

2014 ASABE Giving Back Fund Recipient

There and Back Again

A Professor's Continuing Journey

John Lumkes

As you might have guessed from the title—if you're a fan of J.R.R. Tolkien—my use of the phrase “There and back again” refers to the subtitle of *The Hobbit*, Tolkien's 1937 literary classic that has seen renewed interest due to the hugely successful movies based on his books about Middle Earth. So be forewarned, this might not be your typical *Resource* magazine article!

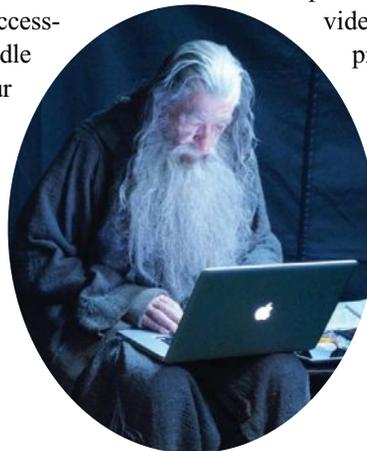
Long before the movies came out, I was a fan of Tolkien's books, and I made my kids read them, too. Actually, they didn't have a choice: I read *The Hobbit* and *The Lord of the Rings* to them, chapter by chapter, at bedtime when they were little. That's a fond memory for us now.

So what do Tolkien's books have to do with this article, the ASABE Giving Back Fund, my work with partners in Africa, and my activities as a professor?

Well, if you'll indulge me, actually quite a lot. As I was struggling with writing an outline to tell my story, I kept remembering various quotations from Tolkien. In a moment of inspiration (okay, some desperate moments due to lack of inspiration), I decided to arrange my outline by following a series of those quotations. Here begins the journey.

“It's a dangerous business, Frodo, going out your door. You step onto the road, and if you don't keep your feet, there's no knowing where you might be swept off to.”

The Fellowship of the Ring



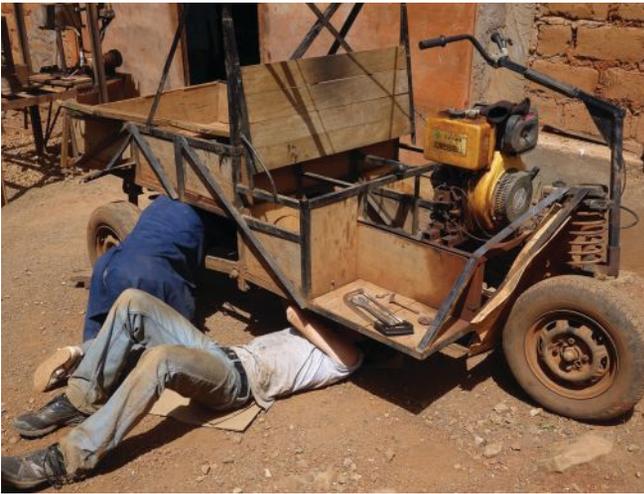
Gandalf checks his email behind the scenes on the movie set of “The Hobbit.” Photo by *Miraclefish*, courtesy of *imgur.com*.

Having recently been awarded a grant from the new ASABE Giving Back Fund, I was asked to write an article about my activities in Africa, in particular about the partnership in Cameroon that formed the basis for my team's video submission for the Giving Back Fund. The preceding quotation, in which Frodo's uncle Bilbo warns him about leaving home, mirrors my own experience during my first trip to Cameroon, which had unintended, but very positive, consequences. I didn't find gold in a dragon's lair, but I found real treasures of a different kind. You can read more about my first few trips in the May/June 2012 issue of *Resource*. Since then, we have built multiple vehicles with our partners in Cameroon, learned a lot about building hydroelectric turbines, and added projects in Tanzania and Kenya related to water and energy—all projects for which agricultural and biological engineers are ideally qualified.

As a result, I have a three-fold purpose for this article:

- To highlight some amazing opportunities for our profession, particularly for current students as we prepare them to be future leaders.
- To show that even in the midst of incredible challenges, there is hope, energy, and a unique vitality in Africa.
- And to remind you that stepping onto the road, although dangerous to your perceptions about a faraway place and about working internationally with students, can lead to new opportunities.

