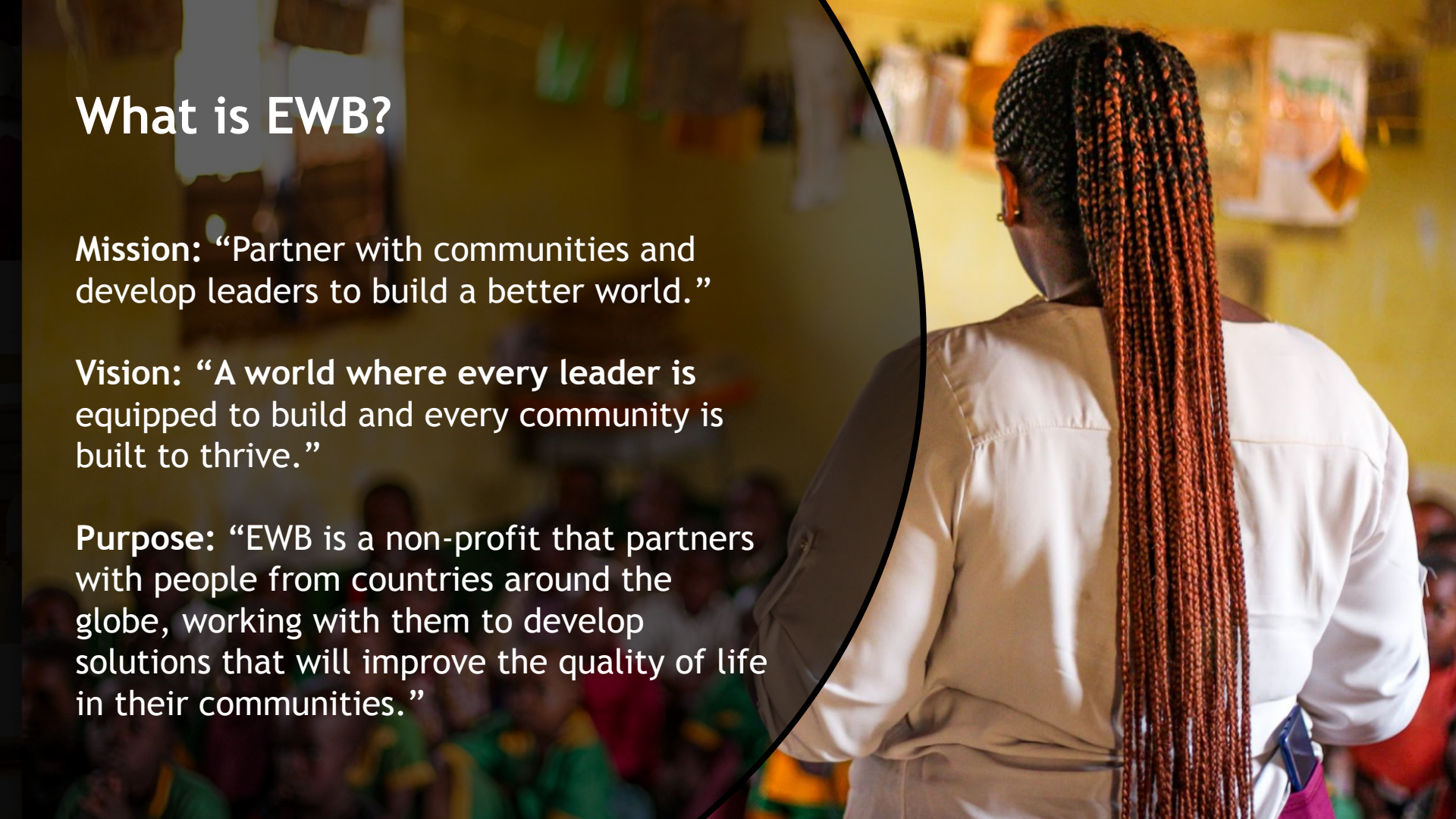

ENGINEERS WITHOUT BORDERS USA
Massachusetts Institute of Technology Chapter
Projects in Global Development

What is EWB?

