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Introduction

Foreign observers have frequently commented on the localized nature of land use conflicts in the United States. In Western Europe, protest actions triggered by land use controversies are usually focused on central governments. When mobilization for political action is attempted, the target is a parliament or the chamber of deputies. In contrast, the typical focus of American protests relating to land use is city hall, the county commissioners, or a state legislature. Underlying this fragmented nature of land use conflicts is one of the most fundamental characteristics of American federalism: Land law is state law. And the implementation of land law has largely been devolved to municipalities, counties and other minor civil division of government. Only one state, Hawaii, has an explicit state-wide system of zoning for land use. Several states, including Vermont and California, have authorized extensive participation by the state in land use planning activities. Although there has been a gradual migration of the direct exercise of land use planning authority up the governmental ladder in recent decades, it still stops short at the state level.

The influence of the federal government in guiding land use is thus largely confined to the use of indirect measures. Though indirect, these are not ineffectual, and their influence has vastly increased since the Second World War. It is the thesis of this paper that, in contrast to the direct exercise of legal authority to control land use, the major

determinants of land use now reside in this federal dynamic. The following sections will explore some of the ways in which this is manifest. Space does not permit any probing in depth. The paper instead will be confined to an annotated catalogue of some of the principal ways in which federal hegemony over the use of non-federal land is gaining ascendency over the conventional legal authority of the states.

Inflation and the Price Level

The most pervasive aspect of recent federal policies affecting land use is also the most intangible. Persistent inflation now determines the economic planning perspective, for land and for all other economic variables. This is not a new phenomenon in the United States. We have had periods of acute inflation in the past, and especially in land values. A substantial part of our history can be written around successive episodes of land boom and bust. Why is this inflation different?

First, because of its duration and apparent life expectancy. Past inflations have sometimes been disastrous, but short lived. We have not had to live with endemic inflation. Housing finance has not had to reckon with prospective property value increases over the life of loans that result in net negative rates of interest. Long term investment plans for agriculture have not had to balance earnings from farm operation with inflationary increases in asset values that promise to dwarf any increases in profitability due to wise investments or prudent operation. Even in the most acute inflations of the past, the prospect of long-term capital gains in land had not entered prominently into farm income accounting. Today it does.

Second, because the rural-urban balance has shifted so drastically. Inflations in the past century occurred when 15 to 40 percent of the

population was still engaged in agriculture. We have no history of coping with inflation when the population in control of agricultural land is 7, 5, or 3 percent of total population. We have no institutions to protect agriculture from scared or restless non-farm capital seeking shelter through land purchases, in the magnitudes now concentrated in urban-industrial hands.

An urban-industrial society relieves the vast majority of its people from the necessity to provide their own food. It does not destroy their desire to use and own rural land. Disenchantment with dense urban settlements is emerging as a major characteristic of our advanced industrial society. Transport technology, shorter work weeks and rising real incomes have given the majority of the urban population the time, the money, and the motivation to increase their consumption of rural land.

In the United States, personal consumption expenditures in constant dollars doubled from 1939 to 1959, and doubled again from 1959 to 1977. Even when adjusted for population growth, per capita personal expenditures in 1977 were 136 percent above the 1939 level (Economic Report of the President, 1978, pp. 258, 287). In 1977 approximately half of total personal consumption expenditures were on housing, household maintenance, transportation, and recreation--expenditures in which land plays a prominent role. In 1939 the comparable expenditure group accounted for only about one-third of total consumer expenditures (Statistical Abstract of the United States, 1948).

Affluence has sharply increased urban demand for rural land. As a result, the farmer must bid for his land against other farmers, and increasingly against non-farmers as well (Raup, 1975). The demand curve for rural land has shifted sharply to the right, for reasons that have little to do with the demand for food and fiber. This shift has not been uniform

throughout the United States, but it has been pronounced in the dairy belt of the Northeast and Lake States, in the Eastern Corn Belt, and in the Atlantic, Gulf, and West Coast regions containing some of our most productive lands.

