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A Growing Concern

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A Growing Concern

Though it holds promise to help alleviate world hunger, agricultural biotechnology has been rejected by millions who might benefit from it. Is there a way to bridge the gap?

**Story by WILLIAM MUNRO,
PROFESSOR OF POLITICAL
SCIENCE**



In a farm field along I-74 in McLean County, Munro sees both answers and unresolved questions to the challenge of alleviating global hunger. (Photo by Marc Featherly)

Over the past 10 years or so, a great deal of my life's journey has been spent on Interstate 74, which links Indianapolis and Peoria, skirting Bloomington on the south. My daily commute goes along that road, between Urbana and Bloomington, 56 miles door to door.

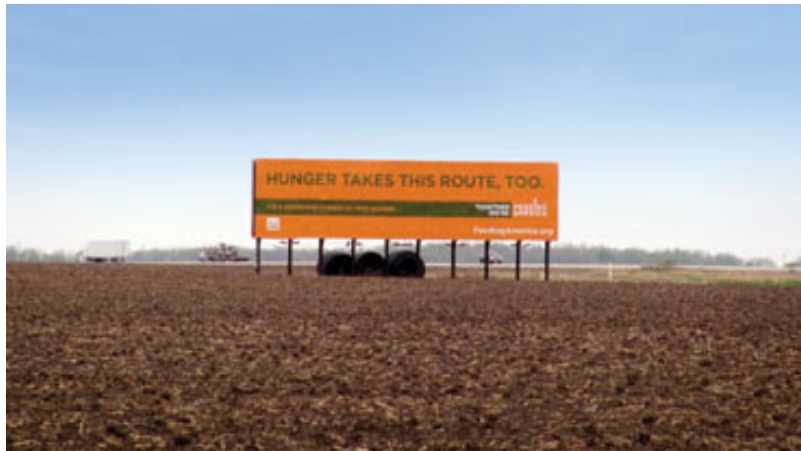
No one I know has ever, at least within my hearing, called the landscape along it profound or majestic (though in truth there are few things more majestic than a black funnel cloud bearing down on your rearview mirror as you race helter-skelter across the prairie). Still, if you spend enough time on I-74, you realize that it is indeed a profound landscape. It is a landscape on which we have inscribed our modernity with a particular confidence and comprehensiveness. Even though it is

sometimes green and sometimes brown, it is, of course, an industrial landscape. And I say that not simply because it produces a wide range of industrial goods — from ink to packing peanuts to biofuels — but because it has been reshaped according to, and for the purposes of, the systematic application of science and technology. Along I-74, this application is clearly seen, from the hulking grandeur of 16-row combines that harvest crops to the prodigious, packed power of genetically modified seeds from which those crops grow.

It is a disciplined landscape, in which the unruly has been contained and the unexpected has been pushed to the margins. It is also a productivist landscape — that is to say, its value is measured in its capacity to produce as much as possible of the commodity crops that are planted upon it. And it is a simplified landscape, whittled down to two crops: soy and corn, corn and soy. It is, in essence, a spare and uncluttered shop floor.

It is also a high modernist landscape, sculpted to embody the particular modern rationality in which we write our will onto the world. It shows us, with its clean lines and sculpted precision, what good farming — highly productive farming — should look like.

For me, there are two images from the landscape of I-74 that stay with me as I journey back and forth, and remind me on a daily basis of the limits of our ability to engineer our world according to our will. One image is the Illinois horizon — it is not very noticeable; it consists simply of a flat line. But driving along one day it suddenly struck me, with a stark visual clarity, how that flat line bifurcates our world. Below the flat line, everything that you see is mapped, measured and managed on an inch-by-inch basis. Above the line, nature is doing what it wants — remember that black funnel cloud?



A billboard posted along the agriculturally rich I-74 corridor in Central Illinois was designed to raise awareness of the growing problem of hunger in America.

