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Water Tight 3.0

The top issues in the global water sector

Government & Public Services

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Contents

Foreword

Welcome to our discussion on the top issues in the global water sector.

Water is our most precious resource. Its availability transcends political borders. While the challenge of increased demand for water is global, the issues must be solved on a local level by governments, businesses, non-governmental organizations (NGOs) and domestic consumers all working together.

The aim of this report is to highlight, for both public and private stakeholders, the issues that Deloitte's global water practice regards as the most important for the water sector. Issues as complex as these are of course interconnected with each other and with other resource issues and should not be considered in isolation. Furthermore, sector challenges have been further exacerbated with the ongoing COVID-19 global pandemic.

Rapid growth in demand for water is a central theme and is reflected in all of the topics we discuss. The global water sector's future will be characterized by efforts to manage demand and increase supply. Appropriate water governance, more effective water pricing, a better understanding of the relationship between water, energy and food, and technology advances will all play an important role in these efforts.

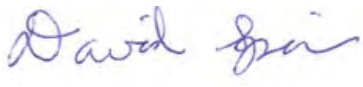
Climate change's impact on the sector is also a key theme. It increases the volatility of water resources availability and exacerbates the forces driving demand. Unpredictable weather and changing climate also adversely affect the functioning of water assets and make planning and investment in water infrastructure more expensive, placing particular stress on vulnerable populations and expanding social equity gaps.

To meet future demand, trillions of dollars will be needed on a global level to upgrade ageing infrastructure and expand water-related assets. With government funding and borrowing capabilities constrained and facing competing demands, the private sector is likely to play a larger role in the sector's future. More water suppliers may embark on some form of private sector participation, and it may be necessary to find mechanisms that allow more complete cost recovery from customers.

Efforts to demonstrate water stewardship and management will be a key theme for utilities and water users in coming years. Close collaboration between utilities, regulators and all water consumers is required to address the ultimate issue—the scarcity of water resources in many parts of the world.

There is great opportunity to tackle several water-related issues through the application of new technologies. Strengthening the relationship between the water sector and technology to enhance the future of water through the integration of Internet of Things (IoT) in water data, agriculture, water meters, and risk mitigation is vital.

Our chapters have been developed in consultation with senior practitioners from Deloitte member firms around the world. I would like to thank them for their help and support.



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Growing demand for a limited resource

The supply of readily available fresh water is limited, and, in many watersheds, its quality is declining. Treated water is also being lost at alarming rates through inadequate infrastructure in many parts of the world. At the same time, demand for this precious resource is expected to grow rapidly. Regional competition for water in many parts of the world is also likely to intensify.

Although water covers 70% of the earth's surface, less than 0.3% of the world's water is available for human and animal use in the form of fresh surface and groundwater.[1] While water is replaced through the water cycle, this is a limited resource neither created nor destroyed.

Scarcity of supply is not the only challenge. The decline in water quality is also a growing problem in many watersheds of the world. The lack of adequate sanitation and waste-collection services in many cities and rural settings means that most sewage and waste ends up in local rivers or the ocean. As a result, some cities no longer take water from nearby rivers and instead use depleting groundwater sources. This not only increases the cost of supplying water for utilities and businesses, but also creates serious health hazards for local residents.

In addition, aging infrastructure, old pipes, and rusty joints are prone to failure. Leaks are costly to repair, cause disruption, and exacerbate water loss. One study evaluates the number of water main breaks across the United States to a staggering 240,000 per year; the direct cost of these leaks has been estimated at $2.6 billion per year.[2]

Less than 0.3% of the world's water is available for human and animal use in the form of fresh surface and ground water.

Water is also unevenly distributed around the world: some regions have plenty, while others have very little. According to World Bank data, as of 2014, Gabon's per-capita renewable internal freshwater supply is 87,058 cubic meters compared with 1,116 cubic meters in India.[3]

This comparison can be shown even more starkly when viewing population densities in the respective countries: Gabonese make up 0.03% of the world's population, while the Indians constitute 17.7% of the world's population.

Against this backdrop of a limited supply, quality issues, and uneven distribution, the demand for water is expected to increase rapidly. The last 40 years have seen an unprecedented growth in global population—to nearly 8 billion. This surge in population has more than doubled freshwater demand in agriculture, energy, industry, and domestic use. Today, scientists estimate that we "withdraw" about 50% of globally accessible and renewable water on an annual basis, and this is set to increase as the United Nations (UN) estimates that the world's population will reach 9.7 billion by 2050.[4]

The majority of population growth is expected to occur in developing and emerging countries. Currently, nearly 4 billion people live in the Asia/Pacific region. By 2030, this number is expected to reach closer to 5 billion.[5] The effects of this increase on water resources are heightened by rapid urbanization, as well as changing dietary and lifestyle habits.

The struggle to ensure access to water has shaped human history. To support life and economic growth, water security is essential. More than 300 rivers cross national boundaries, placing additional factors on the resource's importance.[6] For example, the Nile river basin stretches across 10 countries, and 200 million people—and the region's economic growth—depends on it.[7] This means that one country's water-management system can greatly impact another country's access to water from the same river further downstream.

