

**LEVER FOR
CHANGE**



Bold Solutions Network

An initiative of Lever for Change, a John D. and Catherine T. MacArthur Foundation affiliate



Top Water Security Proposals

April 2020

About This Collection

[Lever for Change](#) is excited to present an opportunity to fund the top water security proposals from the second round of *100&Change*, the John D. and Catherine T. MacArthur Foundation's \$100 million global competition. *100&Change* will fund a single proposal that will make measurable progress toward solving a significant problem. Each proposal was assessed using four criteria: impactful, evidence-based, feasible, and durable, and was rigorously evaluated, undergoing MacArthur's initial administrative review, a Peer-to-Peer review, an evaluation by an external panel of judges, and a technical review by specialists whose expertise was matched to the project. The organizations featured in this collection are among *100&Change*'s Top100 which are the highest-scoring proposals selected out of more than 750 vetted applications submitted from over 85 countries. Lever for Change's [Bold Solutions Network](#) currently showcases the Top100, and will be periodically updated to include other highly-rated, vetted proposals that emerge from Lever for Change competitions. This collection of top proposals provides donors with an innovative approach to finding and funding effective organizations working to provide sustainable access to clean water and safeguard natural water ecosystems.

Navigating this Collection

Below is a summary of ways to engage with the selected proposals in this collection:



Top applicants submitted 2-page factsheets to summarize their projects and promote their work. Under each proposal listed on the Table of Contents, you can click on the page numbers to jump directly to the selected 2-page factsheet.



Additionally, organizations submitted 90-second videos to describe their projects. You can view each video by clicking on the "project video" link under each proposal, or you can watch a playlist of all the project videos by clicking the link at the top of the Table of Contents page.



To view a summary of information that was captured during the application process, you can visit the project's Bold Solutions Network online profile page, which is also linked under each project in the table of contents.

Next Steps

These organizations are ready to solve critical problems and are seeking resources to make it happen. Donors who are interested in providing significant financial support to Bold Solutions Network proposals should contact Dana Rice, Vice President of Philanthropy, at ddrice@leverforchange.macfound.org.

Learn More

If there is a particular project you are interested in learning more about, we'd be happy to provide supplemental information and analyses to allow you to dig deeper into the proposal. We can also create additional curated lists if you are interested in exploring top proposals in another issue area.

Connect with Bold Solutions Network Organizations

We are happy to help broker connections to the organizations featured in this collection or any of the organizations you see on the Bold Solutions Network.

Support Bold Solutions Network Proposals

If there is a particular proposal you are ready to fund, we can advise on structuring grants and answer any questions you may have about how to best support the project and/or organization.



Table of Contents

Water Security Proposals

To view a video playlist of the proposals in the order that they appear in this booklet, please [click here](#).

Please note, proposal order is alphabetical by organization; not reflective of ranking



Columbia University
Ending Toxic Arsenic Exposure from Well Water in Bangladesh

[View factsheet on pages 4-5](#)



[Bold Solutions Network Online Profile Page](#)



[Project Video](#)



The Nature Conservancy

Protecting the Source: Water Funds for Nature and People

[View factsheet on pages 10-11](#)



[Bold Solutions Network Online Profile Page](#)



[Project Video](#)



Columbia University
Safe Water and Sanitation to Promote Human and Environmental Justice

[View factsheet on pages 6-7](#)



[Bold Solutions Network Online Profile Page](#)



[Project Video](#)



The Ohio State

Sustainable Village Water Systems: Tanzania Today, Sub-Saharan Africa Tomorrow

[View factsheet on pages 12-13](#)



[Bold Solutions Network Online Profile Page](#)



[Project Video](#)



Georgetown University
Harnessing Citizen Participation in Watershed Management for Climate Resilience

[View factsheet on pages 8-9](#)



[Bold Solutions Network Online Profile Page](#)



[Project Video](#)



The Regents of the University of Colorado

DRIP: Ending Drought Emergencies in the Horn of Africa

[View factsheet on pages 14-15](#)



[Bold Solutions Network Online Profile Page](#)



[Project Video](#)



Table of Contents

Water Security Proposals

To view a video playlist of the proposals in the order that they appear in this booklet, please [click here](#).

Please note, proposal order is alphabetical by organization; not reflective of ranking



University of California, Berkeley

Ending Arsenic Poisoning for Marginalized People via Safe Drinking Water

 [View factsheet on pages 16-17](#)



[Bold Solutions Network Online Profile Page](#)



[Project Video](#)



Water.org

Empower 25 million people with safe water and sanitation

 [View factsheet on pages 18-19](#)



[Bold Solutions Network Online Profile Page](#)



[Project Video](#)



Ending Toxic Arsenic Exposure from Well Water in Bangladesh

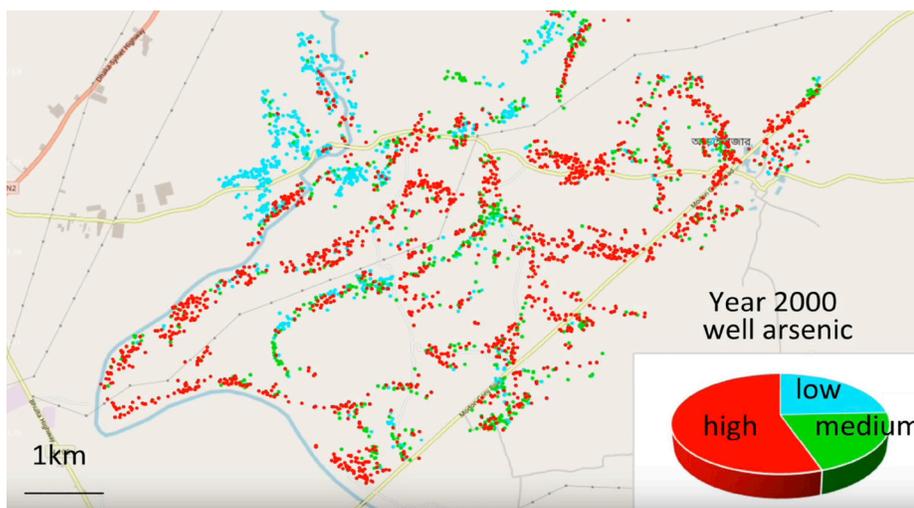
Project factsheet,
January 21, 2020

Lever for Change
Bold Solutions Network

GOAL: Maximizing the use and installation of low-arsenic wells in rural Bangladesh to eliminate over 100,000 annual deaths and raise annual income by US\$800 million.

