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# ENVIRONMENT

GLOBAL STUDY GUIDE SERIES



## INCLUDING:

- Livestock & Climate-Smart Agriculture
- Soil Health
- Water Access & Conservation
- Healthy Stoves



# ENVIRONMENT FOCUS: LIVESTOCK & CLIMATE-SMART AGRICULTURE

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Global Study Guide



## How Can We Reduce the Effects of Climate Change?

At Heifer International, we've been answering this question for years through our innovative yet simple [agroecology](#) programs. Throughout the developing world, we're fighting the environmental effects of greenhouse gasses by training small-scale farmers to use [sustainable](#) methods of rearing animals and raising crops.

Our programs work to improve local [ecosystems](#) while helping families lift themselves out of poverty by:

- Improving soil water [retention](#) through planting trees and wise grazing management
- Controlling soil erosion
- Rotational grazing practices for small and large [ruminants](#) like goats, cattle, llamas, alpacas and water buffalo
- Periodic or sustained use of [zero-grazing](#) pens
- Improved animal feeding with local resources, using an educated understanding of animal nutrient requirements
- Better [manure](#) management through composting, covering wet and dry manure storage and incorporating it into the soil for crops

While animals and animal [byproducts](#) emit greenhouse gasses, an educated understanding of where these gasses come from and the means to reduce their impact are [mitigation](#) practices that can be accomplished by all small-scale farmers. [Read more from the World Ark magazine about how Heifer promotes climate-smart agriculture.](#)

### THINK ABOUT IT:

How do families benefit from learning sustainable farming methods?  
Why would farmers choose to change their farming methods?  
Is it the responsibility of farmers to preserve the environment?

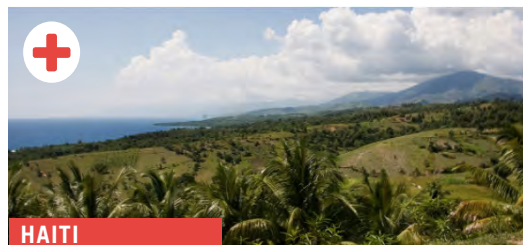
### STORIES



WORLDWIDE

#### A Holistic Approach to Combatting Climate Change

Climate change is real, but it is also actionable. Read how Heifer CEO Pierre Ferrari says we can help bring about change.



HAITI

#### Changing the Landscape

The impact of climate change is particularly devastating for Haiti — one of the most deforested countries in the world. See how Heifer Haiti is lessening the impact by encouraging small-scale farmers to practice advanced agroforestry models and other adaptive measures.



NEPAL

#### Making Dreams Come True

Basmati Budmagar was unsure about her ability to raise goats until she joined the women's group in her hometown of Pragatisil, Nepal. Basmati is now a Community Animal Health Worker, and she shares the dream of becoming a commercial goat farmer with her husband.

VIEW ALL OF HEIFER INTERNATIONAL'S GLOBAL STUDY GUIDES AT [HEIFER.ORG/SCHOOLS](https://www.heifer.org/schools)

# Our Farming Practices

Our projects promote best practices that [diminish](#) negative environmental impacts of agricultural production and processing. For example, we teach project partners to use water and energy [efficiently](#), encourage nutrient recycling in soil and use organic fertilizers as an [alternative](#) to expensive chemical applications, where appropriate. We also employ wastewater treatment, [biogas digesters](#) and energy-efficient milk cooling and processing equipment. From an agroecological perspective, farmers also are trained on and encouraged to use [intercropping](#) techniques and to plant [fodder](#) crops that can improve soil fertility. Heifer promotes agroecological farming practices and increases access to water and land resources by:

**SUPPORTING RESTORATION PROJECTS:** In [deforested](#) areas, we train our farmers to plant trees to improve the air quality and hold topsoil in place, which sustains moisture and nutrients. We also show them how to [compost](#) livestock manure, which nourishes soils in an organic and sustainable way.

