

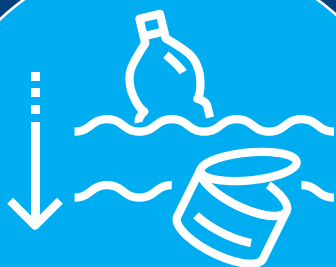
2021 COMMUNICATIONS TOOLKIT



**Enduring
partnerships**



**Value water
better**



**Reduce water
pollution**



**Use water more
equitably and
efficiently**



**Improve the quality
and availability
of data**



**Unlock
investment**

ABOUT THIS TOOLKIT

This toolkit aims to give users the tools needed to communicate clearly and powerfully about the important work the 2030 Water Resources Group is doing in developing partnerships for more equitable and sustainable water resource management.

It was developed over several months and draws on an extensive review of existing communications outputs and interviews with members of the Secretariat, the global communications team, in-country 2030 WRG teams, and our public- and private-sector partners across the globe.

Please contact the 2030 WRG External Relations Officer if you need support in using this toolkit.

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HOW TO USE THIS TOOLKIT

This toolkit consists of three sections:

- Section 1 outlines the **six key messages** that we would like to highlight in 2021. This is by no means an exhaustive list of what 2030 WRG does. Rather, it serves to demonstrate the various lenses through which our work can be viewed. The key messages are meant as a springboard for discussion, not the first and last word on our activities.
- Section 2 outlines the **narrative points** that can be made to support each of the six key messages. The narrative points offer a rationale for why we work the way we do, based on our understanding of the challenges faced in freshwater management and the lessons we have learned in addressing them.
- Section 3 contains **case studies** that provide substance to our key messages and narrative points. They highlight the impact of our activities by providing project-level descriptions supported by interviews with those who benefit from the projects.

BUILDING A STORY

2030 WRG's communication strategy focuses on storytelling: demonstrating the impact of our work through deep dives that elevate the human perspective, supported by metrics that are relevant to our multi-stakeholder partnerships approach. This toolkit aims to provide users with the building blocks needed to produce tailored communications products.

Step 1: Choose one key message. This message might contain elements of other messages, but setting the intent of communicating one message improves the likelihood that that message will resonate with your target audience/s.

Step 2: Choose the narrative points that best align with the values of your target audience. Although suggestions for narrative points have been made, these can be drawn from any key message, taking care to limit the number of key messages—when it comes to communication, less is often more.

Step 3: Choose case studies that best demonstrate the narrative points.

Step 4: Rework and edit for focus, style, and length (see box on page 4 for tips on creating content that flows).

STEP 1

CHOOSE ONE
KEY MESSAGE

We build enduring partnerships between government, the private sector, and civil society to value water as a finite resource.



Society needs to value water better.



We strive to ensure that water is used equitably and efficiently.



STEP 2

CHOOSE ONE OR MORE
NARRATIVE POINT/S

- Water is a basic human right p7
- Multi-stakeholder partnerships can achieve long-term water solutions p7
- Multi-stakeholder partnerships can solve complex problems p7
- Partnership takes time p7
- Partnerships benefit from expertise p8

- Water is necessary for life and livelihoods p8
- Water is an increasingly limited resource p8
- Water is an externality that needs to be internalized p8
- 2030 WRG grounds principles in practice p8

- Agriculture is humanity's most water-intensive activity p9
- Farmer-led irrigation projects hold massive potential for improving water efficiency in food production p9
- Water, knowledge, agropractices, technology, and market linkages are all part of the solution p9

STEP 3

CHOOSE ONE OR MORE CASE
STUDY TO SUPPORT THE KEY
MESSAGE AND NARRATIVE POINT/S

- Wastewater reuse in textile industrial parks [Vietnam] p13
- Raising multilateral funding to restore rivers and canals around Dhaka city [Bangladesh] p15

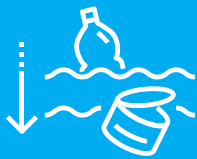
- Bangladesh: a pioneer of valuing water at national level [Bangladesh] p16
- Learning to value water in São Paulo state [Brazil] p17
- Putting the Polluter Pays principle into practice [Mongolia] p18

- Empowering farmers at the heart of successful drip irrigation projects [Northern Karnataka, India] p19
- Improving access to irrigation for smallholder farmers in Kenya p21
- Helping farmers access financing for efficient irrigation [Tanzania] p22
- Farmers' hubs play a critical role in 10-year water efficiency project [Bangladesh] p23
- Improving efficiencies in irrigated areas [Maharashtra, India] p24

STEP 1

CHOOSE ONE
KEY MESSAGE

We work to
reduce water
pollution.



We unlock
investment for
projects that
enhance water
security in support
of the Sustainable
Development
Goals.



We strengthen
water
management
by improving
the quality
and availability
of data.



STEP 2

CHOOSE ONE OR MORE
NARRATIVE POINT/S

- Wastewater is a valuable resource p9
- Extracting value from wastewater requires legislative support and substantial investment p9
- Partnership is the key to unlocking this value p10

- No sector can address water challenges alone p10
- 2030 WRG has expertise in structuring PPPs p10

- Informed decision-making requires reliable and efficient data collection p10
- Robust, current data promotes consensus and trust p11
- Even strong data needs to be effectively communicated p12
- Automation opens the door for the circular water economy p12

STEP 3

CHOOSE ONE OR MORE CASE
STUDY TO SUPPORT THE KEY
MESSAGE AND NARRATIVE POINT/S

- Improving treated wastewater quality while saving money [São Paulo state, Brazil] p25
- Wastewater reuse in agriculture [Maharashtra, India] p27
- Guideline sets high standards for green economic zones [Bangladesh] p29
- Growing crops using minimally treated mine water [South Africa] p30

- PPP financing to transform sewage and wastewater management in Gazipur [Bangladesh] p31
- Implementing performance-based contracts to reduce municipal water losses [Kenya] p32

- Using mobile phones to strengthen data collection and sharing [Kenya] p33
- Greater Dhaka to get 20 surface-water quality-monitoring systems over next three years [Bangladesh] p35
- 2030 WRG asked to update Mongolia's hydroeconomic analysis p36
- Dashboard sheds light on groundwater use in Mongolia p37
- Creating a home for water data [Peru] p37

CREATING CONTENT THAT FLOWS

The building blocks below will need to be edited to create an informative storyline that holds the reader's attention. Here are some guidelines for ensuring a flowing, informative storyline.

- Provide as much background as is necessary as early as possible. Don't provide overwhelming amounts of information or "shopping lists" of detail.
 - Aim for one topic sentence per paragraph. If a paragraph has more than one topic sentence, consider splitting it into two or selecting the more relevant topic.
 - Shorter is better. An opinion piece rarely exceeds 700 words.
 - Write out all abbreviations on first mention. Thereafter, use the abbreviation.
 - Avoid jargon. If unavoidable, provide an explanatory note at the first mention of the term.
 - Write out all names and positions in full on first mention. Thereafter, use the person's last name only.
 - Always add the narrative point titled "Multi-stakeholder partnerships can achieve long-term water solutions" and, if possible, a paragraph on 2030 WRG's activities in the country being discussed (see examples in the case studies).
 - Check for sensitivities. For example, when producing a piece that argues in favor of valuing water, be sure to acknowledge 2030 WRG's position with regard to free water as a basic right.
-

SECTION 1: KEY MESSAGES FOR 2021

The key messages reflect 2030 WRG’s current strategic approach and active projects in the countries and states where it has established multi-stakeholder partnerships.

Since water challenges, policies, and management technologies are constantly changing, these key messages will, over time, need to be reviewed and updated after 2021. They were developed following a review of current projects, and in consultation with internal stakeholders.

These key messages are not exhaustive. 2030 WRG’s approach—of establishing multi-stakeholder partnerships to identify solutions to local water-related challenges—means that a substantial number of projects have been initiated at country and state level. It would not be practical to showcase all these projects. Rather, flagship projects that demonstrate a particular thematic focus area, or highlight a novel approach with potential for scaling, can be highlighted.



We build **enduring partnerships** between government, the private sector, and civil society to value water as a finite resource



We encourage society to **value water better**



We work to **reduce water pollution**



We strive to ensure that water is **used more equitably and efficiently**



We **unlock investment** for projects that enhance water security in support of Sustainable Development Goals



We strengthen water management by **improving the quality and availability of data**

SECTION 2: NARRATIVE POINTS

This section provides discussion, with relevant data points and examples, to support the narrative points.

WATER IS A BASIC HUMAN RIGHT

Worldwide, one in three people does not have access to safe drinking water and two out of five people do not have a basic hand-washing facility with soap and water.¹ The Covid-19 pandemic has demonstrated the importance of this basic human right, which is enshrined in the United Nations' Sustainable Development Goals (SDG 6: Clean water and sanitation).

2030 WRG's work closely aligns with this goal. Our multi-sectoral partnerships approach focuses on strengthening water governance by encouraging the private and public sectors to collaborate around water issues so that this basic human right can be attained.

MULTI-SECTORAL PARTNERSHIP CAN ACHIEVE LONG-TERM WATER SOLUTIONS

2030 WRG brings governments, the private sector, and civil society together to work towards long-term water solutions.

In practice, this means bringing together people from different groups—civil society, business, academics, governments, and funders—to build mutual trust that will translate into meaningful decisions and actions. Only concerted action can solve difficult problems and bring about lasting change.

MULTI-STAKEHOLDER PARTNERSHIPS CAN SOLVE COMPLEX PROBLEMS

Managing water supply and demand, and the social and economic needs that are bound up in how water is used, is complex. To solve this kind of complex, shared problem, a range of perspectives, skills, and experience is needed.

The solutions that emerge from our efforts need to be based on a deep understanding of the local context. Across the globe, agriculture consumes over 70 percent of the world's raw water.² Finding solutions that support farmers' abilities to make a livelihood while also conserving water begins with the understanding that each group of farmers has a unique set of needs and challenges relating to the types of crops they grow, local market conditions, the infrastructure available to them, the specific water- and climate-related challenges they face, and their understanding of the value of water.

Businesses and economic developments consume massive amounts of water. Although some economic activity uses or pollutes water heedlessly, many responsible businesses are searching for ways to use water more sustainably.

When businesses commit to reducing the amount of raw water they use or to release less pollution, they need technologies, policies, and laws to make this possible in practical terms—for example, by helping them track their use and output. They need governments to support them with infrastructure and clear guidelines on tariffs and rebates. Vietnam, where the government has worked to create legislation that enables forward-thinking businesses to take active steps to reduce water pollution, is an example of how a vision can be translated into action through the 2030 WRG multi-stakeholder approach.

