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LAND RESOURCE CONCERNS: PAST, PRESENT AND FUTURE

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Land Resource Concerns: Past, Present and Future*

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A focus on land and resource economics is one of the oldest threads in the tapestry of general economic studies in the United States. Much of the early 19th century writing on this topic was tractarian in nature, while more formal discussions appeared principally in journals devoted to history and politics. In terms of public awareness of U.S. land problems, the decade of the 1880's was especially fruitful. The U.S. Census of 1880 had for the first time published statistics on the tenure status of farm operators, showing that over one-fourth of all farm units were operated by tenants. In a nation that prided itself on an agricultural image based on owner-operation, this was a shocking statistic.

In the 1880's the abuses of the Homestead Act of 1862 and of post-Civil War railroad land grants were beginning to be reported. Henry George published Progress and Poverty in an edition for general circulation in 1880, sparking a vigorous public awareness of the extent of land speculation, both rural and urban. The roots of a national park policy

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had been established by Congressional action reserving public land to create Yellowstone National Park in 1872, to be followed by authorization for the establishment of the first national forest reserves in 1891. A rising public awareness of the need for reservation and protection of land resources led Leonard Salter to characterize the subsequent period from 1891 to 1921 as a "conservation era" (Salter, 1948, p. 8).

Although the foundations of a conservation ethic were clearly established in this period, there was a long lag between these early beginnings and a generalized acceptance of their implications for land resources policy. Many of the most emphatic expressions of public policy stressing continuing land settlement came after 1900, including the Reclamation Act of 1902, the Kinkaid Act of 1904, the Enlarged Homestead Act of 1912 and the Stockraising Homestead Act of 1916. In terms of acres patented to homesteaders, the peak year of public land disposition under the Homestead Act was 1913. More acres were patented in 1923 than in any year from 1862 to 1900 (Hibbard, pp. 397-98). An expansionary ethic was clearly dominant in land policy until after the first World War.

Discussions of the policy implications of this ethic were widespread at the beginning of a formal literature in economics in the United States. Early issues of the American Economic Review, established in 1911, contain articles that

would fall within a broad classification of land economics and resource policy. This pattern of generalized discussion prevailed through the first two decades of the Twentieth Century, with the first significant step toward a sharper focus on land and resource policy represented by the founding of the Journal of Land and Public Utility Economics in 1925. In the context of this symposium, it is worth recalling that Richard T. Ely, the leading spirit in the founding of the Journal of Land and Public Utility Economics, was also one of the founding fathers of the American Economics Association in 1885, served as its first secretary, and as one of its' early presidents. The tie between economics and land economics has been strong throughout the evolution of American scholarly studies in economics for over one hundred years.

I stress this point at the beginning in order to emphasize the nature of the base upon which the subsequent expansion of the field of land economics has been erected. A history of that expansion would be illuminating but would require more time and space than is available for this short paper. At the risk of over-generalization, we can note three major phases in the redefinition of the field of land economics and resource policy:

1. A land settlement and development phase
2. A transition phase
3. An environmental protection phase

A concern with land policy is much older than the institutionalization of this concern in academic disciplines or literature. Its origins date back to the years of earliest settlement in the Americas. It was accelerated by events leading up to and following the American Civil War, which in one sense can be regarded as a war over property rights in land. Its unique feature was the fact that land worked with slave labor was nearly valueless without a labor supply. A major fraction of the net income produced with slave labor had been capitalized into land values, and a destruction of that source of labor meant in effect a decapitalization of asset values in land. The Emancipation Proclamation, in this light, can be regarded as the first major land reform to be introduced in the name of the government of the United States.

It was virtually coincident with the enactment of the Homestead Act in 1862, and with the realization that the railroad era promised a creation of values in land at a speed and on a scale that exceeded any previous experience. The excesses of this process generated the concerns with land policy that gave birth to land economics in its land settlement phase.

This endured up to and through the period of the first World War. The land-price collapse of 1920-21 did not terminate this phase, but it marked the beginning of an end that came with the depression of the 1930's. It was

formalized in the Taylor Grazing Act of 1934 which withdrew the majority of the remaining acres of public domain from further settlement or entry under the various homestead and settlement laws.