Bottom line

On a global level, the numbers do not add up: We have a limited resource for which demand will soon outstrip supply. The world's population is not distributed according to the availability of water, and there are regions where water scarcity is and will remain critical. If we do not address these issues by creating frameworks at a global level and acting locally, the threat of conflict increases as competition for water sources intensifies.

Securing the water supply needs to be at the top of every country's agenda. Where countries rely on each other, this needs to be recognized and formalized. Within this framework, the water industry can play its part in capturing, treating, and transporting water efficiently, while also concurrently promoting ethical usage.

Although the problems are global, the solutions are all local. Therefore, governments, businesses, NGOs, and the public need to collaborate to ensure safe and clean water supplies.

Climate change: Adapting to uncertainty in water resources management

Climate change places significant pressure on the world's already limited and fragile water resources. The past 20 years have seen the quickest rise in the earth's temperature since records began in 1880 and the consequences for the global water system are clear.[8] The changing hydrologic cycle results in less predictable precipitation frequency, amounts, and intensity, exacerbating droughts in some regions while causing severe flooding and heavy storms in others.

The urgency to adapt to climate change impacts on water resources is clear, as sectors such as agriculture, energy, health, transportation, fisheries, environmental management, and overall sustainable economic development are tied to water availability and quality.

The impact of warmer or more volatile weather on water resources varies by location. The large-scale changes in precipitation patterns and intensity mean storms, cyclones, and flooding in some regions and heat waves, water scarcity, and drought in others. Water supplies and natural water storage capacity in glaciers and snow cover are declining. While this will increase the water supply in the short term in parts of South Asia, China, the western United States, and the Andes, over time the amount of water will diminish.

Water quality is also significantly affected by climate change, as sea level rise causes coastal erosion and salt-water intrusion, affecting the adaptive capacity of natural ecosystems to the changing environment. Severe and often unpredictable floods and weather events contribute to pollution of surface water and the ability of water and wastewater utilities to effectively provide safe drinking water. Rising sea levels could devastate coastal areas, with immediate impacts already seen among small islands states globally.

Water scarcity has significant impact on the condition and functioning of existing water infrastructure. Irrigation systems urban water systems, urban water piping and distribution networks, hydropower plants, flood defenses, and water and wastewater treatment systems are all vulnerable to the impacts of droughts, flooding, and extreme changes in the hydrological cycle.

Water scarcity issues already affect 40% of the world's population.[9]

A warmer climate will also drive demand for water. More water will be needed for agricultural use, industrial cooling, and domestic purposes.[10] In the Indian city of Chennai, heat waves in the summer of 2019 and a delayed monsoon caused some of Chennai's freshwater lakes to dry up. Cape Town, South Africa was on the verge of having its entire municipal water supply shut off in 2020 during its water crisis.[11]

Water scarcity in densely populated areas such as Chennai, or in bordering cities, countries, and regions may also exacerbate social equity and environmental justice issues, potentially leading to a variety of social and political conflicts and unrest.

Effective adaptation to climate change's impacts on water resources should consider a cross-sectoral approach and potential transboundary implications and tradeoffs to avoid and mitigate potential water-related conflicts .

Adapting to uncertainty remains a key challenge.
Providing water to a shifting population will put enormous stress on governments' planning and financial capabilities, as well as on water utilities themselves. Historical weather data and assumptions that are often used for short- and long-term planning and decision-making by utilities, farmers, and other water users are no longer sufficient due to the uncertainties from climate change.[12]

Water practitioners and planners need more accurate, reliable, and localized climate data and information.

Planning for the effects of climate change is difficult.
The unpredictability of weather patterns makes it hard to rely on historical statistics, and new technologies are required for planning and investment purposes. There is a need for high-quality data and more analysis into the consequences of climate change. The water industry has had to deal with unpredictability in hydrology for a long time and has developed a wide range of predictive modeling and climate risk management tools to cope with changes in the water cycle. Future planning and development of a range of scenarios to help prepare for the impact of volatility on water supply and demand is a must.

Governments and practitioners should incorporate climate-related risks into their water sector management plans.[13] As national climate adaptation plans continue to integrate water resource management considerations and water sector reforms look to factor climate impacts, the capacity of local governments and practitioners to address climate impacts needs to be enhanced through sharing of knowledge and experience on effects of climate change on water quantity and quality, health, and environment. Data and information on climate must be more reliable, of high quality, and accessible to improve water scenario projections, early warning systems and infrastructure resilience planning.

Climate adaptation and resilience is on the rise and strategies are integrating mitigation and disaster risk reduction into adaptation planning.
Governments are increasingly linking climate adaptation with mitigation efforts to reduce greenhouse gas emissions and disaster risk reduction efforts. Despite some tradeoffs in working in the nexus between mitigation, adaptation, and disaster risk reduction, such as in institutional arrangements, this approach strengthens collaboration, leverages resources and know-how, and promotes sustainability.

Bottom line

Climate change has direct impacts on water supply and water quality globally, increasing uncertainty and unpredictability in weather forecasting, and making the sole reliance on historical data for water sector planning obsolete.

