

Laura Bush a Champion of Women's Rights in Egypt | 10

WorldArk

THE MAGAZINE OF HEIFER INTERNATIONAL® MAY 2013

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Dear Fellow Activists,

ON THE PHILIPPINE ISLAND OF MINDANAO, our Heifer farmers are still reeling from a devastating typhoon that hit Dec. 3 with the horrible strength to destroy already fragile livelihoods. The storm flipped homes from their foundations, decimated banana, rice and palm crops and forests and left families hungry and with little more than their lives to salvage.

In some cases, it will be years before farmers can replant and rebuild what was destroyed. Inland villagers said there had not been a typhoon in this area for more than 80 years. Many of the Filipino farmers interviewed for this issue of *World Ark* also said that they are now experiencing much more challenging growing conditions as weather extremes and pattern changes become the new normal.

For our smallholder farmers and partners around the world, climate change and its effects are undeniable. These farmers are the canaries in the coal mine, suffering drought from the Sahel desert to the U.S. Midwest, rising temperatures throughout Africa and Asia, and floods and landslides in Uganda, Mexico and Haiti.

Even the smallest shifts in rainy and dry season timing have big effects on agricultural productivity, which affects everything from a family's ability to get adequate nutrition, cover school fees and invest in land and housing. Rising temperatures also affect crop yields and water supplies around the world as noted by Lester Brown in his new book *Full Planet, Empty Plates*, which is excerpted in this issue.

Taking care of the Earth is a vital part of our mission. Heifer's values-based training includes practices to help improve the environment. A few examples:

- Biogas units that convert animal manure to a fuel that powers lights and cellphones as well as cookstoves that save trees and reduce air pollution;
- Organic fertilizer made from plant and animal waste to restore or build soil quality for better crop yields;
- Agroecological practices such as combining and layering certain plant types with crops for shade, soil support and to control pests and erosion;



Juan Collaguazo shows Pierre Ferrari agroforestry elements surrounding his tilapia pond in the community of Huinuma, Ecuador. The fruit of the guayaba plant falls in the water and feeds the fish and also creates proper conditions for the algae.

- Development that shifts destructive practices to more sustainable ones, such as in Malawi where families now raise goats instead of hunting wild animals. And in Haiti, where fish-farm projects include hillside reforestation and other measures to improve water quality.

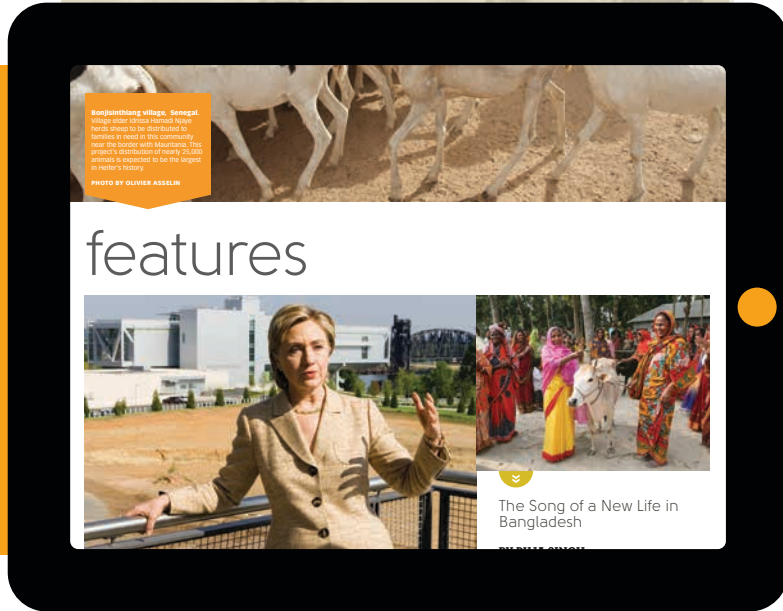
Heifer also is working to prepare farmers in our projects around the world for disasters and climate change, developing new practices to help protect the lives of both people and animals and to protect crops and food supplies under threat of imminent loss. Read in this issue how this system is already saving lives in the Philippines.

Our sympathy, concern and responsibilities extend to our neighbors closer to home as superstorms such as Hurricane Sandy bring home the vulnerability of our own communities. The planet we call home is clearly one system. What we do in Little Rock, Ark., or Seattle, Wash., influences what happens in Vietnam, Zambia and Bolivia. The smallholder farming communities we work with are clearly suffering the most as farmers and families struggle to adapt to a rapidly changing climate. We may not be moving fast enough.

Yours for a better world,

Pierre U. Ferrari






Pierre U. Ferrari, President and CEO



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Cover: Typhoon Bopha destroyed Teresita Servidad's home in Santa Josefa, Philippines. She, her husband and their children are still living on the foundation with tarps and lumber as shelter until they can rebuild.

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Disaster recovery

Cover photo by Nacho Hernandez
 Top photo by Joe Garrison

SCRAMBLED MESSAGE

As a donor to Heifer International and someone who has raised her own chickens and eggs for more than 30 years, I found your recent article “Egg-Economics” (February 2013) to be totally silly and ill-informed.

First of all, why would an organization that promotes providing poor people with chickens for eggs inform us that we (relatively well off) cannot afford to raise our own eggs? This is insane! This would suggest that we are making these people even poorer by giving them chickens!

Second, so let’s assume that the eggs we raise ourselves are expensive. Compared to what? There is simply no comparison between the delicious, nutritious, humanely raised egg from a farmstead where hens are allowed to forage on pasture versus the pale, bland egg from an industrial egg factory. Chickens also provide other benefits around the homestead, including recycling of kitchen scraps, rototilling the garden and pest control. Oh, and you can eat them, too.

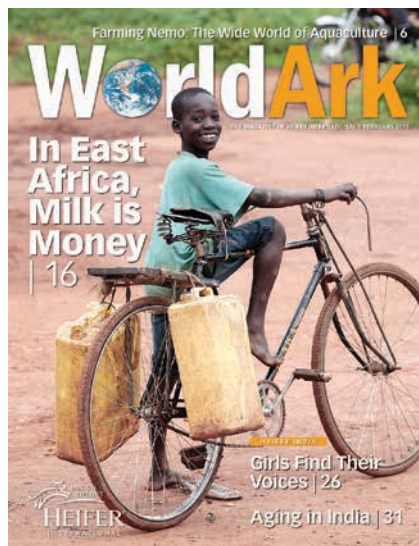
MARCIA STUCKI
Galesburg, Mich.

BODY POLITICS

I have long wondered how women in the Third World deal with periods. Two items that can be used for menstrual blood are The Keeper, a \$35 organic, reusable insert that can last a decade, and the sponge, which is simply a small sea sponge used like a tampon, but that can be washed for reuse. These two, used interchangeably, last for several years and cost next to nothing.

Both of these are cheaper than a lifetime of tampons and avoid the bleach-laden, non-compostable, one-time-use pads and tampons currently in use in much of the world.

Better still would be changing the entrenched, irrational attitudes about menstrual blood and women’s bodies. On the same page you mention women’s safety during toilet use: the odd



juxtaposition of disgust (menstruation) and desire (potential rape) deserves closer examination and reckoning.

G. HARRISON
Maybell, Colo.

I was very pleased to see the short article in *World Ark* about helping women with their periods in developing countries. I sometimes wonder how women in developing countries deal with this taboo topic, especially with issues like debilitating cramps and clotting. Thank you for the information on this important and often overlooked topic!

DAPHNE STOLTZFUS
Lancaster, Pa.

THE GIFT OF GIVING

I was interested in Austin Bailey’s article “Growing Kindness” (February 2013) with its emphasis on teaching children about need and helping them find ways to help. I thought you might be interested in what has proven to be successful with my eight grandchildren. Five years ago I told these grandchildren that I was going to increase what I spent for each of them for Christmas, but that the extra \$15 would go to buy an animal from Heifer with their combined \$120 total.

Their job that day was to look through the brochures I’d brought and decide together which animal they would give as their gift. After a lot of discussion, the vote was in favor of a goat. Each year since, we’ve followed the same pattern, and in December the Christmas tree bears a thank-you card to each child for the contribution toward an animal for a needy family. This has worked to remind even the teenagers that recognizing need and providing help is important in our family.

PATRICIA MILLER
W. Bloomfield, Mich.

GLASS HALF EMPTY?

The strategy listed in “Pouring It On” (February 2013) has been around for 75 years. Of course, it is good that this cooperative event is taking place. Better late than never. These countries have the technology to wage warfare, commit genocide and use agriculture as a weapon. You never read an article about the politics of corruption. Accomplishing these one-off success stories is admirable. But without structural change in these countries, is there any benefit to anyone except the lucky few?

GEORGE CLARK
Chicago, Ill.

Q&A MAY

Do people in the United States and other developed nations have a responsibility to respond when disasters strike in poor countries? Why or why not?

Email your answers to worldark@list.heifer.org. Please limit your answer to 250 words or fewer, and include the city and state where you live. We reserve the right to edit responses for length, clarity and grammar.

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Since 1944, Heifer has helped 18.5 million families in more than 125 countries move toward greater self-reliance through the gift of livestock and training in environmentally sound agriculture.

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I just finished reading your article on the East Africa Dairy Development Program ("Pouring it On," February 2013). It was very interesting and full of hope for a formerly hopeless people.

For the sake of the animals, though, I pray that East Africa does not follow the path of America's dairy industry. The suffering of most dairy animals is incomprehensible, besides the fact that a good portion of our milk is so full of chemicals and antibiotics that it isn't even healthy for us anymore. Maybe they can be taught to do as we say, and not as we do.

ROBYN PARKER
Arnold, Mo.

Q&A FEBRUARY

Do you think we in developed countries take education for granted? If so, how can that be changed?

The children in developed countries have taken education for granted for years. I have worked with Rotary Youth Exchange since 1999. Most of our kids have no idea why they even need to attend school. I believe it comes from the environment they are in, the media pushing the need for all the material possessions and the correct clothing to be cool, and disrespect for people and property. I know there are kids who see the importance of education, but they are the minority. I do not have any answers except for programs like yours. Adults and kids need to see and grasp the reality of life for too many people in this world. I would have every teenager go on exchange to poor areas anywhere in the world or be required to do some kind of work in any impoverished area. It will not happen overnight, but I

continue to have hope when I volunteer with teenagers.

JEAN HATHWAY
Janesville, Wis.

As a former upper grades teacher, I would have to answer a resounding yes, that we, especially our students, in developed countries take education for granted. My students were capable mathematicians and wordsmiths; they applied themselves to achieve high marks, but often without intrinsic motivation or a sense of purpose for their academic growth. I think we adults have focused so much on academic achievement that we have forgotten to help our students to understand why their education is important, and what roles we hope and expect them to play in society as adults, as beneficiaries of this education. How do we get our students to value education and engage more fully? Perhaps all schools should take a lesson from Berea College and utilize their concept of learning, labor and service. Students, especially fledgling adults in adolescence, need to feel useful, productive and responsible for more than their academic growth. They are capable of helping to keep their own environments clean and safe, and they are able to share their academic knowledge for the benefit of others. While schools may say that there is no time for this in the academic day, I would argue that leaving the element of real and substantive service work out of the educational program is just as detrimental as eliminating math or language from the curriculum.

K. RUSSELL
Sacramento, Calif.

We want to hear from you! Please send your comments to worldark@list.heifer.org. Include your name, city and a telephone number or email address. Letters may be edited for length and clarity, and may be published online as well as in print. Because of the volume of mail we receive, we cannot respond to all letters.

The Bumbling Detective



Here's another reason we need to solve the case of the disappearing honeybees, and fast. In addition to pollinating crops and sweetening our tea, bees can be instrumental in solving crimes. Palynology—the science of interpreting pollen and other microscopic residues—can help answer the questions of when and where. Traces of pollen in counterfeit drugs can tell investigators where the drugs came from. And pollen samples taken from paint or clay, examined to determine a date and place of origin, can tell us if a museum masterpiece is the real deal or a forgery.

SOURCE: ENVIRONMENT YALE MAGAZINE

1
JOB
CREATOR

Agriculture is the single largest employer in the world, providing livelihoods for 40 percent of today's global population.

SOURCE: UNITED NATIONS



ISTOCK

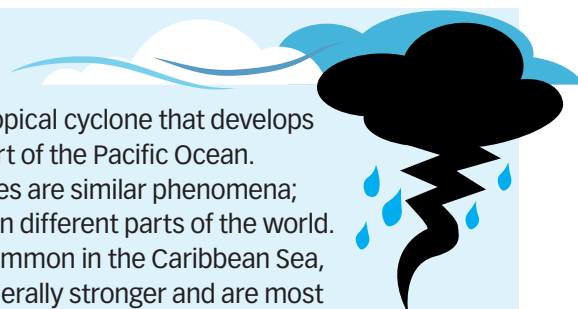
Don't Forget

AIDS and HIV get less press these days, but the number of people affected continues to grow. In 2011, 34 million people were living with HIV, and 1.7 million people were lost to AIDS-related deaths. That same year, 2.5 million new infections were reported. Sub-Saharan Africa suffered the most, with an infection rate of nearly 1 in every 20 adults. A number of Heifer projects worldwide aim to boost nutrition for people battling the deadly virus.

