UWEZO LINK
INITIATIVE

Uwezo Fab Lab: Climate & IoT Innovation Program

Empowering Climate Innovation
Through IoT & Digital Fabrication

About Uwezo Fab Lab

- Uwezo Fab Lab is a flagship program designed to equip students, teachers, and grassroots innovators with the skills, tools, and mentorship to design and deploy IoT-powered solutions that address climate change impacts in their communities.
- Bridging the gap between underserved communities and inclusive development through grassroots innovation, technology, and community engagement.
- Our youth-led initiative seeks to establish a digital fabrication hub where students, teachers, and innovators can prototype and deploy IoT-based climate solutions to real challenges in Kenya.

The Climate Crisis in Rural Kenya

Climate change is no longer a looming threat for rural Kenya; it is an **immediate crisis** disrupting agriculture, livelihoods, and education:

- Over 4.4 million people affected by drought in 2023
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- Kenya loses over 12Over 4.4 million people affected by drought in 2023
- Without adaptation, an additional 1.4 million Kenyans could fall into poverty by 2030

The problem is compounded by a gap in climate literacy, limited access to modern technology, and a lack of youth-centered innovation hubs in underserved areas.

Our Solution: Uwezo Fab Lab

A fabrication laboratory equipped with digital manufacturing tools to empower communities with the skills, tools, and mentorship to design and deploy IoT-powered climate solutions.

Skills for the Future

Training in IoT systems, Arduino programming, renewable energy integration, and climate data analytics using tools like Tinkercad for simulation and 3D design.

Climate-Focused Prototyping

Guided by expert mentors, teams develop solutions to specific local challenges, from soil moisture monitoring to automated irrigation systems and community weather stations.

Field Pilots & Community Impact

Prototypes deployed in partner schools and rural communities for live testing, with data collected to measure environmental and social impact.

Accessible, Inclusive Technology

Training and deployment prioritize low-cost, locally repairable solutions, ensuring sustainability without dependency on expensive imports.

Potential IoT Climate Solutions

Smart Irrigation Systems

Low-cost sensors and automated controls to reduce water waste by up to 30% in pilot areas.

