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SITE VALUE TAXATION — HOW DOES IT RELATE TO FOREST LAND?

ELLIS T. WILLIAMS*

ABSTRACT

Neither the Single Tax movement of nearly one hundred years ago nor current proposals in this country for taxing land values relatively more heavily and untaxing improvements, have given sufficient attention to forest land and timber. The experience of Denmark, Australia, and New Zealand in the site value taxation of forested areas is considered. Site value taxation of forest land appears administratively feasible and resource allocation effects, provided land use controls are effective, likely to be favorable. Forest lands, however, raise questions not encountered in the site value taxation of urban property; empirical studies of forest land applications are needed.

FOR almost a century there have been recurrent proposals that the real property tax be modified by removing (or reducing) the tax on improvements and taxing only (or relatively more heavily) the value of the bare land. Known as "site value," "land value," or "unimproved land value" taxation, the change in tax base has been urged upon grounds of equity, improved resource allocation and administrative efficiency. The debate surrounding site value taxation has developed an extensive literature but this, in more recent years at least, has been concerned almost entirely with urban aspects of the subject. Little attention has been given to the application of site value taxation to rural lands in general or to forest land in particular.

There are at least three reasons why it is timely to consider forest land aspects of site value taxation. First, site value taxation in general is receiving renewed attention both from economists and public finance specialists. Foremost in this development

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has been the Committee on Taxation, Resources, and Economic Development (TRED), an association of academic economists interested in natural resource taxation as related to resource allocation, economic development, income distribution and employment. A series of TRED symposium proceedings contains much current thinking on site value taxation and will be referred to frequently in the course of this article. In any general application of site value taxation in the United States, commercial forest land in private ownership, comprising over 15 per cent of the nation's total land area, would necessarily play a significant role.

Second, population pressures, rising land values, and concern for environmental protection are leading to growing interest in rural land use planning and zoning and in the coordination of land use and property tax policies. Proposed legislation to establish a national land use policy is currently before the Congress and the Intergovernmental Relations Subcommittee of the Senate Committee on Government Operations has been considering the effect upon land use of real property taxation (U.S. Congress, 1971). The potentials and limitations of site value taxation together with practical experience both in this country and abroad, formed part of the inquiry. At the State level, a "quiet revolution" in land use control is taking place (Bosselman and Callies, 1971). Formulated originally with a view to encouraging the development of idle lands, how does site value taxation accord with current emphasis upon land use control for the preservation of forested and other "open space" areas?

Third, foresters and forest owners have long proposed the valuation of forest property for taxation as its "productivity" value. The latter would be derived through an income approach in which net income under given forest management assumptions would be capitalized at an appropriate rate of interest. "Site productivity valuation" in this sense has gained fresh momen-

tum under recent legislation in a number of States providing that farm, forest, and open space lands may be valued in their present, as contrasted with their "highest and best" use. Although site productivity valuation has elements of similarity to site value taxation, the two concepts differ in origin, purpose, and practical application. The relationship of the two needs clarification.

The current article does not argue the merits of site value taxation as such, nor urge its application to forest land. The purpose is rather to throw light on the forestry aspects of site value taxation as illustrated by the experience of other countries and as proposed for adoption in the United States. Site value taxation is considered both in its earlier "single tax" application and as advocated by tax economists today.

Elements of Site Value Taxation

The case for site value taxation was first popularized in the writings of Henry George (1839-1897) characterized by Samuelson (1951, p. 561) as "a printer who thought much about economics." Henry George's ideas gained wide popular support both in the United States and abroad and his *Progress and Poverty*, published originally in 1879, was issued in several editions and sold millions of copies. Useful references to George's economic and social philosophy and to his advocacy of the "single tax" will be found in Hansen (1967), Woodruff (1967), and Barker (1968). A comprehensive analysis of George's thinking is contained in Barker (1955).

George argued that a tax on the economic rent of land would provide sufficient revenue to pay all costs of government and that no other taxes would be needed. The term "single tax" came to be applied to this concept. ". . . such a tax, by taking for the benefit of society the unearned increment, would result in the much wider distribution of the benefits to be expected from a developing industrial society . . . Since the tax would be capitalized, it would lower land prices . . . It would discourage anyone from holding land out of

use, or in under-use" (Woodruff 1967, p. 428). The Single Tax movement was most active from roughly 1880-1920 but lost momentum following World War I and land value taxation in its original form is seldom advocated today. The rebuttal most frequently cited has perhaps been that of Seligman (1925).

The unearned increments in land values to which George referred, were particularly evident in urban areas where locations close to centers of population rose sharply in value in a rapidly expanding nation. In rural areas location rents reflecting proximity to improved roads and to markets tended to be less of a factor than were fertility rents. The latter reflected the "natural and inherent powers of the soil," regarded as the "original and inexhaustible gift of nature." Under Georgian principles bare land value, whether urban or rural, was to be subject to taxation but not the value of buildings or other structures or of land improvements.

The community would recover the value granted by nature or imparted by society but would not penalize efforts of the owner to make land more productive. Thus, *Progress and Poverty* states

If I clear a forest, drain a swamp or fill a morass, all I can justly claim is the value given by these exertions. They give me no right to the land itself, no claim other than to my equal share with every other member of the community in the value which is added to it by the growth of the community (1942 ed. p. 343).

At the time George was developing his ideas, forest land, at least insofar as old growth timber was concerned, was regarded as a resource to be mined. Following removal of the timber, the bare land was thought of as normally available for agricultural development rather than, as today, as being suited to sustained yield forest management and the production of successive tree crops.

