

Sustaining the Profitability of Agriculture

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Sustaining Profitability

Over most of the past century, profits from farming have gone primarily to those who found ways to reduce costs first and expand production the fastest. However, each new round of cost cutting technology has resulted in increased production and lower prices, erasing initial profitability. Late adopters have been motivated by survival rather than profitability and chronically declining prices have forced the laggards out of business. A relentless, never-ending search for new sources of profits has been a necessity of survival.

This paper deals with profits from farming, not profits from the whole of agriculture from input suppliers to retailers. However, American farmers have utilized the same basic model as American industry, including agribusiness, in their pursuit of profits. That model is commonly referred to as the industrial model. The fundamental characteristics of the industrial model are simplification, specialization, routinization, and mechanization. Profits through industrialization are associated with such economic concepts as division of labor, opportunity cost, comparative advantage, and economies of scale.

Adam Smith's Wealth of Nations, the foundation for modern economic theory, was published in the early stages of the industrial revolution. Its ultimate wide acceptance among economists was no coincidence. The economic world view of Adam Smith fit perfectly with the world view of the industrialists. The promise of greater profits provides a powerful motivation for change. The idea that an "invisible hand" would automatically transform individual greed into public good freed decision makers to pursue their narrow self interests, confident they were serving broader public interests as well. Each person could be rewarded most and contribute most by exploiting their individual comparative advantage, whether on farms, assembly lines, or boards of directors. Mechanization removed the drudgery of the most routine tasks by eliminating the economic opportunity for people to pursue such work.

Industrialization of agriculture has consistently lagged behind industrialization in most other sectors, but the process accelerated dramatically in the early 1900s. At that time the potential societal gains from continuing the industrial revolution in the larger society were undeniable. We were still an agrarian society. More than half of the people of this country were either farmers or lived in rural communities, and it took about half of our total resources -- money, time, and effort -- just to feed and clothe ourselves. If we as a nation were to realize the emerging opportunities of the industrial revolution -- to become the modern society we know today -- we had to accomplish two things. First, we had to free people from the task of farming to go to work in factories and offices of the emerging industrial economy. Second, we had to free up income and other resources spent on food and clothing so people could buy the things these new industries were going to produce. In short, American agriculture had to become more efficient. We had to make it possible for fewer farmers to feed more people better at a lower real cost.

Industrialization allowed agriculture to fulfill its public mandate. Through specialization, mechanization, simplification, and routinization nature was bent to serve the needs of humanity. Farmers gradually harnessed the vagaries of nature and transformed their farms into factories without roofs. Fields and feed lots became biological assembly lines with inputs coming in one side and commodities coming out the other. Economies of large-scale, specialized production were achieved as the principles, strategies, and technologies of industrialization were applied to farming. Publicly funded research and education developed many of those new industrial technologies and strategies and transferred them from the experiment station to the farm.

Through industrialization, American agriculture became the most efficient agriculture in the world, at least in terms of the dollar and cent costs of production. This in turn made it possible for this nation to build the strongest economy in world. The agricultural sector takes just pride in its past successes. But the objectives of industrialization have been achieved. The things that industrialization could do for America have already been done.

Today, less than two percent of the people in this country today are farmers. Today, as a nation, we spend only about ten percent, or a dime out of each dollar, of our disposable income for farm produced food. Equally important, the farmer gets only a single penny out of that dime, while nine cents goes to the marketing and input firms. We now pay more for packaging and advertising than we pay the farmer to produce the food. Future societal gains from the further industrialization of agriculture must be squeezed from the farmer's penny. Food would cost only ten percent less on average if the farmer got nothing. It simply doesn't make much difference to society any more whether there are more or fewer farmers or whether farmers are more or less efficient.

Future profits of farmers must also be squeezed from the "farmer's penny," if they continue to use the industrial model. And, the more they squeeze out, the less there is left to squeeze. Thus, farm profits simply cannot be "sustained" through continued industrialization of agriculture. In fact, farming cannot be sustained if we continue to industrialize agriculture. Stewart Smith points out that if past trends were to continue until the year 2020, there would be no farming sector remaining in agriculture (Smith, 1993). The farming sector would be totally absorbed into the input and marketing sectors.

American farmers must shift to a model or paradigm other than industrialization if there is to be any hope of sustaining profits from farming in the future. Agricultural economists must adopt a model or paradigm other than the traditional economic model if we are to be of any use to farmers in making this transition. The profit maximization model has succeeded in virtually eliminating the potential for future profits from continued use of that model by farmers.

