

**LEVER FOR  
CHANGE**



# **Bold Solutions Network**

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



## **Top Sustainable Agriculture Proposals**

April 2020

## About This Collection

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

## Navigating this Collection

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



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



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



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

## Next Steps

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

### Learn More

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

### Connect with Bold Solutions Network Organizations

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

### Support Bold Solutions Network Proposals

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



# Table of Contents

Sustainable Agriculture Proposals

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

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



## Heifer Project International

Soil to Space: Leveraging Water to Bridge the Food Gap

[View factsheet on pages 3-4](#)



[Bold Solutions Network Online Profile Page](#)



[Project Video](#)



## Sistema.bio

Sistema.bio: Supporting Small-holder Farmers as Climate, Food, and Economic Leaders

[View factsheet on pages 9-10](#)



[Bold Solutions Network Online Profile Page](#)



[Project Video](#)



## Mercy Corps

Transforming Small-Scale Farming in the Face of Climate Change

[View factsheet on pages 5-6](#)



[Bold Solutions Network Online Profile Page](#)



[Project Video](#)



## University of Maryland

Ensuring Food Security and Climate Resilience through a Food-Energy-Water Solution

[View factsheet on pages 11-12](#)



[Bold Solutions Network Online Profile Page](#)



[Project Video](#)



## Olam International, Ltd.

Sustainable Rice Platform: Improving Farmer Livelihoods and Fighting Climate Change

[View factsheet on pages 7-8](#)



[Bold Solutions Network Online Profile Page](#)



[Project Video](#)

## SOIL TO SPACE: LEVERAGING WATER TO CLOSE THE GLOBAL FOOD GAP

**A**s the global population continues to increase, the challenge of how to feed everyone on our planet grows with it. Many of the world’s poorest and most food insecure people are themselves already facing the impacts of the climate crisis. Droughts, pests and extreme weather are devastating crops, leaving smallholder farmers – the people who produce up to 80% of the world’s food – without sufficient nutritious food and a reliable source of income.

Today, only 5% of farmland in Eastern and Southern Africa and Central America is irrigated. Drought and poor water management lead to low yields, forcing many farmers to migrate to make money to feed their families. Rapid urbanization and soil erosion only serve to accelerate this trend. Equipped with information on weather patterns, water availability and expected crop yields, together with access to finance and irrigation technology, smallholder farmers can increase production and improve nutrition in their communities, while generating a living income – sufficient money to cover core household costs for a dignified life, including health care and education.

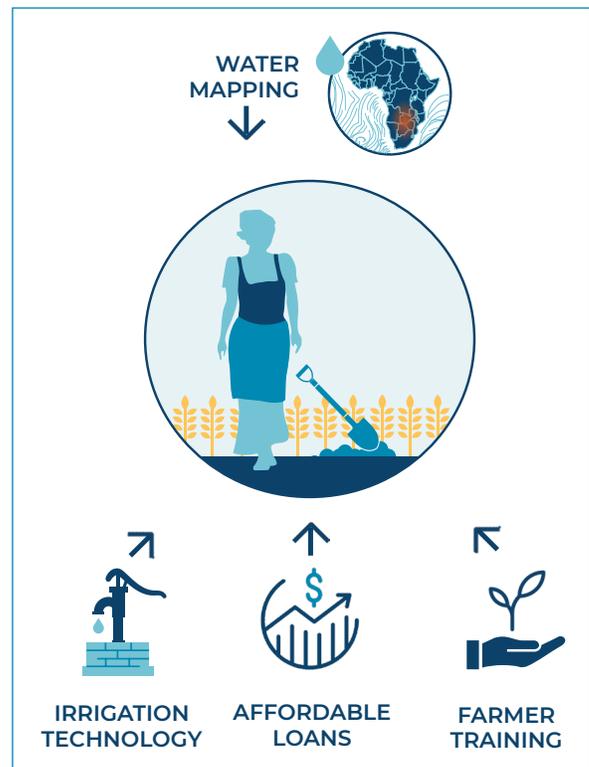


### OUR GOAL: To Build the Resilience of Vulnerable Farming Communities in Africa and the Americas

This project will deploy Heifer International’s established community development model alongside Columbia University’s best in class research on integrated water management, linking the power of community mobilization and cutting-edge science to scale integrated solutions that support resilient smallholder food production systems.

