



THE WORLD WATER QUALITY ALLIANCE NEWSLETTER

September 2023

The World Water Quality Alliance is convened by the United Nations Environment Programme and supported by the Swiss Confederation. It proudly presents its monthly newsletter, YEMAYA, named after the ancient African goddess of the ocean and motherhood. She is associated with fertility, femininity, protection, healing, and childbirth. Her domains are symbolized as water creatures: the seas, rivers, and lakes. She is honoured and revered in the African diaspora, particularly in Cuba, Haiti, Brazil, and the United States.

We, the World Water Quality Alliance Coordination Team, welcome articles about water quality. Tell us about your experiences. Describe the challenges you and your people face. Talk to our global community; talk to people from around the World. Send your articles to wwqa-coordination@un.org.

IN THIS ISSUE

- *Friends of Groundwater*
 - *Outcomes of the WWQA at the World Water Week*
 - *The September Interview*
 - *Introduction of the Handbook on Water Quality Monitoring and Assessment (GEMS/Water Capacity Development Centre)*
 - *The WWQA BULLETIN BOARD*
-

- *WWQA September Conference*
 - *UNEP Adaptation Events at African Climate Week*
 - *Report Launch: wastewater- Turning problem to solution*
 - *Sustainable Lake Restoration : From Challenges to Solutions*
 - *IWRA XVIII World Water Congress*
 - *Job Openings*
-

Friends of Groundwater



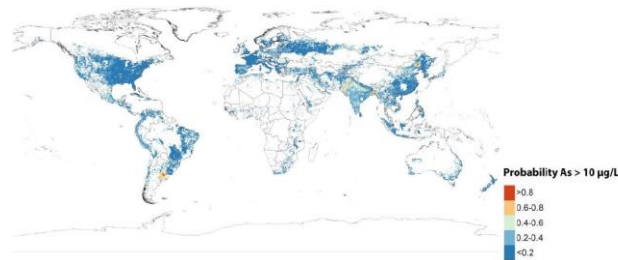
Representing the greatest proportion of fresh water on Earth (excluding the major ice caps), groundwater is an indispensable resource supplying close to half of the water used by municipalities, agriculture and other industry. Due to the high storage capacities of some aquifers, groundwater can also provide a good buffer for mitigating the effects of altered weather patterns associated with climate change. Furthermore, by being underground, groundwater is generally less vulnerable to pollution as compared with rivers and lakes and very often represents the cleanest available source of fresh water.

However, the fact that groundwater is hidden from view means that it is relatively difficult to monitor and, for all but groundwater specialists, often remains out-of-sight and out-of-mind. These two factors contribute to the state of groundwater often being poorly understood and any impacts to it going unnoticed until declines in quantity or quality can no longer be ignored, which is generally associated with significant degradation to the resource. Some common threats to groundwater quality include inappropriate handling and use of industrial chemicals, fertilizers, plant protection products, sewage and municipal waste as well as naturally occurring contamination from the aquifer matrix (the network permeable rock bodies underground which contain or transmit groundwater), such as arsenic, fluoride or uranium. Furthermore, the over-pumping of aquifers in coastal areas can lead to seawater intrusion that may render a well useless for supplying fresh water. Not only can aquifers take up to hundreds or even thousands of years to be recharged from precipitation at the surface (i.e. when rain falls on the ground it infiltrates into soils and moves through the ground into the water table), but once groundwater has become contaminated, its remediation can take correspondingly long and be exceedingly difficult and costly. For these reasons, it is crucial to understand the state of groundwater resources and their vulnerabilities, thereby allowing steps to protect aquifers and ensure their sustainable utilization before reaching a point of degradation that requires costly and long-term remediation efforts.

At the first meeting called by UNEP in 2018 bringing together experts to help produce a World Water Quality Assessment, the several groundwater specialists present decided to group together, calling themselves the "Friends of Groundwater (FoG)", thereby establishing one of the first WWQA

workstreams. [FoG](#) has further developed as a dedicated group of groundwater experts from around the world working together to actively support the goals of the WWQA with respect to groundwater quality.

