CELEBRATING COLLABORATIVE WASH LEADERSHIP & WELCOMING FUTURE CHALLENGES

GLOBAL WATER ALLIANCE: 10-YEAR REPORT

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ABOUT GLOBAL WATER ALLIANCE

The Global Water Alliance started in 2006 as the Philadelphia Global Water Alliance) by a (PGWI) by a group of professionals from the Philadelphia Region and students from the University of Pennsylvania. Following Stan Laskowski's return from the World Water Forum in Mexico City and using the mandate of the United Nations Millennium Goal #7, professionals from different disciplines along with the students banded together to form PGWI. These professionals had engaged in services overseas, often in collaboration with others in Cameroon, India, Kenya, Afghanistan, Haiti and Colombia, to name a few. Their mission was to raise awareness among the business and political leaders in Philadelphia and beyond regarding the global dimensions and intensities of the world's water issues and how we are all connected through water. They sought to educate others about Global water, sanitation and hygiene (WASH) issues by developing curricula and educational materials for undergraduate and graduate courses and high schools, and participating as guest lecturers and in workshops. In 2014, we changed our name to GWA, but our mission remains the same. We work within the visions of the United Nations Water Inter-Agency Collaborative Program, taking our mandate from the Sustainable Development Goals as adopted in 2015 by the U.N. General Assembly, specifically focusing on Goal #6. We have developed a holistic, multi-disciplinary and multi-faceted approach to WASH as we understand the many needs for water, from health and survival to agricultural, commercial and recreational uses, and are aware of the trends regarding water systems (read more here). In addition, we provide assistance to others who work on ameliorating the water needs of poor and underserved peoples everywhere, we mentor the next generation of water professionals, and we promote a "water footprint mindset" among our youth. Our fieldwork depends on funds available and the collaboration of other entities in our network. While not excluding WASH in cities, our fieldwork tends to be in more rural and peri-urban settings, where scale, population dynamics, and capacity are major variables in project and program development.

Today the GWA has extended its commitment to help advance the UN Sustainable Development Goals for water and sanitation throughout the world. By utilizing the resources and expertise of the Philadelphia Region and beyond, we work to increase global access to safe water, sanitation, and hygiene services.

Our Vision

The Global Water Alliance envisions a world where all people have access to safe drinking water and sanitation; a world free of suffering from water – and sanitation-related diseases.

Our Mission

The mission of the Global Water Alliance is to increase global access to safe drinking water, sanitation and hygiene services, engaging the resources and expertise of the Philadelphia region and beyond.

A Word from the President

A message from Angelita Fasnacht-Cuellar, President, Global Water Alliance

The world water crisis is now recognized as one of the greatest threats of the 21st century. In early 2016, the World Economic Forum designated water as having the potential for the greatest global impact in the coming decade. From it's founding in 2006, GWA has grown to include NGOs, government agencies, businesses, and academics. We are a network of organizations with the goal of finding sustainable WASH solutions. GWA is doing its part to save lives in two broad ways — through educational activities and by helping with in-the-field WASH projects. This report, celebrating the 10th anniversary of our founding, provides a sampling of these efforts. As you will see in the following pages, there are many special people — considered "water heros" by many of us — from the Philadelphia Region who, sometimes at considerable personal sacrifice, have helped people around the world plan, finance, and manage their WASH projects. At times, GWA helps with technical advice and expertise, by connecting them with others who have specialized knowledge, and by providing a forum to compare approaches and learn from each other.

The GWA partners provide WASH education in many ways. We organize an annual GWA conference that typically attracts leading experts from around the world on the global water crisis. In recent years leaders from the UN, USAID, and representatives from India, Israel, Sri Lanka, and Africa have made presentations. GWA Board members teach in some of the leading academic institutions in the Philadelphia area including the University of Pennsylvania, Drexel University, and Temple University. These teachers have expertise in environmental science, public health, engineering, and related fields. Through these universities dozens of students have had opportunities to learn by helping with projects in developing countries, by conducting relevant research, and by attending international conferences. Public presentations and civic organizations and the City of Philadelphia Water Department supplement these educational activities through its world-class Fairmount Water Works, which provides water education services to grades K-12.

The Future: The new United Nations Sustainable Development Goals establish very challenging goals for the world community. SDG #7 includes universal coverage of drinking water and sanitation services. GWA welcomes these goals and its chance to help people in developing countries with WASH. We will continue to provide special emphasis on monitoring and analysis, gender issues, and inequality.

SUCCESS STORIES BY MEMBERS OF THE GWA NETWORK

There are many WASH projects in developing countries conducted by organizations in the Philadelphia Region. The following is a sampling of these efforts, starting with Non-Government Organizations [NGOs].

NON-GOVERNMENT ORGANIZATIONS

WATER FOR PEOPLE

Dr. Arun Deb started his volunteering activities more than 25 years ago while working for Weston Solutions, Inc., with a goal to help poor people of developing countries in providing them safe drinking water and good sanitation. Many of those projects tie into volunteer activities for Water For People (WFP).

In the early 1990s, Deb initiated WFP projects to bring safe drinking water to about 10 schools with nearly 1,000 students each. He has been instrumental in completing WASH projects in about 50 schools. Deb, who has served two terms on the Water For People board, is the man behind the WFP project in India working hard to remove arsenic from drinking water and he spends several months each year in Kolkata, India.

When he learned of the huge numbers of villagers suffering from arsenic poisoning caused by contaminated groundwater, Deb helped raise $10,000, with the help of the PA Section of WFP, for a research grant to support the Bengal Engineering and Science University in designing an arsenic-removal process that would not require electricity.

The project has been underway for the last 20 years. Deb's reward comes in the form of outreach from villagers who contact him during his visits to India. The villagers are quite proud of their arsenic-removal unit. For years, Dr. Deb has consistently demonstrated his passion for delivering safe drinking water and improving the quality of life through access to clean water. As a Board Member of GWA, Dr. Deb was been instrumental in developing WASH projects in about 20 High Schools in the West Bengal, India Project.

In 1996, the growing arsenic poisoning of drinking water drawn from the underground in the Indian subcontinent came to the attention of Dr. Deb. At that point, he contacted several academicians in U.S. and India as a conceptual planner and facilitator, and representative of WFP. The goal was to develop an effective project appropriate for

rural Bengal while partnering with Bengal Engineering and Science University (BESU), Kolkata, and Lehigh University of Pennsylvania, U.S., and to find a way to provide arsenic-safe water to villagers in remote areas with no other source of drinking water. Dr. Deb was a pioneer in raising funds and organizing the research to develop appropriate sustainable technology suitable for hand pumps in the rural villages of West Bengal**.** The project supported installation of many arsenic removal units in various districts of rural West Bengal. With the help of Bengal Engineering and Science University, Dr. Deb organized the villagers' support, and developed village level institutions managed by the consumers to properly maintain these arsenic removal units. Now nearly 14 years later, that modest beginning has exceeded all expectations. This project continues today and is a real success.

Arsenic Removal in Rural Water Supply, West Bengal, India, Water For People, Volunteer Program Director.

Arsenic Treatment Plant at Maslandpur, West Bengal, India.
Number of Consumer Family - 200

Currently there are nearly 200 community based wellhead arsenic removal systems in remote villages that routinely provide safe drinking water to nearly 200,000 villagers. Most importantly, these arsenic treatment units are run, financed and operated by the villagers themselves, including the women. The units are socially accepted, sustainable, made out of indigenous materials, and the treatment process runs without electricity and does not require the addition of external chemicals. The partnership between WFP, BESU in India and Lehigh University has come a long way and the project is still growing without any governmental assistance.

For its sustainable engineering approach, the project has received several awards, namely, 2005 Mondialogo award from UNESCO and Daimler-Chrysler; 2007 Grainger Silver award from the National Academy of Engineering (NAE); 2008 Dhirubhai Ambani award from the Institution of Chemical Engineers (IChemE) in the United Kingdom; and 2008 American Society of Civil Engineers' one of the five best civil engineering projects of 2007. This is still a live project with continuous improvement; larger scale treatment systems are currently being installed in several schools where drinking water is laced with unacceptable level of arsenic helping many students.

Women Empowerment Project

Dr. Deb with help from Patrick McCann, Past Chairman of WFP, Chuck Di Laura, Past Chairman of WFP and David Steinglass initiated a women's empowerment program in villages of West Bengal with NISHTHA, a local NGO. The program provides educational and health support to adolescent girls and is so successful that each year about 20 girls are graduated from high school and go on to college. Parents of most of the students are very poor and illiterate with little chance of someday seeing their daughters go off to college. Armed with college education, these girls are changing the social fabric of their villages. The mission is to have no girl left behind**.**

Tenth Annual GWA Conference, Kolkata, India

Dr. Deb has been instrumental in moving the Tenth Annual GWA Conference from Philadelphia to Kolkata, India. GWA is now moving in full gear to organize the conference to be held on January 4-7, 2017 at The American Center in Kolkata, India. We are also planning to bring university students from the Philadelphia area to spend two weeks in the villages of West Bengal to evaluate sustainability of WASH projects.

Vision for the Future

Dr. Deb's focus is to improve the lives of poor villagers of West Bengal, India by providing safe drinking water and sanitation, education, and primary health services. Dr. Deb started with four villages in West Bengal with the objective to provide help in education and health services, including safe drinking water and sanitation services to improve health and education standards for all children enrolled in the

program. Over the ensuing years, the reach of this program has quadrupled and continues to grow. Dr. Deb's vision is for all West Bengalese children to have the opportunity to complete their high school education in good health.

