MESHING NATURAL RESOURCE USE AND DEVELOPMENT WITH INCREASING URBANIZATION

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C. R. Enock, speaking as a conservationist in 1913, made a plea for the merging of the sciences into a new science ". . .a comprehensive and constructive science whose aim would be to evolve and teach the principles under which economic equilibrium in the life of communities may be attained" [3]. He stated, further:

. . .the real science of living on the earth, or "human geography," the adaption of natural resources and national potentialities to the life of the community, has never been formulated. The congestion of the population in towns, the desertion of countryside, the high cost of living, low wages, unemployment and so forth are related phenomena, intimately connected with the conservation and development of natural resources . . .

What Enock observed, as well as did like-minded conservationists, was the emerging economic consequences of technological forces affecting employment and income in natural resource industries - the emerging urbanization with corresponding lessening of national or regional employment in natural resource or extractive industries as a proportion of the total. The implied remedy to the problems (more conservation and development of natural resources) is consistent with the beliefs underlying the conservation movement of 1890-1920, and with the general orientations of our current natural resource policies, programs and institutions. Conversely, my major theses and beliefs are as follows: (1) Our natural resource institutions, including policies and programs, are becoming increasingly less relevant as instruments for dealing with the major economic problems of an urban and urbanizing society; (2) Problems of natural resource use and development of increasing importance are associated with the quality of the urban environment; and (3) Modernization of our natural resource policies, programs and institutions will require intensification and/or redirection of the continuum of research, education and action.

INADEQUATE NATURAL RESOURCE SITUATIONS

Our natural resource policies, programs and institutions are geared to an America prior to the twentieth century, when (1) successful settlement and economic development of the Western region required a major emphasis on natural resource development, especially irrigation, and (2) a predominately rural-oriented national economy was heavily dependent upon natural resource and extractive industries. These policies, programs and institutions are oriented to quantities rather than qualities of natural resources. This quantitative approach associates natural resource use and development with market and marketable goods and services. In an economy that is more and more service or tertiary-oriented, the qualitative and related aspects of the natural environment take on more significance in the spectrum of scarcity and as potential deterrents to economic development. Space, quality and amenity features of the natural (and urban) environment are the resources that count in our crowded urban age [7].

Quality of the urban environment includes attributes associated with the health and physical well-being of people, including both natural elements and manmade cultural amenities. The natural resource aspects of this quality, which comes to mind immediately, are (1) cleanliness of air, water, and other natural elements of the environment; (2) density and arrangement of manmade features to minimize loss of aesthetic attributes of the natural environment; and

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(3) enhancement of aesthetic and utility aspects of the natural elements through addition of manmade elements or facilities. The subject matter and problems corresponding to these aspects of quality receiving major attention by economists and others are pollution, land use and recreation, respectively.

The combination of technological advance, industrial expansion, population growth and urbanization, together with institutional rigidities associated with private property rights and a free market economy, have been the principal contributors to the near crises in pollution and a deteriorating natural environment. People extract a wide variety of vegetable, mineral and animal materials from the environment; they transform these into a wider variety of economic goods. These goods undergo physical and chemical transformation when consumed and become, in effect, garbage or waste. The discarded products of final consumption, as well as the unwanted solid, liquid or gaseous materials generated in the production process, may be harmful, noxious or unappealing especially if concentrated in space. Concentration of pollutants in space increases with increase in concentrations of people, or with urbanization. Total environmental pollution is also related to the level of utilization of materials from the environment, and to the amount and effectiveness of efforts in pollution abatement or arrestment. Prospects are for continued increase in urbanization and levels of consumption, together with lack of corresponding increase in efforts to cope with the pollution problem. Thus, the pollution problem likely will intensify prior to the organization of our collective wills to solve it.

The land-use problem associated with the quality of the environment is more difficult to describe. It bears no relationship to a goal of use of each acre in accordance with its capability. Neither is it remotely related to policy in the use of public lands. It pertains to only about two percent of the land area of the United States, or the amount required (or used) for concentrations of urban populations and associated facilities for work, leisure or living. The subject is foreign territory for most agricultural economists and perhaps for other professional groups except urban planners. With a limited understanding of the objectives and criteria applied by planners of urban land use, it is difficult to understand what urban planners consider to be the urban land-use problems.

One can observe a certain amount of apparent haphazardness in the spread of major urban areas. One can also detect a preponderance of industrial, commercial, landowner and developer interest reflected in the nature and geography of urban development. There appears to be a neglect, or a minimum of attention, to public aspects of the urban infrastructure - - schools, parks, recreational areas, open space, transportation facilities, etc. In short, urban areas seem to have been constructed to serve the interests of the sellers, rather than the consumers, of products and services required for urban living. Thus, quantity, rather than quality, aspects of the urban environment has been (and is) getting the emphasis.

Economically speaking, the land-use problem situation appears to be one of major disassociation of costs and returns. The costs of any adverse quality aspects of the urban environment generated by private development, congestion, or sprawl is borne by the public rather than the private economic sectors.

The recreational problem is closely associated with the land-use problem. Urban development seems to proceed on the assumption that parks, open space and outdoor recreational areas are legitimate features of the open countryside but not of urban areas. That is, the urban people are expected to commune with nature in rural rather than urban areas. The public agencies with interests in developing outdoor recreational facilities also adhere to this view, partly because their authority to develop recreational areas or facilities apply mainly to rural areas, and partly because the forcing of urban people into the countryside for recreation - - due to the inadequacy of these facilities in urban areas - - has created a misleading impression regarding the true demand for rural outdoor recreation. Another factor contributing to this impression of the demands for rural outdoor recreation is the inadequate facilities for cultural pursuits as a use of leisure time in urban areas [10]. This adds to the exodus to the countryside as an available substitute for the limited urban opportunities. All of these expressions about recreational demand should be considered hypotheses until verified (or rejected) by research.

