

Agriculture in the Post-Industrial Era Challenges and Opportunities for Alaskans¹

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The industrial era in American agriculture is coming to an end. Agriculture was among the last sectors in the U.S. economy to become “industrial” because it was among the least well-suited for the industrial model or paradigm of economic development. As a result, industrial agriculture has created few of the intended economic benefits while creating many unintended ecological and social costs. Consequently, the industrial era of agriculture will be far shorter than the industrial era in other sectors of the economy. The industrial era in general is coming to an end and with it will come the end of industrial agriculture.

Because of my age and my life experiences, I have considerable first-hand knowledge of the industrialization of American agriculture. I grew up on a small dairy farm in southwest Missouri. My brother still lives on that farm and continued to operate it as a small dairy farm, still milking less than 50 cows, until he retired about three years ago. He raised a family and had had a good life on the family farm, without becoming an industrial farmer. When I left the farm for college in the late 1950s, agriculture was still dominated by diversified family farms, like ours, that produced primarily for local and regional markets. Commercial fertilizers and pesticides, developed from World War II technologies, were just coming on the scene. Factories that had been producing tanks were being retooled to produce farm tractors. Fossil energy was abundant and cheap; a “dollar’s-worth” of gasoline meant “five-gallons.” However, farming was about to be transformed from a way of life into a bottom-line, industrial economic enterprise.

Many people relate industrialization to the migration of people from farms and rural communities to manufacturing jobs in urban areas. Obviously, we’ve seen such a migration in America. However, the shift to manufacturing and urbanization is simply a symptom of the specialization, standardization or simplification, and consolidation of control, which characterize the industrial paradigm of economic development. Specialization increases efficiency through division of labor. Standardization or simplification is then necessary to facilitate coordination and routinization of specialized production processes. Standardization, simplification and

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routinization simplify the management process, which allows consolidation of control into large-scale, corporate business enterprises. This is the industrial process by which “economies of scale” have been achieved in both manufacturing and in agriculture.

The new post-war mechanical and chemical technologies facilitated agricultural industrialization and were seen as the keys to farm economic prosperity and national food security. Commercial fertilizers and pesticides allowed farmers to abandon diversified crop and livestock operations. Affordable tractors and farm machinery allowed farmers to cultivate more land and/or feed more livestock. Farms could now be specialized, standardized, mechanized, and consolidated into fewer, larger, more-efficient farm businesses. By the time I graduated from college in 1961, agricultural industrialization was well under way. By then, I had been indoctrinated in “modern agriculture” and was committed to helping create a better agriculture for the American people as well as for myself. I took a job in agribusiness with Wilson & Co. Inc., the fourth largest meat packer in the U.S. at the time.

After three years with Wilson & Co., I had become disenchanted with the corporate world. So, I decided to return to graduate school at the University of Missouri, a Land Grant University. The historic mission of Land Grant Universities, as well for all government programs for agriculture, had been to provide food security for the nation by preserving family farms. Farm policy had been about keeping enough farmers on the land who were committed to taking care of the land to ensure that Americans would always be well fed. By mid-1960s, however, the public mandate for American agriculture had changed. We were no longer committed to saving the family farm. Instead, we would make agriculture more efficient, by any means necessary – to help make food cheaper. Cheaper food would make it possible for all Americans to afford to buy enough safe and wholesome food to meet their needs. Agricultural industrialization seemed the most efficient means of providing national food security.

This was the beginning of America's “cheap food policy.” Government price supports and commodity payments were but the tip of the iceberg. In addition to publicly funded agricultural research and extension, the government subsidized crop insurance, farm loans, investments in buildings and machinery, and special “disaster” payments when other subsidies weren't enough. Such programs reduced the risks of farming so farmers could afford to abandon diversification in favor of specialization – first in either crops or livestock, then in specific crops or specific phases of livestock production. However, by removing much of the risk, much of the real profit potential also was removed from agricultural production. Costs of production dropped but so did profit margins per bushel, per hundredweight, and per acre. Government programs virtually forced American farmers to specialize, standardize, and consolidate into larger operations to survive economically. The government was committed to providing food security by making good food cheap.