THE NEPAL FOUNDATION'S BASA PROJECT

Our Mission

This project, lead by Mary C. Carroll, Chairman, Nepal Foundation and Yadav K Rai, Project Manager, with support from Dick Riegler, GWA Board member, is a multi-prong effort that has seven core areas — Sanitation; Clean Drinking Water and Irrigation; Education; Agriculture; Healthcare; Business Development and Entrepreneurship; and Democracy Building. Although the community identified sanitation and clean water as its top priorities, the other core areas also support the principles of sustainable development.

A latrine built by a village family. There is now one per household

Success Stories

The community adopted the slogan of "One family, One Latrine" and that goal has now been met after the people using supplies provided by the Nepal Foundation constructed 370 latrines. More recently the repair and construction of four water systems led to water being available to 600 people. While these projects surely provided excellent health protection, Mary Carroll reports, "The most compelling observation was the confidence and new level of self-esteem I found among the residents and their leaders".

A recent report by Mary Carroll notes that sustainability and the integration of various projects e.g., agriculture, education, and health care by the local community is essential to success. With respect to the sanitation effort the same report emphasizes the importance of education --- "Sanitation Fair was conceived as a fun way to remind residents of all ages the importance of good sanitation practices. Furthermore the Fair provided an opportunity to bring several Basa Project initiatives together so that they complemented one another: sanitation, nutrition, healthcare, education, development of local markets, leadership training, and the promotion of community spirit."

The Basa community is very appreciative of the efforts made by the Nepal Foundations and offered the following endorsements:

We have new latrines in every home.

So many people now have house gardens that grow new vegetables.

Our surroundings are now clean.

Many of us learned construction skills when we were taught to build our new water systems.

Water is now respected for many new reasons.

We are earning money with our ability to sell vegetables.

WH2O: THE JOURNAL OF GENDER & WATER

Our Mission

Governments, foreign aid agencies and non-governmental organizations are increasingly paying more attention to the importance of women's access to water and sanitation, but it is still not enough. At wH2O, our mission is to advance women's economic and social development by creating a centralized body of interdisciplinary research on water and sanitation issues. The issue is crucially important since women bear the brunt of gathering water worldwide. In developing countries women walk up to 5km each way and expend up to half their calories on fetching water. Providing water access and sanitation means that women can stay in school longer, are healthier, and lose fewer days because of sickness in the family.

The idea for the journal came from an early 2011 trip to India and Sri Lanka on behalf of the Master of Environmental Studies (MES) program at the University of Pennsylvania in conjunction with the Initiative for Global Environmental Leadership at Wharton and the Philadelphia Global Water Initiative. Professor Stanley Laskowski, and Masters students Dakota Dobyns and Caroline D'Angelo made the trip. They spoke with several people in the field from the U.N. and local NGOs regarding the issue of women, water and sanitation. Especially inspirational was Kusum Athukorala, an internationally recognized expert on water and gender issues, located in Sri Lanka. These Women for Water Partnership conversations led the students to realize that there wasn't a substantial national or international forum to talk about women's issues as they relate to water and so the Wh2O Journal for Women and Water was created. It has since expanded to include the website and multiple social media outlets. The goal has been tweaked over the years to change the original objective to gender and water.

The journal provides emergent and groundbreaking work on gender mainstreaming and engagement in water management and sanitation issues from academia, non-governmental organizations (NGOs), governments, and private actors. It provides a platform to bring together

viewpoints across the spectrum on how to better engage and empower women within their communities for sustainable development of water resources and sanitation: what works, what doesn't, and what are the lessons learned.

The wH2O Journal was founded by students and is run by students with the assistance of authors, the Editorial Board and the Board of Advisors. It is the only student journal of its kind.

Good sanitation habits are taught in the schools and at an annual sanitation fair

Success Stories

To date, four issues of the *wH20: The Journal of Gender and Water*, have been published all of which can be accessed on our website at *http://wh2ojournal.com*.

wH2O is supported by:

- The Department of Earth and Environmental Sciences at the University of Pennsylvania
- The University of Pennsylvania Trustees' Council of Penn Women
- Global Water Alliance (formerly Philadelphia Global Water Initiative)
- Initiative for Global Environmental Leadership (IGEL) at Penn
- Society for Women Environmental Professionals

We are always eager to partner with new institutions and organizations. If you would like to become part of our network, Please contact us at wh2ojournal@sas.upenn.edu.

In addition, each year we provide our support and assistance to the Global Water Alliance's annual conference. We will be attending the 10th Annual GWA Conference in Kolkata, India on January, 4-7, 2017. Information regarding this conference can be found at http://www.globalwateralliance.net/

If you are attending any of their events and have a blog post you would like to publish, send it to us at *http://wh20journal.com* and we will post it on the Journal's website.

Our Vision

wH2O is an online, open-access academic journal for women and water issues around the world. Our vision is to publish a yearly journal and provide a centralized hub for gender, water and sanitation information. Eventually, wH2O would like to provide research grants to facilitate more research in WASH.

Over the last year the journal has been going through a lot of changes and updates. We will be rolling out a new look in the up-coming months. This does not mean however that we are not active in soliciting academic submissions' for Issue 5.

This year, the wH2O Journal is focusing on the UN's Sustainable Development Goals (SDGs) and their implications for women. The journal accepts full articles from students, faculty, NGOs, and professionals from around the world. Appropriate submissions include, but are not limited to, research papers, case studies, opinion pieces, regional or national studies, and photo journalism. We encourage papers from young scholars and researchers. We especially encourage papers on lessons learned from field programs on gender empowerment in water and sanitation. We would also like interested stakeholders to send us blogs and follow us on twitter: https://twitter.com/wH2Ojournal

Please visit our website for more details.
We look forward to partnering with you in bringing to light these water issues and in finding ways to ease women's water burden.

ENGINEERS WITHOUT BORDERS - UNIVERSITY OF PENNSYLVANIA

Mission and Background

Penn Engineers Without Borders (Penn EWB) is the University of Pennsylvania's chapter of Engineers Without Borders, a non-profit humanitarian organization established to partner with developing communities worldwide.

Penn EWB works to enable sustainable development, both through awareness locally and implementation globally. Our vision is a world in which the communities we serve have the capacity to sustainably meet their basic human needs, and that our members have enough global perspectives through the innovative professional educational opportunities that the EWB-USA program provides.

PennEWB is divided into four different groups: local, international, design, and public relations. In the local committee, students promote sustainable practices in our community and raise local awareness about current topics in sustainability by traveling to a local high school at least once a week and performing various lab activities with them. The international committee is focused on sending a group of students to a developing country and exposing the students to new cultures and the outstanding engineering challenges in developing community. The public relations committee's goal is to raise the organization's awareness throughout our campus. Finally, the design committee focuses on creating technology that promotes sustainability through environmental, health, energy, and social organization.

Penn EWB students working together to mix cement for a latrine

PennEWB team members are working together to put together a rebar grid for the concrete slab

Success Stories

PennEWB has initiated two successful projects in communities on Lake Atitlan in Guatemala. Over the course of our almost seven year involvement in this region, PennEWB has worked to address issues in health and sanitation through our latrine projects. Throughout our time in Guatemala, we have been partnering with the same local NGO, Atit ala. In 2012, PennEWB worked with Ati't Ala on a latrine project in Pajomel. There were 85 families in Pajomel, most with dilapidated latrines or no latrine at all. From 2012-2014, PennEWB worked in Pajomel and with Ati't Ala to provide as many families with latrines as possible.

PennEWB provided the ingredients for the cement, the toilet seat, and masons to help the students. The families have to provide 10% of the costs for the latrines, dug the hole for the latrine, and build the clay walls surrounding the toilet. This ensured that the families would be involved throughout the project and promote sustainability.

In order to ensure maximum impact from the implementation of the latrines, it was integral to our mission to address the many sanitation and hygiene issues. To this end, each project had an education component to address the need for changes in hygienic behavior. The students worked with the women's center and in the schools teaching the groups why it was important to wash their hands and when to do so. In addition, through a series of activities in the schools, the students wrote and performed a play. The ultimate goal of the project was to increase the standard of living and decrease health problems throughout the community.

Other communities were aware of PennEWB's presence and saw the success in Pajomel. Tzunana reached out to Ati't Ala and from 2015-2016, the same latrine project was implemented there. In two implementation trips, the students were able to construct 25 latrines and continue teaching the community about health and sanitation.

Vision for the Future

Over the next few years, PennEWB will grow both internationally and locally. The implementation trips in 2017 will continue to be around Lake Atitlan. There will be a continuation of the latrine project in Tzunana, as well as a new water system project in San Juan. Our goal for 2018 and beyond is to work in other developing countries, such as Colombia, and to continue creating strong relationships with local NGOs.

Additionally, PennEWB will grow locally. We hope to have a larger presence in the University of Pennsylvania and Philadelphia

communities through our local committee and design projects. We plan on fundraising around Philadelphia and getting involved with more high schools.

PennEWB is extremely appreciative of the success it has had in the past thanks to the dedication of its own members as well as external support. We hope that as a community, we can continue to drive forward, making impactful change in the future.