George himself, did regard timber as a renewable resource and foresaw at least some of today's environmental pressures.

Nor must it be forgotten that, while our population is increasing, and our "wild

lands" are being appropriated, the productive capacity of our soil is being steadily reduced, which, practically, amounts to the same thing as reducing its quantity . . . We do not return to the earth what we take from it; each crop that is harvested leaves the soil the poorer. We are cutting down forests which we do not replant . . . (1939 ed. p. 27).

How in fact would forest land and timber have fared under the Georgian approach to land value taxation? Four elements need to be considered: bare forest land, land improvements including roads, the timber stand itself and structures including fences, sawmills, and buildings.

Bare land value whether deriving from fertility or from location would, as a free gift of nature or as socially created, be subject to taxation. The value of *forest land improvements* such as roads, drainage ditches or grading would represent individual investment and would not be taxed. George recognized, however, that treatment could change with the passage of time.

. . . to attempt to separate all that the human race has done from what nature originally provided would be as absurd as impracticable. A swamp drained or a hill terraced by the Romans constitutes now as much a part of the natural advantages of the British Isles as though the work had been done by earthquake or glacier. The fact that after a certain lapse of time the value of such primitive improvements would be considered as having lapsed into that of the land, and would be taxed accordingly, could have no deterrent effect on such improvements . . . each generation is heir, not only to the natural powers of the earth, but to all that remains of the work of past generations (1942 ed. p. 426).

The value of *structural improvements* such as buildings and also fences, bridges, culverts, and other depreciable assets, would not be taxed. Summarizing the situation with respect to improvements in terms of agricultural enterprise, George wrote

For taxes, being levied upon the value of the bare land, would fall as heavily upon

the unimproved as upon improved land. Acre for acre, the improved and cultivated farm with its buildings, fences, orchard, crops, and stock, could be taxed no more than unused land of equal quality (1942 ed. p. 450).

The writings of Henry George seldom consider the *timber resource* itself. The most explicit reference found was in a published conversation between Henry George and David Dudley Field, the legal reformer.

Field: Take the case of the owner of a thousand acres in the Adirondack wilderness that have been denuded of trees, and an adjoining thousand acres that have a fine growth of timber. How would you value them?

George: Natural timber is a part of the land; when it has value it adds to the value of the land.

Field: The land denuded of timber would then be taxed less than land that has timber?

George: On general principles it would, where the value of the land was therefore lessened. But where, as in the Adirondacks, public policy forbids anything that would hasten the cutting of timber, natural timber might be considered an improvement, like planted timber, which should not add to taxable value (1900 ed. p. 223).

The value of "natural timber," i.e., old growth stands and second growth stands of natural regeneration was, as indicated in the above dialogue, considered to be a free gift of nature and so subject to taxation as part of the value of the land. Planted stands, on the other hand, would be exempt from taxation at least to the extent of the value attributable to human effort. Thus, value stemming from the provision of planting stock, cost of planting, fertilization, pruning, thinning, and timber stand improvement would be exempt from taxation as is the value of agricultural crops.

A point not entirely clear is the tax treatment to be accorded that portion of the

value of planted timber resulting from the time element itself. In theory the value added by the mere passage of time or by the forces of nature can be regarded as economic rent.

... suppose ... I put away wine. At the end of a year I will have an increased value, for the wine will have improved in quality. Or suppose that in a country adapted to them, I set out bees; at the end of a year I will have more swarms of bees and the honey which they have made (1942 ed. p. 181).

At another point George refers to

... the operations of lumbermen who throw their logs into the stream, leaving it to the current to carry them to the boom of the sawmill many miles below ... (1942 ed. p. 184).

We may assume that the owner of a stream on which logs were driven would have the "transportation value" taxed away as economic rent!

Murphy (1915), economist with the U.S. Forest Service, was one of the few individuals actively concerned with the relation of the single tax movement to forest land. Murphy agreed with the prevailing view that single tax principles would call for exemption of planted or cultivated forests as of the nature of "land improvements" like any other crop. Second growth forests of natural regeneration were more difficult to classify but Murphy suggested their inclusion with planted forests as "forests grown and matured under man's supervision" and hence exempt from taxation. "I am free to admit that as between the virgin forest at one end and the strictly artificial forest at the other, it is hard to draw the line exactly if we would go after every last unit of value which smacks of an unearned increment."

The Single Tax movement in the United States left no clearly identifiable legacy in the form of special forest tax legislation. It is true that the authoritative Fairchild Report (1935) included as one of its proposed solutions to the forest tax problem, a differential timber tax under which the bare land value would be left subject to the

ordinary property tax but the timber would be granted a reduced assessment related to the degree of income deferment. Although this proposal, which was never implemented, moved in the direction of site value taxation there appears to have been no conscious recognition of a debt to the movement for site value taxation as such.

Alabama, California, Maine, New Hampshire, Oregon, Wisconsin, and other States have from time to time enacted special forest tax laws. These have included yield or severance tax and exemption provisions, the latter applicable either to all timber without limit of time or to certain types of timber or for limited periods, the bare land value for the most part remaining subject to the property tax (U.S. Dept. Agr. 1968). Special forest tax legislation, although doubtless influenced in some instances by site value considerations, has in general stemmed from the desire to encourage timber production.

The present day case for site value taxation in its general application is discussed by Netzer (1966) and Woodruff (1967). The latter (page 433) states: "After World War II, the erstwhile single tax movement mellowed into a modulated advocacy of site value taxation" based largely on four claimed advantages: administrative efficiency, discouragement of under-use of land, public acceptance where adopted and encouragement of greater intensity of land use and hence better communities. Netzer considers site value taxation from much the same standpoints: administrative feasibility, experience where used, resource allocation effects, equity and adequacy.