**PROMOTING RESOURCE MANAGEMENT:** Training in sustainable agricultural techniques — such as zero-grazing, improved [husbandry](#) and renewable energy systems — allows communities to manage their natural resources, building healthier and more stable environments.

**PROVIDING INNOVATIVE TECHNOLOGY SOLUTIONS:** We encourage families to make use of technologies, such as biogas stoves to make efficient use of animal waste and [treadle pumps](#) to provide clean water for whole neighborhoods. Innovations like these [conserve](#) resources and also are more [sanitary](#), providing people with a better quality of life.

"The best approach to cooling the planet is by building larger coalitions of farmers cultivating the land using environmentally friendly practices: covering the soil, rotating crops and integrating different species of crops and livestock. By building closed cycles of food production and resource consumption, farmers become not only resilient to the effects of climate change, but they improve the environment for future generations."

-Oscar Castañeda, vice president of Heifer's Americas program



## VIDEOS



### Cows Save the Planet

Author Judith Schwartz shows how livestock plays into the holistic management of soil.



### Heifer & Climate-Smart Agriculture

See how Heifer helps small-scale farmers combat accelerating climate change.



### The Importance of Healthy Soil

See why healthy soil gives farmers power over hunger and poverty.

## ADDITIONAL READING



### Surprise! Livestock Helps Farmers Become Resilient to Climate Change

## TAKE ACTION

Set up a [fundraising page](#) and organize a fundraiser to help families improve the environment through sustainable farming. Here's an idea to get you started. Share your stories on [When Cows Fly](#).

# 1

## CHORES FOR CHANGE

Think about how you can take steps to support and spread climate-friendly agriculture in your community. Ask friends, neighbors and small businesses to sponsor you for each hour you work to learn more about climate-smart agriculture. Check out Heifer's [Chores for Change](#) guide for help and ideas.

## SHARE ON HEIFER SOCIAL MEDIA



GIVE TO PROJECTS THAT **SUPPORT CLIMATE-SMART AGRICULTURE** TODAY!



ENVIRONMENT FOCUS:

# SOIL HEALTH

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## Soil: More Than Dirt

We all could benefit from being a little dirty-minded. Not the R-rated kind but rather good, clean dirt, a.k.a. soil. You may think of soil just as something that gets you in trouble when you track it into the house, but it's a very important resource. In fact, it's so important that the United Nations designated 2015 as the [International Year of Soils](#).

Why all the fuss about soil? Because every single one of us – all 7.3 billion people inhabiting Earth – depend on it to stay alive each day. It's the source of most of our food, feed for livestock and fiber for our clothing. It filters and stores water, it captures and stores more carbon than any other material, it holds [vegetation](#) in place, and it is home to

hundreds of billions of organisms.

Heifer International recognizes the importance of caring for soil. Each Heifer gift helps to improve soil through promoting [sustainable](#) agricultural techniques such as [composting](#), [reforestation](#) and organic growing techniques that harness topsoil to limit runoff. We teach participants how to care for soil, regardless of climate.

When we provide people with livestock, we also train them how to use the manure as fertilizer. Sharing this knowledge is part of [Passing on the Gift®](#).

For the long-term viability of humanity, we must put more importance on the health of our soil. Our future and our health depend on it.

### STORY



HAITI

#### Dirt Poor

Extreme drought and deforestation leave Haitian farmers stuck with parched, unyielding soil. After a rocky start, project participants and Heifer Haiti staff realized access to water had to be the first step.

### LEARN MORE



#### Healthy Soil = Healthy People

The food you eat is only as good as the soil in which it grew.



#### Cardboard: A Garden's Best Friend

Learn how to transform cardboard to a soil-enhancing, microbe-boosting, weed-smothering all-star in your garden toolbox.

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## The Groundwork for Health

Drive up to Kittredge Farm in central Massachusetts, and you'll find a restored farmhouse with a post-and-beam porch, long hoop houses growing an abundance of seasonal produce and a farmer feeding a herd of beef cows with the help of his 2-year-old son. It's a classic, pastoral scene of a hardworking farm family.