The third reason why inflation today impinges so heavily on land use is because the balance between operating and fixed capital in agriculture has undergone so radical a transformation. In the past, the ratio of the cost of purchased inputs to the gross value of output stood in the range of one to ten, or one to five. Today in intensive crop agricultural systems this ratio is in the range of one to 1.5 or one to two. In livestock and poultry feeding it is in the range of 1 to 1.2 or 1.4. This shifts the incidence of inflation within agriculture, by putting a penalty on slow-maturing enterprises and a premium on fast turnover.

This emphasizes one of the most insidious influences of inflation -- its effect on expenditures and the structure of investment. Synthetically created purchasing power results in patterns of expenditure that are distorting, "not by being excessive in total amount (and so inflationary), but by being wrong in composition -- directed too largely either towards consumption or towards the formation of somehow inappropriate and unproductive mixes of capital" (Brown, 1979, pp. 1-2). Threaded throughout the following discussion we will see examples of ways in which inflation has converted land into a consumers good or has diverted investment into less productive channels.

Tax Policy

In contrast to the indirect influences of inflation, the most direct influence of federal government policy on land use arises through taxation. At first glance, this seems incongruous, for there is no direct federal tax on land. Just as land law is state law, land taxes are local taxes, from which only a few states continue to derive any substantial amounts of state revenue. The federal influence arises through its predominance in the field of income taxation, and the dramatic growth in importance of measures of tax avoidance associated with rising income levels. This growth has been so recent that it is not fully revealed in published statistics.

From 1970 to 1976 (the most recent date for which data are available) the total number of individual federal income tax returns increased from 73,863,000 to 84,536,000, or 14.4 percent (Stat. Abstract of the U.S., 1978, p. 269). In the same period, returns with annual adjusted gross incomes (AGI) of $25,000 or more increased from 2,115,000 to 8,414,000, or four-fold. The population of individuals with incomes at levels that make it rewarding to seek out means of tax avoidance has generated a new service sector of accounting and legal specialists in this field. In addition, rising income levels associated with the graduated and progressive nature of the federal individual income tax give a corresponding progressive value to allowable deductions. This is not the case with the corporate income tax, which is essentially flat-rate on corporate incomes exceeding $100,000.

In consequence, rapidly rising income levels have given high-income individuals added incentive to avoid tax where possible while at the same time and due to the progressive rate structure, the value of allowable deductions has accelerated at a rate greater than the rate of increase in incomes. Since some of the most rewarding opportunities for tax avoidance and

and some of the highest valued allowable deductions concern real estate, these trends have had a major influence on land use.

A sense of the magnitudes involved is provided by the estimates of revenue loss to the federal government through the deductibility of mortgage interest and property taxes on owner-occupied homes. The revenue loss of "tax expenditure" from these two sources is estimated at $14.1 billion in 1979, and is projected to rise to $30.0 billion by 1984 (Congressional Budget Office, 1979, p. 16). The U.S. Senate report on Tax Expenditures points out that "high income individuals receive greater proportional benefits than low income persons, not only because of higher marginal tax rates, but also because higher income taxpayers are more likely to own one or more homes and to itemize deductions ...(and) to own higher priced homes with larger mortgages and higher property taxes" (U.S. Senate, 1978, p. 69).

Since the equivalent of rental income on owner-occupied homes is not included as taxable income but the property tax and debt service expenses of earning it are deductible, the effect is to subsidize owner-occupied housing. This creates a derived demand for building lots and encourages urban sprawl. In this way federal tax policy subsidizes the suburbs and has powerfully augmented the conversion of farm land to residential uses.

In the farm sector, a similar tax-induced stimulus to the demand for land is created by the combined effects of the investment tax credit and the use of one of several accounting methods in computing accelerated depreciation on equipment and special-purpose buildings. For example,

a farmer with a combined federal and state marginal income tax rate of 42 percent and using a seven-year depreciation schedule can obtain a present-valued tax saving over the seven years equivalent to 45 percent of the cost of a new item of equipment or special purpose building. If his combined marginal tax rate is 33 percent, the present-valued saving is 37 percent of the purchase price. If his marginal tax rate is 10 percent, the saving is only 18 percent, and if he has no net taxable income the purchase price will be the real cost to him of the new item (Fuller, 1978, p. 3).