One of these products is a global perspective paper on assessing groundwater quality, which was delivered to the 5th UN Environment Assembly (UNEA 5) as part of a status report on the World Water Quality Assessment and [published in an abbreviated format in the Hydrogeology Journal](#). Another document submitted to UNEA 5 that dealt directly with data and models for the World Water Quality Assessment also contained contributions on groundwater, for example, a global prediction map of arsenic-affected groundwater in areas under irrigation (Fig. 1). The purpose of providing such resources and maps is to raise awareness of groundwater quality issues and prompt action from groundwater management authorities in addressing areas of concern.



1 - Figure 1 Probability of arsenic in groundwater exceeding the WHO drinking water guideline of 10 µg/L in areas equipped for irrigation (adapted from Podgorski and Berg, 2020, Science and Siebert et al., 2007, Univ. Frankfurt & FAO)

FoG has also been working on two projects supported by WWQA seed funding. These have resulted in the creation of the portal groundwater-quality.org (Fig. 2), which contains information on the availability of groundwater quality data, and the development of a set of guidelines for assessing groundwater quality. The guidelines are intended to help countries not only in evaluating groundwater resources for their own management purposes, but also to aid in reporting for SDG 6.3.2 on the state of ambient water quality through the development of a standardized index.



2 - Figure 2: Home page of groundwater-quality.org, which provides an overview of groundwater quality issues and a compilation of data resources.

2022 was the Year of Groundwater, causing it to receive greater attention at various events throughout the year, such as at the World Water Forum in Dakar. Moreover, groundwater featured prominently at the second-ever UN Water Conference held at the UN headquarters in New York in March 2023, including in a well-attended side event dealing exclusively with groundwater that was co-convened by UNESCO and in which several FoG members made statements including on the scarcity of good groundwater quality data.

The Outcome of the WWQA at the World Water Week



The World Water Week 2023 took place in Stockholm, Sweden, on 20-24 August 2023. The World Water Week 2023 was focused on innovation during unprecedented challenges. The theme was Seeds of Change: Innovative Solutions for a Water Wise World, which invited everyone to rethink how we manage water. Its main agenda is understanding which ideas, innovations, and governance systems are needed for a more unstable and water-scarce world. World Water Week was a natural arena for global learning and collaboration since it offered new incentives and innovation, building on the latest scientific knowledge and best practices worldwide.

World Water Week 2023 was built on World Water Week 2022, which explored the value of water and the many vital discussions on resilience held in 2021. The week reflected the extreme urgency of major geopolitical problems such as climate change, biodiversity loss, hunger, inequality, and insecurity. It was closely linked to many international processes and all the Sustainable Development Goals (SDGs).

There was learning from successful and unsuccessful innovations, where participants discussed the processes of innovation, how it's supposed to happen, the context from which it comes, the external stimuli that sparked it, and the ownership needed to ensure its uptake. An overall observation of cultural innovation was required to foster change. For example, in the private sector, the pursuit of market share was a major driver of innovation. The innovations adopted and scaled up to help solve societal challenges and the digital transformation to accelerate the change were examined. The discussions also covered how results from the innovation would be made more widely available where they are most needed,

anywhere in the world. Some of the themes that were paid special attention since World Water Week 2023 took place shortly after the UN 2023 Water Conference

- 1. Water for Health*
 - 2. Water for Development*
 - 3. Water for Climate, Resilience and Environment*
 - 4. Water for Cooperation*
 - 5. Water Action Decade*
-

The World Water Quality Alliance (WWQA) held a talk show on the 21st of August 2023, the second day of World Water Week on the Restoration Lake Ecosystems, to deliver global scale socio-economic benefits. The talk show session debated on the achievement of the ambitions of the World Water Quality Alliance “Embedding Lakes into Global Sustainability” White Paper and the key actions of building capacity monitoring and assessment, embedding Lakes Management in national policies, fostering green finance for lake restoration, and raising global awareness of the benefits of change. The white paper summarized the current international situation regarding the degradation of lake ecosystems and where we are in terms of restoration actions in various countries. The interactive talk-show session discussed the key action agenda in the white paper and how they support the United Nations Environmental Assembly resolution on Sustainable Lake Management and others, including those on Nutrient Management and Nature Solutions. The talk show discussed how the aims of the resolution and sustainable lake management cannot be achieved without transformations of current practice from local to national scales. Achieving the key actions outlined in the White Paper requires feasible options in mult-sectorial and challenging political and financial landscapes. New scientifically sound ideas that attract societal support are needed since the pressure on lakes and reservoirs is still increasing in many parts of the globe. The key aspects for the progress are to ensure that there is mobilization of coalitions among users and that new and economic models for lake protection and durable restoration are formed.