SOURCE: UNAIDS

Jargon

Typhoon: a mature tropical cyclone that develops in the northwestern part of the Pacific Ocean. Typhoons and hurricanes are similar phenomena; they simply take place in different parts of the world. Hurricanes are most common in the Caribbean Sea, while typhoons are generally stronger and are most likely to occur off the coast of Southeast Asia.



I Want to Know Right Now

The tough thing about statistics is that they change by the second. What is the population of the world? As of this moment it's 7,098,110,044. No, wait, it's 7,098,110,067. Now it's 7,098,110,111. See what I mean?

So what about now? Go to www.worldometers.info to find out. The page gives up-to-the-second numbers on population, economics, the environment, health and other important topics key to development.

200
MILLION

acres have been
snatched up since
2002.¹

THE NEW COLONIALISM

2/3

of land grab investors plan to export
what they grow.²

60%+

of land grabs occur
in regions where
people struggle to get
enough to eat.²



TOP LAND GRABBERS¹

governments, government-backed
companies, national and
international companies and
individuals, asset management funds⁴



MOST GRABBED COUNTRIES¹



70%

of the population of sub-Saharan Africa
lives on lands that are classified as
state lands, so government officials
sometimes believe they can simply give
the land away.³



\$1 PER ACRE PER YEAR:

going rate to lease land in
Ethiopia in 2008.³



Some land grabs are **outright
purchases**, but most are
long-term leases.⁴

The **number of land grabs** that have
been completed or are under way is
not known.

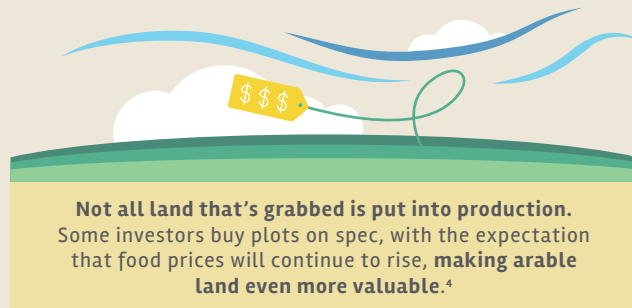
The World Bank identified

464 LAND
ACQUISITIONS

being negotiated between October
2008 and August 2009.



The **food price spikes** of 2007 and 2008 accelerated
the **rate of land grabs**.⁴



Not all land that's grabbed is put into production.
Some investors buy plots on spec, with the expectation
that food prices will continue to rise, **making arable
land even more valuable**.⁴



Sticking it to Cavities

If you failed to floss your teeth today, you're in good company. The regimen of brushing, flossing and visiting the dentist twice a year is a Western one, and in fact, most of the world doesn't follow it. Their lack of nylon bristles and fluoride doesn't necessarily mean their mouths are full of cavities, though.

A combination of diets devoid of sugar and processed food and the use of twigs and other time-tested tools for dental hygiene help many people in developing countries keep teeth and gums healthy.



Brushing teeth with twigs that have been broken, splayed and softened is common in many cultures, as are toothpastes made of mud, charcoal, ash and other readily available ingredients.

SOURCE: MOTHER NATURE NETWORK

Gardens To Go

Here's a clever idea brought to you all the way from Gideon village in Malawi, where women found a way to grow heaps of healthy greens right beside their front doors. Grace Banda, a 28-year-old mother of four, keeps a line of burlap sack gardens planted with cabbage in front of her house.

To make your own, you'll need a large burlap sack, gravel, a tin can with both ends cut out, potting soil and goat berries. If you're plum out of goat manure, compost works fine, too.

Step 1: Put the can in the bottom of the sack and fill it with gravel. Pour equal parts soil and compost around it, up to the top of the can.

Step 2: Slide the can up to the surface of the dirt, refill it with rocks and fill the area around the can with the soil and compost mix.

Step 3: Repeat step 2 until the sack is full.

Step 4: Cut staggered openings about 6 inches long along the sides, and plant seeds in the holes.

The cylinder of gravel inside the sack helps distribute and drain the water, ensuring that none of the plantings get too wet or too dry.



Goating for Broke

If you've got your backyard chicken care routine down pat, maybe it's time to think bigger. Adding goats to your yard is the next step. Keep in mind, though, that a well-kept goat can be pricey in the United States, and you must heed zoning laws. University of Minnesota Extension officer Laura T. Kieser says the per-doe cost of a keeping 10 dairy goats runs a bit more than \$1,000 per year.



Can Do

Here's proof that there are still good, novel ideas out there, waiting to be thunk. Blogger Priscilla Matuson of Egg Harbor Township, N.J., was surprised recently when she tried to donate canned foods for victims of Hurricane Sandy but found that many food banks won't accept them because the homeless people they serve don't have can openers. So Matuson started the Open Your Heart campaign to collect and distribute can openers. You can learn more and support her efforts by visiting her blog at glutenfreeveganmom.com.

Made in the Shade

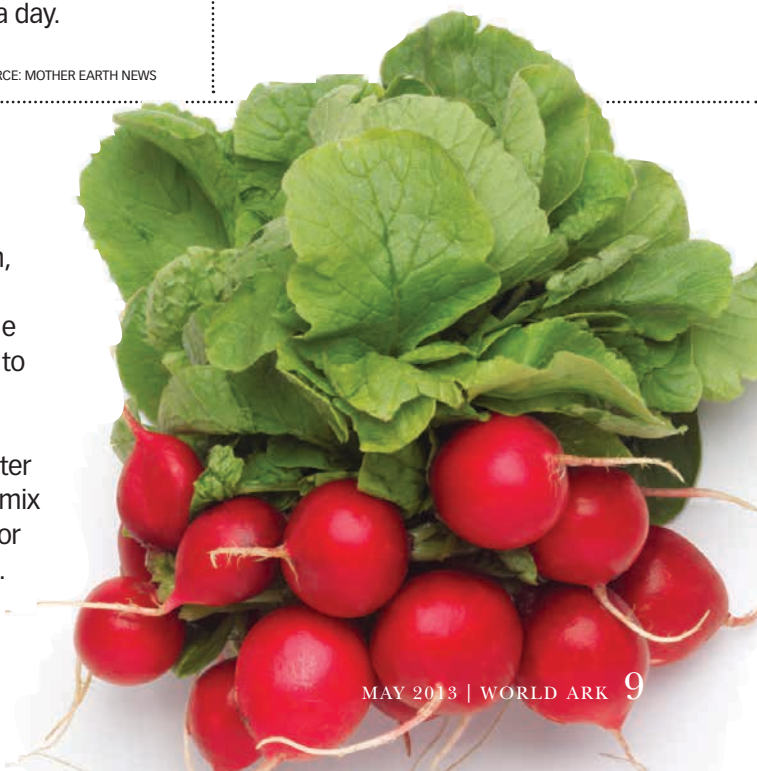
Dreams of bumper crops from a backyard garden are easily dashed when too much shade keeps plants from growing. Tomatoes, squashes and other fleshy, above-ground crops demand plenty of the sun's attention to thrive, but leafy vegetables and root crops can make due with just a few hours of direct light. Arugula, lettuce, spinach, mustard greens and mesclun can all get by with three or four hours of sun, while beets, carrots, potatoes, radishes and turnips will develop, albeit slowly, with only four or five hours of direct sunlight a day.

SOURCE: MOTHER EARTH NEWS

Ravishing Radishes

If you're ready to get a jump on harvesting in your garden, plant radishes. The genus that includes radishes is called *Raphanus*, Greek for "quickly appearing." These zesty little gems can be sown directly in the garden and will be ready to harvest in a month.

In addition to adding them to salads, you can slice radishes thinly and serve them the European way, with butter and salt on dark bread. Or steam sliced radishes until soft, mix them with salt and chili powder, and bake at 350 degrees for 20 minutes to make crunchy, spicy, super low-calorie chips.



ASKED & ANSWERED

Women's Rights

Former first lady Laura Bush and the fellows from the first class of the Bush Institute's Women's Initiative Fellowship Program ring the opening bell at the New York Stock Exchange on Feb. 21, 2012. Bush chairs the program that is helping Egyptian women to become leaders in their country.



PHOTO BY JODYE BOGHOSIAN



Bush Women in the Initiative for a Beacon Middle East

Former first lady Laura Bush chairs a program that unites and empowers Egyptians at a critical time for democracy and women's rights in their country.

By Annie Bergman, *World Ark* senior writer

With its fledgling democracy and tenuous support of women's rights, Egypt has commanded the Western world's attention since the Arab Spring riots shook the predominantly Muslim country in January 2011.

Since then, Egyptians have gained a powerful new supporter who is paying particular attention to their future: former first lady Laura Bush.

Advocating for human—especially women's—rights is a role that comes naturally to Bush, who throughout her tenure as first lady of Texas and then of the nation used her position to call attention to the issue both at home and abroad.

"After September 11 when the spotlight turned on Afghanistan and we saw women were left out—half of the population was denied an education and the right to work—what we saw was a failing country. We learned from that alone that if women are involved in the economy, countries have a much greater chance at succeeding," Bush said.

Now, Bush is chair of the George W. Bush Institute Women's Initiative, where she's focusing on the Middle East. She oversees the work of the Women's Initiative Fellowship Program, which in its second year is



PHOTO BY JOYCE BOGHOSIAN

The first four weeks of the Fellowship Program, or the “experience America” portion, saw the fellows visit places from Google’s headquarters in California to Goldman Sachs in New York. Here, seven of 14 women in the class stand outside the White House in Washington, D.C.

bringing together Egyptian women and teaching them how to effect real social change.

In early 2009 as the Bushes were beginning their lives after the White House, the former president called a meeting in Dallas that would shape what was to become the Bush Institute.

Charity Wallace, then an eight-year veteran of the Bush White House who served as Laura Bush’s director of advance, was present for the meeting, along with about 20 other senior officials, she said.

“It was an opportunity for the Bushes to think about the things they could spend the rest of their lives working on,” Wallace said.

During her time in the White House, Wallace had been on many trips with the first lady. It was during those trips that the two saw the importance of including women in a society.

“I traveled with her to more than 65 countries. I got to see the incredible policies that were put in place and the impact of those policies,” Wallace said. “That’s when I saw the importance of women and their inclusion in a society, the impact that that makes.”

As the Bushes defined the areas of focus for the institute over the course of early 2009—education reform, economic prosperity, global health and human freedom—they saw that women were integral to each area. Then, Wallace said, the president and first lady gave her a directive.

After naming her the director of the Women’s Initiative, “The president said to me, ‘Women will lead freedom and democracy in the Middle East. So, get on that.’ It was a huge



“If women are involved in the economy, countries have a much greater chance at succeeding.”

— LAURA BUSH

task and sort of daunting. How do you equip women to be effective leaders; have effective voices?” she said.

Her answers came from what she learned during her travel with the first lady, and also from research that suggested that a person’s network is a better indicator of his or her success than education.

Armed with that idea, she developed the Women’s Initiative Fellowship Program.

“The program I launched was supposed to be two women from 10 countries, but when I saw that research, I changed from two from each to 12 from one country,” Wallace said. “They would have friends who had shared experiences, which creates this multiplier effect. It makes them much more successful and more effective.”

Laura Bush agreed.

“We have friends from every part of our lives who are a part of our networks. But these women don’t have networks, and that’s the whole idea behind the Women’s Initiative,” Bush said. “We’ve really seen that with the first group of fellows. They all know each other now. When they went back [to Egypt] they had each other. They introduced each other to people and started to rely on each other for what they’re doing.”

“As goes Egypt, so goes the Middle East,” the adage says. And after watching the events of the Arab Spring unfold, that’s precisely why Wallace and Bush chose Egypt as the country where their fellowship program would start.

“[Egypt has] significant influence in the region, so we felt strongly that we needed to start there,” Wallace said. “It was a unanimous decision to start there.”

The selection process for the first class of fellows was intense. Wallace said the Bush Institute worked with

organizations on the ground in Egypt to identify potential candidates: the embassies and USAID, the American Bar Association and the World Bank, among others.

From that pool of women, those interested filled out an application, went through an interview process with a selection committee and were then invited to participate.

So in March of 2012, 14 Egyptian women who had never met flew to Dallas to begin the yearlong program Wallace and Bush created—two more women than they had anticipated. The women had backgrounds in the six most influential sectors of their country: education, health, business, politics, law and the media.

While in Dallas, under the tutelage of professors from Southern Methodist University, the fellows studied women in leadership. Each was given a mentor, Wallace said, who guided the fellows and held training sessions with them every other month.

During this time each woman created a personal action plan for the year, Bush said.

For the remainder of their four-week “experience America” portion of the program, the fellows met with women who run businesses traded on the New York Stock Exchange. They visited Goldman Sachs, Fox News and Google, and met with employees in the U.S. Department of State, the Broadcasting Board of Governors and at the National Archives. They also toured NGOs and other sites.