The second image depicts a billboard. Standing in the middle of a ploughed field of the world's most productive soil, the sign proclaims, without irony, "Hunger takes this route, too." It highlights the difficulty that we seem to have in organizing our society to solve the most fundamental challenge of human life: feeding ourselves. And of course that challenge is writ large today as the threat of global hunger looms.

Inevitably, the landscape along I-74 contains an answer to this threat: agricultural biotechnology, the technology that makes possible the genetically modified seeds that drive its grandeur. When discussing modern agricultural biotechnology, one refers mainly to techniques made possible by Herbert Boyer and Stanley Cohen's 1973 invention of a technique to cut and splice strands of DNA from one organism to another, effectively crossing the species barrier. Gene-splicing created the possibility of "editing" the genetic structure of organisms in such a way as to express desired genetic traits for social, economic or political purposes.

These new, extremely powerful biotechnologies encompass what some have called the Second Industrial Revolution and are potentially applicable to many of the grand social and humanitarian challenges of the day, including global hunger. It is not surprising that this new transgenic

science caught the imaginations of cellular and molecular biologists as well as policymakers and entrepreneurs.

What followed in the 1970s and 1980s was an explosion of complex scientific-industrial projects, especially in the biomedical sector (such as stem-cell research) and in the agricultural sector — notably seed research. In the latter case, the object was to insert genes into crop seeds in order to select for specific desired genetic traits. To date, the main application has been to genetically engineer seeds for herbicide resistance and pest resistance — seeds widely used by U.S. farmers since the mid-1990s. A second generation of transgenic agriculture research is now emerging, which is focused on disease resistance, drought resistance and enhanced nutrition.

This research emerges at a critical time. In 2009, the Food and Agriculture Organization estimated that close to 1 billion people on the planet are chronically undernourished. The vast majority of those people live off the land in rural areas of Asia and the Pacific and in sub-Saharan Africa.

Over the past five years, a concerted international effort in humanitarian science has lumbered into action to attack this global food and economic crisis. This includes a \$150 million initiative funded by the Rockefeller Foundation and the Bill and Melinda Gates Foundation to launch the Alliance for a Green Revolution in Africa. The group, which targets its programs to small-scale farmers, has been careful to say that genetically modified (GM) seeds are only part of the solution. Nonetheless, promotion of the use of GM technology has caused suspicion across the continent — Zambia, Tanzania and Zimbabwe are among the African nations banning the use of such seeds.

Scientists use biotechnology to improve banana plants, an important food source throughout the world.



If we are to understand the implications of this new humanitarian science — and why it has been met with suspicion and even hostility by millions who may potentially benefit from it— we must first appreciate the ways the transgenic science involved is part of what the Obama administration and others have described as game-changing technologies.

Transgenic technologies enable us to import genes from spinach into pigs, from fish into tomatoes, from jellyfish into rabbits, and even to contemplate altering the human genome in order to produce enhanced human beings. As a consequence, these technologies hold profound questions about how we as a society decide or negotiate the risks, the ethics,

and even the ontological implications of their development and deployment. The inevitable rise of such questions also demonstrates that there is an ineluctable relationship between science and citizenship, and we cannot think about these technologies without taking into account how they are to be governed. In this sense, these are game-changing technologies because they change the terms of democracy. What it adds up to, I think, is a serious disjuncture between the

humanitarian science on the one hand, and the forms of deliberation, participation and accountability that we associate with democracy on the other.

This brings us to the second way in which transgenic technologies are game changers. They are what I would like to call “distancing” technologies. By concentrating attention on the molecular structure of the seed and seeking essential solutions in the manipulation of that structure, they place control of the future at a greater distance from those whose futures are at stake.