The high initial cost of water-related technologies and services puts them outside the reach of many farmers. Solutions also need to be tailored to local contexts, rendering generalized solutions ineffective for many farmers. This project will overcome these barriers by bridging the knowledge gap between private sector actors and farmers, linking them to affordable loan products to cover start-up costs, and by offering contextually designed water solutions using state-of-the-art satellite and drone imagery and analysis direct to farmers.

We will also work with market actors to increase understanding of the value and applicability of water technologies for improving income and yields.



Evidence from a major case study covering 286 projects in 57 countries shows that average yields increased by 79%<sup>1</sup>, using the conservation agriculture interventions that will be used in this project. Maximizing soil infiltration, minimizing soil evaporation, collecting surface runoff for supplemental irrigation and improving irrigation systems have also been shown to substantially improve water use efficiency and yields.

Advanced agro-hydrological modeling can reproduce yield gains at scale and provide insights across a wider range of climates, locations, and crops, establishing overall yield potentials. These models show water use efficiency can be increased up to 90% with ambitious water management interventions across regions, having a dramatic effect on productivity potential. This is the case for Zambia, one of the proposed project countries, where an impact evaluation shows smallholders increased household income by an average of 400% using treadle pumps accessed through private sector entities<sup>2</sup>.

## EXPECTED IMPACT OF YOUR SUPPORT

### \$5 MILLION

#### Scenario 1A – Honduras

 5,250 HOUSEHOLDS  170% INCREASE IN INCOMES

 1.02M PEOPLE SEE CALORIE GAP CLOSE

VALUE CHAINS:



#### Scenario 1B – Zambia

 5,250 HOUSEHOLDS  500% INCREASE IN INCOMES

 38,400 PEOPLE SEE CALORIE GAP CLOSE

VALUE CHAINS:



### \$10 MILLION

#### Scenario 2A – Honduras and Nicaragua

 10,500 HOUSEHOLDS  170% INCREASE IN INCOMES

 2.04M PEOPLE SEE CALORIE GAP CLOSE

VALUE CHAINS:



#### Scenario 2B – Tanzania and Zambia

 10,500 HOUSEHOLDS  250% INCREASE IN INCOMES

 171,544 PEOPLE SEE CALORIE GAP CLOSE

VALUE CHAINS:



Each of the scenarios is focused on a five-year commitment. We anticipate households reaching a living income by year three, with work in years four and five ensuring increases in income are sustainable. All calculations are based on Heifer's project data, with the baseline being lower in Tanzania and Zambia, compared to Honduras and Nicaragua.

## CONTACT

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<sup>1</sup> Pretty et al., Environ. Sci. Technol. 40, 1114–1119 (2006)

<sup>2</sup> Shapiro et al., "A panel analysis of the impact of KickStart irrigation pumps in Kenya" (New Delhi, 2017)

# LET'S TRANSFORM THE WAY FARMERS FEED THE WORLD IN THE FACE OF CLIMATE CHANGE.



As weather gets more extreme, growing food gets tougher.

**80%**



of the rapidly growing population in lower-income countries survive on crops grown by small-scale farmers.

**1/4**



of those crops are projected to fail due to increased drought, famine and pests brought on by climate change.

**3 billion**



people will be starving by 2050 if farmers can't adapt their practices to meet this challenge.



**Mercy Corps + NASA are using technology to tackle the problem at the (food) source.**

Since 2012, Mercy Corps' AgriFin model has leveraged the power of technology and a global network of partners to connect **4 million small-scale farmers** to the products and services they need to increase their productivity and income.

Now we're scaling AgriFin – both by integrating **hyper-local satellite-to-soil insights from NASA** to inform climate-smart agricultural practices, and by setting a **key focus on women and youth**. Together, we'll take millions more farmers from subsistence to sustainable.

With your help, we can create a brighter future for farmers and the people they feed.