The main challenge for utilities is to reduce the vulnerabilities of water resources, infrastructure, and demand. There is an urgent need for contingency planning based on scenarios relying on high-quality data and analytics.

But uncertainty and changing environment is not an excuse for inaction. The need to adapt provides opportunities for innovations, from technological improvements in modelling and water planning to innovative ideas for water conservation. Many success stories have already been documented and sharing of knowledge and lessons will continue to build global capacity to address climate impacts on water systems.

Ultimately, we need flexible and smart systems that monitor, regulate, and anticipate continuing changes in circumstances. Utilities and policymakers must work together to address this critical issue.

Managing demand: The era of low-cost water is over

The growing demand for water makes conservation and efficient use central issues. Both utilities and governments are coming under pressure to safeguard this increasingly precious resource and incentivize customers to manage their water usage better. We believe that clearer pricing will have an important role in this.

Several international institutions have highlighted the importance of pricing as a tool to enforce more efficient water management. The World Bank and the Organization for Economic Co-operation and Development have both argued that water prices should be set to address scarcity-related issues.[14]

Water is essential and, historically, it is also often priced at a low cost. In contrast to energy, in many parts of the world, water is either free to the consumer or the bills do not cause much concern for households. They also mostly appear as a minor expense in company ledgers. It has often been taken for granted that water is plentiful, clean, and safe to drink. Furthermore, access to water for domestic use is considered a basic human right. Many regard water as a free resource. Further, utilities process and transport water but do not own it.

Water prices should be affordable, but utilities should also be able to recover the costs of providing the service, now and in the future. Operating water infrastructure is becoming more expensive with rising chemical, energy, and labor costs. There is also considerable investment required to fund the replacement of aging infrastructure or to build new facilities. However, this approach does not address several important issues, such as growing water scarcity, and environmental and social concerns.

Many countries subsidize the price of water to make it available for the public and businesses. However, subsidies have been criticized for creating artificially low prices that undermine effective water use. In many instances, this leaves utilities underfunded, struggling to provide adequate services and undertake necessary investment. The former is the case in some parts of Upper Rio Grande in Brazil, where low prices from efficiency savings have led to overextraction.[15] Some also argue that heavy subsidies in countries such as India fail to provide help where it is most needed. This is because many people living under the poverty line do not have access to piped water and purchase it from street vendors who can charge in excess of the subsidized price.

There is a compelling case for utilities either to increase water prices or create a better pricing system that addresses scarcity issues and provides a satisfactory financial return. Increasing water prices, however, is a difficult political decision, because in many countries water infrastructure is publicly owned and municipalities or a regulator determine the prices we pay, sometimes through taxes. Raising awareness of water-related issues and educating the public about the necessity of more effective water pricing are crucial.

One potential solution that could provide both affordable prices and sufficient returns is the introduction of tiered prices. Under such a system, some 30 to 50 liters of water a day may be provided at a low price for basic domestic usage. As water usage increases, so would the price. This has been successfully used to encourage water conservation and make water easier to afford in several countries, including Israel, Australia, Hong Kong, Japan, South Korea, and parts of the United States.[16]

Water prices have already started rising in several countries. Customers in other countries are paying for desalination plants that had been approved during a period of prolonged, drought, but many have yet to come on line.[17] In Cape Town, South Africa, water rationing is a strategy commonly used to preserve water through times of drought.[18] In Israel, water prices have increased sharply as a result of continued drought conditions, which caused per-capita water consumption to decline from 110 to 90 cubic meters.[19]

As the affordability of water declines due to rising demand, more countries will consider privatizing water supply. When this occurs, it is vital that water remains affordable for the consumer, with a mix of efficiency gains and targeted subsidies looked at as solutions. Emphasis should be placed on making subsidies more effective. For this to occur, a proper mix of blended finance, efficient management and operations, proactive communications, and supportive political coalitions is necessary for long-lasting water-affordability policy. For example, the private company AEGEA in Brazil provides affordable tariffs to customers earning less than minimum wage. The company also provides a social tariff, which halves regular rates.[20]

Bottom line

While water may be a free resource in the environment, its extraction and treatment for drinking, distribution, collection, and retreatment for discharge is operationally and capital-intensive. The costs must be recovered from somewhere. In many countries, pricing systems must be rethought.

Utilities must be able to recover the increasing costs of providing services while at the same time investing in more efficient infrastructure. Water prices should also encourage water conservation and efficiency programs in agriculture, industry, and in homes. A tiered pricing system, underway in countries such as China, the United States, and Australia, could help address availability issues. For example, China's tiered pricing system is based on water consumption levels; top water users will see higher prices.[21]

While price adjustments are difficult political decisions, providing more information and educating the public about why appropriate pricing is necessary will be key both for utilities and customers.