In Bangladesh, 40 million people, nearly one quarter of the country's population, are drinking arsenic contaminated water every day. This has been a public health crisis for decades and has inflicted an immense toll. Arsenic impairs fetal growth, increases infant mortality, diminishes children's intellectual and motor functions, and has been shown to substantially reduce adult earnings. By combining best practices from multiple disciplines with new technology and building on strengthened political will, we now have a solution.

In 2000, as shown in the map below, over half of the 75,000 people residing in our study area were drinking from arsenic contaminated water sources. Our work over two decades proved that if people know a well is contaminated, they will switch to a safer well and target safe aquifers with new wells.

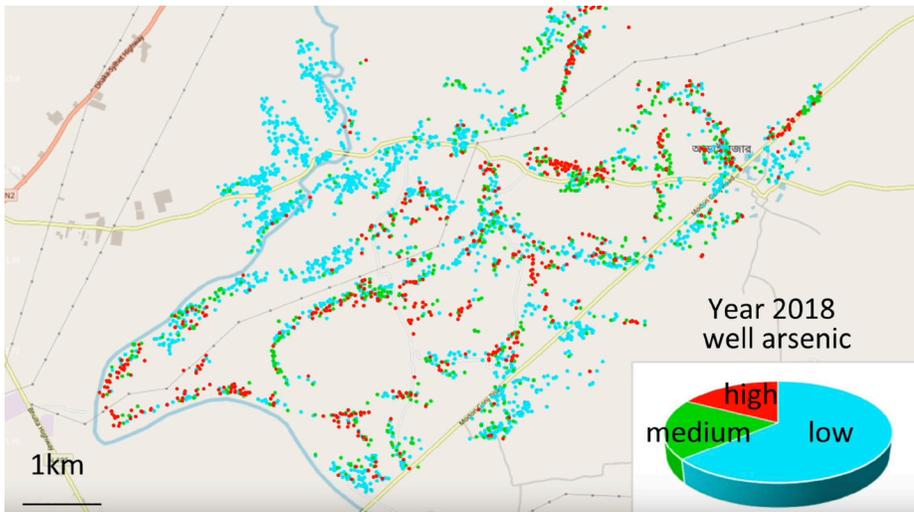


PARTNER INSTITUTIONS:

- **Columbia University, Barnard College, New York**
Earth sciences, public health, development economics
- **University of Dhaka, Bangladesh**
Earth sciences
- **ThoughtWorks**
Smartphone app and server
- **BRAC, Bangladesh**
Large international NGO
- **NGO Forum, Bangladesh**
Smaller national NGO
- **Innovations for Poverty Action**
Randomized-controlled trials
- **Department of Public Health Engineering**
Branch of government in charge

THE EARTH INSTITUTE
COLUMBIA UNIVERSITY

The map below shows that by 2018, three-quarters of the same population had switched. We can do it better, we can do it faster, and we're ready to scale up the approach to the entire country.



This plan will provide millions of Bangladeshis with access to safe water within a few years. Short of a US\$100M grant from the MacArthur Foundation, this is what could be achieved with:

US \$1M in 1 year

Blanket testing of **100,000 wells** serving **0.5 million** people

- Deploy existing app prototype to disseminate test results
- Village-level campaign to promote use of the app
- Document adoption of app

US \$5M in 2 years

Blanket testing of **1,000,000 wells** serving **5 million** people

- Refined version of app based on extensive market testing.
- Randomized-control trial to measure impact of app and incentives on private and public well installations.

US \$10M in 3 years

Blanket testing of **2,000,000 wells** serving **10 million** people

- Final version of app based on wide-ranging user feedback
- Government agreement to use performance-based incentives
- Nationwide assessment of vulnerability towards low-arsenic wells
- Strategy to export approach to India, Pakistan, and Nepal
- Professional documentary about project

Our team at Columbia University's Earth Institute and key partners in Bangladesh

have developed a way to test wells for arsenic in the field and disseminate that information to promote behavior change in a way that drastically reduces exposure to arsenic. Smartphone technology is key for efficiently recording and disseminating well test data and for incentivizing the optimal allocation of public wells.

We propose a new large-scale partnership of affected rural communities and local NGOs to rapidly test 10 millions wells, and disseminate this information to encourage switching to existing safe wells, targeting of safe aquifers for the installation of new private wells, and allocating new and deeper public wells where they are most needed.

Contact: **Alexander van Geen**
 afv2@columbia.edu
 +1 646 379 7843



Safe Water and Sanitation to Promote Human and Environmental Justice



The bulk of the world's population has access to neither toilets nor pipes - Bill Gates (BMGF)

The global Water and Sanitation sector is caught in a paradoxical state of two extremes. On one hand, middle- and upper-class communities who can well afford the cost of clean water, and sanitation services enjoy their benefits by paying a pittance (mostly by being part of piped network systems).

On the other extreme, indigent communities in developing nations and even in the rural black-belt of America, who can barely afford their own livelihoods are burdened with absent or failing water and sanitation infrastructure and pay far higher costs compared to the rest of the populace.



Diseases long thought to have been eradicated are making a comeback in America's own backyard due to untreated sewage. - Catherine Flowers (CREEJ)

This MacArthur 100&Change project proposal brings together some of the global leaders in sanitation and environmental justice. Our overarching goal is to overcome this gross human and environmental injustice through the systematic implementation of culturally respectful and contextually appropriate novel off-grid and on-site sanitation technologies that are institutionalized through appropriate policy frameworks.

Who we are:



Center for Earth Ethics

Center for Rural Enterprise and Environmental Justice



Innovation. Our proposed solutions rely on onsite sanitation systems (OSS) that use the inherent energy and resources present in human waste to fuel its conversion to environmentally benign products. These include clean water fit for discharge or reuse, energy to run the treatment units themselves and nutrients (nitrogen and phosphorus) in the treated material, which could be used as soil amendment. The recovered products lower operating costs and improve the ROI relative to current systems (no recovery).

Enhancing Acceptance and Impact. A key strength of our project is that the OSS technologies will be meshed into the target communities through consultations and recognition of cultural practices, religious norms and social protocols and institutionalized into policies. In this fashion, we expect to enhance end-user acceptance and adoption of the OSS technologies.

Shaping Policy - Improving Lives - Achieving Environmental Justice. A principal direction of this project is to establish and foster an enabling environment, policy and institutional frameworks to maximize the uptake, acceptance and impact of the technological innovations. Led by GIZ, we have already been leading the field-scale implementation of OSS systems in marginalized communities in [Coimbatore, Kampala, Lusaka and Kenya](#) and their integration into legal frameworks for well over a decade. We expect that this project will empower and improve the lives of peoples and communities who have been marginalized and excluded from socio-economic mobility through a lack of access to clean water and sanitation. Our target communities in the rural US Black Belt and in Native American reservations, South Africa, Senegal and India directly reflect our diversity, equity and inclusionary goals and vision.

