

Reviews

FORESTRY IN GREAT BRITAIN; AN INTERDEPARTMENTAL COST-BENEFIT STUDY. H.M.S.O. London. £1.25, 107 pp.

This very interesting study represents the most sophisticated effort so far at an evaluation of investment in plantation forestry in Britain. This review will not consider the sections of this report dealing explicitly with private forestry in the U.K. on the basis that discussions of such material would be of little interest to most Irish foresters.

Public investment in forestry is assayed in a cost benefit framework: valued benefits include wood and recreation outputs; in addition to the usual production costs the value of water foregone is included to comprise estimated costs. Costs and benefits are then discounted to the same point in time using a discount rate of 10 per cent, resulting in negative net discounted revenues (total discounted benefits—discounted costs) for each of the 3 sample areas studied (North Wales, South Scotland, North Scotland).

Measured *benefits* include wood and recreation outputs; a chapter has also been included concerning the local employment generated, and on the cost of this generation to the exchequer. Only employment “in the forest” and the service employment which it generates was considered, the logic being that (p. 72) “it cannot be assumed that in 50-60 years time there will be the present need for jobs in these areas.” Likewise of course it cannot be assumed that there will *not* be the need for these jobs at that time or indeed much earlier, since the pulpwood outputs which are generated 20 years after the initial investment also generate employment. The derivation of the probability (e.g. 0.3-0.5) of underemployment persisting in rural areas 15-50 years from now and its application to estimates of employment “induced” in transport, processing and non basic sectors would have improved the analysis. As the authors demonstrate very effectively, forestry, as a capital intensive and labour extensive operation, has little value *per se* as a generator of regional employment; its premier advantage from a development point of view lies in its very strong forward linkage [*vide* the Fort William pulp mill in Scotland (Greig, 1971) or the Scarriff chip-board plant in Ireland (Lucey and Kaldor, 1969)]. If forward linkage is ignored, than forestry’s most distinctive contribution as a generator of labour-intensive resource-based economic activity is likewise set at nought.

The authors feel that the import-saving effect of forest outputs does not warrant any weight in the public investment decision-making process, but they do incorporate in their study a "variant to the main case" where benefits are arbitrarily valued at 20 per cent above their measured value to reflect the import saving effect. Likewise "strategic" arguments in favour of forestry are dismissed on the basis that in the event of hostilities imports would only be interrupted for "a few months at most"; in this event the main supply limitation would be processing capacity rather than wood supply. As already mentioned, the *costs* considered included the usual production costs and the opportunity cost of water foregone as a result of forest plantation establishment.

The valuation of these costs and benefits gives rise to some interesting questions.

On the benefit side, it has been assumed that the "historic" (50 years) rise in "real" timber prices will not be maintained, and that current prices (in real terms) can therefore be used to value future wood production. This assumption is based on the premises that wood substitutes (steel, concrete, plastics) will prevent the prices of "final" wood products from rising, while advances in extraction, logging and transport technology will keep "per unit volume" costs from rising. Many other equally defensible scenarios can be outlined. A more realistic one in my opinion would go as follows; environmental forces¹ in both the U.S. and Canada will continue to limited the "effective" timber supply, by precluding logging entirely on some areas and restricting logging elsewhere through regulation of clearcut area size, slope of felling area, pesticides, herbicides and the like. These forces will also be felt in a more modified form in the Nordic countries and the USSR, while Japan will absorb an increasing quantity of Siberian wood. At the same time, the competitors for wood will come under much the same kind of increasing cost pressure. The steel and cement industries have serious pollution emission problems, and their reduction to "acceptable" levels will be reflected in higher production costs. Such costs will similarly be imposed on the hydrocarbon (oil) industry; plastics have the additional complication that they are not decomposable, and the resulting higher disposal costs are likely to be reflected ultimately in the consumer price. This latter problem is now considered to be of such significance that the U.S. paper industry is having second thoughts about the wisdom of encouraging

1. Including a desire for "pure" wilderness and natural areas, a concern with fragile ecosystems, erosion, water quality and aesthetic considerations.

paper-plastic composite products from which the organic (decomposable) component (paper) cannot be easily separated.² The net effect in Europe of these postulated forces could be fairly stable demand functions for wood-based products, with supply functions moving to the left, resulting in rising wood prices, the extent of the increase depending on relative supply and demand elasticities, i.e. a continuation of the historical price trend. This rather lengthy scenario is outlined not because of any conviction that it is uniquely correct, but rather to indicate the rather narrow scope of the price predictions analysis in the Treasury study.

To measure recreation and amenity benefits consumer surplus³ per visitor day has been used, and it is assumed that this will increase in value at an annual rate of 5-10 per cent as a result of growth in population and income. The basis for this high growth rate is not documented, and although it does seem to fairly reflect experience in other countries.

The estimation of costs introduced a number of interesting concepts; land was valued not at its market price but at its opportunity cost to society under agriculture, which, when all of the subsidies have been removed yielded a zero discounted net value. Likewise the opportunity cost (shadow price) of labour engaged in forestry was estimated to be just under half of the present wage. This shadow price for labour seems to be inordinately low. The lowest labour shadow price derived from public water projects in the U.S. by Haveman and Krutilla (1968, pp. 76, 77, 82) estimated either by region or by project type amounted to 72.9 per cent of the market price for labourers, and this estimate was for an economy which "tolerates" a rate of unemployment much higher than that normally obtaining in the U.K. As forests mature they result in a loss of water to the local supply system, and this loss has been judged insignificant in Scotland, but priced at 5 pounds per acre in North Wales. The derivation of this estimate is not discussed.

