

Who Owns America
Land Use Planning for Sustainability

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Who owns America? We generally presume that America is owned by the people of America. But, which people of America – all of the people, or just those people who own personal property? Who owns the space that constitutes the geography of America – all of the people or just those people who “own” land? Those who own something get to decide how it is used. So the answer to the question, “Who decides how land is used?” also answers the rhetorical question of “Who owns America?”

Land use decisions in the United States have their foundation in the economic concept of private property. In America, those who own private property may do with it pretty much as they see fit, including exchanging ownership with others, as long as it does not interfere with the private property rights of others. Restrictions on use of privately owned land, therefore, are limited to restricting actions that might affect use rights to other property held by other individuals.

With relatively minor exceptions, land use decisions are determined by the economics of the market place. Provisions are made through laws of eminent domain to acquire private property for public use, without the consent of owners, but not without just economic compensation to current landowners. Only land uses of a criminal nature, deemed to be of clear public harm, may be restricted without compensation.

Land use may be restricted by various types of zoning as well. But in reality, economic considerations commonly dominate planning and zoning decisions. The question invariably becomes how to maximize economic development with the minimum negative impact on community residents. Requests for changes in zoning are typically motivated by a desire to put land to a higher economic use. Opposition to changes typically is motivated by the desire to protect private property rights. Communities rarely use the tools of planning and zoning to ensure the long run ecological and social well being of the community as a whole.

So, with minor exceptions, private property may be put to its highest economic use. The concept of highest economic use gives legitimacy to competing private property rights, but commonly ignores, or even denies, any right of the community, the public as a whole, to participate in all land use decisions. Economic theory treats a community as a collection of individuals, not as an entity with rights separate from, or in addition to, those of individuals of which the community is composed. In addition, conventional economics does not even consider potential ownership rights of future generations. Rights of intergenerational transfer of ownership are based on the premise that to

prohibit or limit such transfers would unjustly restrict current private-property rights. Free market economics makes no provision for future generations, other than those reflected in the self-interests of current decision-makers. Thus, economics drives land use decisions in the US.

The question of long-run sustainability presents a serious challenge to conventional economic thought as the foundation for land use decisions. Over the past decade, many different people have used a variety of definitions of sustainable development. However, the underlying theme of nearly all such definitions is one of intergenerational equity – a responsibility to meet the needs of the current generation while leaving equal or better opportunities to those of all generations to follow. In common language, sustainable development applies the Golden Rule across generations – doing for those of future generations, as we would have them do for us if we were of their generation and they were of ours.

The three cornerstones of sustainability are ecological soundness, economic viability, and social justice. Any system of development that is not ecologically sound eventually will diminish or destroy the foundation for its productivity, and thus, is not sustainable. Any system that is not economically viable will not be able to maintain control over use of its resources, and thus, is not sustainable. And any system of development that doesn't meet the needs and expectations of society will not be supported by society, and thus, is not sustainable. The three are not separate goals or objectives, but instead are three separate dimensions of the same whole -- as with the three dimensions of a box; height, length, and width. Any object lacking any one of those three dimensions quite simply is not a box. Any system of development that is not ecologically sound *and* economically viable *and* socially responsible just quite simply is not sustainable over time. All are necessary and none alone or any pair is sufficient to ensure sustainability.

Thus, sustainability requires that we look beyond the economics of short-run, self-interest to the broader set of issues affecting quality of life or human well being over time. Sustainability requires that we raise our economic thinking above short-run, self-interest to consider the long run health and productivity of the natural ecosystem, not just the optimum means by which it may be exploited for our short-run gratification. Sustainability requires that we broaden our economic thinking beyond self-interest to consider the well being of the community, or society, as a whole, not just the sum of the welfare of individuals who make up a community or society. The economics of self-interest is an important dimension of sustainability, but it is but one among three. Things ecological, social, and economic must be considered as complementing dimensions of the same whole, not as competing objectives that can be pursued separately.

The inadequacies of short-run economics in guiding long run decisions can be made clear through an illustration using fairly basic economics. The economic theory involved in this illustration may seem unduly burdensome to those not familiar with economics. But it's important to understand that an appropriate interpretation of economic theory supports a sustainable use policy that is very different from the land use policies of the US today.

