models to improve efficiencies, promote incentives, for example for energy savings or generation, and for the recovery and reuse of nutrients and biosolids, taking into consideration local perception of reuse and gender specific opportunities and constraints. Success stories will reflect on what made them possible and how they could be transferred to other locations, with special attention to low-income countries.

Smart solutions in water and waste management for liveable cities

Water supply, sanitation and stormwater are integral components of and/or directly interfere with the urban water system, yet they are often not planned or operated in an integrated way. Viewing them as a single system can greatly enhance the utility of water, both in the context of everyday operations and under stress. Minimizing the movement of water, reducing leakage, maximizing reuse and redefining waste as a resource can optimize the productive use of water and reduce pollution. Considering urban water and sanitation (both wastewater and onsite sanitation options) holistically, at appropriate spatial scales, can provide economic, environmental and social benefits. Such approaches should lead to reduced exposure to compromised environments for the most vulnerable, in particular women and children. Fostering rural-urban linkages can lead to mutual benefits and synergies at the water-food-energy nexus. Active participation of multiple sectors and communities is required, as is a proactive, holistic urban water planning approach to minimize conflicts and ecological impacts.

The seminar will address innovations in urban water management, in particular strategies to operationalize the SDGs, the new urban agenda of Habitat III, and the IWA Principles for Water-Wise Cities. We invite papers that describe real-life application of systems thinking to integrated urban water management, including the interactions of water supply, onsite/reticulated sanitation, stormwater etc., especially in developing countries. Papers that describe multi-stakeholder participation for proactive, holistic urban water planning are welcome. We are particularly interested in papers that describe how urban form and integration can help minimize water footprints and maximize potential for resource recovery and reuse. Papers addressing rural-urban linkages that generate mutual benefits/synergies at the water-food-energy nexus, are encouraged.

Harnessing opportunities for the safe reuse of wastewater in agriculture

Achieving food security (SDG 2) is of high priority, increasingly threatened by water scarcity and climate change impacts. The safe reuse of wastewater and other sanitation waste streams (e.g. faecal and sewage sludge) could play an important role towards increasing agricultural production. A key motivation for increasing wastewater reuse in agriculture is reduced costs, since this waste contains enough nitrogen to in theory replace 25 per cent of synthetic nitrogen currently used to fertilize agricultural land, and 15 per cent of phosphorus, along with enough water to irrigate 15 per cent of all the irrigated farmland in the world. Wastewater reuse also reduces nutrient leaching to lakes, rivers, and groundwater. But how do we harness these opportunities and tap into this largely unused resource from a planning, policy, livelihoods and financial point of view? And what are the pit-falls that should be avoided to ensure safe and sustainable wastewater reuse?

The objective of the seminar is to discuss opportunities and limits for the safe reuse of wastewater and, for example, faecal sludge in agriculture. We invite papers that describe examples of successful policies and actions to motivate and encourage reuse in terms of dissemination of appropriate technologies, financial incentives, policy mechanisms, governance, and the role of civil society and private actors including gender aspects. We aim to draw replicable lessons that will assist government agencies, private and civic actors seize agricultural wastewater reuse opportunities.

Water and waste management: the case of the textile industry

The textile industry is a water intensive industry. It contributes to draining and polluting water resources along its value chain. Employing millions of people - mainly women - the industry is key to economic growth, foreign direct investments and export, and often competes directly with agriculture for human and natural resources. The textile industry's gradual move from industrialized to emerging countries has contributed to exploiting workers, land and water resources. The sector is now growing in South-East Asia and Africa, posing great environmental risks. Legislative, governance-related and technical innovations are important to avoid the exploitation of natural resources in traditional and new production hubs. Key developments in circular production, coupled with sound water pollution regulations when thoroughly enforced, could secure a more environmentally-friendly textile industry in the future. Corporate water stewardship and voluntary agreements contribute to addressing this sector's complex problems.

The seminar will present possible paths from "field to fashion" to address environmental exploitation, labour conditions and health hazards in the textile industry. The seminar invites papers that showcase scalable and replicable innovative business models, legal frameworks, financial incentives, pricing mechanisms, and systematic approaches to address the complex problems of this sector. Papers focusing on circular production and consumption are strongly encouraged, as well as practical case studies of successes and failures from industrialized, emerging and lower-income countries.