Accomplishments to date. We are already operating at scale around the world and are looking to broaden our impacts on an even larger audience. Our current projects range from the rural American Black Belt and Native American reservations (CREEJ and UTS) to South America, the entire African continent and Asia (Gates, WRC, GIZ, CSE, Columbia). In India GIZ supports the revision of the national sanitation guidelines, in which new OSS technologies could be integrated. WRC in South Africa has led technology development and field-testing in conjunction with the Gates Foundation of the next generation of advanced OSS including re-invented toilets. Prof. Chandran from Columbia University has designed and studied both de-centralized and centralized wastewater treatment processes around the world. The Gates Foundation and partners have recently developed treatment and performance standards specific for OSS and resource-efficient toilets. All the project partners have been involved in educational training centered on sanitation around the world.

How you can be part of the march towards safe sanitation and justice for all.

Community-specific State of Sanitation (SOS) (\$1 million). Support at this level will allow us to focus on one target community (in addition to those in the MacArthur Foundation 100&Change proposal) and document their 'state of sanitation' in terms of the population size, availability of (non-) piped water and sewer networks and quantify the proportion of waste safely managed (as defined by the Sustainable Development Goal 6). This knowledge could serve as a valuable blueprint to influence decisions on appropriate sanitation solutions, based on additional information on community-specific customs and practices, technologies and protocols (Phase I of the 100&Change proposal).

Onsite Sanitation (OSS)-Prize (\$5 million). While there are many options possible, we suggest that a \$5 million level support could be used to develop a global OSS-Prize to help identify (year 1), pilot (years 2-3) and field-test (years 4-5) one revolutionary OSS technology for safe water and sanitation.

OSS-Accelerator program (\$ 10 million). Support at this level will catalyze the development of a dedicated OSS-Accelerator program (to be housed in the United States) that could help identify, vet and ultimately deliver OSS solutions to communities in the States and worldwide. We expect that the accelerator will attract sustained support even potentially from the Gates Foundation and GIZ.

Contact. Kartik Chandran, Program Director, (212) 854 9027, kc2288@columbia.edu

Useful links

- <https://www.youtube.com/watch?v=l-hPGpigg2o>
- <https://www.gatesfoundation.org/what-we-do/global-growth-and-opportunity/water-sanitation-and-hygiene>
- <https://www.cseindia.org/>
- <https://engineering.columbia.edu/faculty/kartik-chandran>
- <https://centerforearthethics.org/>
- <http://www.wrc.org.za/>
- <https://www.giz.de/en/html/worldwide.html>

HARNESSING CITIZEN PARTICIPATION IN WATERSHED MANAGEMENT FOR CLIMATE RESILIENCY

Empower poor Indian farmers through skill-building in watershed development and climate adaptation to mitigate drought, build community resilience, and improve economic security



GEORGETOWN UNIVERSITY
India Initiative

india.georgetown.edu | @georgetownindia



wotr.org | @wotrindia

PROJECT GOALS

The Georgetown University India Initiative (GUII) partnership with the Watershed Organization Trust (WOTR) will reduce poverty by empowering rural communities with the skills to regenerate the watersheds they depend on, enabling sustainable livelihoods and more resilient communities among Maharashtra's **60 million citizens** reliant on agricultural employment.

Severe drought debilitates large portions of India: inadequate monsoon rains and depleted groundwater caused **drought in 43% of India** in 2019, and the situation is projected to worsen. Participatory watershed management at the village level improves groundwater storage, mitigates the negative impacts of changing rainfall patterns, and provides an inclusive platform to bridge community divisions and empower women.

With additional funding, WOTR can **expand its reach physically and digitally**, improving accessibility and application by farmers and non-farmers alike. Rigorous monitoring & evaluation protocols will inform behavioral-change communication strategies to disseminate evidence-backed lessons to millions of farmers desperate for solutions to the water crisis facing India and the world, and, quite literally, save lives.



ABOUT OUR ORGANIZATIONS

Founded in 1993, **WOTR** is a non-profit that engages at the intersection of practice, knowledge, and policy with the goals to reduce poverty and improve the overall quality of life, especially in vulnerable rural communities in India.

- HQ in Pune, Maharashtra; works in 7 Indian states
- Knowledge partner for flagship Government of Maharashtra drought-prevention scheme, JYSA
- UN Land for Life awardee



Founded in 2015, **GUII** has expertise in research design, impact evaluation, and data analytics, particularly in the context of water scarcity, drought and participatory community development, as well as U.S.-India policies within a global context.

- Based in Washington, DC
- Experience working with the Government of Maharashtra, World Bank, and Gates Foundation
- WOTR partner since 2017

PARTNERSHIP OVERVIEW

Given India's worsening drought crisis, community mobilization for watershed management is a critical, cost-effective resource to be harnessed. **This project reflects our shared commitment to expanding WOTR's participatory water management programming and strengthening its digital education capacity.** Villagers are responsible for water data collection and resource allocation; this way, every drop is *accounted for*, and every household is *held accountable* for water usage. The expansion of WOTR's physical reach will be accompanied by new, evidence-backed digital trainings designed to make WOTR's knowledge accessible to villages and villagers outside their existing footprint.

FEBRUARY 2020

FUNDING POSSIBILITIES

Though these initiatives are large-scale, long-term plans, any amount of funding helps to drive this partnership toward sustainable, community-driven solutions in the face of climate change in Maharashtra and beyond. These funding tiers offer the exciting ability to seek change at-scale and offer a chance to augment the other.

With **\$1 million**, a focused, year-long project would:

- Support WOTR's **existing field sites** in MH
- **Strengthen the evidentiary basis** for WOTR's participatory watershed management model
- Study watershed development projects in **1000 villages** through a mixed-methods evaluation
- Review of WOTR's **programs and training courses** to inform best practices



With **\$5 million**, a focused, 2-year project would also:

- Extend WOTR's work to **500 new villages** in MH
- Develop **digital curriculum** based on WOTR programming, informed by review
- Create **partnerships** with local organizations in **new states**

With **\$10 million**, over a 3-5 year project term, we would:

- Expand WOTR **training program** into 7 other states
- Perform an **iterative**, longer-term impact evaluation to **improve upon physical and digital capacities**
- Promote **collective activity** in other social policy contexts

TECHNICAL BACKGROUND

WOTR follows a **holistic ridge-to-valley model** that includes the construction of water management structures, reforestation, and water-conserving agricultural strategies. This slows the flow of water above-ground to reduce runoff, flooding, and soil erosion, increasing groundwater percolation and water availability during dry seasons.