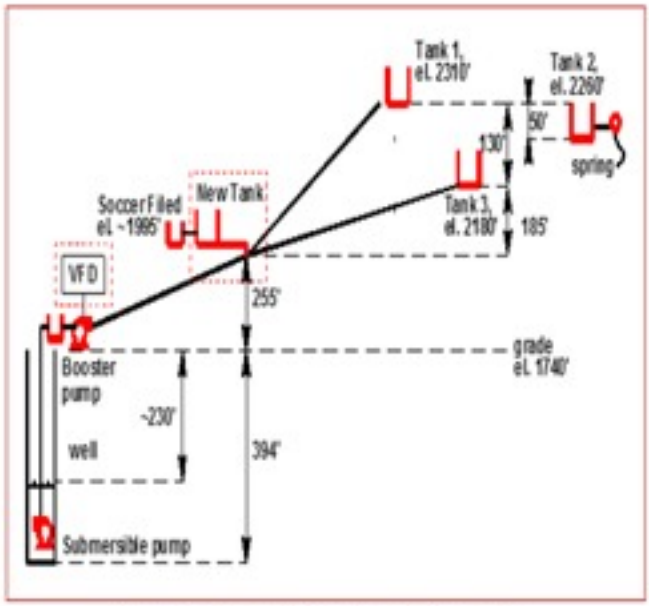
ENGINEERS WITHOUT BORDER - USA

Engineers Without Borders USA is an internationally recognized non-profit organization, building a better world through engineering projects that empower communities to meet their basic human needs and equip leaders to solve the world's most pressing challenges. EWB-USA's vision is a world in which every community has the capacity to sustainably meet their basic human needs. EWB-USA has almost 300 chapters across the United States comprised of 16,800 volunteers. The chapters partner directly with communities on projects to meet the community's self-identified needs. EWB-USA's vast network of dedicated volunteers range from first-year engineering students and engineering professionals to public health professionals.

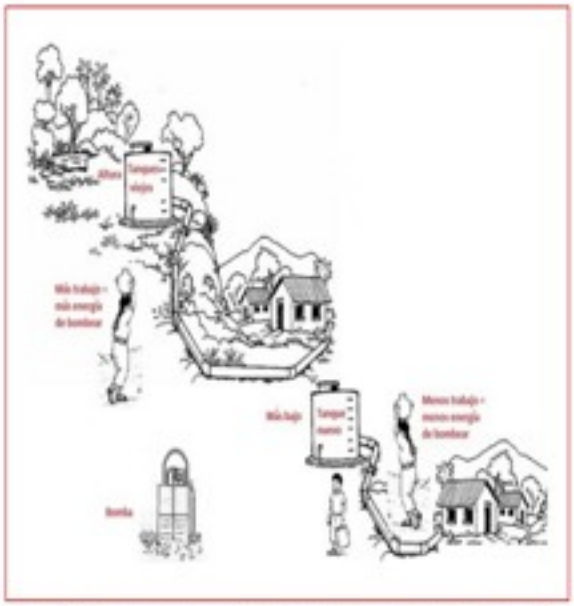
ENGINEERS WITHOUT BORDER - PHILADELPHIA

Las Delicias, El Salvador – Water Supply

EWB-Philadelphia has embarked on collaboration with Project FIAT since 2010 to provide water to the village of Las Delicias, El Salvador, a community near San Salvador with a population of over 5,000 people distributed throughout 600 homes across hilly terrain. Water was initially delivered to homes throughout the community by gravity from three large water storage tanks located at the highest points in the community, then supplied to the tanks from a spring higher in the mountains and from a well situated at lower elevations. The water was pumped from a well to the storage tanks for several hours each day, but the tanks drained quickly because a culture of water scarcity exists in the community that leads to hoarding of water in many storage tanks and vessels. In addition, the community had concerns that the water contained bacteria and parasites. The major concern is inequitable distribution of water to members of the community. While homes close to the water storage tanks received water almost every day, other homes received water only once per week. Other concerns included corrosion of pipes, failure of pipes, and ineffective chlorine disinfection. To begin the project, EWB-Philadelphia conducted a series of assessment trips to gather additional data and build a relationship with the residents and NGO partner.



Our project is a retrofit of an existing system. Above is the critical elevation diagram.



EWB-Philly added a new tank at an intermediate elevation to reduce power consumed by water pumps. This allows us to pump about 25% more water for the same electricity cost. An educational poster above illustrates the principle.

Between 2012-2015, with collaboration from Las Delicias residents, the Implementation Phase included an intermediate-elevation storage tank which was constructed along with a connecting supply and distribution piping. The team also added a variable frequency drive (VFD) to allow pumping at different discharge heads and to eliminate the power factor penalty each household was responsible for paying. Beginning in 2016, the team commenced with its Monitoring & Evaluation trips. This post-construction phase will focus on public health impact assessment, community feedback on water system improvements, education on household water treatment and storage, O&M training, and ensuring a sustainable impact for years to come.

Engineers Without Borders digging a trench to improve water supply in El Salvador

ENGINEERS WITHOUT BORDERS - RUTGERS UNIVERSITY CHAPTER

Mission and Background

Since its founding in 2005, the Engineers Without Borders USA Rutgers University Student Chapter has not only followed the core values of EWB by providing proper engineering solutions in various communities to address the need for clean water, but has also trained community members through educational workshops to leave a truly sustainable impact for years to come. Originally, the student chapter began with a project in Thailand addressing a farming community's water needs. Having completed the project, the chapter now currently focuses on 3 international water supply projects in Guatemala, Kenya, Tanzania, as well as a local community garden project in Camden, NJ. With a consistent growth rate in student membership across the University, the Rutgers Student Chapter continues to achieve success in its initiatives spread across engineering, community partnership, public health, and corporate sponsorship. Below are a few of the chapter's highlights and successes across its various projects, showcasing our commitment to sustainable community empowerment.

Success Stories

Guatemala

The Guatemala Water distribution system project aims to provide a small community at a high elevation with a consistent and reliable supply of water. By collaborating with the community in educational and technical initiatives, the team hopes to build a better future for the people of Nueva Santa Catarina Ixtahuacan. Together with the community, members have installed new pump systems, begun to implement water meters, and surveyed a seven-mile pipeline to recommend improvements.

Camden

Members of the Camden Project gained valuable design and hands-on experience from having recently worked on one of the community gardens by constructing a self-sufficient rain collection system. The team constructed a shed over the course of the year that currently captures about 180 gallons of water every month to be distributed by a solar powered pump. This reduces the workload of the gardeners who tend to the garden that now flourishes with vegetables in the middle of this local food desert.

Over the summer, Tanzania's travel team conducted an assessment trip to meet their partners and determine the needs of a newly-adopted project in the community of Karatu

Kenya

In just this past year, the Kenya Water Supply Project has successfully built and repaired 7 rainwater catchment systems for two school, launched an education initiative on clean water, and has located a site to drill a borehole well in the village of Kolunje. As part of ongoing efforts to increase access to water while also strengthening community relations, the team has developed a partnership with the local government to fund a large-scale distribution project in the coming years ahead.

Tanzania

Focused in the Karatu region of Tanzania, the Karatu Water Supply Project is currently working with the Karatu Water Village Supply (KAVIWASU) and the local community to provide a more reliable and sustainable source of potable water. The team conducted its first assessment trip this past summer, where members were able to meet the community and KAVIWASU as well as obtain data and observe the current situation. The team's next focus includes data analysis and determining the best and most efficient course of action.

Vision for the Future

As a chapter, we aim to expand our reach to the entire University and the greater Tristate area in order to bring as many individuals with non-engineers on board as those with engineering backgrounds. The work we do goes beyond the scope of technical engineering design, as we try to achieve the targets of sustainability (e.g. strong knowledge in community relations, public health, and microfinance) in parallel. The core vision of the Rutgers Chapter of Engineers Without Borders USA is sustainability. The true mark of sustainability is when we understand that a community's needs are not simply satisfied by solving the technical challenges of a project. Instead, a project is considered successful only once a community learns and becomes capable of resolving the challenges it faces on its own. We hope to empower the community and its leaders with the key resources and knowledge they will need to handle future issues, teach others, and ultimately solve newly arising issues for generations to come.

KEIYO SOY MINISTRIES

Keiyo Soy Ministries was founded in 2000 to combat the urgent need for clean drinking water in the northern part of Rift Valley Kenya. The goal was to provide clean drinking water to schools and communities through construction of a gravity-based system.

Success Story

Since its beginning in 2000, KSM has constructed three water towers, completed over 18 miles of pipe line, impacted over 20,000 children with either clean drinking water through construction and installation of Kentanks, provided laptop computers, distributed eye glasses, performed cataract surgeries, and provided shoes and school uniforms. The cataract surgeries were provided in partnership with Volunteer Optometric Service to Humanity (VOSH).

Vision For the Future

KSM is committed to making a greater community involvement impact by launching an Annual Road Race (Marathon, Kenya style), enabling communities to take part in their water, sanitation and health (eye care and cataract surgeries) and hygiene issues. KSM is now turning to the youth of the nation to take part in providing a solution to the Kenya water and health issues. We plan to continue providing Kentanks to schools and communities and also eye care through cataract operations and distribution of eye glasses.

