Research in the Economics of Forestry

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The study of economics won't keep you out of the bread-line; but at least you'll know why you're there.

So it is with forest economics: It won't alone solve our forestry needs, but at least it helps us mightily to understand them. And used in conjunction with the other sciences and arts of forestry, economics research helps us not only to understand, but also to solve, the needs of forestry for contributing the utmost to the wellbeing of the world, the community, and the individual enterprise.

What is Forest Economics?

Forest economics deals with the values, to human beings, of the biological or engineering or other physical phenomena related to forestry. This is not a precise definition, but it is a helpful, workable one. It stresses the link provided by economics between things on the one hand and people on the other. It suggests, for example, that while a function of silviculture is to determine alternative systems of harvesting timber, a function of forest economics is to learn which of these systems will produce the highest values, as benefiting the people concerned. The definition suggests two points that call for emphasis.

First: in forestry, economics is always the economics of something: for instance, the economics of land use or of forest management or of forest industry or of timber marketing or of the consumption of forest products. There is essentially no part of forest economics that does not use the tools of physical or biological science to just as vital a degree as it uses the tools of social science.

Second, and conversely: there is essentially no part of forestry that is not intimately concerned with economics. Take for extreme example some cloistered fundamental study of tree cells in their relation to tree characteristics and development. Do we not find that even this study is founded in economic decisions that led to the choice of it as a potential contribution to human welfare? And do we not find that the study runs
again into economics the moment its results are applied, or
considered for application, to man's needs?

It follows that research in the economics of forestry goes
hand-in-glove with all other fields of forestry research. In-
deed, its field is within these other fields of forestry. Forest
economics therefore stands in a peculiar relation to any forest-
research program in that it is both a separate division of that
program and a part of every division. This is not to suggest
that "forest economists" should run the show. They are
merely partners, minor or major as the case may be. The
forester with good training and experience in economics has
much to contribute to nearly every branch of forestry re-
search, and much to contribute to shaping and guiding whole
research programs.

Data and More Data

Forest economics in this country was christened in a
shower of statistics. It grew up amidst data collection and
compilation: forest areas, timber volumes, forest ownership,
growth, timber output, prices, shipments, manufacture, values,
trade, requirements, consumption. Much amassing and some
analysis of such data constituted our first major projects in
forest economics.

The groups who did this work were principally within the
Federal agencies, among which the Forest Service and bureaus
in the Department of Commerce were perhaps the leaders. But
public agencies in the States, too, made surveys. And some
of the industry associations and even individual firms collected
data, especially resource data, which contributed much to
knowledge of the elements of the forest situation.

This early forest economics was developed from native
American needs and conditions. In this respect it was unlike
our science of silviculture, which sprang from European silvi-
culture and for many years was essentially European in char-
acter.

Workers in forest economics were often criticized for their
preoccupation with mere data. The same criticism is still made
on occasion. It is certainly true that fuller analysis of statistics
and attendant greater efforts to build some coherent principles
of forest economics would have paid good dividends. It is also
ture that some of this early "forest-economics research" was
neither forest economics (rather, it was mensuration and
statistics) nor research (rather, it was simply fact-gathering).

However, the direction first taken by the new line of work
is surely no cause for embarrassment or regret. The first job

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Fig. 1.—Upper Michigan: Once a red-pine forest, now charred stumps and aspen. Is this farm or forest land? Can it pay taxes? Who should own it? What can be done with it?

Fig. 2.—Southern Idaho: A forest survey. How much timber have we? How much may we cut, under good management? How may we adjust our timber-using economy to our forest capacity, and vice versa?
that had to be done before next steps could be taken was to uncover the facts with which forestry and forest policy had to deal. That job was undertaken with vigor. It is not finished. It never will be finished, because the facts of our economy and society are continually changing.

Data-gathering, therefore, should always be a part of forest economics, as in the past. What is done with the data after they are gathered is, of course, another matter. And to what extent data-gathering will dominate forest-economics research is another matter.