Site value taxation as related to the forest resource will be looked at here in the light of actual experience, administrative feasibility and resource allocation effects. The equity of site value taxation and its revenue adequacy are not functions of the type of property taxed and need not be given specific consideration in the context of forest land taxation.

Before undertaking the analysis just outlined, the distinction between site value taxation on the one hand and site productivity valuation on the other, should be clarified. The former, as has been seen, had its roots a century ago in the single tax movement; it

is advocated for application to all real property. In contrast, site productivity valuation, at least as that term has been used in forestry, dates from perhaps 50 years ago (Murphy 1925). It stemmed from pressures for natural resource conservation and development and is advocated for specific application to forest property.

The primary goals of site value taxation have been to recapture the "unearned increment" in land value and to encourage more intensive land use and better urban communities. The purpose of site productivity valuation has been to encourage improved forest management by relating the taxable value of forest property to its income producing capacity in timber production. More recently, an additional goal has been the attainment of long range rural land use objectives. Site value taxation employs for the most part a market data (sales transactions) approach; site productivity valuation in contrast, employs an income approach.

Site value taxation and site productivity valuation both have to do with the property tax base rather than with the property tax rate. The former, however, is concerned with the *composition* of the tax base (bare land as contrasted with improvements) while the latter is concerned with the *valuation* of the tax base (an income as contrasted with a market data approach). Site productivity valuation has been the subject of a recent study (Williams and Canham 1972) and is dealt with only incidentally in the present article.

Experience Abroad in the Application of Site Value Taxation to Forest Land

Examples of the application of site value taxation to forest land are relatively limited. While a number of countries have had experience with the site value taxation of rural land in general (Brown 1955, Wald 1959, and Becker ed. 1969), the specifically forest aspects perhaps stand out most clearly in Denmark, Australia, and New Zealand.

In *Denmark* following the turn of the century, interest in the Single Tax movement led to separate valuation of land and improvements (Larsen 1917). The land Act of 1922 established for the first time

rate differentials between land and improvements, and latter being taxed at a rate just under three-fourths that applicable to land. Differential taxation has continued with improvements presently taxed at rates for national and local levies ranging from 3/5 to 3/4 those applicable to land (Netzer 1966).

With specific reference to forest property, some 10 percent of Denmark is wooded with forest lands distributed among approximately 33,000 properties of which all but 1,000 are of less than 50 hectares (125 acres).¹ Although sales transactions evidence is available for most types of real property, the small number of sales of forest land, some 25 in a typical year, has led to the use of an income approach to tax-valuation for woodland.

In general, woodland is under legal requirement that it be maintained in forest cover. Forest properties are accordingly valued, giving consideration to site quality, in terms of the estimated earnings per hectare of "normal" forests, i.e., those having an equal distribution of timber age classes, with the necessary fencing and roads and in ordinary good condition. Provision is made for adjustments in the "normal value" of specific properties to reflect significantly poorer soils, the presence of plantations under certain circumstances and other special factors. After deducting estimated average forest management costs per hectare based on size of tract, net returns are capitalized at a rate of 4 per cent. Forest properties larger than 50 hectares are valued individually.

A portion of the "normal" forest value is allocated to land by a ratio based on the estimated land-improvement ratio for farming properties. Under the 14th General Valuation (1969) this ratio was set at 40 per cent. It will be reviewed every four years as General Valuations are repeated. The property owner is entitled to a tax-free

¹Acknowledgement is made to Peter Kjøller, Statens Ligningsdirektorat, and to Lecturer Finn Helles, of the Department of Forestry, Royal Veterinary and Agricultural University, Copenhagen, for information relating to the forest resource of Denmark, its valuation and taxation. See Veistrup (1967) for information relating to Danish assessment administration and to land valuation and taxation in general.

deduction for major land improvements (i.e., those over and beyond what would be found on the "normal" forest), such as roads and drainage canals, made within the past 60 years. Deductions are not to exceed the increase in land value resulting from such improvements nor the cost of making the improvements, including the value of the owners' time.

The difference (representing, in effect, the value of buildings and other improvements including standing timber) between the full market value of the property and 40 per cent of the normal value determined as above, was formerly taxed at a differential rate. Such values were frozen some years ago, however, and the taxation of all but the land value is being phased out gradually over a 28-year period. Denmark is thus moving toward full site value taxation of forest land.

Of interest would be data as to the effect upon forest management of taxing forest land on the formula basis with gradual elimination from taxation of the value of improvements. Knowledge would prove instructive as to the extent to which forest owners have responded to the current tax system either by increasing their investment in timber growing-stock or by increasing forest management expenditures beyond what might have been anticipated had forests been taxed year by year at the full property value. The change in tax base may well have taken place so gradually, however, that specific incentive effects would be difficult to identify.

Australia has had long experience with land value taxation both by the Federal government and by the individual States although treatment has varied among taxing jurisdictions and over time (Woodruff 1965 and Woodruff and Ecker-Racz 1969). The Federal government imposed a graduated tax upon the unimproved value of land in 1910 and this remained in effect until 1952 (Bird 1960). Influenced by the thinking of Henry George, land taxes have been imposed by the States since 1885 in South Australia, 1895 in New South Wales and from the decade 1905-15 in the remaining four States.