The illustration is based in production economics. Production economists relate production, or output, to the use of various production inputs through something they call a production function. Output is assumed to be “a function of” – a consequence of – the use of inputs. Inputs can be either classified as variable inputs or fixed inputs. Fixed inputs are those things that contribute to production, but are assumed to be fixed in quantity during a given time period. The amount of output within a given time period then will be determined by the amount of variable inputs applied. For example, in the case of crop production, for any given year, land is generally assumed a fixed input and fertilizer would be a typical variable input. The production or yield of the crop then is said to be a function of the amount of fertilizer applied.

All economically relevant production functions are characterized by three *stages of production*, although the first and third stages are rarely observed in actual practice. During both the first and second stages of production, as more variable inputs are applied production increases – more input results in more output. However, during the first stage of production, each additional unit of input results in more output than did the previous unit of input – output is increasing at an increasing rate.

If it is profitable to produce at all, it will be profitable to increase input use until the end of the first stage – to increase inputs as long as each added input results in more output than did the previous unit. In some cases, money to purchase variable inputs may be limited. In such cases, it would be better to let some of the fixed input go unused than to limit the use of inputs to some point in the first stage of production. For example, it would be more profitable to let some of the land remain idle than to limit the amount of fertilizer per acre to some point in stage one of production. As long as production is in stage one, increased yields from applying more fertilizer to fewer acres would more than offset reduced yields from farming fewer acres.

At the beginning of stage two, each additional unit of inputs still adds to total output, but begins increasing output by a smaller increment than did the previous unit of input/Output is still increasing, but at a decreasing rate. It may be profitable to continue increasing input use during stage two, but only so long as the value of each incremental increase in output exceeds the cost of an additional unit of input needed to produce it. So the optimum amount of inputs used will depend on the added amount of output per additional input, price received for the output, and cost for inputs. Higher prices received for the output and lower costs of inputs increase the optimum level of input use and consequently the optimum level of output. For example, if corn prices are high and fertilizer costs are low, it will be profitable to apply more fertilizer and produce more corn per acre than if corn prices are low and fertilizer costs are high.

The third stage of production begins at the point where additional quantities of variable input result in decreases, rather than increases, in output or production. This stage of production may not seem too logical when applying fertilizer to a crop in a field, but it would be obvious if you were trying to raise a corn crop in a flower pot. At some point, the added fertilizer will begin to inhibit growth and may actually kill the plants rather than

nourish them. At any point in stage three, it would be more profitable to use less, rather than more, variable inputs per unit of fixed input – as less input would result in more output. In other words, beyond this point, production can be increased only by using more of the “fixed” input. In case of crops, beyond stage two, production can be increased only by cultivating more land.

The rational range of production is defined by stage two. At any point in stage one, greater production could be obtained by using less of the fixed input and at any point in stage three more output could be obtained by using less of the variable input. It simply doesn't make sense to use more of either fixed or variable inputs to get less output, even if all inputs were free. This leaves stage two as the only economically rational range of production. During stage two, total production is increasing, but at a decreasing rate. As indicated previously, it is not possible to determine the economic *optimum* level of production without knowing prices of production and inputs. But, if there is a profit to be made, it will be made somewhere within stage two, the range of rational economic production.

The separation of stages of production also provides some other useful information about efficient use of fixed and variable inputs. The end of stage two is the point of maximum total output from a given amount of fixed input – for example, the maximum yield of corn from an acre of land. Consequently, at the end of stage two, the cost of “fixed input” per unit of output is at its minimum – e.g. the cost of land per bushel of corn is at its minimum.

Conversely, at the point marking the beginning of stage two, total output per unit of variable input is at its maximum. Beyond that point, each increase of input results in smaller increments of output, thus reducing total output per unit of variable inputs. Thus, at the beginning of stage two, the cost of “variable input” per unit of output is at its minimum – e.g. the cost of fertilizer per bushel of corn is at its minimum.

Although we cannot determine optimum levels of input use without knowing prices of output and inputs, we can draw some important conclusions regarding optimum land use under some fairly general conditions. For example, we know that if variable inputs were *free*, it would always be profitable to increase their use to the point of *maximum total production per unit of fixed input*, the end of stage two. Increases in value of production that would be feasible prior to that point could be achieved without any added cost. We also know that if land were *free*, it would never be profitable to use inputs beyond the point of *maximum production per unit of variable input*, the beginning of stage two. Any increase in production beyond that point could be achieved at a lower cost by using more land rather than by applying more variable input to a lesser amount of land.