TOPTANK

PHILADELPHIA SERENGETI ALLIANCE

Mission and Background

The Philadelphia-Serengeti Alliance 501(c)(3) was founded in 2012 to improve the lives of the people of Tanzania and empower women and girls to have an equal place in society. Since women and girls frequently miss work and school to travel long distances to gather water, PSA's primary focus has been on developing water projects in severely underserved communities in rural Tanzania. This allows girls to attend school in the morning and bring water home in the afternoon, and for women to run a business or a farm, and also collect water.

PSA water projects do not incur up-front costs to communities. Local contractors install each well while PSA helps each community establish a water user group with board members who oversee all well security and future maintenance. The well then becomes the property and responsibility of the community. The water user groups collect a small fee from each user, either per bucket or a set fee per month that gives every water user a sense of ownership and allows the user group to pay for security and repairs. As a result, the wells do not fall into disrepair because they become a public utility with significant ongoing community support.

Masinki well close up

Success Story: Keeping it Small, Keeping it Focused

Founder and President, Margareth Awiti, was born in Kowak – a small, rural village in Tanzania – and immigrated to the United States in 1996 with the goal of becoming a registered nurse. After working for years as a nurse for the physically disabled in Philadelphia and providing assistance to her family back home, Margareth wanted to find a way to give back to her fellow Tanzanians.

Our organization is made up solely of volunteers in both the United States and Tanzania who work diligently to ensure that we spend as much as possible on direct project costs. Fundraising for PSA has consisted entirely of grassroots efforts. We have hosted social fundraisers in Philadelphia, local fundraisers in Tanzania,

and various other events with churches and universities. Support from students has been a large part of our program, especially from the University of Delaware and Fordham University.

To date, PSA has built three entirely new wells in Tanzania that now serve over 12,000 people on a daily basis: one in the Busega District, one in the Rorya District, and one in the Serengeti District. Due to overwhelming demand for the well in the village of Mkula in the Busega District, PSA held a local fundraiser to acquire and repair an abandoned well, bringing our total to four wells so far.

The wells have had an enormous impact on their local communities. The well in Kowak, Rorya District, provides water to thousands of residents each day who previously gathered water from dirty surface pits or who walked miles to a lake. Mkula in Busega District has seen the highest water user turnout, numbering over 6,000 per day. In Masinki in the Serengeti District, the well was constructed within a mile of a primary school, two miles of a secondary school, and one hundred yards from a health clinic. Masinki's well has enabled the clinic to expand and offer essential services like vaccines and assisted childbirth. All three communities have used the wells to develop gardens.

Vision for the Future

PSA has committed to establishing 30 wells in each of the three districts in Tanzania that we have mentioned, for a total of 90 wells. Reaching that goal will take a lot of time, effort, and money. Although we aimed to build new wells, construction costs that often exceeded $10,000 meant we had to rethink our strategy. Through the efforts of volunteers James Leitner, Katie Coldwell, Sean Kenney, and Susan Kibe, as well as water engineers in all three districts, we have identified a list of abandoned wells that we will acquire and repair to reach our 90-well goal.

Mkulla well

A SPRING OF HOPE

Our Mission

A Spring of Hope is a non-governmental organization partnering with rural South African schools to bring them clean water sources, gardens, and sanitation to order to facilitate economic development opportunities.

Our History

In the summer 2005, mother and daughter Joanne and Brittany visited the Limpopo province of South Africa. Chance circumstances landed them at Beretta Primary School in Acornhoek, an impoverished town located in a former "Bantustan," or apartheid-era "homeland." Beretta had over 1,200 students and no running water, a reality most schools in rural South Africa must face.

The lack of nearby running water made life at Beretta extremely difficult. School gardens, which provided for many students their only source of fresh fruits and vegetables, grew exclusively during the rainy seasons. Volunteer mothers walked several miles to retrieve buckets of water from a government pump to prepare lunch for the children. Without operating flush toilets, students were forced to use unsanitary pits and were not able to wash their hands to keep from spreading illnesses. Beretta, however, was not unusual. Sanitation, hygiene, and water access are some of the biggest obstacles for rural schools not only in South Africa, but also across the entire continent.

Brittany and Joanne teamed up to fundraise for a borehole (deep water well) at Beretta Primary. In 2006, a well was completed with the help of South African friends Brendon and Sheri Schmikl. Water at Beretta Primary significantly improved student health and nutrition through a thriving garden. In 2007, a documentary was produced on *A Spring of Hope* and the changes at Beretta Primary since the addition of the well. The documentary was updated in 2010 and serves to educate people on the topic of the world water crisis and A Spring of Hope's work.

Beretta continues to serve as the primary model of success for *A Spring of Hope*, which was later, founded in 2007 and has grown into a professional NGO with an ambitious and unique mission to combine clean water access with economic and social development programs. Beretta Primary has capitalized on their water investment by expanding their tremendous garden and by selling their surplus fruits and vegetables to the community. The school won a 10,000 ZAR ($1,000 USD) prize for their garden in 2010 and continues to exhibit incredible entrepreneurship and drives to improve the quality of life and education of its students. Today, ASOH has 40 partner schools in the Limpopo and Mpumalanga provinces of South Africa. ASOH has become a team of highly motivated young activists, engineers, and thinkers.

VEGETABLES
GARDEN

2015 - 2016 Projects

In 2015, our work in South Africa continued unabated as we acquired additional funding sources which not only helped us build on our fundamental mission of providing clean water to rural South African schools, but to also further the expansion of our permaculture and sanitation programs. *A Spring of Hope* drilled fifteen boreholes at schools, which provided them with a clean, reliable water source and the necessary pumps, well stands, and other infrastructure. We hosted permaculture gardening classes and did repairs at Tsakelani Crèche and Xitenga Crèche. Gardens and fencing were installed at Tsakelani Crèche, Burlington Crèche and Maranatha Crèche. We hired a Development Director in Johannesburg whose primary job was fundraising and grant writing. She has forged a relationship with Rand Water

Foundation bringing 9million rand (approx. 650,000USD) to ASoH for water-less sanitation projects in 2015 -2017. This partnership has resulted in the installation of new water-less toilets at several of our partner schools, which will drastically reduce the spread of disease, as well as conserve precious resources in the region.

Our Philosophy

Ubuntu is the principle of caring for each other's well being through mutual support. Ubuntu means that people are people through other people.

Our Vision

To combat severe poverty in rural South Africa. *A Spring of Hope* intends to invest in the development of South Africa's future leadership so that they can, in turn, address pressing problems in their communities and their country.

PRIVATE ORGANIZATIONS

PENNONI ASSOCIATES

Pennoni recognizes the plight of the millions of people in developing countries who do not have access to safe drinking water and sanitation services. We have been a proud supporter of the Global Water Alliance (GWA) since its inception ten years ago. Throughout that time we have hosted the GWA quarterly Board meetings and have contributed to GWA annual conferences held at local universities (University of Pennsylvania, Drexel University, and Temple University). These conferences have attracted experts from countries throughout the world, from the United Nations, the World Bank, USEPA, USAID, and from local and foreign NGOs.

We are particularly happy to be able to provide the services of Tony Sauder who manages the GWA Project Committee which is responsible for reviewing proposed projects to ensure that they are well designed and meet the high standards needed to be sustainable over the years.

In 2014 Pennoni was recognized by GWA for its ongoing support in using its expertise and leadership to supply clean water and sanitation to the needy in developing countries. As Pennoni celebrates its 50th anniversary in the business, we look forward to continued collaborations in the future and wish GWA many more years of success.

For more information about Pennoni, please visit us at www.pennoni.com

ANTHONY S. BARTOLOMEO, PE, President and CEO

UHL & ASSOCIATES, INC.

Consulting Hydrogeologists

Mission and Background

UHL & Associates, Inc. implements water resource development and environmental assessment projects in Africa, Asia, the Middle East and South America for International Lending Agencies, USAID Contractors, National Governments, NGOs and Private Sector clients. These projects address a wide range of water-related issues, and have included a country-wide groundwater resource availability assessment (Afghanistan); strategic planning for water-supply development options (Botswana, where wellfields were substituted for a proposed dam based on community and environmental concerns); specialized training for local government water utilities in well design and maintenance, water meter usage and water quality sampling (Jordan, Bangladesh, Liberia); and providing practical water-supply project guidance (CRS).

Success Story

USAID – Irrigated Land Application Potential (ILaP) Project

This project was undertaken for USAID by the firms of MWH and UHL & Associates, Inc. The Project objectives were to:

- Develop an awareness of the opportunities and limitations for small-scale irrigation using shallow groundwater, and of the need for planning and management on a watershed basis so that the groundwater resource is developed sustainably.
- Introduce the principal output of this project: the *Irrigable Land Potential (ILaP) Calculator*. The ILaP Calculator is a tool to assess available quantities of shallow groundwater for small-scale irrigation and develop realistic estimates of the potential land area within a watershed that can be sustainably irrigated.
- Apply the ILaP Calculator to two pilot study basins that are good candidates for expanding small-scale irrigation in the Highlands region of Ethiopia.

Context: Small-scale irrigation in Ethiopia is poised to increase markedly in the coming decades and much of the irrigation will come from groundwater. The Government of Ethiopia plans to potentially move up to 6 million households into food security. The evaluation of shallow groundwater availability and development feasibility before development provides the opportunity to confine use to the renewable part of the resource, avoid over-exploitation, and preserve the resource for future generations.