**Start of a New Period**

Events that followed the First World War led to a basic change in the complexion of forest-economics research.

With the exhaustion of most of the best timber in the South, the focus of forest industry had moved to the West. The East as a whole became more conscious of its forest depletion. The broad, national issues of forest conservation began to be revived in new form. In the South, second-growth pine was making an impressive showing in spots. In the Northeast, continually rising prices of forest products were a stimulus to interest in intensive forestry. In the Lake States, from which the great body of the lumber industry had long since retreated, leaving a wake of extreme devastation, people were in the throes of an aftermath of agricultural disillusionment, tax delinquency, and other maladjustments of rural land use. In the West, the lumber industry was carrying on in the tradition of Paul Bunyan, and yet with new problems of timber utilization, plant and woods operation, labor relations, and community responsibility.

These events were the background for a substantial expansion of forestry research on all fronts. Along with enlargement went increasing specialization of the research and the emergence of old fields with new, clear identity. Not long after 1920, research in forest economics seems to have entered a Second Period of its history.

This Second Period was (is—for apparently we are still in it) characterized by a rise of problem analysis based upon the rapidly accumulating fund of facts and therefore by a strengthening of the link between forest-economics research and forest policy. The period is characterized also by a number of large research projects and large groups of related studies directed at some of the major economic problems of forestry. And as research properly so called has expanded, data-gathering as such has subsided—relatively if not absolutely.

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Taxation: Study to End All Studies

Perhaps the Second Period of forest-economics research opened with the Forest Taxation Inquiry. The purpose of this study was to get to the bottom of a persistent question: Does taxation, especially property taxation, discourage good forestry? Begun in 1926 and participated in by a small army of researchers and collaborators from many branches of forestry and related fields, the Forest Taxation Inquiry was the first major research project in forest economics to be carried through all the stages of collection, compilation, theorization, analysis, and program recommendation, and to appear in definitive published form.

The validity of the results of the Forest Taxation Inquiry and the lucidity of its report have sometimes been questioned. But the significance of its role in the development of forest economics cannot be doubted. A whole generation of forest economists formed their thinking under influence.

Some remaining fringes of the forest-taxation problem are still under study. Spot surveys and analyses are still being made from time to time. And important work is being done to plug one of the few remaining major gaps: the need for equitable assessment procedures.

Forest Surveys

Another sign of the times in this era of great concern over land-use problems was the Nationwide Forest Survey, started in 1929. Its purpose is to determine and analyze timber inventory, growth, drain, and requirements as a basis for policy aimed at balancing the national timber budget. At the time of its suspension because of war, the Survey had covered all or parts of 22 States, comprising about half of the forest area of the country. In 1946 the Survey was resumed, with authorization not only to finish the national coverage (a task expected to be done by 1953), but also, as a continuing project, to keep the forest facts up to date on areas already covered.

Besides the National Survey, a number of projects run by State and other groups have contributed to our knowledge of forest-land resources. Surveys of forests, wasteland, vegetation, or general land-economic conditions were made in the Tennessee Valley and in California, Iowa, Ohio, Michigan, and many other states. A number of forest surveys and related projects significant to forest economics have been undertaken locally.

These forest surveys have produced a vast quantity of raw material for research, only a fraction of which has been competently exploited.

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Forest Economics and Forest Policy

A third benchmark in the opening years of the Second Period was that aggregate of effort within the U. S. Forest Service that resulted, in 1933, in a 1,677-page document entitled "A National Plan for American Forestry," usually called the Copeland Report.

The Copeland Report project was one of compiling and digesting what was already known, rather than research. Furthermore, only parts of it were forest economics. And yet, as the most comprehensive problem analysis of American forestry ever undertaken, the Copeland Report was of profoundest significance to forest-economics research. It pointed up some of the major questions upon which research of an economic character was needed. More importantly, it demonstrated that the materials, techniques, and personnel of forest-economics research have a key function in general problem analysis in forestry—analysis of the interactions of forests, farms, industry, and people in a broad economic and social setting and forming the basis for policy in both research and action. This fact had been suggested in the less comprehensive national studies that antedated the Copeland Report (principally the Bureau of Corporations and Capper projects of 1913-14 and 1920). The fact was confirmed in two studies that followed (the Joint Congressional Committee and Forest Reappraisal projects of 1941 and 1946-47).

