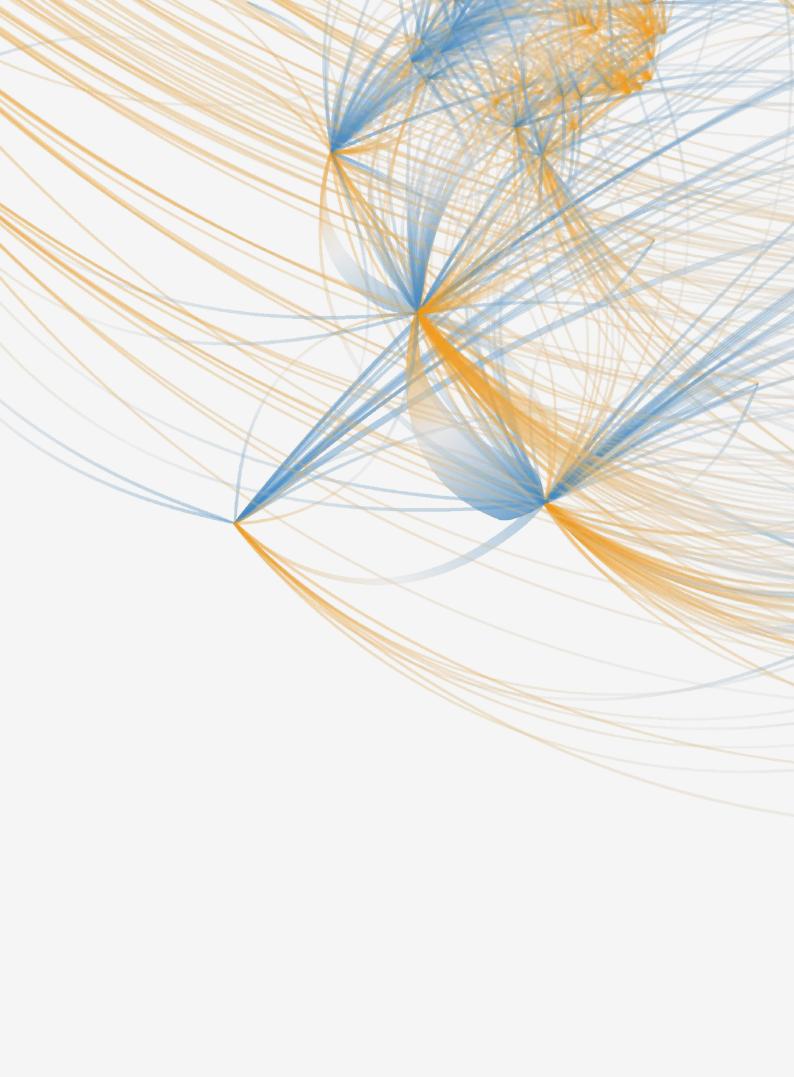


TILE ECONOLIS SERVICES CONTROL OF THE HYDROLOGICAL CYCLE

Valuing the Hydrological Cycle as a Global Common Good

Executive Summary



Preface by the Co-Chairs

We need a sea change in how we understand and act on water. The purpose is clear: bring back stability to the global water cycle, deliver on the human right to safe water, achieve food security and development that works for all, and keep our planet safe for generations to come.

The global crisis of water hurts the most vulnerable first, and hardest. More than 1,000 children under five die every day from unsafe water and lack of sanitation. Yet no community or economy will be spared the consequences of a water cycle that is out of kilter - itself the result of our collective actions over decades. Most dangerously, we will fail on climate change if we fail on water. We will also fail on each and every one of the Sustainable Development Goals.

As Co-Chairs of the Global Commission on the Economics of Water, we are convinced that the world can turn the tide on this crisis. But only if we acknowledge why existing approaches have failed, embrace a fresh policy lens, and move with the boldness and urgency that the crisis demands.

The Commission's report sets out the shifts required to drive radical changes in how water is valued, managed, and used. The new economics of water begins by recognising that the water cycle must now be governed as a global common good, that can only be fixed collectively, through concerted action in every country, collaboration across boundaries and cultures, and for benefits that will be felt everywhere.

Critically, we must value water properly to reflect the multiple benefits it provides as Earth's most precious resource, including the roles of green water – the water stored as soil moisture and in vegetation - in sequestering carbon and sustaining nature's ecosystems. We must ensure that prices, subsidies, and other incentives are brought together to ensure that water is used more efficiently in every sector, more equitably in every population, and more sustainably. We must shape economies to allocate and use water properly from the start and avoid having to fix problems after they occur. And we must organise all stakeholders, from local to global, around the missions that get to the heart of the global water crisis, so as to spur a wave

of innovations, capacity-building and investments and evaluate them not in terms of short-run costs and benefits but for how they can catalyse long-run, economy-wide benefits.

Our report, The Economics of Water: Valuing the Hydrological Cycle as a Global Common Good, is inspired by, and builds on, the game-changing Stern Review on the Economics of Climate Change and Dasgupta Review on the Economics of Biodiversity. We hope that the trilogy provides a pathway for integrated thinking and action on these fundamentally interrelated challenges of sustainability.

The Commission submits this report to help advance new thinking and actions under the multilateral water agenda, including the important work of the UN Special Envoy for Water and that being pursued under the UN System-wide Strategy for Water and Sanitation, and the initiatives leading to the UN Water Conference 2026. We also call for water's critical role, and the need for collective action to restore a stable hydrological cycle, to be recognised in deliberations under the UN Framework Convention on Climate Change (UNFCCC), Convention to Combat Desertification (UNCCD) and Convention on Biological Diversity (CBD).

As Co-Chairs, we are grateful to our colleagues on the Commission, whose wisdom and diverse experiences were integral to our work. We also benefitted greatly from insights from experts from across the public and private sectors, academia, and civil society. We also thank the Government of the Netherlands as the convener of our Commission, for having entrusted us with this vital task, and the OECD for their invaluable support.

The Commission's recommendations are only the beginning of a new journey. It must be a journey that involves continuous dialogue, and that makes inclusivity an action, not just a goal. One that involves all voices including youth, women, marginalised communities, and the Indigenous Peoples on the frontlines of water conservation. One that catalyses a new understanding among leaders and mayors, civil society activists and social scientists, and that motivates businesses to do well by contributing to the public good. A journey that ultimately creates a new social contract: to achieve justice and dignity everywhere and sustains the benefits of nature's ecosystems for humanity.



Tharman Shanmugaratnam
President, Republic of Singapore



Mariana Mazzucato
Professor in the Economics of Innovation and
Public Value at University College London and
Founding Director of the UCL Institute for
Innovation and Public Purpose