Vision for the Future

Two areas of interest.

1. Groundwater Management – the critical need to manage the resource sustainably for future generations.

2. Getting water to rural populations – In the high-tech world of instant information and input, water systems are often installed and forgotten in the remote rural areas of many countries. A key challenge for all of us in the water sector is keeping these systems running day in and day out.

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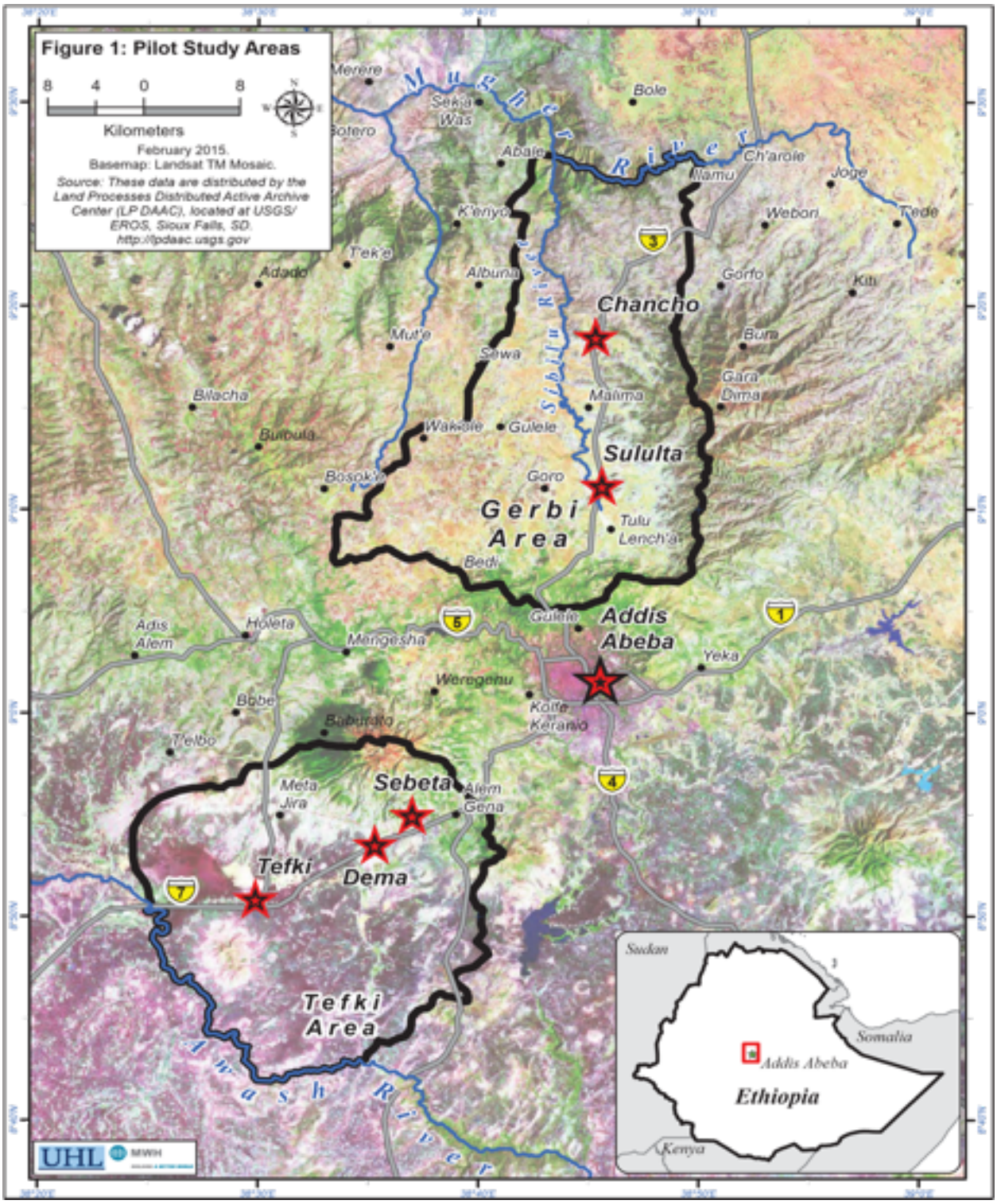
Figure 1: Pilot Study Areas
8 4 0 8
Kilometers
February 2015.
Basemap: Landsat TM Mosaic.
Source: These data are distributed by the Land Processes Distributed Active Archive Center (LP DAAC), located at USGS/ EROS, Sioux Falls, SD. http://lpdaac.usgs.gov
Meyere
Sekia Was
Bole
Abaia
Mamu
Ch'arole
Jogo
Tede
Webori
K'enyo
Tek'e
Adado
Albuna
Gorfo
Kiti
Chancho
Mut'e
Sawa
Buna
Gara Dima
Malima
Bilacha
Wakole
Gulele
Bubula
Sululta
Bosoki
Goro
Gerbi Area
Tulu Lench'a
Bedi
Addis Alem
Holeta
Mengesha
Gulele
Addis Abeba
Yeka
Weregenu
Kotte
Kerarsa
Bobe
Bubuko
T'elbo
Meta Jira
Sebeta
Alem Gena
Tefki
Dema
Tefki Area
Awash River
Sudan
Somalia
Addis Abeba
Ethiopia
Kenya
UHL
MWH

GOVERNMENT LEADERSHIP

PHILADELPHIA WATER DEPARTMENT / FAIRMOUNT WATER WORKS

The City of Philadelphia has long been recognized as a national and international leader on issues of water, sanitation, and hygiene. As one of the co-founders of the Global Water Alliance, it has been our pleasure to contribute to the GWA efforts to help people in developing countries. Our Fairmount Water Works, under the direction of Executive Director Karen Young, is recognized in the Philadelphia Region and beyond as a world-class water education center and has given tens of thousands of students from elementary school to the university level and the general public an appreciation of water and its essential role in our lives. We have been consistent supporters of GWA, hosting visitors from foreign countries and gatherings of GWA supporters from around the world, giving tours of our facility to students and the public, and through our social media outreach efforts on global water issues.

Members of the Philadelphia Water Department (PWD) have shared their expertise in drinking water, wastewater treatment, beneficial use of urban runoff, and other areas with visitors from developing countries and have provided advice regarding water, sanitation efforts to people in these countries. Two hundred years ago the City of Philadelphia was recognized as one of the world leaders in finding creative solutions to the treatment and distribution of water. With the guidance of GWA Board member Ed Grusheski, a retired PWD Public Affairs Director, lessons learned from these experiences are now taught in local universities and shared with other leaders. More recently, our experiences in the management of urban runoff, beneficial reuse of sludge from treatment plants, and the monitoring of environmental pollutants are areas from which developing countries can learn.

We envision a future where the public will more fully recognize the importance of water both here and around the world and where the City of Philadelphia will continue to be a leader in helping GWA and the United Nations meet the goals of universal access to clean drinking water and sanitation. For more information please visit us at http://fairmountwaterworks.org/.

Fairmount Water Works, Philadelphia PA, on the Schuylkill River

Karen Young, Executive Director,
Fairmount Water Works

EDUCATIONAL EFFORTS

UNIVERSITY OF PENNSYLVANIA

Master of Environmental Studies
Department of Earth and Environmental Science

The Master of Environmental Studies (MES) program is proud to have been involved with GWA since its inception in 2006. Students and professors in the MES program have been volunteers for GWA and have been leaders in organizing the GWA annual conferences, developing the website, and helping with the management of the organization. In addition to the many water/sanitation courses that have been taught as part of the MES program, often by GWA Board members, the MES program and the Department of Earth and Environmental Science (DEES) have been joint sponsors of the GWA annual conferences.

MES students have traveled with GWA leaders to many developing countries as part of their education. These trips include attending international water conferences in countries such as India, Sweden, Turkey, France, and South Korea. They have also been involved with water and sanitation projects in the field in many countries including Kenya, Cameroon, India, Guatemala, and Sri Lanka. One example of the lasting legacy of these activities was the founding of the wH2O Journal, the world's leading academic journal on issues of gender and water, by two MES students after their visit to Sri Lanka and India (see separate story herein on the wH2O Journal).

The MES program and the DEES recognize the global water crisis as one of the most important challenges facing the world community and look forward to continuing a close relationship with GWA through many educational opportunities. Please see our website at http://www.sas.upenn.edu/lps/graduate/mes for more information on how to be involved with us.

Dr. Yvette Bordeaux, Director, Professional Masters Programs in Earth and Environmental Science
bordeaux@sas.upenn.edu

Dr. Reto Giere, Professor, Department Chair, Earth and Environmental Sustainability

Jon Freedman, Professor, The Future of Water, University of Pennsylvania

WATER REUSE IS A KEY TO WATER SUSTAINABILITY

The U.S. alone produces approximately 32 billion gallons of municipal wastewater every day. However, it's estimated that less than 10% of treated wastewater in the US is intentionally reused. Globally, the number is even less; today, only 3-4% of the world's wastewater is being reused.

Wastewater, when treated with appropriate technology, can be used to irrigate fields, sustain industrial activity and even create drinking water. Reuse can reduce the amount of freshwater required for these applications and decrease diversion of water from sensitive ecosystems. With governments, businesses, and NGOs around the world looking to spur environmental sustainability and to promote thoughtful water practices, we are seeing increasing water reuse.