This introduced a second phase, which for want of a better name I have called a transition phase. Its principal characteristic was a growing perception that future increases in agricultural production would have to come from a more intensive use of the land resources that were already under cultivation. Central to this perception was a focus on conservation. Water erosion in the southern states and in the northern and western corn belt and wind erosion in the Great Plains provided the dramatic examples that captured public attention for support of a conservation movement focused almost entirely on protection of an agricultural land resource base. Environmental concerns as they are contemporarily defined were a very minor part of this first response to the realization that bringing large areas of new land into cultivation was no longer economically feasible.

Incorporation of this perception into public policy took more than three decades. Dating the transition is hazardous, since many strands of public awareness are involved. The most obvious dates for this phase begin with the Taylor Grazing Act and the establishment of the Soil Conservation Service, in 1934, and culminate in the Clean Air Act amendments of 1970, requiring federal approval of state air

quality standards, and the provision of federal funds to local governments to support water quality planning and operation measures through the 1972 amendments to the Water Pollution Control Act.

The basis for the third or environmental protection phase in land resource policy was laid down in the 1960's. It is interesting to speculate on why environmental protection was expanded to include more than agricultural and forest land in that decade. I am suggesting here that there is a close parallel between the ferment in land policy in the 1880's and the expanded concept of environmental protection policy in the 1960's.

One major thread uniting these periods is the central role played by transport technology. The rail transport revolution after the Civil War created value and the opportunity for capital gain on a scale unmatched in the history of other nations. Although the term was not then used in its present connotation, the railroads made late 19th century Americans into a nation of "rent-seekers," with rural lands and minerals the dominant vehicles.

The scenario was repeated in the 1960's, with automobiles, trucks, jet airplanes, and the Interstate highway system. Here again, the depression of the 1930's and the 1939-45 war had dammed up a more orderly flow in the adaptation of land resource use to new developments in transport technology, as had been the case with the railroads

in the Civil War. At the end of both wars, exploitation of the new transport possibilities resumed with a rush but with one major difference. At the close of the Civil War, we were still an agrarian economy, with half a continent awaiting agricultural development. At the end of the Second World War and its Korean War sequel in the 1950's, we were an urban nation. The rail transport revolution in three decades from the mid-1860's to the mid-1890's centered its value-creating forces on rural lands. The road and air transport revolution from the end of the 1950s to the early 1970's focused its capacity to create capital gains on urban types of land use, primarily in the suburbs. The effects of jet airplanes and the Interstate highway system were thus much more concentrated in both time and space than had been the case with the earlier era of railroad expansion.

It is a thesis of this paper that the crash program of construction of the Interstate highway system after 1956 is a major explanation for the emergence of problems of congestion and pollution that fueled the environmental protection phase of land resource policy after the mid-1960s. But this was not the only propelling influence.

The transition in agricultural technology from an era dominated by innovations in mechanization to an era dominated by genetic, biological and chemical processes occurred almost simultaneously with the revolution in highway transport. Super highways enabled us to expand urban types of land use

and congestion far into the countryside. Chemical and biotechnology in agriculture enabled us to concentrate the potentials for agriculturally induced pollution to an extent never before possible. Advances in animal disease control, feeding technology and transport have enabled large-scale livestock and poultry enterprises to concentrate animal wastes in single enterprises that similar livestock populations once would have spread over entire counties, as recently as the 1950's.

These forces alone would be reason enough to explain the refocusing of land resource policy since the 1960's. Although a list of supporting reasons would be analogous to an inventory of the main features of contemporary culture, one other contributing cause deserves mention. We have redefined the demand for recreation to include a much greater component of space than has any previous generation. Land and water are being revalued, not as producers goods but as consumers goods. This revaluation is itself an outgrowth of the transport revolution, but it has been augmented by an income elasticity of demand for space that is also a direct outgrowth of urbanization.

