

## STRONGER Together





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#### TO OUR DEDICATED EWB-USA COMMUNITY,

This past year, throughout my travels, I met community leaders and families who are determined to gain access to the basic infrastructure they need and deserve. They are frustrated with their current situation; one in which they walk hours on treacherous paths to fetch unsafe water for drinking, one in which mothers give birth in the light of a cell phone flashlight, and one in which farmers cross dangerous torrents to access the next town market. Underserved communities are treated unjustly. All they are asking for is basic infrastructure and yet it is out of their reach. This is a reality for so many, not just in far-flung places, but also across our own country.

These communities are looking to us for partnership, and I am proud to say that in 2022 we answered their call. In 2022 our 233 chapters made significant progress on 470 community projects and completed 72 of them providing clean drinking water, decent sanitation facilities, safe and reliable footbridges, inviting classrooms, and solar energy systems for irrigation and for general use. Imagine for a minute, the change that kids in those communities experience as a result. Altogether 590,825 people in 17 countries gained access to these essential services. Across the USA, we completed 22 projects for community members and support on average 70 communities a year in articulating their infrastructure needs and securing the support to make their initiatives a reality. We did so through our Community Engineering Corps (CECorps) platform, a partnership between EWB-USA, the American Society for Civil Engineers (ASCE), and the American Water Works Association (AWWA), and powered by thousands of engineers who care to support their own neighbors.

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Two significant initiatives also made their mark in 2022 for EWB-USA. First, we completed a comprehensive and global study that examined the impact of climate change on vulnerable communities. Our primary objective was to gain an in-depth understanding of the consequences of climate change in our partner communities such that we can continue to hone our support offering and expertise. A changing climate is a reality we must learn to navigate now. We took a humble approach and prioritized active listening. We engaged with communities in Ecuador, Guatemala, Nicaragua, Uganda, Sierra Leone, and Puerto Rico, especially where our local teams could provide the deepest insights. Second, we focused our efforts in Uganda on enhancing crucial clean water, energy, sanitation, and solid waste management systems in healthcare facilities. Healthcare facilities are a linchpin in creating healthy communities. Post COVID-19 pandemic and Ebola outbreak, that reality is even more clear and our review of the state of healthcare facilities across the country, delivered in close partnership with EWB-East Africa, made the need and opportunity for nationwide retrofit very clear. We are collaborating with government agencies and healthcare network leaders to shape national efforts in that direction.

When I look across the organization I feel inspired by the hundreds of meaningful and respectful partnerships being formed. It gives me hope that nearly 13,000 engineers, both young and seasoned, learning and experienced, chose to take action with us, and were challenged to grow in their own engineering journey.

### It is my great pleasure to share some of these stories with you in this annual report.

The idea of Engineers Without Borders brings together thousands of talented people, both professional engineers and donors compelled to see engineering benefit the most underserved communities. If you are reading these pages, chances are you are one of them, and these results are your results. From our entire team, **thank you**. The impact we are having together is profound and important.

As you know, 2022 is the year I joined EWB-USA as the new CEO.

After carrying out a thorough review in my first six months, I can say clearly that I feel proud of our organization. We have built deep expertise in listening to and understanding the needs of underserved communities and we have learned to deliver impeccable community engineering projects. Everywhere I have been, from Jinja, Uganda to Pinto Pucara, Ecuador, to Foxburg, Pennsylvania, community leaders have repeated to me that the work we do is some of the best they have ever seen. Most of all, I have been impressed and inspired by the leadership of our country partners. They make our work relevant and effective. As we step into our third decade together, it is clear to me that they are well-positioned to harness our know-how in project delivery and help us scale our impact. I look forward to continuing our work together and I hope I can count on your support throughout.

Thank You,

Boris

## MISSION & VISION

#### MISSION

Partner with communities and develop leaders to build a better world.

#### VISION

A world where every leader is equipped to build and every community is built to thrive.

# **Savoring the Present: Engineering and the Pursuit of Sustainable Change**

#### Lily Liu

The Ohio State University

Since beginning college, my understanding of 'what engineering is', has continued to evolve every year. I used to think my engineering degree was abstract and unattached—freshman year, I was so pressed about studying and memorizing and cramming. Engineers Without Borders USA has pushed me to become more concerned with the ways I can navigate through the world with meaning, and intentionally create relationships and community.

The Ohio State University Chapter started its partnership with the community of N'jau, Gambia in May 2016. N'jau experiences a prolonged dry season, which affects water security, agricultural yield, and other aspects of quality of life, such as nutrition, health, education, etc. Over the past seven years, we have directly impacted a community of 2,000+ individuals, improving water access, quality, and infrastructure. Recently, we completed a monitoring and evaluation trip to take stock of continued opportunities for expansion of the community garden.

In December 2019, I was fortunate enough to travel with our chapter for our second implementation trip in N'jau, Gambia. Looking back on it now, it's funny to think that we prepared a weekly, daily, *hourly*, itinerary to follow. Our first few days in Gambia were spent in the capital of Banjul to meet with our contractor, Waterpoint, and our NGO, Women's Initiative Gambia. Just a few days prior, Mr. Touray, Director of Waterpoint, agreed to set an appointment for 1pm. Figuring we'd make a good first impression, we pulled up to his office, squished four-in-a-row in the back of a taxi, at 12:45pm. Early is on-time, and on-time is late, right? At 1pm, the office was still locked; 2pm rolled around, and we resorted to playing tic-tac-toe in the dirt. 3pm came and went, and around 3:30pm, Mr. Touray strolled casually around the corner, greeting us with firm handshakes and a toothy smile. This was our first impression of "Gambia Time"—they say that time is just a construct, and I guess it's true.

Everything was even slower after we got to the community. Not just the meetings and the work, but the cooking and the food, and the play, and the rest. It's a wonderful feeling to be blissfully unaware of time; to savor every

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moment, every conversation, every person you interact with. I remember spending hours next to the stove, waiting for the rice and domoda (peanut stew) to cook over the fire; watching our host Modou prepare coffee, pouring little cups back and forth with long wisps of steam, and doing practically nothing, watching kids skip rope in the dirt and listening to the rhythmic crack of peanuts in the background. In America, there never seems to be time for anything. In Gambia, there is time for everything.