This results in a subsidy to farm enlargement, in that the federal tax expenditure represented by the investment tax credit and accelerated depreciation reduces the variable cost of farming more land. This gives an advantage in the land market to a buyer who is in a relatively high income tax bracket, has substantial debt-carrying capacity, and is highly mechanized. It tends to penalize the farmer who provides most of his labor supply from family resources, buys few purchased inputs, and extends the life of his equipment by careful maintenance and repair. The most significant consequence for land use is the encouragement thus given to large, single-purpose or monocultural farm enterprises, with a resultant greater exposure to market or climatic hazards. The farm sector loses resiliency.

These effects are augmented by tax policy with respect to capital gains. For example, dairy and beef herd owners strongly support the continuation of capital gains tax treatment for breeding animals. Small farmers are as strong in their support for these tax expenditures as are large farmers. They do not seem to realize that these preferential capital gains tax priveleges are of primary advantage to high income individuals.

The tax payer who is in a high marginal tax bracket and expects to remain in this bracket in subsequent years can afford to pay more for the privelege of capital gains tax treatment of his breeding animals. This privelege is of little value to a smaller operator whose marginal tax bracket is below 28 percent (the maximum capital gains tax rate, effective Jan. 1, 1979). In supporting the continuation of preferential capital gains tax rates the smaller operators are giving a bidding advantage to high income operators in the competition for breeding animals, and thus promote farm enlargement.

A similar process occurs in the land market. The prospect of a capital gains tax rate well below his marginal income tax rate can lead a high income individual to invest heavily in capital improvements that will increase the value of the property when sold. His goal is to convert ordinary income into capital gains. Since he does not need additional income to meet daily living expenses, he is led to tilt his investment decisions in favor of those that will maximize capital gain rather than toward those that will increase current income. He will favor value-enhancing investment over output-increasing investments.

If we could assume that the land market was a perfect equilibrating device, reflecting the capitalized present value of an accurately calculated stream of future incomes, the main consequence of this tilt would be to favor investments in long-run, slow pay-out land improving measures. The result would be a lengthened time-frame for investment planning.

It is at this point that the disturbing influence of inflation enters the analysis. If land is desired as a storehouse of value rather than as a producer of annual income flows, market prices for land can greatly exceed capitalized present values of the income stream. This is now the case, in most of the agricultural regions of the United States.

A preferential capital gains tax draws capital into real estate, not by the promise of higher earnings, but by the promise of greater value retention. This distorts investment patterns, displaces operators whose focus is on income flow rather than on net worth, and encourages patterns of land use that will minimize supervisory costs while waiting for land values to rise. It favors the highly mechanized cash grain farm or the single-purpose feed lot over a multiple enterprise crop and livestock unit, with a consequent loss of shock absorbing capacity. It is noteworthy in this regard that the agricultural protest movement of the 1976-79 period in the United States has drawn the majority of its support from highly mechanized cash crop farmers, practicing a largely monocultural form of land use in regions of high climatic hazard.

Risk Assumption

One of the most rapidly expanding ways in which federal policy influences land use is through the assumption of risk. This involves all of the classic questions of land use: where is it used, how is it used, and who is using it? In the economic literature, these questions are typically posed as issues of efficiency and equity. In this framework, federal price support programs for farm commodities provide the outstanding example of land use consequences flowing from governmental assumption of risk.

Any guarantee of farm commodity prices has a differential effect on farms in at least two major dimensions: location and size. The location variable combines both economic and climatic risk, in that the crops most often subjected to wide price variations are in general those produced in areas of greatest climatic hazard. The effect of federal price support programs has been to sustain production in high risk areas at levels that would not have been feasible if all risk was borne by the producers. A parallel can be drawn with building construction in flood plains.

It is generally agreed that public policy should discourage development in areas subject to recurring floods. It has usually required a major disaster to focus attention on this issue, but there have been substantial advances in recent years in flood plain zoning and in related measures to restrict land use in flood-prone areas to those types of use compatible with the risk involved.

Farm price support programs have had an opposite effect. By reducing risk they have encouraged agricultural expansion into hazardous areas. There is a sense in which it can be argued that the 1976-79 farm strike movement was generated by a government price support policy that has consistently failed to include any land use goals. Support for most crops has been

non-selective with regard to recipient, non-discriminating with regard to location (except as freight rates to central markets discriminate), and a flat-rate function of historical production. Until quite recently there has been little willingness to face the fact that production on some lands is too hazardous to merit support in this way.