Of the total area of Australia, 32 per cent is classified as forest land with the

following distribution by States (Australia Department of National Development 1968):

New South Wales	12 per cent
Victoria	30 per cent
Queensland	50 per cent
South Australia	10 per cent
Western Australia	38 per cent
Tasmania	46 per cent

Forest land is largely in public ownership; tax questions relate only to individual and industrial holdings of which there are relatively few, although some of them are large.

Under the former National land tax, the basis of valuation was unimproved capital value sometimes referred to as "unimproved land value." Timber was regarded as real property following the common law definition, and was therefore taxed as part of the land value. Land improvements made, or acquired by, the owner or his immediate predecessor in title were tax-free. Land improvements fell into three categories: those "on, to, or appertaining to" the land. Visible improvements having a separate identity such as buildings, were regarded as improvements *on* the land. So-called invisible improvements which merge into the land as, for example, soil conditioning, drainage, and earthworks were regarded as improvements *to* the land. An improvement *appertaining to* the land was something legally incident to ownership such as water rights from an adjoining property. The clearing of timber from agricultural land was regarded as an "invisible improvement" and thus served to reduce taxable land value.

Land valuation for tax purposes was based on market evidence as indicated by sales transactions. The National land tax was levied at steeply progressive rates reaching a maximum of 5 per cent at one period. Bird points out (p. 390) that the source of greatest legal bickering was in actual land valuation. Failure for the most part to tax leasehold interests held from the Crown represented a departure from the principles of Henry George in that significant "unearned increment" in value thus escaped taxation.

Under Australian State land taxes, unimproved capital value (unimproved land

value) is generally used but applications vary from State to State.² In New South Wales the "unimproved value of land" is used for both the State land tax and local rating purposes. Amending legislation of 1961 moved toward a "site value" concept by including within the statutory value, certain site improvements as defined. No mention was made of timber in the definitions and the value of natural stands continues subject to tax as a part of unimproved value. Forest plantations giving to land a value that it did not possess in the natural state, on the other hand, are regarded as improvements and thus escape taxation based on unimproved value (site value). Further movement toward a full "site value" concept is considered likely.

For local rating purposes, certain allowances are taken into account in determining unimproved value. Such allowances are based upon profitable expenditures by owner or tenant for on-site improvements and, under some circumstances, off-site improvements such as drainage works, constructed for the more beneficial use of the land. Allowances are not to exceed the cost of such improvements.

In Victoria land used for plantations, and in some cases indigenous hardwood production, is exempt from land taxes. In Queensland, neither the value of planted nor indigenous trees is taken into account in assessing unimproved capital value of forested land. The value of improvements such as roads is deducted from sale values. In South Australia, land tax is calculated by deducting assessed values of improvements from analyses of land sales. Improvements include all planted trees, but not indigenous trees, since land bearing the latter is considered unimproved.

In Western Australia, land managed for reforestation purposes is exempt from land tax and only half tax is payable for intensively managed indigenous forest in specific circumstances. In Tasmania, the value of

growing trees is not included in valuation for taxation purposes. Improvements such as roads, dams, etc. are included in valuations. The concept of site value rather than unimproved capital value has been introduced.

As in the United States, the tendency has been to value land in its "highest and best use" and this has resulted in over-valuation, (from the standpoint of the timber producer) of forest tracts adjacent to arable lands and urban sub-divisions. Where little sales transactions evidence is available, an income approach is sometimes used. Slinn (1968) found on the basis of discussions with tax officials, that a realistic attitude toward timber valuation is frequently adopted with the result that *de facto* under-valuation of forest land and timber sometimes occurs. State land tax rates, like those under the former National land tax, are progressive and reach a maximum of $3\frac{1}{3}$ per cent.

For purposes of local taxation (rating), three alternative bases of valuation are found (Woodruff and Ecker-Racz 1969, pp. 159-61): (1) a tax on the capital value of property (land and buildings); (2) a tax on the annual rental value of property; or (3) a tax on the unimproved value of land. With respect to unimproved land value, definitions vary from State to State with differences relating for the most part to the treatment of the so-called invisible improvements to the land. Woodruff and Ecker-Racz point out that valuers (assessing officers)

consider the concept of "unimproved land" as defined in most Australian States and in New Zealand, an anomaly and advocate the use of "site value," which would include invisible improvements. Invisible improvements of agricultural land include clearing of forests and, in cases where this occurred as long as a century ago, the extent and present value of the clearing are fairly hard to determine. With respect to rural land the appraisal of the invisible improvements is an abiding and persistent problem.

Slinn points out that indigenous timber which is clearly merchantable or which has

²Acknowledgement is made to D. A. N. Cromer, Director-General, Forestry and Timber Bureau, Department of National Development, Canberra and to Herbert William Eastwood, New South Wales Valuer-General, Sydney for information relating to forest valuation and taxation in Australia.

benefited from timber stand improvement by the owner, may add significantly to the "unimproved land value" but that a poor stand of trees on land suited to agriculture or grazing might lower the assessed value. Planted trees are normally regarded as improvements and are thus not taken into consideration for purposes of property tax valuation. In some States standing timber is exempt, in whole or in part, from local government rates (taxes). Tasmania exempts stands of indigenous forest of more than 25 acres and plantations of more than 2 acres. In Queensland "timber" and in Victoria "not less than 10 acres of approved trees planted not more than 10 feet apart" are exempt (Slinn 1968).

In Australia, as in the United States, there are thus significant variations in the treatment of forest land and timber for property tax purposes. Such variations result both from administrative practice and from special forest tax legislation. The fact that "land" tends to include all but planted timber under Australian valuation practice lessens the appeal of site value taxation for the forest owner.