PARTNERSHIP TAKES TIME

Trust-building takes time to show results. While 2030 WRG started working in Vietnam only recently, it has been working in Bangladesh since December 2015, following the Prime Minister's approval and gazetting of the Bangladesh Water Multi-Stakeholder Partnership (BWMSPP). This

PARTNERSHIPS BENEFIT FROM EXPERTISE

Any potential solution to water challenges needs to be informed by robust science and up-to-date data. 2030 WRG supports water partnerships by bringing strategic, scientific, technical, and financial experts to the discussion.

WATER IS NECESSARY FOR LIFE AND LIVELIHOODS

The right to clean, safe water and sanitation is as immutable as the right to life. Indeed, water is life: not just for people but for ecosystems and economies too. Most people rely on water for their livelihoods: either directly, such as small-scale farmers, who make up 65 percent of the world's population,³ or indirectly, such as industry workers in factories that rely on water to drive machinery, wash raw materials, and manufacture products. To varying levels, water also has spiritual, emotional, and cultural values for people across the world.

WATER IS AN INCREASINGLY LIMITED RESOURCE

With unrestrained water use and high levels of pollution reducing how much fresh water is available, we are increasingly realizing that water is a finite resource. As the fresh water supply comes under pressure all over the globe, we need to create a shared understanding on how we value it. Water scarcity can create conflict, with users competing for the water they need, in contexts that range in scale from the community-level to the international level. Understanding the value that water has to its different users will help us to defuse conflict and work together to find solutions that work for all.

WATER IS AN EXTERNALITY THAT NEEDS TO BE INTERNALIZED

In business terms, water is widely regarded as an externality: although waterways are often negatively impacted by pollution and other effects of industrial activity, the companies responsible for producing these effects are not usually required to carry the cost of preventing or mitigating these effects. But these costs are nonetheless carried by someone—usually neighboring ecosystems, communities, and future generations.

One way to internalize the value of water is to implement financial mechanisms that place a reflective value on water. These mechanisms don't need to be added to the actual cost of using water to bring about positive change. Rather, they can serve as a tool for assessing a company or project's environmental and social impact over the long term, enabling decision-makers to make more informed, environmentally smart decisions. In Bangladesh, our country team has been working with the Prime Minister's office to find a way to include the true value of fresh water in investment decisions at the national level. In São Paulo, Brazil, we have been working to create a methodology for more accurately pricing the right to use water resources within strategic river basins. In Mongolia, 2030 WRG has developed fee guidelines for discharging inadequately treated water and has conducted a review of water tariffs.

2030 WRG GROUNDS PRINCIPLES IN PRACTICE

Released in 2017, the five Bellagio Principles were drafted by the High-Level Panel on Water, which is led by the United Nations and the World Bank. The principles recognize that water has multiple values to different groups, and that these values need to be reconciled in equitable and transparent ways. On a more practical level, they identify the need to protect water sources by empowering stakeholders through education about the intrinsic value of water, and by ensuring adequate investment in institutions, infrastructure, information, and innovation, to realize the benefits of water while reducing the risks to global water security.

"2030 WRG's approach grounds these principles in practice by creating and maintaining platforms where stakeholders from various sectors and interest groups can share experiences, educate others and themselves to value water more highly, and develop practical, impactful, evidence-based solutions with broad support that are likely to attract both local and international funding," says 2030 WRG's program manager, Karin Krchnak.

AGRICULTURE IS HUMANITY'S MOST WATER-INTENSIVE ACTIVITY

Agriculture accounts for 70 percent of freshwater withdrawals globally.⁴ It is also the key livelihood activity for many of the poorest people in the world, with 65 percent of poor working adults employed in the sector.⁵

FARMER-LED IRRIGATION PROJECTS HOLD MASSIVE POTENTIAL FOR IMPROVING WATER EFFICIENCY IN FOOD PRODUCTION

Because water use is so clearly linked to agriculture, many of 2030 WRG's programs aim to ensure efficient water use and equitable access to water in a farming context. Our experience shows that agricultural water efficiency programs can only succeed if the people involved—mostly small-scale farmers—are able to feed themselves and make a living while using water more efficiently. We have learned that encouraging farmers to take the lead in irrigation development projects yields valuable insights—and potentially scalable models—for governments and agencies looking for solutions that promote water efficiency, food security, and farmer resilience. The resulting projects are embedded in their context, appropriate for the environment, and supported and understood by people on the ground who have the capacity to sustain them.

WATER, KNOWLEDGE, AGROPRACTICES, TECHNOLOGY, AND MARKET LINKAGES ARE ALL PART OF THE SOLUTION

Farmer-led irrigation development involves giving small- or medium-scale farming communities the freedom, resources, and support they need to find their own water-use efficiency solutions. These could involve adopting locally appropriate technologies, developing innovative financing mechanisms or investment strategies, and developing methods to expand linkages with a farming community's customer base. In the FLID model, farmers take ownership of the project early on in the development cycle, while 2030 WRG and other partners serve as conveners, facilitators,

and technical advisors. "Removing barriers to financing, enabling access to technology and markets, building capacity, and knowledge transfer are powerful means of accelerating FLID," says Krchnak.

WASTEWATER IS A VALUABLE RESOURCE

By 2030, the world will require 40 percent more water than it does today. Already, many countries are experiencing seasonal shortfalls in water supply, jeopardizing health, economic activity, and food security. Viewing wastewater differently is part of the solution. Treated wastewater produces by-products that can be used in various applications such as agricultural fertilizer, while the process of wastewater treatment generates biogas that can be used for power generation. Treated water itself has a range of uses—from irrigation, industry and urban purposes, to potable water supply—and its use can relieve the pressure on precious freshwater resources. Seen this way, wastewater—either treated or, where appropriate, minimally treated—is a valuable resource.

"Promoting the circular economy—where treated or minimally wastewater is reused—is an important part of our strategy to help reduce the gap between supply and demand," says 2030 WRG program Manager Karin Krchnak. "Our multi-stakeholder approach helps bring governments and business together to find ways to support development while conserving water."

EXTRACTING VALUE FROM WASTEWATER REQUIRES LEGISLATIVE SUPPORT AND SUBSTANTIAL INVESTMENT

Many governments are responding to the water crisis by revising legislation to allow for the reuse of wastewater. Of course, wastewater reuse needs to be closely monitored and managed to ensure safety, especially for applications where people come into contact with the water, such as washing cars or irrigating fields.

When reusing treated effluent for industrial or agricultural purposes, its biochemical content needs to be checked against the water quality requirements for which it is intended. Facilitating such a seemingly simple transaction requires substantial investment in wastewater treatment plants, mechanisms to transport water from sources to users, and systems that allow for transactions between treated wastewater suppliers with users by quality. Water quality also needs to be tested on an ongoing basis, and wastewater treatment plants must be maintained to ensure optimal operation. Wastewater may also need to be moved from one region to another to meet different needs, calling not only for physical pipelines but also legislative and administrative arrangements.

The expense of such infrastructure and maintenance needs to be evaluated against possible income streams from the sale of treated wastewater: both new finance streams and markets may need to be established to ensure a viable project.

PARTNERSHIP IS THE KEY TO UNLOCKING THIS VALUE

2030 WRG has formed innovative partnerships with the public and private sector in several countries to promote circular water economies, where water is recycled and reused. On three continents, working together with partners in municipalities and cities, we are already making this vision a reality.

NO SECTOR CAN ADDRESS WATER CHALLENGES ALONE

Governments already face urgent pressure to address a complex range of challenges with limited financial and human resources. In 2020, the COVID-19 crisis and the climate change-driven wildfires on several continents highlighted the need to bring stakeholders together to collectively seek solutions to common challenges that include sharing resources, collaborating on innovation, and strengthening financing systems.

“Public-private projects (PPPs)—where governments and businesses work to each party’s strengths with the ultimate goal of improving resilience, building infrastructure, sharing experiences, and transferring skills—can make a vital contribution to improving water security for all,” says 2030 WRG Program Manager Karin Krchnak.

If mandated by government and structured to incorporate relevant checks and balances, such partnerships can bring about real transformation by unlocking both finance and expertise to solve problems.

2030 WRG HAS EXPERTISE IN STRUCTURING PPPs

2030 WRG has expertise in successfully developing and piloting water-related PPPs, which tend to be complex and vulnerable to stalling unless substantial effort is put into developing and maintaining relationships that are based on consensus, mutual responsibility, and a strong evidence base.

Examples of successful PPPs developed by 2030 WRG include the Gazipur City Corporation wastewater and fecal sludge management initiative, which is the first municipal PPP in Bangladesh, and a PPP to reduce water losses in Kenya, where past projects in the water sector have not been as successful.

INFORMED DECISION-MAKING REQUIRES RELIABLE AND EFFICIENT DATA COLLECTION

Climate change and more frequent droughts can lead to competition over water. In areas such as Kenya’s Mount Kenya Ewaso district, where competition over water often causes conflict, the need to collect and share accurate water-use data to ensure fair allocation becomes all the more important.

To support such activities, the Mount Kenya Ewaso

Water Partnership (MKEWP) was co-founded by 2030 WRG in 2016 as a multi-stakeholder platform that brings together public, civil society, and private-sector actors within the Upper Ewaso Ng'iro North Basin. MKEWP is developing a cellphone-based app to help water-monitoring scouts collect water-usage data using standardized protocols and to share them with relevant stakeholders and decision-makers.

The ability to connect just about any type of water sensor to the internet, coupled with technological developments like cloud-based artificial intelligence and blockchain technology, is making it easier to automate and centralize data collection on everything from water offtake volumes to the chemical composition of treated effluent. "Sensor technologies and artificial intelligence have made huge strides in recent years. Yet in many countries, water quality is still tested by hand," says Krchnak. "We help our partnerships explore options for automating water testing to improve the quality of available data and support evidence-based decision-making across all sectors."

Bangladesh's Dhaka City, a populous economic powerhouse, is the site of a project that pioneers the use of internet of things (IoT) technology for water-quality testing. A joint project with 2030 WRG will remotely analyze and monitor pollution in the city's waterways. The information will help inform policy and investment decisions for the city's water sources.

In a similar vein, the 2030 WRG team in Mongolia is developing an artificial intelligence-powered dashboard to monitor groundwater extraction over a network of more than 280 boreholes, enabling critical, real-time decisions about how to sustainably use this valuable resource.

ROBUST, CURRENT DATA PROMOTES CONSENSUS AND TRUST

"If you can't measure it, you can't change it," wrote Peter Drucker, an American intellectual widely described as the founder of modern management. This is as true for water resource management and the shift to the circular water economy as it is for business processes. In many regions, water is a poorly measured resource, with little agreement on its availability and purity, or the likely long-term effects of climate change. The interaction between the availability of freshwater resources and economic activity is also poorly understood.