Ngozi Okonjo-IwealaDirector-General, World Trade Organization



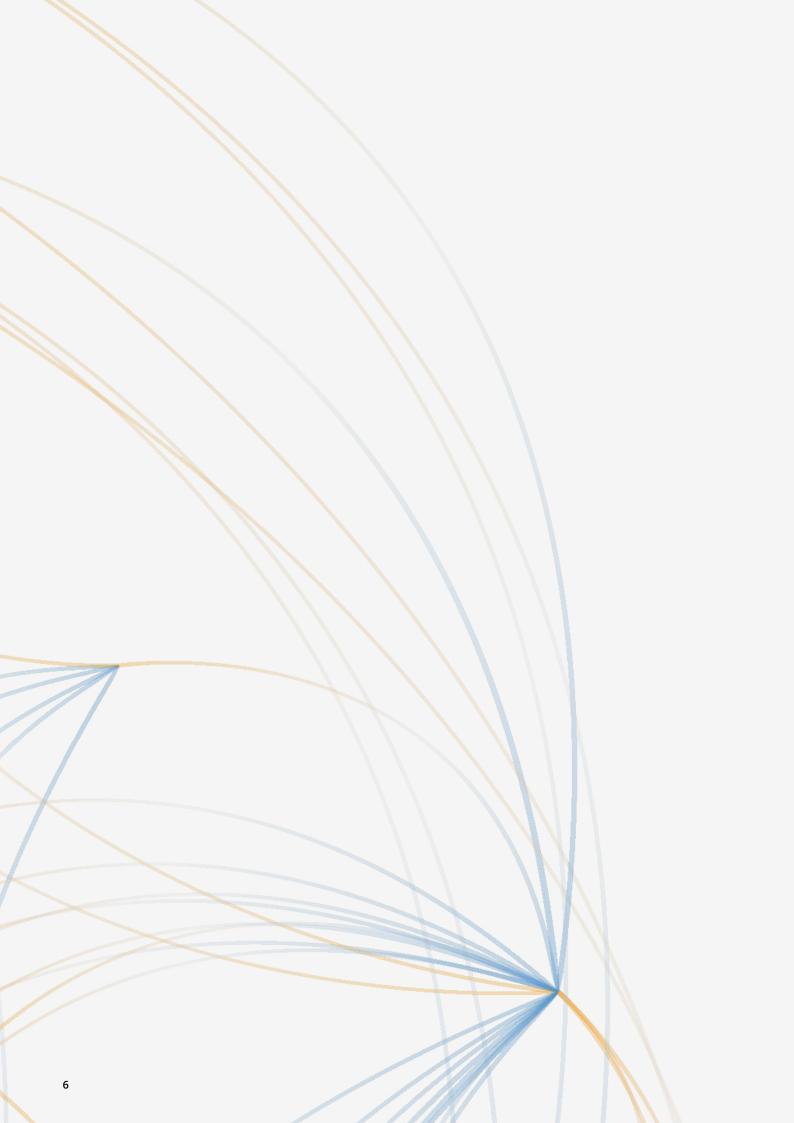
Johan RockströmProfessor in Earth System Science at University of Potsdam and Director of the Potsdam Institute for Climate Impact Research



Henk OvinkExecutive Director, Commissioner, Global
Commission on the Economics of Water

"Creating the Global Commission on the Economics of Water, we aimed to bring together leaders across generations, expertise and cultures, beyond water. I am convinced that the watercycle needs to be understood and valued by everyone. Working together and fostering our collective perspectives, we were able to capture the true values of both green and blue water and imagine just water partnerships. We want to inspire and provoke, because we must reshape our shared relationship with water for sustainable, impactful and just transitions."

Henk Ovink



Preface by youth

A tilted hydrological cycle is fundamentally an intergenerational issue. Since its launch at the World Water Forum in Bali, the Youth Water Agenda has engaged with hundreds of young people worldwide who recognise the stakes and are committed to protecting our global common good. However, current market and societal structures significantly limit young people's ability to fully participate in properly valuing and governing of the hydrological cycle as a global common good.

The continued overexploitation and mismanagement of water by current generations are pushing the hydrological cycle increasingly out of balance, amplifying global instability. This has obstructed our ability to tackle the climate and biodiversity crises, meaning that both current and future generations are already facing and will continue to face even harsher periods of water scarcity and floodings, leading to increased economic hardship, social conflict, and environmental degradation. We, the youth and generations to come, will most acutely experience the consequences of today's inaction, and we have the right to meaningfully participate in shaping the world we will inherit.

As young people, we must (1) ensure that blue and green water resources are used sustainably and replenished so that future generations inherit a system capable of supporting their needs; (2) commit to protecting the balance of the hydrological cycle so that both present and future generations have equitable access to clean and sufficient water, including for productive use, and prevent the concentration of resources or pollution in ways that would disadvantage those to come; and (3) hold to account the current generation to act as stewards of our global common good, taking responsibility for the long-term impacts of their decisions on water, ecosystems and beyond.

A key mission of the Youth Water Agenda is to secure dignified livelihoods for current and future generations in a world where uncertainty is rapidly becoming the norm. We believe that true intergenerational justice can only be achieved if young people are meaningful engaged and systematically included within decision-making

processes across governing institutions, multilateral systems and frameworks.

Strong investments in transforming educational systems are imperative to ensure we have a generation well-prepared to safeguard the hydrological cycle. Young engineers, economists, farmers, entrepreneurs, researchers, bankers and policymakers are uniquely positioned to foster a systemic understanding of water-related challenges and spark transformational shifts. The youth potential is immense, yet, many areas of value creation within our societies - including academia, industry, and policymaking - remain hierarchical and dominated by older generations. Therefore, we urge governments at all levels to invest in youth and shape today's labour markets to integrate young professionals and their voices into the economy. By investing in education and creating green jobs for young professionals, we can unlock exponential growth in intergenerational innovation and research across sectors, address systemic challenges and drive change, while scaling up and supporting existing youth-led solutions and talent.

In building a safe and just water future, as endorsed by the Global Commission on the Economics of Water, young people must be continuously included, consulted and adequately compensated at each step of the process, with robust accountability mechanisms, to promote an intergenerational approach to water governance. Shaping markets means investing in youth today a condition for success tomorrow.



Elizabeth Wathuti, on behalf of the Youth Expert Group

Founder, Green Generation Initiative, Commissioner, Global Commission on the Economics of Water

Executive Summary

From crisis to opportunity

The world faces a growing water disaster. For the first time in human history, the hydrological cycle is out of balance, undermining an equitable and sustainable future for all.

We can fix this crisis if we act more collectively, and with greater urgency. Vitally too, restoring stability of the water cycle is critical not only in its own right, but to avoid failing on climate change and safeguarding all the earth's ecosystems, as well as on each and every one of the Sustainable Development Goals (SDGs). It will preserve food security, keep economies and job opportunities growing, and ensure a just and liveable future for everyone.

Decades of collective mismanagement and undervaluation of water around the world have damaged our freshwater and land ecosystems and allowed for the continuing contamination of water resources. We can no longer count on freshwater availability for our collective future. More than 1,000 children under five die every day from illnesses caused by unsafe water and sanitation. Women and girls spend 200 million hours each day collecting and hauling water. Food systems are running out of fresh water, and cities are sinking as the aquifers underneath them run dry.

We have, fundamentally, put the hydrological cycle itself under unprecedented stress, with growing consequences for communities and countries everywhere. Our policies, and the science and economics that underpin them, have

also overlooked a critical freshwater resource, the "green water" in our soils and plant life, which ultimately circulates through the atmosphere and generates around half the rainfall we receive on land.

Most gravely, while itself a victim of climate change, the degradation of freshwater ecosystems including the loss of moisture in the soil has become a driver of climate change and biodiversity loss. The result is more frequent and increasingly severe droughts, floods, heatwaves, and wildfires, playing out across the globe. And a future of growing water scarcity, with grave consequences for human security. Nearly 3 billion people and more than half of the world's food production are now in areas where total water storage is projected to decline.

We need bolder and more integrated thinking and a recasting of policy frameworks to address these challenges. The Global Commission on the Economics of Water (GCEW) calls for a new economics of water:

 One that recognises the hydrological cycle as a global common good: understanding that it connects countries and regions through both the water that we see and atmospheric moisture flows; that it is deeply interconnected with climate change and the loss of biodiversity with each rebounding on the other; and that it impacts on virtually all the SDGs.

- One that transforms water governance at every scale, from local to river basin to global, to ensure it is governed more effectively and efficiently, delivers access and justice for all, and sustains the earth's ecosystems.
- One that brings together fundamental economic concepts and tools, to value water properly to reflect its scarcity and the multiple benefits it provides as the Earth's most precious resource.
- One that tackles externalities caused by the misuse and pollution of water but shifts from fixing them after the fact to shaping economies so that water is used efficiently, equitably, and sustainably from the start.
- One that spurs a wave of innovations, capacity-building and investments, evaluating them not in terms of short-run costs and benefits but for how they can catalyse long-run, economy wide benefits and hence dynamic efficiency gains through learning, scale economies and cost reductions.
- One that recognises that the costs entailed in these actions are very small in comparison to the harm that continued inaction will inflict on economies and humanity.

Why we must govern the water cycle as a global common good

It starts with recognising that the problems we face are not only local. Communities, countries and regions are interdependent not just through transboundary blue water – as globally, more than 263 watersheds and 300 aquifers span political boundaries - but through atmospheric moisture flows that travel great distances.