This busy and sought-after farmer is Dan Kittredge. With roots growing up on an organic farm and being involved with the food movement for his entire life, he founded Bionutrient Food Association. This organization is changing the way we think about our food, our health and, most importantly, the soil under our feet.



### DESERTIFICATION 101

Desertification is the process by which fertile land becomes desert, typically as a result of drought, deforestation, or inappropriate agriculture. Check out this infographic from the Fall 2015 *World Ark* magazine to learn more about this process and how it can be avoided.

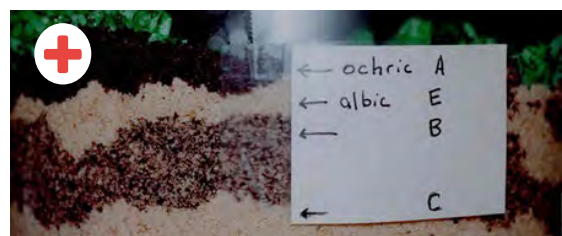


## ACTIVITIES



### Manure and Microbes

Observe microbes in action and learn about how they improve soil quality. Adapt and enhance this activity by creating graphs to represent changes in volume, pH and more by tracking the changes.



### Dirt Pudding

Learn more about soil layers and enjoy the fruits of your science!

## VIDEO



### Soil 101

As helpful as soil is to keeping humans alive, we haven't taken very good care of this precious, non-renewable resource.

## TAKE ACTION

Set up a [fundraising page](#) and organize a fundraiser to donate a gift that will change the lives of families in need. Here are a few ideas to get you started. Share your stories on [When Cows Fly](#).

1

### EAT DIRT BAKE SALE

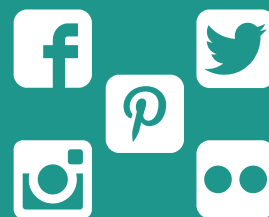
Make "dirt" pudding cups or "dirt" cupcakes and sell them to friends and family.

2

### HEALTHY EARTH CAFE

Host an event in your community to sell organic shade-grown coffee, fair-trade chocolate products and fresh produce from your garden.

## SHARE ON HEIFER SOCIAL MEDIA



**GIVE A BOUNTIFUL HARVEST GIFT BASKET TO A FAMILY IN NEED TODAY!**

# WATER ACCESS & CONSERVATION

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## Providing Clean Water

Did you know that access to safe water sources and proper sanitation could save the lives of up to [1.5 million children a year](#)?

That's according to the United Nations, who is monitoring progress toward the [Sustainable Development Goals](#). While the world has made significant progress toward achieving the goal of [halving](#) the proportion of people without sustainable access to safe drinking water and basic [sanitation](#), there's still much work to be done.

Millions of people around the world still lack access to clean drinking water. In the impoverished communities where Heifer works, many homes lack running water, and some families do not even have a well nearby. Instead, they must spend each day fetching water. This is often a

chore left to the children — especially girls — leaving no time for school.

But Heifer has a solution: helping families and communities install [irrigation](#) and [treadle pumps](#) and teaching them the value of water [conservation](#).

We provide this through two gifts in our gift catalog. The [Gift of Clean Water](#) provides communities with clean, healthy water for daily living; helps families install treadle pumps; teaches communities about managing water resources; and improves health by emphasizing the importance of proper sanitation. The [Gift of Irrigation Pumps](#) uses treadle pumps to efficiently irrigate farmland and shares water-saving techniques.

Ultimately, Heifer is devoted to providing communities with clean, healthy water for daily living.

### STORIES



MALAWI

#### Tapping into the Possibilities

In this village, change started slowly as a convenient new pump and fresh water ease women's burdens ahead of a new goat project.



ZAMBIA

#### A Young Girl's Walk for Water

Idess must walk one mile to retrieve a bucket of water four or five times a day. Learn how Heifer is supporting her family by teaching them about water [consumption](#) and conservation.