When I left graduate school with a Ph.D. in Agricultural Economics in 1970, I shared the commitment to make agriculture more efficient. During the first half of my 30-year academic career, I was a pretty traditional, bottom-line, free-market economist. I had been taught a successful farm had to be managed as any other bottom-line business, if it was going to survive. I told family farmers that their farms and families had to be treated as distinct and separate entities. Farming could no longer be viewed as a way of life; the only sustainable farms would

be those that became agribusinesses. Quality of life was something farmers bought with farm profits, and what they bought was a personal matter that had no place in my vision of the economics of farming. I was doing what I thought was good for farmers as well as for society.

During the farm financial crisis of the 1980s, I was forced to confront a very different reality. I eventually was forced to admit the way of farming I had been promoting was neither good for farmers nor good for society. The so-called *progressive* farmers had borrowed heavily at record high interest rates to expand their operations during the export driven economic boom years of the 1970s. When the economy fell into economic recession during the 1980s, export markets collapsed, commodity prices fell, and many of these farmers were caught with large debts at high interest rates they simply couldn't repay. Stories of farm bankruptcies and foreclosures sprinkled the national network news programs. Occasional suicides by bankrupt farmers captured both local and national headlines. It wasn't just poor managers who were failing. Farming for the economic bottom line had led to widespread financial and personal failure for *good* farmers.

I was head of the Department of Extension Agricultural Economics at the University of Georgia at the time. In that role, I sat across the table from more than a few struggling farm families trying to help them find some way to survive, or get out of farming while they still had something left. I soon began to realize that what I had been trying to teach farmers over the years had contributed much more to their problems than it could ever contribute to the solutions for those problems. The farmers who had followed the recommendations of their agricultural universities and government agencies most closely, including my own, were in the greatest financial difficulties. Ironically, the farmers who had focused most narrowly on the economic bottom-line were now failing economically.

After a while, I began to realize the financial failure of family farms was not only destroying farm families, it was also destroying the viability of many rural communities. It takes people to support communities, not just production. It takes people to shop on Main Street, serve on volunteer fire departments, sit in church pews, keep local schools open, and keep a doctor in town. As I dug deeper into the causes of the farm financial crisis I also became aware of the negative environmental and ecological consequences of industrial agriculture. Farming fencerow-to-fencerow with chemical-intensive, industrial farming methods caused soil erosion, water pollution, and pesticide poisoning of people and wildlife. I was forced to conclude that this way of farming wasn't good for farmers, it wasn't good for rural communities, it wasn't good for society, and it wasn't good for the future of humanity. There had to be a better way to farm than the way I learned in college and the way I had been promoting for the past fifteen years.

In my search for a better way to farm, I discovered the concepts and realities of sustainable agriculture. In my search for economic viability in farming, I discovered a paradigm or model for agriculture that has social, ecological, and economic integrity. I came to understand that a sustainable agriculture must be capable of meeting the needs of the present without diminishing opportunities for the future. Industrial agriculture certainly wasn't meeting the needs of farmers or people in rural communities. In addition, it was destroying the natural productivity of the land, and with it the opportunities for future generations to meet their needs as well. Only later would I realize that industrial agriculture wasn't even meeting the needs of American consumers today.

By the late 1980s, I had decided I could no longer reconcile the agricultural economics I had been taught and had been teaching with my new understanding of ecological, social, or economic reality. I abandoned many of my previous academic ambitions and joined the newly emerging sustainable agriculture movement. However, the economic and political forces driving industrial agriculture were strong and were not to be easily reversed by the growing ecological or social concerns. By the year 2000, American agriculture was dominated by large specialized corn, soybean, cotton, wheat, and rice farms and large-scale confinement animal feeding operations. Farms had become factories without roofs and fields and feed lots biological assembly lines.

Industrial agriculture has succeeded in making food cheap, as is loudly and widely proclaimed by the agricultural establishment. Americans spend a smaller proportion of their disposable income on food than any other nations, so they brag. Each American farmer feeds 50, 100, or 150 Americans, depending on who is counted as farmers. However, it's long past time to confront the truth about the "success story" of American agriculture. In truth: the cheap food strategy of the past 50-years has failed dismally, not only in terms of its high ecological and social costs, but even in its most fundamental mission of providing national food security.