It was transformative for most of them, Wallace said.

Sara Galal, a member of the first class and creator of an online business called Sweet Heaven that helps parents and children communicate, agreed with Wallace’s assessment of the program’s impact.

“I returned to Egypt after the program equipped with many skills that helped me to take a big step in my life, which was opening my own startup. Leadership, communication, networking and setting smart and clear goals all are skills we



"Our goal and our hope is that we create a broad network across the Middle East of women who are educated and who advocate for education for women and girls."

— LAURA BUSH

acquired during the program and had a huge impact in my life," she said.

And while neither Bush nor Wallace knew it at the time, helping these women create networks would prove beneficial.



After Hosni Mubarak was ousted as president in February 2011, there was widespread optimism among Egyptians. That feeling remained through the first part of 2012 as Egypt elected a parliament and began writing a constitution.

The fellows were encouraged and sustained by their country's future.

"They were so optimistic about the future of Egypt. Their voices were finally heard. They were excited about democracy," Wallace said.

Bush, too, noted the fellows' bravery in pursuing the program with the political stability of their country uncertain.

"These women are brave women. Many of them are married and their husbands were very supportive of them having the opportunity to work on their own lives," she said.

While the fellows were making inroads into business and government in their home country during the fellowship program, the shift into democracy began hitting significant snags.

Work on the constitution was halted, restarted and then boycotted by part of the constitutional assembly. The new president, Mohamed Morsi, then pushed through a

constitution that would strip many people of their rights—women especially.

Bush reiterated that the women of both the first class of fellows, and those of the incoming class who began programmatic work in March, showed unwavering resolve.

"I know they're worried," the former first lady said. "They want to make sure that the rights of women and men are guaranteed."

Bush said the current state of Egypt is concerning, but that the Women's Initiative and the fellowship program won't cease work just because of instability.

"We want to make sure the Egyptian fellows aren't somehow jeopardized," she said. "When the last group went back they were detained at the airport, but they got home. It is a worry working any place in the Middle East."

While the new government has had a rocky start, it's important to give the people and the new system time to adjust, Galal said.

"Looking back on the Egyptian history, Egyptians are strong and they always proved that they are free people," Galal said. "Giving the current elected party an opportunity to complete their ruling period is a must and part of the democratic process. I have much hope in Egypt."

For now, Wallace and Bush are concentrating on seeing the second class of 21 fellows through the program and are reveling in the success that the first class has found, even within a confusing and frustrating political climate.

Each woman has accomplished so much, it's hard to pick out who has had the most impact in her home country, Wallace said. Along with Galal, Wallace named Azza Koura as one of the fellows making notable impacts.



PHOTO BY ERIC DRAPER



PHOTO BY ERIC DRAPER

Sara Galal (left) speaks during a visit to Google. Galal launched her own startup in Egypt and was recently named Entrepreneur of the Week there. Three other fellows (right) enjoy a break on the Google campus.

“One of them, a fundraising professional, hosted a conference and raised over \$30 million for a children’s hospital. She was very successful,” Wallace said of Koura.

Another was Namees Arnous, who now owns her own media company, Bokra Media.

“One of them was a television personality, a journalist, during the revolution and was told to disseminate false information. She chose not to and quit. [Arnous] started her own news organization online. She covers all of the protests, the legislative issues and the news out of Egypt. [Arnous’] real proposal is to create a women’s talk show that highlights women and the different issues that are relevant to them,” Wallace said.

The program allowed them to find their voices and become more vocal, Wallace said. And that’s getting the women one step closer to her and Bush’s goal for them.

“Our real goal is for them to lead this democracy movement,” Wallace said. “Whether it be through youth development, or through media organization, or through law, or if they run for office, those are the different things that they can do.”

As the program continues, Bush and Wallace both envision reaching women in other Middle Eastern countries, they said.

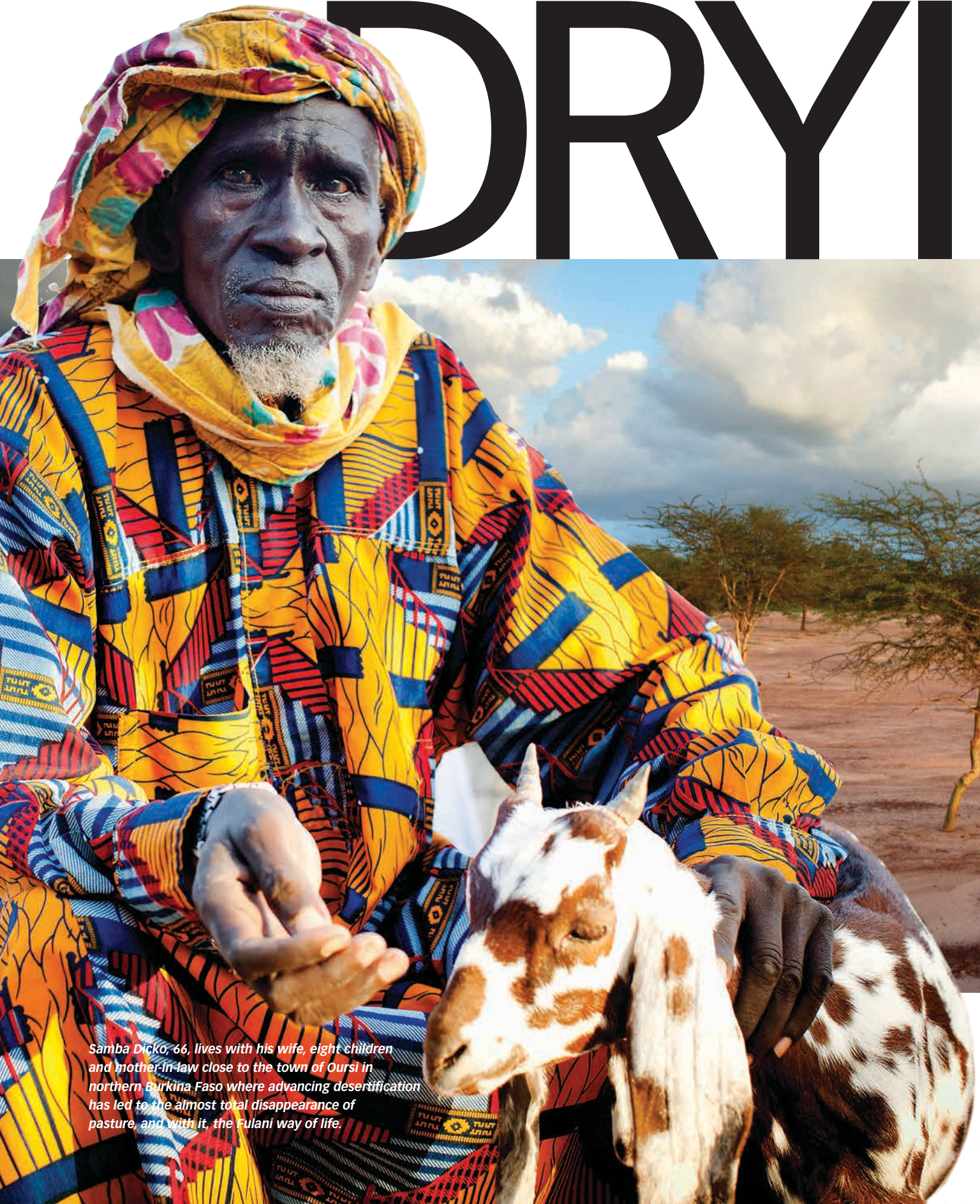
The second class of Egyptian fellows will help expand the networks already being created by the first class, Wallace said. After Egypt, Wallace said the Women’s Initiative would look to neighboring countries like Iraq, Tunisia, Jordan and Kuwait for expansion of their program.

Wallace said there could also be a third class of Egyptian fellows, though, depending on what unfolds there in the coming year.

Bush agreed that the Women’s Initiative advisory board wouldn’t make any decisions about where to work next in the immediate future, though the goal is to reach as many Middle Eastern women as possible.

“It’s important to have women’s voices at the table. A broad network empowers women and gives them more of a voice,” Bush said. “Our goal and our hope is that we create a broad network across the Middle East of women who are educated and who advocate for education for women and girls, who advocate for women’s rights along with the rights of men.” ■

DRY



Samba Dicko, 66, lives with his wife, eight children and mother-in-law close to the town of Oursi in northern Burkina Faso where advancing desertification has led to the almost total disappearance of pasture, and with it, the Fulani way of life.

NG UP:

A photograph of a dry, open landscape, likely a savanna or steppe in West Africa. The ground is reddish-brown and sandy, with sparse green vegetation. Several acacia trees are scattered across the scene, some in the foreground and others in the distance. The sky is filled with large, white, fluffy clouds, with some darker patches of blue visible. The overall atmosphere is one of a dry, open environment.

Pastoralist Way of Life Disappearing in West Africa

By Jocelyn Edwards, *World Ark* contributor

Photos by Anne Ackermann

WRITER JOCELYN EDWARDS AND PHOTOGRAPHER ANN ACKERMANN TRAVELED TO BURKINA FASO FOR *WORLD ARK* TO INTERVIEW PASTORALIST FULANI FAMILIES ABOUT HOW THE CHANGING CLIMATE AFFECTS THEIR LIVELIHOODS. WE INTERVIEWED THESE FAMILIES TO SHOW THE CHALLENGES PASTORALISTS IN THE REGION FACE. THOSE INTERVIEWED ARE NOT A PART OF A HEIFER PROJECT, AND NONE OF THE ANIMALS DESCRIBED OR PICTURED ARE HEIFER ANIMALS. HEIFER ALREADY WORKS IN THE SAHEL COUNTRY OF SENEGAL, PROVIDING SHEEP, GOATS AND POULTRY AND TRAINING IN HOW TO ENSURE THERE IS ENOUGH WATER FOR FAMILIES, ANIMALS AND CROPS. SEE “HEIFER INTERNATIONAL IN THE SAHEL” ON PAGE 19 TO LEARN ABOUT HEIFER’S PLANS TO HELP MORE FAMILIES IN THE REGION.

DJIBO, BURKINA FASO—It’s at the meeting point of the savannah and the Sahel, just steps from the beginning of the red dunes that stretch north from Burkina Faso into Mali, that Samba Dicko, 66, lives with his wife, eight children and mother-in-law. Of the nomadic pastoralist Fulani ethnic group, they are one of the last families of one of West Africa’s largest tribes remaining in the area.

Others were driven away by the advancing desert and the disappearance of pasture. But the family remains here, they say, because they don’t have anything worth saving.

“Animals are dying all the time now, not just in the dry season,” Dicko said. His bright orange robes covered in geometric patterns belie his family’s poverty. Over the past five years, they lost all but two of their 70 cattle: 40 were lost to drought and disease, the others sold to buy food for the family.

For centuries, nomads like Dicko followed the rains across West Africa, sometimes moving hundreds of miles to find pasture to feed their herds, and when conditions started to get tough in Burkina Faso, the family went to Mali. But there, they found the same problem—too many people and not enough pasture.

It’s the result of a string of recent droughts in the Sahel, the transition zone between the Sahara desert and the tropics of sub-Saharan Africa that the United Nations’ Environmental Program (UNEP) has dubbed climate change’s “ground zero.”

Winding north from Burkina Faso’s capital, Ouagadougou, trees dried bone-white start to appear and the patches of red dust blown in from the desert get wider



and wider; they are the signs of a lowering water table and increased soil erosion.

Precipitation in the area is down. In recent years, Dicko watched the waters of the Mare d’Oursi, a shallow lake nearby, recede to the point where it is little more than a swamp. “Before, if you came here, you would find hippopotamus, elephants and hyenas: many wild animals. But today, there is nothing,” he said.

Climate change in the Sahel is impoverishing Fulani like Dicko and threatening their way of life.

“We are suffering a lot. For us Fulani, we don’t know any other way besides keeping animals: cows, goats and sheep. This is our work,” said Dicko, who is left with only five goats and some chickens, which he is selling off one by one to buy food. After the goats are gone, “(Only) God will help me.”

HOT ZONE

Stretching in a band across Africa from Senegal in the west to Sudan in the east, the Sahel region is tagged by scientists and environmentalists as one of the world’s global warming hot spots. Its location south of the Sahara and the dependence of its people on agriculture and livestock renders it particularly vulnerable to climate variability.

And while people in many parts of the world peer into the future trying to determine what the effects of a warming world will be, in the Sahel, its first consequences are already being felt. Precipitation dropped between 29 percent and 49 percent in the region between 1968 and 1997, according to the International Panel on Climate Change.

In Burkina Faso specifically, a United Nations



Where the savannah meets the Sahel desert close to the town of Oursi, sand dunes start stretching from northern Burkina Faso into Mali. Former pastures have dried up, and the Fulani livestock are dying. The Sahel desert is one of the world's global warming centers.