In *New Zealand* as in Australia, land value taxation has long had a place. The National land tax dates from 1891 and local units of government have either been permitted or required to exempt improvements from taxation since before the turn of the century (Netzer 1966, p. 20). State governments were abolished nearly 100 years ago and the administration of the land tax now centers in the national government with respect to both national and local levies (Woodruff 1965, p. 200).

Until recently, unimproved capital value (called land value), formed the basis for assessment under the national land tax. "Unimproved value" was defined as the "fair selling value of the land itself devoid of all improvements." The latter, which were excluded from the tax base, were further defined as "any work done, or materials used, on or for the benefit of the land by any owner or occupier, and resulting in an increase in the value of the land."

Timber, whether planted or indigenous, was regarded as an "improvement" and was thus exempt from land taxation. Nearly 25 per cent of New Zealand is forested

with a quarter of the forested area in private ownership. Of some 12 thousand private exotic forest plantations only about 200 are of more than 100 acres and only 27 are larger than 1,000 acres.³

In 1970 a new definition of land value (site value) was adopted under which "invisible" land improvements are included and are thus subject to taxation. Such improvements include roads, drainage and other land reclamation works, changes in the character of vegetation, alteration of soil fertility and flood prevention works. Timber, as a visible improvement, remains outside the tax base. Trees planted to prevent erosion, however, may have their value for such use, but not their commercial timber value, included in land value.

The New Zealand Forest Service (1969) points out that the basis for assessing forest land is normally fair market value based on current sales transactions. Land values are not officially determined by an income approach involving the discounting of anticipated future net income.

The national land tax is progressive but rates are low, rising from 4/10 of 1 per cent of unimproved capital value to 1.67 per cent on taxable values over NZ \$40,000 (NZ \$1 is equivalent to approximately US \$1.20). A general rebate of 50 per cent of the total tax assessed is applicable so that effective tax rates are one-half those indicated. Moreover, a special exemption of \$60,000 reduces dollar for dollar as the unimproved capital value exceeds \$60,000; the exemption thus ceases when a value of \$120,000 is reached. Rates for local land taxes vary from county to county; although comprehensive data are not available, in one tax district regarded as indicative, rates ranged in 1964 from 4 cents to 19½ cents per acre.

Local taxation (rating) in New Zealand may utilize any of three bases of valuation: site value (including invisible land improvements), capital value (including improvements in general), and annual (rental) value. Tax districts using capital

³Acknowledgement is made to M. B. Grainger, forest economist and to R. W. M. Williams both of the New Zealand Forest Service, Wellington for information relating to the forest resource of New Zealand, its valuation and taxation.

value are nevertheless required by statute to exclude the value of timber trees. Taking the situation as a whole, Woodruff and Ecker-Racz (1969, p. 57) comment "The final outcome both in New Zealand and Australia is that the land tax is a significant factor in private business decisions only in cases involving high values of land and almost exclusively urban land."

The Application of Site Value Taxation to Forest Land in the United States

Although limited efforts to apply land value taxation have been undertaken from time to time in this country (Brown 1955), the only major application to rural areas so far as known, has been that of the California Irrigation Districts all of which are said to now assess land value only (Henley 1969). Two additional provisions of somewhat similar character should, however, be mentioned.

North Dakota exempts farm structures and improvements from the property tax but neither planted trees nor those of natural regeneration are regarded as falling within the definition of "improvements." Hawaii embarked in 1965 upon a gradual transition from uniform taxation of land and buildings to use of a 40 per cent building tax factor. Since the change applies only to buildings rather than to improvements as a whole, however, and in any case does not apply to agricultural or conservation land (Bennion 1972), timber is not affected.

Special assessments levied by California Irrigation Districts are thought to have had almost no impact on forest land and timber although lack of central direction of assessment administration has led to diverse practices and to lack of comprehensive information.⁴ There is relatively little timber located within irrigation district boundaries other than that on land owned by the districts at the source of their water, and this land is tax exempt. Moreover, such timber as is located on taxable land tends, in practice, to be excluded from the land value

on which special assessments are spread. This is the case even though timber, in California, falls within the legal definition of land.

Irrigation districts using county assessment rolls do, it is true, have *taxable* timber included in land value since such rolls do not list timber and land separately. The county rolls, however, reflect the California immature timber tax exemption (Section 12-3/4, Article XIII of the State constitution). Even though case law holds that the exemption is not applicable to *ad valorem* special assessments, the practical effect is thus to take it into account where county rolls are used.

Assessment rules applicable to California property in general, provide that the value of unpaved roads, ditches, embankments, levees, etc. be included as a part of land value; paved roads are regarded as improvements. It is thought that irrigation districts for the most part follow such guidelines.

Considering the subject more broadly, what might be the resulting impacts as respects the forest resource if site value taxation were to be applied generally in the United States? Before turning to analysis of administrative feasibility and resource allocation effects, two characteristics of the forest resource which differentiate it from real property in general, should be recalled. Such differences relate to soil fertility as a value-determinant on the one hand, and to the nature of improvements, both so-called land improvements and the timber growing stock itself, on the other.

The value of urban land is derived in large measure from its location with reference to centers of population and to community services and institutions. The recapture of "location rents" of urban land was, as has been seen, a leading objective of the earlier movement for land value taxation. Rural lands devoted to agriculture and forestry derive a portion of their value, to be sure, from location, as for example, proximity to transportation and markets. The predominant value determinant, however, tends to be the fertility of the site. Thus in forestry terminology, "site value" has come to refer only to the value stem-

⁴Acknowledgement is made to Ronald B. Welch, Assistant Executive Secretary-Property Taxes, State Board of Equalization, Sacramento, for forest assessment information relating to California Irrigation Districts.

ming from prevailing biotic, climactic, and soil conditions.