NICARAGUA

#### Female Farmers Tackle a New Reality

As the mercury goes up and rainfall levels drop, farmers in the dry corridor tweak techniques to keep their crops growing.



# How Much Water Does it Take?

Fixing leaky faucets and taking shorter showers will certainly help a bit, but you may be surprised to discover the other ways we're draining our water supply. [Manufacturing](#) food, electricity and clothing all soak up far more water than you may think.



Brewing a gallon of coffee requires significantly more water than a gallon of tea: 880 vs. 128 ounces.



"Dry-goods" is a [misnomer](#) considering it takes 713 gallons to produce a single T-shirt.



One half-pound of leather requires 1,096 gallons to produce.



You could make less of a splash if you opted for goat at dinner. Goat meat requires only 127 gallons of water per pound to produce, as opposed to beef, which needs 1,799 gallons.

Visit [watercalculator.org](http://watercalculator.org) to estimate your total water use and to learn more about [minimizing](#) your water footprint.



Did you know that the United States uses 346 million gallons of fresh water every day? Find ways to conserve water in your home and to protect this precious resource around the globe. +

## LEARN MORE



**A New Climate for Farming**  
[Ethnobotanist](#) Gary Paul Nabhan shares the secrets of farmers who've dealt with drought for thousands of years.



**10 Facts on Women and Water**  
View more facts from Water for the Ages.

## VIDEO



**Homemade Treadle Pump**  
Learn how to build a treadle pump.

## TAKE ACTION

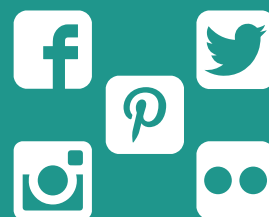
Set up a [fundraising page](#) and organize a fundraiser to donate clean water to change the lives of families in need. Here is an idea to get you started. Share your stories on [When Cows Fly](#).

# 1

### LIFESTYLE CHALLENGE

Estimate how much water you consume in a day at [watercalculator.org](http://watercalculator.org). Collect and boil this amount in the morning to use throughout the day, and pack it so it's available to drink and cook with. Ask your friends and family to join you, or collect sponsorships if you complete the challenge.

### SHARE ON OUR SOCIAL MEDIA



**GIVE CLEAN WATER TO A FAMILY IN NEED TODAY!**



## Cooking up Healthy Solutions with Biogas

For most families in the places where Heifer International works, cooking usually means gathering firewood by hand, which often depletes the soil and robs the environment of its trees.

In addition, smoke [inhalation](#) in poorly [ventilated](#) homes often leads to chronic lung and eye diseases. Millions of women and girls in developing countries spend part of every day foraging for fuel to cook their families' meals. This effort to chop, collect and carry [biomass](#) for miles can take hours, cutting into the time they need for other chores.

A [biogas](#) stove is a better option. It runs off [methane](#) gas captured from animal waste, and it burns cleanly,

reliably and efficiently. This not only is better for the environment, but it is more [sustainable](#) and healthier for families feeding their children.

In Guatemala, villages are working with Heifer to install life-saving stoves that burn only two or three logs a day, compared to the 25-30 needed to fuel traditional open cook tops. The stoves are installed with chimneys, which bring the harmful smoke outside families' living quarters.

Giving biogas stoves to project families, including training in using biogas technology, creates a cleaner, healthier environment. [Learn more about stoves](#) and how they can help families around the world.

### STORIES



UGANDA

#### Refuse Reuse

A biogas project in Uganda leaves nothing to waste. Through the use of simple technology, animal [manure](#) is transformed into fuel, fertilizer and electricity.



SENEGAL

#### Biogas Lights the Way

As the first person in his community to own a biogas digester and stove, Mamadou Diouf is leading the way in his community with a blue flame.