Before leaving for N'jau, I remember reading dozens of manuals on borehole drilling and preparing detailed data collection tables—I had such a narrow impression of the opportunity in front of me. Outside of the technical aspects of the trip, I absorbed unending wisdom from the women in the community who patiently invited us into their homes, gardens, and lives. They taught me to acknowledge the contingency of the world, and they gave me permission to be relieved of the pressure of productivity, savoring and sitting still in the present moment.

Engineers Without Borders USA has given me exposure to what wellrounded, informed development should look like—an act of reciprocity, of giving and learning. With this mindset, I feel well-equipped to practice reciprocity in any context I pursue. Through Engineers Without Borders USA, I have realized that engineering is about more than technology and innovation; engineering can be the foundation of sustainable global development. I once heard the sentiment that "innovation rarely reaches those who need it most", and as long as those with the ability to change the world isolate themselves from the part of the world that needs changing, those people are not going to be fully equipped to change the world.



I have realized that engineering is about more than technology and innovation; engineering can be the foundation of sustainable global development."



## **Council of Regional Presidents (CORP)**

**Duyen Nygun,** Co-Chair of the Council of Regional Presidents

I started my EWB-USA journey in 2010 when I joined as Chapter President of the Louisiana State University Student Chapter (Geaux Tigers!). Since then, I served in many leadership roles and partnered with several communities around the globe.

EWB-USA has given me the opportunity to use my skills in service of others. It taught me to actively reflect on the impacts of global engineering and made me a more conscientious engineer. I've gotten to meet so many incredible people from our partner communities and staff to our incredible volunteers.

Our volunteers are the heartbeat of our organization. I am inspired by their kindness, generosity, and hard work every day. I am so excited to serve our volunteers as Co-Chair of CORP. I strive to empower and enable them by providing guidance and tools, leveraging best practices, and strengthening our network within EWB-USA. CORP is made up of experienced super volunteers that are ready to support any and all of our members. By the end of my term, I want CORP to become a comprehensive and accessible resource that members know they can always lean on.



## The Faculty Leadership Council (FLC)

Bill Oakes, EWB-USA Board Member / FLC Representative

Students today are enthusiastic about the opportunities EWB-USA offers. That is why I am proud to serve on the FLC and its representative on the EWB-USA's board of directors.

The Faculty Leadership Council provides a perspective on EWB-USA processes and procedures, contributing to the development of resources and training for the organization. An important part of our work is to stand with students on the front lines, nurturing their learning experiences along with delivering projects that meet needs within our partner communities.

The impact on the students is immense and carries through into their careers. We all feel fortunate to be a part of this work, serving to underline the importance of university support for the student chapters and the faculty mentors. EWB-USA is really about partnerships with students, professionals, communities, faculty and universities working together to equip our future leaders while we make the world a little better today.

# **HARTER OF ANTICAL STATE**

Our work this year has spanned continents, as our dedicated volunteers and passionate supporters have joined forces to tackle the world's most pressing challenges. Through sustainable engineering solutions and unwavering commitment, we have empowered communities to thrive and overcome obstacles. From constructing vital infrastructure to implementing clean water projects, our impact has been profound, touching the lives of countless individuals. Together, we stand resolute in our mission to build a brighter future for all, because when we unite our skills and compassion, we truly become unstoppable.

# Climate Resiliency & EWB-USA's

#### **Gerard Dalziel**

Lead Engineer

Toward the end of 2021 and early 2022, when an end to COVID travel restrictions appeared feasible, EWB-USA staff recognized the need for an update in our climate change evaluation methodology. While looking at the various climate data we realized that to truly improve our evaluation of climate change, EWB-USA needed to hear from our partners as to what climate change really looks like in their individual communities. Thanks to the commitment of the board of directors, EWB-USA leadership, and support from donors, funders, and country offices, EWB-USA embarked on an initiative to understand what resiliency and sustainable project design mean to the different communities we partner with.

Revising EWB-USA's climate change evaluation methodology meant realizing that sustainable project design is not possible without including the evaluation of the impact of climate change in individual communities. While numeric climate data can help size a water tank or the length of a bridge for future climate conditions, that is not enough. The important question is, what other factors need to be looked at in order to design a project for maximum service to a community in an uncertain future?

#### **Listening to Communities**

The main goal of this initiative was to understand the ramifications of climate change in our partner communities. However, to do this we needed to first listen to these communities. We targeted our three country offices Ecuador, Guatemala, Nicaragua, and one regional office, Uganda, as obvious choices for community data collection. We also visited Sierra Leone in West Africa and Puerto Rico in the Caribbean. Once identified, staff developed a program of community meetings and focus groups with our partner communities with the goals of 1) understanding and documenting all the impacts that climate change may be having within a community, and not just primary impacts such as droughts and flooding, but also secondary impacts like loss of access to markets and increased migration;

and 2) understanding the effects of these impacts, including economic, social, and cultural.

The interviews were conducted by EWB-USA staff and county office staff and included local NGOs, government officials, and other appropriate parties. The interviews started with a more formal question and answer session and then in some cases, the team would walk with the community very often to see an existing EWB-USA project site. These less formal chats during the walks were valuable in that the individual community members would often open up about their struggles outside of the formal group setting. Seeing the impact firsthand reinforced the need and urgency for additional climate evaluation.

After hearing from our partner communities, we realized an update on EWB-USA's design practices was very much needed. We need to adjust our design practices based on the data to include additional design parameters in the evaluation and design of projects, take into account the unpredictability of climate events, and consider the secondary effects of climate change in the design of projects if possible.

The type and impact of climate change varied with the geography, demographics, and economics of each community. However, several broad generalizations can be made about climate change's impact:

#### **The Climate Has Changed**

Much of the language around the discussion of climate change involves preventing future impacts. For many of our partner communities, the climate has already changed, and not for the better.