Resource efficiency: Technology in the driver's seat

Organizations worldwide agree that a closer relationship between the water sector and technology infrastructure will be critical in advancing strategic priorities. However, what that marriage looks like in practice can be a bit harder to imagine. Public ownership, minimal margins, and assets with long (yet unreliable) lifespans have limited the water industry's ability to innovate. The industry is often considered inefficient, conservative, and slow to change compared with other industries.[22]

However, continuing scarcity and security issues combined with growing demand will force the industry to react more quickly and more creatively. Harnessed correctly, the power of integrating technology in the water sector can result in better data aggregation, risk mitigation, and a roadmap for the next generation of water technologies that drives efficiencies worldwide.

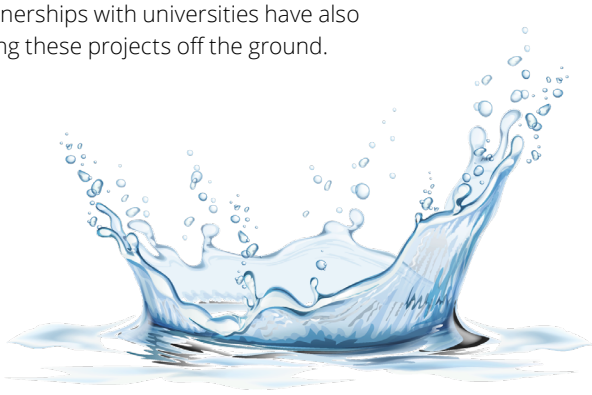
Better water data will be critical as we look to identify and tackle our largest global gaps in the water sector. By integrating leading technology solutions, such as Internet of Things (IoT) enabled sensors, into new and existing infrastructure, governments, private sector stakeholders, utilities, and international organizations alike will have access to the information they need to improve the efficacy of water usage, distribution and maintenance worldwide.

One example of data innovation can be seen in agriculture. The agriculture industry accounts for around 70% of global water withdrawal.[23] Using IoT sensors within crop management infrastructure, farmers and governments are able to gather data in real time around soil moisture levels and crop health, therefore reducing water usage and spillover into freshwater supplies while improving crop yield and creating drought- resistant crops.

Smart meters are a more commonly known integration between the water sector and technology. Almost half of US water users have smart meters. In 2018, Nigeria announced a test pilot for 2,000 customer smart water meters.[24] Smart meters and IoT integration with precision agriculture are just two of many examples where technology implementation in the water sector can expand data-driven decision-making and the usage and maintenance of our freshwater resources.

Technologies can even help provide advanced notice for acts of nature and support effective action. In Honduras, sensors on rivers are deployed to monitor river levels, alert citizens (via SMS) to quickly rising water levels, and allow time for flood gates and other interventions to be raised to prevent issues such as agriculture runoff.

The integration of technology into water and sanitation infrastructure pays for itself. What if we could recognize an ailing piece of water infrastructure before it fails and causes disruptions in service to hundreds of citizens? What if we could see where our supply of water is too great for our demand? What if we could sense quality issues in water before they hit the general public, or prevent the side effects of natural disasters, such as flooding, on our water sources? Now we can. By implementing solutions like IoT technologies augmented by artificial intelligence and machine learning, we have seen 10-15% increases in operational expense savings in addition to up to 45% reductions in maintenance costs. Governments can partner with international donor organizations to fund initial pilots to showcase the financial impacts of technology integration and then use the recouped funding to scale the capabilities. Partnerships with universities have also been fruitful in getting these projects off the ground.



A sustainable roadmap for the next generation of water is possible with the integration of technology in water interventions. In addition to strengthening overall infrastructure for the future, as previously mentioned, leveraging technology allows us to expand future mobilization of financial resources, improve diplomatic engagement, and strengthen public-private partnerships (PPPs).

Looking back at agriculture as an example, farmers who use desalination technology will not only be able to consistently access water for themselves but also could redirect fresh water back to the general population.

Improved data insights into demand, supply, and usage coupled with risk mitigation capabilities can also support pricing restructuring for the resource provision, entice additional private sector investment, and improve governance of shared resources and utilities management.

Technology has also improved water reuse and recycling by more easily allowing centralized control and visibility into resource use, disposal, and by making innovative water recovery possible.

Bottom line

The water sector could benefit enormously from closer integration with technology to achieve effective water usage and water reusability.

Smart meters, accelerometers, pollutant detectors, cost-efficient desalination, and many other innovations can become essential tools in easing supply-side constraints. The water industry globally has grown to where these types of technology solutions can be afforded to mitigate the costs of water loss, degradation, or misuse climbing daily.

Integrated thinking: The water, energy and food nexus

A strategy to manage water usage more effectively should include an integrated approach to addressing the interconnected relationship between water, energy, and food. The water-energy-food nexus offers an innovative perspective to understand the complex interdependent nature of the three systems and to inform the management of resources. As framed by the World Business Council on Sustainable Development, "water, energy and food are intrinsically interrelated: A sustainable solution for one almost always has an impact on the others."[25] The management of the three resources is particularly important for many countries. For international policy and development stakeholders, the management of all three resources and delivering them to communities in need are critical to help achieve many UN Sustainable Development Goals (UN SDGs).[26]

Energy and electricity access

In many parts of the world, the generation of energy and provision of related electricity services is water-intensive. Electricity production, transportation, and refining of certain energy resources all require significant amounts of fresh water. Electricity generation is particularly water-intensive. On-grid power generation, such as thermoelectric plants, draw large amounts of fresh water for cooling. Alternatively, countries that rely on hydroelectric turbines to generate power are also particularly sensitive to the impact of annual rainfalls and upstream water management.