Establishing consensus on the key challenges to the availability of fresh water, and how these concerns will affect and be affected by economic activity, is an important first step towards managing freshwater resources more sustainably. "When we start working in a new geography, one of the first things we do is to conduct a hydroeconomic analysis (HEA) to find out what data are available, where we need to close information gaps, and where the real problems and opportunities lie in water management. This helps us develop an understanding of how shifts in economic activity can bring about improvements in water security while supporting development objectives," says Krchnak.

"In producing these hydroeconomic analyses, we build relationships with and between the government, businesses, civil society, and researchers. These two activities—the technical assessment and building bridges between sectors—are equally important. They form a foundation of common, evidence-based understanding and trust, without which no project can succeed."

EVEN STRONG DATA NEEDS TO BE EFFECTIVELY COMMUNICATED

Data can only guide decisions if decision-makers can access and understand it. In countries like Peru, where the water administration system is especially complex and different entities have access to different data sets, having a central repository of reliable, up-to-date information is essential for enabling decisions and action.

With this in mind, 2030 WRG Peru supported a leading university in forming the Observatory of Water, which acts as a library of collated and curated water data and develops indicators for better use and interpretation of data. This data has many applications, including the creation of methods to charge for water use.

AUTOMATION OPENS THE DOOR FOR THE CIRCULAR WATER ECONOMY

Treating effluent to potable levels can be expensive, but wastewater doesn't need to be treated to fully potable levels to be reused. Different applications require water of different quality: you don't need potable water to wash cars, for example. Water that is deemed safe to handle but not consume is sufficient for this purpose. The key is to match the user's needs with the quality of the available treated wastewater.

The potential to treat, test, and sell wastewater to willing buyers makes investing in the circular water economy viable—attractive, even—for industries. Technology has an important role to play in making this entire process practical, cost-effective, and safe. 2030 WRG invests substantial resources into accelerating the development of such technologies, says Krchnak: "In 2019, our Maharashtra team hosted a hackathon to develop algorithms that support the transactions involved in the reuse of treated industrial and municipal wastewater." These building blocks have been shared with other country teams and will contribute to future circular water economies across the world.

SECTION 3: CASE STUDIES

In line with our strategic aim of demonstrating impact through story-telling, these case studies provide context, granular detail of projects, and first-person impressions from partners on the ground.

WASTEWATER REUSE IN TEXTILE INDUSTRIAL PARKS

Vietnam's GDP could shrink 3.5 percent by 2035 if nothing is done to address the effects of water pollution on human health.⁶ According to a 2019 report, four river basins accounting for 80 percent of GDP are projected to suffer from water stress by 2030 due to an increase in urbanization. Currently, only 12.5 percent of urban wastewater receives treatment. Now, a high-level task force with representatives from government, prominent clothing brands, a textile association, and civil society are working together to improve wastewater treatment in the textile industry.

The task force only came together in December 2019, but it draws on the global experience of its convening partner, the 2030 WRG. "Our aim is to bring disparate stakeholders with a common interest in water around the table to constructively explore ways to improve local water security," says Krchnak. "In many instances, our partnerships have brought together high-level decision-makers who have never met, despite sharing a vision of creating a water-secure country with a strong economy."

The 2030 WRG Textiles Task Force is chaired by the Vietnam Textile and Apparel Association (VITAS), the Vietnam Environment Administration, and 2030 WRG. It is supported by the Ministry of Planning and Investment (the state agency for the management of economic zones and industrial parks) and the Ministry of Industry and Trade (which oversees the industry sector, including textiles).

Country: Vietnam

Summary

- Vietnam's GDP could shrink 3.5 percent by 2035 if nothing is done to address the effects of water pollution on human health.
- The four river basins that account for 80 percent of GDP are projected to suffer from water stress by 2030.
- Currently only 12.5 percent of urban wastewater receives treatment.
- With 2030 WRG's support, a high-level multi-stakeholder task force has been formed to improve wastewater treatment in the textile industry.

According to Vu Duc Giang, the chairman of VITAS, "The multi-stakeholder approach is critically important for the success of a policy or a long-term project, especially for this cross-sectoral initiative.

"A weakness often observed in Vietnam is lack of coordination among central line ministries and between the central and sub-national levels, leading to fragmented and ineffective management that in many cases has resulted in 'tightening the bottlenecks that need unlocking' (for example, bottlenecks in investment in textiles, fabric-making and dyeing)," he says. The MSP's shared

leadership structure has encouraged frank, productive discussions about such challenges, as well as the sources of water pollution, the legislative barriers to reusing treated wastewater, and possible solutions.

Treating wastewater to remove chemicals is a costly process that holds little financial incentive for industry unless businesses are able to sell or reuse the treated wastewater. However, existing legislation does not facilitate this.

Any proposed solution to Vietnam’s water pollution problem needs to incorporate changes to both the policy environment and industrial practices. To address the former, 2030 WRG worked on a new report that proposes legislative revisions. Drawing on 2030 WRG’s experience in Mongolia, South Africa, and India, the proposed revisions focus on wastewater reuse. The report was presented to the National Assembly in May 2020. The law will hopefully be approved by the end of 2020, enabling sub-laws in coming years.

Meanwhile, the task force has commissioned a study on the feasibility of wastewater reuse in two textile-specific industrial parks. “The vision ... is to develop an exemplary model, and to set out the guidelines for other industrial parks to follow,” says Vu Duc Giang.

The parks will act as a testbed for new wastewater reuse regulations, laws, and policies—and financial incentives—that the Vietnamese government is proposing to introduce. The plan is to “learn by doing”, and develop good practices that can be implemented in the whole industry.

2030 WRG has been active in Vietnam since 2016. The Urban Industrial Water Pollution Management workstream was formed in December 2019 after a water governance study by the World Bank’s Global Water Practice highlighted the need to work in this sector. The workstream is chaired by the Vietnam Environment Administration (which falls under the Ministry of Natural Resources and Environment). One task force focusing on textiles has been formed, with another two—focusing on urban wastewater management and alternative finance—imminent. The formation of a multi-stakeholder partnership (MSP) Steering Board is planned for 2021.

RAISING MULTILATERAL FUNDING TO RESTORE RIVERS AND CANALS AROUND DHAKA CITY

The Government of Bangladesh has applied for \$636 million from the World Bank International Development Association (IDA) to support a project to restore rivers and canals around Dhaka city as part of its 10-year, \$5 billion Master River Plan.

Dhaka, one of the world’s mega-cities, is home to more than 20 million people.⁷ The five rivers surrounding the city—Buriganga, Turag, Sitalakhya, Dhaleshwari, and Balu—are “ecologically critical” due to high population growth, rapid and unplanned urbanization, encroachment, inappropriate disposal of solid wastes, and discharge of untreated industrial effluents and untreated sewage.

The funding application, developed by the Bangladesh Water Multi-Stakeholder Partnership (BWMSP) with 2030 WRG’s support, is backed by the partnership’s strong track record in rolling out water projects with measurable benefits.

That the Government of Bangladesh entrusted the BWMSP and 2030 WRG with developing this key proposal is a testament to the level of trust between the parties, and specifically between the public and private sectors. Although the BWMSP is government-led, it has strong private sector and civil society components. “The multi-stakeholder partnership approach aims to cement relationships between key decision-makers from all sectors early on in the project-development cycle, so that when the going gets tough—as it always does—there is an existing relationship and common understanding to carry the project through,” says Krchnak.

If the funding application succeeds, around \$5 million will go to scientific studies to inform actions that will help to restore the ecological state of the rivers and canals. Such actions could include capacity-building; improving municipal and industrial wastewater treatment and sludge

Country: Bangladesh

Summary

- The Government of Bangladesh has applied for \$636 million from the World Bank International Development Association to support a project to restore rivers and canals around Dhaka city.
- 2030 WRG Bangladesh provided technical expertise to the Bangladesh Water Multi-Stakeholder Partnership, of which it is a member, which was tasked with developing the funding application on behalf of the government.

management; reconnecting drainage canals with rivers; developing domestic sewage-treatment plants and on-site sanitation for informal areas; dredging rivers to improve navigation; and forming public-private-partnerships for industrial effluent treatment.

2030 WRG has been working in Bangladesh since December 2015, following the Prime Minister’s approval and gazetting of the BWMSP. The BWMSP works through five workstreams that focus primarily on strengthening water management in agriculture, industry, and municipalities. 2030 WRG facilitates the effective functioning of the Steering Board and its workstreams by acting as the secretariat, developing project concept notes and proposals for solutions, identifying and partnering with third-party implementers, mobilizing financing for projects, and monitoring project progress.

BANGLADESH: A PIONEER OF VALUING WATER AT NATIONAL LEVEL

In a world first, the Government of Bangladesh is spearheading a project to determine shadow prices for water by region, season, source, and sector. Government entities and businesses will be able to use these prices to determine the true costs and benefits of future activities that use water.

When the UN and World Bank Group’s High-Level Panel on Water launched the Bellagio Principles in 2017, “the Government of Bangladesh ... immediately sought to begin valuing water at the national level,” says Zuena Aziz, the Principal Coordinator of Sustainable Development Goals (SDG) Affairs at the Prime Minister’s Office.

This led to the launch of the shadow-pricing project. Even though the concept of valuing water has been widely studied, this is the first attempt to determine the value of water at country level.

Aziz explains how a shadow water price might inform better business decisions: “In Dhaka, the groundwater table is falling rapidly. Surface water is highly polluted. It is just a question of time—if nothing changes—before companies will face water scarcity, especially in the dry season ... If a textile company has the choice to invest in washing machines that use less water but [cost more], the financial analysis would vote against it [based on] the current water price. If, however, the cost of water is expected to increase [due to the need to dig deeper for groundwater, or secure an alternative water source] the more water-efficient investment is the smarter business choice.”

Failing to consider impending water scarcity could come at a high future cost for all sectors, including agriculture, where farmers currently pay a flat annual rate for water. “Volumetric [shadow] pricing would ... incentivize farmers to use water-efficient methods,” Aziz explains.

A national understanding of the value of water is expected to help encourage policy reforms and attract investment for development projects. “Achieving universal, safely managed water and sanitation services [in Bangladesh] by 2030, as envisioned by SDG 6, is projected to require capital

Country: Bangladesh

Summary

- The Government of Bangladesh is committed to valuing water.
- 2030 WRG Bangladesh has provided technical support to a project to determine the shadow prices of water by region, season, source, and sector.
- This is in line with the Bellagio Principles of 2017.

expenditure of \$114 billion per year. Investment on that scale, along with accompanying policy reforms, can be motivated by a growing appreciation of the value of water,” says Aziz.