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.”

Purpose: “EWB is a non-profit that partners with people from countries around the globe, working with them to develop solutions that will improve the quality of life in their communities.”



EWB's Values ->

Collaboration

The challenges we are tackling are complex. We achieve the outcomes we promise by working with diverse perspectives, and know that those most affected are key to developing solutions. In the spirit of collaboration our first response is "yes, we can".

Equality

A life of dignity and self-determination is a right for everyone. We work equitably, promoting fairness for all, so that no-one is left behind.

Bigger Picture Thinking

We recognise that we operate in complex socio-technical systems and that every intervention has wider implications. We consider our world's delicate interconnectedness in every decision we make.

Learning

We are active learners who place great value on asking questions, listening openly, and responding to what we learn in constructive ways. We create environments which enable honest reflection and ensure that what we learn is informing how we, as individuals, as an organisation, and as a sector, deliver our work.

Innovation

When considering any solution we are creative, utilising new and existing ideas, combined with context to develop successful solutions. We are agile and disciplined, using evidence to adapt, refine and improve outcomes.

Success

We are results-focused and celebrate success small or large, because success in our work means success for all. We take educated risks and sometimes fail, but we learn from failure to be yet more effective and driven to deliver positive impact.

Courage

We have the belief and confidence to hold a true course, to retain our authenticity, even in the face of adversity, or if the power is not balanced in our favour. We are comfortable with conflicting perspectives and embrace ambiguity.