During the depression of the 1920's and 1930's, rising interest in land-resource utilization and economic planning led forest economics (an integral, but often not distinct, part of such work) into new and wider fields. Local and State planning, land zoning, and land-utilization research; the agricultural planning program of the U. S. Bureau of Agricultural Economics and the State Colleges; the studies of the National Resources Planning Board; the postwar-planning work of the U. S. Department of Agriculture and the States—these and other programs produced much of significance to forest-economics research and served to broaden its horizons. One primary aim of such work was to seek out solutions to the grave problems of poverty and partial idleness of rural people and rural resources, including forests.

As the forest problem of the United States and of many localities becomes more acute and more sharply focused in public attention, the need for periodic broad problem analyses becomes greater. Thus the need for research into the status of the forest economy as the basis for problem analysis increases. And the need for forest-economics-research techniques and
personnel as the means of making the problem analyses likewise increases.

**What Will Forestry Pay?**

A fourth major type of project that has marked the present period in forest economics is research in the economics of forest management. Here is another example of how forest economics is dovetailed with other parts of forestry—in this case silviculture, regulation, products, engineering, and others. Unlike such projects as broad forest surveys and problem analyses, which are primarily social economics, this research in forest management deals primarily with the economics of the individual firm.

Many agencies have done work in the economics of forest management, and on a wide variety of problems. There was the group of “logging and milling studies” or “selective-logging studies” that purported to find the effect of tree and log size upon the profit of operation. There were case studies attempting to learn or forecast, by spot observations and often scanty historical data, whether or what kind of forestry would pay. The purpose was to guide the policies of individual forest enterprises and to encourage the practice of intensive forestry by pointing the way to financially attractive management. Great attention, here, was given to the farm woods, and some progress was made in selling the idea that forestry is part of the farm business and farm planning.

Perhaps the highest development of this management-economics research has come on those permanent experimental forests where running records are kept of the costs and returns of single or alternative procedures in forest management. Such records are gradually revealing the financially best methods applicable to particular forest types and conditions. Private forest owners, forestry schools, and State forestry groups have all had a hand in such research. The U. S. Forest Service, in its recently enlarged work-center program in forest management, is taking an active part. Greatest progress has been made in the South and East, where rapid timber growth or good markets offer special encouragement to private forestry.

As such work develops, the concept of the economics of forest management is taking shape that it consists primarily of the evaluation of alternatives: alternative first decisions regarding the use of a tract of land and the use of investible capital and other resources; alternative methods of forest regeneration, culture, harvest, administration, and protection; alternative products and outlets for them. A methodology is

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being built up for this evaluation of alternatives in forest business. At least one comprehensive study is now under way in the field of methodology.

Some Other Projects

Besides the four groups of forest-economics projects described, only a few others call for special mention.

One group of studies, relatively very small ones, has dealt with some of the economic aspects of forest protection. Studies are under way or nearing completion in several areas aimed at learning the best policies and the most economical intensity of protection against fire and against white pine blister rust and against the spruce budworm. Studies have been completed and published on the merits and possibilities of forest-fire insurance. In this connection it should be mentioned that some thought has been given to the needs and opportunities for specialized forest credit, though not much research has been done.

There has been a little research and a great deal of publication on the subject of marketing forest products, particularly farm-woodland products. This work has recognized the great difficulties of farmers and other small woodland owners in timber management and marketing. In some of the work an attempt has been made to analyze small owners' handicaps so as to suggest ways to improve the systems on which these owners are dependent. Research in cooperative marketing has been a part of this general movement, most of it taking the form of promoting and studying actual associations by case-history methods. In addition to this marketing research are at least one comprehensive study of stumpage and log prices and several studies of product prices.