Increasingly, droughts and heatwaves show the vulnerability of the electricity sector to surface water constraints, limiting hydroelectrical and thermoelectric power-generation capacity worldwide.[27] As water becomes increasingly constrained, policymakers may need to manage the effects of impacted energy production.

Food and agriculture production

In many parts of the world, agriculture remains the main source of employment, livelihood, and income for 50% to 90% of the population.[28] To manage water resource for agricultural demand, many countries implement infrastructure and policy measures to secure critical water supplies (e.g., storage dams, irrigation techniques).

However, as climate impacts such as chronic droughts become prevalent across the world, many countries face increasing water resource constraints and shortages. These water shortages, in turn, are causing food insecurity and malnutrition among the most vulnerable populations in the world.[29]

As water resource constraints in both energy and food systems intensify, competition and perceptions of insecurity between the two sectors will also rise. To manage this, countries' policymakers and the development stakeholders will need to pay attention to the nexus trade-offs.[30]

Water, health, and sanitation access

Water is the cross-cutting nexus element between energy and food systems. The management of water is not only critical to both systems, but it is also essential in improving the quality of health and life for communities around the world. Worldwide, 780 million people currently lack access to improved water sources, and an estimated 2.5 billion people lack access to improved sanitation.[31] The provision of a clean and safe water supply is necessary to ensure the health and hygiene of communities. In doing so, countries can manage the impact of disease outbreak and death due to improper and inadequate sanitation conditions.[32]

Ultimately, it is critical that water used for energy and food systems not come at the expense of safe and clean water provision for communities. It is imperative that policymakers, businesses, and development stakeholders understand the nexus linkages between the different interdependent systems and plan accordingly.

Bottom line

The futures of the water, energy and agricultural industries are inextricably linked. Increased agricultural activity will drive both water and energy demand, while energy production itself can be water intensive. Utilities and water sources may struggle to keep pace. Increased water demand, especially in areas of scarcity, may lead to higher energy demand related to additional pumping and treatment requirements. This symbiotic relationship cannot be ignored.

There is an urgent need for closer collaboration between these sectors. This integrated approach to solving key issues between the water, energy and agricultural sectors, and may lead to lower carbon emissions while also benefiting ecosystems.

New sources of financing and funding: Engaging private sector partnership

To meet the rising costs associated with increased demand for water and ongoing maintenance of existing water and wastewater assets, an increase in financing and funding will be necessary.[33] However, current rates of investment by governments globally are insufficient in meeting capital and operational expense. The World Bank Group estimates that in order to meet its Sustainable Development Goal 6—ensuring availability and sustainable management for water and sanitation for all—by 2030, an investment of at least $114 billion will be needed annually over the next 10 years.[34] If traditional sources of financing and funding are inadequate, where will investments come from to fill the gap?

In recent years, innovative approaches to finance water infrastructure have become increasingly prevalent. PPP alternative-delivery approaches provide opportunities for governments to partner up with private sector investors and service providers to optimize the delivery of water and wastewater services. Within the world of PPPs, there exists a wide spectrum of partnership models where governments and private entities can agree on the optimal allocation of risk fitted for specific contexts.

The World Bank's PPP Knowledge Lab has identified 545 water projects that have involved private participation in emerging markets over the last 10 years, which is less than one-third of the number of energy PPP projects during this same period.[35] This shows that significant opportunities exist for more PPPs and for more private sector participation in water and sanitation in emerging markets.

In fact, private sector participation in the water industry is not new and is not limited. The benefits from new PPP strategies in India not only increased the percentage of the population's access to improved water sources from 87.4% to 94.1% but also increased the country's quality of the electricity supply and transportation infrastructure.[36]

Private sector engagement in the water industry is expected to grow. This is because, in the era of government budget constraints, the private sector's funding power is becoming more important.

Manila Water Company in the Philippines provides an example of a successful privatization program. The Manila Water Company took over control of Metro Manila's water delivery service in 1997 after a water crisis had hit the capital. This was considered the "biggest water privatization in the world."[37] The Manila Water Company increased its service coverage by 57% in a span of five years. Drinking water-quality standards increased to 99.8% by 2002. This privatization not only increased access and quality of water and saved consumers billions, but also contributed to the Philippine economy by creating employment opportunities for tens of thousands of people.

The Ivorian national water utility, SODECI, demonstrates an example of one of the oldest and largest water PPPs in the world, established in 1959. One factor that has contributed to the success and sustainability of the concession model has been the private operator's promotion of local management and the emphasis of capacity building to build expertise of local staff.[38]

Another innovative approach being deployed in recent years to bridge WASH financing gaps is the use of blended finance. Blended finance refers to the use of catalytical capital from public or philanthropic sources to increase private sector capital, typically in sustainable infrastructure and development projects.[39] For example, one program called WaterCredit successfully launched a first-ever $50 million blended finance fund to grow microfinance water and sanitation loan products, and scale water and sanitation enterprises.[40] While blended finance approaches have mobilized roughly $132 billion in capital toward sustainable development in some countries to date, water and sanitation-related investments remain relatively unsubstantial.

