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## The Quest for Environmental Indices

Our indicators of gross national product, cost of living, and unemployment are based on somewhat arbitrary definitions that can produce quite misleading results if their assumptions and limitations are not fully recognized. And yet these measures of the economy are critical factors in both formulating and evaluating economic policy. Despite their shortcomings, they are adequate for their purpose, and their use has improved both policy formulation and the level of political dialogue.

Is it possible to provide a similar set of indices for environmental quality? The Council on Environmental Quality and other organizations concerned with the environment have been grappling with this question. I am convinced that we not only *can* develop such indices, but that we *must* if the level of environmental policy and planning is to be improved.

A limited number of environmental indices, obtained by aggregating and summarizing available data, could be used to illustrate major trends and highlight the existence of significant environmental conditions. These indices could provide measures of the success of federal, state, local, and private programs in coping with environmental problems that must be solved.

Many obstacles lie in the path of developing environmental indices. For some aspects of the environment there are conceptual questions that must be answered. For example, we know that land use is a basic component of environmental quality, but at this point it is not clear what aspects of land use we should be measuring.

Good indices depend upon good data, but the environmental data now being collected are deficient in many respects. Inadequate sampling is probably the most pervasive problem. Much of our air pollution data, for example, is based on results from only one monitoring station in each community. It makes a big difference whether that single station is located next to a power plant or on the outer fringes of the suburbs. Similarly, water pollution readings are only rarely adjusted to take into account the location of the stations collecting the data. Another major problem is the excessive length of time between collections of data. Unsatisfactory systems for data storage and dissemination are often notable deficiencies.

Finally, in many cases the scientific knowledge necessary to properly weight the components of an index is lacking. How important is dissolved oxygen compared to turbidity in estimating the quality of our nation's water? How much park space does a typical urban dweller need or want? Until sound standards are set for the major aspects of the environment, a number of somewhat arbitrary assumptions will have to be made in the computation of indices.

Although there are formidable obstacles to the development of environmental indices, real progress has been made in this direction. There has been a marked increase in interest in the subject among federal, state, and local agencies and also within the academic community. The dialogue concerning environmental problems has increasingly been based on empirical evidence instead of on intuitive assumptions or political interests.

Policy-making neither can nor should become totally "scientific." Vital decisions will always depend ultimately on the values we hold and on the way we express these values through the political system. But we must also strive to make maximum use of the scientific evidence available to us, and the development of environmental indices is one important way of doing this.—RUSSELL E. TRAIN, *Chairman, Council on Environmental Quality, 722 Jackson Place, NW, Washington, D.C. 20006*

# Science

## The Quest for Environmental Indices

Russell E. Train

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