Occasions can arise when production is needed from these high-hazard areas, or national policy may dictate that agriculture in these areas should be maintained in a "ready reserve" status. If so, there are cheaper ways to achieve this than by lifting the total structure of national farm prices to cover average costs in these high risk regions. But before these alternatives can be attempted, a national land use policy is needed.

Some progress in this direction has been made recently through the development of legislative proposals for the consolidation of federal programs of crop insurance and disaster assistance. An indication of the land use implications of these efforts is provided by data from Kiowa County, Colorado, bordering the dust-bowl area.

In the period from 1945 through 1975 the coefficient of variation in net farm income was 288 percent. "Net income was negative in 13 of the 31 years. Farmers losses during years in which crops failed nearly equaled the net returns during years in which yields were good" (Miller and Walter, 1977, pp. 12-13). No program based on insurance principles can be considered in areas as hazardous as this. Whether or not production should be attempted is a matter for national land use policy. It is apparent that risk and uncertainty on this scale can only be assumed at the national level.

In subsidizing production in high risk areas, the most direct federal assistance is provided by the 1973 Farm Act which authorizes the Agricultural

Stabilization and Conservation Service to make disaster payments to participants in the various commodity programs. From 1975 through 1977, payments to farmers under this program averaged $428 million per year, accounting for 67 percent of total federal outlays for all forms of crop insurance and disaster aid to farmers (Miller, 1978, pp. 5-7). There are in addition disaster loan programs administered by The Farmers Home Administration and The Small Business Administration. The degree of political popularity of these low-interest rate loans is indicated by the fact that in 1977 just under two-thirds of all counties in the United States were designated as "disaster areas."

Any federal assumption of risk also has a differential effect on farms in different size classes. A major strength of medium sized single proprietor farms has been their ability to absorb risk. If the farm is too small and the risk too great the farm will fail. But if risk is reduced it increases the attractiveness of farming to large-scale enterprises or to non-farm investors. Federal assumption of risk through price support programs or through disaster assistance is not scale neutral. It is of greater value to large operations, using highly leveraged debt financing and dependent on a single market or a single crop. We have noted above how tax policy favors highly mechanized monocultural forms of land use. Risk assumption by the federal government has the same tendency to encourage large scale single-purpose farm firms.

Historically, the major device for risk management in rural land use has been the diversified farm. Even the largest farms find it impractical to practice geographic risk-spreading. Unable to reduce risk by spreading activities over space, they have instead spread risk over a variety of types of crops or land use. This has been coupled with risk-spreading over time.

This has been achieved through the perfection of a management unit -- the family-type farm -- that maximizes incentives to reduce labor costs in times of adversity by lowering family levels of living in order to preserve the farm firm. If this form of risk management is replaced by federal risk assumption, either through price support or disaster aid programs, it will have a profound effect on how land is used (monoculture?), where it is used (high risk areas?), and who uses it (large scale firms?). By the scope of its impact, it seems probably that federal assumption of agricultural risk is the single most pervasive example of a federal dynamic affecting land use.

Environmental Protection Measures

The preceeding examples of a federal dynamic affecting land use have been greatly expanded in the 1970's but their roots trace back to the 1930's and even earlier. The one genuinely new initiative from the federal level dates from the enactment in 1969 of the National Environmental Policy Act. Its consequences for land use are due in particular to the requirement that a "detailed statement of environmental impacts and alternatives" preceed any "major federal action that might significantly affect the quality of the human environment" (42 U.S.C. 4321 et seq.). As Andrews has emphasized, the resulting Environmental Impact Statements (EIS) shift the emphasis from land use to the actions of government. The governmental decision-making process becomes the focus of attention, instead of a geographically defined land area (Andrews, 1975, p. 39). The goal has been to force various single-mission agencies of government to consider the external effects of proposed actions as they interrelate with other governmental programs and with the environment. In effect, the EIS originated as an internal housekeeping measure within the federal government to insure a better environmental accounting. It can be likened to the imposition of a double-entry system of bookkeeping, in which assets must be balanced against liabilities, in a firm that had previously maintained only ledger accounts. Its immediate goal was to bring order into the federal government in those actions that affect land use, in its broadest environmental definition. The consequences have extended far beyond the federal household.