## EVERYTHING A FARMER NEEDS

- Climate-Smart Insights
- Quality Seeds + Machinery
- Financing + Insurance
- Irrigation
- Buyer Connections

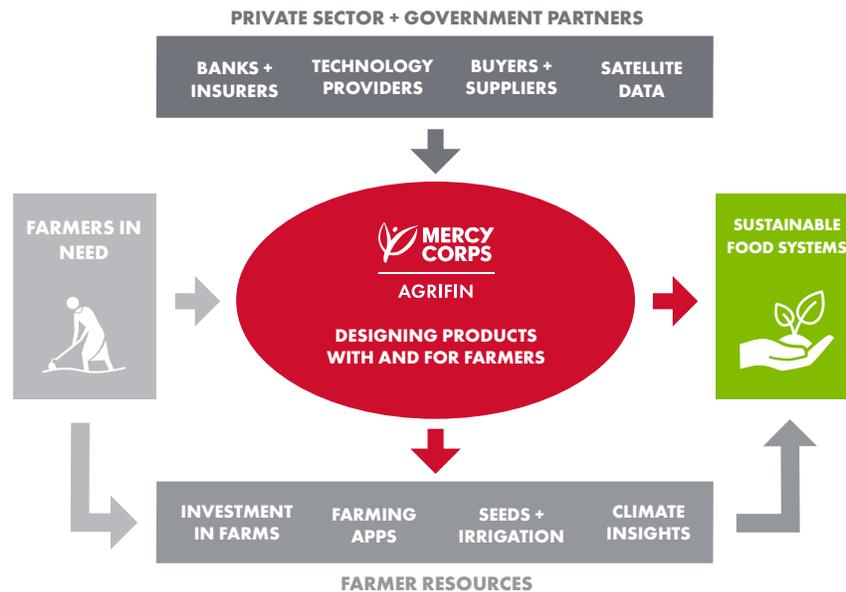
## DELIVERED THROUGH DIGITAL INNOVATION

- Mobile Apps
- Interactive Voice Response
- SMS Chat Bots
- Peer-To-Peer Education
- Online Markets

## TO FEED MILLIONS

- Profitable Farms
- Increased Crop Yields
- Resilient Communities
- Sustainable Food Systems
- Safe + Healthy Food

# AGRIFIN IS AN INNOVATION CATALYST LEVERAGING A POWERFUL NETWORK OF PARTNERS.



## YOUR SUPPORT CAN TAKE OUR IMPACT FURTHER.

\$5 MILLION TRANSFORMS LIVES	\$10 MILLION TRANSFORMS NATIONS
<p><b>Your gift expands AgriFin in existing countries to uplift the world’s most vulnerable populations.</b></p> <ul style="list-style-type: none"> <li>Scale-up impact with NASA insights in an AgriFin country, including Kenya, Nigeria, Ethiopia, Tanzania, Zambia, Uganda, Zimbabwe, and Indonesia</li> <li>Deepen focused efforts with key groups like women and youth, or strengthen key interventions like irrigation, climate change learning and harvest-loss recovery</li> </ul>	<p><b>Your gift powers the full spectrum of AgriFin services in an entire country for up to 4 years.</b></p> <ul style="list-style-type: none"> <li>Introduce AgriFin’s powerful suite of services and NASA insights to farmers in existing and new countries like Rwanda, Nepal, Colombia, Ghana, India, and Myanmar</li> <li>Accelerate breakthrough technology innovation by expanding the product development, partnerships and education small-scale farmers need to practice climate-smart agriculture</li> </ul>

*Farmers can’t change the weather – but they can change how they prepare for it. And that could change everything.*

Learn more at [mercycorpsagrifin.org](http://mercycorpsagrifin.org) or contact our team:

**Mary Stata**  
 Managing Director, Foundation Partnerships  
[mstata@mercycorps.org](mailto:mstata@mercycorps.org)

**Leesa Shrader**  
 Program Director, AgriFin  
[lshrader@mercycorps.org](mailto:lshrader@mercycorps.org)



\*NASA is critical to our efforts but does not directly receive funds as a technical Mercy Corps partner.

# Sustainable Rice Platform: Improving farmer livelihoods and fighting climate change

## The Issue

Rice is integral to global food systems. Worldwide, 3.5 billion people consume rice and 144 million family farmers produce rice. Tragically, some 90 percent of them live in or near the poverty line - many of them are women.