A growing number of studies are being made of the economic possibilities of new methods and equipment for extracting, handling, hauling, and processing forest products, including such products as naval stores in addition to timber. Most such research is oriented around the economics of the individual firm. It has as its prime object the reduction of cost through better utilization of labor. Forest economics shares this field with forest products and industrial engineering. Besides these specific studies, a number of general studies of forest industry have been made, particularly of the lumber industry.

Where Do We Stand?

After several decades of accumulating knowledge in forest economics, where do we now stand in the development of this aspect of forestry research?
In building a body of principles and methods which will give forest economics unity and coherence and a standing within social science, there has been little progress. In developing men thoroughly qualified by training and experience for high-grade research and leadership of thought in the field, some small gains have been made.

The gathering of economic facts of forestry is still much further advanced than other parts of forest economics. No comparable progress has been made in problem analysis based upon the facts—especially the analysis to guide research programs.

In general, forest economics has made small headway in recognizing and understanding those forest values which cannot or should not be expressed in dollars and cents. We have been slow to investigate the borderline field between sociology and economics in forestry: to take account of the fact that men act as social, and not purely economic, creatures. This fact is important in forestry, with its long periods of production and its close tie to rural institutions. We are still deeply perplexed by the problems of evaluating—and even the question whether we ought to evaluate—the forest intangibles, such as scenery and recreation.

In land utilization and related subjects, forest economics now has a large body of methodological and research material in land and agricultural economics on which to draw. Its relation to these other fields is generally understood. Many specific studies needed have not been started. Forest taxation stands with a definitive treatment in the broad.

In the economics of forest management, a start has been made toward getting answers, locally, to the question of what forestry will pay. Especially good progress has been gained in developing accounting techniques. There has been less progress toward rounding out a basic theory independent of accounting. Outside the timber field, forest-management economics remains largely unexplored, save for some basic work in watershed values and limited studies in forest-range economics.

The field of forest-industry economics, with a few notable exceptions, has until recently remained the happy hunting ground of data collectors. Some research, of course, has been done on the problems of individual firms. During the Second World War, timber shortage focused public attention upon forest-industry problems in general. Related price and production studies, especially of the lumber industry, received attention from a number of competent research workers.
within and outside of forestry. But the broad questions of the efficiency of forest industry as the link between forests and wood consumers are still largely neglected.

Marketing and prices of forest products have so far been dealt with chiefly as a field of description rather than research. Little wonder, considering the vast size of the field. Progress is most likely to come through studies of specific market areas, market functions, or commodities. Much groundwork has been laid for commencing such studies.

The economics of forest-products consumption has been entered through the medium of "requirements" studies made as a part of forest surveys and related projects. Upon this work, the heavy hand of the industry and products technician has left a strong mark. As yet, little application of the techniques of consumption economics has been made to these studies.

This review may seem unduly critical. It is not so intended, but is proposed merely as a nutshell description of what has and what has not been gained in forest-economics research. Considering the great size of the job, progress has been immense. Indeed, we may already be approaching the close of the present Second Period—this period of groping on a broad front.

Some Major Needs

The Third Period in forest-economics research should be marked by a stabilization of the data-gathering parts of the work. It should be marked by emphasis upon the development of theory, techniques, and problem analysis which will unify and lend order to the field. Perhaps this new period will begin soon after the Nationwide Forest Survey is completed for the first time. It can scarcely begin before.

The development and recognition of research in the economics of forestry will depend upon how competently such research is applied to our major forest problems. These problems must be answered in the interest of world and community wellbeing based on forest conservation. From the viewpoint of forest-economics research, some of the chief problems and requirements for the future appear, to the writer, to be these:

1. We need to improve vastly our knowledge and methods of conveying forest products from stump to consumer. Forests' contribution to the economy depends upon the use of products by consumers. But prices of forest products to consumers have risen persistently (lumber prices, 350 percent in the 80 years preceding 1940); consumption has declined;
costs of conversion and distribution have increased; technology has lagged; labor has subsisted on sub-standard wage rates and working conditions. Most critical in the East, these problems are growing in the West.