#### Unpredictable

The majority of our partner communities are located in regions where the rainy season/dry season cycle is the dominant weather pattern. They reported that the beginning and end of the rainy season are no longer consistent. When the rain comes, the way it manifests has also changed. Instead of regular steady rain spread out over days or weeks, the rain now comes in short bursts of intense storms that only last a day or two. This unpredictability can have a dramatic impact on the community. For example:

The unpredictable start to the rainy season means that farmers don't know when to plant. "Before we used the moon to plan our planting seasons. Now, we don't know when to start." - Los Gomez, Nicaragua

Planting at the wrong time can lead to reduced crop yields or a complete failure of that season's crop. Most of our communities survive on subsistence agriculture or are small-scale commercial operations (they sell their produce at the local market or in the nearest town).

A reduction in crop income means a severe reduction in family and community income.

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#### **Hotter and Dryer**

Although there are exceptions, the majority of our communities reported that the total volume of wet season rainfall had dropped and that the wet season has gotten shorter. A longer dry season means hotter temperatures for longer intervals.

- A lower wet season total rainfall means lower crop yields.
- In order to make up for less water, the farmers are using more fertilizer. Using fertilizer costs more and, because fertilizer production is energy-intensive, can contribute to greenhouse gas emissions.
- With hotter temperatures come more insects, pests, and fungi. To combat these invaders the community members are buying more pesticides, again raising costs.

#### **Extreme Events**

Extreme events, such as hurricanes and floods, have had a dramatic impact on many of our communities. These impacts go beyond the obvious destruction of floodwaters and high winds. For example, increasingly strong hurricanes have impacted our partners throughout Central America, the Caribbean, and Gulf of Mexico in recent years. Many of these partners have reported loss of critical services such as power and water. Loss of these resources has severely impacted the ability of first responders and healthcare workers to provide emergency services, increasing vulnerability in these communities during a time of need.

#### Water Access

At EWB-USA, the communities we partner with drive projects. We work with them to implement their highest priorities. *Water is life* and most of our projects revolve around water. Having a reliable source of clean drinking water helps insulate a community against the unknowns of future weather patterns, whether those changes involve changing water cycles caused by climate change, or severe impacts from extreme events. It also provides a strong foundation on which a community can build for future prosperity.

- Women don't have to spend as much time walking to get water and have time for other economic pursuits. "We have more money and our shoes last longer." - Tingo Pucara, Ecuador
- Children have fewer school absences due to sickness and can get a better education.
- Reduction in waterborne diseases.
- Reduction in childhood mortality.
- Less money is spent on medicine.
- Management and operation of a water system build organizational and team working skills.
- Reduction in migration due to a brighter future "People are returning to the community because we now have water." - Curingue, Ecuador

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We haven't grown watermelons in 30 years, now we grow watermelons again."

#### PARARIA, BOLIVIA

#### Other EWB-USA project types also benefit communities:

- Bridges are keeping people safe and out of ever more frequent floods. "We used to cross the river by walking through it and the water is contaminated. Garbage around the bridge has been reduced. Trade has improved between sides of the bridge." - Zapote, Guatemala.
- Energy projects are reducing greenhouse gas emissions and reducing spending on wood and fossil fuels for cooking. Solar projects provide energy when the grid electrical system fails.
- Civil projects are improving road drainage and reducing damage caused by extreme rainfall events.

#### Where Are We Going

The end goal of this initiative will be revised design practices and guidance on how to incorporate future climate change into the engineering of projects. It will work to set up EWB-USA as a leader in international development, specific to climate change adaptation.

Our face-to-face meetings with our community partners have left us excited and energized about this work. Through these meetings, we have gained invaluable insight into the impacts of climate change and how this change impacts our community partners, men and women, children, and the elderly who are at the core of this work. Their health and wellbeing are the reason for our projects. We are looking forward to using the new climate data tools and our insights from the 2022 Climate Initiative to do a better job on the evaluation, design, and construction of our projects in the future.

#### Our work is only beginning.



Collins Aerospace has partnered with Engineers Without Borders USA on a Clean Energy initiative. Together we're creating sustainable solutions around the globe with over 25 projects under way. Our company and employee volunteers are committed to supporting the work of EWB-USA and building much needed climate resiliency within communities.

I'm proud of the work we've begun together, and we need others to join in!"

> LEANN RIDGEWAY CHIEF SUSTAINABILITY OFFICER, COLLINS AEROSPACE

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## Uganda's WASH Program: Setting the Stage for Resilient Healthcare

#### **Peter Nzabanita**

Executive Director

Safe access to Water, Sanitation, and Hygiene (WASH) services is one of the most critical services that enable healthcare systems to deliver quality care and improve the health and wellbeing of patients and staff. In Uganda, while the government has made progress to bring health care services closer to people, access to safe water and sanitation services remains very poor. Only 31% of health facilities in Uganda have basic water; 12% have basic sanitation; and 43% have basic waste disposal. The poor state of WASH services in health care facilities (HCF) presents high public health risks of spreading diseases, such as Ebola, instead of preventing them, and the gaps in access produce some concerning stories that only amplify the need for action.

- Patients, including pregnant mothers and caretakers, travel up to 500 meters from the health care facility for clean water.
- Pregnant and delivering mothers are often faced with the difficult choice of giving birth in a healthcare facility that is worn or otherwise not adequately equipped with water, sanitation, and hygiene or giving birth at home. In many cases, either choice can be risky to the health of both the baby and the mother.

To address the gaps in WASH at healthcare facilities, a multisectoral and participatory approach needs to be employed to enhance the efficiency, effectiveness, and sustainability of the

The availability of sustainable water, sanitation, and hygiene services is critical to improving quality of care, resulting in prevention, reduction, and control of infectious diseases and associated mortality, improved occupational health, staff morale, and performance, and increased trust in health care services."

#### THE UGANDA MINISTER OF HEALTH, THE HON. RUTH ACENG

[in her foreword to the National Guidelines for WASH in Health Care Facilities (2022)]

WASH at these facilities. The implementing team is ready to lead: Engineers Without Borders East Africa (EWB-EA) and Engineers Without Borders USA (EWB-USA).