The WWQA convened a second session on 23rd August 2023 entitled ‘Water: The Source of Future Social Sustainability’. This session showcased local communities’ importance in addressing global water-related challenges. It emphasized the significance of local dialogue, engagement, and exchange and the practical application of data generated by the Pathway to the World Water Quality Assessment. The session aimed to demonstrate how local communities are key in the battle to overcome global water-based challenges. The session welcomed development cooperation and water experts who had the opportunity to observe, learn, and engage with local water forums and youth organizations working with the WWQA. The local water forums convened by the WWQA Social Engagement Platform comprise not only local politicians, businesspeople, and researchers but also ordinary citizens representing all ethnic

groups, low-income sectors, and the entire social reality of their locality. These individuals have become involved in water quality issues and work with neighborhood cultural actors to communicate its importance. Different local water forums showcased the work they have accomplished and how it has impacted not only themselves but also society which concluded by emphasizing the importance of local engagement to move from data to action

Article contribution by *Vivianne Kiriinya*

Alex Pires, Programme Management Officer, Source-to-Sea Pollution Unit, Marine and Freshwater Branch, Ecosystems Division, UNEP

Please tell us about yourself, your experience, and your passions and how they have inspired you to dedicate your career to environmental issues, protecting marine and freshwater ecosystems, and how this relates to your work in wastewater.

My passion for water from source to sea, from rivers to the ocean theme, started when I was a child. Water, freshwater, and marine ecosystems are closely linked and related to my aspirations of who I am and what I have become. I was born in Salvador de Bahia, a city in Brazil, that is on one side faced by the Atlantic Ocean and on the other side by a beautiful bay. From an early age, I did many hobbies in the sea, like swimming, diving, sailing, and paddling. On the other hand, I loved mathematics and engineering, so when I went to university, I opted for engineering instead of environmental science or marine science, because it was a very broad field. Naval engineering was in my short list, but in the end I decided to go for civil engineering, which made me love all the signatures related to water, wastewater treatment, and river-basin management. I worked in the sector for some time and then for my Ph.D. I focused on sustainable water use, working on developing indicators that include technical, social-economic, and environmental elements needed by decision-makers. I have worked a lot with river basin management and integrated water resource management. When you look and see the connection between source to sea, it doesn't make sense to work just with the 'salty part' or 'not salty' part of the water because everything is connected, and I am happy to be where I am now in the Source-to-Sea pollution unit in the Marine and Freshwater Branch of UNEP's Ecosystems Division.



3 - Image provided by Alex Pires, Programme Management Officer, Source-to-Sea Pollution Unit, Marine and Freshwater Branch, Ecosystems Division, UNEP

Wastewater management is a global concern. How does your work in the Source to Sea Pollution Unit relate to the goals and initiatives of the World Water Quality Alliance?

I am thrilled to see a complementarity between the World Water Quality Alliance's goals and initiatives and the work we do here in the Source-to-Sea Unit. As far as I know, one of goals of the WWQA is to make reliable data and knowledge on water quality accessible to all and to make sure this data and knowledge is converted into realistic and tangible actions. We as UNEP are generally very good at collecting, managing, presenting data but we are then faced with the question of how does this data become a tool for transformation, a tool for us to make things different and face the challenges related to wastewater management? The Source-to-Sea Unit has been promoting and supporting many countries in all the world's regions on acting towards pollution and reducing the amount of plastic that reaches our oceans; how to address the unprecedented challenges of nutrient pollution e.g. nitrates, and phosphates, etc. We also address wastewater management, considering urban wastewater and the whole spectrum of water that is used, contaminated, and sent back to the ecosystems. This includes industrial sewage, agricultural runoff, and urban wastewater. What is clear is that we need to address the challenge of wastewater to promote solid climate action, preserve our biodiversity, and eliminate pollution by reducing the amount of wastewater generated. We are partnering with the World Water Quality Alliance by leading the workstream on 'Wastewater surveillance' and see fantastic complementarity between the activities these different entities of our organization have been doing to serve member states. Rather than focusing on collecting data or helping governments collect data, our unit's mandate is rather to go to the action and support the learning develop the policies they need to achieve their targets. We also promote tools like national planning to reach the targets and using the data and information coming from many sources, including the World Water Quality Alliance.