Current approaches tend to focus on water resources rather than the economic drivers that shape the water cycle. They also deal predominantly with the water we can see – the "blue water" in our rivers, lakes, and aquifers. They overlook a critical freshwater resource, namely "green water" – the



water stored as soil moisture and in vegetation, which returns to the air through evaporation and transpiration. As it circulates naturally, green water generates around half of all rainfall over land, the very source of all our freshwater.

Further, current approaches too often assume stable patterns of water supply year after year, but this is no longer true: as land-use changes and global warming destabilise the water cycle, rainfall patterns are shifting.

Most dangerously, disruptions to the water cycle are deeply intertwined with climate change and the depletion of the world's biodiversity, with each reinforcing the other. A stable supply of green water in soils is crucial to sustaining the natural systems that absorb more than a quarter of the carbon dioxide emitted from fossil-fuel combustion.

Yet the loss of wetlands and soil moisture, together with deforestation, is depleting some of the world's most important carbon stores, accelerating global

warming. In turn, rising temperatures trigger extreme heatwaves and increased moisture loss, severely drying landscapes and heightening the risk of wildfires. When viewed holistically, the impact of water scarcity on both people and nature now jeopardises virtually every one of the SDGs. Left unchecked, it will result in growing gaps in nutrition in populations already at risk, the greater spread of diseases, widening inequalities within and across nations, and increased conflicts and forced migration.

The water cycle must therefore be governed as a global common good: recognising, first, our interdependence through both blue and green water flows; second, the wicked interaction between the water crisis, climate change, and the loss of the planet's natural capital; and third, how water flows through all our 17 SDGs. A destabilised water cycle is a large-scale collective and systemic problem, which can only be fixed through concerted action in every country and collaboration across boundaries and cultures.

A shared understanding of the common good is crucial. Otherwise, what might look good for one country today could easily create problems for that same country tomorrow, as well as for others around the world.

The costs of inaction

The human and economic costs of inaction will be substantial. Globally, total water stored on and beneath the Earth's surface is unstable and declining across areas where populations and economic activity are concentrated, and crops are grown.

- High-population density hotspots, including northwestern India, northeastern China and south and eastern Europe, are particularly vulnerable.
- The poorest 10% of the global population obtain over 70% of their annual precipitation from land-based sources and will be hardest hit by deforestation.
- If rainfall that originates from deforestation hotspots were to disappear, growth rates in Africa and South America could drop significantly

 by 0.5 and 0.7 percentage points, respectively.
- Intensely irrigated regions tend to see declines in water storage with some experiencing a rate of decline twice as fast as other regions. If current trends persist, extreme water storage declines could make irrigation unfeasible, leading to a 23% reduction in global cereal production.

The economic impacts of such trends will be severe. The combined effects of changing precipitation patterns and rising temperatures due to climate change, together with declining total water storage and lack of access to clean water and sanitation imply that high-income countries could see their GDPs shrink by 8% by 2050 on average, while lower-income countries could face even steeper declines of between 10% and 15%. Disruptions of the hydrological cycle therefore have major global economic impacts.

The water challenge becomes even more pressing when we recognise how much water each person needs daily to live a dignified life. While 50 to 100 litres per day is required to meet essential health and hygiene needs, a dignified life – including adequate nutrition and consumption – requires a minimum of about 4,000 litres per person per day. Most regions cannot secure this much water locally. Although trade could help distribute water resources more equitably, it is hampered by misaligned policies and the water crisis itself.

Reframing the economics of water: Shaping markets for efficiency, equity, and environmental sustainability

We need a new water economics to redefine the way we value water and govern the water cycle as a global common good. At its heart is the recognition of the connection between environmental sustainability, social equity, and economic efficiency.

Historically, these "Three 'Es" (3Es) have been pitted against each other. The GCEW envisions the 3Es as interdependent, equally important, and best implemented together through a more robust economics.

A core shift is to correctly price water and allocate subsidies to achieve both its efficient use and access for all. The widespread under-pricing of water today encourages its profligate use across the economy. It can also quite unwisely skew the locations of the most water-intensive crops, and water-guzzling industries such as data centres and coal-fired power plants, to areas most at risk of water stress. Further, we must recognise the value of green water, including its co-benefits, in decisions on land use planning.

Water is often taken for granted as an abundant gift from nature, when in fact it is scarce and costly to provide to users. Economic modelling tells us adjusting water tariffs to account for water scarcity and its externalities can drive significant GDP gains, particularly in water-scarce, low- and middle-income countries. Proper pricing reduces wastage, promotes more productive use, and ensures that water is treated as the valuable resource that it is.

This impact can be amplified by eliminating harmful subsidies in water-intensive sectors or redirecting them towards water-saving solutions and providing targeted support for the poor and vulnerable. By doing so, we can unlock a triple dividend: improved water management enables greater prosperity and economic growth, the benefits are pro-poor and enhance equity, and environmental sustainability is promoted through improved management of water resources.

To actively put the 3Es at the centre of our response, calls for recognising the power of economic incentives in promoting better stewardship of water resources. This must include recognising both the positive externalities that contribute to the full value of water, including multiple benefits of a stable hydrological cycle, and tackling the negative externalities caused for example by water pollution and over-abstraction. Further, our economic framing should shift from sorting out problems after the damage has been done to preventing them from occurring in the first place. We should shift from fixing externalities after the fact to shaping economies, so that water is allocated and used efficiently, equitably, and sustainably from the start.

Indeed, markets across our economies – from agriculture and mining to energy and semiconductors – must be reshaped to achieve this. Opportunities for innovation around our water challenges need to be assessed not in terms of short-run costs and benefits but in terms of how they can catalyse long-run, economy wide benefits and hence dynamic (rather than static) efficiency gains. This requires understanding the dynamics of increasing returns to scale, where cumulative investments generate learning, innovation and cost reductions.

Five mission areas to address the water crisis

To radically transform both water use, and supply, requires a shift from siloed and sectoral thinking to an economy-wide approach to the entire water cycle including both blue and green water, that shapes and crowds in innovations. It will require new commitments from many actors and sectors and new roles for governments – including a mission-oriented approach to meeting the most fundamental water challenges. The GCEW offers five such missions, as critical adaptive pathways towards safe and just water futures.

It means reorienting the policy tools – pricing, subsidies, regulations, procurement, grants, loans – and the roles of the institutions, such as public development banks, water utilities, state-owned enterprises, to achieve these critical goals.

Governments can catalyse investments in water in every sector through greater certainty in policies

Zooming in on agriculture in Africa

As climate change advances, we have a critical window for transformation of agriculture in Africa, where food and nutritional demands are certain to grow significantly in coming decades. Many parts of Africa are well endowed with shallow groundwater resources. Around 255 million people in poverty live above this vast and largely untapped resource. This condition presents an opportunity to boost crop yields and build food security without investments in potentially costly, environmentally damaging and socially disruptive large storage dams. The availability of affordable solar-powered pumps enables farmers to draw groundwater at almost zero marginal extraction cost.

These should be combined with effective initiatives and policy incentives to address risks of over-abstraction of groundwater and to groundwater-dependent ecosystems. Steps should be taken to reform land-use and farming practices to conserve soil moisture and scale up rainwater harvesting systems to enhance the resilience of agriculture which is very largely rainfed in Africa. There is ample opportunity to unleash a revolution in more sustainable food production to meet both Africa's and global needs.

and regulation, and especially through patient investment with a long-term direction. They must also establish more symbiotic partnerships with the private sector, including incorporating conditionalities in contracts, such as to ensure high standards of water use efficiency and environmental protection.

Policymaking must become more collaborative, accountable, and inclusive of all voices, especially those of youth, women, marginalised communities, and the Indigenous Peoples who are on the frontlines of water conservation.

We can and must succeed in tackling five missions that address the most important and interconnected challenges of the global water crisis.