In 2022, Peter Nzabanita, EWB-EA Director, began building a collaborative team to lead this initiative. Organizations and government agencies, such as Water Compass, the Program for Accessible Health, Communication and Education (PACE), the individual Ugandan Catholic, Protestant, and Muslim Medical Bureaus, the Ministry of Health, the Ministry of Water and Environment, and others, have been involved at every stage and their inputs highly incorporated along the project cycle. With their help to identify and mobilize the healthcare facilities and communities where these WASH systems will be established, the long-term operations and maintenance of the facilities and behavior change for improved sanitation and hygiene will be accomplished.

This intervention seeks to advance access to safe water supply, sanitation and waste management, and energy to 90% for the HCFs in targeted areas. The positive outcomes sought include:

#### Improved Infection Prevention and Control in HCF

By improving the WASH infrastructure and operation in HCFs and the adherence to approved protocols, the risk of contamination and infection, and disease transmission within healthcare facilities will be significantly reduced.

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At the busy Irundu Healthcare Center in Eastern Uganda, where there are approximately 80 live births monthly, water was once supplied using either a simple hand pump or one fueled with expensive diesel fuel. This method of water supply was unreliable (often due to the lack of diesel or mechanical problems), this meant that women often had to give birth without access to clean water. Engineers Without Borders USA partnered with the Uganda Catholic Medical Bureau (UCMB) to rebuild and repair the water system. Now, with the new well and pump in place, not only does the facility have proper means to sanitize and care for all of its patients (including expectant mothers), but there are also enough resources to add a kiosk that provides potable water to 200 children who attend the school next door.

Our mothers used to come in and give birth without water, and now we have clean water in order to take care of them."

FATHER ANATOLI BALIKOOWA

#### **Sustainable Management of Facilities**

Through the implementation of WASH infrastructure management contracts with Water Compass, the WASH facilities within each HCF will be sustainably maintained via a professional maintenance service. Training of HCF management committees regarding asset management planning and life-cycle costing of WASH infrastructure will ensure proper budgeting for facilities management and replacement.

#### **Reduced Operating Costs for HCF**

Through the use of solar-powered water and energy systems, the cost of utilities will be reduced. Additionally, the establishment of public water supply tap stands fitted with user-agreeable pre-payment systems will allow revenue to be generated for water system maintenance and excess revenue put towards other operating costs of the facilities.

#### **Climate Change Reduction and Resilience**

Through the use of renewable energy sources for both water supply and power supply, the HCFs will no longer be reliant on utilities operated by fossil fuels and therefore not contribute to the causes of climate change through high carbon emissions. Additionally, by using groundwater sources for water supply, the HCFs will have a resilient source of water as opposed to surface water sources, which are more vulnerable to the impacts of climate change, such as prolonged droughts.

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#### **Improved Healthy Behaviors in Communities**

Through targeted social behavior change communication in catchment communities, basic public health practices will be improved and maintained. These healthy behaviors will be reinforced by improved healthcare provisions, helping to create a healthier community at large.

#### **Model for National Scalability**

Through the implementation, sustainable management, and monitoring of this project successful lessons-learned and operational data will be gained for future replication across Uganda with the potential for national scalability to significantly improve WASH in HCFs.

Thanks to EWB-EA's leadership, in collaboration with others, including EWB-USA and the many chapters and volunteers who make Uganda and the East Africa region a priority, 2023 will be a year of tremendous progress!



Realizing the importance of WASH in healthcare facilities, the UN Sustainable Development Goal 6 (SDG 6) calls for at least 50% of all healthcare facilities globally to have basic WASH services by 2022, 80% by 2025, and 100% by 2030. According to the recent National Micro Planning Handbook for Water, Sanitation and Hygiene in Healthcare Facilities in Uganda, released by the Uganda Ministry of Health in July 2022, 17% of HCFs in Uganda currently have no access to water, 22% have limited access, 60% with basic access, and only 1% with advanced access. At the same time, access to sanitation in HCFs in Uganda is estimated at 10% without any sanitation facilities, 81% with limited access, 5% with basic and only 4% with advanced. It is estimated that it will require more than \$175,000,000 to close the access disparities.

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## **CECorps Partners with Communities to Close the Infrastructure Gap:**

## A Journey of Resilience and Collaboration

In the vast landscapes of the United States, where bustling cities overshadow the challenges faced by rural communities, a pressing issue quietly persists: crumbling infrastructure and inequitable resource allocation.

Infrastructure inequities have long plagued underserved and overburdened communities, leaving them with limited access to essential resources. However, a ray of hope emerged with the introduction of historic legislation like the Infrastructure Investment and Jobs Act (IIJA) and the Inflation Reduction Act (IRA). These initiatives aim to address the disparities that marginalized, underserved, and overburdened communities face. The Justice40 Initiative, in particular, sets a milestone as it ensures that 40 percent of the overall benefits of federal investments reach those most in need.

> For the first time in history, the Justice40 Initiative set a goal that 40 percent of the overall benefits of certain federal investments flow to marginalized, underserved, and pollution-burdened communities. Millions of dollars have been allocated to improve infrastructure in underserved communities, aiming to rectify years of inequitable resource distribution. However, accessing these funds and navigating the complex grant process remains a challenge for many communities.

#### **OUR WORK**

## THE LAUREL WATER PROJECT: A PATHWAY TO CLEAN DRINKING WATER

One compelling example is the Laurel Water Supply project in Indian Head, MD. In December 2020, this small community, comprising around 50 people and 16 homes, faced a grave crisis when their well collapsed. Cut off from fresh and clean drinking water, they discovered their vulnerability as they operated their own water system, and were unable to pay for a new well. Quickly the community water board explored their options on how to restore their well or connect to the local water utility system. After contacting the closest county, in hopes of tapping a water consolidation loan and connecting their community to the county water lines, they were faced with a 1.2 million dollar construction estimate. A bill that was way outside of the capacity for this small community to take on. Many in the community were unaware that they were not connected to county water lines and had no idea their water was well water. Once consolidation was off the table, half of the community's battle was educating their fellow community members, but also learning who could help them solve their problem and fill the gap in their lack of water operations knowledge in the USA.