How can collaboration among government bodies, local communities, and environmental organizations be facilitated to achieve wastewater management objectives? How does the Global Wastewater Initiative support partnership-building for global action on wastewater?

Collaboration is key in this process. Wastewater is a cross-sectoral issue and a cross-sectoral approach that involves government bodies at all scales, may it be at the national scale or the supranational scale, i.e., the county, city, industrial area, an agricultural area, and plantation fields is essential to solve the problems related to it. This is very important, but we should step beyond the regular environmental organizations and understand that all productive sectors that use water through some process and put it back into the ecosystem are generating some form of wastewater. For instance, the private sector is an important actor in the Global Wastewater Initiative. The youth, young professionals and professionals creating and putting together new solutions for wastewater through startups are critical to achieving wastewater objectives. Through the Global Wastewater Initiative, we are convening an open platform for knowledge exchange, partnerships, promoting collaborative work, and having a global forum that discusses wastewater-related issues. Actions should be taken at different levels with different actors involved since global wastewater action is essential.

The topic of wastewater has been rising on the agenda. It's not an emerging issue but has been there since cities' development and the first manufacturers started forming their industries. It's nothing new, but it's becoming a challenge limiting our ability to address climate change and support ecosystem services. The Global Wastewater Initiative has been working for the last ten years, promoting spaces for dialogues, boosting efforts to scale up water solutions worldwide, and proudly creating a global program of action for protecting the marine environment from land-based activities. The core of this initiative is the protection of the marine ecosystem from essential pollution. The challenges are enormous, such as the amount of untreated wastewater in our environment is higher than ever, affecting the ecosystem and people's health, and the economy and threatening sustainable development.

As a call to action for wastewater as a resource and an opportunity, we launched the 'Wastewater – Turning Problem to Solution' global report which calls for three concrete steps to reduce the amount of wastewater we produce. The first call for action is to use less water to generate less wastewater; the second action is to prevent and reduce contamination by paying attention to what we put in the water to make it wastewater e.g. contaminants and materials – because in the end we are losing nutrients, materials, energy and water when we produce wastewater. The third call is to manage wastewater so that the resources available in it can be reused, including the water itself and the resources it contains. For instance, the amount of greenhouse gases (GHG) in wastewater is nearly equal to that of the aviation industry and with proper reuse, they can be recovered and converted back into energy. This is especially important when you think about the sky high cost of fertilizers these days, and how much of these are thrown away in wastewater through industrial, agricultural and urban wastewater.

As the workstream leader of the Wastewater Surveillance workstream, what does the workstream expect to achieve in the coming year?

The workstream is related to wastewater for essential surveillance for public health. Wastewater can be a unique and cost-effective way of understanding the issues related to the population generating that wastewater since the wastewater contains biological materials from us and all the things that pass through our digestive systems. So, it's much easier to understand what's happening with a particular group in the population if you sample the wastewater. We are lending this knowledge to colleagues especially in the WHO and other countries, address that through our expertise. It's interesting that our organisation, the UN Environment Program, helps the public health sector access better data. This was used e.g. in the COVID-19 crisis through mass testing or sampling of the wastewater. One of the things we plan to do in the upcoming year is to include youth representatives and other organizations in those discussions. We had a fantastic conversation a couple of weeks ago in Stockholm during World Water Week, where representatives from the European Union, the Turkish Institute of Water, the WHO, and research organizations all came together to discuss the agenda leading to a global effort or network, to use wastewater as a centre future pandemic and for health problems that might emerge. One of the things we noticed is that youth are not integrated into the process yet. We are involving young, brilliant, and creative people. They can bring together attractive solutions, technologies and approaches to the discussion, much as the WWQA is doing to actively involve youth in community engagement projects and across workstreams

Is Yemaya familiar to you as a Brazilian?

It is familiar yes! But it is pronounced more like 'Yemanjá'. She is the queen of the seas and a celebration takes place on the 2nd of February every year in my city (Salvador de Bahia). This is a wonderful celebration that is honoured by people, especially the fishermen and fisherwomen, where they keep the goddess by giving her flowers and many other gifts for her to protect them during the whole year. It's a beautiful celebration where everyone goes to the seafront with flowers and other facilities.