Toward greater efficiency and lower costs of timber utilization, logging, processing, and marketing; toward a healthy industry and a healthy labor situation based on better technology and more abundant consumption of forest products, forest-economics research has much to contribute.

2. Forest abundance depends on good forest management; yet management today is predominantly poor. National sawtimber growing stock is down about a half in 35 years. Timber quality is worsening rapidly. Saw-timber cutting and losses exceed growth by 50 percent. Our requirements for wood products are much in excess of what our depleted forests may properly yield. This resource pinch is a problem primarily of the private forest holdings, which comprise three-fourths of our commercial forest area, and especially of the farm woods and other small holdings, which make up well over half of it. Only 4 percent of the cutting on these small holdings conforms to good practice.

A major need for improving private forest management is to demonstrate its financial desirability. Toward learning what type and intensity of forest management will pay, a large contribution is required from forest-economics research.

3. We need to enlarge tremendously our knowledge of the economics of forest products other than timber. Timber depletion generally has served to underscore the problems of forest watershed, recreation, and wildlife management. The growth of metropolitan centers and of irrigation agriculture in some of the water-deficient areas of the West, the rise of the pulp and other water-using industries in the South, and increasing national awareness of the problems of soil conservation and flood control—all emphasize the importance of forest watersheds. Now that the war is over, people are returning to the forests in numbers greater than ever before for hunting, fishing, and general recreation. Depletion of Western ranges and a recent focusing of the spotlight upon Eastern pine-forest ranges reemphasize the role of grazing in forestry.

Studies of an economic nature are needed to answer, among others, three large questions: What are the economic principles and problems of multiple-use forest management? What are the values at stake in the various forest products?
Fig. 3.—Nebraska: Sawing cottonwood lumber at a portable mill. Does such a mill make economical use of its raw material? Does it make economical use of its labor?

Fig. 4.—Georgia coastal plain: Cattle grazing on carpetgrass and panic grasses beneath an old-field stand of slash pine. What combination of forage and timber production represents the best use of such land?
and services, as a guide to management policies? What forms and intensities of single- and multiple-use management yield the highest net returns from the standpoint of private business and public welfare?

4. We need a better understanding of world requirements and supplies of wood, and how to correlate them. A smaller world, more vitally in need of international cooperation, calls for such understanding. Forest depletion, particularly of softwoods, has a world-wide meaning. With Europe scarcely self-sufficient in timber, with South America and Africa mainly hardwood producers, with Australia and much of Asia net deficit areas, the softwood timberlands of North America assume a key position in world forestry. Greater industrialization in the future, particularly in Asia, will require more timber. Rising world standards of living will create tremendous new demands for paper and other wood products.

In our search for objectives and methods of world cooperation in correlating wood supplies and requirements, a large contribution will be demanded of forest economics.

5. We need local and national and world facilities for continuously reappraising and periodically reporting upon the forest situation. The increasingly critical status of forest resources emphasizes the need for such facilities.

Research should take leadership in ferreting out and compiling the facts of the forest situation. It should lead in analyzing the facts impartially in the light of the needs of the public welfare as a basis for policies of remedial action. Forest economics, dealing as it does with the fundamental values of all aspects of forestry, should comprise a leading part of such research.

6. In order for research in the economics of forestry to play the part required of it in enhancing forest values, we need to stride toward organizing the basic theoretical principles of the field. And we need trained men to understand and apply those principles. The principles of forest economics must be formed out of the material of social science, but must be deeply rooted in the biology and engineering of forestry. In most cases, too, workers in the field should have their basic training in forestry, their further training in economics and the economics of forestry.

Not until the forest schools and graduate schools supply the trained men to do the job can we expect the large contributions from forest-economics research that are demanded of it.

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