Even an intuitive grasp for the meaning of the three stages of production is sufficient to understand some fairly critical conclusions regarding the economics of land use. From a short-run economic perspective, production should be increased beyond the point of minimum cost of inputs, the beginning of stage two, to a point where value of additional

production no longer exceeds added cost of inputs. If inputs become cheaper or new technology allows more production per unit of input, the optimum level of input use will move nearer the end of stage two, to higher levels of production in pursuit of more profits. As a consequence less land would be required than before to produce any given level of optimum total production.

This is the economic rationale for the politically motivated “high-yield” farming movement. The basic argument is that if we use more commercial inputs and new production technologies to increase production per acre of land, more land can be set aside for wildlife and other non-agricultural uses. Alternatively, if we rely on less input-intensive farming methods, total production will fall, making it necessary to farm more land to meet the food and fiber needs of people. This would require the use of more environmentally fragile lands, some of which is currently set aside for wildlife. It is not likely a simple coincidence that high-yield farming maximizes input use and is supported by those who sell or promote inputs – thus, the political motivation for its promotion. However, the economic argument is valid *only* from the perspective of short-run, self-interest economics.

The conclusions are totally different if we instead take a long run, sustainable economic perspective of the land use question. Nearly all the agricultural inputs that are variable in the short run are fixed over the long run. For example, fossil fuels, commercial fertilizers, pesticides, and machinery are all derived from finite, non-renewable stocks of natural resources. Thus, the long-run supplies of such inputs are finite or fixed, not variable, although their use in the short run may be variable.

In the long run, our only variable resource is solar energy. Living organisms, including people, represent renewable resources, but living organisms are dependent on finite natural resources as well as solar energy. Every productive resource on earth quite realistically can be depleted, even used up, over some finite period of time. But, the continuing supply of energy from the sun is expected to continue for billions of years into the future. Solar energy is as close to being an infinitely renewable variable resource as anything that humans can conceive.

Geographic space is required to capture solar energy. Land occupies geographic space. Thus, land – as space – serves as a proxy for the only long run, *variable* resource. Of course, land has characteristics other than space -- such as topography, organic matter, texture, and water holding capacity – which influences its productivity and potential market value. But, the non-spatial aspects of land are finite, and thus, may be depleted over time. Land as space, while fixed in total at any point in time, represents a virtually infinite supply of solar energy that may be utilized in varying quantities over time, and thus, represents a *variable* long run resource.

Ironically, those things that are variable in the short run are fixed over the long run, and the one thing most fixed in the short run. As we should expect, that which appears to be optimum from a short run perspective appears to be far from optimum when one takes a long run perspective. Returning to stages of production, since solar energy is the only

variable resource and since it is free, the economic optimum input use and output will be at the *beginning* of stage two. In the long-run sustainable context, this is the point where production per unit of *long run fixed resources (short run variable)* is maximum. This also is the point where we get the maximum possible total production from the only *long run variable resource*, and the only unlimited and free resource, which is solar energy.

Conventional economic theory claims that maximum production from use of short-run variable (long run fixed) inputs will be ensured by competition. However, conventional economic assumptions have several critical flaws. The most obvious is a lack of competition, at least competition in an economic sense. The persistence of ten to twenty percent annual returns of investment in the food industry, for example, is clear evidence that profits are not competed away, as would be necessary to maximize the efficiency of input use. However, even in competitive economic sectors such as farming, competition does not ensure minimum costs of production, and thus, maximum efficiency in use of resources. Successive innovations force farmers to continually move from adoption of one new technology after another, limiting the competition among farmers using the same technologies and preventing markets from reaching their theoretical competitive equilibrium.

Even more critical flaws of conventional economics relate to assumptions concerning the nature of fixed and variable resources. In the short run economic situation, fixed resources, such as land, are assumed to have no cost. By assumption, they have no alternative use within the short-run timeframe, and thus, no *opportunity cost*. However, land is not assumed to be free in the sense that additional land could be obtained without cost. In fact, the opposite is true. Economists assume that in the short run no additional land is available at any cost. If land costs were included in short run economic analysis optimum use of variable inputs would always exceed the point of maximum efficient use.