Mission 1: Launch a new revolution in food systems

The Green Revolution more than a half century ago significantly increased agricultural yields and lifted large populations out of poverty. We now need another major transformation in agriculture to reshape the reliance on large quantities of water and nitrogen-based fertilisers, so as to sustain the planet, while at the same time strengthening farmers' incomes and delivering nutrition equitably

across populations. We must make radical gains in water productivity – maximising yield per drop of water – and in preserving soil moisture.

This can be achieved by scaling up access for traditional farmers to micro irrigation techniques and the use of climate-resilient seed variants and cropping patterns. While water irrigation will inevitably have to grow in the next few decades to meet growing food needs, a combination of these measures is estimated generate savings in irrigated water consumption of a quarter or more by 2050. To work best, the measures should be coupled with regulatory measures to cap water withdrawals, to ensure water savings are not re-channelled back into expanding irrigated areas or used to switch to more water-intensive crops.

It also requires a major step-up in adoption of regenerative agriculture systems to preserve soil health – including by storing organic carbon in the soil and improving soil water retention – with the aim of covering at least 50% of global cropland by 2050. Achieving these systems will require leveraging large agroindustry coalitions to transform supply chains, as well as creating farmer-centred solutions that enhance demand for regenerative agricultural products and restoring sustainable traditional techniques.



Critically too, we must reduce our collective dependence on water-intensive foods. We should aim to increase the share of plant-based sources to about 30% of proteins in people's diets by 2050, particularly in higher income nations which have high red meat and dairy consumption. Examples already show we can move in this direction through R&D and culinary innovations, and low lift interventions that do not remove a sense of individual choice. This global shift is ambitious, and consumer habits will take time to evolve. However, they are necessary for everyone's good as animal-based foods are major drivers of the agriculture sector's impact on water use, greenhouse gas emissions and natural habitat loss.

Mission 2: Conserve and restore natural habitats critical to protect green water

Changes in land use over the last half century have had the largest negative impact on freshwater ecosystems. Agricultural expansion in particular has been the main driver of deforestation, altering green water's key role in the hydrological cycle, hence impacting rainfall patterns, lowering agricultural yields and threatening food security itself, particularly as 80% of the total cropland and more than half of the world's food production is rainfed.

It is therefore critical to integrate the benefits of green water into how we manage land use and natural habitats and guide investments for their conservation. To safeguard this precious resource, we should aim to conserve 30% of the world's forest and inland water ecosystems and restore 30% of degraded ecosystems by 2030, in line with the Global Biodiversity Framework. Priority should be given to protecting and restoring those areas that can best contribute to a stable water cycle. Efforts must also be made to engage with and support Indigenous Peoples, who are stewards of a quarter of the planet's land and about 40% of remaining natural lands worldwide.

Mission 3: Establish a circular water economy

Wastewater reuse holds significant, untapped potential. About 8% of today's total freshwater withdrawals, close to the total amount distributed by municipalities worldwide, can be reclaimed from wastewater every year. Massive inefficiencies also exist in water distribution, with roughly 40% of urban water lost through leakage, for example from ageing pipelines. The costs saved by minimising these leaks are substantial and could be reinvested to extend the reach of water infrastructure and ensure its regular upgrading.

We must establish a circular water economy that captures the full value of every drop. Industrial strategies that catalyse and shape technologies and systems that are greener, more inclusive, and more resilient are required. For example, breakthroughs in membrane and solvent-based technologies are driving down costs of water recycling, enabling a future where each drop of used water can eventually yield another drop. Treatment and reuse of wastewater within business facilities must also be scaled up and backed by clear regulations and standards to protect public safety. These moves are more beneficial if water saved is directed towards conservation, not towards furthermore intensive water uses.

Beyond just water, wastewater treatment offers the potential to recover valuable resources such as nutrients, energy, heavy metals, and minerals – generating new revenue streams and enhancing the sustainability of our water systems.

Mission 4: Enable a clean-energy and Alrich era with much lower water intensity

Renewable energy, semiconductors and artificial intelligence (AI) are defining a new economic era. We must ensure their growth does not exacerbate

global water stresses or constrain the benefits they provide.

Water-efficient clean energy solutions are being introduced and must now be scaled up – from waterless cleaning for solar panels, to second-generation biofuels, to water-efficient cooling towers for nuclear and geothermal plants.

Setting higher standards of both energy and water efficiency for producing semiconductor chips and operating data centres will speed up the adoption of viable solutions and spur innovation. Changes are also needed in how the world mines and produces metals which are foundational to both the clean energy transition and AI revolution, especially by scaling up the adoption of closed-loop water systems.

Mission 5: Ensure that no child dies from unsafe water by 2030

We can no longer ignore the large-scale human tragedy, including innumerable child deaths, caused by unsafe water and sanitation. Unacceptably too, the problem of contaminated water continues to grow, undermining water's ecosystem services, economic development, and human well-being.

Cities such as Phnom Penh in Cambodia, Porto Alegre in Brazil and others in China have shown that it is possible to bring water and sanitation to poor and vulnerable communities. However, much more needs to be done in every region to tackle this problem, through solutions for both the resilient supply of clean water and its more efficient and equitable use.

We need a paradigm shift to ensure access to rural and hard-to-reach communities. Advances in technologies and capacity-development have reached a point where decentralised water treatment and sanitation systems are a viable complement to centralised utilities. Affordable, off-grid water treatment solutions can now deliver clean water to these communities, and with much less discharge or pollutive sludge. Low-cost point-of-use chlorination can also be scaled up in low-income countries.

National public finance and central government funding should support decentralised systems and provide technical assistance to local districts to enhance water and sanitation capabilities. It is also vital to rebuild resilience in water supply by restoring and expanding wetlands and other natural storage solutions.

Equally, utilities and governments must manage water demand more effectively and equitably, and improve cost-recovery so as to enable continuous maintenance and investments. Tariff and subsidy structures should incentivise water conservation particularly by the largest users while supporting the poor.

Critical enablers of change

The GCEW has identified critical enablers to successfully tackle these five missions. They reflect key dimensions of the critical new way of governing, nationally and internationally, to benefit both people and the planet.

Govern partnerships, property rights, and contracts for an efficient, equitable and sustainable future

Around the world, in cities and countries there is an unfulfilled need for (forging) enduring partnerships to deliver efficient, equitable, and environmentally sustainable water solutions.

Among water utilities, both public and private operators have frequently struggled to provide cost-effective, accessible, and resilient services. Symbiotic partnerships, with collaborative decision-making and contract designs that steer the private sector towards public value creation, and with an appropriate sharing of risks and rewards, can address this need.

Importantly, regulatory frameworks must focus on outcomes-based performance measures, regarding both operational efficiencies and long-term system resilience. Regulators should also enable regular tariff adjustments to reflect the true costs of water provision and support timely maintenance and reinvestment, without comprising incentives for operational cost-efficiency. They should allow investors to achieve viable economic returns, whilst guarding against monopolistic pricing.

We must also recognise the impact of legacy water rights tied to property ownership or special interest influences, which have especially affected Indigenous Peoples and local communities without modern titles to land.

Solutions may include renegotiating existing contracts, setting conditions on new agreements, and preventing water rights from becoming entrenched as quasi-property rights that hinder necessary reallocation efforts.

Shape finance for a just and sustainable water future

Water, as a sector, and water efficiency across every sector, remain severely underfunded.

Achieving SDG 6 alone will require around \$500 billion per year in additional investments in lowand middle-income countries. Yet, this funding gap is only part of the story. Far greater investments are needed to conserve both blue and green water and scale up innovations for more efficient water use across agriculture, industry, mining, and other sectors that are critical for stabilising the water cycle – underpinned by the new economics of water advocated in this report.

Public investment in water security suffers from puzzling neglect, in too many countries. All too often, the approach to water infrastructure has also been short-term and reactive, leading to neglected assets, frequent service disruptions and leakage – culminating in higher long-term costs.

Private investment in the water economy has been sparse, and most so in developing countries. The under-pricing of water in many cases weakens the case for investment. Investors have also been deterred by the high upfront investments and long payback periods typically required in water infrastructure, without the regulatory consistency that is needed to reduce risks.

We need a new understanding between governments and private investors, to reduce and ensure a fair distribution of risks, and to raise the quantity, quality and reliability of finance for water.