A larger percentage of Americans are hungry today than were hungry during the 1960s. The latest USDA statistics, for 2008, places total "food insecurity" at 16% with more than 22% of American children living in food insecure homes. Non-government surveys place total "food hardship" for 2010 at close to 20%.ⁱ This is not just a reflection of the current recession. The only time significant progress has been made in food insecurity over the past 30 years was during the unsustainable economic boom of the 1990s. We need to face reality; we can't solve the hunger problem by making agriculture more economically efficient. People are not hungry because food prices are too high. They are hungry because they are poor and don't know how to produce or prepare their own food. Industrial agriculture makes those problems even worse.

Those who can afford to buy enough food to satisfy their hunger, too often end up buying foods that destroy their physical health. While their percentage of incomes spent for food has dropped by more than half since 1950s, the cost of American health care has more than doubled.ⁱⁱ Major contributors to the health care crisis include obesity, hypertension, diabetes, heart failure, and other problems linked with poor nutrition. America's food/health concerns also include carcinogenic chemical residues, endocrine disruptors, growth hormones, antibiotic resistant bacteria, salmonella, E-Coli 0157:H7, and more recently genetically modified organisms, or GMOs. The health problems associated with these concerns include diminished fertility, various forms of cancers, attention deficit disorder, and a growing variety of food allergies. While we don't know the specific cause and effect relationships for all these health problems we do know all these concerns are linked directly with industrial agricultural technologies.

We have justified the demise of family farms, decay of rural communities, pollution of the rural environment, and degradation of the natural productivity of the soil as all being necessary to provide food security for the nation. These justifications are no longer valid or acceptable. Too many Americans are still hungry; too many Americans are sick. The industrialization of agriculture, and the government policies that supported it, has been an absolute failure. An agriculture driven by the economic bottom has failed to provide food security either for those of

present or future generations. An industrial agriculture is not sustainable. Fundamental change in American agriculture is not an option; it is a necessity.

The industrial era is over; not just in agriculture but throughout the global economy. The economic growth of the industrial era was made possible by an abundance of cheap energy – first the old growth forests, then surface mining of coal, and for the past 100-years, by shallow reservoirs of oil and natural gas. However, the old growth forests are gone. We are fracturing the earth's bedrock and blowing the tops off of mountain to get the remaining coal and natural gas. We are drilling for oil deep beneath the oceans and in the remote corners of the world. We are like an alcoholic who as awakened with a hangover to discover he has no more booze. We are scrounging around in nature's garbage can for its last remaining drops of fossil energy.

We are not out of fossil energy, at least not yet, but we are quickly running out of cheap energy. We are at a near a peak in global oil production and are powerless to stop persistent declines in production and rises in prices until the recoverable reserves are depletes. In addition, the remaining sources of fossil energy, mostly coal, are major contributors to greenhouse gasses and other pollutants which are threatening the ability of the earth's natural ecosystems to support human life. By the year 2050 very little recoverable or useable fossil energy may be left. The only sustainable source of energy is solar energy. However, energy from all the sustainable sources combined – wind, water, solar panels, biofuels – will be less plentiful and far more costly than fossil energy. The days of cheap, abundant energy are over. The industrial era was an aberration in human history that is not likely to be repeated. We can't continue doing what we are doing. It is simply not sustainable. Change is no longer an option; it is a necessity.

American agriculture is confronted with the same necessity for change. The impressive productivity of American agriculture is a direct consequence of abundant, cheap fossil energy – for fuels, fertilizers, pesticides, and transportation. The American food system now claims about 20% of all fossil energy used and requires about 10 calories of fossil energy for each calorie of food energy produced. About one-third of this total is accounted for at the farm level. The food system contributes a similar share of environmental problems, as greenhouse gasses are inevitably released through the use of fossil energy. Farming poses an added threat to global climate change through the release of methane, a powerful greenhouse gas, from livestock operations and carbon dioxide from clearing and tillage of the soil.