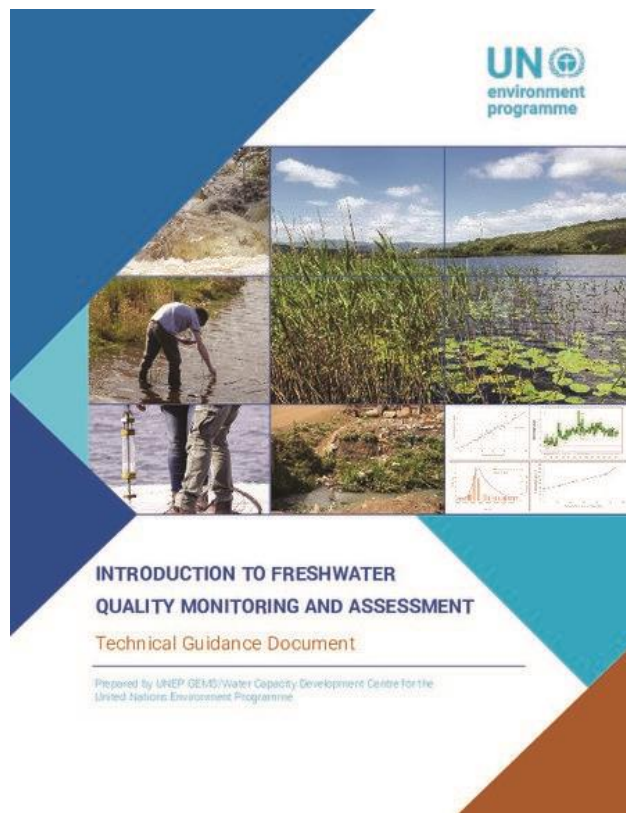


4 - Image from <https://tinyurl.com/3sf5hf4k>

What actions in your everyday life can you recommend on an individual level to minimize wastewater?

Everybody should first understand where our wastewater typically ends up. The second thing is the products we consume and the water that produces these. Many people know about the concept of water footprint but should also be mindful of the wastewater footprint. Ensure that the regulations for producing our products are in place and are adhered to since they might impact the ecosystems related to wastewater more than what is required. It is good to be aware of the nitrates and phosphorous used in the agricultural sector and how this contributes to wastewater. We are only guaranteed good water quality and ecosystems if we manage pollution, and beating wastewater pollution is critical for this purpose.

Introduction of the Handbook on Water Quality Monitoring and Assessment (GEMS/Water Capacity Development Centre)



Worldwide workers in the water sector, take note! In an era where freshwater resources are under increasing threat from pollution, urbanization, and climate change, the importance of monitoring and assessing freshwater quality has never been more critical. Recognizing the urgent need to equip both established professionals and new learners in the water sector with the necessary tools, insights, and expertise, UNEP GEMS/Water are thrilled to announce the launch of two new resources for ambient water quality monitoring and assessment:

- *A series of free courses on Ambient Freshwater Quality Monitoring and Assessment available via UNEP's eLearning platform [here](https://elearning.unep.org/course/index.php?categoryid=11).*
 - <https://elearning.unep.org/course/index.php?categoryid=11>
-

-
-
- *An extensive series of technical guidance documents focused on critical aspects of water quality monitoring and assessment available [here](#).*

- <https://www.ucc.ie/en/gemscdc/onlinecourses/handbooks/>
-

The development of these new resources is driven by UNEP GEMS/Water's commitment to provide individuals and organisations with the necessary resources effectively monitor and assess ambient freshwater quality. Our free courses via UNEP's eLearning platform are a condensed, accessible version of UNEP GEMS/Water's more advanced training programmes in ambient water quality monitoring. Suitable for both new learners in the water sector and seasoned professionals, they combine our decades of experience in water quality monitoring training with state-of-the-art techniques, all available for free, wherever you may be.

Our comprehensive technical guidance documents serve as invaluable roadmaps for navigating the complexities of this field. Developed by a team of seasoned water quality experts, these documents offer step-by-step guidance to best practices, enriched with practical examples. From selecting appropriate monitoring techniques to interpreting data effectively, every aspect of the process is meticulously covered in these new resources. They provide an essential reference and will find ready use in any water quality laboratory and classroom. And, like our eLearning courses, they are absolutely free.

