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# *Megatrends Reshaping American Agriculture and Agricultural Universities*

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A cluster of interlocking megatrends is converging to make twenty-first-century agriculture much different from its twentieth-century counterpart. These trends are not novel, twenty-first-century phenomena. We saw them begin to stir during the waning years of the last century, and now they are upon us, reshaping both US agriculture industries and the land-grant universities that have traditionally served them.

I left the farm exactly 40 years ago this fall to attend a land-grant university (the one that now employs me), and so let me use 1968 as the anchor point for how things used to be. Many of you in the over-50 category will identify with my story, which begins with an 800-acre farm in the Red River Valley along the Minnesota-North Dakota border. We grew wheat, barley, sunflowers and corn. Most of the crops were sold, but we chopped much of the corn into silage to overwinter the small herd of brown and white cattle that spent the short North Dakota summer on pasture out behind the barn.

There was no question about the identity of the customer. We hauled grain to the Arthur Farmers Elevator Company or to Amenia Seed and Grain, and when the cattle were fat and the prices good, we delivered them to the West Fargo stockyard. I still remember the names of the customers, because they were our neighbors. And while we had a vague sense of that great river of grain making its way from Dakota to the millers and other food processors in the east, my father and the other farmers did not much concern themselves with what we now call the food system.

I was part of the great twentieth-century outflow of talent from America's farms and rural areas—some of us more modestly endowed than others. We were the sons and occasionally the daughters who wanted to maintain a connection to “the land,” but who chose not to farm it. So we migrated to land-grant universities, settled down into agricultural majors, and as professors of agriculture, became—as our academic parents and grandparents before us—the foundation of those institutions.

These were careers made simple by a natural transition from our own formative experiences early in life. We intuitively knew what agriculture was all about, and agriculture remembered where we had come from. It was a world of transactions within neighborhoods—geographical ones, philosophical ones, and those enriched by customer-client relationships.

## LOOKING BACK

This kind of agriculture, one that we now see receding through the rearview mirror, had several defining features. I think that the key megatrends relating to today's agricultural system all relate to the recasting of these features by a series of smaller trends that were not so much spawned from within as imposed from outside of agriculture. All of them relate to globalization. I want to focus on these trends, but first let's think about those twentieth-century features as cast through the lens of someone who has spent most of his career in land-grant universities.

- Each of the participants in the agricultural value chain, especially those producers on the front end, focused not on the ultimate consumer as customer, but rather on the next participant down the chain. My durum-wheat-producing father could not have even named more than one or two of the pasta products that he was helping to produce, and we had certainly never tasted them. It was inconceivable that the opinions of diners would ever have an impact on our dusty wheat fields.
- Land-grant universities stayed close to the farm. We understood and drew our talent from production agriculture, and we enjoyed easy relationships with grateful commodity groups and agricultural firms. The land grants were equally comfortable with their historical structure and its emphasis on disciplines—among them soil science, agronomy, entomology, plant pathology, agricultural economics, and animal science. Soil scientists solved fertility problems, entomologists took care of the insects, economists assisted with farm management, and so on.
- We all knew about Cooperative Extension, which was hard wired into the system and linked operationally and on a day-to-day basis with research. It enjoyed a near monopoly market share as provider of science-based information to our production-agriculture customers.
- Strategy at the land grants was ideological. There was no need for much discussion of the importance of what we were doing, the beneficiaries of our efforts, or how we could best meet their needs. Most of us just understood, thanks to the forces that had been shaping our world views since childhood. Because we all shared a common system of beliefs, we could be spontaneous and deliberate in our actions.
- We were interested in international activities, but engagement with the rest of the world meant helping those less fortunate than we. If you were curious about international agriculture, there was sure to be an office down the hall or around the corner that dealt with such matters and could help you “go on an international assignment.”

In short, the agricultural world, including that of the land grants, was defined and seemed well understood. So what happened? What are those megatrends that upended our cozy twentieth-century existence? The rise of global agrifood systems is arguably the single most defining change. We have left the world in which it was sufficient for agricultural producers to simply deliver raw materials to the elevator or the local stockyards or some other buyer, and have entered one in which far-away people really matter. And it has not been easy.