In metropolitan areas in recent years, growing demands for farm and forest recreation, together with expanding needs for residential sub-division and other real estate development, are resulting in location becoming more important than formerly in the determination of rural, and specifically forest, land values. The mix of intrinsic and extrinsic factors influencing the value of a particular tract has a bearing upon the separation of land and improvement values required in site value taxation.

Forest *land improvements*, including not only roads and earthworks such as grading and ditching but also soil conditioning, raise specialized problems as has been seen in Australia and New Zealand. For example, how are land improvements to be appraised and at what point should their value be regarded as having merged into that of the land itself?

Timber growing stock may truly be said to be *sui generis* as respects site value taxation. As a biological entity, timber at least during its growth period, is an appreciating rather than a depreciating asset. Unlike farm or orchard crops, moreover, annual growth i.e., the ring of new wood on the tree, is not separable but becomes an integral part of the residual growing stock, the wood "factory." This identity of "factory" and "product," together with the long period required to mature a timber crop, are frequently cited as distinguishing characteristics of the timber resource and set it apart both from structural improvements and from annual farm crops in any application of site value taxation.

Under what circumstances, moreover, is vegetative cover on forest land an "improvement" and under what circumstances does land clearing constitute "improvement"? More fundamentally, is timber growing-stock, following the common law definition of land, to be regarded as part of the unimproved capital value? Must a distinction be made between old-growth timber as a "free gift of nature," and second-growth timber, either of natural regeneration or planted, subject as it is, to varying intensities of forest management and hence of investment input? In the dis-

cussion that follows it is assumed that timber will, in fact, be classified as an "improvement" rather than as "land."

That forest property differs from urban property as respects the influence of location in determining value and that it differs from both urban and other rural property as respects the nature of land and timber improvements, is apparent. To what degree are such differences significant for site value taxation?

Administrative Feasibility

The feasibility of converting from an unmodified property tax to site value taxation of forest land has both transitional and longer term aspects. It is clear that transition to site value taxation would call for significantly higher standards of assessment administration in rural areas. Harriss (1970, p. 226) writes "Of absolutely prime importance will be the quality of assessing—not only 'in general' but also as bearing upon land values in particular." Impacts upon urban assessment districts would be severe enough but in many rural, especially forested, districts the adjustment could well prove to be beyond existing or potential local assessment capability.

Fortunately, a number of State tax commissions and equalization boards have over the years provided increasingly detailed forest assessment guides for local use (Williams 1968). In at least one State, New York, the Commission stands ready upon request of local assessing officers to provide advisory appraisals of privately owned forest lands in excess of 500 acres. A number of other State tax commissions, moreover, employ staff foresters to assist in the appraisal of the larger forest properties. The transition to site value taxation could be expected to further advance State leadership in this field. It is significant that centralized leadership has characterized the application of site value taxation in Denmark, Australia and New Zealand.

Over the longer term, the successful separation of land and improvement values surely underlies any application of site value taxation. Hicks (1970) discusses three bases for making such separation: bare site sales, the fair market value of the property

as a whole less the replacement cost of the improvement (normally its original cost less depreciation), and use of a fixed ratio representing the average relation of land to improvement value for given types of property. Back (1970) discusses also "land residual" methods of site valuation making use of an income approach.

Bare site sales are likely to be more frequent in rural than in urban areas. Timber in the case of all but the longer rotations, tends to be harvested more frequently than obsolescence requires buildings and other structures to be replaced. Some tracts of forest land will not be under management at any given time and will lack forest cover. For tracts under even-aged forest management (a silvicultural system characterized by cutting the entire timber stand on an area followed by the establishment of a new stand in which the trees are essentially of the same age) bare land will recur periodically. This will not be the case, it is true, under uneven-aged management (characterized by selection cutting with maintenance of stands in which there are considerable differences in age of trees). Even though the latter system is followed, however, land clearing will occur from time to time by reason of financial need, change of ownership, or as a result of fire, windstorm, pest or other casualty. Determination of bare site values from sales transactions evidence is thus likely to be less difficult for forest than for urban land.

Should bare site sales of forest land not occur with sufficient frequency to serve as a guide in the assessment process, sales transaction evidence may nevertheless be available for forested tracts in which the consideration includes the value of both land and timber. In such situations, the market value of the timber can be deducted from the total value to provide a residual land value. The valuation of timber growing-stock is far from an exact science, however, as when discounts must be applied to reflect deferment of harvest resulting from market limitations or inaccessibility (absence of roads). Fortunately, problems growing out of the valuation of obsolete improvements in the cities, find few counterparts in the forest. Even oak ship-timbers grown for the royal dockyards as described by Hart (1966) in

his fascinating one thousand year history of Dean's Woods in Gloucestershire, can be put to other, more modern, uses!

Where sales transactions evidence either for bare land or for land and timber together, is inadequate for assessment purposes, the use of an income approach is indicated. Original or reproduction cost is irrelevant in the case of land and in the case of timber is useful for valuation purposes only for plantations of trees in their earlier years. An income approach as, for example, under a productivity concept as described by Williams and Canham (1972), will provide a total value for the tract which may then be separated into land and timber components. Here the ratio method of allocation, as in Denmark, may prove the most practical approach.