WOTR's programs utilize a traditional knowledge base that shaped 1970s-era watershed development (WSD) projects, which were intended to help farmers capture and store rainwater, reduce soil erosion, and improve soil nutrients and carbon content for greater agricultural yield and income generation. Today, WOTR's community-led interventions treat WSD as just one component of a larger socio-technical system.

Through "train-the-trainer" workshops at a learning center in Darewadi, Maharashtra, WOTR introduces these techniques to villagers to build local capacity and institutions. Working in **7 states**, across **500 villages**, WOTR has **directly improved the lives of 3+ million citizens**, but the potential impact is exponentially higher.

MONITORING & EVALUATION PLAN

Mixed methods M&E will be used to track groundwater levels, the strength of local institutions, and socioeconomic indicators to reflect our goals of increasing local capacity + water availability for improved environment + livelihoods:

1. **Measure change in groundwater availability** over time using satellite data and well levels, as well as qualitative surveying of village-level data on water presence, farming methods, community engagement, and the growth of local institutions. Using *difference-in-difference analysis* to compare similar villages, these micro-data will allow us to track benefits to local communities, taking into account the length of the intervention period, and geographic and hydrological differences. The data collected will provide information about the successes of WOTR's initiatives in **reducing drought vulnerability**, and in **strengthening local collective action institutions and SEC indicators**.

2. **Evaluate behavioral change communications (BCC) strategy** to disseminate the learnings from WOTR's accumulated record to farmers beyond WOTR's reach or area of specialization. This will require the use of *randomized control trials* involving informational interventions in which the content and medium of the BCC is manipulated. The RCTs will provide insight on the **successes of digital versus in-person trainings**.

FEBRUARY 2020

We can help cities cope with the global water crisis by scaling a proven solution: nature.



Kenyan woman picking tea in the Upper Tana Watershed, Kenya. © Nick Hall

Half of all people live in cities where their water sources are being degraded or used up faster than they are being replenished. Places from Cape Town to Mexico City to Chennai have experienced severe water stress, with the most economically disadvantaged people disproportionately affected.

Pathway to Change

The Nature Conservancy has a tested solution to address the water crisis: water funds. A water fund allows downstream water users to invest in conservation activities upstream to protect and restore their watershed. Watersheds are a hidden piece of a city's natural infrastructure, collecting and filtering water while providing numerous benefits, including food, habitat and climate resilience. Nature is a powerful solution for water security, and we need to recognize its value.

In Nairobi, for example, the Upper Tana River Water Fund provides farmers in the watershed with training, resources and equipment that help keep the Tana River—the region's primary source of drinking water—healthy. Farmers reap the benefits

of higher crop yields and communities get a cleaner and more reliable source of water. With more than 40 water funds in operation globally, we know water funds work.

Our vision is to mainstream nature-based solutions for water security.

By 2025, we can:

- Provide 70 million people with better water security
- Help 150,000 rural people improve their livelihoods
- Protect 2 million hectares of freshwater habitat in Africa, Asia and Latin America

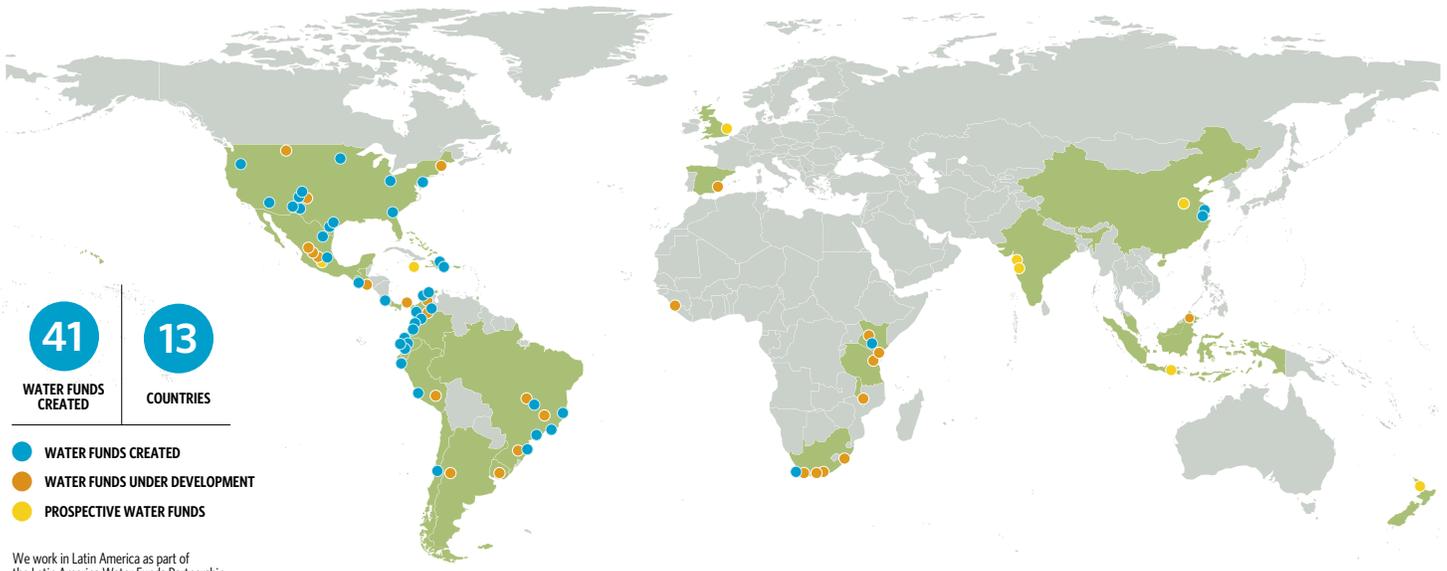
We estimate that four out of five cities could benefit from nature-based solutions, like upstream forest restoration and improved farming practices. Water funds create a way for cities to protect their watersheds cost-effectively and efficiently. Once launched, these funds become self-sustaining through local public and private funding.

How does a water fund work?

Downstream water users—businesses, utilities and local governments—invest money collectively in the water fund. These funds go to upstream farmers, landholders and communities to pay for conservation activities, such as replanting native trees, using cover crops to prevent erosion or restoring wetlands that filter pollution. Water users then benefit from improved water quality and quantity.