Some of these far away people are global competitors who have learned to exploit their local resources and ever-cheaper global transportation networks to deliver agricultural products to our local customers, sometimes more cheaply than we can do so ourselves. Many such competitors have been able to construct and then exploit efficient twenty-first-century infrastructure, even as we attempt to refine and update our aging manufacturing, logistics, and transportation systems of the last century. Few of us can speak their language or bother to understand their political and social systems. But if you speak to them (almost certainly in English), you will quickly learn that they have taken the time to know all about us.

## GLOBALIZATION

Globalization has greatly changed the fabric of the land-grant universities, too. Cooperative Extension has rapidly lost market share as new, web-based forms of information exchange have become commonplace. And international agriculture is rapidly being assimilated into the fabric of our activities. It has been humbling—and to some of our faculty, inexplicable—to see our models of helping the less fortunate morph from the narrow one-way alleys of the past into modern thoroughfares in which knowledge moves rapidly in both directions. The asymmetry of the last century’s “we give, they receive” model has been reformatted into a much more balanced equation in which our ability to listen is as important as our ability to speak.

Globalization has also dislodged the strategy that guided most land-grant universities during the past century. My generation’s vision, one that rested on shared beliefs and collective experiences, is being replaced by that of younger talent that increasingly is drawn not from rural areas of the United States and our land-grant educational systems, but from other places. I recently assembled the numbers at my institution and learned that fully one-third of our new faculty hires were either born abroad or had received formal degrees in other countries.

The effects of globalization should not be viewed as bad. An understanding of the true customer creates value and opportunity; competition breeds innovation and entrepreneurship; strategy based on something other than ideology can make for flexible organizations willing to confront risk; and faculty members with early exposure to the globalized world offer color and perspective to the institutions that employ them. But there have been challenges.

With the advent of global food systems has come a new sense of empowerment on the part of consumers. Some of them are far away, and others are close, but they share a desire to know where their food is coming from, how it was produced, processed, and

transported, and the impacts of food systems on the environment. Sometimes they ask politely, but more and more often they are demanding this information—and if the answer is not what they want to hear, they get fussy and tell us to change the way we do things. The CEO of a major meat-products firm summed up this situation a few months ago at a large agricultural forum, and I wrote down what he said: “Customers care a lot about the background of our products. Conversation is radically, and I mean radically, different than before. They ask about animal welfare, antibiotic usage, environmental stewardship, trace back, total food safety, community involvement, how you monitor your suppliers—and then, if there is time left, they ask about price, quality, and delivery.” His tone was poignant as he described how his firm had moved beyond perplexity and begun to grapple with these issues.

Land-grant institutions are perplexed, too, as we scramble to align our expertise with new realities of the twenty-first century. I have experienced this myself. Shortly after the turn of the century, I represented my land-grant university at a meeting with the state’s pork industry leaders. After our animal-science faculty had summarized their recent accomplishments, several of us found ourselves in informal conversation near the end of the day. I asked the industry leaders to identify the most important challenge that we could help them overcome. After a slightly too long pause that had begun to make me uncomfortable (just what had I said?), one leader—and then the others—agreed that their number-one problem was coping with environmental regulatory policies related to confined animal units. We had some of the world’s best nutritionists, reproductive biologists, experts in genetics and lactation and physiology—but environmental regulation? Sorry, wrong department! And as I later thought more deeply about this issue, I concluded that “sorry, wrong university” might have been a more accurate assessment of the situation. We did in fact have someone in another department who was interested in animal wastes, but he wasn’t into policy.

This experience was repeated just a few months ago, when someone asked a group of Michigan fruit growers about their top problems. We have a world-class cohort of horticultural faculty dealing with all aspects of fruit production, but the industry’s questions were of another sort. “Can you help us secure a reliable supply of labor?” “How can we compete with China?” And “how can we cope with global retailing and the power it is exerting back through supply chains?” We can and are helping our fruit producers address these issues; but, as an institution, we are not adequately prepared for these sorts of questions—ones defined by the twenty-first century. And yes, we are a little bit perplexed.