When considering the long run, all inputs are variable, and land will never be a free economic resource. In a market economy, land will always have a positive price. There will always be more people who want to control and use land than there will be land available. In a market economy, the control and use of land is rationed by price, and the greater the demand for a given supply, the higher will be the price. As a result, a conventional long run competitive equilibrium would always result in over-utilization of non-renewable inputs and under-utilization of land. So, even economic competitive markets would not ensure efficient land use in short run and virtually ensures the misuse of land over the long run.

Where does this leave the argument for high-input, high-yield agriculture? The only logical conclusion is that high input use, while resulting in high yields in the short run, simultaneously depletes finite stocks of inputs at higher than optimal long run rates. The result is lower than optimum total production over the long run, and ultimately, greater than optimal reliance on solar energy and land use, over the long run, as input stocks are depleted. In the long run, more land will be required for agriculture, leaving less land

for wildlife and other uses, because productive inputs will have been prematurely exhausted. Thus, high-yield agriculture makes economic sense if one is pursuing short-run self-interest, but makes economic nonsense if the goal instead is long run sustainability.

So what does all this mean for land use planning? It means that *markets cannot be allowed to allocate the use of land as space*. This is the most important conclusion of the foregoing illustration of short run versus long run economics. The same reasoning holds for any type of land use where non-renewable materials are placed upon the land to create something of economic value. Markets place positive prices on economic inputs, resources, and products. Those things that are most scarce – that are less available relative to the aggregate desire and ability to possess them – will command the highest market prices. Higher prices both ration the scarce supplies among those who are willing and able to pay and provide an incentive for increased production to reduce the scarcity. Higher prices limit the use of resources and inputs in scarce supply and simultaneously encourage increased production to reduce the scarcity. But land, as space, cannot be allowed to have a positive price without misallocating its use, and higher land prices quite simply cannot create more space.

Land prices guide the use of land toward its highest valued short-run economic alternative – whether for residential development, factories, farms, or wilderness. Those using outdated economic theory have falsely assured us that we will realize the highest total value from a given stock of land by allowing free markets to allocate land use. Some portion of the total value of land will reflect its inherent productive capacity, whether in agriculture, recreation, or other land-based production processes. That portion of land value can be allocated by market prices. However, much of the value of land represents its value as space – a geographic place to carry out some activity, or simply as space to be held or controlled. The value of land as space must be allowed as a public good.

More specifically, land as space, as a collector of solar energy, must be treated as a *free resource* if we are to achieve its *long run*, optimum use. Any market value placed on land as space will cause it to be used too intensively, using too many finite or non-renewable inputs on too little land, and will deplete resources at a faster than optimum rate. Thus, long run sustainability will require a rethinking of fundamental concepts of private property, specifically of what it means to *own* land.

The concept of private property has never meant the right to do whatever one chooses with the property they own.” Conditional” ownership was always implied, if not always stated. A new condition on land use is needed to ensure sustainability. Land “ownership” cannot convey any right to degrade the productivity of land, if land is to be used sustainably. Thus, the “owner” of land cannot be allowed to possess, and thus cannot convey to another, the right to use land in ways that are inconsistent with long run societal well being. If society, rather than the individual, makes the ultimate decisions regarding how land is used, land as space will have no market value because

there will be no right of alternative use for its owner to convey. Its price will reflect only that portion of its value that is associated with its potential productivity in its current use.

Traditional remedies to unsustainable land use, such as lawsuits and environmental regulations, will not provide lasting solutions. Traditional remedies are based on the principle of conflicting self-interest, rather than the collective interest of the community as a whole. Lawsuits, at best, only compensate individuals who are damaged by the actions of another – even in the case of class actions. Environmental regulations invariably reflect some compromise among conflicting individual interests, which settles to some minimum common denominator in a society driven by short-run, self-interest. Communities must find the courage and the means to act as a whole, for the long run well being of the community as a whole, considering both current and future generations. Sustainable land use is not a matter of compromise among conflicts; it is a matter of finding harmony within.

Communities may use zoning laws to pursue their objectives where they are allowed to do so under current state law. In cases where state or national laws prevent a community from protecting its resources from economic exploitation, the laws must be changed. But zoning, as currently practiced, is only a “band aid” treatment for a potentially fatal disease. Those with the greatest economic interests ultimately prevail. New means must be found for allocating land use that will remove any economic incentive for rezoning land to allow more intensive uses. Land must be treated as a commonly managed natural resource, rather than an economic commodity that can be bought and sold to the highest bidder.