The great transformation

There is hope for sustainable farm profits. Continued industrialization is not inevitable. Peter Drucker, a time-honored consultant of twentieth century industrial managers, believes we are in the middle of a great transformation from an industrial to a post-industrial society. In his book: The Post-Capitalist Society, he states: "Every few hundred years in Western history there occurs a sharp transformation. Within a few short decades, society rearranges itself -- its worldview; its

basic values; its social and political structure; its arts; its key institutions. Fifty years later, there is a new world.... We are currently living through just such a transformation." (1994 p. 1). Drucker contends the current transformation began in the early 1970s.

A potential new paradigm for farming profitably in the post-industrial century is emerging from the search for a more sustainable agriculture. Sustainable agriculture has no universally accepted definition. However, one thing is becoming increasingly clear. Agricultural sustainability will require changes far more significant than simply fine tuning the environmental and social constraints of the profit maximizing model of economic efficiency. History will quite likely reveal the most significant aspect of the sustainable agriculture movement to be the emergence of a new mental model, mind set, or paradigm for decision making.

This new sustainable agriculture paradigm demands that we economists rethink some of the fundamental assumptions of our discipline. For example, the assumptions that all rational decision makers maximize profits and thereby promote the public good are obsolete if not outright erroneous. Such assumptions form the foundation for traditional economic analysis of agriculture, whether related to farms, markets, or public policy. The sustainable paradigm is about "balancing" rather than "maximizing." Utility, in terms of quality of life, is viewed as a product of healthy relationships, not just something achieved through acquiring more things.

The fundamental question of economics is the same for the new paradigm as for the old. How can people, individually and collectively, best allocate scarce resources to meet competing ends? The competing ends are the same: alternative sources of satisfaction, utility, or quality of life. It's the conceptual leap from utility to profitability that causes problems. The fundamental economic law of diminishing marginal returns -- in consumption and production -- are unchallenged. However, the nature of causality between price and quantity and the feasibility of "holding other things constant" are questioned. In short, the new economic paradigm for sustainability is being build upon the same conceptual ground as the old paradigm of economic efficiency. But the foundation of our old economic paradigm is crumbling. Remodeling is not the answer. Sustainability dictates that we rebuild from the ground up.

Evidence of emergence of a new paradigm abound in economic sectors outside agriculture. While agricultural economists debate the characteristics of future stages of industrialization, much of the rest of society is already moving into a new post-industrial era of human social and economic evolution. This post-industrial era in not just an extension of industrial age thinking with new biological and information technologies. It is not about producing more things more efficiently. It is about producing different things, in different ways, for different reasons.

The industrial model of specialization, mechanization, simplification, and routinization seemed appropriate for meeting the needs of its time. Adam Smith's "invisible hand" seemed to guide market economies toward ever greater economic efficiency during the industrial era. However, the industrial era is giving way to a new era of human progress. The profit maximizing model for economic efficiency likewise must give way to a new paradigm -- a paradigm adequate to meet human needs during the post-industrial century.

The industrial model made it possible for societies to rise above subsistence living. It removed much of the drudgery from work and made possible increased leisure time for pursuit of entertainment. But, industrialization appears fundamentally incapable of sustaining human progress. The economic benefits of industrialization have declined as its ecological and social costs have risen. The goal of sustainability reflects a new world view of sustainable human progress. Sustainable agriculture is just one little piece of something far greater that is literally transforming human civilization.

Agricultural economists have much to offer during this great transformation. The fundamental question is whether we help develop a new economic paradigm capable of meeting the challenge agricultural sustainability or continue to drift toward increasing irrelevance as we tinker with ideas whose time have past.

The end of the industrial era

No trend goes on forever. A couple of scientists recently proposed to the world scientific community a list of their "Top 20 Great Ideas of Science." Some of the ideas on their top 20 list were the first and second laws of thermodynamics and the universal laws of motion. But, also on that list was the proposition that "Everything on earth operates in cycles," physical, biological, economic, and social (Science, p.1309). If this proposition is valid, the industrial era will end. The question is not whether but when.

Paradigms, such as industrialization, become dominant because they are found to be capable of exploiting new opportunities or solving problems that previous paradigms could not solve. The industrial era was fostered by a host of interrelated and complex developments, but among the most important was accessibility to large supplies of fossil fuels. However, those fossil energy supplies are being rapidly depleted by an expanding global economy. In addition, industrialization has generated a whole new set of unanticipated environmental and social costs.