Ultimately, for countries to successfully attract and engage with private sector stakeholders, it is important for countries to create and maintain an attractive enabling environment. The regulatory environment needs to include clear institutional roles and legal framework that define asset management, economically sound cost recovery ratios and tariffs, and benchmarking metrics for service providers.[41]

Bottom line

The large amount of capital countries will need to upgrade aging infrastructure and build new water systems in the coming decades will stretch public finances and test these countries' ability to borrow.

The private sector is expected to take a more active role in the global water industry, not only in terms of managing assets on behalf of the state but also in owning and financing the assets.

COVID-19: An urgent call for disaster risk and management for resiliency

The global coronavirus disease 2019 (COVID-19) pandemic not only resulted in over 2.7 million deaths globally but continues to wreak economic and financial havoc across all sectors. The water sector is no different. Utilities must balance staff safety with the need to provide essential services, adapt to the changes in consumer demands and abilities to pay, and work to ensure continuity of services for the long-term. Most utilities in developing countries, where non-revenue water (NRW) is already a major financial constraint, faced challenges absorbing sharp declines in revenues as a result of needed payment relief for water services and changes in consumer behavior.

Maintaining continuity of service and business operations while coping with reduced workforce, unpredictable changes in demand, uncertainties throughout the supply chain, and lower revenue collection will continue to be key challenges. But the pandemic also offers opportunities for these utilities to strengthen their planning, improve their adaptive capacity for future disaster scenarios, and build resiliency into the sector.

Low- and middle-income countries (LMICs) are disproportionately impacted by the global health crisis. Already before COVID-19, water service providers in LMICs, whose budgets are strapped, faced challenges related to low access to services, aging infrastructure, lack of capital to expand infrastructure networks, NRW and related low revenue collection, and continued financial insolvency of the sector. COVID-19 has exacerbated these sector challenges in LMICs, where most water services are government-operated.

COVID-19 has put a greater strain on demand for water service provision and access. Water is one of the most basic frontline defenses against COVID-19 and yet a quarter of the world's population still lacks access to a reliable water supply—according to the International Finance Corporation (IFC). For those living in dense urban areas without household water access for hand-washing and other safety practices, the risk of disease spread remains high.[42]

Further decreased revenue collection due to payment relief schemes, consumer financial hardship, and lack of ability to collect in-person payments worsens utility financial insolvency and further delays necessary infrastructure investments and upgrades reliant on those revenues.

The COVID-19 pandemic increases the urgency for utilities and decision-makers to build resiliency into the water sector against future disasters, especially in the face of climate change. To address this urgent call for crisis management and business resiliency, water service providers must focus on supporting changes to their workforce, business operations, supply chain, and continuity planning.

Digitalization allows for utility efficiency, workforce flexibility, and continuity of operations. Technical infrastructure and end-to-end digital processes ("paper-less") are key elements to safeguard productivity during disastrous events. First-response actions such as implementing business continuity plans and stabilization of business operations should be accompanied by proactive measures—utilities should accelerate their digitization strategies to increase resilience and optimize business processes at the same time.

Revenue collection and customer engagement should be reimagined to improve utility efficiency. Water utilities should expand payment options to include digital payments, such as online or mobile payments, thereby adapting customer service to include chat and more effective use of call centers. A report by CGAP in 2019 shows that digital payments reduce collection costs by 57-95%; increase revenues between 15-37%; and increase customer reach.[43]

COVID-19 is a reminder that business resiliency must include long-term continuity planning, integrate disaster risk reduction and incorporate crisis management. Utilities and water service providers need to assess financial vulnerabilities and adopt more-resilient business plans—especially in supply chain, workforce structure, and operations.

Bottom line

Achieving Sustainable Development Goal 6—ensure availability and sustainable management of water and sanitation for all by 2030—has become more urgent. COVID-19 underscores the importance of clean water access for all and has demonstrated the impact unprecedented crises can have on sustainable water service delivery. Water service providers urgently need to improve business resiliency and sustainability of the water sector as we look to tackle another series of unprecedented challenges that will come with climate change.

Resilience and sustainability through water stewardship: The way forward

To overcome the challenges and risks touched on in this report—such as growing demand, COVID-19 impacts, climate change, and rising costs—a commitment to water stewardship will be critical to achieving resilience and sustainability of water resources and infrastructure. The essence of water stewardship is the sustainable and ethical management of both natural resources and built infrastructure for the benefit of current and future generations. Government regulators, public and private utilities, and industrial/agricultural consumers must demonstrate their engagement and commitment to water stewardship at both national and regional levels.