Governments – national and local - need to provide for realistic tariff adjustments and greater certainty in policies and regulation, as well as reprioritise investments in water in public finance itself. There is also a large opportunity to reduce and redirect the massive direct and indirect financial subsidies which currently contribute to the overuse of water and pressure on the hydrological cycle. Environmentally unsound and inefficient subsidies in agriculture and water and sanitation are estimated to be at least US\$700 billion per year.

The discount rates used to assess investments in water infrastructure and ecosystem preservation should take into account their long term – including intergenerational – social, economic and environmental benefits. Further, there has to be concerted effort to recognise the value of green water, which is essential to develop schemes for Payment for Ecosystem Services.

Development banks – national, regional, and multilateral – must also be regeared to play catalytic roles across their activities, to mobilise vastly greater amounts of private finance, including the patient, long-term finance for water infrastructure projects.

We should establish Just Water Partnerships to ensure larger and more reliable financing of water in low and lower- middle income countries to expand water infrastructures and scale up innovations, serve vulnerable communities and protect ecosystems. These partnerships, involving development finance institutions and national authorities, should seek to build capacity and strengthen the pipeline of water projects to mobilise investments and manage water sustainably. They should make more active and bolder use of the menu of instruments available to catalyse private investments, including firstloss guarantees, concessional finance, and coinvestment arrangements. There is also untapped potential for diversifying risks, by bundling water projects across sectors and countries, to attract funding from institutional investors.

Harness data as a foundation for action

Data is critically needed to transform how we value and govern water.

- For governments, water data is key to sustainable water management at every scale – from river basin to inter-basin to sensitive evaporation sheds. Robust water metrics allow governments to estimate externalities and hold polluters accountable for the harm they cause. They also support early warning systems for climate and water extremities.
- For private entities, data is essential for mitigating water and climate risks in their operations and supply chains, and steering investment towards practices that are just and sustainable and do not destabilise the hydrological cycle.

 For citizens, access to good water data empowers them to engage in water-related decision-making and contribute to the development of locally relevant solutions. It also enables consumers to make informed choices, which could influence corporate decisions.

The water data landscape today is highly fragmented and has large gaps. Alarmingly, data collection, quality and comparability have declined in recent years.

We should work towards a new global water data infrastructure to enable science-based decision making, using and building on data at every level of the water cycle including local and Indigenous knowledge. To achieve this goal, data collection within water basins and globally, and interoperability of data reporting must be strengthened to ensure methodological consistency and the capacity to benchmark outcomes and thus highlight best practices.

We should also generate momentum for market-based disclosure of corporate water footprints through actions by coalitions involving the private sector and civil society organisations, and expedite work towards regulatory standards that mandate disclosure, taking lessons from the journey towards carbon disclosure. Regulatory requirements should aim to throw light on the double materiality of companies' dependence on water as well as the impact of their operations on water resources and land use changes.

Crucially too, we must develop pathways to value water as natural capital. Though still in its early stages, this initiative is an important enabler for responsible stewardship of freshwater ecosystems, and for recognising the interconnection between conserving water and reducing carbon emissions. It also enables governments and all stakeholders to evaluate the costs and benefits associated with land conversions, conservation, and restoration projects.

Build global water governance

As we have highlighted, water runs through virtually all the SDGs, impacting economies and human well-being everywhere. Further, the hydrological cycle transcends local and national boundaries, connecting us all. And water problems are reinforcing climate change and the loss of biodiversity. Yet, our current multilateral governance

of water is fragmented, incomplete and ineffective.

The UN has recently adopted the UN System-wide Strategy for Water and Sanitation focused on accelerating progress to achieve SDG 6. There are also existing legal arrangements, such as the UNECE Convention for the management of the transboundary rivers and lakes, which however only address blue water for riparian states, overlooking the critical role of green water in ecosystem and climate regulation, food security, and its interactions with blue water. It is time to consider whether and how similar governance arrangements could be applied to atmospheric moisture flows, for instance drawing inspiration from the UNECE Convention on long-range transboundary air pollution, both in its process and outcomes.

The ultimate ambition for global water governance should be the establishment of a Global Water Pact. It should recognise that water is both a local and global issue, and the hydrological cycle, encompassing both blue and green water is a collective and systemic challenge. The Pact should set clear and measurable goals to stabilise the hydrological cycle and safeguard the world's water resources for a sustainable and just water future. However, the path to such a Pact requires a careful and multi-stakeholder approach, identifying intermediate milestones and enhancing existing conventions both in water and related sectors, building on the three Rio conventions – the convention on Biological Diversity (CBD), the United Nations Convention to Combat Desertification (UNCCD), and the United Nations Framework Convention on Climate Change (UNFCCC), as well as the Ramsar Convention on Wetlands.

Reforms to global water governance must be complemented by public sector capacity building at the local, regional, and national levels. Governments require the administration and implementation capacity to design, develop, and deliver water missions with a focus on designing more symbiotic partnerships and financial arrangements and ensuring the effective governance of data and utilities.

The five critical water missions identified by the GCEW provide a starting framework. Around each of them, coalitions from public-private-philanthropic partnerships can draw on diverse expertise to tackle the water challenges. These coalitions could contribute to a broader multilateral process in the longer term. For instance, the World Bank's

Global Challenge Program on water, "Fast Track Water Security and Climate Adaptation", seeks to mobilise public and private sector resources across three broad pillars: (i) universal access to water and sanitation (ii) irrigation and water management, (iii) climate adaptation and resilience.

Addressing the root causes of the local to global water crisis, revaluing water, governing the hydrological cycle as a global common good and spurring innovative solutions, means recognising the necessity of a dialogue process that paves the way for a Global Water Pact. Such an ambitious dialogue process must involve engaging all sectors and all voices, particularly those marginalised or disproportionately affected by water scarcity and degradation, including Indigenous Peoples and local communities, women, and youth. It also means shaping a common understanding by including diverse and local perspectives of water management. It must lead to a clear action agenda, a methodology for institutional innovation and development of the capacities to see it through.

Turning the tide for a just and sustainable water future

Humanity needs a new course for water at every scale: from local sources to river basins, from national to transboundary and globally in multilateral cooperation.

The challenges we face are far from insurmountable. We can and must transform them into an immense global opportunity. One that drives economy-wide innovation and prosperity. One that forges a new social contract among all stakeholders. One with justice and equity at the centre of its efforts.

Our commission's work and proposals are just the beginning. They chart a new economics for a future where water efficiency and security can be achieved for all, where ecosystems are protected, and sustainable development can be realised, everywhere. We can turn the tide on the water crisis and create a more resilient and equitable world for generations to come.



Recommendations

The GCEW offers a set of recommendations, to value and govern water so as to stabilise the hydrological cycle, enable food security and human dignity, and keep the Earth system safe for humanity. Underpinning all our recommendations is the need for justice and equity to be key principles intrinsic to managing water more efficiently, dynamically and sustainably, and not merely an add-on.