Yes, Africa has political and economic struggles, food production is often dependent on small-holder subsistence-level farmers, and women provide the majority of the agricul-



Matthew Lumkes and co-laborer do maintenance on the 2012 PUP.



David Wilson paints the new PUP's rear frame.

tural labor. But Africa also has resources that can help feed the world's growing population, it has significant opportunities for engaging in new markets, and it is filled with diversity and energy.

"You certainly usually find something, if you look, but it is not always quite the something you were after."

The Hobbit

How true this was for me. In our various professional positions, we are often encouraged to provide personal growth plans by answering questions like "Where do you want to be in five years?" If anyone had asked me that back in 2009, before my first invitation from Vincent Kitio, founder of the African Centre for Renewable Energy and Sustainable Technologies (ACREST, www.acrest.org), to visit him in Cameroon, not one sentence in my five-year plan would have included Africa, or things like maize grinders, water pumps, appropriate technologies, and slow sand filters.



The team in Cameroon with a newly constructed 2013 PUP. Author John Lumkes, front row, far right.



ACREST and the 2013 Purdue team

Five years later, we have built multiple vehicles in Cameroon—we renamed our original Basic Utility Vehicle (BUV) the Practical Utility Platform (PUP) to reflect the multiple labor-saving tasks that it’s designed to accomplish. We have tested the PUP with a variety of implements like maize grinders and water pumps, and we have received requests from other countries in Africa to start similar partnerships. After my first trip, back in 2009, I returned home with a notebook full of ideas, and I’m still adding to it! This year, we started a multi-grain thresher project and an electric driveline option for the PUP using batteries and an electric motor to replace the engine. The goal is to use off-peak surplus electricity from the hydroelectric project to charge the PUP for local use. This will promote renewable energy in Africa, demonstrate electric vehicle technology to the many groups that visit ACREST (politicians, schools, and other NGOs), and provide valuable on-the-ground data for future electric vehicle efforts.

“Well, you can go on looking forward,” said Gandalf. “There may be many unexpected feasts ahead of you.”

The Fellowship of the Ring

To say that I am excited about future opportunities is an understatement. In fact, the opportunities are often overwhelming, and I struggle to balance the high levels of student interest, possibilities for new projects, and the normal demands of being a working college professor. Blessed with an incredibly supportive family, I also need to make time for being a father and husband, and serving those around me. Occasionally, these different roles blend beautifully. Last year, my son and I worked side by side in Cameroon, Kenya, and Tanzania. With the projects continuing in Cameroon, new projects in Kenya and Tanzania, and more on the horizon, it has been an “unexpected feast” indeed.



High-density housing in Kibera, Kenya.

“All have their worth and each contributes to the worth of the others.”

The Silmarillion

About halfway through our 2013 trip, I told the students, “Every time I come here I am more humbled by how much I continue to learn, even after multiple trips.” Before their first visit, students often have the preconception that they will simply show our African partners how to do everything. They quickly learn that formal education is just one way to learn (and it certainly comes with privileges), but skills like resourcefulness, problem-solving, and the ability to fix things are not guaranteed, nor even likely, from formal education alone. It is hugely rewarding to see our Purdue team sharing ideas with our African partners, learning from each other, and in the end coming up, jointly, with a plan to solve the problem. The distinct cultural and educational backgrounds add value and perspective. When those differences are respected and embraced, everybody learns, and everybody wins.

“Where there’s life there’s hope.”

The Hobbit

In 2013, we added projects in East Africa. After finishing the vehicle build in Cameroon, a few students, my son, and I flew to Kenya to meet a second group of students. This team was working on an earthen dam for water collection combined with a water filtration system for a small village in Tanzania. The students chose this project as their capstone design project in agricultural engineering. Knowing that they couldn’t visit the village after graduation unless they raised their own funds, they wrote grants and were successful in raising enough money to cover their travel expenses. Flying into Nairobi made sense because it was more economical, and it provided us with an opportunity to visit the East African Farmer Innovation Fair and our colleagues at UN-Habitat.



Octopizzo, a Kenyan rapper, gave a tour of Kibera.

The year before, I had met Octopizzo, a Kenyan rap artist from Kibera (<http://octopizzo.com>). Kibera is the largest slum in Africa, with about one million people, and it’s a difficult place to comprehend. Octopizzo offers a walking tour of the slum—as opposed to a “drive by and look out the windows” tour. It doesn’t take long to realize that life is difficult for the people of Kibera. Water, sanitation, and energy are daily struggles. But there are also numerous NGOs, schools, and many ongoing projects, such as those presented by our UN colleagues.