The discounting of the costs and benefits at 10 per cent results in negative net discounted revenues even under the "best" conditions and these results elicit a set of forest management "recommendations", including shortening the rotation length, employing less intensive management, and using better sites. Only under the (rarely found) "best" management and site conditions does forestry

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2. Dane (1972) has demonstrated that the social external environmental costs imposed by lumber production are less per dollar of output than for any "competing" construction material.
 3. Provides an approximate measure of consumers' aggregate willingness to pay for a commodity.

show positive net discounted revenues.

The more general conclusion then is drawn that "new planting compares unfavourably with the hill-farming it replaces in economic resources and in Exchequer costs per acre," and that unless great weight is given to the generation of (p. 81), "slightly more local employment," then new plantings must be judged of doubtful social value.

The selection of a 10 per cent rate of discount in a sense predetermined this conclusion; the authors themselves point out (p. 49) that "it appears that only in the most favourable combination of climate and soil (possibly Chile or New Zealand) is a return of 10 per cent attainable." How has this discount rate been arrived at? The authors do not discuss its derivation, and we must assume that it has been determined elsewhere that 10 per cent represents British society's rate of time preference. A society's rate of time preference is defined at the rate at which it discounts future values in *real terms* in its decisions about present versus future consumption; if a society's rate of time preference is 10 per cent it theoretically will be "indifferent" about receiving 100 pounds now or 110 pounds one year from now in "real" terms. If the average annual rate of inflation were 8 per cent, this rate of time preference would imply that society would be indifferent between 100 pounds now and 118 pounds (approx.) received one year from now in "money" terms. This author suspects that instead of representing the social rate of discount in "real" terms, part of the 10 per cent rate is attributable to the current British high rate of inflation; some evidence for this view would be that the discount rate used by governments tends to be increased as the rate of inflation increases. This hypothesis obviously cannot be tested for this review but the authors of the study should certainly have included an appendix detailing the rationale for the selection of this 10 per cent rate, since, as already pointed out, its use predetermined their conclusions.⁴

Criticism of this cost benefit analysis has focused thus far on the exclusion of secondary benefits, the uncritical use of "present" prices to be applied to future yields, the very low shadow price adopted for labour and the very high discount rate employed. One might also question the position taken by the study group in regard to the balance of payments question; they observe that (p. 13) "the only sensible framework for such an analysis is to assume that the U.K. is able to maintain a satisfactory balance of payments position

4. *A priori* it is hard for this reviewer to accept that the "real" rate of return on private investment (i.e. the "opportunity cost" of government spending) in Britain averages 10 per cent.

in conjunction with the desired level of employment over the time span in question." The post-War empirical evidence suggests quite strongly on the other hand that high rates of unemployment are positively correlated with a strong balance of payments position and *vice versa*; if the study group had evidence to the contrary in favour of their "sensible" assumption, they should have produced it.

These criticisms lead to a more fundamental question; Is cost benefit analysis an appropriate method for making public policy decisions of this magnitude? Experience in the U.S. is illuminating in this regard: Cost benefit analysis became widely used as a means of evaluating public water projects after the 1936 Congressional Flood Control Act which stipulated that for a project to be regarded as "feasible" the benefits, to whomsoever they accrue should be in excess of the costs, and its use quickly spread to other non-water projects. Criticisms of cost-benefit analysis in the early years focused on the measurement difficulties (especially of benefits) and the difficulty of incorporating distributional considerations. More recently the ability of analysts to give proper consideration to environmental variables has been questioned. These misgivings have culminated in recommendations recently proposed by the Water Resources Council (1971)⁵; for each proposed plan a complete display of relevant *effects* should be produced. Among many others, effects would include the value of goods and services produced, and their associated "direct" costs, regional employment, income and its distribution, and environmental effects such as impacts on open and green space, wild and scenic rivers etc., as measured by environmental "indicators". The emphasis then is on the development of an *information system* which can be used in a multi-objective framework. It appears as though we have now come full circle; the desirability of compressing as many of the relevant variables as possible into a single efficiency criterion is no longer "officially" accepted. To be useful in a democratic society decision criteria must achieve broad acceptance from the groups involved. Cost benefit analysis has failed this test, and this probably explains the move to a more broadly based and less definitive approach to decision making in the public arena in the U.S. The Treasury team would perhaps have served the public better if they had shown the impacts of forestry investment in terms of variables such as rate of financial return, employment generated, balance of payments effects, etc., and allowed the decision makers to judge

5. The agency responsible for the planning of Federal and certain federally assisted water and land resource programs and projects.

the relevance or otherwise of the indicators selected [e.g. balance of payments, employment], although to be sure economists can help in this task. The incentive to dismiss as irrelevant (in the case of balance of payments) or to oversimplify (in the case of price projections) would thereby be removed, and the debate in the political arena could focus more on issues and less on the validity of various monetary valuations and assumptions.

Although this review has emphasized the negative aspects of the report, it has much to commend in it; for the first time, a conscientious and systematic effort has been made to delineate the role which public forest investment can play in British society. We may quibble about some of the assumptions and methods used but the study does at least attempt to examine the forestry sector from society's viewpoint. In this sense it stands as an indictment of British forestry planning, since any profession or organization presuming to manage hundreds of millions of pounds of publicly held assets has an obvious responsibility to indicate what return (in its broadest sense) this public is getting for its money, and why the investment should (or should not) be enlarged (or liquidated). If such had been done, the vacuum which encouraged the undertaking of the present study would have been filled, and I feel sure that public forestry in Britain would not now be on the defensive.

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