- **1.** We must **govern the hydrological cycle as a global common good**, recognising our interdependence through both blue and green water flows; the deepening interconnections between the water crisis, climate change, and the loss of the planet's natural capital; and how water flows through all our 17 Sustainable Development Goals.
- 2. We must recognise the minimal water requirements of water for a dignified life. This report offers 4,000 l/p/d as a reference for further discussion.
- New water provision should focus on those left behind first.
- 3. We must value water, the Earth's most precious resource, to reflect its scarcity, ensure its efficient and equitable use, and preserve its critical role in sustaining all other natural ecosystems.
- We must price water properly to incentivise its conservation, particularly by the largest users. Today's massive subsidies that contribute to water's overuse in many sectors and environmental degradation should be redirected towards water-saving solutions, protecting and restoring freshwater ecosystems, and ensuring access to clean water for vulnerable communities.
- We must account for the impacts of industrial, national and global development on both blue and green water resources.
- We must also embed the value of green water systematically in decisions on land use so as to better protect evapotranspiration hotspots such as forests, wetlands, and watersheds. Measuring green water's benefits, including its co-benefits, can also enable schemes for Payment for Ecosystem Services.
- 4. We must shape markets to spur a wave of mission-oriented innovations, capacity-building

- and investments across the entire water cycle, including blue and green water, to radically transform how water is used, supplied, and conserved. These investments must be evaluated not in terms of short-run costs and benefits, but for how they can catalyse dynamic, long-run economic and social benefits.
- 5. We must forge partnerships between all stakeholders, from local to global, around five missions that address the most important and interconnected challenges of the global water crisis, and must drive innovation in policies, institutions and technologies:
- Launch a new revolution in food systems to improve water productivity in agriculture while meeting the nutritional needs of a growing world population.
- Conserve and restore natural habitats critical to protect green water.
- **Establish a circular water economy,** including changes in industrial processes.
- Enable a clean-energy and Al-rich era with much lower water intensity.
- Ensure that no child dies from unsafe water by 2030, by securing the reliable supply of potable water and sanitation for underserved communities.
- **6.** We must forge **symbiotic partnerships** between the public and private sectors to deliver efficient, equitable, and environmentally sustainable use of water from the start.
- Governments should incorporate conditionalities in contracts and property rights to ensure high standards of water use efficiency and environmental protection, including corporate responsibility for watershed and water basin conservation programmes. They

- should also provide certainty for investors through clear and consistent regulation and policies, including realistic tariff adjustments.
- For utilities, collaborative decision-making and contract design can steer the private sector toward public value creation with appropriate risk and reward sharing. The focus of partnerships should be on outcome-based performance for operational efficiencies and long-term system resilience.
- 7. We must raise the quantity, quality and reliability of finance for water in every sector.
- reprioritise investments in water, and repurpose today's environmentally harmful subsidies, estimated at over US\$700 billion per year in agriculture and water and sanitation alone. The discount rates used to assess investments in water infrastructure and ecosystem preservation should take into account their long term including intergenerational social, economic and environmental benefits.
- Development finance institutions (DFIs) –
 national, regional, and multilateral must
 be regeared to provide catalytic finance
 to unlock vastly greater amounts of private
 finance, including more patient finance for
 water infrastructure projects.
- Just Water Partnerships involving DFIs and national authorities should be established to build capacity and mobilise investments for low and lower-middle income countries.
 There is large untapped potential for doing so, such as by leveraging concessional finance and pooling risk through bundling projects across sectors. Also key in creating an enabling environment for financing is to build a pipeline of bankable projects, consistent with holistic, programmatic approaches and national development strategies.
- **8.** We must **harness data as a foundation for action** by governments, businesses, and communities.
- We should work towards a new global water data infrastructure, building on and strengthening capacities for data collection on blue and green water at every level of the water cycle, from local to river basin to

- global. It should include local and Indigenous knowledge, and aim for interoperability of data reporting.
- We must accelerate efforts toward market-based disclosure of corporate water footprints, and expedite work towards regulatory standards for mandatory disclosure, so as to steer action toward sustainable water practices. The aim must be providing transparency on the double materiality of water risks posed by companies' operations including both their own vulnerabilities, and the impact of their operations on blue and green water resources. We recommend that water disclosure be integrated in carbon transition plans and be an integral part of sustainability-related disclosures.
- We must develop pathways to value water as natural capital to enable responsible stewardship of freshwater ecosystems, including enabling governments and all stakeholders to evaluate the costs and benefits associated with land use changes.
- 9. We must build global water governance that values water as an organising principle, recognises that water is both a local and global issue, and that the hydrological cycle encompassing both blue and green water is a collective and systemic challenge.
- The ultimate ambition should be the establishment of a Global Water Pact that sets clear and measurable goals to stabilise the hydrological cycle and safeguard the world's water resources for a sustainable and just water future.
- To achieve such a Pact, we need a multistakeholder approach that provides for a clear action agenda, institutional innovation, and capacity building.
- The five critical water missions offer a starting framework for developing public-private-people coalitions, drawing on diverse expertise and engaging with all sectors and voices, including Indigenous Peoples and local communities, women, and youth.
- Water and its values should be anchored in every convention, including climate, biodiversity, wetlands, and desertification, and UN agreement, with clear goals and targets.

The Commission

Co-Chairs

Tharman Shanmugaratnam

President, Republic of Singapore

Ngozi Okonjo-Iweala

Director-General, World Trade Organization

Mariana Mazzucato

Professor in the Economics of Innovation and Public Value at University College London and Founding Director of the UCL Institute for Innovation and Public Purpose

Johan Rockström

Professor in Earth System Science at University of Potsdam and Director of the Potsdam Institute for Climate Impact Research

Executive Director

Henk Ovink

Executive Director, Global Commission on the Economics of Water

Commissioners

Drawn across regions, backgrounds, and generations, this group of eminent individuals worked with the co-chairs on the report contributing analyses and insights informed by their diverse roles and experiences and reaching out to a broad community of practice.

Yvonne Aki-Sawyerr

Mayor of the City of Freetown, Sierra Leone, and Co-Chair, C40 Cities

Alicia Bárcena Ibarra

Secretary of Environment and Natural Resources, Mexico

Richard Damania

Chief Economist, Sustainable Development Vice Presidency, World Bank

María Fernanda Espinosa

CEO of GWL Voices, Former President of the UN General Assembly, Former Minister of Foreign Affairs of Ecuador

Daniel Esty

Hillhouse Professor of Environmental Law and Policy, Yale University

Arunabha Ghosh

Founder-CEO, Council on Energy, Environment and Water, New Delhi, India

Joyeeta Gupta

Professor, Faculty of Social and Behavioural Sciences, University of Amsterdam

Naoko Ishii

Professor and Director, Center for Global Commons, The University of Tokyo

Ma Jun

Founder, China's Institute of Public & Environmental Affairs (IPE)

Henk Ovink

Executive Director, Global Commission on the Economics of Water

Mamphela Ramphele

Emeritus President, Club of Rome, South Africa; Co-Founder of Reimagine SA, Chair, Global Compassion Coalition; Chair, Archbishop Desmond Tutu Intellectual Property Trust

Usha Rao-Monari

Former Under-Secretary-General and Associate Administrator, United Nations Development Programme

Aromar Revi

Director, Indian Institute for Human Settlements

Martha Rojas Urrego

Executive Secretary, International Whaling Commission Secretariat, and Former Secretary-General, Ramsar Convention on Wetlands

Abebe Selassie

Director, African Department, International Monetary Fund

Ismail Serageldin

Founding Director, Bibliotheca Alexandrina, Alexandria, Egypt

Jo Tyndall

Director for the Environment Directorate, OECD

Elizabeth Wathuti

Founder, Green Generation Initiative

Acknowledgements

Former Commissioners

- LaToya Cantrell (Mayor of New Orleans)
- Kathleen Dominique (OECD)
- **Quentin Grafton** (Australian National University)

- Juan Carlos Jintiach
- **Inge Kaul** (†2023)

Key Aides and Chiefs of Staff of the Co-Chairs

- Lauren Seaby Andersen (PIK)
- Yuvan Aunuth Beejadhur (WTO)
- Luca Kühn von Burgsdorff (University College London)
- **Julius Lim** (Istana)

Key experts

- Tamma Carleton
 (University of California at Berkeley and Santa Barbara)
- Simon Fahrländer (PIK)
- Ram Fishman (Tel Aviv University)

- Lucio Scandizzo (University of Rome Tor Vergata)
- **Alain Vidal** (Consulting Professor at AgroParisTech)
- **Dale Whittington** (University of North Carolina at Chapel Hill)

Contributing and commissioned researchers

- Nitin Bassi (CEEW)
- Aaron Baum (IIPP)
- Amir Bazaz (IIHS)
- **Prajna Beleyur** (IIHS)
- **Hilmer Bosch** (University van Amsterdam)
- Miguel Cardenas Rodriguez (OECD)
- **Daniele Cufari** (University of Rome Tor Vergata)
- Lylah Davies (OECD)
- **Safa Fanaian** (Australian National University)
- Ketaki Ghoghe (IIHS)