Environment Program report revealed a temperature increase of between 0.5 degree Celsius and 1 degree Celsius from 1970 to 2006. The country also experienced an increase in extreme weather. Within the years of the study, most areas of the country suffered seven or eight floods.

"The old people say there are phenomena (they) have never seen before," said Dabire Koffi Emmanuel, the director of the department of environment and sustainable development for Burkina Faso's Oudalan province, a predominantly pastoralist zone.

The area he oversees experienced an increase in sandstorms, droughts, floods and freak weather events. "Last Wednesday evening, it (hailed). It knocked down gates and bushes and pierced three people. The old people said that they had never seen this before. We just told them it was climate change," Emmanuel said.

For the pastoralist Fulani, climate change represents a particularly acute threat. As a minority in every country they inhabit except for Guinea, they already occupy a precarious position at the margins of society.

While in theory, the areas in northern Burkina Faso are set aside for pastoralism, in practice, this policy is rarely enforced, and recent years have seen significant encroachment by agriculturalists into formerly pastoralist zones.

As Burkinabe professor Issa Diallo stated in a report for the International Working Group for Indigenous Affairs, "The nomadic pastoralists have absolutely no land security at all, in a rural environment in which land conflicts are becoming increasingly common and ever more violent."

Heifer International in the Sahel

Last year, after yet another food crisis threatened the people of Africa's Sahel region, Heifer International made a decision to intervene on behalf of the smallholder farmers and pastoralists who have made this area their home for centuries.

Heifer already works in Senegal and northern Ghana, part of the Sahel region that has been so hard hit by climate change and drought. Now, Heifer plans to expand its reach into this region that stretches across the African continent between the Sahara desert to the north and the sub-tropical areas to the south.

"We're shifting from the more coastal areas to the more arid areas," said Elizabeth Bintliff, Heifer's vice president for the Africa Program. "We'll be working with these communities to mitigate the effects of climate change on their livelihoods."

Heifer's model in the Sahel will be based on a successful project implemented in agro-pastoralist communities in Kenya about eight years ago. In the Sahel, Heifer will work with smallholder sheep and goat farmers to ensure access to forage and fodder, to fresh water and to markets for the hundreds of thousands of animals sold across national borders within the Sahel.

Heifer will help establish holding facilities, or hubs, that will serve as places where farmers can take animals to be counted, tagged, vaccinated, fed and fattened for market. Increased domestic animal production will make sheep and goat meat more accessible and affordable for poor local consumers and also improve market infrastructures in these countries, boosting economies, said West Africa Regional Director Rashid Sesay.

Heifer will also help pastoralists properly utilize land they need for their animals to thrive, and the markets where those animals can be sold.

Heifer is only beginning its work in the Sahel, Bintliff said, but the work will continue until a system is in place that works for the farmers of West Africa.



Malnourished cows (top) are a sad reminder of the dire conditions created by climatic changes. The cows are not Heifer animals. Young Fulani boys (right) care for goats from an early age so that traditional pastoralist knowledge is passed on to the next generation. Portrait of a Fulani boy (above) with traditional ritual scars on his forehead.

LIVELIHOODS LOST

It's a situation that has Dicko Boubakary worried. He's the *amiru*, or elected chief, of Djibo, a town in northern Burkina Faso with one of the largest populations of Fulani in the country.

"My father lived like this, my grandfather lived like this," he said. "If we don't take precautions, (pastoralism) will disappear."

He's dressed in white robes and a black turban, sitting in the small receiving room at the front of his house. Above his chair are photographs of him with the suit-clad politicians in sparkling halls of the capital's modern buildings. But here at Boubakary's home, the scene is more rustic. Goats and sheep periodically wander past into the courtyard, an indication of the tight bond between these people and their animals. "A Fulani can die for a cow. If a cow is sick, he will do everything that he can and when a cow dies, it is almost as if a person has died," Boubakary said.

It's difficult to overstate the importance of the cattle to the Fulani, who do not kill their cattle unless the animals are sick and even then, rarely eat their own cows. Once a cow is dead, however, they use all its parts—the fat to make soap, the horn as a container and the hooves as an ornament.

A Fulani family can subsist on the milk of one cow alone for months at a time. "If I don't have milk, I feel that I haven't eaten," Boubakary said.

But in recent years, many of Boubakary's constituents have seen their herds disappear, one by one. Among those constituents is Amadou Dicko, who sits in the shade at the edge of Djibo's weekly cattle market. The 55-year-old man lost eight cows in last year's drought and has been forced to sell 10 others this year to buy food. "When you take a cow to market, it doesn't feel good. It's a part of yourself you are giving to someone else," he said.

But the Fulani's attachment to their cows isn't just sentimental. A pastoralist's herd is his bank account, representing his capital for paying all his family's future expenses. Sitting in the dust outside her family's house of sticks, Djenaba Diallo, 80, looked up from the ground only long enough to explain that drought and disease have consumed all but four of her 160 cows. With the loss of their cattle, "the wealth that the Fulani had has disappeared. People are becoming poorer and poorer," Diallo said. "Maybe the young people will have to learn to cultivate," she speculated.

But farming isn't easy in this harsh Sahelian climate,



Dicko Boubakary sits in the reception hall of his house. He is the amiru, or elected chief, of Djibo in northern Burkina Faso, the town with one of the largest populations of Fulani in the country.

Boubakary said. "There are years when it doesn't rain at all."

And climate change promises to make farming an even less viable strategy in a region where at least two countries are predicted to lose their agricultural industries in the next 100 years. A 2000 Yale University study, *Climate Change Impacts on African Agriculture*, forecasts that rain-fed agriculture will disappear entirely in Chad and Niger by 2100.

SURVIVAL STRATEGIES FAILING

Migration used to be the coping mechanism that allowed the Fulani to survive in harsh conditions. It's a strategy that is starting to fail them.

On his wall, Boro Sidi, the head of the department of pastoralism in the province of Oudalan, has a map showing the historical migratory routes of the Fulani. The nomads used to roam north to Mali and south to Togo and Ghana.

“If things weren’t going well somewhere, they would entirely change villages. But now it is almost the same everywhere,” Sidi said.

Throughout the region, successive years of drought have led to the widespread death of cattle, stillbirths and reduced milk production, Sidi said. The result is widespread famine.

“It has now been three years that food has been a problem. Each year, the government has to take measures,” Sidi said.

Major droughts occurred in the region in 2005, 2010 and 2012. The food crisis in 2012 resulted in 18.7 million people going hungry, according to the United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA). In Burkina Faso itself, a season of bad rains was compounded by an influx of refugees fleeing the political crisis in Mali.

Milk used to be a necessity in the Fulani diet, a daily staple. Today, it is scarce.

The changing climate is also increasingly bringing the Fulani into competition with their farming neighbors. In Ghana, clashes between Fulani pastoralists searching for grazing land and farmers led local media to label the nomads “the Fulani menace” and call for their expulsion. Meanwhile, in Burkina Faso itself, at least 25 Fulani

herders were reported killed by Dogon farmers along the border with Mali in May 2012.

While pastoralists are pushing farther into farming areas, farmers searching for productive land are moving into historically pastoralist zones. “The earth is becoming more and more tired. (Farmers) are now moving like pastoralists,” Sidi said.

PLANTING HOPE

With rising temperatures, mass livestock deaths and threats from outside groups, it’s not surprising that there is a rising sense of anxiety about the future among many Fulani.

“When we were children, if people had said that (these changes would occur) we would have said no, that will never happen,” said Dicko Amadou Hamadoum, the chief of a village just outside of Djibo.

Faced with a problem climate experts say was created oceans away by people living lifestyles they cannot fathom, despair would be a natural response. But some Fulani are trying to find solutions.

“The experts have told us that trees can help the rains to come,” Hamadoum said. He strides toward the gate of a small plot of land just outside the village, his dark green robes billowing behind him. Behind a locked chain-link



A girl carries a bowl of milk (above). Together with millet and meat, milk is the staple food of the Fulani. Due to the climatic changes and the decrease in livestock, milk is becoming scarce and Fulani people say they have started eating food without milk. A Fulani man (right) sits in front of a traditional grass mat house, which is called a suudu cekke.





Dicko Amadou Hamadoum, the chief of a village just outside of Djibo, tends his garden in the middle of the desert. Over the past six years Hamadoum has planted 700 trees donated to his village by international NGOs. Lately, only three of the 17 wells in his area have water during the dry season. Hamadoum hopes reforestation will restore the water supply.

fence is a small forest—a verdant stand of trees in the middle of the bush.

Over the past six years, Hamadoum planted 700 trees donated to his village by international NGOs. Lately, only three of the 17 wells in his area have water in them during the dry season. He’s hopeful that reforestation will restore the water cycle.

Hamadoum wants others to follow his example. “If many trees are planted, it (may) stop the climate from changing,” he said.

Elsewhere, there are other efforts. Observing the disappearance of the ancient baobabs and other species of trees from the landscape, Fulani in the village of Petoye appointed a six-member council to prevent further deforestation.

“We decided to appoint this committee because we saw how many problems we had and how the forest was being destroyed,” said Hamadou Amadou, the village leader.

The committee fines people for cutting down trees or

letting their animals eat them. “If you cut down a whole tree, you must pay 50,000 *francs* (\$100).”

The efforts might seem small against the backdrop of global climate change, but Hamadoum hopes that they will go some way toward making the environment more livable for him and his people.

“This is the place that I’m from. If I make it a good place, it will help me and other people,” he said, standing in the middle of his desert Garden of Eden. It’s the rainy season, and behind him a small seasonal stream is flowing. “To say it is the will of God and do nothing will only make it worse.” ■

Jocelyn Edwards is a freelance journalist who has been based in Kampala, Uganda, for the past three years. She has written for Reuters, the Toronto Star, The Daily Beast and other international outlets from around East Africa. You can read more of her writing at jocelynedwards.com.

A woman with short dark hair, wearing an orange and black t-shirt and blue shorts, stands in a desolate, debris-strewn area. She is looking off to the side with a somber expression. In the foreground, a light brown dog lies on the gravelly ground. The background is filled with the wreckage of a building, with wooden beams and corrugated metal sheets scattered around. A large, gnarled tree trunk stands to the left of the woman. The scene is brightly lit by sunlight, casting shadows on the ground.

SALVAGE



ING HOPE

IN THE AFTERMATH OF DEADLY TYPHOON BOPHA, HEIFER INTERNATIONAL WAS QUICK TO MOBILIZE RELIEF EFFORTS. DRIED FISH, ROOFING IRON AND OTHER SMALL OFFERINGS BROUGHT IMMEDIATE COMFORT AFTER THIS UNPARALLELED STORM, BUT THE PEOPLE KNOW IT'S HEIFER'S COMMUNITY-MANAGED DISASTER RISK REDUCTION TRAININGS THAT WILL PREPARE THEM TO FACE FUTURE CALAMITIES.

BY ANNIE BERGMAN, *World Ark* senior writer
PHOTOS BY NACHO HERNANDEZ





SAYON, PHILIPPINES—The wind woke Noel Apan at 4 a.m. on Dec. 4. It was unusual, he thought. Still, he didn't worry. Typhoons hit farther north. There was no need to wake the family.

The weather service probably had it wrong, Apan told himself, remembering the warnings issued days before. Other villagers said that a typhoon hadn't reached Sayon in 80 years.

Even if this were such a storm, surely it wouldn't move this far inland. So he sent text messages to family throughout the village joking about its severity. "How's the wind?" Apan's tongue-in-cheek messages read.

In seven hours he would be homeless.



Typhoon Bopha made landfall on the southern Philippine island of Mindanao late on Dec. 3, 2012, just hours after the sun set on what was said to be an unusually beautiful day.

The Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) had predicted a signal 3 storm for inland Mindanao, or a typhoon with wind speeds between 62 and 114 miles per hour.

But Bopha, or Pablo as it was named locally, packed sustained winds of 161 mph, making it a super typhoon—equivalent to a Category 5 hurricane on the Saffir-Simpson scale used in the United States.

Though the cyclone did lose punch as it moved inland from the southeast, it displaced more than 1 million people and killed more than 1,000. Nearly 1,000 more people remained missing three months later, many of them fishermen who were out at sea as the storm closed in on the island nation.

In the U.S., news coverage since the typhoon has focused on the badly hit Compostela Valley, just north and east of where the storm came ashore in Davao, where landslides trapped and buried many.



Typhoon Bopha's track (above) tore straight through the Santa Josefa region of Mindanao. What trees weren't toppled by the typhoon were left bent and broken. Fields were flooded and homes ripped from their foundations (left).

But in Sayon, along with the other villages that make up the Santa Josefa region slightly north and west of the Compostela Valley, the storm stripped the hillsides of mahogany, palm and mango forests, swamped villages and surrounding rice fields, decimated cash crops like oil palm and bananas, and left thousands with gaping holes in walls and roofs. Others were left with no home at all.

Nearly 400 families involved in Heifer projects here lost all or part of their homes, and many lost livestock. More than 250 pigs and 90 goats died in the storm, and farming families saw more than 1,000 acres of rice, corn and banana lands ruined.