## STRATEGY DEVELOPMENT

So what about our collective future in agriculture? How can we move beyond simple recognition that things have changed and get on with developing sound strategies for the future? Key to our land-grant future is strategy itself. Shared ideology was sufficient in the professional world that I entered 40 years ago. In today’s much less predictable and much more complex global world, there is need to be adaptive.

Writing in 1998, Mintzberg, Ahlstrand, and Lampel (see *Further Reading* below) draw a distinction between strategy as position and strategy as perspective. The positioning part

is easy, and indeed, most strategic planning at land-grant institutions focuses on where we are and where we want to be in the future (numbers of students, ranking of our programs, level of grants income, and so on). It is more difficult to optimize organizational perspectives on the future, especially when tomorrow will almost certainly be much different from today—perhaps chaotically so.

Here are four interrelated strategic perspectives that I offer to those of us with a stake in agrifood systems. I frame them through the lens of land-grant institutions, but each is equally valid when viewed through the lenses of others.

- We are part of a world that really is flattening, and so knowledge, goods, and—increasingly—talent, will be moving around more freely in the future than today. Maybe much more freely. We must learn as much as we can from those who are far away from us and position ourselves to compete with and address the needs of those who are not like us.
- We are competing in a flat world that is also developing spikes—places with qualities that attract and retain the best talent, create disproportionate amounts of knowledge and put it to use, and generate the technology that the future demands. We should aim to become these spikes, understanding that we may have to alter our structure, practices, timeframes, and metrics of success in order to do so.
- Each of us must position ourselves to address the needs of our unique piece of the greater agrifood system, recognizing both that there is no alternative to tomorrow's spiky, globalized world and that our piece may neither want to be part of it nor even view itself as unique. This will require synthesis across disciplines, new types of reward systems, much more involvement of “nonagriculture” expertise at our institutions, redefinition of our stakeholder communities, and deep, candid conversations with the members of these communities.
- We have to attune our programs to the needs of tomorrow's globally savvy consumers, some of whom live far away and some of whom are our geographical neighbors. They will impose a variety of different demands on us, some of which neither we nor our stakeholder groups will understand or agree with. Few of these consumers will be satisfied with conventional scientific explanations. Addressing these needs will require a lot of listening, new models for communication, and a bold commitment to involvement in policy arenas.

#### FURTHER READING

Florida R (2008) *How's Your City? How the Creative Economy is Making Where to Live the Most Important Decision in Your Life*. New York: Basic Books.

Friedman TL (2005) *The World is Flat. A Brief History of the Twenty-First Century*. New York: Farrar, Strauss, and Giroux.

Mintzberg H *et al.* (1998) *Strategy Safari. A Guided Tour Through the Wilds of Strategic Management*. New York: Free Press.



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On January 1, 2006, **STEVEN PUEPPKE** became director of the Michigan Agricultural Experiment Station and assistant vice president for research and graduate study at Michigan State University (MSU). Shortly after his arrival, he was appointed to serve also as the director of the Office of Bio-Based Technologies. It was a homecoming of sorts. The Fargo, ND, native received his undergraduate degree in horticulture from MSU. He also has a doctorate in plant pathology from Cornell University.

Dr. Pueppke came to MSU from the University of Illinois, where he served as associate dean for research in the College of Agricultural, Consumer and Environmental Sciences (1998–2005), as a professor of crop sciences and as director of the University of Illinois National Soybean Research Laboratory and of *Global Connect*, an initiative focused on globalization of the college's academic, research and outreach programs.

Before moving to Illinois, he served as chairman of the Department of Plant Pathology at the University of Missouri and as plant sciences unit leader. He was also a faculty member in the Departments of Plant Pathology at the University of Florida and of Biology at the University of Missouri-St. Louis (1976–1979), and was a senior research associate at the Charles F. Kettering Laboratories (1975–1976). He served as the 2003–2004 chair of NABC.