TNC uses our science and planning expertise to identify where water funds are likely to be successful, engage stakeholders and investors, and design and create the water fund. Water funds are very adaptable to local enabling conditions, capacity and context.

- Visit waterfundstoolbox.org for more information.



Better Water Security, Healthier Communities and a Healthier Planet

TNC research indicates that 1,000 cities could be employing nature-based solutions with a positive return on investment. Our goal is to bring this solution to a tipping point by empowering 300 early-adopter cities around the world to begin water funds in the next five years.

To get there, we are:

- **Demonstrating success** by launching and expanding water funds in critical places
- **Building the capacity** of our partners to create their own source water protection projects
- **Influencing** industry associations, governments, corporations and international financiers to create the national policy and funding needed to transform the water sector

→ WHY TNC?

Over the last two decades, TNC has worked with more than 600 partners in 13 countries on four continents to create 41 water funds, with 35 more funds in development. We have developed the tools and resources needed to help practitioners around the world begin implementing their own water funds. Together we are changing how watersheds are managed and securing water globally.

→ JOIN US

Philanthropic support is critical to the start-up of a water fund. Once established, a water fund becomes self-sustaining through public and corporate funding, making it an incredibly high-leverage philanthropic investment. In Latin America, for example, TNC donors have invested \$58 million in water funds to date, which has leveraged an additional \$166 million from public and private sources.

The following leadership gifts will help ensure communities across the globe have the water they need to thrive:

- **\$5 million** will advance critical policy changes that stimulate demand for source water protection in more than 15 cities.
- **\$10 million** will demonstrate water funds success in an influential geography. (In India, for example, we aim to improve the livelihoods of 40,000 farmers and enhance 15,000 hectares of watersheds.)
- **\$15 million** will launch three international hubs to equip 300 early-adopters to mainstream water funds and source water protection.

→ Visit [a natural solution to water security](#) for more information.

Please contact Christina Cheatham: ccheatham@tnc.org for more details.

Published February 2020

Global Water Institute Sustainable Village Water Systems

*Tanzania Today,
Sub-Saharan Africa Tomorrow*



The Challenge

Over 300 million people lack access to clean water,¹ impacting food, sanitation and hygiene across Sub-Saharan Africa. In Tanzania, 18 million people (one in three residents) face this reality daily,² and 21 million people are food insecure.³

For decades, people have been working to meet the critical need for clean water. Unfortunately, efforts have often been short-lived and sometimes destructive. There are 46,000 non-functional water points in Tanzania alone.

A Bold Systems Solution

A single clean water source has a ripple effect within a community, positively impacting health and well-being for generations to come.

The Ohio State University's Sustainable Village Water Systems (SVWS) model is a scalable, evidence-based comprehensive systems solution that seeds economic empowerment and promotes healthy communities.

SVWS is centered on local ownership and governance and builds upon community assets. Leveraging expertise and resources from vested partners, SVWS operates at the nexus of water (solar-powered wells), food (agricultural extension), and sanitation and hygiene (schools and clinics). Our solution focuses on long-term outcome measures not short-term metrics.

How It Works



Water and Power Infrastructure

Installation of boreholes, solar-powered pumps, storage tanks, and metered distribution at population centers, schools, and healthcare facilities



Climate-Smart Agricultural Practices Training

Empowering women and families, leading to improved food security and cash crops for sale at local markets



Training and Education

Skills training for operators, technicians, and entrepreneurs with links to formal education opportunities



Private Operator Model

Water tariff collection with region-appropriate pricing policies generates funds for maintenance, capital needs, and increased employment opportunities

1. *Progress on Drinking Water, Sanitation and Hygiene: 2017 Update and SDG Baselines*. Geneva: World Health Organization (WHO) and the United Nations Children's Fund (UNICEF), 2017.

2. *WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene*. 2019, "Estimates on the use of water, sanitation and hygiene in United Republic of Tanzania," available from: <https://washdata.org/data/household#!/>.

3. *Food and Agricultural Organisation of the United Nations, FAOSTAT database, United Republic of Tanzania*, available at: <http://www.fao.org/faostat/en/#country/215>

Sustained Impact

SVWS has been developed with the full support of the Tanzanian government. Local ownership of water access points ensures system maintenance and community-wide economic growth. Remote monitoring of wells allows district water managers to maintain operations and monitor borehole replenishment.

By investing in education and training, we are empowering local entrepreneurs who not only support their own families, but who reinvest into their community.

The Opportunity

Reliable access to clean water supports healthy communities. Clean water leads to improved sanitation and decreased exposure to water-borne illnesses and infectious diseases, and water is fundamental to growing fresh crops that improve nutrition and generate income for women and families.

With the support of our partners, The Ohio State University team is currently deploying sustainable village water systems in 27 villages in Tanzania. Please join us in bringing water, food, health and sanitation to even more communities by making an investment in this critical work.

<p>Your investment of \$1 MILLION supports:</p> <p>Capacity-building for long-term sustainability of the Sustainable Village Water Systems model, including private operator training, a water resources database, drill rig and pump truck--impacting 50+ communities in Tanzania</p>	<p>Your investment of \$5 MILLION supports:</p> <p>Capacity-building + Implementation of the Sustainable Village Water Systems model in 11 rural communities</p>	<p>Your investment of \$10 MILLION supports:</p> <p>Capacity-building + Implementation of the Sustainable Village Water Systems model in 25 rural communities + Public Service Campaign</p>
--	---	---

Our Partners



globalwater.osu.edu

*Sustainable Village Water Systems:
A Promising Solution for Africa's Water Crisis*

Contact: Leanda Rix, Executive Director of Foundation Relations, rix.10@osu.edu, 614.292.3058

February 2020

The Drought Resilience Impact Platform (DRIP)

Ending Drought Emergencies in the Horn of Africa



The **destabilizing impact** of drought emergencies increases with each successive event, leading to **vulnerability** and **insecurity** in this complex region of Africa.

The Challenge

Millions of people living in the drought-prone Horn of Africa face persistent threat from lack of safe, reliable and affordable water year-round^{1,2}. The arid regions of **Somalia, Kenya** and **Ethiopia** are experiencing increasing frequency and severity of drought³. Drought emergencies occur when reduced rainfall—exacerbated in recent years by climate change⁴—combines with limited community capacity and institutional failures to cause dramatic reductions in access to water for people, livestock and agriculture. Those affected are among the most marginalized communities in East Africa.