Industrial systems historically have degraded their environment and depleted their natural resource base. For example, industrialization has transformed an agriculture created for the purpose of converting solar energy to human-useful form, into an agriculture that uses more non renewable fossil energy than it captures in solar energy from the sun. In addition, commercial fertilizers and pesticides, essential elements in a specialized, industrialized agriculture, have become a primary focus of concerns for environmental pollution.

Industrial systems also degrade the human resource base. Henry Ford is quoted as once saying the biggest problem in running a factory is that you have to hire whole people when all you need is two hands. Factory farms transform independent decision makers, into farm workers, people who know how to follow instructions or directions, but not necessarily how to think. Dee Hock -- founder, president, and former CEO of VISA -- states it very bluntly: "Newtonian, mechanistic, command and control pyramids of power were an anachronism of the Industrial age. They were not only increasingly archaic and irrelevant, they were a public menace" (Hock, p.10).

Industrial agriculture, like industry in general, is management extensive rather than management intensive. It allows fewer farmers to farm more land and produce more livestock by using more

capital equipment, hiring more laborers, and purchasing more off-farm inputs. The new agricultural mega-farms and feed lots are no less mechanical and hierarchical in organization than are those deemed by Dee Hock to be anachronistic, archaic, irrelevant, public menaces.

The focus of industrialization is on production rather than people. As farms have grown larger and more specialized, agriculturally dependent rural communities have withered and died. Larger farms meant fewer farms and fewer farm families to support local schools, churches and public institutions, and retail businesses. In addition, larger farms tend to bypass local communities in purchasing production inputs and in marketing their products. The fundamental purpose of agricultural industrialization was to make it possible for fewer people to produce more. It takes productive people, not just production, to sustain local communities.

The industrialization of agriculture made sense as long as displaced farmers could find more productive employment in the larger economy. However, the days of good paying factory jobs are gone. American industries are reducing employment at all levels. Robots and computers are replacing people and eventually will do anything and everything that can be done without thinking. American industry simply doesn't need any more displaced farmers.

The growing environmental and social costs of industrialization may have more than offset its declining benefits as far back as two to three decades (Drucker, Hoval). Great transformations take time. But there is growing evidence that the industrial era is drawing to a close.

The post-industrial era

Alvin Toffler -- a futurist quoted by people with views so different as Speaker, Newt Gingrich and President Bill Clinton -- points out that many forecasters simply present unrelated trends, as if they would continue indefinitely, without providing any insight regarding how the trends are interconnected or the forces likely to reverse them. The professional and popular agricultural press is filled with such forecasts for the future industrialization of agriculture.

Toffler contends that the forces of industrialization have run their course and are now reversing, that the industrial models of economic progress are becoming increasingly obsolete, and that old notions of efficiency and productivity are no longer valid. He contends that mass production is no longer a symbol of "modern" business operation. The new "modern" model is to produce customized goods and services aimed at niche markets, to constantly innovate, to focus on value-added products and specialized production. Toffler contends that mass production of basic commodities were the trends of the past, not the trends of the future.

Some contend that large industries will simply tailor specialized products for niche markets and continue the industrial trend. But the primary advantages of industrialization comes from being able to produce large quantities of the same basic things rather than from producing small quantities of lots of different things. Large firms realize that the profitable markets of the future are in the niches, but most also realize that as they target these markets, they become increasingly vulnerable to competition from small firms and independent producers. Thus, we see large industrial firms begin to decentralize, downsize, outsource, and otherwise begin to

dismantle themselves to forestall their eventual competitive destruction by more flexible, innovative, creative, dynamic, smaller competitors.

Toffler goes on to state in his book Powershifts: "the most important economic development of our lifetime has been the rise of a new system of creating wealth, based not on muscle, but on the mind" (Toffler, p. 9). He contends that "the conventional factors of production -- land, labor, raw materials, and capital -- become less important as knowledge is substituted for them" (Toffler, p. 238). "Because it reduces the need for raw material, labor, time, space, and capital, knowledge becomes the central resource of the advanced economy (Toffler, p. 91). Toffler also states that separate and sequential systems that characterize industrial production are being replaced with synthesis and simultaneous systems of production. Synergism is replacing specialization as the primary source of new productivity.

Dee Hock states that "The most abundant, least expensive, most under-utilized, and frequently abused resource in the world was human ingenuity: the source of that abuse was the archaic, Industrial Age institutions and management practices they spawned" (Hock, p.10). He believes the era of knowledge and information-based human progress will be fundamentally incompatible with the industrial model or organization.