In *The Hobbit*, the dwarves and Bilbo are trapped in the Lonely Mountain for many days. The dwarves despair—“This is the end,” they say, “We shall die here”—to which Bilbo responds, “While there’s life there’s hope!” This hopeful attitude is also evident in Kibera, and throughout Africa. Even in the most difficult places, people refuse to give up. They find solutions to problems, and they are incredibly resourceful. In the heart of Kibera, children were laughing on their way to school; shopkeepers were buying, selling, and bartering on every street; craftsmen were making all sorts of tools and goods; and there was music from people like Octopizzo. Ultimately, our students must ask themselves how they would respond if they lived in such circumstances. And now, given their education and skills, what can they do for the world, for a country, or for a village? In confronting these questions, they discover that there are abundant opportunities to contribute to the grand challenges of our time.

“Don’t adventures ever have an end? I suppose not. Someone else always has to carry on the story.”

The Fellowship of the Ring

I think we all agree that the grand challenges will not be solved in our lifetime. And I expect that as we find solutions, we will also find new challenges (probably caused in part by our new solutions). Who will carry on? Science and engineering will continue to play a key role, and I am especially excited about the opportunities for agricultural and biological engineering. But how do we recruit and mentor future leaders in this profession? Getting students involved as undergraduates, or even as high school students, in projects like I have described is a great place to start. I have worked with high school teachers through the NSF Research Experience for Teachers program, and I involve them in my research during the summer. The pre-engineering teacher at a local high school and a group of his students traveled with us to Cameroon in 2012 and to Tanzania in 2013. Many of the high school students who have traveled with us are now pursuing careers in engineering. I also keep in contact with the project’s many alumni who have chosen to continue in internationally focused careers, some through industries like John Deere, Cummins, and other companies with an international footprint, and others as graduate students.

Meanwhile, our activities continue to expand. In 2012, I made my first visit to East Africa and met with various institutions and community-based organizations. As a result of the contacts we made during that visit, in 2013 a graduate student did her research on fluoride removal in a region north of Arusha, Tanzania, in partnership with the Nelson Mandela African Institute of Science and Technology (NM-AIST, www.nm-aist.ac.tz) and Oikos (www.oikoseastafrica.org), a Tanzanian NGO that promotes the protection of biodiversity and sustainable use of natural resources as tools to fight poverty.

This year, I have two graduate students working in East Africa—one in Kenya doing research on urban energy through an internship with UN-Habitat, and another in Tanzania working with NM-AIST on a constructed wetland project. These two students were undergraduates in ABE at Purdue. Through opportunities as undergrads, they became excited about international work in the grand challenges and decided to pursue graduate degrees. Another graduate student who started working with me on the PUP project in 2011 as a sophomore in ABE is now in the first year of his MS program, working on a multi-grain thresher, and planning a trip to Cameroon. These examples are not about my accomplishments—they show that encouraging our students to get involved internationally has a significant influence on their later career choices, and thus on the relevance of our profession to the world.

“True education is a kind of never ending story—a matter of continual beginnings, of habitual fresh starts, of persistent newness.”

J.R.R. Tolkien to his students

One thing I love about my job is the never-ending opportunity to learn, and getting involved internationally has been a large part of this. I don't know what I'll be doing five years from now, and I never could have guessed what the last five years have held for me. Students continue to arrive each year; we work with them, mentor them, challenge them; and then they graduate. Each year brings new lessons, opportunities, friendships, and setbacks that we all learn from.