The damage to Heifer projects was estimated at \$550,000. In the Santa Josefa area, damage just to Heifer beneficiaries' property was estimated at nearly 28 million Philippine pesos, or \$69,000.

The average Filipino small farming family makes about \$400 a year.



Downed trees dammed the Agusan River near Sayon, causing it to change course and flow through hundreds of acres of rice fields. Above, a man drives into the river on a muddy track that was once one of two roads into the village.

"WE STOOD THERE HUGGING IN THE RAIN AND WIND,
NOT KNOWING WHAT TO DO. WE JUST SAID GOODBYE
TO THE HOUSE AND KNEW IT WAS A GOOD DECISION TO
LEAVE. IN JUST A SECOND, THE HOUSE AND ALL OF THE
THINGS INSIDE OF IT WERE UPSIDE DOWN.
WE WERE THE ONLY THINGS THAT MADE IT OUT."
—NOEL APAN



By 7 a.m., the wind was howling. It was clear to Apan that he was wrong. This had to be a typhoon.

The entire house was awake by then, including his wife, Rosalyn, his two children and two brothers, and they were getting scared. None of them had experienced winds like this. Flash floods are common, but the combination of the wind and rain was terrifying.

That's when Apan went to work. He had been one of the lucky members of a Heifer pig project to receive Community-Managed Disaster Risk Reduction (CMDRR) training designed to help families in this exposed island nation mitigate damage in the face of natural disasters.

Apan gathered every piece of furniture in his small wooden-slatted home in the main living area. He put their table on top of the pile and told the family to huddle underneath.

"I did this in case the house collapsed," Apan said. "I knew we wouldn't be trapped. We would be safe there."

And there they sat, hugging, worried, scared, but mostly silent, waiting for the storm to pass.



Aware that the country was prone to a variety of natural disasters—tropical storms, volcanic eruptions, floods and landslides among them—Heifer International had already identified the Philippines as its number one country for concern.

About four years ago, Heifer Philippines staff began implementing training in local projects to address disaster preparation. Participants were taught how to secure livestock and feed, to harvest crops for food and to secure water and firewood. Project members identified evacuation centers



and were also taught how to safeguard important papers, education materials and cash.

But the projects in the Santa Josefa region—like the one Noel Apan is part of—are newer projects, and only two of the 16 Heifer self-help groups had received the CMDRR training, said Forcep de la Torre, Heifer Philippines program officer for Mindanao.

"The day most of these families were supposed to have the training is the day Typhoon Bopha hit," de la Torre said.

The two self-help groups that did receive the training learned many of the same things that Heifer implemented with groups in older projects farther north.

Hermie Evangelio, a local government leader, explained that the Sayon groups first identified the primary hazards facing the area. Since no



one in the region could remember experiencing a typhoon, such storms weren't included in their planning, he said.

It was determined that floods were the primary hazard, with landslides a secondary threat. The community helped map the area to identify which households were the most vulnerable. As the only two-story building, the school was designated the evacuation center. A boat was reserved for water rescues as well.

But no one could have prepared for a storm of this strength, Evangelio said.

"All of our learnings from the CMDRR seminar were not applied because we were shocked," Evangelio said. "We were ignorant about typhoons. We ignored the warnings. It was hard for us to help our neighbors because we didn't know what to do. The one who was supposed to be responsible



For three weeks following the storm, Noel Apan and his wife, Rosalyn, (above), lived under tarps and among the possessions they were able to save from their house. Local government official Hermie Evangelio (left) said the people of Sayon lack basic necessities after the typhoon.



Members of 16 Heifer self-help groups came together 14 days after the typhoon to pack relief supplies. Almost every Heifer family shared food with other community members not involved with Heifer.

for the rescue had to be rescued. How could we help?" he said.



Apan's furniture shelter kept the family safe for three hours.

"About 10 a.m. the whole house started moving. It actually shifted about three feet on its foundation," Apan said. "We were inside, still under the table. We started to panic. I managed to keep calm and relax everyone."

What the family didn't know was that a mango tree bowing to the winds was leaning heavily on a drop wire from the electric lines that came through the wall. As soon as the house was pulled several feet by the falling tree, the family knew they had to leave.

"We decided to leave the house, but the door wouldn't open. We had to push on the wall to get out," Apan said.

Seconds after all six of them had squeezed through an opening in the wall, the entire structure was lifted off the ground and flipped as one complete piece—a combination from the force of the tree pulling the drop wire to the ground and the gusts of wind.

"We stood there hugging in the rain and wind, not knowing what to do. We just said goodbye to the house and knew it was a good decision to leave," Apan said. "In just a second, the house and all of the things inside of it were upside down. We were the only things that made it out."

Apan said he looked for anything to protect the family from the strong winds and pounding rain. He saw their bamboo loveseat sitting in a field, so he retrieved it from the swamped land and brought it back to the concrete slab. Almost as soon as the family sat down, the wind picked up the couch along with all six family members.

"It was just terrible," Apan said.



While scientists agree that it's impossible to blame one extreme weather event on climate change, rarely has such a storm hit as far south in the Philippines and with as much strength as Bopha.

Still, the Philippines experiences an average of 20 typhoons a year, but the season for these storms is typically between June and October. So a December typhoon with 160 mph winds is certainly unusual.

Greg Holland, a hurricane expert with the National Center for Atmospheric Research in Boulder, Colo., explained that rising ocean temperatures have "provided more energy that is available over longer periods for intense storms to develop."

Naderev Sano, the Philippines' chief climate negotiator, said at the Doha Climate Change Conference just days after the typhoon that he is concerned warming atmosphere and ocean temperatures could lead the people in the Philippines to only become more familiar with these highly destructive storms.

Holland validated Sano's concern.

"The proportion of intense systems is expected to increase substantially with climate change," Holland said. "The Intergovernmental Panel on Climate Change and World Meteorological Organization have both indicated this as a likely outcome and recent research by us has indicated that there already has been a substantial increase."

As for what governments and aid agencies can do to help people prepare for storms like Bopha, Holland said advance preparations of any kind, like Heifer's CMDRR training, is a necessity.

"I would say that there is no reason to believe that conditions will improve, so any planning and care taken now will be a good investment in future well-being," he said.



When the wind finally died down about 11 a.m., Apan and his family started to look for concrete homes where they would feel more secure. They saw their neighbors' home still standing about 300 yards away and decided to head there.

The family set off, but Apan was worried about his pig from Heifer, which had been left in its pen near the house. Apan went to see about the animal. What he found surprised even him.

"I saw the pig swimming, so I picked it up. She became an evacuee with us," he said.

By the time the family reached the neighbors it was nearly noon, and the family realized they hadn't eaten.

"We hadn't eaten breakfast or lunch. The neighbors fed the children about 1 p.m. but we couldn't eat knowing what had just happened to our home," Apan said.

Apan's wife, Rosalyn, convinced him to try to make it to the town center. She was worried about the daycare where she worked as a teacher and also about her 59-year-old mother.

Trudging through debris-filled floodwaters that reached to his waist, Apan left his children with the neighbors and went to find Rosalyn's mother and check on the daycare center. The daycare building's roof had peeled off in part, and books and supplies inside were water-logged.

Rosalyn's mother was fine.

"The scene was awful to watch," Apan said. "My wife was crying. I saw people evacuating their houses to the school, but the roof of the school was sagging under the weight of the rain and they were afraid of the ceiling collapsing. The people who had escaped the rising waters to the second floor were streaming to the first floor even though it was full of water."

After learning that everyone they knew was safe, the couple returned to the neighbor's home where they had left their children and Apan's brothers. They collected tarps and waded back through the floodwaters to where their home had stood only hours before.

They set to work tying the tarps to trees. The family lived under these makeshift shelters for the next three weeks.

"The most important thing was that everyone was OK," Apan said.



Immediately after the typhoon, Heifer and its partner organizations went to work assessing the damage to projects.

On Dec. 9, five days after Bopha, Heifer approved \$50,000 in disaster rehabilitation funding to help provide short-term food relief and materials to repair homes and a feed mill, such as tin for the roofs and raw feed ingredients for surviving animals.

While Heifer focuses on long-term solutions to immediate problems like hunger and poverty, it was clear that without relief supplies families affected by the typhoon might not recover enough to become resilient to future disasters, de la Torre said.

While Heifer and partner organization HEED were collecting roofing and feed mill supplies for distribution, word of the damages reached other Heifer communities in neighboring provinces not damaged by the storm.

In just 10 days, Heifer was able to provide each family with 12 pieces of corrugated iron roofing, one 100-pound sack of rice, two pounds of dried fish, 11 pieces of assorted canned goods and 16



Florita San Miguel (above) finds hope in the piglets that were born just days after the typhoon.

sachets of instant coffee. The food was intended to last 30 days.

“All the supplies came from neighboring communities,” de la Torre said. “And it was volunteers from affected families who came and helped pack the sacks of supplies.”

Then the rebuilding began in earnest.

The 366 Heifer families were divided into groups of five. These groups then got together to pool food and to help one another rebuild their homes. The Heifer families also took it upon themselves to divide the food among neighbors who weren’t involved in Heifer projects, de la Torre said.

They made schedules based on need to determine which homes to rebuild first. The rebuilding also depended on whether families had resources or the funds to buy those resources for their new homes.

It was during this time that families took comfort in one another and began focusing on the few positive stories they could find.

Florita San Miguel lost her home, but spent the first three days after the typhoon monitoring the sow she received from Heifer. The pig was

pregnant and stressed, she said, and she wanted to ensure the sow had a successful birth.

And though she’s facing hardships beyond any she’s known, San Miguel said she now finds hope in the seven piglets that were born just three days after the typhoon.

“It’s crisis for us right now. We’re depending on donations for food,” she said. “But the pigs have helped so much.”

Still, most families here depend on cash crops for the majority of their income, and most experts indicate that it will take years—two years for banana plants, three to five for rubber trees and up to 10 for palm and coconut trees—to regrow the plants to a degree where these families can begin earning money from them.

The government has said it will support the families by providing seedlings of cash crops, and in the meantime will provide rice and corn seedlings to replace the crops that were lost in the typhoon and the flooding.

Beyond the relief that Heifer gave, assessments are still being made for how to help families fully recover from the storm as emergency food supplies quickly run out.

"IT'S CRISIS FOR US RIGHT NOW. WE'RE DEPENDING ON DONATIONS FOR FOOD. BUT THE PIGS HAVE HELPED SO MUCH."

—FLORITA SAN MIGUEL



Apan and his family lived in a tent and under tarps until Dec. 26, working by day to salvage any materials they could from their old home.

He and his brothers were able to save about 75 percent of the wood and other materials from his home. Apan sold two piglets that his sow had shortly after the storm for \$231. He used that income to buy an additional eight sheets of corrugated iron to add to the 12 pieces that Heifer provided, and to pay for the carpenter he hired to rebuild his family's home. The total cost to rebuild the structure was about \$25. He saved the rest to pay for his children's schooling.

Apan says he knows he wouldn't be in this position without Heifer and sees many of his friends and neighbors still struggling.

"The neighbors are really discouraged about life. When it comes to their homes, their houses, they're passive about it because they can't afford to buy the lumber," he said.

Evangelio echoed Apan's assessment.

"Their basic needs aren't being met. All of the cash crops are gone. These families have no source of income," he said.

And while Apan has started working again both on his rice farm and also as a motorcycle taxi driver, he knows his future isn't quite secure, either.

Food is running thin, he said. In addition to the relief from Heifer, he received a loaf of bread, peanut butter and apples from the Department of Social Welfare—the typical relief supplied to non-Heifer participants in the area, he said. And they're worried about more storms.

But he has something that many here don't: his pig. Apan is grateful to have had this resource to help him weather the storm, and he said he looks forward to passing on piglets and training so other families can become resilient, too.

"The pig is a big help for us. It's part of our livelihood. I treasure the pig because it's a gift from another family and one for another family." ■



Apan sold piglets to help pay for the construction of his new home. He is hopeful the remaining pigs will help see him through this time.

Sao Pao, 45, listens during one of Heifer's values-based literacy program classes.



Reading Lessons

For many Cambodian women, schooling was either a luxury denied to them or taken away by the reign of the Khmer Rouge. Along with the gifts of livestock and training in their care, Heifer's literacy classes are now helping women to be considered their husbands' equals as they improve family incomes, health and nutrition.

DONG THOM VILLAGE, Cambodia—For most of her life, Lok Channy rose with the sun. As the first rays lit the rice paddies, footpaths and thatched huts of her rural village, she roused herself from a creaky bamboo-slat floor for a bowl of rice before plowing muddy fields, tending animals and cooking over wood fires until dark.

Life was a struggle. Poor soil in small, rain-fed rice paddies often left her family hungry during the dry season. Sickness was common and health care distant. There was no time or money for school, especially for Lok and other village girls whose education wasn't a priority.

It left her feeling helpless to improve her circumstances—particularly after marrying and having children of her own.