Shadow pricing can be a useful tool to determine equitable and incentivized pricing for water. Aziz cautions that it is important to strike a balance between principle and practice. “Noble as the [Bellagio] principles seem, it is quite difficult to implement them. The process of valuing water has the potential to make the private sector nervous that we are in the process of increasing the price of water. We have been very clear to reiterate that valuing and pricing are completely different concepts.”

Bangladesh’s water supply profile is marked by extremes: at different times of the year, there is either too much or too little, or it is too polluted. “There is a Bangla saying, *panir moto shosta*, which means ‘as cheap as water.’ The perception that water is cheap is anchored in the very language used. It will take substantial work to change this ... However, we [also] find that the people of Bangladesh are recognizing the value of water,” says Aziz.

The Valuing Water Initiative receives technical support from the 2030 WRG team in Bangladesh and is being implemented through the BWMSP in collaboration with the Prime Minister’s office and the Ministry of Water Resources.

LEARNING TO VALUE WATER IN SÃO PAULO STATE

An initiative to develop an innovative methodology for charging for raw water use is expected to help water authorities make more technically sound pricing decisions that are aligned to river basin planning goals.

“We must ... demonstrate to stakeholders that there is a positive and significant return to society from investments to maintain and continuously improve our tools and institutions to manage the water ... Effective water management is a valuable asset,” says Prof. Guilherme Fernandes Marques, of the Institute of Water Hydraulic Research at the Federal University of Rio Grande do Sul.

The initiative, spearheaded by 2030 WRG São Paulo, will culminate in a report that establishes state-of-the-art methodologies and draws on national and international experience, including lessons from France, whose water charge system has been in place for more than 50 years and has influenced the water management structure in Brazil. The report will identify potentialities and limitations, and propose outcomes for various charging models and prices in a severely water-stressed basin. It will also suggest different financing possibilities, and evaluate the impact of pricing water on selected sectors.

“The main challenge ... is that while water itself is perceived as valuable, the water management framework required to make the water available and reliable is often elusive,” says Marques.

By integrating different methodologies, prices, and financing options, the study is expected to facilitate a better understanding of the issues facing basin water authorities and support acceptance by sectoral water users.

“Bottom-up approaches start on building a common perception of watershed issues, problems and potential. Only by bringing different views together can we construct a true common perception. Our project is showing how decisions on ‘what to do’ and ‘how many resources do we have’ can be integrated in the water management process,” Marques explains.

Country: Brazil, São Paulo

Summary

- 2030 WRG São Paulo spearheaded an initiative to develop a methodology that the government can use to charge for raw water use.
- It aims to demonstrate that integrated water management is a critical priority in water-stressed regions (such as the Piracicaba, Capivari, and Jundiaí river basin).
- The study is expected to support acceptance by sectoral water users.

This study has been developed by a team of 2030 WRG-contracted consultants with support of the Basin Agency for the Piracicaba, Capivari, and Jundiaí rivers. The process also involves discussions with other water authorities in Brazil, such as the Water Management Institute of the State of Minas Gerais and the National Water Agency. Workshops will bring stakeholders together around this important issue.

The study builds on work done previously by the same consultants for the World Bank Water Practice Brazil in 2018. The first phase reports will be delivered in late 2020, with the second phase—developing the simulation model—beginning soon after.

2030 WRG started to work in Brazil in July 2017, when it signed a Memorandum of Understanding with the Government of the State of São Paulo, through what was then the State Department for Water Resources and Sanitation. This department was restructured into the State Department for Infrastructure and Environment by the new São Paulo state government (2019–2022). 2030 WRG São Paulo currently has three working groups that focus on strengthening water management in agriculture, industry, and municipalities. This project falls under the working group Charging for Water Use.

PUTTING THE POLLUTER PAYS PRINCIPLE INTO PRACTICE

Pollution in the river Tuul, which runs through Mongolia's capital and largest city, Ulaanbaatar, is a particular challenge. The river is the main source of water for the urban population as well as industries. The central treatment plant receives more wastewater than it has capacity to treat. As a result, inadequately treated wastewater reaches the river, with negative effects on the environment and human and animal health downstream.

In areas where water pollution poses a threat to long-term water security, polluters need to learn to value water better and be motivated to treat effluent to acceptable levels at the source.

Putting in place such a mechanism can be challenging. "In 2012, the Mongolian Parliament passed the Law on Water Pollution Charges, but the law has not been implemented until recently," says Batsukh Tserendolgor, a water engineer at APU JSC, a liquid food producer and stakeholder. The rules and methodology for implementing the law had not been approved because "the content, principles, and implementation methods of the procedures and methodologies [were] difficult, unclear, and incomplete for enterprises," according to Batsukh.

This continued to be the case until 2019, when a partnership between public, private, and civil sector representatives successfully put forward revisions to the law to make it more practical to implement. The revised law promotes water reuse and encourages large businesses to treat wastewater on-site for supply to willing offtakers. In this way, businesses can avoid both network discharge and pollution compensation fees.

The partnership that proposed the revisions was convened by the Mongolian chapter of 2030 WRG and the Ministry of Environment and Tourism. Involving large water users such as power plants, beverage companies, public commercial utilities, and mining companies in proposing changes to the law has helped to streamline the rollout of revised licenses and discharge permits for water use and wastewater discharge.

Country: Mongolia

Summary

- A partnership initiated by 2030 WRG Mongolia and the Ministry of Environment and Tourism has successfully suggested revisions to the Law on Water Pollution Charges that will make the law more practical to implement.
- 2030 WRG Mongolia has also developed a guideline for estimating pollution, for fees for discharging inadequately treated mining water, and national standards for treated wastewater reuse.

APU JSC is one of the first companies to implement the law. "APU JSC has been actively involved in the activities of 2030 WRG [and] has introduced best practices in water management in its operations, while enforcing the Law on Water Pollution Charges. We are also actively working on water reuse," says Batsukh.

Since the revision was approved, 2030 WRG in Mongolia has helped develop national standards for treated wastewater reuse, and pollution estimates and fee guidelines for discharging inadequately treated mining water. 2030 WRG has also built the capacity of local laboratories to analyze the quality of wastewater discharge. The team conducted a review of water tariffs, which encourage wastewater reuse and promote the sensible use of freshwater.

The Mongolian 2030 WRG MSP was formed in 2014. The MSP works through three workstreams that focus on identified needs, including urban and industrial water use and reuse. 2030 WRG Mongolia plays an independent supporting role, promoting dialogue and collaboration among government, the private sector, and civil society.

EMPOWERING FARMERS AT THE HEART OF SUCCESSFUL DRIP IRRIGATION PROJECTS

Drip irrigation is widely understood to be the most water-efficient technology available, yet projects to roll it out often fail. Reasons cited include lack of interest by the population, poor site selection, and lack of finance and skills to maintain systems. Now, a 24 000-hectare pilot project is showing that the key to successful drip irrigation rollout lies in putting farmers at the heart of project design.

The Ramthal Drip Irrigation Project in Northern Karnataka, now in its fourth year, is the world's largest Drip-to-Market Agri-Corridor (DMAC). DMAC is a joint initiative by the Government of Karnataka, the farming community, 2030 WRG, and implementing partners. The state's Department of Water Resources funded construction and oversees the whole project, along with the Department of Agriculture and Horticulture. Operation and maintenance of the irrigation system is done through two private companies. After five years, the farmers' associations will take over the irrigation system. Farmers are currently being helped to build capacity to operate the irrigation system and strengthen their revenue models.

Central to the long-term success of the project are efforts to link farmers with buyers. Ningappa Mahantappa Sandegwad, a farmer from the Ramthal Project and chairman of the Amruta Farmer Producers' Company Ltd, is enthusiastic about this aspect. "Since the introduction of DMAC, farmers in my own farmer-producer organization we have managed to trade close to 1.5 crore [15 million Indian rupees, or about US\$205,000] worth of produce directly to private company buyers. This was done through collective marketing," says Sandegwad.

Connections between farmer groups and buyers have been formally established through Memoranda of Understanding facilitated by 2030 WRG and the DMAC Project Implementation Unit (PIU) under the Department of Agriculture and

Country: India (Karnataka state)

Summary

- Drip irrigation projects often fail for various reasons, including lack of interest and insufficient finance to maintain systems.
- To address these concerns, 2030 WRG and the Department of Agriculture and Horticulture are facilitating linkages between the farmers of the Ramthal Drip Irrigation Project in Northern Karnataka and potential markets.
- Farmers' profits are already improving.

Water Resources. According to the PIU, these new market linkages, along with the introduction of high-yield crop varieties, have already improved income for 15,000 farmers. In January 2020, farmers from four of the water users' associations sold close to 175 metric tons of produce, earning about 7,500,000 rupees (\$100,000). Pooling their harvest and collectively marketing directly to buyers enabled the farmers to get a better price for their produce and pay lower transportation costs than when they sold to intermediaries or local traders.

In addition to facilitating the market linkages, 2030 WRG and the Department of Horticulture and Agriculture, along with the DMAC PIU consultants, are helping these associations secure larger procurements. "Contract farming—where farmers are supplied with seed and produce prespecified crops—is another option available to a planned project such as Ramthal," says Sandegwad. "[Since the project started,] various cooperative societies have established direct connections with private buyers, and discussions on contract farming are being taken up. My own farmer producer organization is discussing contract farming with [two companies]."

With contract farming, profit can increase from about 2,000 rupees (\$30) per acre to as much as 25,000 rupees per acre (\$270), Sandegwad explains. “Contract farming comes as a package that includes quality inputs and advanced farm advisory, reducing the farmer’s input costs while securing an assured market.”

Cooperative planning, trust-building, and communication are essential. “It’s important that we come together and plan to plant different crops. Farmers lose market when everybody plants the same produce and there is a bumper crop. It means a steep reduction in the price due to oversupply,” Sandegwad points out, adding that many farmers will not enter into contracts with buyers due to trust issues. “Here, farmers’ collectives ... play a vital role,” he says. “Because our [organization] made transactions worth 1.5 crore last year, this year we have been able to strike a deal for sweet corn production.”

To ensure the sustainability of the drip irrigation project, two private-sector partners are responsible for maintaining the project for its first five years. The project entered its fourth year in 2020 and there is a strong focus on transferring knowledge and capacity to the farming groups that will ultimately take ownership of the infrastructure, which is technically complex and requires ongoing monitoring and maintenance. “The drip irrigation system is the most efficient irrigation system,” affirms Vaibhav Desai, Ramthal Project Manager, of Jain Irrigation, one of the private-sector partners. “The Ramthal Project operates according to water demand ... [so] if there was rain, there will be less demand for piped water. Our centralized pumping and operation system also helps to save water.”