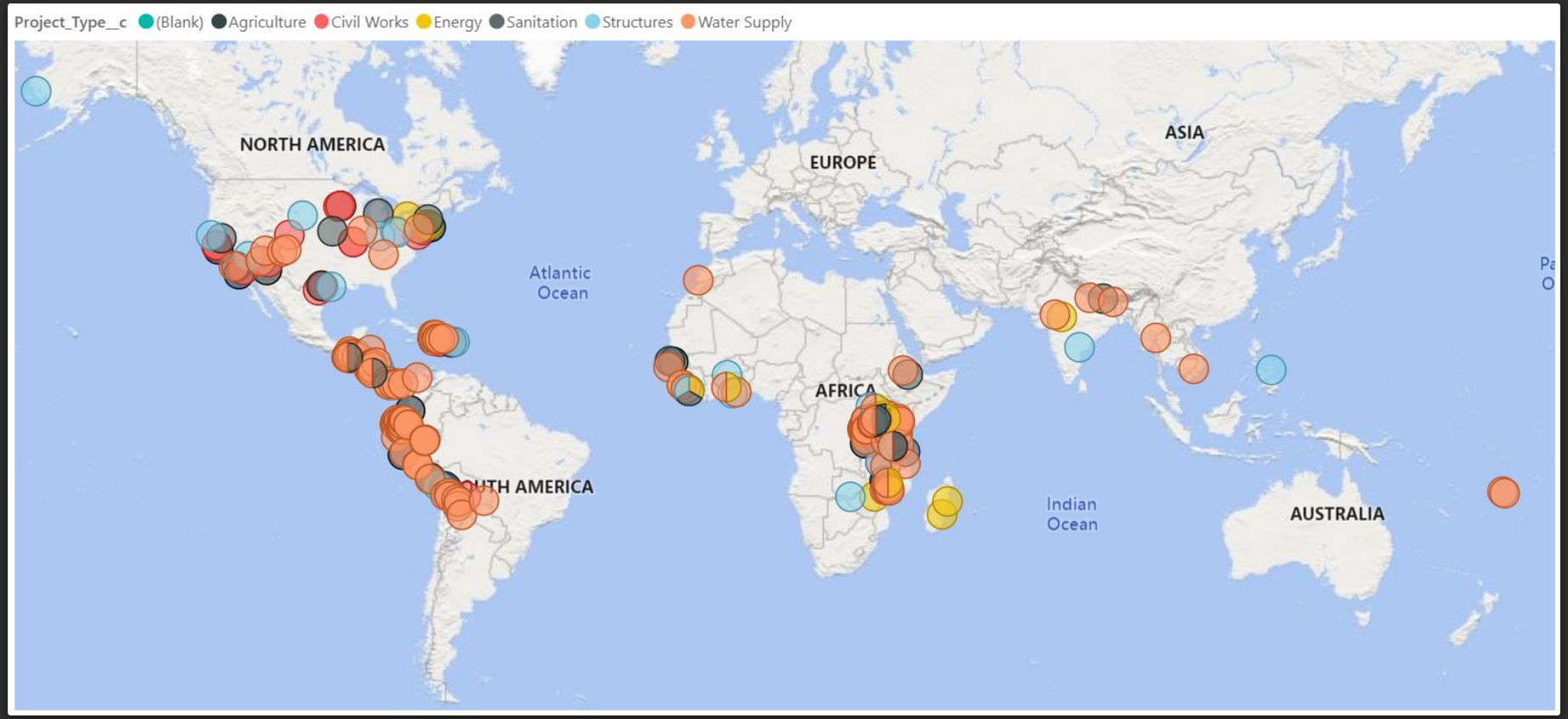
Integrity

We do what we say, say what we do and we make good if we can't. We deliver on our promises because we, as global citizens, have ultimate responsibility for the planet and its people, now and for the future.


Global development is all about working together to *uplift economic, environmental, educational, and health conditions* in underserved regions of the world, achieving a higher quality of life *for all people.*

EWB-USA Projects

Projects	Chapters	Beneficiaries
382	193	1,852,822



EWB Project Process

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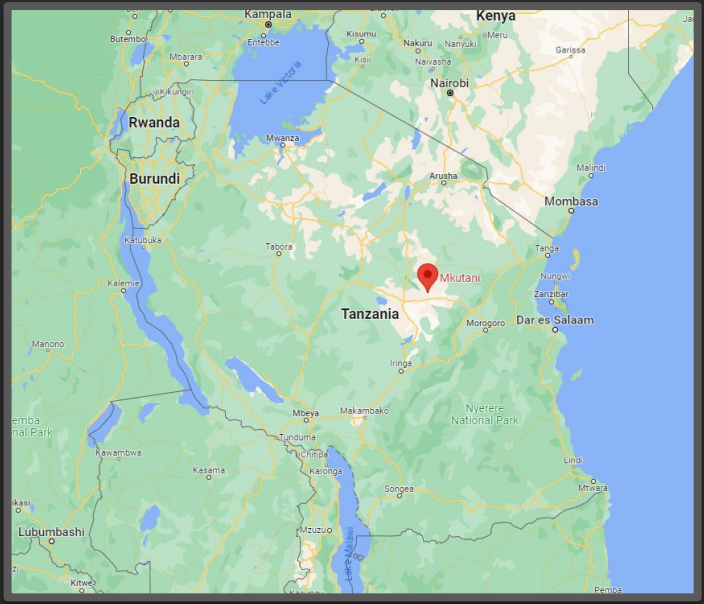


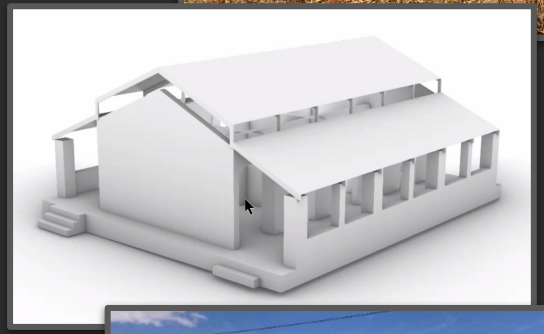
We are currently working in Mkutani, Tanzania through two main project teams:

- Health and Sanitation
- Farm and Irrigation

Health & Sanitation Teams (1/2)

Overview: Renovating healthcare dispensary and Promoting health education

- **Roof Team:** Working on new roof design with structural engineers from EWB Boston Professional Chapter
- **Water Catchment Team:** The facility does not have enough water to support day-to-day patient care year round; currently working on water catchment design



Health & Sanitation Teams (2/2)

Overview: Renovating healthcare dispensary and Promoting health education

- **WASH Team:** Holding sanitation workshops for around 600 schoolchildren & supporting the WASH club at the school to reach their sanitation goals.
- **Menstrual Health Team:** Working on ways to make menstrual cups accessible to women in the community & ways to train community members on female health education

What are some other challenges in local or global health you can think of?