Drucker, in his book: The New Realities, talks of the "Post Business Society." He states, and I quote: "the biggest shift -- bigger by far than the changes in politics, government or economics -- is the shift to the knowledge society. The social center of gravity has shifted to the knowledge worker. All developed countries are becoming post-business, knowledge societies. Looked at one way, this is the logical result of a long evolution in which we moved from working by the sweat of our brow and by muscle to industrial work and finally to knowledge work" (1989, p. 173).

Robert Reich, U.S. Secretary of Labor, addresses future trends in the global economy in his book, The Work of Nations. He identifies three emerging broad categories of work corresponding to emerging competitive positions within the global economy: routine production service, in-person service, and symbolic-analytic services.

He calls routine service workers the old foot soldiers of American capitalism in high-volume enterprises. These workers typically work for large industrial organizations and live primarily by the sweat of their brow, or their ability to follow directions and carry out orders, rather than by using their minds. In-person service, like production service, entails simple and repetitive tasks. The primary difference is these services must be provided person-to-person.

Symbolic-analysts are the "mind workers" in Reich's classification scheme. They include all the problem-solvers, problem-identifiers, and strategic-brokers. He points out that symbolic analysts often work alone or in small teams, which are connected only informally and flexibly with larger organizations. Like Toffler and Drucker, Reich believes that future human progress will result from symbolic-analysis, from mind work, rather than routine production or in-person services.

Drucker points out an important, fundamental difference between knowledge work and industrial work. Industrial work is fundamentally a mechanical process whereas the basic principle of knowledge work is biological. He relates this difference to determining the "right size" of

organization required to perform a given task: "Greater performance in a mechanical system is obtained by scaling up. Greater power means greater output: bigger is better. But this does not hold for biological systems. There, size follows function. It would surely be counterproductive for a cockroach to be big, and equally counterproductive for the elephant to be small. As biologists are fond of saying, 'The rat knows everything it needs to know to be a successful rat.' Whether the rat is more intelligent than the human being is a stupid question; in what it takes to be a successful rat, the rat is way ahead of any other animal, including human beings" (Drucker, 1989, p. 259).

He concludes that differences in organizing principles may be critically important in determining the future size and ownership structure of economic enterprises. Other things equal, the smallest effective size is best for enterprises based on information and knowledge work. "'Bigger' will be 'better' only if the task cannot be done otherwise" (Drucker, 1989, p. 260).

But if all this is true, why are we currently seeing rapid industrialization in some sectors of the agricultural economy, specifically in hog and dairy production? In Joel Barker's book: Paradigms, he points out that new paradigms tend to emerge while, in the minds of most people, the old paradigm is doing quite well. Typically, "a new paradigm appears sooner than it is needed" and "sooner than it is wanted." Consequently the logical and rational response to a new paradigm is rejection (Barker, p. 47). New paradigms emerge when it becomes apparent to some people, not necessarily many, that the old paradigm is incapable of solving some significant problems of society. Aging paradigms may also be applied in situations where they are ill suited, creating major new problems while contributing little in terms of new solutions.

American agriculture provides a prime example of over-application of the industrial paradigm. The early gains of appropriate specialization in agriculture lifted people out of subsistence living and made the American industrial revolution possible. But the potential societal benefits from agricultural industrialization were probably largely realized by the late 1960s. More recent "advances" in agricultural technologies may well have done more damage to the ecological and social resource base of rural areas than any societal benefit created by more "efficient" food production.

Industrialization of agriculture probably lagged behind the rest of the economy because its biological systems were the most difficult to industrialize. Agriculture by nature doesn't fit industrialization, it had to be forced to conform. Consequently, the benefits were less and the problems were greater. It is becoming fully industrialized last, and likely will remain industrialized for a shorter period of time.

Sustainable agriculture: the new paradigm

Joel Barker, in his book Paradigms, defines a paradigm as a set of rules that do two things: (1) defines standards of success and (2) establishes or defines boundaries and defined rules for behavior within the boundaries. He uses the game of tennis as an analogy to illustrate these concepts. Tennis courts are standard in size and out-of-bounds are clearly marked. The ball must hit within these bounds to "stay in play." The ball must be struck with a tennis racket, not the hand or anything else, and the ball is allowed to bounce only once before it is returned over the

net. Success is achieved by consistently returning the ball over the net while making it difficult for your opponent to do likewise.