The role of policy in driving sustainability through water reuse is increasing as water demand starts to exceed supply. In the past, policy has often been focused on effluent quality with a view towards protecting the environment. And while this is a much-needed and continued focus, policy is shifting to promote greater water reuse.
Governments have four main policy levers that they can use to promote greater recycling and reuse:

1. Education and Outreach
2. Remove barriers
3. Incentives
4. Mandates

The first step should be education and outreach, which can convince people that it is not only important, but also safe to use recycled water. It addition, it can provide technical information on water recycling and reuse efforts, and also recognition of successful programs. For example, Spain's 2010 draft National Plan for Water Reuse (PNRA) has three of its eight main objectives focused on public education and outreach to promote and raise awareness on the benefits of water reuse.

Barriers to water recycling and water recycling systems come in many forms: technological, financial, and regulatory. Many communities are constrained by state or federal requirements that they must follow. However, communities do have control over local building and development codes as well as local funding, all of which can play a significant role in encouraging or discouraging water recycling and reuse. For example, Canada's National Plumbing Code was updated in 2010 to include a grey water reuse standard.

Providing financial, regulatory or other incentive can help encourage water recycling and reuse. Economic incentives can often make recycled water cheaper than

potable water and spur faster adoption, but other forms of incentives exist. One such example is the San Francisco Public Utilities Commission's (SFPUC) grant assistance program which provides up to $250,000 for single-building projects adopting non-potable water reuse, and as much as $500,000 for projects in which two or more buildings share alternative water sources.

Finally, communities facing acute water scarcity due to factors like changing weather patterns, population growth, or resource overuse sometimes adopt laws requiring the use of recycled water. These mandates sometimes restrict the use of potable water to domestic uses, forcing other water users to rely on recycled water. For example, California's Water Code Section 13551 states that "A person or public agency, including a state agency, city, county, district, or any other political subdivision of the state, shall not use water from any source of quality suitable for potable domestic use for non-potable uses."

In a world faced with increasing water new and innovative water reuse policies can help lead the way to a more sustainable future.

MES students Caroline D'Angelo and Dakota Dobyns conferring with students and visiting arsenic project near Kolkata, India

INITIATIVE FOR GLOBAL ENVIRONMENTAL LEADERSHIP
WHARTON IGEL

The Initiative for Global Environmental Leadership (IGEL) at the Wharton School, University of Pennsylvania, is proud to have been a partner with the Global Water Alliance (GWA) since its inception ten years ago. IGEL recognizes the critical role that water plays in the world and opportunities that exist for the business community to be leaders in finding sustainable solutions that meet the needs of the people in developing countries. IGEL, in partnership with GWA, has held conferences at Wharton on water-related topics such as Energy, Food & Water Nexus, Valuing Water, and Public-Private Partnerships in America's Public Water Systems. It has also sponsored the annual GWA conferences, been partners with GWA on multi-disciplinary student research, supported students attending international water conferences, and provided students with employment opportunities.

Eric W. Orts, Director, Initiative for Global Leadership

IGEL is uniquely positioned to assist in meeting the United Nations Sustainable Development Goals (SDGs) for 2030 and the business community will play an essential role in addressing SDG 6 which sets ambitious targets related to the world water crisis. We recognize that the best solutions are usually found in the multi-disciplinary approach that includes the talents of the Wharton School (eg, management, financing, economics, and marketing), the expertise of others at the University of Pennsylvania (eg, environmental science, engineering, public health, and social policy) and the practical experience and leadership of our corporate partners. We look forward to working with GWA and our many other partners to support solutions to the world water crisis.

Please visit us at
https://igel.wharton.upenn.edu/

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DREXEL UNIVERSITY DORNSIFE SCHOOL OF PUBLIC HEALTH

The Dornsife School of Public Health is proud to be a partner with the Global Water Alliance. Dr. Shannon Marquez serves as the Director of GWA's Research and Education Committee and has been instrumental in promoting the annual GWA conferences and directing related research by Drexel University students and others.

The Dornsife School of Public Health offers a wide range of programs to help people in the developing world obtain access to water, sanitation, and hygiene services including "hands-on" experiences in developing countries throughout the world. One example of these opportunities is a fully-funded experience in Sub-Saharan Africa to tackle development projects and improve health outcomes. At Drexel we offer a variety of global health courses and research opportunities throughout the world.

We look forward to doing our part in supporting the UN Sustainable Development Goals and envision a future where to disciplines of public health, water science and management work closely together to meet these critical global challenges.

For more information please go to http://drexel.edu/dornsife/global/office-of-global-health/ or contact Idris T. Robinson, MPH, Assistant Director, Office of International Programs & Office of Global Health, 267.359.6058; idris@drexel.edu.

Shannon Marquez, PhD, MEng
Associate Professor,
Director of Global Public Health Initiatives

TEMPLE UNIVERSITY

TEMPLE UNIVERSITY®

College of Public Health

Dr. Heather Murphy is an Assistant Professor in the Division of Environmental Health, within the College of Public Health at Temple University. She joined Temple in 2015 and became a GWA board member the same year. Heather has over ten years of experience in water and wastewater treatment, water quality, drinking water distribution, risk assessment and environmental health in both North America and abroad. Heather obtained her PhD in Environmental Engineering from the University of Guelph, Canada, where she focused on appropriate household water treatment technologies in rural Cambodia. Following her PhD, she worked for the United Nations International Emergency Children's Fund (UNICEF) as a Water, Sanitation and Hygiene Specialist in Mali and Madagascar. Prior to joining Temple she was a research fellow at the University of Guelph where she conducted research on the challenges of water provision in Canadian First Nations communities. Heather's research interests involve understanding and addressing water and health challenges in both developed and developing countries.

WASH in Schools

In collaboration with GWA and UPenn, Heather recently finished a project funded by UNICEF where she was working on developing and testing a costing model for WASH programs in developing countries. The costing tool she developed with a team of Wharton business students allows for health and education ministries to calculate how much these programs will cost per student, and how to best allocate funds and resources. This is an important first step ensuring that WASH programs and infrastructure are integrated into educational sector-wide planning. A first draft of the model was completed in August 2016. The model is designed to work in different country contexts. The next step is to pilot the tool and assess its effectiveness in collaboration with UNICEF country offices and their government counter-parts.

Candidate countries include: Indonesia, Ghana, Myanmar, Nepal and Colombia.

Improving Water Quality In the City of Philadelphia

Last summer Heather and a team of Temple undergraduate students undertook some microbial water sampling on Cobbs Creek and Taconey Creek in the city of Philadelphia. The goal of the project was to assess what enteric pathogens may be surviving in these creeks as a result of storm water run-off. Although it is illegal to recreate in the creeks in Philadelphia, people still do recreate in these waterways. Heather was investigating to what extent people's health could be compromised as a result of exposure to waterborne pathogens. She will begin partnering with the Philadelphia Water Department (PWD) on a more in-depth sampling strategy to investigate the impact of PWD storm water management practices are having on the water quality in the creeks.

Contact Information

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ABINGTON SENIOR HIGH SCHOOL

MISSION AND BACKGROUND

Abington Senior High School is a public, suburban school that sponsors an H2O for Life Club where more than one hundred students are actively engaged in local and global water education while raising funds to build water and hygiene systems globally. Every dollar raised is matched 100% by a United Nations affiliate. We have brought clean water to more than 12 schools since we began our club. In the last five years, we have funded water projects in Tanzania, the Dominican Republic, South Africa, South Sudan, Rajhastan, Kenya and Nicaragua.

Abington Senior High School students prepare for a special presentation on Science Day at local elementary schools. Most of these students are now graduated from college and working at National Geographic, Google, the EPA and around the world.

Fundraising is half of our initiative and the most laborious task that we do. Students have raised over $30,000 in five years, seemingly one dollar at a time. We have sold hot chocolate, handmade piñatas, held an annual Walk for Water, held a dinner with foods that are native to our country that year and sewn scarves to sell. Our biggest and best-attended event is our SoundWAVE concert held in the middle of the winter each year. We have student and adult bands that play for the benefit of clean water. Last year we added two SuperSmash Bros. Tournaments and a Ping Pong Tournament!

The second part of our H2O for Life Club is education. We encourage local and global thinking and try to come up with unique ways to present our information and message. We received a grant in 2013 and began the movement to put environmental advertising on the sides of trash trucks. We have students create water-borne disease costumes and act out what a chance encounter might look like between a person in an undeveloped country and the microbes in their water. We make our own watershed models out of spray foam insulation to take to elementary schools where students can explore various agents that might contaminate their water. At our Walk for Water, participants can visit ten, hands-on booths as they travel through the course. We have been proud to be invited to visit the United Nations on World Water Day and the US Capitol for the 10th Anniversary of the Water for the Poor Act. We have lobbied with WASH Advocates and taught at the National Service Learning Conference each year.

Our last area of significant impact is our environmental participation agenda. We scrub part of the Pennypack Creek and its tributaries; Sandy Run and Baderwood Creek; the Wissahickon Creek, and other

bodies of water. Each year we participate in International Coastal Clean-up Day and log our findings. We conduct water quality testing each year throughout Montgomery County.

As a student run club, it is up to them to lead the way. Our students do feel as though we have been on the forefront of water advocacy and hope to continue to learn and make a significant impact on the environment and in the lives of school children around the world.