Industrial agricultural production is particularly vulnerable to the unstable weather patterns that seem destined to arise from disruptions in global climate. Irrigated agriculture, a mainstay of industrial agriculture, is also vulnerable to the growing competition for increasingly scarce supplies of fresh water in both streams and aquifers. The current “bubble” of agricultural prosperity is inflated by agricultural and energy policies that are neither economically nor morally defensible. Change in American agriculture is no longer an option: it's a necessity.

People ask me if I think it's possible to feed a growing global population with organic farming or other approaches to sustainable agriculture. My standard answer is that I don't know, at least not with certainty. However, I know that we can't feed the world with agriculture that is inherently dependent on fossil energy in a world that is running out of fossil energy and filling up with agricultural pollution. I then go on to point out that I personally know several organic

farmers with yields just as high and costs just as low as their conventional farming neighbors. Furthermore, some of the most credible global food studies indicate that sustainable farming practices are in fact the best hope for hungry people in the poorest and most densely populated areas of the world.ⁱⁱⁱ The primary difference is that sustainable farming is more “management intensive” than industrial farming, meaning that will take more thoughtful, caring farmers to feed the world sustainably. So, what's wrong with having more thoughtful, caring farmers?

People also ask me if I am optimistic about the future of agriculture. My answer is that I am not necessarily optimistic but I am hopeful... and hope is more important than optimism. Hope comes with the knowledge that something is possible, even if it's not going to be quick and easy, or even certain to succeed. Hope comes from the realization that something makes sense, regardless of how it turns out. After decades of doubt, I once again have hope for the future of American agriculture and for the future of humanity. My hope is kept alive by my continuing involvement in the sustainable agriculture movement. The movement includes farmers who call themselves organic, ecological, biodynamic, holistic, practical, innovative, or just plain family farmers. What they have in common is their commitment to creating an agriculture that can meet the needs of the present without diminishing opportunities for the future. They also know they must balance their need for economic viability with ecological and social integrity.

The numbers of farmers in the movement is growing each year, as is evident at the dozens of sustainable agriculture conferences held annually all across the North American continent and around the world. I don't know how strong the movement may be in Alaska, but at least six “sustainable agriculture” conferences in the U.S. and Canada each draw more than 1,200 participants each year, with a few reaching 2,500 to 3,000. The larger conferences typically are organized by grass-roots organizations and the vast majority of those attending are farmers and their customers. Sustainable agriculture conferences drawing 500-700 are far from rare and conferences drawing 100-250 people per year are too numerous to attempt to count, including conferences in virtually every state in the U.S. The size and numbers of such conferences is growing each year.

Perhaps even more important, these new farmers are being supported by a growing number of allies among like-minded non-farm groups. The issues of global food safety, health and nutrition, global climate change, fossil energy depletion, economic globalization, social inequity, corporate consolidation of the food system, confinement animal feeding operations (CAFOs), and genetically modified organisms (GMOs) are creating growing support for sustainable agriculture. The Slow Food movement, for example, is a worldwide organization with about 100,000 members in over 150 countries. Slow Food's approach to agriculture, food production and gastronomy is defined by three interconnected principles: “Good: a fresh and flavorsome seasonal diet that satisfies the senses and is part of our local culture; Clean: food production and consumption that does not harm the environment, animal welfare or our health; Fair: accessible prices for consumers and fair conditions and pay for small-scale producers.^{iv} *Good, clean, and fair* are becoming the watchwords of the sustainable foods movement.

The movement is reaching far beyond the farm gate, beyond farmers markets and CSAs, and into higher-volume food markets. Independent food processors, distributors, and marketers are beginning to realize they face the same kinds of challenges from a corporately controlled, global

food system as do independent family farmers. They are also beginning to understand that they have the same kinds of opportunities as farmers in helping to create and benefit from a new and different sustainable food system. Food industry studies indicate approximately one-third of American consumers are willing pay premium prices for healthful and nutritious foods that have ecological, social, and economic integrity.^v With these new allies, the sustainable agriculture movement now embraces tens of thousands, if not hundreds of thousands, of like-minded advocates and active supporters scattered across the continent.