In the sustainable agriculture paradigm, a sustainable human society is the standard of success. A sustainable agriculture must be capable of maintaining its value to human society forever, or at least for as long as the sun continues to shine. One cannot prove empirically that one system of agriculture is sustainable and another is not. It would take forever to collect the necessary data. Thus, the science of sustainability must be built upon logic. Logic, and common sense, leads to the conclusion that to sustain human life on earth agriculture must be ecologically sound, economically viable, and socially responsible.

Any system that degrades or depletes the productivity of its resource base will eventually lose its ability to produce, and thus, is not sustainable. Likewise, any system that pollutes or poisons its environment in the process of producing will eventually lose its net value to society and likewise is not sustainable.

Economic viability is necessary to maintain control over resource use, regardless of the economic system employed. A system that lacks economic viability eventually must sacrifice control over its resources to some economically viable alternative. In common sense terms, if farmers cannot stay in business, their farming systems are not sustainable. However, economic viability and profitability are not synonymous. Economic profits imply that returns exceed opportunity costs -- that resources are put to their "highest" economic use (Levins, 1996). Economic viability requires that only returns to resources are sufficient to maintain control over their use in an ever-changing, dynamic environment.

A sustainable agriculture must also be socially responsible. The fundamental purpose of agriculture is to provide for the basic needs of people. Thus, an agriculture that fails to provide an adequate supply of safe and healthful food and fiber and a reasonable cost is not sustainable. However, people also must be provided opportunities to participate as productive members of society. We must produce something to earn money to buy the things we want and need, but we should also have an opportunity to realize satisfaction from the productive employment of our abilities. Quality of life is as much a function of working and contributing as it is of loafing and consuming. Employment in any given sector of an economy need not be proportional to its production. But displaced farmers with no alternative employment are no less a cost to society than is an aquifer polluted by agrochemical or a sediment-clogged stream. A socially responsible agriculture must do its part to provide opportunities for people to contribute as well as consume.

Finally, sustainable systems must be ecologically sound, economically viable, *and* socially responsible. All three are necessary and no one or two of the three is sufficient. A system that lacks ecological soundness cannot sustain its productivity over time, no matter how profitable or socially supportive it may seem in the short run. A system that is not economically viable will not be employed, no matter how ecologically sound or socially responsible it may seem. And a system that is not deemed to be socially responsible will be discarded or destroyed by the society it must support, no matter how profitably or environmentally friendly it might otherwise seem to be.

These are the standards of success. The sustainability game is like old-fashioned pinball. The only thing we win is the privilege of playing another round. We can judge how well we are playing the game, but success is a process rather than an outcome -- a direction rather than a destination.

The traditional paradigm of economics is fundamentally incapable of addressing the issue of agricultural sustainability. The standards for success are different. The boundaries and different. The rules of behavior within those bounds are different. Different standards, different bounds, and different behaviors imply different paradigms.

Traditional economic models are based on the assumed goal of profit maximization. The environment and society are external to the decision unit. The sustainable agriculture model treats ecological soundness, economic viability, and social responsibility as three inseparable dimensions of the single goal of objective of long run sustainability. All three are "inside" rather than "outside" the bounds. The bounds of sustainability are the laws of nature, including human nature.

Sustainability is a function of balance as much as level. This concept becomes apparent if one assumes a theoretical long run, dynamic global equilibrium situation. Ultimately, global quality and quality of human life must be balanced with global resources, and global economic activity. Any attempt to increase one without enhancing the other two will create an unstable and less sustainable situation. When the three are out of balance, enhancing the performance of one relative to the others may increase sustainability. But when the three are in balance, one cannot increase without decreasing the others. Increasing one but not the others makes the system unstable and less sustainable.

Traditional economic models clearly consider the natural environment and larger society to be "external," or out of bounds. Externalities are internalized by demands of society -- imposed by decree -- not by choice of the decision maker. Success in the traditional economic model is measured in terms of profits and growth. Within the limits allowed by nature and society, the economically rational decision maker may take a wide range of actions. Almost anything that is possible and legal is encouraged if it leads to profits and growth.

The rules of behavior are different for the sustainable paradigm. Sustainability requires thoughtful, purposeful human intervention in the development process. The earth cannot sustain the level of population and per capita consumption that might result from the thoughtless pursuit of narrow self-interests. The natural ecosystem must be "managed," not simply treated as a mine or a sink, in order to sustain its productivity. Sustainability requires that we make decisions collectively for the collective good of society as a whole. Dignity of work may affect our quality of life as much or more than how much "stuff" we are able to buy and the leisure time we have to use it. Quality of life is the product of how we relate to each other -- economically, politically, and socially within and between generations. The quality of human life cannot be sustained without caring and sharing in addition to working and making "stuff."