Contact Information

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COLLABORATION WITH
THE UNITED NATIONS ASSOCIATION OF GREATER PHILADELPHIA

MODEL UN

The collaboration with the UNA-GP was deep from the onset due to a few people who had interests in both entities. Over the years that collaboration was most uniquely felt around the way GWA's mission and vision was shaped by the work and policies of agencies in the UN System. GWA actually takes its mandate from the calls by the Secretary General and the UN WATER platform to become engaged in finding solutions to the global water crises. The work of GWA is informed and influenced by our links to WHO, UNICEF, UNESCO, as well as the FAO and UN WOMEN, among others. Recently UN HABITAT has gotten into that same set of references. We think that GWA is quite unique among water related NGOs in the USA for its strong willingness to connect to the UN System.

Locally our collaboration with the UNA-GP has focused mostly on educational activities. Over the years, several talking points at the "UNCAFE SERIES" were related to WASH and WATER. We also collaborated for speaking events at colleges and universities and clubs and churches, such as the UU church on Lincoln Drive or The Ethical Society at Rittenhouse Square.
In the last five years, UNA-GP and GWA worked together on offering an "Alternative" Model UN Conference on Water Stewardship to high school students.

Dr. Christiaan Morssink,
Executive Director, UNA-GP; Treasurer, GWA

GLOBAL WATER ALLIANCE BOARD MEMBERS

Angelita Fasnacht-Cuellar. President

Angelita Fasnacht-Cuellar has over 17 years of experience in Environmental & Civil Engineering, Grant Management and Engineering Management, specializing in Water and Community Health. She obtained a Masters in Public Health degree from Emory University's International Public Health program. Her professional & academic experience includes managing and supporting projects for Safe Water Network, AguaAyuda, International Rural Water Association, Catholic Relief Services, Pan-American Health Organization, and WaterAid through Kosovo-Addis consulting group. She lectures at the University of Pennsylvania Schools of Engineering, Nursing, and at Drexel University school of Public Health. She has represented Millennium Water Alliance (twelve-partners' alliance, including UNICEF), and served as an adviser to private and federal grantees on program design and M&E formulation. She negotiated and managed grants and contracts with several donors in the USA and Colombia, including UNICEF, USAID, Conrad Hilton Foundation and the Coca-Cola Africa Foundation. She has also worked for CARE's Senior Advisor for WASH, and participated on his behalf on El Salvador's national water agenda planning meeting. In Colombia, she managed development projects for a local NGO in Huila.

Stanley Laskowski, Vice-President

Mr. Laskowski has been a senior executive, leader, teacher, scientist, advisor, and mentor during his career in environmental protection. Currently he is a lecturer/ advisor at the University of Pennsylvania [PENN]. At PENN, he develops and teaches environmental management and policy courses and advises students and professors in many Departments. His areas of special interest include issues related to the attainment of the UN Millennium Development Goals for water and sanitation, US and global environmental management and policy, environmental regulation, and making Penn's campus more sustainable. He has been and continues to be

active in support of various non-profit organizations. In 2006, Mr. Laskowski, with other environmental leaders, founded the Philadelphia Global Water Initiative, now the Global Water Alliance, www.globalwateralliance.net a regional network of organizations dedicated to helping to provide water and sanitation services through projects in the developing world and through education and research. He was also instrumental in establishing the Initiative for Global Environmental Leadership at Wharton/PENN and remains active in their efforts regarding business and the environment. In 2009 he received the LPS Distinguished Teaching Award for Non-Standing Faculty. Mr. Laskowski is a former Senior Executive at the US Environmental Protection Agency where he served for over 31 years including 15 years as the Deputy Regional Administrator for the Middle-Atlantic States for which he was awarded the Presidential Distinguished Executive Award.

Dr. Christiaan Morssink, Treasurer

Christiaan Morssink is the executive director of the United Nations Association-GP, after having been its president from 2008-2012. Dr. Morssink's professional background is public health policy, specifically around professionalization. Dr. Morssink has developed a network of collaborative relations in the city and has become active with several organizations. He is founding member of the Philadelphia Global Water Initiative, re-branded the Global Water Alliance; a network of professionals and volunteers joined to make progress on the United Nations Millennium Development Goals, focusing mostly on water availability and sanitation. Also in 2009 he joined the advisory board of the Fairmount Water Works Interpretive Center. In 2010 Dr. Morssink became one of the founding board members of the networking initiative, the Global Philadelphia Association, where he now serves as the secretary of the board. One of his main interests is Urban Farming as a substantial venue for complementary food sources for the world food supply, and he has specifically promote SPIN Farming as model of expanding the scope of subsistence

farming at the World Water Forum in 2009 in Istanbul. Recently he became the treasurer of the Rotary Club Madrugadores of North Philadelphia and he has joined the board of the Harmony for Peace Foundation.

Hence, in addition to wanting to rid the world of landmines and cluster bombs, Dr. Morssink is interested in the elimination of social inequities and the related consequences for health, nationally and globally. From a development and sustainability perspective, Dr. Morssink is focusing much energy on the need to rethink and restructure the global food production, our educational, parochially oriented curricula and international labor practices.

Dr. Morssink holds Candidandus and Doctorandus degrees in cultural anthropology and non-Western sociology, respectively, from the University of Amsterdam in the Netherlands, a MPH from Johns Hopkins, and a Ph.D. in Public Health Policy and Administration from the University of Illinois at Chicago School of Public Health.

Greg Kedler, Secretary

Mr. Kelder has 25 years of experience with complex environmental, asbestos, toxic tort and insurance coverage matters throughout the U.S. He has developed particular acumen in business matters related to emerging environmental risks, as well as broader environmental challenges related to environmental pollution, and water policy.

As a recognized leader on environmental and insurance issues, Mr. Kelder has been requested to serve as a speaker for corporations, universities and conferences

Greg received his law degree from Rutgers Law School. In 2010, he completed a Master's Degree in Environmental Policy at the University of Pennsylvania. At Penn, he was presented the Dean's Scholar Award, the Institute for Environmental Studies Award for Excellence and was chosen as a Wharton Initiative for Global Environmental Leadership ("IGEL") participant for an Antarctica Leadership Venture.

Mr. Kelder serves on the Board for the Philadelphia Global Water Initiative, is a member of the Environmental Claims Journal Editorial Advisory Board, the Environmental Inn of Court, the PA

Environmental Council, and the PA Bar Association.

Arun K. Deb. PhD., P.E.

Dr. Arun Deb started his volunteering activities more than 25 years ago, while working for Weston Solutions Inc. with a goal to help poor people in developing countries access safe drinking water and good sanitation. Many of those projects tie into volunteering activities for Water For People (WFP). In early 1990s, Dr. Deb initiated WFP projects to bring safe drinking water to about 10 schools with nearly 1,000 students each and by now he is instrumental in completing WASH projects in about 50 schools. Dr. Deb, who has served two terms on the Water For People board, is the man behind the WFP project in India to remove arsenic from drinking water. Dr. Deb spends several months each year in Kolkata, India where he focused his vision on improving the lives of poor villagers of West Bengal, India by providing safe drinking water, and sanitation, education, and primary health services. Dr. Deb started with four villages in West Bengal with the objective to provide help in education and health services. With safe drinking water and sanitation services, and primary health services, children will be healthy, and as a result education standards will also improve. Dr. Deb envisions their children completing high school education and will have good health.

Walter Walker

Walt Walker is a Project Manager at Greeley & Hansen in New York, NY. He has more than 9 years of experience in municipal engineering and construction management. He is responsible for design of water and wastewater facilities and infrastructure, hydraulic analyses, sewer capacity studies, geographical information systems (GIS) mapping, and environmental protection permitting. Walt was formerly the Philadelphia Chapter President of Engineers Without Borders USA (EWB-USA) form 2008-2009 and 2012-2016, and has been an active EWB-USA volunteer since 2006. EWB-USA is a non-profit volunteer organization that partners with developing communities to design and implement sustainable engineering projects, while empowering those served to build a better world. His EWB-USA experience includes capacity-building global development projects in the field of water supply,

sanitation, public health, education in Malawi, El Salvador, Guatemala, and the Philippines. Through the EWB-Philadelphia chapter, he is also is heavily involved in community service throughout the Philadelphia region, featuring urban green development, neighborhood cleanups, and mentoring of EWB student chapters. Walt is also a regional EWB student chapter mentor, and has recently begun involvement with the EWB-NYC Professional Chapter. Mr. Walker is a registered professional engineer (P.E.) in Pennsylvania and New Jersey. He received a Bachelor's Degree in Civil Engineering and a Master's Degree in Environmental Engineering, both from Rowan University.

Richard R. Riegler

Former Vice President Aqua America, Inc. Riegler held numerous positions with Aqua America throughout his 38-year career, the last as Vice President, Engineering and Environmental Affairs. Riegler was responsible for the management and oversight of the engineering, water quality, laboratory and environmental affairs functions, as well as purchasing and fleet operations. He also managed the corporation's annual $250 million capital budget until retirement in 2008. Riegler has served on the Board of Directors of Water for People from 2000 through 2007 and was a member of the Rotary Task Force. Riegler is also a founding member of Global Water Alliance (GWA). He has served on its Board of Directors and had responsibility for the development of the organization's Strategic Plan. Riegler is a former chairman of both the Pennsylvania Section and the Resources Division of the American Water Works Association (AWWA). He has served on Advisory Committees of the Pennsylvania Department of Environmental Resources (DER), the Delaware River Basin Commission (DRBC) and the Water Resources Association of the Delaware River Basin. He also served on the Board of the Settlement Music School, Philadelphia. A graduate of Drexel University's Civil Engineering Program, Riegler was a licensed Professional Engineer in Pennsylvania, New Jersey and Florida prior to his retirement.