So what might all this suggest for the future of agriculture in Alaska; what are the challenges and opportunities? First, I am certainly not an expert of Alaskan agriculture. I have only visited Alaska once before, in the mid-1980s, back when I was a conventional agricultural economist talking about risk management strategies. I have read some background information about previous government initiatives in Alaska, which I would characterize as industrial agriculture initiatives. Perhaps, it's just as well for the state as a whole that these initiatives were not particularly successful; although I'm sure the experiences were painful for those directly involved. At least, Alaska doesn't have an industrial system of agriculture to dismantle.

I do know enough about Alaskan agriculture to know that it is different in many important respects from agriculture in the “lower 48 states.” Agriculture is different everywhere, but your shorter growing season and longer colder winters, greater distance from large urban markets, and rugged topography with few good roads make your agricultural challenges more difficult. That said, the basic principles of sustainable farming and sustainable agriculture in general are the basic principles of nature. These principles apply to everything, everywhere, at all times. The question then becomes how to apply the principles of sustainability to particular ecological, social, and economic situations in particular places. Alaska is one of those particular places.

I have written about the basic principles of sustainability on many occasions, including in a new book to be published by Kumarian Press next spring, *The Essentials of Economic Sustainability*. However, I have found over the years that many people like to have a complete conceptual and operational framework to guide them, rather than a set of general principles. One of the most popular approaches I have found, which is also consistent with the principles of sustainability, is “Holistic [Resource] Management.”

Holistic Management (HM) was developed and pioneered by Alan Savory, widely recognized as the “godfather” of planned rotational grazing or management intensive grazing of livestock. HM is rooted in a three-part holistic goal which is used to guide decision making: means of production, future resources, and quality of life.^{vi} A holistic goal related directly to the economic, ecological, and social dimensions of sustainability. The holistic goal ties people's visions of their desired material, social, and ethical way of life to the particular natural ecosystems and resources that must support their visions of the future. Their decisions then are guided by the things they value most deeply – economically, socially, and spiritually. All of their actions and decisions are tested and constantly monitored to determine whether or not they are moving toward or sustaining their desired way of life.

Holistic Management might be particularly relevant in developing a sustainable livestock sector for Alaskan agriculture because it considers the key role of animals in agricultural

sustainability. Animals are important in continually renewing the productivity of the land, by contributing to the four basic ecosystem processes identified by HM: water cycles, mineral cycles, energy flows, and the dynamic relationships among organisms in natural ecosystems. Holistic Management relies on eight tools for managing these ecosystem processes: human creativity, technology, rest, fire, grazing, animal impact, living organisms, and money and labor.

The basic principles and management process of HM are completely consistent with the basic principles of agricultural sustainability. These principles are fundamentally different from the specialization, standardization, and consolidation of control that dominant agricultural industrialization. Every practitioner of Holistic Management interprets the principles somewhat differently and eventually creates his or her own unique framework for decision making. Alaskans quite logically would interpret the principles of HM and sustainability somewhat differently as well. However, a basic approach to natural and human resource management, such as HM, might be very useful in guiding an organized planning process toward a sustainable Alaskan agriculture, including sustainable animal agriculture.

I obviously don't know with any degree of certainty what the outcome of such a process might be. However, several general characteristics of a sustainable Alaskan agriculture are suggested by the basic principles of HM. First, the desired quality of life guiding the planning and management process must be far different from the dreams of economic wealth from fur, gold, or oil that have lured many people to Alaska in the past. None of those sources of economic development were or are sustainable. A sustainable quality of life in Alaska will be much more attuned with the way of life of the indigenous people who were already in Alaska before European immigrants began to arrive. This doesn't suggest a return to hunting and gathering, but instead to a highly desirable quality of life – economically, socially, and spiritually – that can be found only in the unique natural environment of Alaska. A sustainable Alaska agriculture, including animal agriculture, must accommodate and sustain a uniquely Alaskan quality of life.