The farming groups have started setting aside a portion of their revenue to afford the cost of maintenance and operations. “They have taken the initiative and become more involved in this project,” explains Desai. “In time, there will be a smooth system handover to the societies and farmers.”

By the end of 2020, the Ramthal DMAC project will scale up to more than 200,000 hectares across five projects at Poorigali (Mandya District), Tarikere (Chikkamagaluru), Singatalur (Gadag), Savanur (Haveri), and Koppal (Karnataka). By June 2021, all five new projects will be ready to roll out with water user associations established and buyers supplying support in the form of seed and fertilizer ahead of the planting season.

Sandegwad wants the lessons learned from the project to inform future projects. “It is an excellent project. However, if it [is] replicated anywhere in the world, extensive community consultations must be conducted. Farmers must be involved from scratch,” he says.

The Karnataka MSP was formed in 2017 to discuss efficient approaches for water conservation management. The MSP works through three workstreams that focus primarily on strengthening water management in agriculture, industry, and urban areas.

IMPROVING ACCESS TO IRRIGATION FOR SMALLHOLDER FARMERS IN KENYA

An innovative action research project is examining what it will take to make it possible for Kenyan smallholder farmers to access new irrigation technologies.

Agriculture is the most water-intensive sector in Kenya, accounting for nearly 60 percent of water withdrawals.⁸ Irrigation could radically improve productivity while reaping huge water-savings benefits for the water-strapped country, yet farmers face severe challenges in accessing finance for this technology.

Making the shift from uncertain rain-fed agriculture to efficiently irrigated agriculture could transform water management in Kenya, increasing agricultural productivity, profitability, and resilience to climate change. The country's National Water Master Plan aims to have approximately 765,000 hectares under irrigation by 2030.⁹

To support this vision, a collaborative action research project is working with 10 farming groups across six counties to identify the systemic and complex constraints they face, and to explore ways to access irrigation and irrigation financing. According to Vincent Kabuti, the deputy director of the National Irrigation Authority, these constraints include limited access to irrigation equipment, the high cost of power for pumping water, and lack of structured marketing for produce. "There is no clear structure for marketing agricultural commodities produced ... through irrigation," said Kabuti. "This creates uncertainty for sustaining consistent agricultural production."

Shifting to drip irrigation could open up market opportunities, increasing income for farmers and their communities. Kabuti pointed to contract farming—where farmers plant according to buyer's requirements and are assured of the sale—as an example. "[This] can create employment at farm level and along the value chain. It can

Country: Kenya

Summary:

- Kenya's National Water Master Plan aims to have approximately 765,000 hectares under irrigation by 2030.
- 2030 WRG is supporting a collaborative action research project to identify barriers to finance for irrigation for smallholder farmers.

support industries. Large towns sprout up around rich agricultural areas," explains Kabuti, adding that assured sources of produce can improve community access to nutritious food.

The action research project considers the entire agricultural ecosystem, including farmer organizations, finance, water storage, input-supply systems, value addition technology, post-harvest practices, and market linkages. It started in January 2020 and is expected to run until December 2020. It is a partnership between 2030 WRG, the Ministry of Agriculture (through the National Agricultural and Rural Inclusive Growth Project), SNV Netherlands Development Organisation, and Wageningen University and Research.

The Kenya MSP was formed in 2015 following an invitation by the Government of Kenya to support the development of a multi-stakeholder partnership. The MSP works through three workstreams that focus primarily on strengthening water management in agriculture, industry, and in urban areas.

HELPING FARMERS ACCESS FINANCING FOR EFFICIENT IRRIGATION

A 2030 WRG-led project to help farmer groups successfully apply for drip-irrigation finance could radically reduce water demand in Tanzania, where the agriculture sector accounts for 85 percent of national freshwater withdrawals,¹⁰ of which nearly half—45 percent—is lost.¹¹

The project focuses on 3,000 farmers in the Kilimanjaro water stewardship area, where the 2030 WRG-initiated Kilimanjaro Water Stewardship Platform has been active for the past four years. Enabling a switch from inefficient flooding and furrow irrigation to drip irrigation within the catchment will reduce water offtake and improve water flows.

By June 2020, three farming groups were ready to submit their financing applications to the Tanzania Agricultural Development Bank and commercial banks. To help these groups pay back potential loans, the research team is also helping to develop direct linkages between the farmers and buyers to secure a market for their produce. If guaranteed contracts can be secured, this will improve the farmers' credit ratings and allow further access to credit.

2030 WRG has been active in Tanzania since 2013, following an initial invitation from then President Kikwete. A Hydro-Economic Overview in 2014 prioritized the basins where water stress was more likely and where mandated government institutions had host capacity for an MSP. This initially resulted in a catchment-based MSP, the Kilimanjaro Water Stewardship Platform, which had been replicated in all nine river basins by 2020. The establishment of a National MSP is anticipated in 2021.

Country: Tanzania

Summary

- In a project focusing on 3,000 Tanzanian farmers, 2030 WRG is working with partners to enable a switch to drip irrigation, thereby reducing water demand.
- The partnership has identified and assisted three farming groups to submit financing applications.
- The project also aims to link farmers with buyers to secure a market and enable access to credit.

FARMERS' HUBS PLAY CRUCIAL ROLE IN WATER EFFICIENCY PROJECT

A project that uses profit as an incentive to drive water efficiency and reduce groundwater abstraction in Bangladesh offers valuable lessons for how to use water more sustainably.

Despite the Government of Bangladesh's policy to reduce groundwater abstraction and use, over-abstraction and pollution have caused groundwater levels in the water-hungry Barind Tract to become depleted. Introducing Water Efficient Technologies (IWET) is a 10-year pilot project that aims to motivate 10,000 farmers there to shift to more efficient watering techniques. The reward: increased agricultural productivity, strengthened market linkages, and better profits.

In the first two years, the IWET project has worked with 6,000 farmers to save 3.6 million cubic meters of water by trading flooding-type watering techniques for drip irrigation, and shifting from Boro rice to higher-value, less water-intensive produce such as mangoes. Farmers who prefer to continue farming rice are encouraged to do so using the alternate wetting and drying irrigation method instead of conventional flooding technique, a shift that is expected to save water by 30 percent according to the IWET project's projections. They are also encouraged to have a second high-value non-rice crop on the same ground. The construction of 70 farmers' hubs by June 2020 has been central to the project's ability to support farmers' marketing efforts and profitability. "A farmers' hub is a one-stop commercial-service platform situated very close to each farming zone," explains Farhad Zamil, country director of the Syngenta Foundation for Sustainable Agriculture, one of the project's partners. "It delivers essential services to smallholders, including best-quality seedlings or saplings and farm machinery."

Farmers' hubs provide crucial market support. "It is an aggregation point close to the farm gate where farmers bring their produce in plastic crates. This proximity helps farmers reduce losses and marketing/transportation costs. Each hub has facilities [for] sorting, grading, scaling, and washing." The hubs allow farmers to aggregate their produce and sell to large traders at better prices, says Zamil. "Farmers' hubs provide market

Country: Bangladesh

Summary

- The Bangladesh government has a policy to promote water efficiency and reduce groundwater abstraction.
- 2030 WRG is part of a 10-year pilot project to motivate 10,000 farmers to reduce reliance on groundwater.
- The reward for the farmers is increased agricultural productivity, strengthened market linkages, and better profits.
- In the first two years, the IWET project has worked with 6,000 farmers to save 3.6 million cubic meters of water.

prices through both a physical and digital platform (the 'eFarmersHub'). This knowledge helps their bargaining power. They sell their produce directly to the hub owners or to large traders. Typically, a hub links with five to eight large traders. Due to aggregation and less handling of fresh produce, farmers get better prices, and the buyers get the required quality product from a single source."

Another important aspect of the project is sharing knowledge. The IWET project ensures that farmers receive hands-on training. Demonstration orchards of mangoes train farmers in drip irrigation, while other plots demonstrate alternate wet-and-dry farming for Boro rice. The team has also worked with the Department of Agricultural Extension within the Ministry of Agriculture to develop a state-of-the-art training module on ultra-high-density mango, which is being considered for inclusion in the national agricultural syllabus.

Farmers' hubs play a critical role here too, says Zamil: "The hubs grow a special type of mango sapling suitable for ultra-high-density plantations, which are ideal for drip irrigation ... They also make the alternate wetting and drying pipe-and-drip kits available and affordable." By selling essential services and tools and providing appropriate information to the farmers, hubs play a vital role in transforming technology and enhancing productivity.

IMPROVING EFFICIENCIES IN IRRIGATED AREAS

A multi-stakeholder project to enable farmers to use water more efficiently in India's Maharashtra state has already had success since it kicked off in May 2019, including improving water efficiency and water savings.

This is the first project in Maharashtra with commitments secured from the public sector, the private sector, and civil society to achieve a common vision of improved agricultural water efficiency. It is a brainchild of the Maharashtra MSP. ITC, a private-sector partner, signed the first MoU with the Water Resources Department. Each party has an important role to play: the state Water Resources Department has committed to overseeing the project and improving bulk water supplies to farms; farmers have organized into water users' associations to invest in efficient water technologies; and private-sector players have committed to building capacity and developing market linkages. In all, the project will cover 98,000 hectares across four command areas and include sugar cane, onion, tur dal, and cotton crops.

Bringing together the right stakeholders is important for a project of this scale and ambition. ITC has a long record of involvement in large-scale water-stewardship projects through the ITC Water Stewardship Programme. "Water resource management is one of the most critical challenges for India, with agriculture still being mainly rainfed and dependent on groundwater," says Munesh Saxena, ITC's program manager for the project.

Saxena shared the story of Kanchan Jadhav, a sugar-cane farmer from the Jadhavwadi community in the Pune district. "[Jadhav] has been a great inspiration to sugar-cane growers in her village. After receiving training at our farm field school, she successfully applied farming practices [that] led to an improvement [in water efficiency] of about 45 percent to 50 percent. Productivity increased by about 30 percent.

"Her success brought about a water-management revolution, not only in her own village but also in nearby villages. Due to Kanchan's efforts, about 80 percent of the sugarcane in the village is farmed using recommended practices." By June 2020, 13,312 farmers had attended the 332 farm schools established by the project.

Country: Maharashtra, India

Summary

- The project hinges on farmers adopting water-efficient technologies, with assured access to water and markets incentivizing change.
- It utilizes an innovative Public-Private-Civil Society Partnership model.
- The key private sector partner, ITC, has a long record of involvement in large-scale water-stewardship projects.