Effective collaboration between organizations as well as across borders is needed to address the often-competing priorities among many water-related challenges. Stewardship of declining water resources or aging water infrastructure can be addressed with focus on the topics already addressed in this report, with risk mitigation, resilience, and, ultimately, sustainability as the desired outcome for any given community, region, or nation. At the national and local levels, many government regulators must continue taking water scarcity seriously through proactive (versus reactive) approaches, incorporating long-term climate change mitigation and drought management into their planning and taking an integrated water resource management (IWRM) approach with transboundary considerations.

For example, under the Smart Waters project (2015 to 2020), U.S. Agency for International Development (USAID) supported the Government of Kyrgyz Republic in adapting and mainstreaming IWRM principles and introduced long-term sustainable planning at the river basin level. Technical assistance was provided to the government for developing regulatory acts on economic mechanisms of water resources management. This project supported capacity-building at all levels of water users and managers in the Kyrgyz Republic, engaging more than 500 participants.[44]

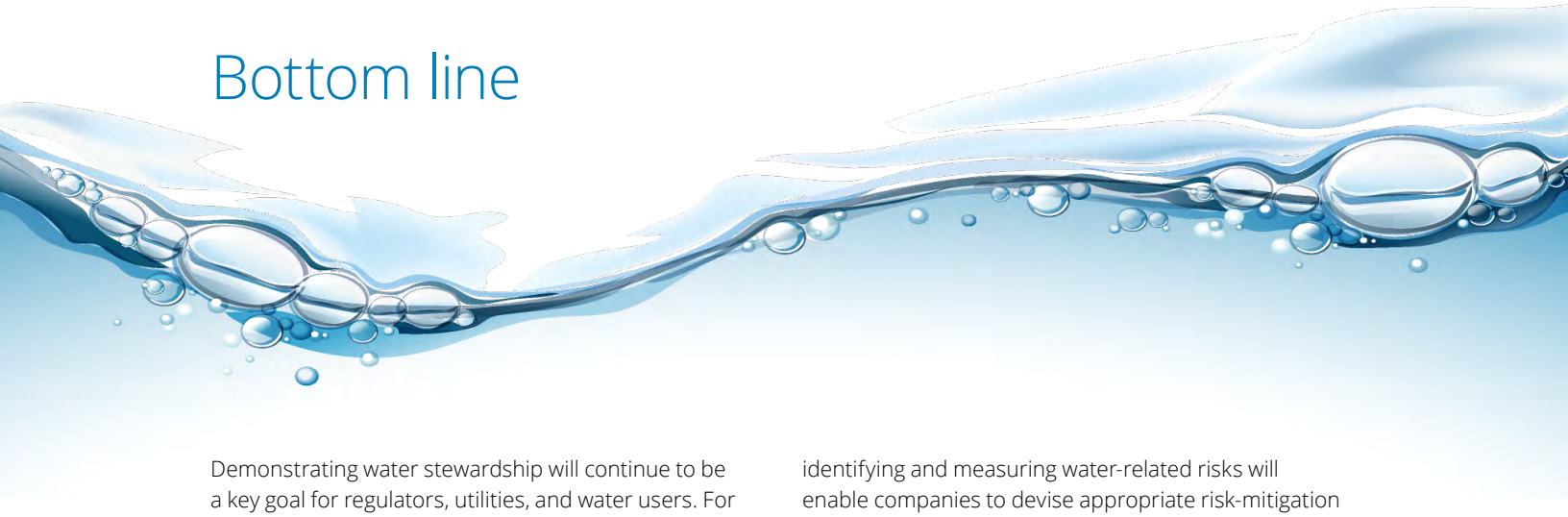
While some governments may plan for potential water-shortage crises, others have sought water reforms in other ways, such as redefining water rights to emphasize stewardship while promoting sustainable access to water for vulnerable populations. For example, in Sub-Saharan Africa, where water rights are typically tied to land ownership, many countries implement nationwide permit systems for water rights and allocation as an important element of effective IWRM. However, studies have shown a resulting unintentional burden on small-scale farmers, and hybrid approaches to permitting and other water law reforms are now being considered to balance the needs for equitable access and efficient water resource management.[45]

Water is viewed as the next critical risk because many businesses in agriculture and manufacturing rely so heavily on water. Both the public and private sector are therefore coming under increasing pressure to show more initiative in identifying water risks, protecting the water resources they use, and managing their water usage more effectively. One such initiative is the Water Disclosure Project, which was first launched by the Carbon Disclosure Project in 2009. Global companies are invited to fill in the questionnaire on a voluntary basis, and companies report both water and carbon emissions disclosures. The 2018 report revealed that 75% of the 296 companies that have been consistently responding to the questionnaire for the past four years now report water risk. Most risks reported relate to declining water quality and water scarcity.[46]

Utilities face increasing challenges to deliver safe and reliable water supply, and industrial and agricultural users face emerging water risks. These key stakeholders in the private sector will need to continue innovating and partnering with local, regional, and national governments, especially where water reforms are being implemented. For example, many governments have applied water law reforms to foster investment in the water sector, and utilities and other major water users will be key players in stewarding their existing infrastructure and water supplies to manage scarcity, reliability, and quality while promoting long-term sustainability of their company.