- Andrea Guerrini (WAREG)
- Saiba Gupta (CEEW)
- Ivan Hascic (OECD)
- Ulla Kask (WTO)
- Suparana Katyaini (CEEW)
- Ekansha Khanduja (CEEW)
- Marijn Korndewal (OECD)
- Jagdish Krishnaswamy (IIHS)
- Maren Ludwig (University of California at Santa Barbara)

- **Celine Nauges** (INRAE)
- Kangkanika Neog (CEEW)
- KV Santhosh Ragavan (IIHS)
- Claudia Ringler (IFPRI)
- Neha Sami (IIHS)
- **Sandra Schoof** (Water as Leverage)
- **Sandy Sum** (University of California at Santa Barbara)

- Poojil Tiwari (CEEW)
- Sophie Tremolet (OECD)
- Mahima Vijendra (IIHS)
- **Luc van Vliet** (University van Amsterdam)
- Kavita Wankhade (IIHS)
- Ankai Xu (WTO)
- Mariam Zagout (IIPP)

Speakers at GCEW retreats and hearings

- **Shabana Abbas** (Agua for All)
- **Guy Alerts** (IHE Delft)
- Pedro Arrojo-Agudo
 (UN Special Rapporteur on the human right to safe drinking water and sanitation)
- Soumya Balaubramanya (World Bank)
- **Don Blackmore** (Australian Water School)
- **Scott Bryan** (ImagineH2O)
- **Albert Cho** (Xylem)
- **David Craig** (TNFD)
- **Helge Daebel** (Emerald Global Water Impact Fund)
- **Jasper Dalhuisen** (Dutch Ministry of Economy)
- Reem Bint Ebrahim Al Hashimy (UAE)
- Ang Eng Seng (GIC)
- **Bridget Fawcett** (Citi)
- **Eliza Foo** (Temasek)
- **Christopher Gasson** (Global Water Intelligence)
- **Erica Gies** (Writer)
- Mark Gough (Capitals Coalition)

- David Grant (PepsiCo)
- **Guillaume Gruère** (OECD)
- **David Hebart-Coleman** (SIWI)
- **Petra Hellegers** (University of Wageningen)
- **Jud Hill** (Isquared Capital)
- Torgny Holmgren (SIWI)
- Leo Horn Phathanothai (WRI)
- Anuj Kedia (Temasek)
- **Saroj Kumar Jha** (World Bank)
- Cate Lamb (CDP)
- **Thorjorn Larssen** (Norwegian Institute for Water Research)
- **John Lienhard** (MIT)
- Anuj Maheshwari (Temasek)
- Wanjira Mathai (WRI)
- Rachael McDonnell (IWMI)
- Amina Mohammed (DSG UN)
- **Alex Money** (Watermarg)
- **Alexis Morgan** (WWF International)

- **Dean Muruven** (BCG)
- **Nolita Thina Mvunelo** (The Club of Rome)
- **David Nabarro** (4SD foundation)
- **Gim Huay Neo** (WEF)
- Paul O'Callaghan (BlueTech Research)
- **Stuart Orr** (WWF International)
- **Noémie Plumier** (Secrétariat international de l'eau)
- Barbara Pompili (One Water Summit)
- Ismahane Remonnay (Veolia)
- Yonatan Rabinovitch (Asterra)

- **Will Sarni** (The Water Foundry)
- Michel Scholte (Impact Institute)
- Nicola Shaw (Kelda Water)
- **Saud Siddique** (Odyssey Capital)
- Prof. Lord Nicholas Stern
- Tania Straus (WEF)
- **Tim Wainwright** (Water Aid)
- **Dominic Waughray** (WBCSD)
- Mike Webster (2030 WRG)
- **Simon Zadek** (Nature Finance)

Youth Expert Group

- Fatmata Hannah Conteh
- Mare de Wit
- Megi Marku
- Anita Sangalo
- Srishti Singh

- Leticia Tanchella Niehues
- Mona Wolf
- Rosa Aurora Mija Yangua
- Marta Zaragoza

United Nations

- **David Cooper** (CBD)
- **Joakim Harlin** (UNEP)
- Sonja Koeppel (UNECE)
- Alvaro Lario (UN Water, IFAD)
- Lifeng Li (FAO)

- Mary Mathews (UNDP)
- Federico Properzi (UN Water)
- Ibrahim Thiaw (UNCCD)
- Stefan Uhlenbrook (WMO)

Participants in the Bellagio brainstorming seminar

- Brinda Adhikari (Media Strategist)
- **Bill Balaskas** (Artist)
- Carter Brandon (WRI)

- Joachim Declerck
 (Architecture Workroom Brussels)
- Rada Dogandjieva (Dalberg Catalyst)

- Shahnoor Hasan (Deltares)
- **Morten Højer** (City of Copenhagen)
- **Kuku** (Musician)
- **Adrian Lahoud** (Royal College of Art)
- Cate Lamb (UNEP FI, CDP)

- **Musonda Mumba** (Ramsar Convention)
- **Philip Rode** (LSE Cities)
- Caterina Ruggeri Laderchi (Food System Economics Commission)
- **Lisa Scholten** (Delft University of Technology)
- Eliza Swedenborg (WRI)

Counterparts in the Dutch government

- Steven Collet
- Meike van Ginneken
- Maarten Gischler
- René van Hell

- Wampie Libon
- Omer van Renterghem
- Eva Schreuder
- Niels Vlaanderen

Inspiring artist

• **Nicolas Floc'h** (The colors of water)

Communication

- Samuel Stacey, Holly Holmes, Kimberly Viloria, Monica Evans, Isabel Wilson, Samurdhi Ranasinghe, Nini Fernandez-Concha (Cultivate Communications)
- Denise Young and Johannes Mengel (Young & Mengel)
- Will Yeates Communications

- Marion Davis, Sarah Wild Writers
- Misha Pinkashov Editor
- Wanda Bleckmann, David von Buseck,
 Sascha Collet, Aitana Gräbs Santiago,
 Steffen Hänsch, Tim Hönig (Figures GmbH)