This crisis results in: ➔ **catastrophic crop failures** ➔ **economic shocks** ➔ **public health stress** ➔ **displacement of people**

The Solution: DRIP

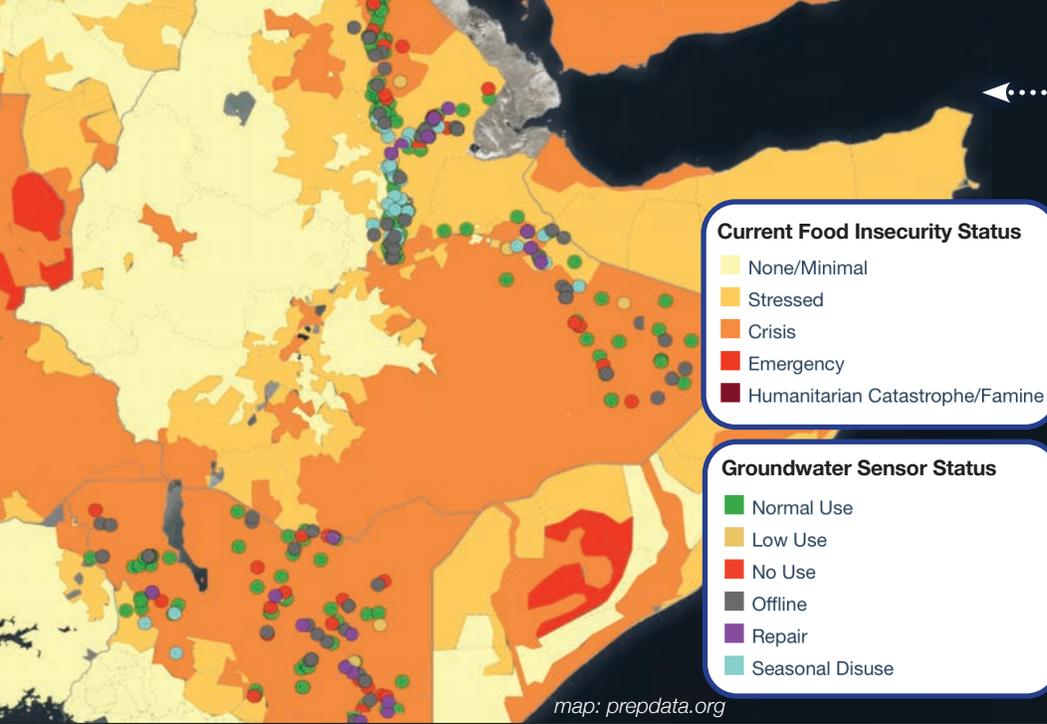
Together, we can end drought emergencies.

Drought-driven humanitarian emergencies **can be prevented** if groundwater is made reliably available at strategic locations during cycles of water stress. DRIP's comprehensive systems-based design integrates early detection and planning with proactive groundwater management to ensure water availability, thus enabling communities to become effective managers in the prevention of these drought-driven humanitarian crises. The platform replaces reactive and expensive short-term assistance measures. With the support of our coordinated partners on the ground, DRIP can **direct** adaptation responses, **secure** ongoing delivery of key services, and **deliver** assistance specifically when and where it is needed.



MONITORING | EVIDENCE-BASED DECISIONS | COORDINATED ACTION

Our Approach



Current Food Insecurity Status

- None/Minimal
- Stressed
- Crisis
- Emergency
- Humanitarian Catastrophe/Famine

Groundwater Sensor Status

- Normal Use
- Low Use
- No Use
- Offline
- Repair
- Seasonal Disuse

map: prepdata.org

- Identify and prioritize** strategically selected groundwater using local water system monitoring and regional drought forecasting.
- Operationalize** DRIP's water services through pay-for-performance contracting, ensuring incentives to provide year-round water supplies.
- Measure** performance through innovative impact evaluation methods.
- Expand** our capacity-building work by building resilient and sustainable socio-environmental systems.
- Provide** guaranteed year-round water services for 20 million people.

Our Vision: A Resilient Horn of Africa

Our vision is a resilient Horn of Africa where everyone has reliable access to safe water, year-round, regardless of water stress; where pastoral communities are able to rebuild herds and sustain crops, and regional security stressors are relieved as water is no longer a source of conflict. In this vision, children are not impacted by food scarcity, thirst, or dirty water, and families are able to thrive in their traditional way of life.

The pieces are in place, but bold funding is required.

We seek partners to help us achieve our goal of ending drought emergencies in the Horn of Africa. At scale, **DRIP will reach 20 million people**, at a cost of **\$5/person**. An investment of \$5-10 million in DRIP will provide valuable resources to begin this work. Funding opportunities include:

- Building capacity to integrate DRIP and deploy our strategy with a subset of initial partners in Somalia, Kenya and Ethiopia.
- Scaling installation and monitoring of sensors at boreholes across the region.
- Launching a pay-for-performance contracting structure, ensuring that all institutions and partners are coordinated and incentivized to provide year-round water supplies.

USAID estimates that **for every \$1 invested** in resilience in areas of recurrent crises, **nearly \$3 will be saved** in averted losses and humanitarian need.



CONTACT

Dr. Evan Thomas, Director of the Mortenson Center: ethomas@colorado.edu

Amy Hill, Managing Senior Director of Development: amy.hill-1@colorado.edu

303.492.0567

Proven Leaders, Working Together

The **Drought Resilience Impact Platform (DRIP)** is led by the University of Colorado Boulder's Mortenson Center in Global Engineering with the USAID and NASA Famine Early Warning Systems Network (FEWS Net) and the Millennium Water Alliance. We will work together through partnerships with the Ethiopian Ministry of Water, Irrigation and Energy, Somaliland State Ministry of Water Resources Development and Kenya National Drought Management Authority.

The **Mortenson Center in Global Engineering** at CU Boulder combines education, research and partnerships to positively impact vulnerable people and their environment by improving development tools, policy and practice. Supported by USAID, NASA, the National Science Foundation and others, the Center has successfully designed and deployed sensors that monitor and enable maintenance of water systems for over 3 million people yearly in the Horn of Africa. Our USAID Sustainable WASH Systems Learning Project leads a \$15.3 million, four-country, multi-partner study to identify the institutional and governance conditions that result in effective improvements of complex water and sanitation systems in this region.