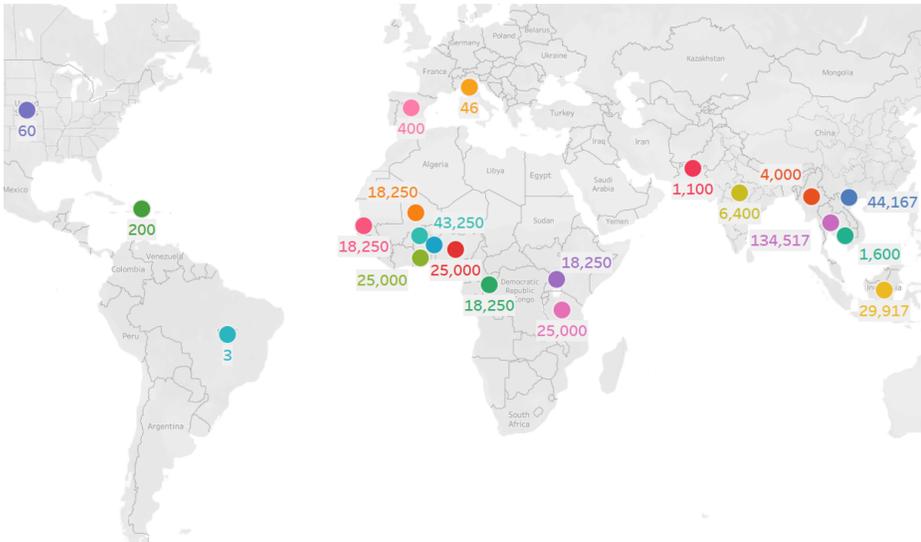
As the population grows so does the demand for rice. Meeting a growing demand poses an enormous challenge in a world with finite resources. Annual water consumption and greenhouse gas emissions of rice top the charts among food crops.

Rice smallholders, especially women, bear the health and economic risks of production as they are inadequately equipped to safeguard their livelihood against climate change impacts and market risks. If we do not act now, today's children will live in a severely degraded environment and many of them will remain within the poverty trap in rice.

## Big Challenges

- 1 out of 4 farmers in the world are rice smallholders, who earn on average US\$2 to US\$7 per day from rice.
- Irrigated rice cultivation uses 30-40% of the world's freshwater and is responsible for 10% of global man-made methane emissions.
- Rice production is a leading cause of habitat loss, both in wetlands and forests.
- Global rice consumption is projected to grow 13% from 2018 to 2027, requiring 500 million tons of milled rice annually.

**SRP Projects are implemented at varying scales in Asia, Africa, Europe and the Americas, reaching 500,000 rice farmers**



**Africa:** Benin, Burkina Faso, DR Congo, Ghana, Mali, Nigeria, Senegal, Tanzania, Uganda  
**Asia:** Cambodia, India, Indonesia, Myanmar, Pakistan, Thailand, Vietnam  
**Europe:** Italy, Spain  
**North and South America:** Brazil, Dominican Republic, USA



## Bold Solutions

**Drive scale:** The Sustainable Rice Platform (SRP) network comprises 100 global public, private and civil society organizations. We foster multi-stakeholder partnerships to deliver proven solutions in the global rice sector. We scale through establishing SRP National Chapters to secure commitment at country-level and drive durable public-private-people partnerships.

**Build capacity:** With the SRP Standard for Sustainable Rice Cultivation, we enable farmers to adopt practicable and sustainable rice farming techniques. Individual progress is tracked to ensure farmers maintain positive outcomes.

**Incentivize change:** SRP Projects offer an integrated and customized approach to ensure appropriate timing and suitable smallholder incentives. We feature the positive outcomes for smallholders and communities to promote a shift to climate-smart and sustainable practices.

**Facilitate market linkages:** Through the SRP Assurance Scheme, we enable participating farmer groups to connect with buyers seeking sustainably produced rice with value chain transparency. Retailers can make credible public claims and create market differentiation through sustainable rice, inspiring consumer choices and behaviour.

**Deliver tangible impacts:** Aligned with the UN Sustainable Development Goals, the SRP Performance Indicators assist in measuring the economic, environmental, and social impacts of sustainable best practices in rice production.



**100+ institutions**  
engaged



**25 projects**  
registered



**21 countries**  
across 5 continents



**10% increase**  
in farmers' income



**20% savings**  
in water use



**50% reduction**  
in GHG emissions



## Get Involved

Your investment will allow us to improve farmer livelihoods and fight climate change.

\$10 m	\$5 m	\$1 m
Up to <b>100,000</b> farmers	Up to <b>50,000</b> farmers	Up to <b>10,000</b> farmers

We have a track record of delivering results, with each project running for 3-5 years. We conduct baseline studies in geographies of interest to efficiently allocate funds to tackle the most immediate challenges in a given context.