Willard Cochrane, a pillar of the agricultural economics profession, states that "we must replace the philosophy of extreme individualism with a philosophy of community responsibility," if we

are to reverse the current slide toward economic collapse and social chaos. By community responsibility "we mean the willingness of each individual to consider the needs of all other members of the community; we mean the willingness of each individual to support the actions designed to meet the needs of all other members of the community; we mean that individual members must recognize Mother Earth as an integral part of the community and to respect her nurturing role in it; we mean that each and every child must be taught in the home, the church and the school what his or her rights in the community are and what his or her responsibilities to the community are; we mean, finally, that the Golden Rule must be our guide to human conduct in the community" (Cochrane, p. 36).

The challenge to agricultural economists

Barker points out that successful old paradigms often collect a host of avid, but unwitting, advocates. Advocates of traditional economic thinking tend to spontaneously apply their paradigms to any issue that arises. We fall back on the paradigms we were taught as if they were based on irrefutable truths of the universe. However, Donald McCloskey, in an article "The Rhetoric of Economics," argues convincingly that the official methodology of economics is modernism. He further contends that "Modernism is influential in economics, but not because its premises have been examined carefully and found good. It is a revealed, not a reasoned, religion" (1984). The post-modern era is begging for a post-modern paradigm of economics.

The traditional economic model of functional separation, profit maximization, and economic efficiency is consistent with the principles of Newtonian physics (see Capra, 1982). The community, farm, and farmer are modeled as a machine with many complex and interrelated, but separable parts. If a part breaks, you have to fix it or replace it, but the machine can be made to function again. The direction of cause and effect are definite, if not readily discernible. The objective is to achieve maximum output relative to input through purposeful tinkering with causes and effects.

The sustainability model is much more consistent with the principles of quantum physics. The community, farm, and farmer are modeled as living biological organisms, each a whole in itself, but also made of a complexity of inseparable wholes" (Savory, Kirschenmann). If a critical part "breaks" the organism gets sick or dies. If it gets sick, it may heal itself if the illness is corrected in time. If it dies, it cannot be revived and made to function again. The nature of cause and effect is never completely definable. Everything is connected to everything else. Cause and effect are circular rather than one way. Purposeful change requires thoughtful intervention rather than tinkering. The objective is to sustain the health and productivity of the system over time. Continual change, regeneration, is a fundamental part of that process.

In biological models, individual elements must conform to their ecological niche. Big farms will be sustainable only if their "niche" is equally large. It is readily apparent that many of today's large farms are degrading both the natural and human resource base as they have expanded beyond their ecological and societal niches. It will take "mind work," not physical or economic muscle, for farmers of the future to find a niche where they can carry out their function by means that are ecologically sound, economically viable, and socially responsible. The vast majority of those niches will likely be smaller than today's large, "industrial-sized" farm.

The sustainable agriculture paradigm is consistent with the visions of Toffler, Drucker, Reich and others of a post-industrial era of human progress. Sustainable agriculture is management intensive, rather than management extensive. Sustainable systems must be individualistic, site-specific, and dynamic. Thus, sustainable farming is inherently information, knowledge, and management intensive.

The future will require not only more thinking, but will require new ways of thinking as well. In the Post Capitalistic Society Peter Drucker states: "In the knowledge society into which we are moving, individuals are central. Knowledge is not impersonal, like money. Knowledge does not reside in a book, a databank, a software program; they contain only information. Knowledge is always embodied in a person, carried by a person; created, augmented, or improved by a person; applied by a person; taught by a person, and passed on by a person. The shift to the knowledge society therefore puts the person in the center."

Productive people are clearly the key to sustaining human progress during the post-industrial era. The ability of farmers to think for themselves, to shape their own destinies -- not just apply technologies and strategies developed by others -- will be the key to sustaining agricultural profitability. Agricultural economists are social scientists -- people scientists -- thus, we clearly have a potentially important role to play in developing the new post-industrial paradigm for farming. As social scientists we at least should be willing to question whether we have a responsibility to the people who farm and live in rural communities as well as to the consumers of food and fiber. The post-industrial paradigm of sustainable agriculture will continue to evolve over decades, if not centuries, into the future. The fundamental question is whether agricultural economists will help develop a paradigm capable of sustaining farm profitability, or instead will become irrelevant as our logical role is assumed by others who are less bound to paradigms of the past.

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