An example will illustrate the complexity of the consequences. In any large scale project involving land use, the lead time involved in planning and carrying out productive investment is a major part of subsequent unit cost of production. The "front end load" represented by this lead time must be

spread over the productive life of the investment as an addition to fixed costs.

If the land using investment is in the private sector but receives federal subsidy, or produces for an interstate market or is otherwise subject to federal regulation, an environmental impact statement must be prepared. This lengthens the lead time and increases the front end load.

In the typical situation this front end load is covered by borrowing, which adds to debt, or by selling stock to investors who will forego current income in the hope of later capital gains (which is in effect a form of borrowing).

If rapid technological change shortens the prospective productive life of the investment this too will increase the ratio of fixed costs to operating costs. In practice, and in many types of land use, both things have occurred. The life expectancy of new technologies has declined, and investment lead times have increased. The clearest examples involve electric power generating facilities.

Much of the increase in lead time has been due to power plant siting regulations that have depended heavily on the preparation of environmental impact statements. Although power plant siting is typically governed by state law, the standards specified typically depend upon the federally required environmental impact statements.

The lengthened lead times and increased ratio of fixed to operating cost make the cost of borrowed capital a critical variable in any enterprise that depends upon the private capital market. In the case of private sector electric generating plants, it creates a strong incentive to reduce initial capital expenditures where possible, and shift as much of total cost onto operating costs. In practice, this leads private utilities using coal as a fuel to locate the generating plant as near the market as possible, in order

to reduce the capital cost of transmission lines (a part of the front end load).

Maximum efficiency in resource use might dictate mine-mouth location of the generating facility and long distance transmission of the power. If the public utility obtains its capital from the private market it will find mine-mouth location uneconomic if lead times have been greatly increased by environmental protection measures. Its solution is to haul the coal long distances and transmit the power short distances. The reason: coal transport costs can be legitimately used as a basis for rate setting based on demonstrated operating costs. Transmission line costs are a part of capital costs and worsen the ratio of debt service charges to cash flow. In effect, anything that lengthens the lead time, as environmental protection measures have done, has at least two consequences:

1) It increases the probability that responsibility for electric power generation will have to be assumed by government, due to the high capital costs imposed by greatly lengthened lead times.
2) It distorts decisions regarding mineral land use by shifting the incidence of costs associated with rail transport of coal relative to powerline transport of power.

It seems reasonable to conclude from this example that the initial usefulness of environmental protection measures in calling attention to unintended spillover effects of governmental actions is now itself in need of study. It is not facetious to suggest that we have now progressed to the point where we need more careful analysis of the economic impact of environmental impact statements.

We can note in this development a variation on the same themes that emerged in the discussion of tax policy and risk assumption. The federal dynamic in land use decisions is having an indirect (and unintended) but powerful influence on where land is used, how it is used and who uses it. The influence on the "where" and the "how" is not surprising, and is open to analysis by the use of market prices and environmental and conservation criteria that are widely available although not always widely accepted. The most problematic unknown introduced by federal determinants of land use concerns the "who" of use.

Influence upon the scale of firms, the provision of capital, the nature of the motivation for saving and investment, and the distribution of property rights in resource ownership emerge as the key questions raised by federal policies affecting land use. The influence of these policies is shifting the frontier between public and private spheres of operational responsibility, in favor of the public sector. This is perhaps the most significant and emphatic consequence of the growing concern for environmental protection.

Grants in Aid of Highways

The discussion to this point has dealt with federal activities that were not primarily designed to affect land use. We come now to a class of measures that were explicitly intended to achieve land use changes, usually of a kind that would turn sand into gold.

In terms of tradition, cost effectivenss and immediacy of response the most potent of the various intentional federal policies affecting land use has been cost-sharing through grants-in-aid to the states to promote internal improvements. Dating from our earliest days as a nation, these have typically involved transport, in many versions. Wagon roads, canals, rivers and harbors, railroads, highways and airports have in successive generations been the recipients of massive capital contributions, with land use consequences of far-reaching importance.