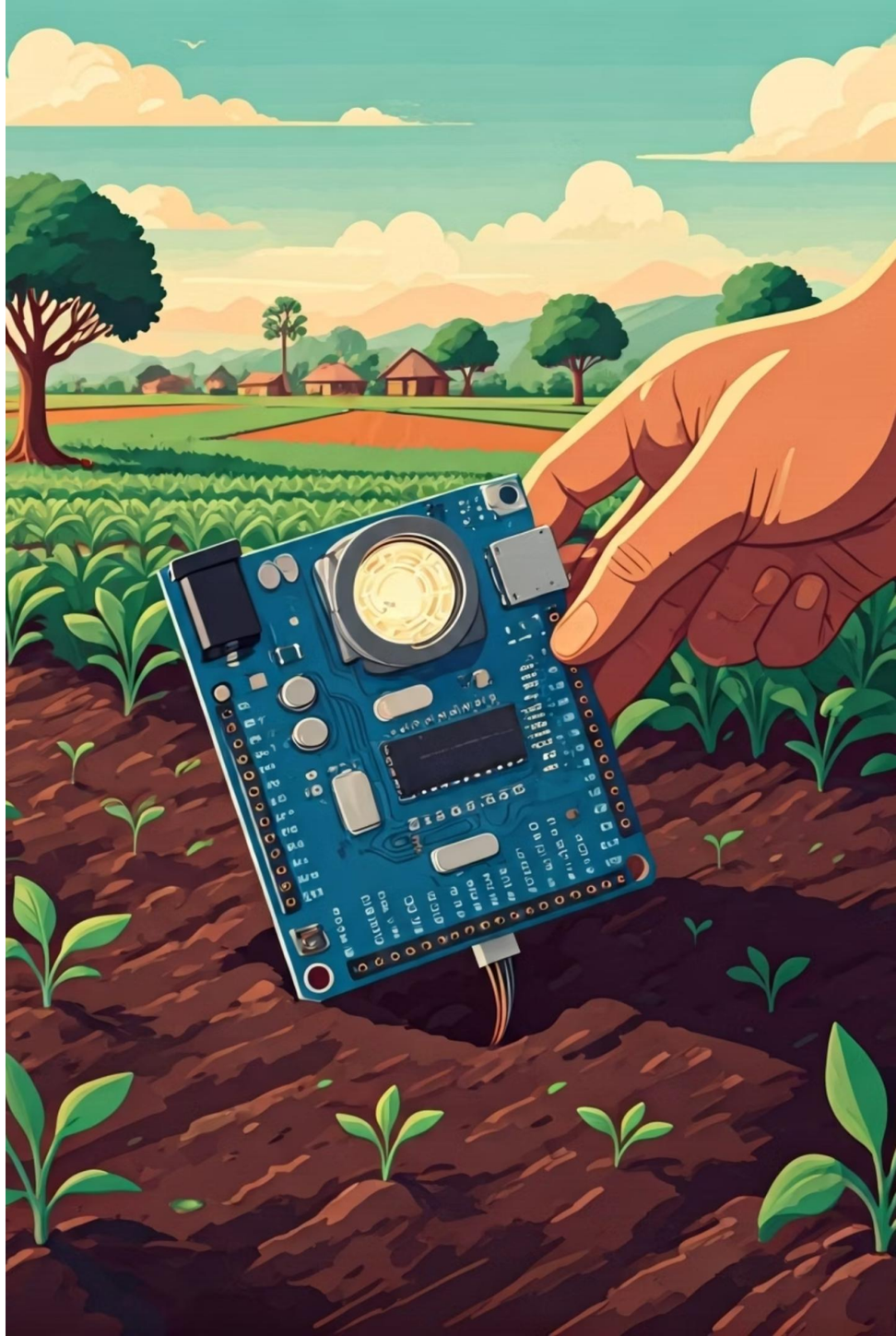
Renewable Energy Monitors

Affordable systems for schools and homes to track and optimize energy usage.

Waste Management Solutions

Tailored recycling and waste tracking systems designed for rural contexts.

These solutions transform the narrative: climate resilience is not a luxury, it's a right. Youth have the potential to be the greatest innovators in solving the climate crisis if given the tools, training, and opportunity.



Program Goals and Objectives

To empower communities in Kenya, especially youth and women, with hands-on skills in Climate-Smart Innovation, IoT for Sustainability, and Digital Fabrication over a 5 Phase implementation plan.

Phase 1

Build technical capacity by training 250 participants (200 youth, 50 teachers) in Arduino, Tinkercad, and climate sensor deployment.

Phase 2

Foster climate innovation through establishing fabrication space and mentoring startups, resulting in 15 climate prototypes developed.

Phase 3

Increase climate awareness by reaching 1,000 community members through workshops and deploying 5 IoT-based environmental monitoring stations.

Phase 4

Support female innovators with 40% of trainees being women and 5 women-led projects piloted.

Phase 5

Create sustainable pathways with 20 climate-tech businesses registered and 100 jobs created.

Key Technologies

Tinkercad

A free, browser-based 3D design tool that's simple enough for kids. You drag and drop shapes to build models (like gears, simple enclosures, or toy prototypes) then export designs for 3D printing or further electronics work.

Arduino

Small, programmable circuit boards that let you bring your digital designs to life - from blinking LEDs, reading sensors, or even measuring water quality. Kids learn simple C-style code to tell the board what to do.

IoT (Internet of Things)

When everyday objects, like farm soil sensors, water pumps, or air quality monitors, are connected to the internet so they can collect and share data. In a Fab Lab, IoT lets communities track climate conditions in real-time.

Digital Fabrication

Using computer-controlled tools like laser cutters, CNC machines, or 3D printers to make things directly from a design file. This lets communities quickly create custom solutions for climate adaptation.

Call to Action

> "Let's build a Fab Lab that sparks creativity. Let's ignite a movement where anyone, anywhere, can make anything."

Funding & Partnership Request:
We are requesting for funding as well as collaboration to establish and operate the Uwezo Lab for its first year. This includes:

- Fab Lab setup, equipment purchase, and solar-powered backup systems.
- Training programs for teachers, students, and local innovators.
- Component sourcing and prototyping resources for IoT solutions.
- Field deployment and monitoring of community-based climate projects.
- Incentives, mini-grants, and networking events for innovators.

For more information:

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