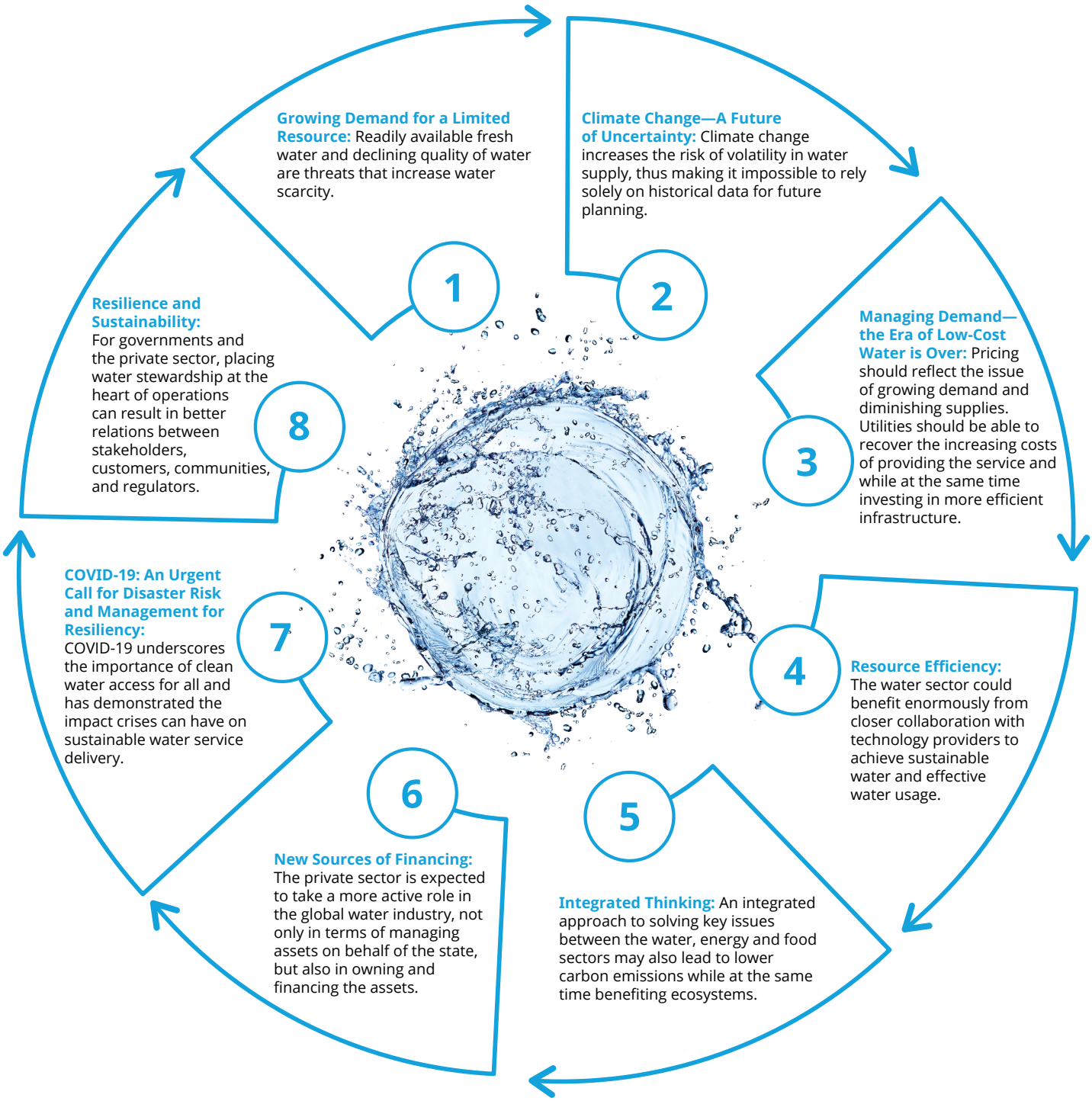
Lastly, the importance and need for an integrated approach to water stewardship is vital in preparing for future global threats. One prime example that shows the weight and vitality of water stewardship in a global context is the 2020 global outbreak of COVID-19. The World Health Organization (WHO) emphasized the importance of good hygiene for protecting public health and responding to the virus. However, it is estimated that 40% of the world's population does not have adequate handwashing facilities in the home.[47] Individuals and communities who lack access to improved sources of water and access to sanitation services have been put in a vulnerable position as they are more easily susceptible to catching the virus.[48] Shared responsibility for water stewardship and continued collaboration between public and private water stakeholders will be critical to protecting vulnerable populations and maintaining public health amid virus outbreaks and other challenges, whether those are water shortages or other climate risk events.

Bottom line



Demonstrating water stewardship will continue to be a key goal for regulators, utilities, and water users. For governments and the private sector, placing water stewardship at the center of operations can result in better relations between stakeholders, customers, communities, and regulators. At the same time, identifying and measuring water-related risks will enable companies to devise appropriate risk-mitigation plans for predicted water system collapses. Close collaboration between utilities, regulators, and all users of water is required to address the ultimate issue—the scarcity of water resources in many parts of the world.

Water Tight 3.0 report chapter summary



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End notes

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