The best way to capture what I mean here is to cite a 2002 report from a task force of the U.S. Department of Agriculture: “The fundamental life sciences upon which so much of the future depends are now more esoteric and further removed from the day-to-day experience of lay people,” this report states. “Thus, while traditional agricultural sciences are still necessary and important, the old methods of decision-making do not work well with the new sciences involving genetics, cell and molecular biology and proteomics. ... This question becomes particularly complicated when you put it in the context of a global economy, global regimes of expertise, increasingly global networks of knowledge and vast humanitarian needs. The lay person, even if exceptionally intelligent, can no longer judge the value of specific lines of research. Only scientists in similar or related fields can know whether the science is or is not likely to yield any useful answers.”

In short, this science draws agricultural knowledge and expertise away from the local ecology, away from the farm, away from the farmer, away from farming communities and consumers, and packs it very intimately into the seed. And the knowledge in the seed is portable; whoever controls the seed can take that power wherever they like. In effect what the science does is take knowledge out of the landscape and take the landscape out of knowledge.

What are the implications of these game changes for addressing the grand humanitarian challenges of our time, such as global hunger? The broadest implication, I think, is that — much like the landscape of I-74 — the precision, power and sense of possibility that the technology conveys captures our cognitive imagination and pushes us toward particular technical definitions of, and solutions to, the problem.

To a problem such as malnutrition, the solution offered — such as enhancing the nutritional value of the seed — is universal. Place, space and locality (the landscape, if you will) fade from the picture as well. The logic of the humanitarian enterprise pushes both policymakers and scientists to define beneficiaries of humanitarian science as repositories of nutritional need rather than as human agents. They fall into mass categories such as “the global hungry,” or “malnourished,” or the “rural poor,” or, most particularly, “resource-poor farmers.” Contextual issues of local culture, local ways of knowing and local knowledges are washed out of the equation.

Here then, we encounter the paradox of “game-changing” humanitarian science. As our humanitarianism draws closer the connections between humans across space and resources, our science threatens to extend the distance between them. How do we resolve this paradox to address the challenges of global hunger? Or should we?

I began my career as a social scientist and liberal arts scholar in South Africa. Under the dark and very long shadow of apartheid, it was a time when the popular insurrection was gaining momentum and the authoritarian regime was beginning to show cracks. Under these circumstances, I became interested, both intellectually and politically, in the possibilities of democracy in South Africa — an interest that led to my later doctoral research in Zimbabwe, as a comparative case of African political change.

In the Democratic Republic of the Congo, a woman harvests lettuce. While the nation is rich in natural resources, the majority of the population is undernourished.



In most African countries, the bulk of the population lives on the land, and so if one is interested in the politics of democracy and citizenship, it makes sense to look closely at rural communities. In Zimbabwe, I tried to understand the ways in which ruling authorities and rural communities have negotiated the terms of rule and citizenship, focusing on the meanings of “community” and “conservation.” In later research, I focused again on South Africa. As the nation was moving into a phase of democratic transition, I spent a few years working with small-scale sugar farmers and timber growers to find out whether local farmers’ organizations might provide a vehicle for rural communities to expand their democratic participation.

If you work with small-scale commodity producers in rural Africa, you realize very quickly that their lives and livelihoods are ruled as much by international commodity markets as they are by local politics. And so I began to study and to teach about the dynamics of the international food economy. In both Zimbabwe and South Africa, I observed how the imposition of particular cognitive schemes upon local communities and ecologies not only generates anger and resistance but can undermine the resilience of local environments. Continuing my research on agrarian change in the United States, the focus has shifted — from the science of politics to the politics of science. But at the heart of the enterprise remains the relationship between democracy, poverty and agrarian power.

This relationship has grown ever more unsettled with the emergence of biotechnology and genetically modified organisms (GMOs). Recently, I joined with Rachel Schurman of the

University of Minnesota to study the social and political movements spawned by the emergence of GMOs. The result was our 2010 book, *Fighting for the Future of Food: Activists versus Agribusiness in the Struggle over Biotechnology*.

In our book, Rachel and I document how and why the debate over agricultural biotechnology became both deeply polarized and deeply polarizing. Specifically, we looked at how the governance and distribution of this technology led to an anti-biotech movement launched by social activists — one which successfully shaped public perceptions of GMOs as potentially harmful “Frankenfoods.” This debate led to a hardening of oppositional cognitive and moral positions regarding genetically modified organisms: pro- versus anti-; good versus bad.