- Mental disorder prevention and treatment
- Outbreaks of vaccine-preventable disease
- Care for “Rare” and noncommunicable diseases
- Effect of climate change and pollution
- Humanitarian crises such as wars, conflicts, and natural disasters
- Barriers to healthcare access
  - High cost
  - Transportation
  - Limited resources
  - Inequitable treatment

Farm & Irrigation Team

Goal: Build an irrigated garden at Mkutani Primary School

- *A third of the students live too far away to go home for lunch*
- *Serves about 600 students*
- *Garden will provide both food and educational opportunities for students*
- *The main challenge is **irrigation** and some of the agricultural aspects of the project*

What are some other challenges in local or global agriculture you can think of?

- Responding to global demand for food and commodities and trade instabilities
- Climate change, soil erosion, & biodiversity loss
- Providing a livelihood for farmworkers
- Access to ample supply of water
- Access to agricultural land and resources
- Investment for new technologies

Besides our Farm & Irrigation and Health & Sanitation Project Teams, we have four committees that support our projects…

Presidential

Big-picture planning and maintenance, GBM Planning, and Operations Documentation

Fundraising

Raising money by finding sources of funding, applying to grants, and hosting fundraising events

Publicity

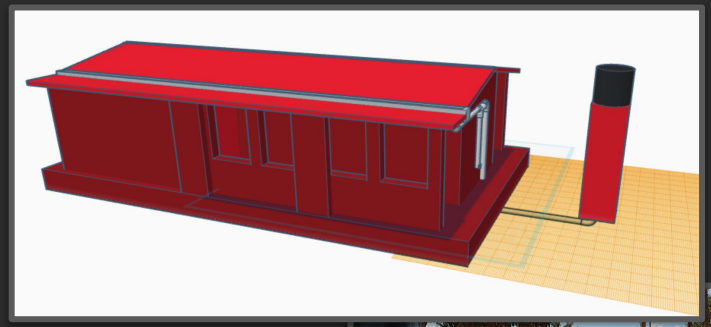
Pubbing the club's activities, posting about fundraising, meetings, project progress, and trips

Education

Organizing guest speakers, educational events, and workshops on global development

Work on projects with real-world impact…

Gain valuable experience and skills…



Meet people with similar interests and make new friends!

Activity 1:
Water Filtration

Assemble your own water filter!

Why is Water Filtration Important?

Health - filtration removes contaminants like chemicals, particles, and bacteria from our water so that it is safe to drink

Sustainability - reduces waste by eliminating the need for pre-packaged water and water bottles

Types of Water Treatment

Activated Alumina	Sand filters	Activated Charcoal	Ceramic Filters
Distillation	Reverse Osmosis	UV Light	Xylem Filters

Components

plastic bottle

coffee filter

cotton balls

gravel

sand

Step 1: Cut Plastic Bottle

Carefully cut your plastic bottle horizontally with scissors a little bit above the halfway point. (We can assist with this step if needed).

Step 2: Gather Filter Components

- Flip the top half of the bottle upside down
- Layer in the:
  - coffee filter
  - cotton balls
  - sand
  - gravel
- Feel free to experiment with different methods, but make sure that the materials will stay in the filter when water flows through it

Step 3: Assemble Filter

Place the upside-down top of the bottle inside the bottom of the bottle. Make sure that it is secure so that water can flow through the filter into the bottom compartment!

Step 4: Test Your Filter!

Now we will pour dirty water through the filters.

Make observations about the results of your water filtration experiment and others!

⚠️ *Don’t drink the water before or after filtration!* ⚠️

Step 5: Analyze

Discuss with the people around you:

What do you think made certain filters more effective than others? What did other people do differently that may have affected the water quality?