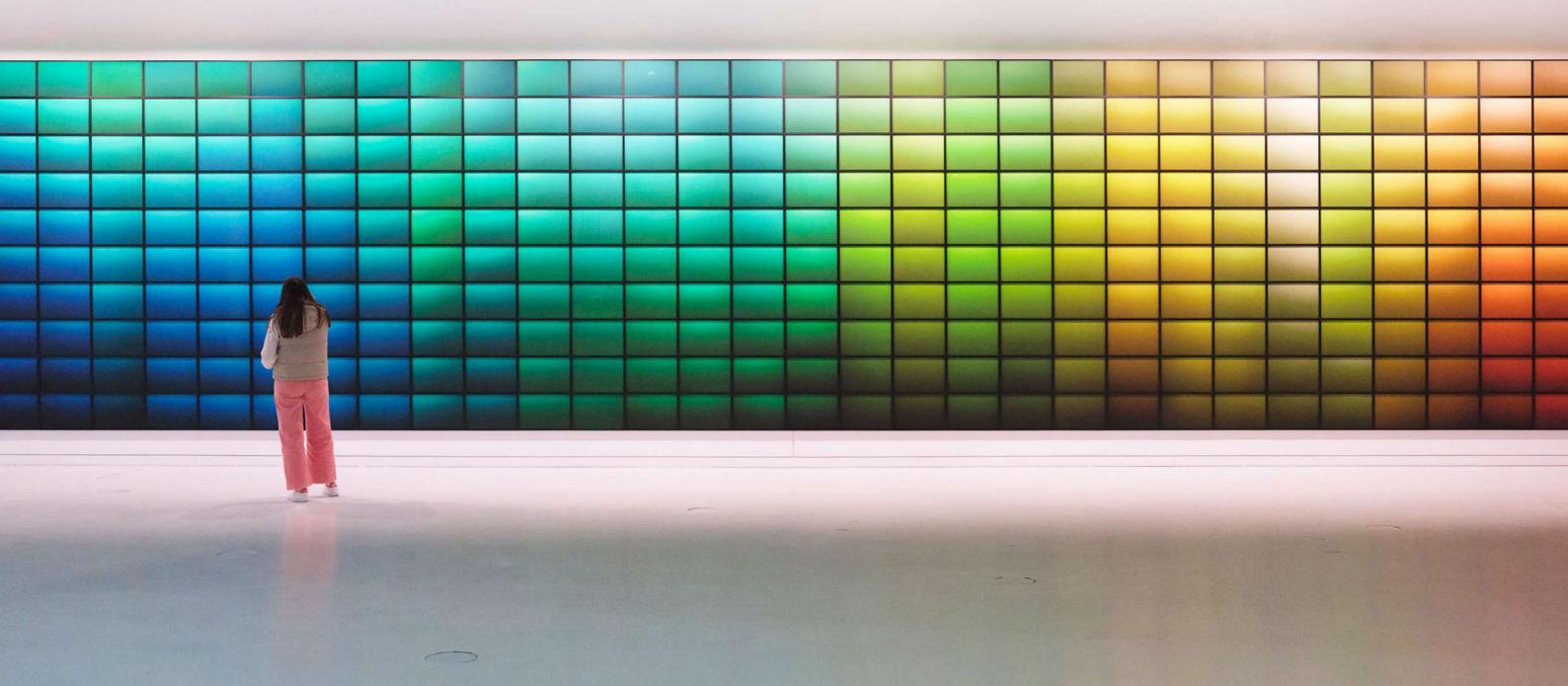
OECD Secretariat

- Elin Adolfsson
- Juan-Diego Avila
- Martha Baxter
- Anna Dupont
- Ekaterina Gosh
- Xavier Leflaive

- Mariana Portal
- Charlotte Raoult
- Ines Reale
- Preston Thatcher
- Jennifer Timmins
- Lucy Watkinson

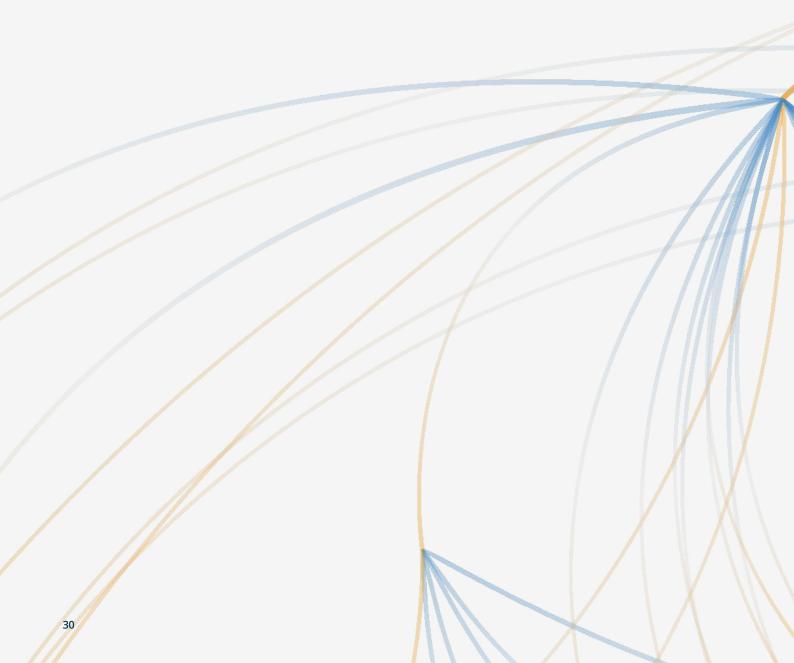
Nicolas Floc'h, Ocean Rivers – Mississippi, The Color of Water, Water Columns from 0 to -100 m in Depth, Mississippi Delta, from Empire to the Gulf of Mexico (100 km), USA, 2022.

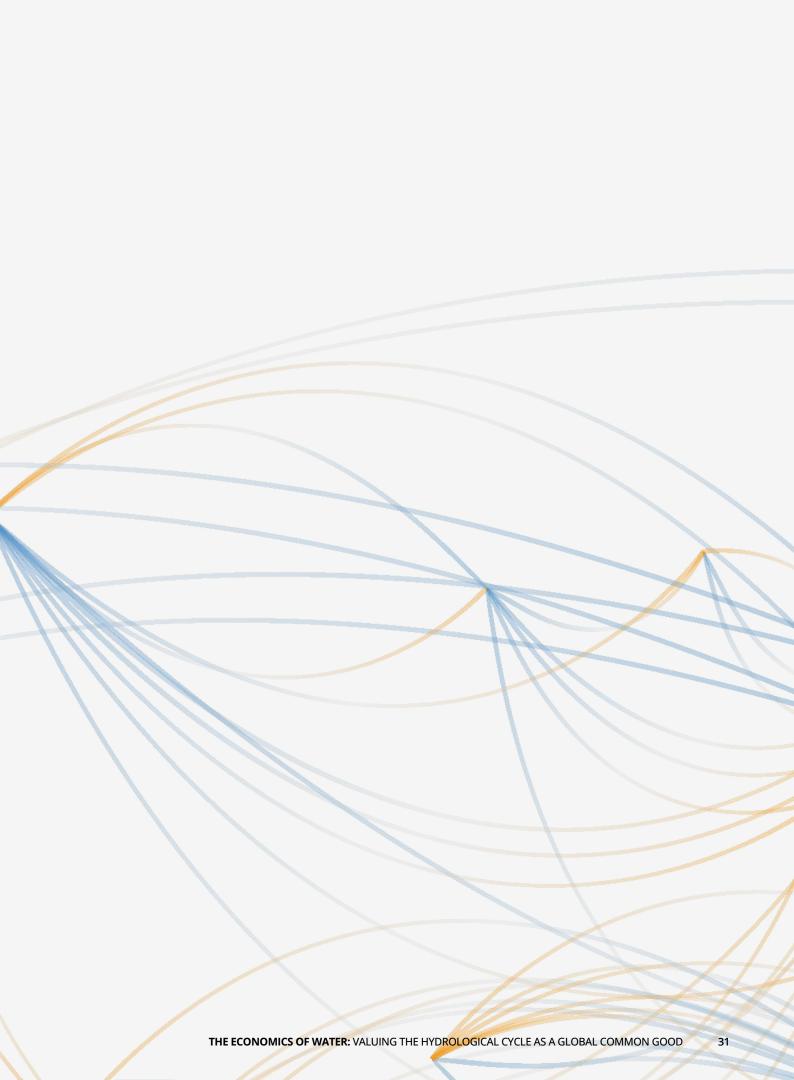
72 photographs extracted from the grid of the delta to the ocean, composed of 516 color photographs organized geographically. Pigment prints, 40 x 56 cm each. Chapelle du Méjan, Rencontres Photographiques d'Arles 2024. Courtesy of Galerie Maubert, Paris.



Disclaimer

The Global Commission on the Economics of Water is an independent commission. The cochairs and the Commissioners each contributed in their personal capacities. The co-chairs took final responsibility for the contents of the Report, while Commissioners contributed actively with substantive inputs and comments. The outputs of the Global Commission (reports, executive summary, infographics, other communication materials) do not necessarily reflect in their entirety the views of the respective Commissioners or those of their respective institutions.







The Global Commission on the Economics of Water (GCEW) is redefining the way we value and govern water for the common good.

It is presenting the evidence and the pathways for changes in policy, business approaches and global collaboration to support climate and water justice, sustainability, and food-energy-water security.

The Commission is convened by the Government of the Netherlands and facilitated by the Organisation for Economic Co-operation and Development (OECD). It was launched in May 2022 with a two-year mandate.

The GCEW is executed by an independent and diverse group of eminent policy makers and researchers in fields that bring novel perspectives to water economics, aligning the planetary economy with sustainable water-resource management.

Its purpose is to make a significant and ambitious contribution to the global effort to spur change in the way societies govern, use and value water.

info@watercommission.org watercommission.org

OECD Environment Directorate Climate, Biodiversity and Water Division 2, rue André Pascal 75775 Paris Cedex 16