"My family's living conditions were poor, and I (didn't) think anything would change," she recalled recently outside her home in Svay Rieng, one of Cambodia's poorest provinces. "I had no knowledge of how to solve our difficulties of living."



But today she can read, write and make basic calculations thanks to a yearlong Heifer literacy class, which has taught her to improve rice yields, better treat children's illnesses, understand school enrollment forms and help run a village credit and savings group.

And working in concert with other facets of Heifer's program, which provides animals, seeds and training, the literacy classes' themes of women's empowerment helped broaden her traditional role at home and transform her view of her own ability to change her life.

"I decided to start this small store," Lok said, proudly showing the plastic bags holding cooking oil, batteries

and lard she sells at an informal home shop for extra income. "I can read now, about medicines and growing rice, and calculate sales at the market."

In a country plagued by decades of civil war, extreme poverty, corruption and suffering, Lok Channy is among the hundreds benefiting from the latest addition to Heifer's community empowerment program, whose holistic, mul-



Lok Channy (above) discusses her small retail business while making a sale as her grandmother, Lear Youn, acts as the cashier. Lok learned basic business management and math skills as part of her participation in a local Heifer self-help group. Lok sits with daughter Charm Kanika, 2 (left).

tifaceted self-help approach has helped 8,820 vulnerable families in 188 poor, rural communities since 1999.

Heifer's values-based literacy class, added in 2010 to help leverage Heifer's existing array of assistance from animals to self-help savings groups, has served nearly 1,900 people, mostly women. The classes offer some of the country's most impoverished families a crucial new tool to improve diets, health and family incomes.

"Women are often the most vulnerable, and building real

skills and social capital can help lift them and their families out of poverty," said Keo Keang, Heifer Cambodia's country director.

NEED IS GREAT

Driving east on Highway 1 out of Phnom Penh, the road to Svay Rieng province becomes dotted with ox carts and rickety motorbikes, some hauling pigs to market. Along the road, in rice paddies that are watery-brown with monsoon rain, men walk behind cows pulling wooden plows.

At a ferry crossing, one bombed by the U.S. during the Vietnam War and portrayed in the film *The Killing Fields*, women sell piles of fried insects and knockoff sunglasses.

Svay Rieng is one of the nation's poorest provinces, government statistics show. It's a rural, isolated place of lowland rice paddies and traditional thatch and wood-plank homes built on stilts. Homes, connected by raised paths rutted with motorbike tracks, rarely have electricity or sanitation.

Here, most residents are subsistence farmers. One-third of the farmers have less than two acres of land, often low-quality rice plots fed solely by rainwater during the wet season. Because families rely on these plots to feed their large

families, hunger during the dry season is common, as are waterborne diseases and malaria.

Although outside aid has helped, one-third of Cambodia's population lives on 60 cents a day—deep poverty that is partly rooted in dark decades that began during the 1970s reign of the Khmer Rouge, which left nearly 2 million dead from starvation, disease and execution.

“There is high migration because the poverty is very bad, so in some villages there are mostly children and older people,” Keang said.

In Toeun, 42, who lives amid the sugar palms and rice paddies of Bung Kriel village, said she grew up in this province in a large family crammed into a tiny thatch hut, in a childhood spent fleeing war with the Khmer Rouge and battling poor sanitation and nutrition. As a girl, she also faced additional disadvantages.

She spent only a few years in primary school in a culture where women often are told they do not need to learn. It's a common attitude in a nation that once relied on Buddhist temples for education where only boys were sent. Even today, public schools are scarce in rural areas and often underfunded, said Makara Orn, who heads Heifer's literacy efforts.

“Many women also think they don't need it, they will do housework and take care of children. Culturally, it's not seen as necessary to study,” she said, pointing to statistics show-

ing that in Cambodia only 71 percent of women are literate, compared to 85 percent of men.

In, who is married and has five children, said her difficult rural life has improved substantially with help from Heifer, which since 2007 provided a cow, vegetable seeds, fruit tree saplings and training on how to keep animals and crops healthier by adopting changes such as adding mosquito netting to the animal shelter. Her husband cares for sick village animals, a Heifer-taught skill, and, all told, family income has risen from \$200 a year to \$500 a year.

But In said her inability to read is a critical missing piece, and she plans to take the new literacy class to play a stronger role in family and village decision-making.

“I would like to be able to read better for myself and my family,” she said.

CLASS HELPS BUILD SKILLS

On a hot July day in the Svay Rieng village of Ampou Prey, 17 women sat on tiles in the shade of the village chief's home, located off a reddish dirt road where several motorbikes were parked.

Shooing flies and nursing children, the women—the majority illiterate, the rest with limited skills—sat hunched over literacy workbooks, turning pages filled with cartoon illustrations and Khmer vocabulary, spelling and math exercises.

Teacher Lok Sareng walked in front of a small easel,



Learning facilitator Lok Sareng, 42, instructs her students during a Heifer literacy program class. Participants break into small groups to discuss the day's lessons and to work through reading and writing problems.

Heifer's values-based literacy class has served nearly 1,900 people, mostly women. The classes offer some of the country's most impoverished families a crucial new tool to improve diets, health and family incomes.

teaching the women about the importance of participating in village decision making—one of the dozen themes from nutrition and income to gender equity and education that undergird each lesson. Dividing the class into groups, she asked them to write down and discuss the benefits of participation on large sheets of paper.

"During a meeting with the men [women are] afraid to speak up," Lok Sareng said to the class. "If a woman doesn't want to share, how do you get her to speak up?"

"You give them encouragement, say your ideas are important to us," one woman responded, before the class moved on to a game teaching the concept of opposites and a song about the importance of hygiene.

Developed over several years and put into place in 2010, the values based literacy classes have grown to more than 100, led by 44 Heifer-trained literacy facilitators—typically a more educated village woman who must pass a writing test. These women earn \$25 a month, about half the salary of a public schoolteacher.

The class meets for two hours, three times a week, with breaks for rice planting in summer and harvest in November. Classes use a series of Heifer-developed literacy workbooks that start with the alphabet and simple addition and move to complex passages, multiplication and division.

Each is infused with Heifer's 12 Cornerstones, or self-help themes that include women's empowerment, self-confidence and equality. For example, one book has reading lessons that include drawings of women sweeping, cooking and caring for children; it then shows men helping around the house, too. It addresses domestic violence on another page, something that many women in this part of the world experience.

"It's not only learning to read, it is learning knowledge for living," Orn said. "Some men complain that their wives are busy taking [the class], but most don't mind when they

see it helps."

Orn and Sareng said challenges have included persuading women of literacy's relevance to their rural lives, finding and keeping village teachers, locating proper classroom space and students who struggle because of undiagnosed vision problems.

"Some participants don't know anything, so you really have to encourage them. Some must be taught how to put pens to paper," Sareng said. "The first couple books are difficult."

One of the students, Te Ken, 53, a mother of four, had largely forgotten how to read and write from early childhood during the Khmer Rouge era, when they closed her school. Now, she's re-learning and brushing up on math.

"It was difficult at first. I wanted to quit," she said. "But I'm glad I haven't."



Heifer's literacy program teaches participants problem-solving skills.

IMPACT ON DAILY LIFE

In an open dirt courtyard filled with dogs, flies and the smell of rice and smoke from cooking fires, Theng Thy hauled a metal pot full of rice into her kitchen located under her traditional stilted home, hemmed in by a garden and shaded by banana and mango trees.

It's clear the family is prospering—there are a couple of motorbikes, earthen ovens for making rice wine, a fish pond near a healthy garden and an old TV that runs on car batteries. But it wasn't always like this before Heifer's literacy class and self-help program.

"I was so worried because my children kept going without food," said Theng Thy, whose family was forced off her land by the Khmer Rouge, and, when she was older, had to collect snails and wild greens to eat.

One year after joining Heifer's self-help groups, which provided piglets, lemon and mango trees and fish in a pond, she joined the literacy class. Suddenly, she could read in-

structions for digging an optimal-sized pond for fish farming and use math skills to stop overpaying for food at the market. She learned how to better feed chickens so they were fatter and healthier. She studied the process for making rice wine as a business.

Learning to read “has been a very big help,” she said, noting that family income has risen from 2.5 million *riels*, or about \$625, to 6 million *riels*, or about \$1,500. The extra money has allowed the family to make chicken and fish a daily staple, instead of a rare treat. And her family built a tin-roofed home with a dedicated outhouse with a ceramic floor toilet next door.

She’s not alone. More than 1,050 have passed the test at the end of the class so far—and current and former students say their newfound skills have had a significant effect on their daily lives.

For example, they can read Heifer newsletters that outline practical ways to improve animal management, teach safer sanitation practices to avoid illness and include meth-

ods for growing bananas or making money-saving fertilizer.

At makeshift local markets, where women sell chickens, vegetables and rice, an ability to calculate numbers keeps them from overpaying, underselling or getting cheated. And when they have ideas for micro-businesses, such as selling coconut cakes, raising fish or growing sugarcane, they say they can read about hygienic cooking practices, optimal pond sizes or techniques to increase yields.

Ros Saleng, one of the women in the class, is a 43-year-old mother of three. She said she goes home every night after class to share what she’s learned. Already, they’ve started selling market vegetables and are seeing less sickness in their cows. They have also expanded their rice crop. The extra income allows them to buy and eat more meat.

“It is helping me learn about businesses and better ways to grow rice and raise animals,” she said. “And the group has great solidarity.”

Kert Reun, a 68-year-old midwife who has helped women give birth in thatched huts for decades, never imagined she



When not in training or classes, members of Heifer's self-help groups are busy planting the year's rice crop. Many Cambodians often rely on the monsoon season to grow their year's supply of the staple food.



Kert Reun is learning to read and write at age 68.

would attend school at her age. But learning the basics has opened new doors, she said. Now she's reading health materials about safer childbirths, and recently put to use new antiseptics to help avoid infection during a recent birth in Dong Thom village.

"I saw others taking [the class]. I wanted to learn to read and write, too. People said, 'At that age?' But I said yes, I can learn. It helped me in my job. I could learn about how to be safer, use antiseptics and other things," she said.

And because of the women's empowerment themes—and the ritual of gathering three times a week to discuss them—more women are in leadership roles in homes and villages. There's greater gender equality and less domestic violence. Women also are increasingly seeing the importance of sending their own children to school, especially the girls.

As part of Heifer's holistic approach, family incomes have risen from an average of \$237 a year to \$871 a year, accord-

Small Savings, Big Changes

By **Chris Kenning**

BANGVILLAGE, PREYVANG PROVINCE, Cambodia—As pigs rooted nearby in the monsoon heat and humidity, 19 women and men sat cross-legged on plastic mats shaded by banana trees, forming a half-circle around a locked green metal box.

The group hushed as one woman pulled out a small key, opening the box to reveal tiny stacks of neatly bound *riels*, the Cambodian currency. Each of the rice-farming family members knew how difficult it had been to save—but were equally aware of its power to im-

prove their lives.

After an approval from the group, Sao Chanara handed fellow savings-group member Neang Vanny, age 50, a \$25 loan to buy feed at about 2 percent interest rate—far lower than the 10-20 percent interest or even higher rates she would get from lenders or banks that charge fees or require collateral.

"I will buy feed for my piglets, and then I can sell them and pay back the loan," said Neang, who was also facilitating a meeting in which members made savings deposits and took loans for seeds, fertilizer, medical care, food, school expenses or micro-business-

es. "It's good because we help each other."

Heifer International's self-help savings and credit groups, which have grown to more than 600 groups in 13 Cambodian provinces, are designed to sidestep exorbitant middlemen and scant credit options in rural areas to help families save. Although it's an old concept, used from Mali to India, it's proving a powerful help to isolated, poor villagers in Cambodia.

Although it can be initially difficult to persuade villagers their money won't be lost or stolen, members all know each other and quickly warm to the idea. Defaults are rare, and if borrowers struggle to repay a loan they're given more time. At the Bang Village group, the mostly female members say the system empowers them to play a bigger role in family affairs, while it also eases financial strains that

ing to a 2011 study by Heifer among the more than 11,000 members of 662 Heifer self-help groups in Cambodia.

Few have seen such benefits more starkly than Lok Channy, whose family income has risen from one million *riels* a year to 4 million, or from about \$250 to \$1,000. Learning about gender equity in the class has helped change her role in the family.

"In household chores, now we help each other. Before, I didn't send my children to school. Now I understand how studies are important so I send my children to school. And now I can do the business, to make record of what we buy and sell and profit. I can read how to raise animals better, so we could expand the number we have," she said.

She said among many participants in her small village, meat is now a daily staple instead of a rare treat. Fewer men are forced to leave for the city for weeks or months at a time to seek work as a low-paid laborer or factory worker. And in

daily village life, she said, women "express ideas" and have leadership roles.

And along with passing on the gifts of vegetable seeds, saplings, pigs and training to others, Lok is using what she learned to help start other literacy classes in other villages where the needs are high—a replication method that allows Heifer's efforts to multiply.