Published February 2020

THE DRIP CONSORTIUM



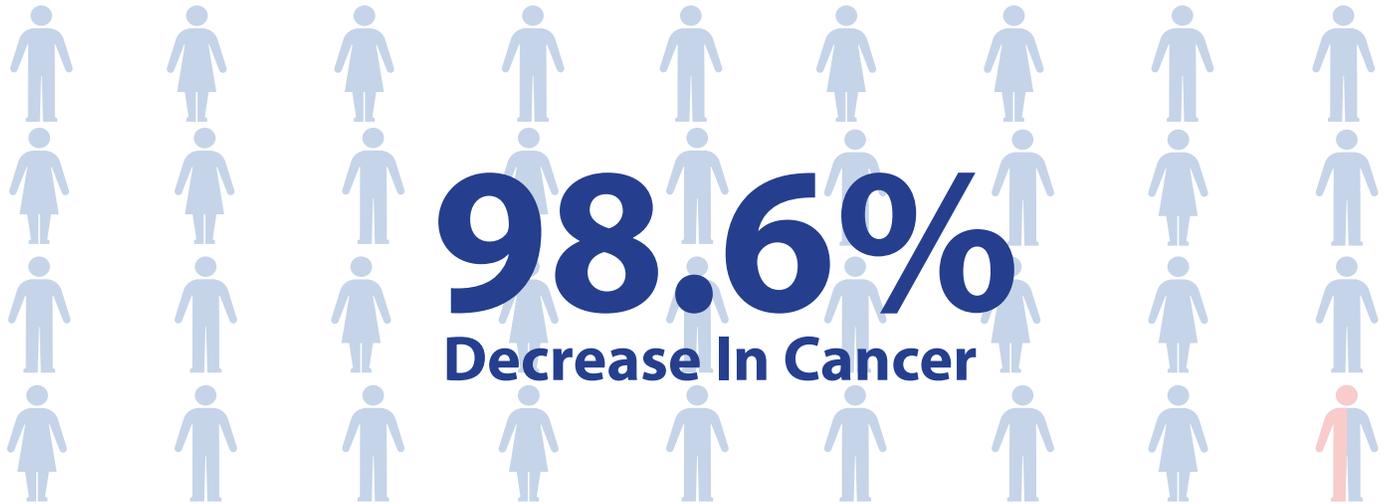
[1] Bekele Shiferaw, Kindie Tesfaye, Menale Kassie, Tsedeke Abate, B. M. Prasanna, and Abebe Menkir. Managing vulnerability to drought and enhancing livelihood resilience in sub-Saharan Africa: Technological, institutional and policy options. Weather and Climate Extremes, 2014. issn: 22120947. doi: 10.1016/j.wace.2014.04.004. [2] Ellen

Viste, Diriba Korecha, and Asgeir Sorteberg. Recent drought and precipitation tendencies in Ethiopia. Theoretical and Applied Climatology, 2013. issn: 14344483. doi: 10.1007/s00147-013-0665-9. Masanj, F. C. H. M. S. A. L. S. H. K. I. R. A. B. P. O. P. O. C. A. U. P. G. U. G. H. I. C. R. A. T. I. O. N. A. L. A. N. A. S. A. K. C. A. T. I. A. G. A. Z. R. E. C. O. N. D. I. T. I. O. N. S. E. I. L. E. R. T. S. G. Z. A. I. T. C. H. I. K. B. V. E. R. D. I. N. J. Examining the role of unusually warm Indo-Pacific sea-surface temperatures in recent African droughts. Q J R Meteorol Soc. 2018; 144 (Suppl. 1): 360-383. <https://doi.org/10.1002/qj.3266>.

Stop Arsenic in Drinking Water

the Largest Mass Poisoning in History

200 Million people drink arsenic contaminated water



**Out of 200 million, 36 million will develop a cancer of some form.
After our water treatment, we will reduce the cancer incidents by 98.6%.**

Public Health Catastrophe

200 million historically marginalized people around the world are being poisoned by toxic levels of naturally occurring arsenic in the groundwater they depend on for drinking. Chronic arsenic poisoning has no cure. Its effects include debilitating disabilities, internal cancers, and death.

Arsenic poisoning disproportionately affects vulnerable populations in poor rural areas, including women, children, and the most socioeconomically disadvantaged.

- Malnourished individuals -- the truly poor -- tend to develop earlier and more severe symptoms of arsenicosis than their more affluent counterparts.
- Chronic arsenic exposure reduces children's cognitive development and intellectual functioning.
- People with symptoms of arsenic poisoning often suffer extreme stigmatization and social exclusion, such as young married women in India being returned to their parents.

Our Goal: End mass arsenic poisoning via safe drinking water

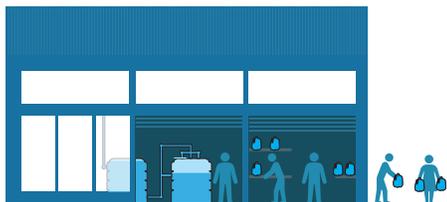
We will end this mass poisoning by scaling an effective arsenic-removal technology with a solid business model. We have invented and successfully piloted ECAR (ElectroChemical Arsenic Remediation) to provide poor rural communities with safe, affordable drinking water. ECAR works under even the harshest conditions and purifies water locally. It generates sufficient revenue for ongoing operation and sustainable expansion while improving communities' health and standard of living.

ECAR Team

Innovators in engineering and social science at the water-energy nexus, our team is driven by a shared passion to alleviate poverty and human suffering. Team leader Dr. Ashok Gadgil is a well-known inventor and the Distinguished Chair Professor of Safe Water and Sanitation at UC Berkeley. Jadavpur University, based in India, will provide crucial expertise on social placement that will help gain acceptance and integrate ECAR in a culturally-appropriate manner. Our industry partners, who will help with implementation, have extensive experience building and operating distributed, community-scale water delivery systems in rural India. The core team has worked together for more than six years building and operating ECAR, which now serves more than 5,000 people in West Bengal.