Animals almost certainly will have a prominent role to play in the future of Alaskan agriculture. It will be critically important to utilize animals in maintaining the efficiency and integrity of water cycles, mineral cycles, energy flows, and the associated ecosystems dynamics. However, many areas of Alaska obviously are not well suited for domesticated livestock, so wildlife and fisheries will need to continue to make important contributions to the material, social, and spiritual quality of life of Alaskans. Some of the wild species may eventually be domesticated, or at least managed as commercial animal operations. However, a key to success may well be finding ways to carry out domestic livestock operations, on a modest scale, in harmony with healthy and viable populations of wild animal species. New technologies, particularly electric fencing, has made modest-scale livestock and poultry production economically feasible in parts of the “lower 48” that are still heavily populated by natural predators. Holist Management has been successfully employed on wildlife reserves in southern Africa and might logically be adaptable to livestock production in Alaska.

Many residents in the more remote areas of Alaska probably came north for the privacy and solitude of life in the wilderness. The economic costs of self sufficiency and isolation will remain very high but will be no reason for most people in the post-industrial era to migrate to urban areas. Economic development will not arise from economies of scale but rather from individual

human imagination, creativity, and entrepreneurship. Thus, the economic viability of Alaskan agriculture may well be found in the development of diverse, dispersed, economically viable community-based food systems. As transportation costs rise, there will be greater economic incentives to produce, process, prepare, as much of local food as possible within local communities. More than 80% of the money spent for food in the U.S. pays for processing, transportation, packaging, advertising – costs other than the cost of food itself. Returning those activities to local communities not only contributes to local agriculture but also to the viability of local economies. These activities were moved out of rural areas during the era of cheap fossil energy and environmental neglect. High energy costs and environmental concerns may well bring them back. The remoteness of Alaskan communities may actually turn out to be an asset in reestablishing the relationships among people and their sense of connectedness with the land that are absolutely essential for sustainability.

It may be somewhat uncomfortable at first for people in universities and other public institutions to become involved in planning processes that are driven by social and ethical value, as much or more than economic values. However, the basic purpose of public institutions is to help people achieve a more desirable quality of life, not just to make more money. It took me a long time to realize that the pursuit of wealth is fundamentally different from the pursuit of happiness. Furthermore, the pursuit of wealth is not sustainable because it inevitably leads to the extraction and exploitation of nature and society, which are essential to our social and spiritual, as well as economic, quality of life. Certainly, we are material beings; we need a measure of economic well-being. But we are also social and ethical beings. We need positive relationships with other people and we need a sense of purpose and meaning in life. Sustainability ultimately is about finding purpose and meaning in life through our relationships with other people and with the earth. What could possibly be a more important purpose or mission for public institutions?

I believe a sustainable future of Alaska and Alaskan agriculture will be found in returning to the basic cultural values that have kept people in Alaska for reasons other than the hope of “striking it rich.” It will be found in the things that have always connected Alaskans to the land and to each other. In these connections, Alaskans will find the key to sustainable ways to farm and a sustainable way of life. The technologies will be very different and the level of economic well-being will be higher. But, a sustainable agriculture for Alaska in the future will be built upon the foundation of sustainable Alaskan cultures of the past.

End Notes:

ⁱ Food Research and Action Center, *Food Hardship in America – 2010*. http://frac.org/wp-content/uploads/2011/03/food_hardship_report_mar2011.pdf

ⁱⁱ The 20th Century Transformation of U.S. Agriculture and Farm Policy, USDA, Economic Research Service, www.ers.usda.gov/publications/eib3/eib3.htm.

ⁱⁱⁱ International Assessment of Agricultural Knowledge, Science and Technology for Development, *Agriculture at a Crossroads*, Synthesis Report, 2009. Available at: [http://www.agassessment.org/reports/IAASTD/EN/Agriculture%20at%20a%20Crossroads_Synthesis%20Report%20\(English\).pdf](http://www.agassessment.org/reports/IAASTD/EN/Agriculture%20at%20a%20Crossroads_Synthesis%20Report%20(English).pdf).

^{iv} Slow Food International, <http://www.slowfood.com/international/2/our-philosophy>

^v Allison Wortington, *Sustainability, the Rise of Consumer Responsibility*, The Hartman Group, Bellevue, WA, Spring, 2009.

^{vi} Wikipedia, The Free Encyclopedia, “Holistic Management,”
http://en.wikipedia.org/wiki/Holistic_management