SRP Projects offer customized interventions, demonstrating positive impacts on people and planet. Notable outcomes include water use, carbon footprint and chemical input reduction, contributing to increased farm incomes. Additional funding will increase our capacity and scope from farm-level to landscape-level approaches, including biodiversity and gender inclusivity.

## Our Goals

The Sustainable Rice Platform (SRP) is a global multi-stakeholder alliance to promote resource-use efficiency and climate change resilience in rice systems – both on-farm and throughout value chains.

We work globally to:

- **Improve smallholder livelihoods** in developing countries;
- **Reduce the freshwater & carbon footprint** of rice production; and
- Offer **responsibly cultivated rice** in the global market.

*Within the next 10 years, we aim to reach 10 million rice farmers who are the first line of defense against global food insecurity and further environmental, economic and social degradation.*

## Contact Us

### Wyn Ellis

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### Paul Nicholson

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## Team up with us!

- **Support an on-the-ground project** in a rice producing country to enable smallholder rice farmers to shift to sustainable farming practices. Kickstart or upscale training activities in the field and support entrepreneurs to deliver services that **increase farmer profitability, reduce environmental footprint, improve health and food safety, empower women, and build more resilient communities.**
- **Launch a high-visibility national, regional, or international advocacy campaign** to scale action with multi-stakeholders. Connect the average **consumer** to the farmer, secure commitment of **retailers** to source sustainably cultivated rice for their shelves, featuring high-impact opportunities for **innovation**, and make the case for **policy support.**
- **Gain access to data and verifiable metrics** on impacts of interventions for credible public claims aligned with the UN Sustainable Development Goals to **highlight your contribution** in driving positive impact.



**Be part of our journey toward rice sector transformation.**



Sistema.bio Model

## Sistema.bio

We work with **smallholder farmers** to address the challenges of **poverty, food security and climate change**. We have identified the right products and skills farmers need to become more financially secure, productive and climate smart.

## How we work

We provide access to innovative **technology, training and financing** to help farmers produce clean energy, maximize local resources, and increase their productivity. By building packages that adapt to local conditions, we allow farmers to have the highest **return on investment** and the best **environmental and health impacts**.

## Scalable and global tech-solution

We operate **globally** with the potential to bring clean-energy and sustainable agricultural practices to a **100M farmers on over 15% of the world's farmland**. Our strategy and technology has been proven scale, and we are ready to accelerate growth to reach more farmers.

## About Sistema.bio

**Headquarters** Mexico City, Mexico

**HUBS:** Colombia, Kenya, India

**Operations:** LATAM & The Caribbean, East Africa, Asia, Europe (**25 countries**)

**Established** 2010

**Impact Areas:** Agriculture, Clean Tech & Energy

**Global Team Size** 200 (full-time)

**CEO & Co-Founder** Alex Eaton

**CPO & Co-Founder** Camilo Pagés

## Smallholder farmers grow 70% of the world's food

Our products and services are designed to reach the full range of family farms worldwide



Backyard farms



Small & Medium scale farms



Small agri-businesses



[www.sistema.bio](http://www.sistema.bio) | February 2020

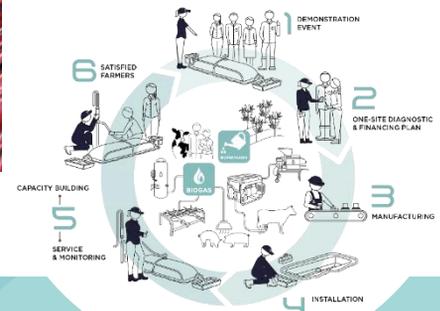


## US\$10M

Sistema.bio reaches farmers by establishing agricultural training HUBs that demonstrate the best regenerative agricultural practices for the region. From there, local farmers are hired as technicians to promote and install technology. We work with local farmer organizations, microfinance institutions, and NGOs to multiply our impact.

Support for Sistema.bio establishes new HUBs, hires local farmer technicians, and supports promotion of our sustainable technology, training and financing. Each new HUB is established in regions with the potential to reach hundreds of thousands of farmers. HUBs cost US\$200K to establish and run for 3 years and with the US\$10M we will set up 50 centers in Latin America, East Africa and India to create access to an additional 5M smallholder farmers.