Opportunities and limits to water pollution regulations

Preventing water pollution, from ridge tops to reefs, is a global governance challenge that needs command-and-control, market-based instruments, as well as moral persuasion. These approaches have strengths and limits that are the forte of government agencies, private sector and civic movements respectively. Commitments to improve water quality by reducing pollution (SDG 6.3) and reduce marine pollution of land-based activities (SDG 14.1) are on agendas of government agencies, private sector and civic movements respectively. Decision makers face nexus challenges and complex questions such as: How much pollution is acceptable and affordable for desired economic

development (and to whom, with what risk perception)? How can water pollution be regulated from point and diffuse sources or from emerging substances with unknown hazardous consequences? Which technological innovations decrease the amount of untreated wastewater but increase production costs, or may be economically feasible but socially unacceptable? How should both polluters and public campaigners keep pace with ever changing regulatory practice and legal regimes? Finally, are monitoring and reporting systems sufficient or capable of ensuring that instruments of modern physical and social sciences are employed and enforced to their full potential?

This seminar will discuss opportunities and limits to water pollution regulations, innovations and campaigns. This seminar seeks experiences of overcoming barriers in discipline-divided silos that miss synergy and sustainability across sectors. Also, regulation and implementation authorities should consider potential transfers of sludge pollution from water to land. The focus will be given to a range of instruments from legal, economic and administrative tools to ethics-driven behavioural aspects of pollution reduction. Cases of pollution prevention will be presented from developed and developing countries to draw lessons that help governments, private and civic actors improve their own work through inter-sectoral collaboration.

Governance of water and waste: a key to sustainable development?

Governance is a broad term that includes legislation and regulation, the institutional framework, and less tangible aspects such as integrity and anti-corruption and the roles of different stakeholders including women. Good governance of water and waste is important to a society's development and to the achievement of the best possible outcomes for society and people. Trade-offs between different users and economic sectors, geographical scale, affordability to the customers and users of services, the urban or rural setting, and cross-border cooperation, all add complexity to governance of water and waste. The Sustainable Development Goals cover all of these topics with an overarching commitment in SDG 6.5 to implement integrated water resources management – itself a governance issue. Many countries are now reviewing and updating their policies to achieve the SDGs; this is a complex task in which national governments need support from international organisations, civil society, academia and the private sector.

This seminar addresses governance of water and waste with a particular emphasis on wastewater management and reuse. Given the huge breadth of this subject, the seminar will concentrate on four topics: integrating water resources management; reducing and reusing waste; managing water and waste in the urban context; and promoting integrity and anti-corruption in the water and waste sectors. We particularly invite papers that describe successful examples of policies, institutional arrangements and stakeholder engagement that relate to these four topics.

Understanding the gender dimension of water and waste

A gender perspective which seeks to include an understanding of gender roles and relations and how these affect and are affected by water and sanitation interventions can ensure greater sustainability and resource efficiency, and can therefore enhance water and sanitation benefits. Experience has shown that interventions that include the views, input and participation of both men and women generally work better. Water is not gender neutral. Water resource management is incomplete without a gender perspective and active involvement of women. Understanding and contextualizing (all) gender dimension within broader sustainable developmental priorities requires developing gender-sensitive databases, information and monitoring systems and participatory action research to determine how to invest in this sector and to evaluate the impact of such investments, in addition to determining their transformative potential for women and men.

This seminar looks for case studies explaining how gender was incorporated in water and waste related activities. The following areas could be of interest: how are women's capabilities being enhanced from investing in their active participation in this sector? How do economic and business opportunities from wastewater management better address gender dimensions, as well as women career paths in management positions? What are the key steps to be taken to ensure that women are included in decision-making related to wastewater management and improving water and sanitation systems, as well as agriculture and land-use projects that affect water quality and quantity? What policy implications will this have and what policy gaps are to be addressed to ensure the effective inclusion of women? Case studies from local, national and transnational contexts are encouraged.