This is an unproductive standoff at a time of great human need. The question is not whether this is a good or bad technology but how we should understand it (as indeed we should understand all game-changing technologies) as part of a larger human ecology — an ecology that must, by its very nature, take account of different ways of knowing. And this requires what I am simply going to call an ecological imagination.

But in calling for an ecological imagination, I am not just insisting that we should take the ecology into account when we constitute our world cognitively. Rather, I am referring to a way of constituting our world cognitively. Ecological thinking is relational thinking; it requires acts of imagination that go beyond our own journey. It is thinking that takes us out of the center of our own narratives and metaphors through which we traditionally appropriate the world. It asks us, in other words, to de-center our cognitive imagination, and to recognize ourselves as embedded interactively in landscapes in which there are numerous other agents.

Of course, this is by no means a novel argument. But we need to apply it to the particularities of the present. We live in a time in which game-changing technologies and the management of knowledge play a central role in the way we organize society. Even in a time of great humanitarian need, the game-changing technologies that we valorize make ecological thinking a very difficult task. It requires at least two qualities. One is a willingness to take seriously other ways of knowing, other ways of being in the world and other ethical traditions — that is, knowledges embedded in particular human landscapes and ecologies. The other requirement is empathy — simply the recognition that there may be times when we need to de-privilege perspectives that we hold dear because others, more resonant with those other local ways of being in the world, are more salient at that particular time.

If we are to think empathically and ecologically, we cannot be contained by the bounds of our consciousness. We must continually question the categories that constitute those bounds.

If there is one lesson from the paradox of humanitarian science, it is that this requires hard work. It also requires us to revisit those staples of democratic theory: languages of deliberation, forms of participation and modes of accountability. We must constantly reinterpret our landscapes, whether they be a small-scale sugar farm in rural South Africa or the expansive corn and soybean fields along I-74. This, as it turns out, is extraordinarily difficult — we are lulled by the clean linear aesthetic of our agrarian landscape even as the Illinois skyline emphasizes the limit of its reach; but it is essential. It is sometimes fun. And it is ultimately profoundly fulfilling.

ABOUT THE AUTHOR

In 2012, Munro was presented the Kemp Award, the University's highest teaching honor.



According to Associate Provost Frank Boyd, William Munro is “known for his immediately recognizable sense of humor, his formidable intellect and a modesty that attempts to hide his impressive academic pedigree.” Munro is the 2012 winner of the University’s top teaching honor: the Kemp Foundation Award for Teaching Excellence. The award was presented at the annual Honors Convocation on April 15. Munro’s keynote address, “I-74, Humanitarian Science and the Ecological Imagination,” was adapted for this article.

Joining IWU’s faculty in 2000, Munro holds a doctorate in political science from Yale University and bachelor’s and master’s degrees from Cambridge University. He also earned a bachelor’s degree with honors from Natal University in South Africa in 1981. He is an honorary research professor at the University of KwaZulu-Natal in South Africa and a research scholar at the Center for African Studies at the University of Illinois at Urbana-Champaign.

Prolific in his research, Munro has spoken at conferences across the nation and abroad and is the author of numerous articles and two books. For his most recent book, *Fighting for the Future of Food: Activists versus Agribusiness in the Struggle over Biotechnology*, he and co-author Rachel Schurman of the University of Minnesota won the American Political Science Association’s

Lynton Keith Caldwell Prize in 2011. The prize is given for the best book in environmental politics published in the past three years.

A former director of IWU's International Studies Program (ISP), Munro teaches courses in international and African politics, conflict areas in the global south, development theory and social movements. He also serves as chair for the Technos Award Selection Committee; is a member of ISP's African Studies, Development, and Diplomatic Studies teams; and is faculty coordinator of the John and Erma Stutzman Peace Fellows Program.

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