Cutting-Edge Information

In the ever-evolving landscape of environmental monitoring, staying abreast of cutting-edge methodologies is paramount. These resources include information of the latest technological advancements in the field, and you will discover how innovative tools and techniques are reshaping the way we monitor and assess ambient freshwater quality. By incorporating the technical guidance and advice provided, you'll not only have the opportunity to enhance the accuracy of your water quality monitoring data but gain a deeper understanding of freshwater ecosystem dynamics. These resources will help you find the pathway to turn your water quality monitoring data into tangible management decisions and action.

A Global Perspective

Freshwater ecosystems are diverse and dynamic, each facing its unique set of challenges. Our initiative transcends geographical boundaries, addressing the global relevance of freshwater quality monitoring. Whether you're situated near a sprawling river delta, a tranquil lake, or a mountain stream, in deserts or wetlands, our resources are tailored to your context. By acknowledging the unique characteristics of

different environments, these resources allow you to make informed decisions that resonate with your local ecosystem's needs.

Interactive Learning Ecosystem

Education thrives in collaborative environments, and these new resources also foster a vibrant community of learners. Our free open and self-paced online courses offer a holistic learning experience, designed to accommodate various levels of expertise. Collaborate with fellow learners, engage in meaningful discussions, and share diverse perspectives that enrich the learning journey. Through interactive assignments and case studies, theory is brought to life, ensuring a well-rounded education.

Certifying Your Expertise

We understand the importance of validating your newfound knowledge. Upon successful completion of our open courses, you'll earn certificates that recognize your commitment to freshwater quality monitoring and assessment. These certificates not only acknowledge your achievements but also serve as tangible evidence of your dedication to safeguarding our planet's most precious resource.

Join the Movement

Now is the time for action, and knowledge is the catalyst for change. By engaging with our initiative, you are becoming part of a global movement to protect and restore freshwater resources for the environment and local communities. Use the resources we have provided to equip yourself and your organisation with the tools to make a meaningful impact, whether you're a seasoned professional seeking to elevate your expertise or an eager learner embarking on a transformative educational journey.

Visit GEMS/Water CDC's [<https://www.ucc.ie/en/gemscdc/>] today to see everything we're doing, and visit our hub of online resources here [<https://www.ucc.ie/en/gemscdc/onlinecourses/>] to access our technical guidance documents and enroll in our free open courses. Together, let's dive into the future of freshwater quality monitoring and assessment!

Article contribution by David Fouser, Timothy Sullivan and Vivianne Kiriinya

The WWQA BULLETIN BOARD

WWQA September Conference.

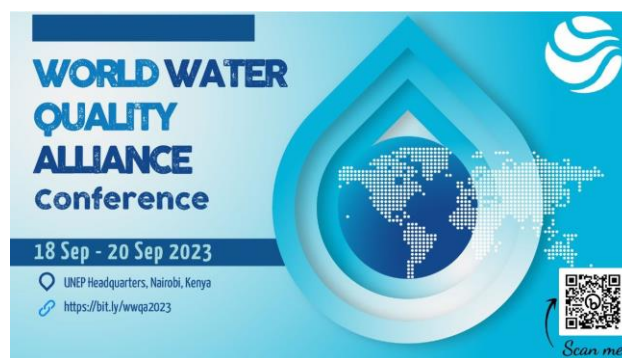
The World Water Quality Alliance (WWQA) is delighted to announce the dates of The WWQA Conference 2023, which this year will be held at the United Nations in Nairobi from 18th – 20th September 2023. The

WWQA has organised this event to promote local dialogue, engagement, and exchange; to highlight how the water quality data can be transformed into practical local action and how, as a result, all members of society can maintain a permanent dialogue with decision-makers at a supranational level to advance issues relating to water quality.

Development aid experts, scientists and water experts are invited to actively observe, learn from, and engage with the members of the WWQA and its workstreams. As was the case in the WWQA 2022 Conference held in Konstanz, Germany, Local Water Forums will be a key element of the event. They are composed of local politicians, businesspeople, and researchers, but most importantly of all, ordinary citizens representing all genders, ethnic groups, low-income sectors, and the full social reality of where they live, who have become engaged in the issue of water quality together with neighbourhood cultural actors capable of communicating the importance of water quality and stimulating an emotional response. They will be joined by Youth organisations who have recognised the need to not only become engaged but, more importantly, to initiate and lead actions that address issues that will directly affect the future of their generation and the future of their respective communities. Technical workstreams of the Alliance will also present on water quality data, modelling, status, and how this feeds into the Pathway to the World Water Quality Assessment.