Anthony Sauder

Mr. Sauder is a registered professional engineer and hydrogeologist at Pennoni Associates with 30 years of experience in water resources, water distribution, hydrogeology, and environmental engineering. His experience includes 10 years of international work on projects involving water supply and construction. Mr. Sauder has experience with water supply systems, sewer collection systems, discharge monitoring, hydrogeological investigations involving well drilling, pumping aquifer tests, and groundwater modeling; water system studies and comprehensive plans; environmental site assessments; and investigations with remediation of soil and groundwater contamination.

Mark Freed

Mark L. Freed represents clients in the areas of environmental law and litigation. Mr. Freed was repeatedly named a Pennsylvania *Super Lawyer*. In November of 2013, Mr. Freed was elected to the Board of Supervisors of Tredyffrin Township, Chester County, Pennsylvania. In 2015 Mr. Freed was named to the Pennsylvania Pipeline Infrastructure Task Force, Local Government Workgroup.

Mr. Freed served eight years as an Assistant Counsel with the Pennsylvania Department of Environmental Protection. At DEP he was lead counsel to the Southeast Regional Waste Management and Water Supply Management Programs. He also counseled DEP's Water Quality, Storage Tanks, Land Recycling (Brownsfields) Programs. Mr. Freed also served two years as a criminal prosecutor in the Pennsylvania Attorney General's Environmental Crimes Section, where he prosecuted cases involving water pollution, hazardous water and storage tanks.

Mr. Freed has argued and tried numerous cases in State and Federal courts including the United States Court of Appeals for the Third Circuit and the Pennsylvania Supreme

Court. Mr. Freed has served as an adjunct professor at the Saint Joseph's University Graduate Institute for Public Safety and Environmental Protection and as a member of the Pennsylvania Environmental Justice Advisory Board.

Heather Murphy

Dr. Murphy has over ten years of experience in water/ wastewater treatment, water quality, drinking water distribution, risk assessment and environmental health in both North America and abroad. Dr. Murphy obtained her PhD in Environmental Engineering from the University of Guelph, Canada, where she focused on appropriate household water treatment technologies in rural Cambodia. Following her PhD, she worked for the United Nations International Emergency Children's Fund (UNICEF) as a Water, Sanitation and Hygiene Specialist in Mali and Madagascar. While in Mali, she coordinated a $25-million-dollar Water, Sanitation and Hygiene (WASH) in Schools program, covering 1000 schools, the largest program of its kind in the world. She recently completed a research fellowship with the Public Health Agency of Canada where she focused on quantifying the burden of waterborne disease on the Canadian population. Prior to joining Temple, she was a research fellow at the University of Guelph where she conducted research on the challenges of water provision in Canadian First Nations communities. Dr. Murphy's research interests involve understanding and addressing water and health challenges in both developed and developing countries.

Shannon Marquez

Dr. Márquez is an accomplished educator, researcher, administrator and "public health engineer," who has garnered local, national and international recognition for research and practice in the field of global environmental health. Her international areas of focus include safe water systems, health systems strengthening and health governance, and agricultural health. Dr. Márquez also lead research on sustainable solutions to address the environmental burden of disease and health disparities in developing countries of Africa, and has also worked in Asia, and Latin America and underserved communities in the United States. Prior to joining Drexel, Dr. Márquez was the associate dean for academic and faculty affairs, and associate professor of health policy and public health, at the Mayes College of Healthcare Business and Policy at the University of the Sciences.

She has also held positions at The University of Iowa College of Public Health, The University of Texas Health Sciences Center at Houston School of Public Health, and at Temple University, where she was the MPH program director and founding director of the Temple Center for Global Health. Dr. Márquez has served on the Association of Schools of Public Health Diversity and Global Health committees and is a Council on Education for Public Health trained site visitor. She is also a member of the Philadelphia Board of Health, Board of Scientific Councilors at the Centers for Disease Control, and Agency for Toxic Substance Disease Registry. Dr. Marquez holds a PhD in environmental sciences and engineering from the UNC Gillings School of Global Public Health, a Masters in Civil Engineering from Texas A&M University, and a BS in Mechanical Engineering from Prairie View A&M University

Vince Uhl

Mr. Uhl began his career in water supply development and management in Central India where he initiated a water development project for the Lutheran Church at the age of 25. This project evolved into an organization with over 50 employees and provided a full service approach to water supply development from the siting of production wells utilizing geophysics and remote sensing applications to well repairs and drinking water quality evaluation. The project installed over 3,000 wells in the hard rock regions of central and southern India and provided a training ground for other projects in the region including UNICEF - WES.

Since that time, Mr. Uhl has specialized in the exploration, development, protection and management of water resources for public, industrial and agricultural uses and in the investigation and remediation of soil, groundwater, and surface water contamination incidence. He has investigated and characterized hundreds of industrial sites, large municipal landfills, interstate petroleum and gas pipelines and

formulated monitoring and remedial strategies with regulatory authorities.

At Malcolm Pirnie, Inc., an international civil engineering firm, he managed the firm's Groundwater Group. In 1984, he opened and managed a New Jersey office for Geraghty & Miller, Inc., a highly respected groundwater and environmental engineering consulting firm. In 1991, he started his own consulting practice that provides water and environmental consulting to industry, municipalities, international governments, consulting firms and legal clients on all projects with water and/or environmental components. He has worked extensively in the United States, southern and eastern Africa, the Philippines, and India, and in 10 other countries on short-term assignments.

Mr. Uhl has taught graduate level courses in Hydrogeology at the University of Maryland, the University of Akola in India, and at the New Jersey Institute of Technology in Newark, New Jersey. He has given many presentations at seminars, international conferences, universities, and for corporate forums.

Ed Grusheski

Mr. Grusheski has been the General Manager of Public Affairs for the Philadelphia Water Department [1999-2009] where he was responsible for public relations, education, government affairs, and the Department's call center. He has also been the Director of the Fairmount Water Works Interpretive Center [1988-1999] and a consultant to that organization [2010-present]. For the past 20 years Ed has also been President of the Oliver Evans Chapter (regional) of the Society for Industrial Archeology (national). He has also been a member of the Partnership for the Delaware Estuary and a Board member

UPCOMING GWA EVENTS

During the coming year organization in the GWA network will continue to conduct projects around the world. There will also be additional education events which include:

- The tenth annual GWA Conference. This conference will be held in Kolkata, India on January 4-7, 2017. Please see the GWA website for additional information.

- Model UN Conference on Water will be held at the University of Pennsylvania on January 17, 2017. The theme will be disinfection strategies. Contact Christiaan Morssink for additional information christiaanmo@yahoo.com

- A workshop on the global wastewater treatment challenges at the Wharton School on April 5, 2017. For more information please contact Stan Laskowski at stanlaskowski7@gmail.com

ACKNOWLEDGEMENTS

This report is the result of the contributions of many volunteers in the GWA network. GWA Board members and people in other organizations supplied the success stories contained herein. Please note that these are only a sampling of the work being done by those in the Philadelphia area to help those in developing countries find clean water, sanitation, and hygiene services.

Special thanks go to:

Catherine Nabukalu

Catherine is a current student in the Master of Environmental Studies at the University of Pennsylvania, majoring in Environmental Sustainability. She designed, assembled this report and coordinated members of the Global Water Alliance to contribute to our success stories.

Pam Lazos

Pam is a writer/editor extraordinaire, who edited the report.

Nalat Phanit

Nalat authored our five-year report in 2011. She assisted with the final review of the 10-year report.

Steven Liang for his editing contributions.

Jasmin Miller who used her skills in graphic design to work with Catherine.

The hard work and sense of teamwork by all who contributed to this report, exemplifies the spirit of GWA.

CONCLUDING THOUGHTS

From this report we hope that you have some idea of the wonderful work that extraordinary people in our area are doing to help those in developing countries with their needs for WASH services. The United Nation Sustainable Development Goals for WASH are extremely ambitious and provide an opportunity for everyone to look beyond their own life to serve the greater good. GWA is an all-volunteer organization that provides opportunities for people to use their skills to contribute. We, of course, need sponsors for our activities. But, since GWA was formed with the idea that we are stronger if we share knowledge, resources, and other support, we also seek additional partners and workers for our network. Public relations, teaching, administration, engineering, science, website management, legal, financial, public health, government, planners, designers are all skills that are needed. You will be given self-starter, leadership opportunities to showcase your skills and contribute to the larger global efforts that have the potential to save the lives of thousands of children each day.

Please see our website at www.globalwateralliance.net or contact me at stanlaskowski7@gmail.com [or President Angelita Fasnacht-Cuellar at angelita@kosovo-addis.com ; our Treasurer Christiaan Morssink at christiaanmo@yahoo.com] to explore opportunities that may interest you.

Stan Laskowski, Co-Founder and
Vice President, GWA