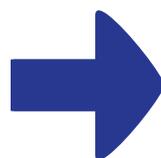
Our Team:

Our team: UC Berkeley (lead), Jadavpur University, Livpure, Sarvajal, and WaterLife



100 plants serve 500K people water

sold at

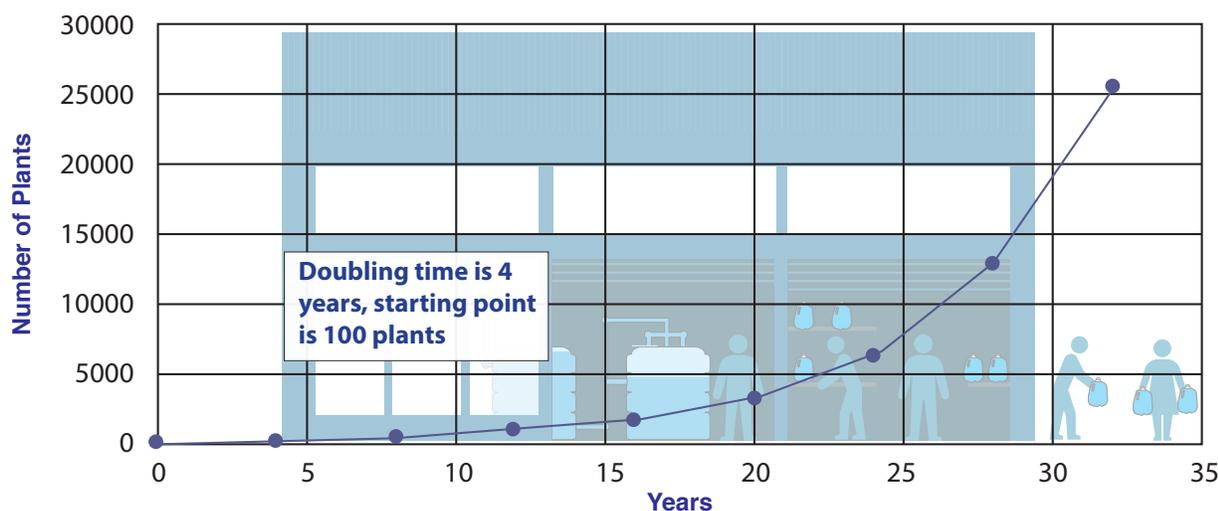


30% ROI

Reinvested to produce more impact

Scale up plan

With a \$10 million investment, we can install and operate 100 ECAR plants to provide safe, affordable drinking water to 500,000 people within three years, starting in South Asia where the problem is most acute. Our focus on community awareness, consistent usage, monitoring, and timely maintenance will establish the self-sustaining infrastructure to permanently eliminate water-based arsenic poisoning in these 100 communities. As we scale up, our operations will achieve the financial viability and community enthusiasm needed to cross the adoption tipping point to end what the World Health Organization has called “the largest mass poisoning in recorded history.”



The Time Is Now

For the first time in 25 years, we have a proven, rapidly scalable technology to address arsenic poisoning from groundwater. Demonstrating the durability, effectiveness, and financial viability of 100 new ECAR plants will unlock further resources for growth. These include potential funding from the pool of INR 8 billion (~ USD \$120M) released by the Indian Central Government in 2016 to the affected States for community-scale remediation of arsenic and fluoride from drinking water. In the absence of a demonstrated solution, these funds have remained mostly untapped. Access to this capital, as well as the inflow from corporate-social-responsibility funds required in India, will allow industry to continue building, operating, and improving ECAR plants in the most affected regions once the success of the first 100 plants has been demonstrated. Ultimately, ECAR’s built-in mechanism for financial sustainability will attract public and private investments to construct the additional 40,000 plants needed to serve the 200 million people worldwide living in communities currently suffering from arsenic poisoning.



“Schoolchildren in West Bengal collecting water from an ECAR plant. Over 3,000 students and school staff have been served since 2016. During scale up, we will prioritize installing plants on or near school campuses”

Contact Us

Email: ajgadgil@berkeley.edu Phone: 1-510-486-4651 Website: arsenicfreewater.lbl.gov

02/2020



Water is the way

To break the cycle of poverty.
To achieve global equality.
To make a bright future possible for all.

Access to safe water means:



Women have more time to earn income for their households instead of walking hours each day collecting water.



Improved health, the prevention of the spread of infectious diseases, and the reduction of physical injury from constant lifting and carrying of heavy loads of water.



Increased school attendance, especially for girls, as children are often responsible for collecting water for their families.

Financing works for people living in poverty

For millions around the world, access to funds stands between them and safe water and sanitation in their home. Through our work, we have found that when given the opportunity to pay for water and sanitation improvements with loans, families opt to finance long-term solutions versus struggle day-to-day to find that next liter of water or a place to go.

Financing works at a global level

There's a gap in financing. The World Bank estimates that \$114 billion a year is needed to achieve safely managed water and sanitation and meet the Sustainable Development Goal 6 (SDG 6) targets. That is 3x the current investment levels, and those are the costs only for constructing new infrastructure, not of operating and maintaining that infrastructure over time.

New solutions are needed to fill the gap. New sources of finance are critical to achieve universal access to water and sanitation. Bridging the financing gap and delivering safe water and affordable access to water and sanitation will depend on innovative and efficient approaches. Solutions that strategically use donor funds to attract private investment can fill in the financing gap.

That's where Water.org comes in.

Founded by Gary White and Matt Damon, Water.org pioneers market-driven financial solutions to break down barriers between people living in poverty and access to safe water and sanitation.

A proven and powerful solution

Our core solution, WaterCredit, is the first to put microfinance tools to work in the water and sanitation sector. It helps bring small loans to those who need access to affordable financing and expert resources to make household water and toilet solutions a reality. After more than 15 years in action, WaterCredit is in high demand, it's sustainable, and reaching people in need. Together with our 129 partners around the world, we've catalyzed \$2.1 billion in capital to support small loans that bring access to safe water and sanitation to people across 12 countries.

This solution works because it recognizes people as customers with untapped economic potential and empowers them to define their own future.

25 million

lives changed

5.7 million

loans for water and sanitation
disbursed

\$2.1 billion

In loan capital disbursed by our
partners for water and sanitation

\$3.75

average daily wage of our
borrowers

87%

of borrowers are women

99%

loan repayment

Your money is a catalyst

WaterCredit is a catalyst and it is empowering more people, faster, with access to safe water and sanitation. Every dollar put into WaterCredit makes \$66 of capital available in local currency, amplifying the impact achieved by your support. That means that for every \$1 million donated, \$66 million in capital is made available as small, affordable loans for people living in poverty. With loan repayment rates at 99%, every repaid loan frees up capital to empower another family, making the impact sustainable over time.

Change the future for up to 1 million people in need

A \$10 million gift can transform the lives of up to one million people with access to safe water and sanitation. It also supports critical efforts needed to scale and amplify that impact.

- It fuels powerful and innovative solutions that accelerate universal access to safe water
- It helps forge strategic partnerships to expand our reach
- It creates system-level change as we work to influence policy and practice in the countries where we work

Invest in water. Invest in us.

A donation to Water.org is an investment in long-term, systemic change. Help us transform the lives of 60 million people with access to safe water and sanitation by 2022.





Visit www.Solutions.LeverforChange.org to explore more Bold Solutions. To learn more about Lever for Change or inquire about our services, please visit www.LeverforChange.org or contact us directly at info@leverforchange.org.