The conference will be organized as an in-person event given the nature of engagement and discussions that form the basis to the agenda. Some sessions will be streamed.

For those wish to attend please [register here](#)



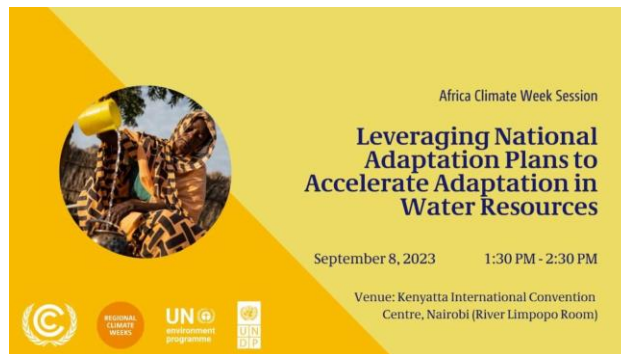
UNEP Adaptation Events at African Climate Week

Leveraging National Adaptation Plans to Accelerate Adaptation in Water Resources

When: Friday 8th September at 1:30pm-2:30pm (East Africa Time)

Room: River Limpopo

This side event, co-organized by UNEP and UNDP, will take the form of an interactive panel discussion on National Adaptation Plan (NAP) actions related to water in four African countries. The event will take the form of a moderated chat show-style discussion. By the end of the event, the audience will have a greater understanding of the complexities of identifying, prioritizing and implementing NAP/NDC priority adaptation actions related to water. A secondary outcome is to increase the understanding of moving from incremental, one-off actions to planning for transformational adaptation.



Report Launch : Wastewater- Turning problem to Solution

The global water, and especially water quality, crisis is worsened by wastewater from kitchens, bathrooms, toilets, industrial effluent, agricultural effluent, stormwater, and urban run-off. Chemicals and excessive nutrients in wastewater degrade ecosystems, contributing to food insecurity and other social issues. Today, only 11 per cent of the world's treated wastewater is reused and around half of the world's untreated wastewater still enters rivers, lakes, and seas with huge impacts on water quality.

Wastewater is a growing health and environmental threat, accounting for almost as much global warming emissions as the aviation industry. However, with the right policies, wastewater could provide alternative energy to half a billion people, supply over ten times the water provided by current global desalination capacity and offset over 10% of global fertilizer use. The UN Environment Programme (UNEP) under the umbrella of the Global Wastewater Initiative (GWWI) and GRID-Arendal have released in August a report 'Wastewater. Turning problem to solution'. This report urges governments and businesses to treat wastewater as a circular economy opportunity and calls for three key actions to manage wastewater: reduce the volume of wastewater produced, prevent and reduce contamination, and manage wastewater to capture resources that can be safely reused.

Reusing nitrogen, phosphorous, and potassium from wastewater would help reduce dependence on synthetic fertilizers, offsetting 13.4% of the global agricultural nutrient demand. Proper wastewater management has the potential to irrigate around 40 million hectares, an area equal to Paraguay's size. Additional resources that can be recovered from wastewater include raw materials for producing paper, polymers, pesticides, rubber, paint, biodiesel, food preservatives, fireproofing and waterproofing fabrics, medical products, jewelry, food packaging, hygiene, and other products.

Improving water management and reuse is a complex challenge, but countries worldwide have experience building on and scaling up. The report highlights examples of successful wastewater management from both high- and low-income countries, including the Caribbean, China, Colombia, Denmark, Egypt, Germany, India, Israel, Namibia, Senegal, Sweden, Singapore, the Solomon Islands, and Tunisia.

To see more information and download the report, please see here:

<https://www.unep.org/news-and-stories/press-release/down-drain-lies-promising-climate-and-nature-solution-un-report>