Being able to access appropriate technologies is important for productivity and water efficiency. With this in mind, the ITC team supported existing women's self-help groups to set up 26 hiring centers that hire out farm equipment such as mulchers, ploughs, and sprinkler sets at an affordable price, with easy access to credit. "The hiring centers make advanced crop-specific farm equipment available during peak agriculture season," says Saxena. "ITC has a vision to enable these women to catalyze the development of the agricultural landscape," says Saxena, pointing to the 26 hiring centers run by woman farmers. These centers were very active during Maharashtra's first COVID-19-related lockdown. "During lockdown, these hiring centers helped farmers access necessary equipment [and] continue to earn livelihoods. In the three months of lockdown [April to June 2020], these groups earned 2.49 lakh rupees [\$3,900]."

The project targets four command areas that are managed by the Water Resources Department. The project area is expected to expand in the coming year, with new private-sector partners coming on board. Two additional projects with the Development Support Centre and Yuva Mitra were initiated in August 2020, covering an additional 55,000 hectares. The Water Resources Department of Maharashtra established a PIU to coordinate all the stakeholders, monitor progress and bring key issues to the MSP forum for guidance. 2030 WRG continues to support all the stakeholders in documenting lessons, knowledge sharing, adopting innovative ideas, and building new partnerships.

IMPROVING TREATED WASTEWATER QUALITY WHILE SAVING MONEY

With the support of 2030 WRG Brazil/São Paulo and World Bank, SABESP, the São Paulo state water and sanitation company, has embarked on an ambitious program to improve the capacity and efficiency of four wastewater treatment plants in the São Paulo metropolitan area, including the Barueri plant, one of the largest in South America.

SABESP estimates that twenty-one million people live in the São Paulo metropolis, with 39 municipalities. In 2019, according to SABESP's data, 87 percent of the total domestic sewage produced in its concession area was collected, and 78 percent of this was sent to wastewater treatment facilities. SABESP is expanding collection networks in the region, but the treatment plants—which discharge treated wastewater into water bodies of the Tietê River basin—have bottlenecks that limit their treatment capacity and efficiency. The existing wastewater treatment facilities need to operate at their best to receive increasing sewage loads while meeting, and even exceeding, their original design specifications and local environmental requirements.

“With the support and technical advice offered by 2030 WRG, we were able to develop advanced strategies to increase the efficiency of removing pollutants,” says Monica Porto, Director of Regional Systems at SABESP.

The project started with a series of workshops and field visits to some of the sewage treatment plants in the metropolitan area of São Paulo. An international expert hired by WRG found that the first step into circular economy principles should be improving treatment capacity and effluent quality at the existing plants. Enhancing the performance of existing infrastructure would postpone the need to invest in more costly technologies and new civil works.

Country: São Paulo, Brazil

Summary

- SABESP, the São Paulo state water and sanitation company, is improving the capacity and efficiency of four key wastewater treatment plants.
- Support and technical advice aimed at developing advanced strategies to increase the efficiency of removing pollutants has been provided by 2030 WRG.
- With initial stages complete, an expanded optimization program is being financed by SABESP as counterpart investment related to a contract in force with the World Bank.

Porto explains that SABESP has already implemented some of the preliminary recommendations: “Processes audits are being implemented, with a detailed analysis of each of the processes within the WWTP. Even during the audits, the identification of bottlenecks allowed the immediate adoption of significant improvements that led to postponing investments in new works and expansion of infrastructure.”

At the Barueri plant, the performance improvement prevented discharge of the equivalent of about 140 million cubic meters of raw sewage into the Tietê River in four months. Based on these promising results, SABESP is now performing a complete process audit on the four treatment plants to identify bottlenecks, define measures to improve performance, and prepare them to receive investments in circular economy.

“[T]he treatment plants are being audited and transformed at the same time. The operations teams immediately started to monitor the processes and act to start gaining efficiency from the beginning of the project. There have already been significant gains and results. It has been a very beneficial learning process for these teams,” says Porto.

Although 2030 WRG funded the preliminary analysis, the expanded optimization program is being financed by SABESP as counterpart investment related to a contract in force with the World Bank.

The project at SABESP is part of a broader shift to reusing wastewater in São Paulo, according to Porto. “We are already investing in the identification of technologies and opportunities for electricity generation and good destinations for sludge. In the metropolitan region of São Paulo ... we no longer have hydro-intensive industries ... Currently we are seeking to ensure that all less demanding uses in terms of quality, such as washing streets, are carried out with treated effluents.”

2030 WRG brings together high-level representatives from the public, private, and non-profit sectors to find solutions to local water challenges. It started in Brazil in July 2017, when it signed a Memorandum of Understanding with the Government of the State of São Paulo, through what was then the State Department for Water Resources and Sanitation, recently restructured into the State Department for Infrastructure and Environment. 2030 WRG São Paulo currently has three working groups that focus primarily on strengthening water management in agriculture, industry, and municipalities. The project falls under the working group Optimization of Sanitation.

WASTEWATER REUSE IN AGRICULTURE

A project that aims to allow farmers to safely use treated wastewater for their crops could help turn life around for smallholders in the Aurangabad area of Maharashtra State, India, where small- to medium-sized farms that grow quick-to-harvest, low-value crops are the norm.

One of the key requirements of sustainable agriculture is an assured, adequate water supply: safe, unpolluted water fit for crops for food and fodder. But rural farmers in drought-prone areas who lack access to irrigation infrastructure are often forced to use polluted rivers and streams.

Long-term use of this contaminated water has negatively impacted local farmlands of Aurangabad, says Anil Kumar Hadgaonkar, the Sub Divisional Agriculture Officer of Aurangabad. “The soil and water sources like farm wells have degraded in quality,” says Hadgaonkar. “There is an oily layer on the topsoil and a white crust of salts is formed, which affects the entire ecosystem. This impacts the health of livestock. The farmers end up paying substantial amounts towards medical treatment of livestock, and it is becoming less profitable for them.”

Using polluted water for crops also poses health risks. “Due to the presence of heavy metals, pesticides, and other chemicals in the food crops, there have been major health concerns,” says Hadgaonkar.

These problems could be elegantly solved by encouraging farmers to use safely treated wastewater on their crops. However, current formal processes for accessing treated wastewater for farming are not well defined.

To address barriers like this, the Government of Maharashtra invited 2030 WRG to help strengthen the current policy framework. 2030 WRG worked closely with affected communities to explore possible solutions—including using

Country: Maharashtra, India

Summary

- Long-term use of contaminated water has negatively impacted the farmlands of Aurangabad, Maharashtra State, India.
- A demonstration project that aims to allow farmers to safely use treated wastewater for their crops is underway.
- Initially, the pilot-scale project will provide two million liters per day of treated water to a group of 10 farmers.
- The Government of Maharashtra has also invited 2030 WRG to help strengthen the current policy framework to allow treated wastewater to be used for crops.

treated wastewater. Now 2030 WRG, Aurangabad Municipal Corporation (AMC), and the World Bank Group’s Project on Climate Resilient Agriculture (PoCRA) are implementing a pilot project at Zalta, an agrarian community about 10 km away from Aurangabad with acute water shortages.

AMC has already installed a modern, energy-efficient sewage treatment plant (STP) at Zalta that is able to treat wastewater to a much better quality than the raw polluted water the farmers were using. “Initially, the pilot-scale project will provide two million liters per day of treated water from the STP to a group of 10 farmers registering a Water User Association. Soon after successful registration of the first group, multiple Water User Associations would be formed to encourage reuse of treated wastewater for farming. This assured, quality water supply will certainly help build more climate resilience and enhance farmers’ income,” says Hadgaonkar.

Using treated wastewater will free the farmers from their dependence on unpredictable rainfall. More land could be cultivated with higher-value crops, including those for export, as well as horticulture. With an assured source of feed, farmers could take up additional activities like year-long farming and raising poultry and cattle, building resilience by diversifying their income sources.

Apart from the health benefits of not using polluted water, treated wastewater has inherent value in an agricultural context: it contains organic matter and nutrient sources such as nitrates, phosphates, and potassium salts, reducing the need for chemical fertilizers and saving costs.

Creating an ecosystem where farmers use better-quality water will require several interdependent actions. Already, 2030 WRG has helped the Government of Maharashtra and its partners to identify opportunities for alternative financing; reach out to academics and research organizations to develop technologies to measure water quality; and work with local communities to form wastewater users' associations.

The response from farmers has been positive so far. "The farmers truly understand the value of treated wastewater," says Hadgaonkar. "A few years back, the farmers requested local authorities to provide direct access to treated water. The farmers needed little convincing of the significance of reuse and recycling of treated wastewater."

GUIDELINE SETS HIGH STANDARDS FOR GREEN ECONOMIC ZONES

A visionary future for Bangladesh is taking shape through an innovative project to improve energy and water efficiency in fast-growing economic zones that couple economic development with sustainability.

Bangladesh is already highly advanced when it comes to green factories. By 2019, the country had the highest number of green garment factories in the world, reflecting commitment by government, forward-thinking businesses, and civil society to the principles of environmental sustainability. Now there is growing interest in establishing green infrastructure within economic zones to strengthen sustainability and competitiveness at minimal cost, according to Paban Chowdhury, the executive chairman of the Bangladesh Economic Zones Authority (BEZA). He explains the authority's vision for the zones. "[We] want to encourage industries to[ward] a more sustainable path to global competitiveness," he says.

"We have a vision to develop 100 economic zones in the next 15 years by developing 30,000 hectares of land. Around 97 economic zone sites have already been identified. One of the major thrusts of BEZA is to develop the zones in a sustainable manner [while] maintaining the highest level of environmental standards and preserving ecological integrity and biodiversity."

The economic zones will draw on "the three Rs"—reduce, reuse, recycle—to integrate the waste, water, and energy-management systems of various users within the zone. "For example," says Chowdhury, "waste heat or steam from power-generating or steel-manufacturing plants will be supplied to receiving industries through insulated pipeline networks, [while] treated wastewater from the central effluent treatment plant will be supplied to users for toilet flushing, gardening, floor cleaning, and so on, through a dedicated water-supply network."

The Bangladesh Water Multi-Stakeholder Partnership, with support from 2030 WRG, is helping the Government of Bangladesh develop a

Country: Bangladesh

Summary

- Bangladesh has embarked on a visionary project to improve energy and water efficiency in fast-growing economic zones.
- The BEZA project aims to establish green infrastructure within economic zones to strengthen sustainability and competitiveness for business at minimal cost.
- The vision is to develop 100 green economic zones in the next 15 years by developing 30,000 hectares of land.

draft national guideline for these green economic zones. The guideline, which is aimed at several different users such as BEZA, entities that manage economic zones, and tenants within these zones, will form the basis for a new national performance standard. Companies that are awarded certificates of compliance to this rigorous standard will be able to market themselves as being environmentally smart and resilient-traits that global firms are increasingly demanding as value chain partners.