"I feel very happy I can help other people. I never dreamed before I would be able to, that I would become a donor," she said. "Every day I am happy about our life." ■

Chris Kenning is a newspaper reporter and freelance journalist from Louisville, Ky. His travels have taken him to Africa, Central America, the Middle East and Southeast Asia, where he has reported on issues such as land mines in Cambodia, poverty in Nicaragua and curable blindness in Syria.

can help fuel domestic violence.

"There are fewer broken pots at homes," Neang said.

Heifer's savings groups have pooled \$128,079, and now country staff are working to link smaller savings groups together, combining richer and poorer groups into cooperatives that would allow for larger loans and more ambitious projects, said Heifer Country Director Keo Keang.

But the Prey Vang group for now is made up of 22-25 participants who save 50 cents to \$1 a month, giving them 930,000 *riels*, or about \$232—enough for five members to take out three-month loans. Each member is trained in handling balance sheets and financial statements.

Rice farmer Sek Meth, for example, said he has used a loan to buy supplies for a rice-wine business that adds extra income for food, better housing

and motorbike fuel to get around. Lok Channy, who is a member of a different savings group, used a loan to purchase stock for an informal store at her home selling oil, lard, batteries and cigarettes—income that played a role in easing longstanding family poverty.

And at a group in neighboring Svay Rieng province, members have saved about \$600, which residents have used for loans for businesses making cakes, handicrafts and bamboo beds, as well as providing feed, fertilizer and rice plows.

One member, Chom Thoun, a 40-year-old farmer, saves 3,000 *riels* a month. He has used \$50 loans to start new vegetables and sugarcane and has \$46 saved in the bank.

"Before we had to borrow from the middleman, it was 15-20 percent a month," he said. "Savings groups are important for us."



Chom Thoun and his daughter, Chom Soriya, age 6, talk about their participation in the local Heifer project.

EXCERPT

Staple Crops Vulnerable to Rising Temperatures

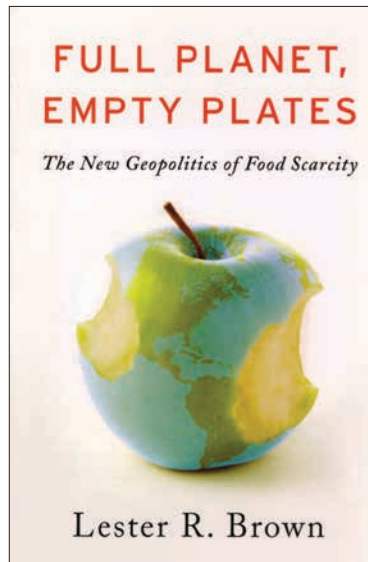
Book excerpt by Lester R. Brown, Earth Policy Institute

Agriculture as it exists today developed over 11,000 years of rather remarkable climate stability. It has evolved to maximize production within that climate system. Now, suddenly, the climate is changing. With each passing year, the agricultural system is becoming more out of sync with the climate system.

In generations past, when there was an extreme weather event, such as a monsoon failure in India, a severe drought in Russia, or an intense heat wave in the U.S. Corn Belt, we knew that things would shortly return to normal. But today there is no “normal” to return to. The earth’s climate is now in a constant state of flux, making it both unreliable and unpredictable.

Since 1970, the earth’s average temperature has risen more than 1 degree Fahrenheit. (See figure, opposite page) If we continue with business as usual, burning ever more oil, coal, and natural gas, it is projected to rise some 11 degrees Fahrenheit (6 degrees Celsius) by the end of this century. The rise will be uneven. It will be much greater in the higher latitudes than in the equatorial regions, greater over land than over oceans, and greater in continental interiors than in coastal regions.

As the Earth’s temperature rises, it affects agriculture in many ways. High temperatures interfere with pollination and reduce photosynthesis of basic food crops. The most



Full Planet, Empty Plates: The New Geopolitics of Food Scarcity

By Lester R. Brown
Earth Policy Institute
WW Norton & Company, 2012,
\$16.95, 144 pages

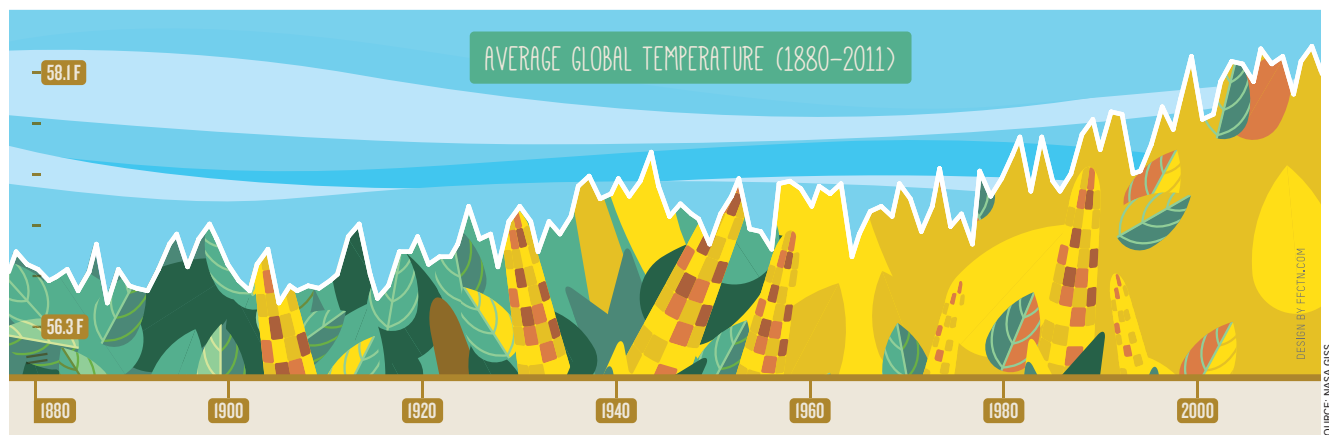
vulnerable part of a plant’s life cycle is the pollination period. Of the world’s three food staples—corn, wheat, and rice—corn is particularly vulnerable. In order for corn to reproduce, pollen must fall from the tassel to the strands of silk that emerge from the end of each ear. Each of these silk strands is attached to a kernel site on the cob. If the kernel is to develop, a grain of pollen must fall on the silk strand and then journey to the kernel site where fertilization takes place. When temperatures are uncommonly high, the silk strands quickly dry out and turn brown, unable to play their role in the fertilization process.

When it comes to rice, the effects of temperature on pollination have been studied in detail in the Philippines. Scientists there report that the pollination of rice falls from 100 percent at 93

degrees Fahrenheit (34 degrees Celsius) to near zero at 104 degrees, leading to crop failure.

High temperatures can also dehydrate plants. When a corn plant curls its leaves to reduce exposure to the sun, photosynthesis is reduced. And when the stomata on the underside of the leaves close to reduce moisture loss, carbon dioxide (CO₂) intake is also reduced, further restricting photosynthesis. At elevated temperatures, the corn plant, which under ideal conditions is so extraordinarily productive, goes into thermal shock.

In a study of local ecosystem sustainability, Mohan Wali



and his colleagues at Ohio State University noted that as temperature rises, photosynthetic activity in plants increases until the temperature reaches 68 degrees Fahrenheit. The rate of photosynthesis then plateaus until the temperature reaches 95 degrees Fahrenheit. Beyond this point it declines, until at 104 degrees Fahrenheit, photosynthesis ceases entirely.

All of these changes affect crop yields. Crop ecologists in several countries have been focusing on the precise relationship between temperature and crop yields. Their findings suggest a rule of thumb that a 1-degree-Celsius rise in temperature above the norm during the growing season lowers wheat, rice, and corn yields by 10 percent. Some of the most comprehensive research on this topic comes from the International Rice Research Institute in the Philippines. Crop yields from experimental field plots of irrigated rice dropped by 10 percent with a 1-degree-Celsius rise in temperature. The scientists concluded that “temperature increases due to global warming will make it increasingly difficult to feed Earth’s growing population.”

Stanford University scientists David Lobell and Gregory Asner conducted an empirical analysis of the effect of temperature on U.S. corn and soybean yields. They found that higher temperatures during the growing season had an even greater effect on yields of these crops than many scientists had reckoned. Using data for 1982–98 from 618 counties for corn and 444 counties for soybeans, they concluded that for each 1-degree-Celsius rise in temperature, yields of each crop declined by 17 percent. This study suggests that the earlier rule of thumb that a 1-degree-Celsius rise in temperature

would reduce yields by 10 percent could be conservative.

The Earth’s rising temperature also affects crop yields indirectly via the melting of mountain glaciers. As the larger glaciers shrink and the smaller ones disappear, the ice melt that sustains rivers, and the irrigation systems dependent on them, will diminish. In early 2012, a release from the University of Zurich’s World Glacier Monitoring Service indicated that 2010 was the twenty-first consecutive year of glacier retreat. They also noted that glaciers are now melting at least twice as fast as a decade ago.

Mountain glaciers are melting in the Andes, the Rocky Mountains, the Alps, and elsewhere, but nowhere does melting threaten world food security more than in the glaciers of the Himalayas and on the Tibetan Plateau that feed the major rivers of India and China. It is the ice melt that keeps these rivers flowing during the dry season. In the Indus, Ganges, Yellow, and Yangtze River basins, where irrigated agriculture depends heavily on rivers, the loss of glacial-fed, dry-season flow will shrink harvests and could create unmanageable food shortages.

In China, which is even more dependent than India on river water for irrigation, the situation is particularly challenging. Chinese government data show that the glaciers on the Tibetan Plateau that feed the Yellow and Yangtze Rivers are melting at a torrid pace. The Yellow River, whose basin is home to 153 million people, could experience a large dry-season flow reduction. The Yangtze River, by far the larger of the two, is threatened by the disappearance of glaciers as well. The basin’s 586 million people rely heavily on rice from fields irrigated with its water.

Yao Tandong, one of China's leading glaciologists, predicts that two-thirds of China's glaciers could be gone by 2060. "The full-scale glacier shrinkage in the plateau region," Yao says, "will eventually lead to an ecological catastrophe."

The world has never faced such a predictably massive threat to food production as that posed by the melting mountain glaciers of Asia. China and India are the world's top two wheat producers, and they also totally dominate the rice harvest.

Agriculture in the Central Asian countries of Afghanistan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan depends heavily on snowmelt from the Hindu Kush, Pamir, and Tien Shan mountain ranges for irrigation water. Nearby Iran gets much of its water from the snowmelt in the 18,000-foot-high Alborz Mountains between Tehran and the Caspian Sea. The glaciers in these ranges also appear vulnerable to rising temperatures.

In the Andes, a number of small glaciers have already disappeared, such as the Chacaltaya in Bolivia and Cotacachi in Ecuador. Within a couple of decades, numerous other glaciers are expected to follow suit, disrupting local hydrological patterns and agriculture. For places that rely on glacial melt for household and irrigation use, this is not good news.

NEW AND NOTEWORTHY

The Last Hunger Season: A Year in an African Farm Community on the Brink of Change

By Roger Thurow

Four women, all smallholder farmers in Africa, use a new approach to try to escape relentless hunger and poverty.



Antifragile: Things That Gain from Disorder

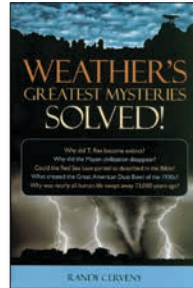
By Nassim Nicholas Taleb

Taleb argues that security and predictability are overrated, and that it is desirable, even necessary, to endure turmoil and stress in the name of progress.



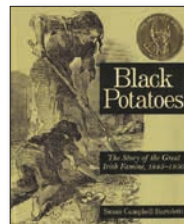
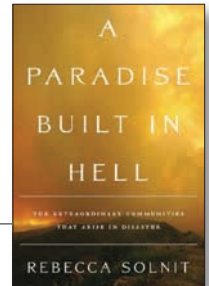
FIVE FAVORITES ON DISASTERS

The ways we predict and respond to disasters can make all the difference in how, or if, we progress as a society.



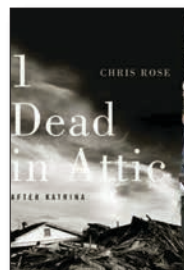
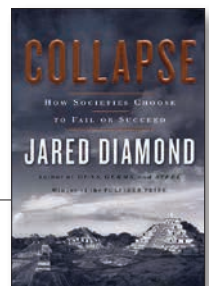
Weather's Great Mysteries Solved!
By Randy Cerveny

A Paradise Built in Hell: The Extraordinary Communities That Arise in Disaster
By Rebecca Solnit



Black Potatoes: The Story of the Great Irish Famine, 1845-1850
By Susan Campbell Bartoletti

Collapse: How Societies Choose to Fail or Succeed
By Jared Diamond



1 Dead in Attic
By Chris Rose

Heifer's CEO Tours Ag Sites in Haiti with President Clinton

FERRARI SIGNS DEAL WITH HAITIAN GOVERNMENT TO WORK JOINTLY TO MODERNIZE ANIMAL PRODUCTION

Story and photos by Donna Stokes, *World Ark* managing editor

TERRIER ROUGE, Haiti—Two large U.N. helicopters swooped in on Sunday, March 10, to North Coast Development Corporation's farm in northeast Haiti for a visit by former President Bill Clinton and a delegation of executives key to agricultural development in Haiti, including Heifer's President and CEO Pierre Ferrari.