Jean Holloway with the Southeast Rural Community Assistance Project (SERCAP), not only provided tireless supporters of the Laurel Water Supply community since 2020, but she also played a pivotal role in connecting them with CECorps and facilitating their engagement with multiple grant opportunities. Her dedication and guidance helped the community maximize the potential of the Preliminary Engineering Report (PER), ensuring they received the support they desperately needed. Working closely with the CECorps team, a comprehensive Preliminary Engineering Report (PER) was produced. It began with an alternatives analysis to provide the community with three options on how to move the project forward. Once the best alternative for the community was selected, the team did a feasibility study that assessed various critical aspects, including shut-off valve installation options, system and household metering, long-term storage and distribution system requirements. Armed with this report, the community successfully applied for USDA grants to redrill and upgrade their well. Ensuring a sustainable water supply for their residents and the tools and knowledge to maintain their system with current and new residents for years to come.

#### CLOSING THE GAP: THE POWER OF CECORPS

The Community Engineering Corps (CECorps), has stepped in to close this gap by providing the required engineering expertise and consulting. Through **CECorps**, communities gain a better understanding of the steps needed to improve their infrastructure and become competitive in grant funding applications. Through the combined power of legislation, technical expertise, and dedicated volunteers, CECorps is bridging the gaps and transforming communities.

**OUR WORK** 

## THE FOXBURG, PENNSYLVANIA PROJECT: REBUILDING ROADS TO RESILIENCE

In Foxburg, PA, another community faced a daunting challenge: a dilapidated road posing safety hazards and potential damage to homes. The community accessed a grant to upgrade the road, however, the funds were insufficient and Foxburg couldn't afford the engineering expertise that was needed to see the project through. Utilizing CECorps and working hand in hand, Karen, the Borough Secretary, accessed additional funding to complete the construction and address the issue that plaqued the community for far too long. CECorps played a pivotal role in providing complete engineering designs and assisting with the contractor selection process. This success story exemplifies the struggles communities face in tapping into funding sources and the required role of engineering support that often gets left out of grant funding. With the technical expertise provided by CECorps, Karen could leverage her resources effectively, securing the necessary funding for their road project. By navigating the roads together Foxburg successfully worked with the CECorps team to design and upgrade the dilapidated road in their town. The Foxburg community highlights the struggles communities face to tap funding sources and receive accurate estimates to support them from design to implementation.

Degrading infrastructure across the United States often remains hidden from the eyes of many residing in well-maintained areas with functioning systems. However, when these systems fail, the impact is acutely felt by communities, jeopardizing their health and quality of life. From the Laurel Water community's struggle for access to clean water to the road woes of Foxburg, modern infrastructure's shortcomings are laid bare.

While engineering alone cannot solve all these problems, it often acts as the linchpin for communities to secure grants, advocate for more support and funding, and discover sustainable solutions. Engineers, working in collaboration with communities, become catalysts for positive change, driving progress in the face of adversity. Our efforts empower communities to advocate for more support, win grants, and discover sustainable solutions to their infrastructure challenges.

The stories of Laurel Water and Foxburg exemplify the challenges encountered by communities nationwide in tapping into funding sources and receiving technical expertise to support their infrastructure projects. As CECorps continues to address the critical

issues of the crumbling infrastructure and inequitable resource allocation, the voices of those impacted resonate strongly. The gratitude expressed by the Laurel Water community reflects the profound impact EWB-USA and CECorps have had: "We just don't know how to thank you all!" Their sentiment echoes those of communities across the nation. Ouotes such as "CECorps went above and beyond at all times for us" and "Couldn't have been more helpful and thorough" exemplify the unwavering commitment and expertise provided by volunteers. Sara Schmieg, a volunteer, aptly summarizes the importance of this work: "We are an experienced team that had worked together several times before. I am aware of the immense need for this program and the benefits it provides."

We are grateful to our dedicated volunteers, partner organizations, and community members who continue to inspire us with their resilience and determination. Together, we will continue our mission of transforming lives and improving infrastructure to create a more equitable and prosperous future for all.

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# Maner In STEM

Engineers Without Borders USA is making a significant impact in supporting women in STEM through its initiatives. With 39% of its volunteers being female, the organization surpasses the national average in the profession, demonstrating its commitment to promoting gender diversity. By supporting women in STEM we build leaders that can dismantle systemic biases and create a level playing field for all aspiring engineers. Our volunteers uplift and inspire by breaking down barriers and creating a more inclusive industry.

#### **WOMEN IN STEM**



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They [women] can take like three hours to go for water, and that thing has brought problems in our families."

#### **CHIEF JOSEPHINE**

## THE NYANSAKIA PROJECT A Tale of Determination and Resilience in Engineering

NYANSAKIA, KISII, KENYA

#### Emily Schabert

University of Minnesota Duluth

Emily, along with a group of passionate individuals, embarked on a remarkable journey during her freshman year at the University of Minnesota Duluth. In 2017, they formed a chapter of Engineers Without Borders USA (EWB-USA), with a small team of just seven students, most of whom specialized in chemical engineering.

By 2018, their dedication and hard work paid off as they became an official EWB-USA chapter and a recognized club at their university. Excitement filled the air as they eagerly applied for their first project. The moment they received the email confirming their approval for the Nyansakia project in January 2019 became etched in their memories forever.

Throughout the spring and summer of Emily's sophomore year, they worked tirelessly, driven by the desire to make tangible progress on their inaugural project. Finally, in December 2019, they embarked on their assessment trip, brimming with anticipation and hope. The project itself sought to improve clean water access in Nyansakia, where community members often walked up to six hours round trip for water. Emily's University of Minnesota Duluth Chapter worked to design a gravity-fed water distribution system, with a borehole and pump connected to a tank that feeds to 6 tap stands placed strategically around the community, so that anyone could walk to the tap, get water, and return home, within just 30 minutes.

As the new year arrived, they delved into fundraising and design work, eager to turn their plans into reality. However, fate had a different plan in store. The COVID-19 pandemic struck, forcing classes online and imposing lockdown orders. Undeterred, Emily and her team remained resolved, hoping the situation would soon improve, allowing them to continue their design work virtually. "We had to start virtually working on calculations to figure out what amount of head pressure was necessary to get water to all of the tap stands. This was about as far as we got into the design before I graduated (which is not very far)."