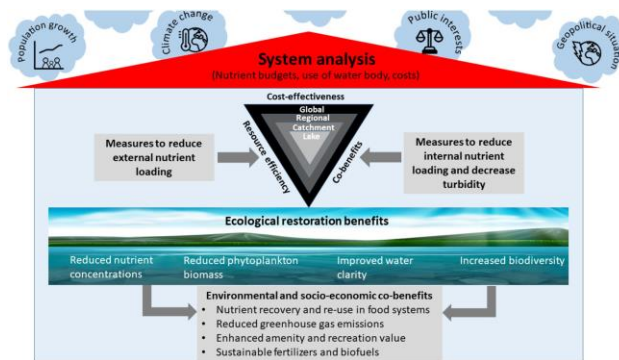


5 - Image from: <https://tinyurl.com/mrtkht45>

Sustainable Lake Restoration - From Challenges to Solutions

Sustainable lake restoration: From challenges to solutions: WWQA provided a forum for discussions on sustainable lake management and restoration for this [new paper just out on WIREs Water](#):

Unsustainable nitrogen (N) and phosphorus (P) use has accelerated widespread eutrophication of water bodies globally, resulting in water quality issues, cyanobacterial blooms, habitat loss, biodiversity decline, and human health risks. Eutrophication exacerbates problems like oxygen depletion, elevated pH, and greenhouse gas emissions from sediments, compromising water usability for drinking and irrigation. These effects can lead to loss of habitat, biodiversity, and amenity value and cause human health risks associated with harmful algal blooms. Restoration is an important approach in lake water quality management. Restoration efforts, focused on improving ecological health and ecosystem services, have shown notable success, particularly with advanced wastewater treatment technologies. There is increasing evidence that freshwater restoration and advanced wastewater treatment technologies offer high benefit-to-cost ratios and can mitigate various environmental challenges, including greenhouse gas emissions, potentially avoiding trillions of dollars' costs to society.



6 - Image from <https://tinyurl.com/3pyxexhz>

IWRA XVIII World Water Congress

Adaptation to climate change requires a strong knowledge of its impacts, especially on water resources and its uses (for municipalities, agriculture and energies) and related ecosystems: we cannot manage what we do not know. The sustainable quantitative and qualitative management of natural resources, water in particular, and the control of global change are at the heart of global issues. This session will discuss building knowledge regarding drought, rainfall, discharge and evaporation, and more generally, "multi-sensor" satellite data that can be mobilized, since these data are essential for water resource management and climate change adaptation. Hydro-meteorological Information systems can integrate both data from classical in situ monitoring networks and satellite altimetry data. For instance, the session will present the Surface Water Ocean Topography (SWOT) launched in December 2022 dedicated to altimetry data collection, jointly developed by the French space agency (CNES), and NASA, with the objective to explore for the first time almost all of the Earth's surface water. Objectives:

The objectives of this session are to:

- *show how satellite monitoring can complete in situ monitoring.*
- *present innovative Water Information Systems*
- *promote an improved cooperation by sharing data*

All in all, it all comes to demonstrating why data is so crucial for decision-making and how it can be best produced, processed, tested, validated and finally shared and disseminated. It will also address the issue of innovation: it has undergone dazzling development in the water sector. It creates both opportunities and a risk to overlook the solid foundation of data & information systems on which even the most innovative technologies rely on.

For more info: <https://www.worldwatercongress.com/>



7 - Image from <https://tinyurl.com/2n8wn4rm>

Job Openings

Are you passionate about sustainable development and do you want to become part of DHI's UN Environment Programme collaboration centre? Then you might be our new colleague!

For more info click : [DHI Programme Advisor to support UNEP](#)

UNV job opening in FEU: <https://app.unv.org/opportunities/1733849610717440>

In the October Issue of YEMAYA

- *The Africa Use Cases*
 - *Outcomes from the WWQA 2023 Annual Conference*
 - *The October Interview*
 - *Results from the SEP workshop*
 - *The importance of Nature Based Solutions*
 - *The WWQA BULLETIN BOARD*
-

Please follow our social media handles at:

Facebook: <https://www.facebook.com/profile>

Twitter: https://twitter.com/UN_WWQA

LinkedIn: <https://www.linkedin.com/company/wwqa/>



*Unless otherwise indicated, all contributions are by the WWQA coordination team.

YEMAYA is a publication of the World Water Quality Alliance. The World Water Quality Alliance is convened by the United Nations Environment Programme and supported by the Swiss Confederation. All rights are reserved. For further information about the World Water Quality Alliance see the website www.wwqa.info or contact the WWQA Coordination Team at wwqa-coordination@un.org

YEMAYA welcomes articles, opinions and audio-visual material related to the issue of water quality. Please send any contribution to wwqa-coordination@un.org with a short 100-word biography, the name of your organisation and a phone number where you can be contacted.