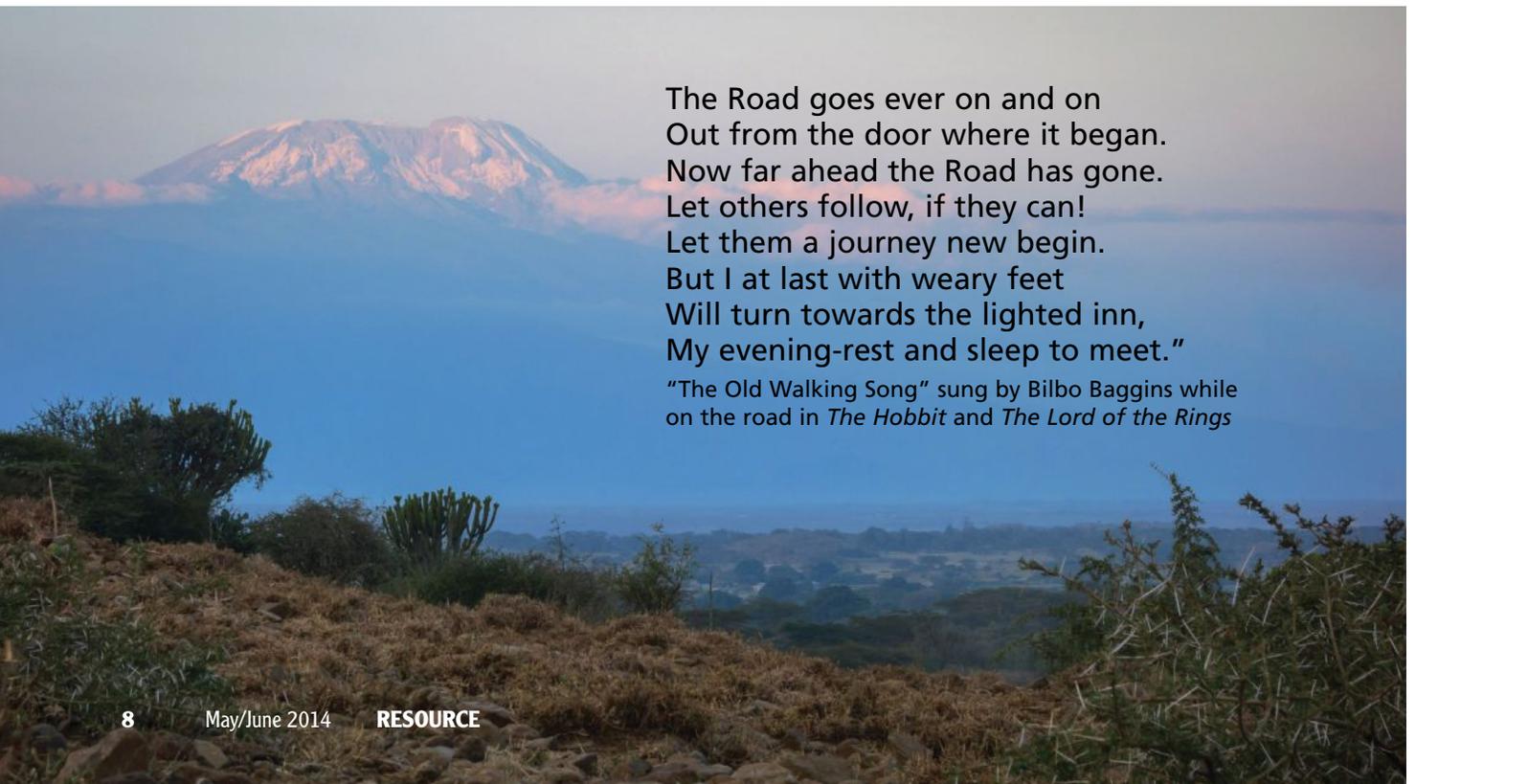
“It's the job that's never started as takes longest to finish.”

The Lord of the Rings

Okay, this is supposed to be the grand conclusion, the big motivational finale. Instead, all I have to say is get involved where you can, when you can. For me, getting started has led to one opportunity after another. Working with the students, with our partners across the globe, with my colleagues at Purdue, and with many of you has been incredibly rewarding. For every student I work with, every country I visit, every project I work on, every friendship I make, there seems to another waiting to get started. Whether you are a faculty member, current student, newly employed, or looking for a job, there is a place for you to get involved. Just be careful—you don't know where that first step out your door might lead!

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For more information about the ASABE Giving Back Fund, visit www.asabe.org/awards-landmarks/giving-back-fund.aspx.



The Road goes ever on and on
Out from the door where it began.
Now far ahead the Road has gone.
Let others follow, if they can!
Let them a journey new begin.
But I at last with weary feet
Will turn towards the lighted inn,
My evening-rest and sleep to meet.”

“The Old Walking Song” sung by Bilbo Baggins while on the road in *The Hobbit* and *The Lord of the Rings*