The farm is especially close to Heifer's heart as we work with operator Andy English and owner Ann Piper to offer Heifer training in beekeeping and animal health care. The farm will also be the site of one of three purebred goat breeding centers as part of Heifer's \$18.7 million REACH project to strengthen the livelihoods of more than 20,000 vulnerable farming families in Haiti.

"If you really want to change something in this country that currently has very poor quality animals, you have to invest long-term," said Country Director Hervil Cherubin. "We're developing our own high-quality centers to improve the quality of animals throughout Haiti and reduce imports from the Dominican Republic."

Ferrari agreed. "What we're doing is addressing the problem immediately and with scale. We're building a system that creates value for everyone in the chain."

In a few years, "we can look back and measure the difference in quality, income and economic value created by this project," Ferrari said. "Many of the complaints about groups working in Haiti are that they don't stay long enough to make real change. Heifer has been here for more than 12 years, and we're investing in structural change and the long-term success of Haitian agriculture."

In a very busy few days in Haiti, Ferrari, accompanied by Cherubin, also signed a memorandum of understanding with Haiti's Minister of Agriculture, Jacques Thomas, to modernize livestock production in Haiti. The agreement is a commitment for both Heifer Haiti and the government to work together to move the agricultural sector forward. Haitian television and radio stations attended the press



Heifer CEO Pierre Ferrari talks with President Clinton in Haiti.

conference after the signing at government offices in Port-au-Prince.

"Haiti is the first country that I've visited where I've been able to systematically meet all the players of the value chain, thanks to Clinton and his foundation as conveners," Ferrari said. "All players have to be integrated to sustain change."

Cherubin noted it was especially exciting that the government is now involved with the same thinking.

Ferrari added, "We're all aligned. Fundamentally, that's what's different and what will allow change to happen."

In a speech at the Heineken brewery in Port-au-Prince, Clinton echoed the words of Haitian President Michel Martelly, saying, "Haiti, indeed, is open for business."

"We are trying in Haiti to establish a laboratory to prove that farmers are smart everywhere, they know how to protect their land and make the most of it and all they need is organization, inputs and support," Clinton said. ■



Elanco employee James McCurdy stands near the peak of Mount Kilimanjaro in Tanzania.

FIGHTING HUNGER AN UPHILL CLIMB

Elanco fundraising team summits Mount Kilimanjaro in Tanzania

Story and photos by Kelly MacNeil, *World Ark* contributor

MOUNT KILIMANJARO, Tanzania—
“Look!” Marta said, forcing us to pause. “We’re walking above the clouds!”

And it was true—laid out before us was a textured white carpet familiar to airplane travelers. And yet we weren’t behind tiny circular windows; we were standing on the side of Africa’s tallest mountain, Kilimanjaro, as part of



a fundraising effort for Heifer International by employees of Elanco Animal Health.

In the five days it took our six-person group to approach the crater rim of this ancient volcano, we tried to soak in the strange beauty around us, but always with the question in our minds: will we make it all the

way to the top? Months of training were invested, but the extraordinary altitude could fells even the most physically fit person.

Randy Bagg, a researcher for Elanco, initiated the trip, a fact the others found surprising as Randy admitted he hadn't been in a tent since age 8. But the challenge intrigued him. Randy was pleased to bring along Brendan, his wry and soft-spoken son.

When Randy first proposed the trip to his officemate, the fun-loving James McCurdy, James wasn't sure whether to take him seriously. But he quickly signed on and the group expanded to include more Elanco employees: the buoyant and generous Marta Haley and Gail Neuwirth Geisler, a woman with shining eyes who seemed to feel she was breaking the rules by taking such an outrageous trip.

As a Heifer International employee, I would come along to document their trip. Climbing Mount Kilimanjaro was already at the top of my "bucket list," a dream that became suddenly, stunningly real.

On the morning of the first day, we eagerly stepped out onto the Rongai trail, only to hear "Ah! Ah! Ah!" as the guide waved us back behind him. "Po-le, po-le," he said cheerfully—"slowly, slowly." As we settled behind his measured pace, we exchanged incredulous glances. Slowly, indeed. Five days later and several thousand feet higher, however, we would be begging him to go slower still.

The climb up Kilimanjaro isn't technical; there are no ropes or crampons, just a long, steady walk. Nonetheless, between 15 percent and 50 percent of climbers (depending on who you ask) don't reach the top, mainly because of problems with the altitude. Kilimanjaro reaches 19,341 feet, more than three miles high. On the third day of the climb our lead guide, Priscus, calmly explained the dangers of altitude sickness. For an unlucky few, headaches and exhaustion could advance to nausea, coughing, vomiting and confusion. Once someone gets sick, the only solution is to descend.

We were already feeling some of the peculiar effects of the thin air. The short walk from my tent to the dining area—a distance of perhaps 12 yards—left my heart

pounding. To help acclimatize, we were directed to drink several liters of water a day, which had predictable consequences. There were frequent pee breaks on the trail, and the Elanco group quickly became intimate over jokes about bladder capacity.

The group had set a goal of raising \$5,895 for Heifer International from friends and family—\$1 for every meter of Kilimanjaro's height. They asked family and friends to contribute, and held an after-hours gathering with co-workers that included a raffle. The winner decided to donate all the prize money back to the cause.

Elanco, the animal health division of Eli Lilly and company, has a long-standing relationship with Heifer. Since 2008, Elanco has funded three projects—in Indonesia, Zambia and China. In addition, the company is contributing more than \$400,000 to a project in India. In total, the Lilly Foundation with Elanco and its employees have donated more than \$2 million. Employees like Randy and Marta grew up on farms and believe strongly in the potential of farmers. Randy is also a veterinarian and would casually recite the breeds of cattle we passed at the foot of the mountain.



Retreating glaciers at the top of Mount Kilimanjaro.

Marta, who recently held the corporate responsibility position at Elanco, said the company's employees understand the problem of hunger. "When someone has a personal connection with a cause, there's an innate thirst to do more. I've witnessed this firsthand with many of my colleagues around the globe," she said.

Even with the Elanco group's commitment, the climb up Kilimanjaro would not have been possible without the assistance of expert guides and a cavalcade of porters carrying tents, sleeping bags, fuel, food and other equipment. (Local men undergo the grueling climb because the pay is comparatively good, but not all touring companies pay a fair wage or provide decent clothing and support.)

Each morning, we ate a plentiful, hot breakfast while porters dismantled the tents. Later, on the trail's narrow groove, we would step aside, marveling, as the porters hurried by with enormous loads atop their heads. "Jambo!" they greeted us. "Jambo!" we breathlessly replied.

The guides spoke English well and introduced us to the basics of Tanzanian culture, including the immortal phrase “*poa kichizi kama ndizi*,” meaning “crazy cool like a banana.” As the climbers shared stories and jokes with the guides, the value of the entire experience took on new significance. The importance of the stated goal—the summit—began to recede, even as we neared it.

In the afternoons, a chill enfolded us at the instant the sun dropped behind a cloud, as if someone had flipped the switch of the world’s thermostat. We ate dinners shivering, dressed in down coats and fleece hats. We talked about what lay ahead, not knowing what to expect.

Just before midnight on the fifth night, we began our summit attempt. Summits on Kilimanjaro are timed so that climbers will reach the top in the early morning, before the afternoon clouds roll in. In the biting cold, the Elanco group members adjusted the nose pieces for their supplemental oxygen. The full moon hung distant and white overhead.

At Kilimanjaro’s highest peak, the trail steepens into switchbacks on loose scree. Walking up the soft volcanic soil was like scrambling up a sand dune. The upward struggle became hypnotic, marked only by deep breathing and tiny, deliberate steps.

After five and a half hours, the team reached the rim of the crater, and we saw the glow of the sunrise. We were not yet at the highest point, but as the horizon turned pink, we could see the curve of the Earth, as if from space.

There was now a steady stream of other climbers trudging past the glaciers toward the summit: Uhuru Peak. The water in the tubes of our water bladders had frozen solid. As we continued, the setting moon lingered over the

Western horizon long enough to mirror the sun as it rose in the East.

And suddenly, we were at the top: a simple wooden sign on a broad field of rock. We dropped our packs and looked at each other in amazement. “We did it!” Marta exclaimed, with tears in her eyes.



The Elanco team of Randy Bagg, Marta Haley, Brendan Bagg, Gail Neuwith-Geisler, James McCurdy and author Kelly MacNeil with expedition guides and cooks.

The guides, who had cared for us like children during the climb, permitted us only 15 minutes at the top to snap photos, because of the altitude. James and Randy were feeling nauseated, and the sun was now glaring. We lurched back down the scree at a pace that made our legs scream.

The next day, striding downhill on tired feet, Randy mused, “At first, this trip was about me and my accomplishment. But it ended up being about learning—about Tanzania and its people, and the things we can do to help others.”

The great achievement of the Kilimanjaro trek, all agreed, was that it brought the idea of global citizen-

ship to life. Of course, the Elanco climbers were already big-hearted and generous. In all, the group raised more than \$8,000 for Heifer International. Beyond that, the hikers return with stories of the Tanzanian people whose lives intersected briefly with theirs.

“One day on the trail,” James recounted, “I heard one of the porters laugh and thought it sounded just like my friend Steve back home. It didn’t matter that we don’t speak the same language; he was just a guy laughing with his friends at work.”

“It drove home for me that hard work to feed a family is what most of the world does every day. We are so fortunate to be able to fulfill a dream and raise funds for Heifer International’s cause at the same time.” ■

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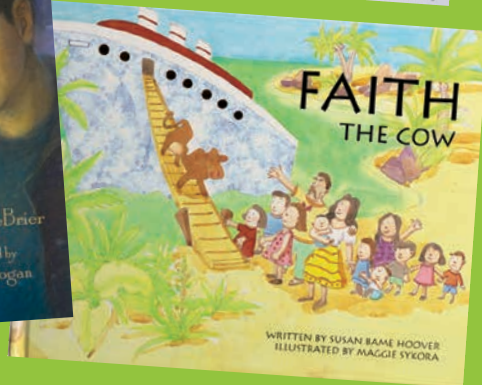
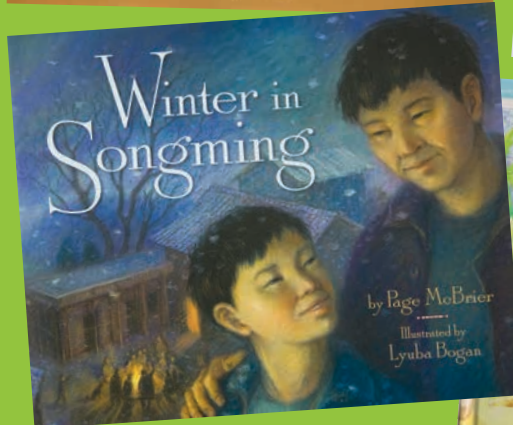
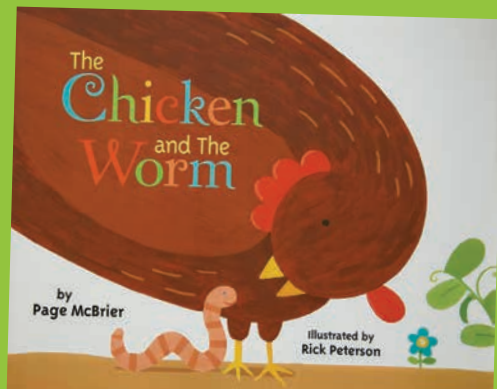
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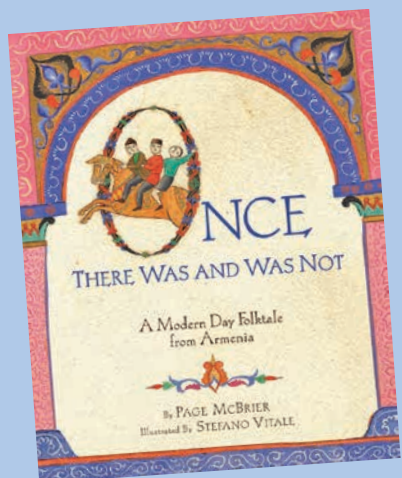
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On Dec. 4, 2012, Typhoon Bopha ripped through Sayon, Philippines, where Kim Oquino lives with his wife, two children and his father. The storm flooded his home and left his village in ruins. But because of Heifer’s disaster training, Oquino was able to protect his food stores and pigs from the floodwaters and damaging winds. He is one of the lucky few who didn’t lose everything. Read more about Typhoon Bopha on page 24.

Photo by Nacho Hernandez | Interview by Annie Bergman



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