The resulting demands upon land resources have blurred the distinction between productive and consumptive resource use. One of the most dramatic examples concerns farm land. The current and continuing growth in numbers of small farms of under 50 acres in a period of severe stress in production

agriculture must be interpreted as evidence that, for many rural residents classed as farmers, their farms are in large part a component in their consumption function. If we add to this the area of rural land now devoted to pleasure horse maintenance it is apparent that recreational uses of farm land make up a major current growth sector in the field of land resources. This too has helped focus attention on environmental quality issues affecting land, water, and air.

The early years of the 1970's mark a hinge-point in our perception of environmental problems in a more intangible dimension. It can be argued that the environmental movement in the 1960's was primarily a domestic affair, within the United States. Three events in 1972 and 1973 internationalized this concern.

- a.) The unexpected appearance of the Soviet Union in the world grain market as a major importer.
- b.) The formulation of OPEC and its subsequent embargo of petroleum sales to the U.S. and other nations.
- c.) The publication of the book "The Limits to Growth" (Meadows, et al, 1972) and the resultant wide publicity given to the presumption of physical supply constraints on further resource use.

The catalyzing effect of these events occurred in a setting created by a world-wide concern with the consequences of explosive population growth. This concern was intensified

by a decline in world-wide carry-over (end of marketing year) stocks of grain, from 24 percent of utilization in 1960/61 to 11.5 percent of annual utilization in 1974/75 (USDA, 1986). It seemed clear that the world was not only in danger of exhausting its energy supplies but was approaching its limits in food producing capacity.

The rhetoric of the era of gestation of international environmental concerns in the 1960's was apocalyptic. Paul Ehrlich popularized the notion of a "Population Bomb," waiting to explode, and concluded in the late 1960's that "it is already too late to prevent a drastic rise in the death rate through starvation" (Ehrlich, 1968, p. 3). Garrett Hardin wrote of the "Tragedy of the Commons", concluding that freedom to breed is intolerable and that we must recognize "the necessity of abandoning the commons in breeding" (Hardin, 1968, p. 1248). Kenneth Boulding wrote in space-age metaphor of the limits imposed by "spaceship earth", providing the environmental protection phase of concern with land resource issues with one of its most evocative symbols (Boulding, 1966).

Revisiting the environmental literature of the 1960's is a salutary experience. It points up the speed with which the critical issues of one era can be dissolved and reformed by the passage of only two decades. The central premise of the concern with resource limits in the 1960's and 1970's was with what I am calling the finite assumption. The notion

that the earth's supply of all resources is fixed seems so self-evident that it can be asserted with no proof needed. Yet it is this finite assumption that must be questioned.

In approaching problems of resource supply we have repeatedly violated the injunction that Howard Odum phrased for us decades ago: Do not separate the age-old quartet of man and land, time and space (Odum, 1938). In this space age it is abundantly clear that we cannot define space without a concept of time. It should be equally clear that we cannot define land or resources independently of man. It was a failure to recognize this duality that generated the alarmist literature of the environmental concerns of the 1960's and 1970's.

In terms of the measurements used to estimate resource supply, there can be no resources until they are recognized by human beings. Quantity cannot be measured except in terms of the use to which the resource can be put. These uses, in turn, are functions of perception, rates of recovery, costs of transport, efficiency in conversion, prices, and consumer tastes. These change, and the available stock of resources changes with them.

A stock of resources is thus inadequately measured in terms of physical quantities. In economic terms, the stock does not exist until it can be used by human beings. A resource, in this view, is a cultural achievement, for which

the proper measurement units can only be defined in terms of the totality of a culture, at a given time and place.

In a poet's words:

"The mind of man is the world's true dimension
And knowledge is the measure of the mind"

(Greville, 1633)

But wait. There are minerals in the ground or forces in the electro-magnetic spectrum that we do not know are there. Are they not resources? They are there, and the fact that we do not know they are there, or that we see them and do not know what to do with them, does not cause them to vanish.