Follow this link to read Emily's full story and learn more about how The Nyansakia Project impacted her as a woman in STEM. CHECK IT OUT >

#### **WOMEN IN STEM**



#### **Megan Lewis Taylor**

Principal Engineer, Collins Aerospace and EWB-USA volunteer

In August 2010, I was stationed at a United States Coast Guard Small Boat Station in Michigan. A distress call came in for me to respond to an unknown number of swimmers in distress in Middle Bay, Michigan. The seas were violent and unpredictable, with four-foot waves and winds gusting at 20 knots. Despite the dangerous circumstances, I was able to locate three people. By throwing them a lifeline, pulling them in, and helping them on board, we were able to save all three. Less than 12 hours later that day, we received a nighttime report of multiple persons in the water in Grand Marais, Michigan. Despite the darkness, rough seas, and hazardous shoals, I skillfully executed my duties to assist the coxswain in searching for the two persons. Little did I know that these pivotal experiences would lead me to choose to devote my life to public service. I eventually went on to join the police force, where I would be a first responder to multiple crises, including the Boston Marathon bombing and Hurricane Sandy.

Being a woman working in male-dominated organizations like the U.S. Coast Guard and as a Police Officer was fraught with difficulty. But fastforwarding to where I am now, I can confidently say that I've faced some of the hardest challenges being a woman engineer in a profession that has historically favored male success. I've been grateful to enjoy many highs, but there have been severe low moments where I have wanted to resign and move on. Thankfully, we are making progress, and there are many forthright initiatives that are aimed at supporting women's corporate advancement. Still, we have a long road ahead of us, as only one out of four C-suite leaders is a woman (Krivkovich et al., 2022). Women engineers in particular fight an extraordinarily uphill battle, as women collectively make up only 13% of the total engineering workforce (Silbey, 2016).

The hurdles that women face in the workplace are well-known and documented in resources like the Harvard Business Review. Male or female, we can all relate on some level to the common situations we must navigate daily in a corporate setting. With that in mind, it's important to have an appreciation of what it would be like to layer even more difficulty onto these situations. One important thing I have learned throughout my life is that the real definition of success is not letting yourself be defined by the challenges that you face. I have learned the hard way that you must take a personal stake in your professional development journey; you are your own best advocate and the architect of your path forward.

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#### **WOMEN IN STEM**

Megan listed some of the most important lessons that she has learned to help her excel in the face of professional challenges:

- 1. Create a strategy for professional success to propel you forward in your career journey. Once I identified my goals, the first step towards achieving those goals was to find a mentorship network where I could lay out and refine my individual development plan.
- 2. Seek opportunities outside of your job, to gain visibility within the industry. In 2019, I was introduced to Engineers Without Borders USA (EWB-USA) through the announcement of the Raytheon Technologies partnership while volunteering for our Hartford KNOX project. Volunteering with EWB-USA opened my eyes to working outside of the box while also transforming my leadership abilities in my job today.
- 3. Find innovative solutions to the roadblocks you are experiencing by using the tools the business has set up. As a woman engineer, there will likely continue to be challenges ahead. But the most important thing you can do is take these challenges and transform them into leadership opportunities. Many employees in your organization are probably already great at calling out problems, but presenting solutions to those problems is what transforms your manager's assessment of your abilities.

Working as a female engineer will certainly be an uphill battle for many in the profession. However, by utilizing the tools of success we have learned along the way and we can drive meaningful change in our environments. Volunteering with Engineers Without Borders USA has fast-tracked my skills as an engineer and as a leader within my corporation. Those we help today may one day change the world themselves. Familiarizing ourselves with the mission of EWB-USA not only transforms our perspective on humanism but also imbues us with an awareness of our place in corporate social responsibility. No one truly knows what the future has in store. However, one thing I know for sure is that I will continue to change the world one day at a time with the help of Raytheon Technologies, which has empowered me with leadership to drive this initiative. When you start achieving success in your career, take a moment to stop and appreciate what you have learned and consider how you can help teach it to others. By leading and teaching, we will all become stronger together and naturally overcome any challenges that we are faced with—one day at a time.



Read Megan's full story and take into consideration her advice on succeeding as a woman in STEM. CHECK IT OUT



## HIGHLIGHTS Another Year of Learning & Impact

In 2022, our **13,000**-strong volunteer base, across **233** local EWB-USA chapters, worked on **470** projects impacting more than **1.1 million** people. We are proud to be working alongside our partners in **17** countries and **21** states and territories. **2022 HIGHLIGHTS** 

## **PROJECTS UNDERWAY**



Engineers Without Borders USA proudly celebrates the completion of our 1,000th project in 2022!

This remarkable achievement exemplifies not just our global impact but YOUR unwavering commitment to creating positive change and transforming communities around the globe.

**PROJEC** 

DOD PROJECT

We would like to express our heartfelt gratitude to the Bechtel Corporation for their invaluable support of this project.

**JESSICA JANSON** 

MARKETING AND COMMUNICATIONS MANAGER The collaboration between EWB-USA's Southern Methodist University Chapter and the resilient community of Lljolla Grande, Bolivia allowed us to embark on a large-scale, multi-phase water project that has revolutionized the lives of the community members. Through the implementation of a solar pump connected to a deep well, we have ensured a sustainable supply of clean drinking water. This precious resource is then distributed throughout the community via an elevated tank and an efficient piping system. The impact of this project goes beyond access to clean water; it has equipped the community with the tools they need to foster growth and create a thriving environment.

This project in Lljolla Grande, Bolivia, stands as a shining example of the remarkable outcomes that can be achieved when our dedicated volunteers and supporters come together. By harnessing the power of clean energy initiatives, we have not only addressed the immediate needs of the community but also laid the foundation for a sustainable future. Through the provision of clean water, we have unlocked a world of possibilities for education, health, and economic growth. Together, we are proving that clean energy can transform lives, uplift communities, and create lasting change.

As we celebrate this remarkable milestone, we extend our deepest gratitude to our volunteers, supporters, and partners who have been instrumental in the success of our 1,000 projects. Each project represents a unique journey, a story of resilience, and a testament to the collective efforts of our global EWB-USA community. **Together**, we have overcome challenges, embraced innovation, and uplifted communities in need. This milestone reaffirms our belief that engineering has the power to change the world, one project at a time.