The most massive of these expressions of direct federal power to alter land use in the Twentieth Century has been the system of federal aids for highway construction. If any single example of a federal dynamic in land use is to be selected as dominant in our age it is the Federal Interstate and Defense Highway Act of 1956. The funds to finance this system are derived primarily from taxes on motor fuel and tires. Revenues are a linear function of distance traveled. The money has been spent to link cities, and increasingly to save travel time and relieve congestion in metropolitan areas. With distance only in the revenue function, and distance plus time in the expenditure function, we have created a money-pump. The effect has been to generate large windfall capital gains for landowners at the urban fringe and to encourage rapid suburbanization.

The result has been the sprawled city, the linear city, the nodular city, and an urban life style that maximizes our dependence on petroleum

fuels. The error in this system is its lack of symmetry. In any activity in which space is a key variable, the dynamic determinant is creation and control of access. The method by which highway location decisions have been made has precluded the balancing of windfalls with wipeouts. The gain from creation of access has been immediate and largely appropriable by private land owners and users. The incidence of loss has been diffuse, spread over a much longer time period, and the burden of its repair falls heavily upon the public sector. The obvious land use dimension of federal grants in aid of highways has been the use of the federal taxing power to create new wealth in land. The hidden dimension has been the creation of an asymmetrical transfer mechanism that shifts income from land users to land owners.

The efforts to introduce balance into this system have largely been confined to the use of environmental impact studies focused upon the physical environment. There is no federal requirement for the parallel development of national economic or region-wide impact studies that transcend the localities affected by specific highway segments. The political process has at times generated intense study of fragments of the system, with the controversy centered upon the question of location. Some method is needed to confront the question "should this highway be built?", instead of the more typical question, "where should it be located?" Until this is achieved through federal coordination, we will continue to condemn to haphazard use one of the most effective potential tools for land use guidance.

Do We Need a Land Ethic?

This brief survey has attempted to highlight some of the ways in which policies of the federal government are affecting land use. Some are intentional, but more often they are unplanned consequences of action designed to achieve other goals. One reaction to this confusion of purpose has been a call for the development of a land ethic. In a study that seems destined to become a classic in the land use literature of the United States, Bosselman and Callies based their interpretation of The Quiet Revolution in Land Use Control on the recent change in emphasis from land as a commodity to land as a resource (Bosselman and Callies, 1971, p. 315).

It is both, as they rightly point out. But this play on words obscures more than it reveals. The implication is apparently that land as a resource should not be traded, or dealt with in the market place. This seems to be the only interpretation that gives sense to the distinction.

It is more appropriate to turn the argument around. There is evidence from our courts, our legislatures, and our credit system that land has not been treated as just another commodity. It has not been regulated in interstate commerce until quite recently. Transactions in land are not subject to review by price-setting and rate-making bodies, as are the prices of other commodities that have a high component of public utility. It has not been possible to transfer use rights or ownership rights in land with the same freedom and efficiency that is possible with other tangible evidences of wealth.

Many cultures have sanctified land. Even in nominally monotheistic cultures it has often contributed an element of pantheism that in an extreme form can legitimately be called land worship. The remarkable feature of the settlement history of North America is that this land worship was constrained. Land was desired, but it was not sanctified. Instead of arguing for an ethic that would freeze land into uses deemed appropriate by this generation, it is more persuasive to argue that land should be treated more like a commodity, not less. It should be subject to the entire range of regulations, controls, review, and specification that are required in a market economy for the efficient functioning of markets (Babcock, 1975, pp. 12-18).

It is not that we lack a land ethic. It is rather that we have not divested ourselves of a now outmoded land ethic. Our Anglo-Saxon attitudes and land laws evolved to protect land users when there were no stable governments, no accessible systems of justice, inadequate modes of transport and marketing, and no functional systems of welfare other than the one provided by land ownership.

Nazi Germany had a land ethic. Marxism provides a variation that is less racist but no less rigid. Tribal societies are retarded by land ethics that are major barriers to the recognition of their human potential. What we now need to do is to demythologize land. The call for a land ethic is a call for worship at the feet of a false god.

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