HEIFER INTERNATIONAL

COLUMBIA UNIVERSITY
IN THE CITY OF NEW YORK

FEBRUARY 2020

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

As 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.

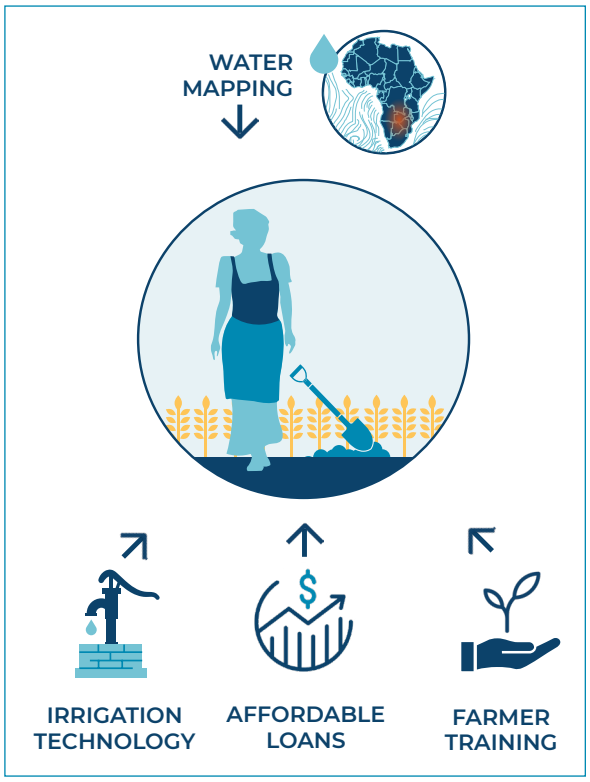
Today, only 5% of farmland in Eastern and Southern Africa and Central America is irrigated. Drought and poor water management lead to low yields, forcing many farmers to migrate to make money to feed their families. Rapid urbanization and soil erosion only serve to accelerate this trend. Equipped with 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.



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Evidence from a major case study covering 286 projects in 57 countries shows that average yields increased by 79%[1], 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[2].

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: BEEF, DAIRY, BEANS, CORN

Scenario 1B – Zambia

- 5,250 HOUSEHOLDS
- 500% INCREASE IN INCOMES
- 38,400 PEOPLE SEE CALORIE GAP CLOSE
- VALUE CHAINS: CHICKEN, EGGS, VEGETABLES

$10 MILLION

Scenario 2A – Honduras and Nicaragua

- 10,500 HOUSEHOLDS
- 170% INCREASE IN INCOMES
- 2.04M PEOPLE SEE CALORIE GAP CLOSE
- VALUE CHAINS: BEEF, DAIRY, BEANS, CORN

Scenario 2B – Tanzania and Zambia

- 10,500 HOUSEHOLDS
- 250% INCREASE IN INCOMES
- 171,544 PEOPLE SEE CALORIE GAP CLOSE
- VALUE CHAINS: CHICKEN, EGGS, GREEN GRAM, VEGETABLES

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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[1] Pretty et al., Environ. Sci. Technol. 40, 1114–1119 (2006)
[2] Shapiro et al., "A panel analysis of the impact of KickStart irrigation pumps in Kenya" (New Delhi, 2017)