Looking forward, we are energized by the impact we have already made and the countless lives we have touched. As we continue to forge ahead, we remain steadfast in our commitment to tackle the most pressing challenges facing underserved communities. With your support, we will build upon this remarkable milestone, creating a ripple effect of positive change that reverberates far beyond our 1,000th project. **Together, let us continue to engineer a brighter future, where every community can thrive, and every individual can access the opportunities they deserve.** 

# OUR IMPACT

## Beyond the data: listening and learning from our partner communities

Throughout 2022, Engineers Without Borders USA (EWB-USA) head office and country office staff traveled to five countries to visit partner communities. Our goal was to listen to our partners and learn more about the impacts of climate change on their lives. Staff also took this opportunity to do long-term monitoring on previous projects that were completed between 1-11 years ago.

During these trips, staff collected climate impact data from 55 projects in 39 communities and project impact data from 33 projects in 26 communities. We sat down with focus groups, had conversations with community members and leaders, and met with community organizations, and local NGO and government partners. The goal was to understand how projects were doing in the long term and what the impacts of EWB-USA projects were for communities.



#### **Stronger Together: Critical Partnerships Build Resilience in the Face of Disaster.**

In a world where natural disasters can strike without warning, the importance of preparedness cannot be overstated. At Engineers Without Borders USA (EWB-USA), we understand that being ready and resilient is crucial in mitigating the harmful impacts of these calamities. This is why we are immensely grateful for the unwavering support of our donors and the fruitful partnerships we have forged with other NGOs. Together, we have achieved remarkable milestones, making a tangible difference in the lives of countless individuals.

READ THE ENTIRE ARTICLE



## FOUR MAJOR FINDINGS

Across countries and across project types, communities shared stories with us about how their lives have changed since the project was constructed. While each community shared a unique story, we were able to summarize the themes that connected them into four findings:

#### Community partners are healthier and have a better quality of life.

Around the globe, our community partners shared that there have been overall health improvements and fewer cases of illness and disease in their communities since the EWB-USA projects were implemented. Community members in Nuevo Amanecer, Nicaragua, lauded that *"there is a big improvement in respiratory health"* since the installation of improved cook stoves. Meanwhile, our partners in Wai, Sierra Leone told us that, after the implementation of a water project in their community health clinic *"there is less disease in the dry season because we used to have to travel really far in the dry season to find a stream."* 

For those of us with readily accessible running water, we may often take for granted the daily household activities that are made easier, like bathing or doing laundry. Prior to the implementation of improved water systems, our partners in Guantugloma, Ecuador used to go to the river with donkeys in order to retrieve water for such tasks, now they tell us **"We can clean the house and bathe. We can wash clothes in our home."** Members of the Curingue community in Ecuador told us that due to lack of access to water, they used to "not bathe for weeks at a time" but now, after a successful water project **"sanitation is better because we can bathe more [often]."** 

## 2. Community partners have increased educational opportunities and improved learning environments.

For some communities, a school building with access to water, energy, and/or sanitation services has improved educational opportunities for students and allowed for more focused study opportunities. At the Hope Integrated Academy, Uganda, our partners reported students spending more time in class saying **"We have access to** *clean water for basic use, students do not have to walk long distances to fetch water."* And in Chi Elias, Guatemala, the school project has allowed the community to expand its use for meetings and cultural activities. Teachers shared, "**We are** *more comfortable and have the capacity to have meetings and cultural activities."* 

## Community partners have more time resulting in improved economic and other opportunities.

Many communities shared how their time has freed up as a result of the project and so they

have more opportunities to work and earn money. In Agua Fria, Ecuador, our partners told us "Everything has changed. Life is easier. We used to go to the river to get water, it took a long time, it wasn't easy. Took a full day to fill the tanks at the river. We used animals to get water, everyone participated, including the kids. Now we have more time to find jobs. We earn more money because we can work more. We also have more time to rest." And in Omorio, Uganda, the community shared how they have earned money as a direct result of our project "It [the fish pond project] has been a great source of income to the benefiting families, especially during this hard economic situation."

#### Communities are more organized and have a sense of solidarity with • neighboring communities.

Our partner communities shared that through the EWB-USA projects in the area, they were able to provide support to neighboring communities, and they also experienced that their own community became closer and more organized through the project experience. Feeling a sense of solidarity, a community member in Malingua Pamba, Ecuador told us *"It (the project) brought the community together. The community is more organized and more powerful now. People are more friendly and we are able to compromise better."* 

To read the full report, including more impact stories, methodology, monitoring data, and recommendations, <u>click here</u>.



### ENGINEERS WITHOUT Borders USA

## **CELEBRATING TWENTY YEARS**

We were so thrilled to welcome all of you to our 2022 Virtual Conference last October. We thoroughly enjoyed engaging with everyone and connecting over our shared dedication to humanitarian engineering.

Please join us in continuing to celebrate the wonderful volunteers who received awards for their amazing achievements in 2022!

- The Growing Stronger Together Award went to EWB-USA Gateway Professional Chapter
- The Accomplished Mentor Award went to Dave Sacco
- Premier Professional Chapter award went to the Minnesota Professional Chapter and University of Massachusetts Amherst Chapter

- The Peter J. Bosscher award went to Adam Peckens, Faculty Advisor for the Hope College Chapter
- Exceptional Leadership Awards went to Professor Daniel Oerther, PhD, PE, and Anteneh Zewde
- The Founder's Award goes to Chuck Dragga

# SUPPORTERS

We are honored to acknowledge the unwavering dedication and immense impact of the remarkable individuals and organizations who have championed/ the mission of Engineers Without Borders USA. With their generous contributions of time, resources, and expertise, our supporters have fueled our endeavors and propelled us forward in making a lasting difference. From corporate partners investing in sustainable development to passionate individuals advocating for social change, their unwavering commitment has been the bedrock of our success. Together, we have built bridges of opportunity, provided access to education and healthcare, and improved livelihoods for countless communities around the world. Our supporters are the heart and soul of our organization, and we extend our deepest gratitude for their invaluable partnership.