Chowdhury believes this approach is already proving its value. "A large number of water- and energy-intensive industries—such as textiles, steel/iron, power plants, pharmaceuticals, chemicals, paints, and food processing—are exploring opportunities for using efficient, cleaner, and cost-efficient production technologies in the economic zones currently under development."

The draft guideline integrates green and resilience principles across four performance areas: economic zone development and management, environmental concerns, social issues, and economic needs. The guideline is currently with the Technical Committee/Task Force for Green Economic Zones for review. This will be tested at selected industrial zones and, once finalized, will apply to about 100 zones over the next few years.

GROWING CROPS USING MINIMALLY TREATED MINE WATER

An innovative project has demonstrated that untreated or minimally treated mine water can be safely used to grow food that is fit for human consumption.

South African law requires mining companies to ensure that water used during mining activities is treated and safely stored, away from natural water sources, when closing a mine. However, the cost of such treatment—particularly if the water needs to be brought back to potable levels—is prohibitive.

To help develop a sustainable solution for mining companies, the Strategic Water Partners Network (SWPN), 2030 WRG’s South African chapter, asked: what if water could be made fit for non-potable uses with minimal treatment? One option was to treat the mine water to the point that it could be used to grow crops.

To test this option, the Mine Water Coordinating Body—a multi-stakeholder partnership with its roots in SWPN—ran a demonstration project that used untreated mine water, or mine water that was minimally treated with lime, to grow crops on unmined land at the Exxaro/Anglo American Mafube Colliery. The colliery is situated in the Mpumalanga coalfields, which supplies much of the Kruger National Park’s water.

The project is partly funded by South Africa’s Water Research Commission and is run by the University of Pretoria with the help of a local farmer. The Department of Water and Sanitation is also a key partner. If successful, the project can be scaled up and applied across South Africa.

To date, the project has produced four seasons of white maize using untreated mine water from the colliery for irrigation, with a fifth that commenced in September 2020. The first two seasons yielded an average of 12.5 metric tons of maize per hectare, compared with five tons for dryland farmers. While the dryland farmers generated a loss, the project farmer made a profit (excluding some subsidized pumping costs).

Testing has found the maize to be safe for consumption. Stooling rye, which is used as animal feed, was planted successfully in winter,

Country: South Africa

Summary

- A demonstration project has used mine water to grow crops fit for human consumption.
- The implications are considerable, as the project can be scaled up and applied to other mine closures across South Africa.
- The project is run by the Mine Water Coordinating Body—a multi-stakeholder partnership with its roots in Strategic Water Partners Network, 2030 WRG’s South African chapter.

illustrating the potential for mine water to be used during dry months.

Only some mine water is suitable for irrigation, and “fitness for use” is an important criterion for any future selection for mines. But the project is an important step towards establishing that mine water has value. According to Carla Hudson of the Mine Water Coordinating Body, the research holds several benefits. “Irrigating with mine water opens the possibility that communities affected by mining closures can use the water for economic enterprises such as agriculture,” says Hudson.

Encouraged by successes to date, researchers are examining which types of mine water would be suitable for use on other crops in different soils. The study is also costing the effects of mine water on water infrastructure, such as filters and pipes, which are vulnerable to corrosion. The research has also tested cultivation on rehabilitated mining land, but the yields on unmined land have been better, says Hudson.

The South African MSP was launched at the UN Climate Change Conference in Durban in December 2011 after the South African Minister of Water Affairs approached 2030 WRG to help establish an MSP in South Africa. The MSP works through workstreams that focus primarily on strengthening water management in agriculture, industry, and municipalities.

PPP FINANCING TO TRANSFORM SEWAGE AND WASTEWATER MANAGEMENT IN GAZIPUR

2030 WRG has been involved in developing the first municipal PPP in Bangladesh, the Gazipur City Corporation wastewater and fecal sludge management initiative. This project will help local businesses partner with the municipality to address serious pollution problems. An important consideration for the initiative was that it should make minimum use of public resources, exploring innovative—and possibly trailblazing—PPP financing options instead.

“Gazipur City Corporation, which adjoins North Dhaka, is the largest municipal corporation in Bangladesh and comprises eight zones. The GCC wastewater management initiative aims to develop integrated wastewater management facilities for the city, starting with two urbanized zones – Tongi and Gazipur, which have a combined population of about 1.2 million people,” says Akbar Hossain, Additional Chief Engineer at Gazipur City Corporation.

The city currently has no wastewater infrastructure or effluent treatment facilities. For people living in the area, this means living with water that is dangerously polluted by sewage and industrial effluent. For industries, which are currently operating in a context without proper wastewater treatment, it means options for sustainable growth are limited.

To get the ball rolling, 2030 WRG initiated a study to develop technical and financing options for a project that will allow household sewage to be safely stored and removed to sewage treatment facilities. Hossain explains that out of 100,000 households, about 50,000 to 60,000 will need prior action to benefit, including “construction of septic tanks [for individual plots and shared between plots], anaerobic filters, soak pits, and community toilets.”

“Sewage treatment plants and fecal sludge treatment plants have been proposed ... The treated water that will be generated from these treatment facilities will be made available to the industries,” says Hossain.

Country: Bangladesh

Summary

- 2030 WRG is involved in developing the first municipal PPP in Bangladesh, the Gazipur City Corporation wastewater and fecal sludge management initiative.
- It will bring local business into partnership with the municipality to address serious pollution problems.
- The project will start with two urbanized zones within Gazipur with a combined population of about 1.2 million people.

Because the concept of using a PPP in this way is so new, the preparatory work included meeting with stakeholders over several months, discussing the proposals to build understanding, validating the proposed benefits through analytical work, and sharing comparative scenarios with stakeholders. Enabling stakeholders to explore options in this way was an important part of building consensus for the proposal.

“Micro-financing is one of the potential options to help households invest in the improvement of existing sludge containers,” Hossain says. “The initial idea behind this instrument is to extend loans to the households at a very low interest rate for a longer period of time. The households may be given the option to repay the loan amount with their monthly service fee for the sanitation service.”

Following approval from stakeholders, 2030 WRG assisted the Corporation with the procedural and administrative process of obtaining a PPP. In December 2018, the Cabinet Committee on Economic Affairs accorded approval to take the project forward, and in January 2019, the Corporation and the PPP Authority of Bangladesh agreed to retain the International Finance Corporation to provide transaction advisory services.

IMPLEMENTING PERFORMANCE-BASED CONTRACTS TO REDUCE MUNICIPAL WATER LOSSES

The Government of Kenya has set its sights on reducing municipal water losses due to theft, leaks, and faulty equipment, which currently sit at about 42 percent, according to the Water Services Regulatory Board (Wasreb).¹²

This project uses an innovative PPP to bring municipal water utilities together with private entities to increase water efficiency by addressing non-revenue water losses. Kenya loses 42 percent of municipal water to theft, leaks, and faulty equipment. Since there are no PPPs for water in Kenya yet, this project offers an opportunity to prove the value of this kind of collaboration.

Wasreb has shown strong commitment to this process, including it in their Annual Sector Performance Report. Going forward, the projects will be implemented by the Water Sector Trust Fund in collaboration with Kenya's water utilities. 2030 WRG played a facilitating and technical advisory role. Phase 1 involved an initial assessment of the suitability of six possible water service providers for piloting performance-based contracts. Project designs, looking in detail at technical and financing elements, were also developed.

The Kenya MSP was formed in 2015 following an invitation by the Government of Kenya. The MSP works through to strengthen water management in agriculture, industry, and in urban areas.

Country: Kenya

Summary

- The Government of Kenya aims to reduce municipal water losses due to theft, leaks, and faulty equipment, which currently sit at about 42 percent.
- 2030 WRG is part of an innovative private-public partnership to bring municipal water utilities and private entities together to address these water losses.
- 2030 WRG has played a facilitating and technical advisory role in the project, which has already assessed the suitability of 6 possible water service providers.

USING MOBILE PHONES TO STRENGTHEN DATA COLLECTION AND SHARING

An innovative cellphone app, which helps water-monitoring scouts in the Ewaso Ngiro catchment gather and disseminate data to both water users and local government, could help to end conflict around water use in the drought-prone area. “Water ... is a unique resource that underpins all development drivers,” says Peter Hetz, CEO of the Laikipia Wildlife Forum, currently the secretariat of the Mount Kenya Ewaso Water Partnership (MKEWP). “Despite its fundamental role, water data is all too often missing. Data is critical to manage scarce resources with competing uses like water.”

Together with Microsoft Kaizala East Africa, MKEWP is exploring using a smartphone app to improve water-data collection, management, and sharing. “Using smartphones and pre-approved data-collection categories and protocols, MKEWP can support speedier, more accurate, and reliable transfer of data between monitors, users, and enforcers,” says Hetz.

Water use in the Ewaso Ngiro catchment is becoming increasingly stressed. Groundwater is depleted by both large commercial farmers and smallholders. Although most commercial farmers are now also using stored rainwater, the rivers that supply farmers and villages are increasingly running dry. Conflict levels are high, with downstream users expressing anger towards upstream users when rivers dry up. Better access to water information can help.

In Kenya, local registered water resource users’ associations are responsible for collaboratively managing water resources, with emphasis on conflict resolution. These associations are responsible for keeping the peace and ensuring that water is shared fairly. Yet, despite their official status, they lack funding and capacity to collect and manage the data they need.

Country: Kenya

Summary

- In Kenya, water resource users’ associations – made up of farmers and other ordinary citizens – are responsible for collaboratively managing water resources, including collecting data.
- 2030 WRG is supporting a project run by the Mount Kenya Ewaso Water Partnership to assist the water resource users’ associations in accessing much-needed operational funding.
- An innovative cellphone app, developed by MKEAP and Microsoft Kaizala East Africa, could help the associations collect and disseminate data, and help to end conflict around water use in the drought-prone area.

2030 WRG is supporting an MKEWP project to establish the water resource users’ associations as service providers to the Water Resources Authority, which is responsible for assessing, monitoring, allocating and regulating Kenya’s water resources.

Under this arrangement, the associations would receive payment for critical services such as collecting data and readings for billing. “At present, there is only limited support for this function,” says Hetz. “The simplest [way to collect data] remains water scouts, who regularly monitor riparian health and water flows, supported by cellphones, forms, and local transport.”

At present, more than 70 percent of water abstraction in the upper basin is illegal and unpaid, according to Hetz. But if scouts are deployed to collect water-level readings at gauging stations—supplementing the readings from the water meters and effluent meters found in about two dozen villages, two towns, and on larger farms in the area—the readings could be submitted to the Water Resource Authority for billing.