Exactly so. And because we do not know they are there, or do not know what to do with them, we are unable to define a resource except in terms of our intelligence and skill in putting it to use. At any one time, intelligence and skills are limited. But the history of the human race provides no evidence that they are fixed or finite over time. If resources can only be defined in terms of human intelligence, and if this is not finite, then the stock of resources cannot be finite.

It is in this sense that the concept of "spaceship earth" has had a perverse influence in inhibiting a clearer view of the true constraints on resource supply. It has hardened the perception that we live on a finite planet, are in danger of exhausting its resources, and must impose social

constraints on resource development and use. The underlying finite assumption has perverted much of the discussion of global environmental issues into arguments for maintaining the status quo. It betrays what Ralf Dahrendorf once described as a zero-sum mentality, not only within cultures, but over generations (Dahrendorf, 1976, p. 7).

A finite assumption is fundamental to many religious creeds, political beliefs, and philosophical systems. It has fostered the "concept of limited good", which has guided many strategies in business mergers, labor union agreements, and commodity cartels. It is deeply imbedded in doctrinal creeds that strive for a steady state in economics, or for an ecological balance in bio-systems. It is basically a static assumption, and it has dominated virtually all pursuits of equilibrium, whether in natural or man-made systems.

This is an unfortunate legacy of much of the environmental awakening that has defined our contemporary concerns with land and resource policy. Unfortunate, because it has diverted attention from a more defensible base for a belief that we should be concerned with problems of resource waste, misuse, pollution, inequitable distribution, or ecologic imbalance. If resources are culturally defined, as I have argued, then the only way they can be destroyed or damaged is through cultural deficiencies. An assertion that resources are finite in a conventional sense implies that our

cultural constraints threaten to slow down or stop the generation of new resources.

This is the sense in which it can be argued that resource supply may impose a limit to growth. We can visualize a weakening of the processes of intellectual development. We can reach levels of population density that outrun the social organization needed for their maintenance. Congestion can approach levels of overcrowding that cause us to "bite each other's tails", as pigs do in close confinement. These are the ways in which a resource stock can be destroyed or stunted, in a dynamic context.

The surest way to exhaust resources is to destroy intellectual freedom in our schools and universities. These are the factories in which resources are created. But preserving a cultural climate congenial to new resource development is not enough. Knowledge is migratory and transferable, but it must be applied. The critical variable is the supply of functioning institutions that can disseminate, adapt, and apply each generation's stock of potential resources.

Developing an appreciation of this central role of institutions is the challenge that faces all of us involved in land and resource policy. It is especially heartening to know that this goal remains prominent in the conception and conduct of the program in Land Resources in the Institute for Environmental Studies at the University of Wisconsin. You

have here an unmatched opportunity to build on an academic tradition that has married the mechanistic and the biological strands in contemporary science.

This is a major intellectual heritage. Many of the social and policy sciences are in danger of being dominated by mechanistic models. The machine is the symbol of our era. Near-instantaneous responses are the expected time-dimension of productive activity. Short run payouts are the goal of business planners. Quarterly balance sheets dominate financial analysis. We have a population that is almost totally divorced from biological processes in daily life.

A reemergence of a realization of the importance of time in the generation of new knowledge is long overdue. This is especially important in land economics, since we are dealing with long-run consequences, in both a social and biological sense. I am indebted to Torsten Hägerstrand, the distinguished Swedish scholar, for an illuminating illustration of this final point.

Hägerstrand recounted at a conference in June 1981 their experience at the University of Lund with a small group exploring the potentials of interdisciplinary study. Different skills or disciplines make demands upon different kinds of knowledge. Consider language skills, dancing, carpentry, or economics.

They found in Lund a carpenter who had made a set of carpentry tools of a kind used in ancient Egypt. With them,

he had constructed a replica of a chair recovered from the tomb of Tutankhamen, from the 14th century, B.C.

In replicating this chair he discovered what no one else had noticed before: There were no right angles in the chair. Its shape, form, and articulation was biological. Legs joined in curves. The back and seat flowed together. There was no evidence of right-angled thinking.

That is what I wish for you as you enter the second decade of your graduate program in Land Resources: no right-angled thinking.

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