In urban areas the application of "original state" and "base state" concepts for land assessment has been proposed. Such methods of valuation, however, have proved difficult. Thus, Hicks (1970, page 14) refers to problems that arose in London fifty years ago when "valuers found beyond their capacity the degree of imagination that required them to value, for instance, site after site in Regent Street as if in turn each site was covered only with 'sedge, grass or other natural growth' all other buildings remaining intact." As an alternative, Vickrey (1970, page 27) suggests use of a "standard state" defined for urban land, for example, as a "bare lot free of encumbrances above the surface, similarly free from conditions below the surface causing unusual difficulties in setting foundations, and provided with the utilities and similar facilities normal in that general area." The valuation of forest land, here again, represents a simpler problem since forest land by its very nature, is closer to its original state and less subject to externalities such as utilities and other community services.

Other urban valuation problems discussed by Vickrey relate to land sub-division and assembly and to the consequences of errors in forecasting land use needs. Although such considerations do arise in the valuation of forest land, they appear with one exception to be significantly less difficult of solution than for urban property. The exception relates to the area of tract to be

assessed. Forest tracts vary widely from a few to many thousands of acres and some agreement as to a standard-size tract might well be needed.

On balance it would seem clear that the separation of forest land and improvement values would prove less of an administrative problem than for urban land, although clearly more difficult than for farmland with crops being harvested annually. The value of both forest land and farm land derives in significant measure from fertility, however, and soil productivity, once established, needs to be re-determined relatively infrequently. Continuing progress is being made in land capability classification based on analysis of farm and forest soils.

Resource Allocation Effects

Short-term impacts.—Tax effects of shifting toward site value taxation are determined in the short run by the ratio of improvement value to land value for the individual tract as contrasted with the weighted average ratio for the tax district as a whole. Thus, when the improvement-land value ratio for the individual tract is less than that for the tax district, the tax burden other things being equal, will increase since the tax payable on improvement value decreases less than the tax on land value increases. Conversely, owners of tracts having a higher improvement-land value ratio than the district average, will have their tax reduced and owners whose improvement-land value ratio approximates the district average will not, at least in the short-run, have their tax burden greatly affected by a shift to site value taxation.

For individual forest tracts, as in the case of urban sites, the value of the improvement (timber in this case) relative to that of the underlying land, varies greatly. Thus, in the Douglas-fir region of the Pacific Northwest, old growth stands could well average 60 thousand board feet per acre valued at \$80 per thousand giving an improvement value of \$4,800 per acre. Bare land value might not exceed \$60 per acre. The improvement-land value ratio would thus be 80 to one. At the other extreme would be land of high site quality covered by brush or weed species that would need to

be eliminated by mechanical or chemical means if site preparation for tree planting were to be undertaken. The improvement-land value ratio in such instance would be negative.

Tax districts vary widely in their mix of forest, agricultural, suburban and urban land. Land owners located in a forested district of homogenous character might find their annual property tax changing relatively little following introduction of site value taxation. In districts containing a mixture of forested and farming areas or forested, farming, and developed areas, on the other hand, the distribution of the tax burden will be subject to conflicting influences. Tracts with relatively good stands of timber would doubtless tend to have higher improvement-land value ratios than would nearby farm land due to the combination of lower improvement value and higher land value characterizing the latter. Taxes would thus tend to be shifted away from forest owners. At the same time, improvement-land value ratios for forest tracts might well be lower than for tracts affected by urban development. In such cases, taxes would tend to be shifted to forest owners. Generalization is thus difficult in evaluating forest land impacts following adoption of site value taxation.

Clark (1961), Netzer (1966), and others have referred to the tendency for the improvement-land value ratio in urban areas to increase as one moves from central-city locations to residential and other outlying districts. Both improvement values and land values tend to decline under such circumstances but land values would usually fall more rapidly. In moving from suburban to farming areas, it would seem that this trend would be reversed: while both improvement value and land value would continue to decline, the value of improvements would tend to fall more rapidly. In moving from farming to forested areas the trend might well reverse again with a rising improvement-land value ratio as has been indicated above. Although there have been a number of studies of improvement-land value ratios in urban and suburban areas, such data are needed for farm and forest lands.

Two distorting effects upon tax impacts

should be borne in mind. A shift to site value taxation is likely to focus attention upon assessment administration in general as referred to above, and thus affect the distribution of the tax load as assessment procedures are refined. Second, a shift to site value taxation will itself influence land values and changes will eventually be reflected in the assessed valuation of individual tracts. This longer term effect is referred to below.

Longer-Term Effects.—Site value taxation influences economic development in four ways that Becker (1969, pp. 24-30) refers to as the capitalization, holding cost, fixed cost and unburdening effects. The response of forest land to the interplay of such influences would appear to differ more in degree than in kind from that of urban, suburban, or farm land.

The *capitalization effect*, as is generally recognized, stems from the fact that taxes on land, unlike those on improvements, cannot by restriction of land supply be shifted forward in the form of increased rentals to tenants. Rather such taxes must ordinarily be absorbed by the owner in the form of a reduction in land value, the reduction being equal to the capitalized value of the tax.

Even though the supply of urban and suburban land is not completely inelastic in the long run due to opportunities for rural land conversion, the supply of rural land does, in effect, tend to be inelastic if such factors as soil erosion and loss of fertility are disregarded.⁵ The capitalization effect on forest land is thus likely to be more pronounced than on urban land. Lower rural land values would tend to encourage investment in forest land acquisition and development for timber management or other uses. Less directly, credit needs for forest land acquisition would to some extent be reduced.