Activity 2:
Irrigation System

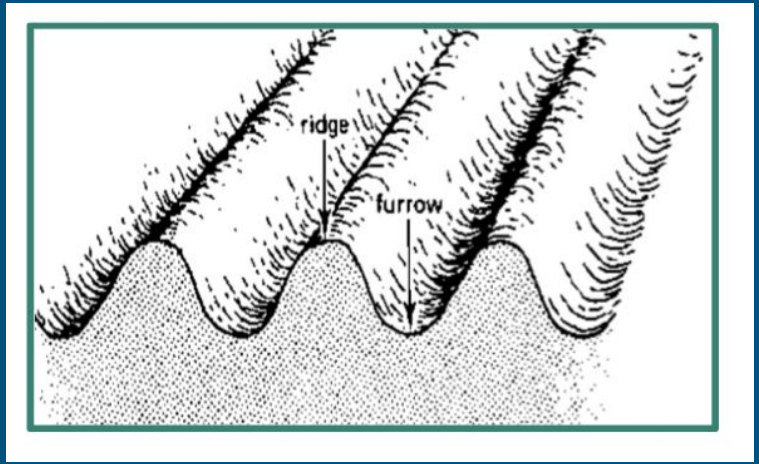
Build a mini furrow irrigation system

Surface Irrigation

Systems that deliver water to crops using a gravity-fed, overland flow of water. Surface irrigation is the oldest method and most common form of irrigation throughout the world.

Furrow Irrigation Systems

A type of surface irrigation where water applied to the field is guided by narrow channels – furrows – dug between the rows of crops



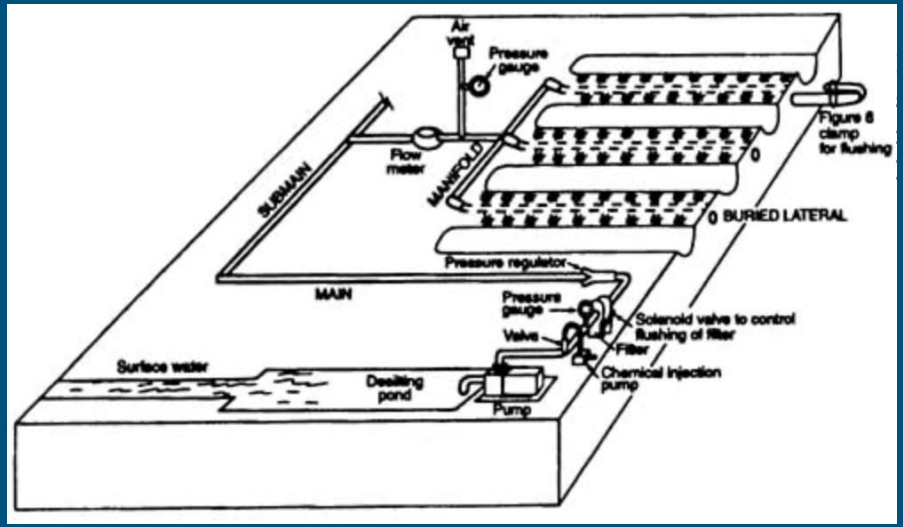
How do furrow irrigation systems work?

In furrow irrigation systems, farmers dig furrows between crop rows. Water is delivered to the top of each row using siphon hoses or gates. The crop is irrigated as water flows from the top (where the water enters the furrow) to the bottom of each row (the furthest point from the pipe or siphon).

Perforated Pipe Irrigation

Network of tubes with regularly spaced perforations.

Advantages: water conversation, reduced soil erosion, energy efficiency, less weed growth



Goal

Work in teams of 3-4 to design and build a furrow irrigation system. The goal is to move a cup of water a distance of 1 foot and distribute it evenly in two cups.

Materials

- Paper Cups
- Straws
- Tape
- Paper clips
- Clay
- Water

Debrief

- What worked well
- What was challenging?
- If you could redesign your system, what would you do differently?
- What have you learned about surface irrigation after designing your own irrigation system?