### VIDEO

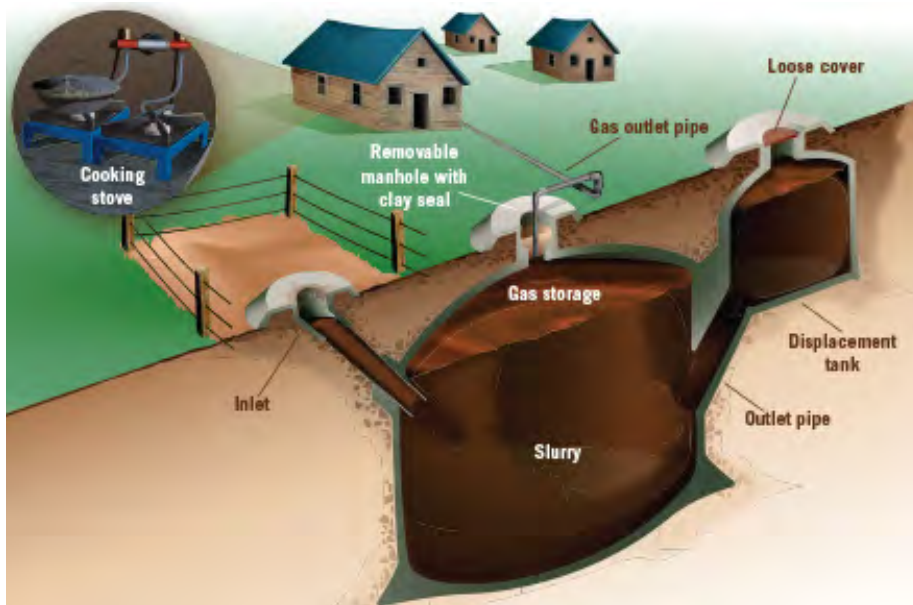


#### THE POWER OF POO

#### The Power of Poo

See how a biogas system has changed the lives of a family in Senegal.





## Biogas Basics

[Biogas digesters](#) can be a key [component](#) of an [integrated farm](#), turning [organic](#) waste into rich fertilizer and [combustible](#) methane gas. The gas is used to generate light for the house and heat for cooking. Children can study past sunset thanks to the lighting, and time once spent fetching fuel can go to other tasks. Heifer Uganda initiated a biogas program to address [deforestation](#), which is a serious problem in the country.

Additionally, biogas digesters:

- **Reduce** air pollution from smoke, which leads to less [respiratory](#) diseases and eye [ailments](#)
- **Create** more free time for families, particularly females of households who no longer have to collect firewood
- **Generate** opportunities for local employment through construction of biogas digesters
- **Control** [greenhouse gas emissions](#) from livestock in a responsible way

Bio-slurry, a biogas production [byproduct](#), is used to improve agricultural yields and restore soil [fertility](#). Learn more about [Heifer's work in Uganda and around the world](#). See if you can find other ways that we integrate sustainable agriculture practices with simple, life-saving technologies.

## LEARN MORE



### The Burning Question

Learn more about the benefits of biogas stoves from Gautam Yadama, author of "Fires, Fuel & the Fate of 3 Billion: The State of the Energy Impoverished."



### Portable Clay Cookstoves

In the Kasungu Heifer project in Malawi, we teach participants how to make portable clay cookstoves. These stoves use only a third as much fuel as traditional cooking fires, cook meals faster, [emit](#) less smoke and are less dangerous.



### Biogas as a Source of Energy

Learn about different types of energy and try building a biogas system in your classroom.

## TAKE ACTION

Set up a [fundraising page](#) and organize a fundraiser to donate healthy stoves that will change the lives of families in need. Here are a few ideas to get you started. Share your stories on [When Cows Fly](#).

1

### SOLAR OVEN BAKE SALE

Build a [solar oven](#) or other nontraditional cooking system. Use it to bake cookies, then hold a bake sale.

2

### SELL TREE SEEDLINGS

Biogas stoves limit deforestation – saving trees! Work with a local gardening club or greenhouse to sell tree seedlings to your community.

## SHARE ON HEIFER SOCIAL MEDIA



GIVE **HEALTHY STOVES** TO A FAMILY IN NEED TODAY!