Civil laws are clearly designed to protect property rather than people – to bring a civil case, one must have suffered some loss that has private, economic value. In civil court, those without property, and no potential to acquire it, can have no claim because they have nothing to lose. Cases brought to protect the “rights of future generations” make no sense to those who view protection of private property as the only legitimate role of the courts.

The inherent common property nature of land as space certainly is not a new concept. In 1796 revolutionary writer Thomas Paine, in his paper, *Agrarian Justice*, pointed out that all land was initially held in common. Thus, the previous removal of land from the commons deprived those of later generations of their common birthright – the right of access to land. Initially, land could only be removed from the commons if there was as much and as good land left for any others who chose to claim it. Consequently, land taken from the commons had no market value – by definition, it could not be scarce. A similar argument can be made to support the rights of future generations to as much land as good land as we have today. And to protect this right, land, as space cannot be allowed to have a market value.

Economist, Henry George in his 1879 book, “*Progress and Poverty*”¹ proposed that all use value of land be taxed away to prevent the pricing of land as a market commodity. A more logical approach today might be to devise a policy for capturing any increases in

land values attributable to rezoning for higher market valued uses in order to compensate those whose land is rezoned to lower-valued uses. This would remove any economic incentive for current or future owners to rezone land to either higher or lower valued uses, and would make it much easier for the community as a whole to make logical long run land use decisions. A similar capturing of capital gains in land values attributable to growing population demands would remove speculative incentives for land ownership and would generate public funds to sustain and enhance the productivity capacity of land.

Sustainable development ultimately will require that land use decisions be made by means that find harmony among long-run economic, social, and ethical or moral concerns. It makes no more sense to buy and sell the right to *misuse* land than to buy and sell the right to misuse another person. Land, particularly land as space, is a fundamental resource upon which all life depends. It cannot be allowed to belong to anyone individually or to us in total as a collection of individuals -- just as people cannot belong to other people. Land belongs to the earth just as people belong to the earth, to the collective *us* as a whole – inseparable, indivisible, across all generations.

We may logically buy and sell those things that enhance the productivity of land -- for those uses with impacts that fall within the realm of legitimate self-interest. But we cannot allow markets to allocate the use of land as space. We may logically decide some land use issues by a vote of the people -- for those uses with impacts that fall within the realm of community interests. But, many uses of land as space have impacts on future generations, and future generations cannot vote. Such land use decisions must reflect our fundamental values concerning the responsibilities of being human. Such issues cannot be resolved by economics or politics; they rest on a fundamental code of ethics or morality. They arise out of a consensus of what is fundamentally right and wrong.

Many issues concerning the natural environment are fundamentally moral or ethical issues. We should not be buying and selling pollution rights, because no individual has the moral right to pollute in the first place, and thus, has no right to sell it. Businesses may argue that society has given them that right, through the political process. But, no society has the right to pollute, so it cannot convey that right to a business or anyone else. Pollution of the environment is fundamentally, morally wrong, the same as it is morally wrong to kill, to steal, or enslave. The environment can assimilate some level of waste, as society can tolerate certain amounts or kinds of killing, stealing, or enslaving. But, those things are still morally and ethically wrong, regardless of the ability of society to survive them. We don't condone or encourage them by allowing people to openly buy or sell the right to enslave another person, nor vote on whether one person should be allowed to kill another for personal reasons. We cannot prevent pollution, but it is always morally wrong to degrade the natural environment.

No one has the wisdom to plot a true course toward a sustainable human society. At this point in time, we simply don't know how we can meet the needs of the current

¹ George, Henry, 1879. Progress and Poverty. Random House, New York, NY.

generation while leaving equal or better opportunities for those of future generations. But, we are beginning to learn some things that we cannot do. We cannot allow the economics of short-run, self-interest to determine the *use of our land*. We know that the relentless pursuit of profits and growth will degrade and eventually destroy the resources upon which the future of human life on earth depends.

The people who “own” the land do not “own” America – they only own a right to use the land. No one really “owns” the land, but we people do have a responsibility to see that the land is used wisely. We all share this responsibility – all of us equally. Thus, we must be given an equal voice in deciding how the land of America is to be used. Ultimately, we must reach a consensus to use the land sustainably, if there is to be a future for America and Americans. Ultimately we must discard the outdated paradigm of short-run, economic self-interests for a new paradigm of sustainable economic, ecological, and social development. We may not own America, but it is still our responsibility to ensure that the land of America is used sustainably.