The *holding cost effect* results from ris-

ing taxes on sites having a lower improvement-land value ratio than the average for the tax district. It thus becomes increasingly costly to hold such land in an undeveloped or underdeveloped condition. Costs, moreover, will compound over time as annual taxes accumulate upon property that is either non-income producing or from which the income falls below that obtainable from more intensive development. The holding cost effect reinforces the capitalization effect in causing land values to fall, since owners will tend to sell lands with low income potential. On the other hand, in the case of lands having a higher potential, there will be a tendency to develop the site sufficiently to offset the burden of taxes and carrying charges.

The holding cost effect would tend to lower forest land values with sales of poorer sites and more intensive development of better sites to be expected. Such increased development could take the form of building up timber growing-stock for the production of wood products or of use for other forest, or non-forest, purposes.

The *fixed cost effect* "refers to the fact that the amount of the land value tax bears no relation to the extent of development of any given site . . . Moreover, if land is developed by marginal increments, total tax cost on land value will not rise. Instead, the average tax costs per unit of improvement will decrease with an increase of investment in improvements" (Becker 1969, p. 27).

The forest owner, by reason of the fixed cost effect, would have an incentive to practice more intensive timber management since he would not be faced with increasing assessed valuations as the timber matured. Particularly in urban-rural fringe areas, however, he would need to determine whether development should take the form of increased capital investment in timber growing-stock or whether a shift should be made to non-timber-growing use.

The *unburdening effect* stems from the removal of the property tax from buildings and other improvements; it thus removes an obstacle to economic development rather than providing direct stimulus to development as in the case of the three effects already considered. Just as a roadblock to

⁵A net increase of forest land area resulting from farmland abandonment has been a factor in some regions over recent decades. Net increases after withdrawals for urban expansion and other uses, however, occur less often than formerly and the total area of commercial forest land is projected to drop about 5 per cent during the next 50 years.

urban renewal is removed by untaxing buildings, so is more intensive development of rural land facilitated when taxes on improvements including standing timber are reduced or eliminated. The quantity of timber growing-stock in fact, would be particularly responsive to a reduction of property tax costs since the option to "cut out from under the tax" by premature timber harvest would be rendered less advantageous.

Becker points out (1969, p. 25) that whereas the capitalization and holding cost effects work to lower land values, the fixed cost and unburdening effects have the opposite tendency to raise land values. The net result will thus depend upon the relative strengths of the four influences with respect to any given site. In any case the four effects taken together, support the view that a shift to site value taxation would encourage economic development. This, as has been indicated, has been a prime objective both of the earlier Single Tax movement and of the current movement for land value taxation.

Full play of market forces through tax valuation of land in its "highest and best use" must necessarily, however, under today's conditions come to be valuation in "highest and best *socially consistent* use." Urban zoning, explicit or implicit, has long stood in the way of the intensive development of Central Park in New York, Fairmount Park in Philadelphia, the Lake Front in Chicago and Union Square in San Francisco. That long range rural land use planning and zoning will be needed to protect green belts, "open space," forest recreational and timber management areas is likely to be increasingly recognized under current population and land use pressures.

It follows that tax policy and land use policy must be coordinated if site value taxation is to make its maximum contribution. Thus, Grey (1969, p. 95) points out that "... adequate recognition of the potential of planned controls upon land use is long overdue in discussions of land value taxation." Copes (1970, p. 65) states "The principles of site value taxation and those of planning for the best use and development of land should parallel each other; ... for a jurisdiction contemplating

the introduction of site value taxation, the need is to bring land taxation and planning into close relationship." Harriss (1970, p. 246-8) states "Land use requires some non-market guidance (zoning and planning, for example) to serve man best . . . Plots of 'green and beauty' may be covered with brick and mortar sooner or more completely than without the tax change. . . . Without full accounting for results whose values are not priced and which are not appropriately balanced in the decisions, the best for the private owner can diverge sadly from the best for the community. . . . The need for good zoning and planning would be very real."

More recently the study prepared for the Sub-Committee of the Senate Government Operations Committee (U.S. Congress, 1971, p. 38) has stated "One of the concerns about land-value taxation is that it might stimulate overdevelopment . . . proper planning could assure the maintenance of parks and other open spaces." In dealing with this subject from a broader standpoint Netzer (1966, p. 207) has referred to the conventional wisdom in the study of public finance that it is usually more sensible to try to effect desirable non-fiscal ends by direct measures than by manipulating taxes for this purpose. ". . . if the goal is the preservation of open spaces, then an unneutral property tax is a clumsy instrument indeed to guarantee this. . . . It cannot assure that the appropriate types and locations of open space are preserved, only an entirely accidental selection."

That forest land and timber are particularly vulnerable to land use pressures is apparent. Timber, by its very nature both "factory" and "product" as brought out above, may either be retained as growing-stock or harvested for consumption. Moreover, the long production period required to mature a timber crop, together with the risks of fire, windstorm, insect and disease which are for the most part as yet uninsurable, make it difficult for any but the financially stronger forest owners to engage in commercial timber production. Other forest uses such as those for recreation, wild-life management, or watershed preservation find it difficult to compete with industrial, commercial, or residential development.

And yet as pointed out by Sunley (1972, p. 337) "... costs for conservation, forest protection, and reforestation do involve collective benefits. That is, the benefits to society from these expenditures are greater than the private benefits to the timber owner."

Conclusion

Examination of the somewhat limited experience of other countries in the application of site value taxation to forest land and *a priori* consideration of possible application in the United States, lead to the conclusion that such application is feasible and, in conjunction with land use controls, desirable. Empirical studies are needed, however, to gain a clearer understanding of site value taxation as it relates to rural lands in general and to forest land in particular. Such studies would serve a useful purpose at this time.

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