Carol completely credits EWB-USA staff and volunteers for doing the hard work of transforming communities through engineering and education for the next generation.

## eet Carol

Many years ago, Carol was talking with her friend, a university professor, who had recently returned from a trip with students to Africa. During the conversation, she was immediately curious about the Engineers Without Borders USA organization that the trip was associated with. It piqued her interest because while it benefited the community in Africa that was in need of water, it also taught the students about the needs and challenges of doing projects in developing countries. For Carol, it was an obvious win-win strategy that she wanted to be a part of.

Initially, Carol began to support her friend's student chapter in small ways but kept the larger organizational mission in the background to learn more. It was when she happened to pick up an airline magazine (back when they had magazines) on a plane that featured an article about one of their charity partners - Engineers Without Borders USA - that compelled her to look into Engineers Without Borders USA and its organizational mission more.

Carol did her research. She learned about the student and professional chapters, the countries served, and the need for basic services. Carol has long believed that everyone deserves clean water, soap, and sanitation, and when everyone has the basics, then they can focus on how to make their community thrive for future generations. She reached out to staff at EWB-USA and initially became a capacity supporter of the chapter programs. It was when EWB-USA developed the concept of country offices that her passion really took off. Suddenly there would be the opportunity to build capacity for a more efficient operation, in-countries, through offices and targeted partners.

After more than a decade of support, Carol makes it well known that her desire is to continue adding value where she can for the organization she calls "[her] number one pick for international impact!" She acknowledges her friend, the university professor, may have introduced her to EWB-USA, and is extremely happy to be a donor, but she completely credits EWB-USA staff and volunteers for doing the hard work of transforming communities through engineering and education for the next generation.

Thank you Carol for all your support! And thank you for being an inspiration to us!

## Our Supporters Donor Honor Roll

On behalf of our volunteers and all the communities around the world that partner with EWB-USA, we thank and recognize the donors below who gave \$1,000 or more to not only strengthen our capacity but advance our chapter's projects that truly engineer change!

\*Denotes members of the Cornerstone Society, those who have chosen to include EWB-USA in their legacy plans.

#### \$500,000 - \$999,999

American Chemistry Council, Inc. (Plastics Division) Bechtel

#### \$200,000 - \$499,999

Anonymous Pratt & Whitney Raytheon Technologies Corporation Xylem

#### \$100,000 - \$199,999

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American Society of Civil Engineers (ASCE) Bentley Systems, Inc. Burns & McDonnell General Motors Gross Family Charitable Foundation National Science Foundation Northrop Grumman Stantec Consulting Services, Inc. United States Department of Agriculture (USDA) Warmenhoven Family Foundation

#### \$25,000 - \$49,999

AECOM American Water Works Association (AWWA) Arup Brown and Caldwell CDM Smith Farvue Foundation Inc. John and Linda MacDonald Foundation Power Engineers, Inc. SPX Cooling Technologies, Inc. Tetra Tech, Inc. Ulteig

## Impact Fund

Engineers WIthout Borders USA (EWB-USA) launched its IMPACT FUND in 2022, an initiative to provide EWB-USA volunteer chapters and country office partners the opportunity for targeted funding. The goal of the program is to offer meaningful funding for mission aligned projects, initiatives, and collaborative partnerships. Thanks to dedicated partners CDM Smith and the Trimble Foundation, we opened the application and were able to provide over \$80,000 in financial support to chapters. To learn more on how you can help the Impact Fund, email IMPACTFUND@EWB-USA.ORG.

## Cornerstone Society

When you include Engineers Without Borders USA in your long-term estate or financial plans, you create a lasting legacy committed to building a better world through engineering. To learn more about contributing to the EWB-USA mission through a legacy gift, such as listing EWB-USA as a beneficiary of a life insurance policy, a retirement plan, or through other estate planning, reach out to the Development team at

PLANNEDGIVING@EWB-USA.ORG.

#### \$10,000 - \$24,999

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## Statement of Financial Position 2022

#### Assets

#### **CURRENT ASSETS**

TOTAL ASSETS	\$11,349,083
Investments - endowment	322,053
Furniture & equipment (net)	47,542
Funds held on behalf of EWB-I	-
Project advances	70,254
Prepaid expenses	24,304
Contributions and grants receivable	929,850
Investments	2,710,836
Cash and cash equivalents	\$7,244,244

#### Liabilities & Net Assets

#### CURRENT LIABILITIES

Total Liabilities	\$271,103
Refundable advance - PPP	-
Agency liability	-
Refundable advance	54,542
Accrued personnel costs	67,903
accrued expenses	\$68,010
Accounts payable and	

#### NET ASSETS

TOTAL LIABILITIES AND NET ASSETS	\$11,349,083
Total Net Assets	\$11,077,980
With donor restrictions	7,372,055
Without donor restrictions	\$3,705,925

## **Statement of Activities 2022**

Without Donor Restrictions	With Donor Restrictions	TOTAL
\$3,717,393	\$3,541,692	\$7,259,085
1,175,063	///·	1,175,063
61,325		61,325
(228,264)	3.4	(228,264)
3,281,803	(3,281,803)	-
\$8,007,320	\$259,889	\$8,267,209
	Without Donor Restrictions \$3,717,393 1,175,063 61,325 (228,264) 3,281,803 \$8,007,320	Without Donor Restrictions With Donor Restrictions   \$3,717,393 \$3,541,692   1,175,063 -   61,325 -   (228,264) -   3,281,803 (3,281,803)   \$8,007,320 \$259,889

Expenses	Without Donor Restrictions	With Donor Restrictions	TOTAL
PROGRAM SERVICES	))((///		<u>A</u>
Total Programming Services	\$6,264,920		\$6,264,920
SUPPORTING SERVICES			
General and administrative	\$742,945		\$742,945
Fundraising	433,081		433,081
Total Supporting Services	\$1,176,026	<u> </u>	\$1,176,026
TOTAL EXPENSES	\$7,440,946	-	\$7,440,946



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#### Return to an in-person EWB-USA Conference!

EWB-USA CONFERENCE 2023 STRONGER Togoolhor

Save the Date November 9-11, 2023 EWB-USA CONFERENCE



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in