The Centre for Training and Integrated Research in ASAL Development (CETRAD), with the assistance of the Swiss Government, is installing automatic river-gauging stations to monitor flows. This information is sent wirelessly to the water resource users' associations and the Water Resources Authority. The system will provide information on water quality and quantity, and reduce the conflicts and competition downstream. But these stations are still somewhat fragile, subject to interference and flooding.

Water-data systems tend to be isolated and inadequately tied to county-focused development and land-use planning, says Hetz. He adds: "Little of the information necessary for water management is shared with those responsible at the sub-catchment, ward, county, and cross-county levels." Linking water data and users in a circular fashion will support systematic basin-focused water management.

"The ultimate information management goal of MKEWP is to foster a system for the better collection, storage, use, and management of water data in a more comprehensive fashion, and to help ensure its interpretation for application and enforcement by different user groups," says Hetz.

MKEWP is an MSP bringing together public, civil society and private sector actors within the Upper Ewaso Ng'iro North Basin to engage collectively in water resource use, conservation, and management. 2030 WRG is a founding partner of the MKEWP, which falls under the Agricultural Water Management workstream of the 2030 WRG MSP in Kenya.

GREATER DHAKA TO GET 20 SURFACE-WATER-QUALITY MONITORING SYSTEMS OVER NEXT THREE YEARS

Dhaka, the capital city of Bangladesh, has experienced rapid growth in recent years. As a result, the rivers around the city have become increasingly polluted, posing a threat to ecological and human health.

Twenty advanced IoT-enabled water-quality monitoring stations will be installed in four major rivers over the next three years as part of an ambitious project to better monitor surface water quality around the city.

Bangladesh already monitors surface water quality manually, but this limits the geographical area and frequency of testing. An automated water-quality monitoring system will provide timely, high-resolution data for a wide range of parameters, improving the ability to detect pollutant plumes as they occur. “The project is designed to generate reliable and transparent information ... to help decision makers, regulators and stakeholders,” says Dr Fahmida Khanom, Director, Natural Resources Management, Department of Environment in Bangladesh. It will also help evaluate the effectiveness of recent policy reforms meant to improve the legislative environment for water-quality management, and identify investments to improve water quality.

The project will make real-time information on water quality publicly available online so that citizens can make informed decisions regarding water use, which will “create a level of confidence on the quality of the surface water,” says Dr. Khanom. “[It will also help] sensitize them to keep water sources clean by refraining from discharging untreated municipal wastewater.”

Most of Dhaka’s pollution is caused by industries discharging untreated wastewater into the sewerage system and rivers. To address this problem, city authorities need more advanced monitoring than the current 20-year-old stations allow. “An effective monitoring system is an essential precursor to future investments or changes in practices to improve water quality. It

Country: Bangladesh

Summary

- An ambitious project to improve water quality in Dhaka will see 20 internet-of-things-enabled water-quality monitoring stations installed in four of the city’s rivers over three years.
- The groundbreaking project will use state of the art technology to generate information that will give decision makers lead time on interventions to protect public health.
- Real-time information on water quality will also be publicly available via a website to enable citizens to make informed decisions regarding surface water use.

is difficult to gauge improvement of water quality without measurement,” says Dr. Khanom.

Twenty million people and 3,000 industries consume about 5.9 million cubic meters of water per day in Dhaka—, according to the Department. Most of this water is groundwater from the aquifer around the city, which is becoming increasingly overdrawn. Improving the quality of the river water would increase the volume of water available, shaping a more sustainable home for the city’s inhabitants.

This is the first time in Bangladesh that a public-private partnership will be asked to operate and maintain a water-quality-monitoring project for a period of 15 years. During this time there will be a phased transfer of ownership, during which the private sector will be responsible for enhancing public-sector capacity. Institutional readiness, infrastructure, and technical capacity-building will be key to the success of the project, says Dr. Khanom.

2030 WRG ASKED TO UPDATE MONGOLIA'S HYDROECONOMIC ANALYSIS

The Government of Mongolia has asked 2030 WRG to update the HEA produced in 2016 to include a deep dive on the effect of, and opportunities for, copper mining and related infrastructure in the water-stressed Southern Gobi desert.

The 2016 report—which included detailed analyses of water challenges linked to gold and coal mining in the Shivee Ovoo and Tavan Tolgoi areas—found that projected economic growth and planned large projects, such as a coal-washing plant, a power plant, and water transfer projects, would make it impossible for existing groundwater resources to meet demand by 2040. “[At] 20,227 thousand cubic meters per day ... projected demand [in 2040] is 2.4 times the current usage,” says Sukhbaatar Sukhbat, Head of Infrastructure in the Ministry of Mining and Heavy Industry.

“In order to implement large-scale mining and heavy industry projects in the South Gobi region, it is important to identify the growing demand for water in the region and address water supply based on relevant estimates,” says Sukhbat. Mongolia’s recently published Vision 2050 highlights mining as an important sector for economic growth, limited by the availability of a sustainable water supply.

The updated HEA will contribute to the development of a Mining and Heavy Industry Development Plan that aligns with Vision 2050. The plan aims to achieve full productive capacity while using water resources sustainably. “The stakeholders should work together to implement water-efficient, reusable, and dry technology solutions; to use existing and planned groundwater resources in an efficient manner; and to conduct exploration work,” says Sukhbat. “To meet the growing demand for water, surface water transfer projects should be considered as an alternative. There are many ways to implement them jointly.”

Country: Mongolia

Summary

- 2030 WRG has been asked to update the HEA from 2016 to cover copper mining in the Gobi desert.
- The Mongolian Government believes current, transparent, and accessible information – as exemplified by the HEA – is important for achieving consensus between stakeholders.
- The HEA has identified that Mongolia’s projected economic growth path will make it impossible for groundwater resources to meet demand by 2040.

Current, transparent, and accessible information is important for achieving consensus between stakeholders, says Sukhbat, adding that “openness, equity, objectivity, and accessibility of information on projects and activities that will bring economic growth are the most important conditions for successful implementation.”

The Mongolian 2030 WRG MSP was formed in 2014. The MSP works through three workstreams that focus on identified needs, including urban and industrial water use and reuse. 2030 WRG Mongolia plays an independent supporting role, promoting dialogue and collaboration among government, the private sector, and civil society.

DASHBOARD SHEDS LIGHT ON GROUNDWATER USE IN MONGOLIA

With mining and water demand predicted to grow, a good understanding of groundwater conditions, particularly in the mining sector in the southern Gobi region, is critical. To this end, 2030 WRG and Mongolia’s Ministry of Environment and Tourism have developed a groundwater-monitoring dashboard that tracks information such as groundwater levels, pressure and temperature, in real time.

Groundwater is a priority in Mongolia. It accounts for about 82 percent of total water use¹³—and this use is increasing. The mines of the Southern Gobi area in particular rely on ancient non-renewable aquifers that are up to 35,000 years old to meet their water needs.

The dashboard includes historical groundwater data dating back to 2015. Artificial intelligence is being used to analyze this data to help decide future water policies and permissions. To improve data quality, the Ministry of Environment and Tourism has extended the groundwater monitoring network to a total of 268 monitoring boreholes, with another 10 boreholes installed by the end of 2020.

Country: Mongolia

Summary

- Groundwater is a priority in Mongolia, accounting for about 82 percent of total water use.
- 2030 WRG and Mongolia’s Ministry of Environment and Tourism have developed a groundwater-borehole monitoring dashboard that tracks critical information in real time.
- Artificial intelligence is used to analyze this data to make decisions around water policies and permissions.
- The dashboard is at an advanced stage of development and will be finalized in 2020 after intensive feedback from stakeholders.

The dashboard is at an advanced stage of development and will be finalized in 2021 after intensive feedback from stakeholders.

CREATING A HOME FOR WATER DATA

The current quality, quantity, and availability of Peru’s water and sanitation data needs to be strengthened to develop technical instruments and to support responsive, evidence-based decision-making across all sectors.

With the support of 2030 WRG’s MSP in Peru and the Universidad del Pacífico, a leading Peruvian university, a “water governance observatory”—a central repository for the collection and dissemination of water knowledge from various sources and for the construction of indicators to facilitate the interpretation and analysis—was launched in February 2019 as a way to inform the national water debate.

“The aim of the Observatory of Water Governance is to work with national and international institutions to get better social awareness about the importance of water for life, health, and the economy,” says Elsa Galarza, an economist and leader of the Observatory of Water Governance. “In this initial stage, we are working with datasets from national institutions. Some of the data is open and some needs to be worked on by the institutions.”

To demonstrate how the Observatory contributes to national development goals, Galarza explains how her team collaborated with the technical regulator, National Superintendence of Water Services and Sanitation (SUNASS for their Spanish acronym), the technical regulator agency, to determine the optimum number of water-delivery trucks needed

to supply water to the city of Lima’s peripheries, where potable water is not available. “The next step is to optimize the transportation time under realistic constraints like traffic jams during rush hour and times when water is most in demand—for example, for cooking. This work is not only an exchange of data but implies the usage of more complex indicators for policy formulations,” says Galarza.

The Observatory has compiled technical notes on water governance, financial instruments, and water regulation for the Ministry of Environment. These will support Peru’s OECD Water Policy Dialogue for incorporation as a full member of the Organisation for Economic Co-operation and Development (OECD).

The Observatory’s systemic approach and ability to provide economic and financial analysis with a long-term perspective—and the support of the 2030 WRG MSP—has positioned it as a valued partner in water resource management. “We are also working with international institutions such as COSUDE [a Swiss cooperation agency], the World Bank, UNEP Riso Center, and the Ministry of Environment on different water-related topics, such as methodologies for adaption to climate change for the water sector, and voluntary mechanisms to improve water efficiency in the private sector, among others,” says Galarza.

Working at the basin level is important for Peru, according to Galarza. “Basins connect different political jurisdictions and usages. This is the main reason the Water Resource Observatory is vital—it allows us to take a top-level, geographically wide approach to water concerns. The datasets we gather from different public organizations’ websites and open public data allow us to have a holistic view—incorporating an economic, social and environmental approach—of Peru’s river basins.”

The Observatory aims to enable civil society and the public to contribute to the discourse on water issues. According to Galarza, “Efficient communication [about] basic performance and results can be a very powerful tool to build better water governance. Informed people lead to better accountability.”

Country: Peru

Summary

- A water governance observatory was launched in February 2019 to elevate and inform the national water debate.
- The aim of the Observatory of Water is to work with national and international institutions to contribute to social awareness about the importance of water for life, health, and the economy.
- The Observatory has compiled technical notes on water governance, financial instruments, and water regulation for the Ministry of Environment that will be used to support the country’s OECD Water Policy Dialogue for Peru’s incorporation as a full member of the OECD.

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