### Field Implementation Model



## Customer lifetime value using Sistema.bio technology

The smallest Unit requires only 1 bucket of waste per day (2 cows)

Produces 3h of biogas cooking

Which is equivalent to 2.1 kWh electrical energy, or 0.5 kg of LP gas, 0.75 L gasoline, 2.5 kg of firewood

Sistema.bio Digester technology transforms organic waste to renewable gas and fertilizer

Resulting in cash savings and incomes generation through energy, fertilizer savings, health savings, time savings, soil productivity, and better harvests

And also produces 80 L of biofertilizer/day (5 ha fertilized per year)

### Key Awards

- 2010 BiD Challenge International Winner
- 2011 Ashoka Fellowship and Iniciativa Mexico
- 2012 New Ventures Scholarship
- 2013 Clinton Global Initiative Recognition
- 2014 MIF IDB Technical cooperation
- 2016 USB-Visionary Finalist
- 2017 Buckminster Fuller Institute Finalist
- 2017 Endeavour Fellowship
- 2019 Ashden Award winner, category for clean cooking
- 2019 Schawb Foundation Social Innovation awardee by the World Economic Forum
- 2019 UN Leadership Award for SDG7

### Milestones Achieved

- 2010 Obtained \$300K USD in funding
- 2011 Opened first regional office and created Sistema.bio's Loan Program Revolving Fund with a \$500K grant
- 2012 Developed key partnership with KIVA to expand Loan Program
- 2014 Signed contract with International Development Bank FOMIN for a US\$260K non-reimbursable investment fund designed for regional growth
- 2015 Closed US\$1M Investment round
- 2016 Opened first Nicaragua office
- 2017 Expansion to Colombia and Kenya
- 2018 Expansion to India, growth in LAC and East Africa
- 2019 Closed US\$12M investment | US\$13M cum. revenue

### Impact to the date

-  **Systems installed:** 11,518
-  **People impacted:** 63,350
-  **Waste treated:** 9,054,308 kg
-  **Trees saved:** 1,503,257
-  **CO<sub>2</sub>e mitigated:** 100,217 ton

# Ensuring Food Security and Climate Resilience through a Food-Energy-Water Solution

*An Initiative of the Global Alliance for Sustainable Water Reuse, Food and Health*



By 2050, there will be 9.8 billion mouths to feed worldwide, requiring a 70% increase in food production despite diminishing water and energy resources. We must adopt ways to produce more food with less water and energy, or global food insecurity will surge.

## A GLOBAL CRISIS

870 million people are food insecure worldwide, and climate change is crippling the water and energy resources needed to grow more food. **Ethiopia** and **Nepal** are among the world's most fragile nations, with high geographic disparities in water and energy that hinder food production. Solutions to increase harvests must address complex connections between food, energy and water instead of focusing on only one aspect of this nexus.

More than **6.2 MILLION CHILDREN** under age five—approximately 40%—in Ethiopia and Nepal are stunted due to food insecurity. Stunting has devastating long-term effects on human health and development.

## OUR VISION

Working with our local partners, the Global Alliance for Sustainable Water Reuse, Food and Health is a leading catalyst alleviating global food and water insecurity, improving health and building resilience to climate change.

## OUR TEAM

Spanning four continents, a unique multinational university and NGO alliance of world-renowned agricultural, public health, environmental, social/behavioral, engineering and policy experts

- ▶ University of Maryland in the United States
- ▶ Hebrew University of Jerusalem and the Arava Institute in Israel
- ▶ Bahir Dar University and CultivAid in Ethiopia
- ▶ Kathmandu University and the Environment and Public Health Organization in Nepal

## OUR HOLISTIC SOLUTION

1. **A toolbox of technology- and policy-based interventions** including on-farm horticultural, water reuse and renewable energy solutions that increase crop yields while improving water and energy efficiency
2. **Community-driven capacity building** that leverages local resources, mobilizes women, and cultivates sustainable partnerships
3. Experiential **science, technology, engineering and math (STEM) education** that increases participation by vulnerable populations and prepares future changemakers

## MEASURING IMPACT

We measure progress through data-driven monitoring, evaluation and learning. Our impact to date:

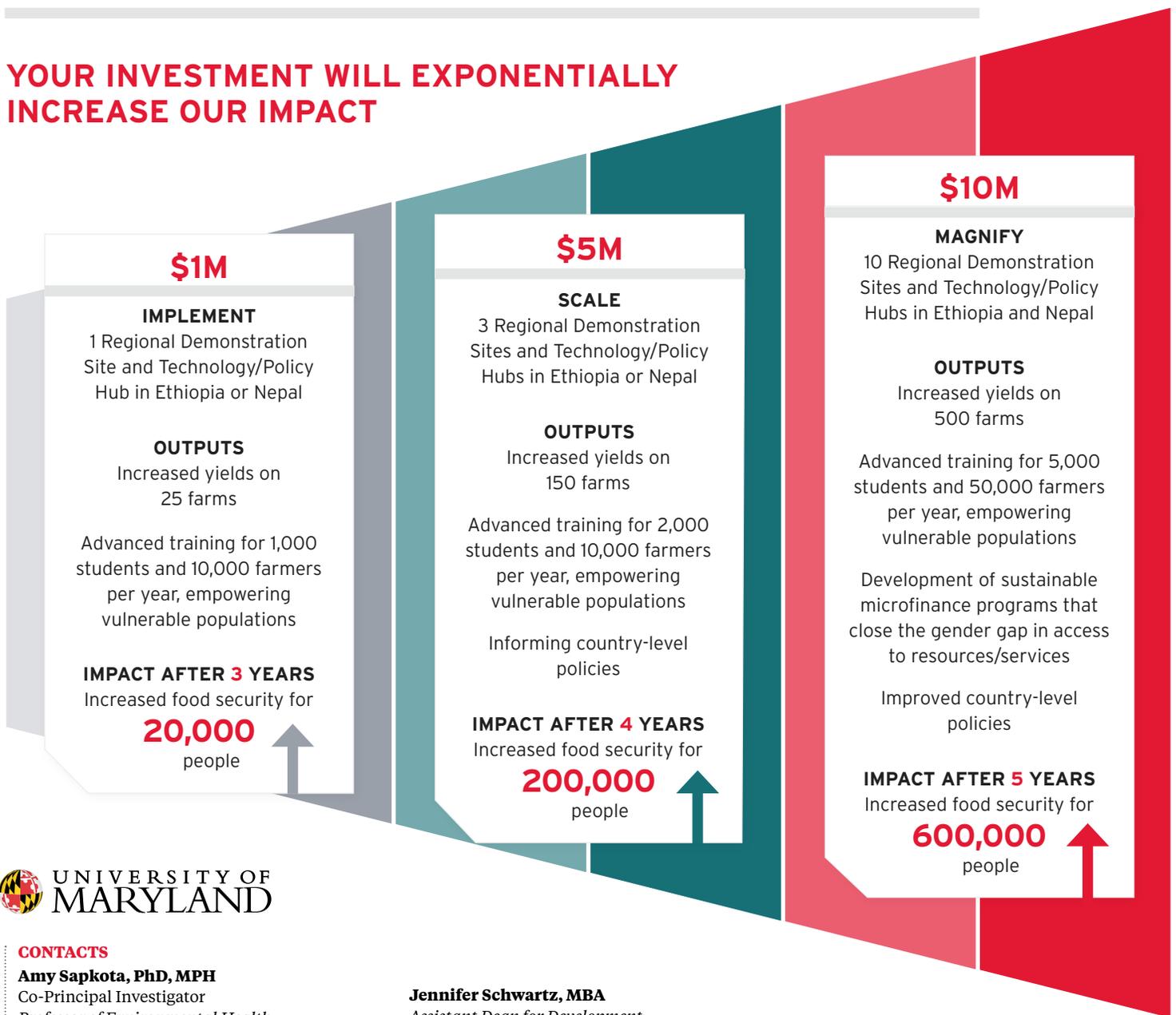
### Ethiopia

- Improved diets for more than 10,000 Ethiopians
- Increased crop yields and diversification tenfold
- Reduced irrigation water use by 80%
- Improved research and technical skills of more than 4,000 university students and 750 local agronomists

### Nepal

- Improved diets for more than 3,500 Nepalis
- Increased crop yields threefold
- Diversified vegetable crops on 200 family farms
- Initiated 20 community-driven microfinance groups

## YOUR INVESTMENT WILL EXPONENTIALLY INCREASE OUR IMPACT



### CONTACTS

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