J. ENVIRONMENTAL SYSTEMS, Vol. 5(3), 1975

NOTE ON "BENEFIT-COST ANALYSIS: A QUESTIONABLE PART OF ENVIRONMENTAL DECISIONING"*

DR. ALAN S. COHEN
Energy and Environmental Systems Division
Argonne National Laboratory
Argonne, Illinois

ABSTRACT

Professor Müller compares the ecologist's stability and the economist's benefit-cost criteria for setting environmental standards and concludes that "the results of the benefit-cost analysis are either misleading or superfluous." This note presents arguments which indicate that Professor Müller's conclusion is incorrect; the correct conclusion being the exact opposite of Professor Müller's.

Criteria

Professor Müller compares the ecologist's stability and the economist's benefit-cost criteria for setting environmental standards and concludes that "the results of the benefit-cost analysis are either misleading or superfluous." This conclusion is based on two assumptions: 1) the marginal social cost (MSC) function of pollution damages used by the economists is continuous and has a finite slope and 2) the environmental damages of polluting the environment beyond its absorption capacity is potentially catastrophic. These two assumptions imply that the economist conducting this analysis is using the wrong marginal social cost function and certainly, the decision reached by using incorrect information may be misleading. But this conclusion only reflects the

* This *Note* is a discussion of Frank G. Müller's Benefit-Cost Analysis: A Questionable Part of Environmental Decisioning, *Journal of Environmental Systems*, *4*:4, Winter, 1974, pp. 299-307.

doi: 10.2190/BKRB-M58A-R1GK-P8K7
http://baywood.com

ineptness of the economist who used the wrong MSC function and not the inadequacy of the benefit-cost approach for making environmental decisions.

APPROPRIATENESS OF THE BENEFIT-COST APPROACH

For example, if the second assumption is correct, the MSC function would look more like MSC″ in Figure 1. This curve is equal to zero to the left of Y_E and then jumps to a value which is

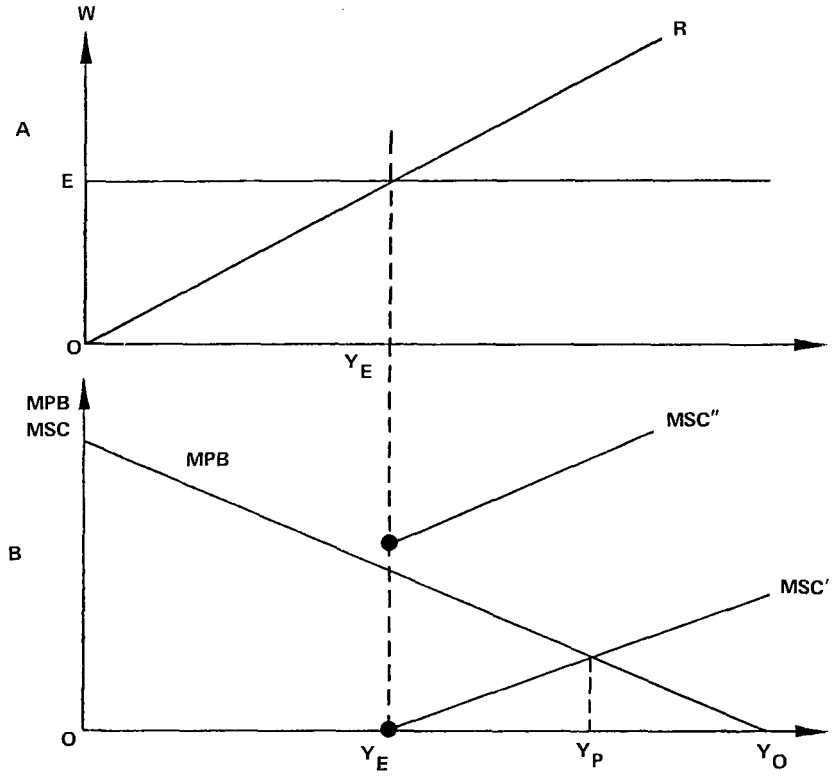

Figure 1.

greater than the marginal production benefits (MPB) at Y_E. This jump reflects the catastrophic damage which results if the pollution level strays anywhere above the ecological stability point Y_E. (Alternatively, MSC″ may be a vertical line, i.e., infinite slope, through Y_E.) The correct MSC function violates Professor Müller's first assumption. As a result his conclusion that the economist's benefit-cost decision rule is misleading is shown to be incorrect

since the appropriate decision is identified using the benefit-cost approach.

INADEQUACY OF STABILITY APPROACH

To accept the second half of Professor Müller's conclusion that the benefit-cost approach is superfluous is to accept his second assumption. Since ecologists and other biological and physical scientists have been unable to substantiate the hypothesis that *any* increase in pollution beyond the present stability point would have catastrophic consequences rather than causing small adjustments in the ecosystem resulting in another stability point, there is now no reason why economists or anyone else should accept this assumption. If, in fact, it is not true and the MSC function originally used in Professor Müller's paper, MCS′, is correct, then the ecologist's decision rule is the one which is misleading and certainly the benefit-cost approach cannot be superfluous.

The point of this note is not to suggest that the economist's approach is correct and the ecologist's is incorrect. Rather it points out the need for the ecologists and economists to improve their estimating procedures. The ecologist must improve his estimates of the deleterious effects of pollution and the economist must improve his monetary valuations of these effects. Only when this occurs will we be able to improve our environmental standard setting decisions.