INADEQUATE ANALYTICAL FRAMEWORK

Research to verify (or reject) such ideas as set forth above suffers from the heavy emphasis on intangibles in studies dealing with quality of the environment. Let's face it - - economics, and perhaps science generally, is as production oriented as is the natural-resource policies, programs and institutions discussed earlier. The significance of measurement of phenomena in the advancement of science is one factor contributing to a limited emphasis upon studies of quality of the environment. In economics, the emphasis on quantitative analysis is not diminishing, yet the needed economic research for establishing a knowledge base necessary for modernizing our natural resource institutions cannot now be easily placed into this cast.

Economic research alone cannot overcome the obstacles to quantitative analysis. The major problems are technical. Evidently a coordinated program of

research encompassing economics, physical and biological sciences is a necessary approach for meeting the challenge. Economists can contribute in this program by identifying the needed physical or biological relations for social evaluation of alternative policies or programs. It appears that the subject of economics is more useful as an approach to a theory of choice than as a science, or as a framework for analysis of decision problems, rather than in and of itself a body of knowledge. As such, it may be considered an indispensable aid in the entire process of arriving at pollution abatement or control policies.

The substantial amount of economic research on pollution problems during the past decade has not contributed significantly, to date, to public policies or programs [5, 6]. It has fallen short of producing specific answers to relevant issues in policy.

There has been a distinct tendency for economists researching independently of the other sciences on pollution problems to either (a) take a negative and naive attitude about what economics can contribute to policymaking, or (b) take an opposite view - - that providing immediate answers to pollution policy issues is within both the capability and responsibility of economists. The first view is exemplified by the following statement by Dales:

. . .economic analysis, which is all but useless in helping us decide on a policy, is all but indispensable in helping us decide on the best way of implementing a policy once it has been chosen. The criterion is simply that the best way of implementing a policy is the least costly way . . . [2].

Research in accordance with the first view may provide a volume of cost estimates - - largely hypothetical or fictitious - - but such information is of low utility in the practical process of policymaking. The second view is exemplified by Ciriacy-Wantrup's article nearly a decade ago proposing a "fishy standard" in water quality [1]. This view, by overstating the case for economics, diverts attention from the physical, biological and other knowledge deficiencies impeding quantitative economic analysis.

Much of the foregoing concern about research on pollution problems also applies to urban land use. Both relate to the quality of the environment. However, it seems a major opportunity exists for studying the incidences of benefits and costs of the various patterns in urban development. Who are the despoilers of natural resources, who benefits, and who bears the costs? How can unearned increments due to actions of society be determined, identified in respect to private claimants, and diverted from private to public uses?

Since urban land-use planning is nearly void of economics (principally because of the absence of relevant economic information), a coordinated effort by urban planners and economists could be a highly productive endeavor. Aside from this kind of effort, there is need for economic research within a broader frame-of-reference - - in terms of numbers, sizes, locations and functions of urban places. We are groping for information necessary for intelligent thinking about a national policy of land settlement as a means of solving the problem of urban congestion, and associated social costs, connected with our larger metropolitan centers [4, 8, 9].

Recreation has been thoroughly researched during the past decade if the number and volume of publications is indicative of progress [11]. However, most of this research seems to evade the kinds of basic issues raised earlier, namely, the relation between urban recreational facilities and demand for rural outdoor recreation, and the substitution relations between recreational activities and other uses of leisure time. Unless these issues are dealt with forthrightly in economic research, existing orientations in recreational development policy will likely go unchallenged.

A major weakness in all economic research relating to quality of the urban environment is the inadequate attention to institutional structures. Solution to pollution problems inevitably will entail changes in institutions - - especially those relating to private property rights and the free market economy. The same may be true for urban land use and recreational problems. The inviolability of these institutions will require challenge, and a coordinated legal-economic-institutional research program in relation to problems of the urban environment could be the most effective means for creating this challenge. The close ties of our private property and free market institutions with the mainstream of economic thought is a major handicap in achieving a research orientation necessary for challenging these institutions.

Another kind of institutional problem is the sponsorship or administration of research budgets by public agencies with vested interests in retaining the current orientations to natural resource policy and programs. Under these circumstances, the pressures on research workers pertain mainly to the choice of questions to be dealt with in the research, rather than to the nature of the answers to the questions asked. Thus, the major problem of objectivity relates to the scope of the research undertaken rather than to any bias in presenting answers to questions providing the focus of the research.

A third institutional problem relates to ourselves and our profession. As products of the rural environ-

ment, we tend to think "rural." Our inclinations are to "write off" the urban areas as having a limited potential for environmental improvements, and to conclude that urban people must have a more rural exposure to acquire an increase in quality of life. Unless we can accept the proposition that America is highly urban and becoming more so, and that the main hope for advancing the quality of life of the American people may lie in improving the quality of the urban rather than the rural environment, then we can contribute but little to solving these problems. However, the barrier may not be ourselves, but institutions associated with our profession. Somehow we need to acquire public support for reorienting agricultural economics research to less agriculture, less production economics, and to more attention to problems of an urbanized and urbanizing society.

SHIFT IN EMPHASIS REQUIRED

We should be concerned about the possibility of attempting to deal with environmental quality problems through current institutional machinery geared to deal with situations of natural resource scarcity in a quantitative sense. Already we hear voices articulating the beneficial effects of natural resource use or development projects or programs in terms of environmental quality. Yet the physical measures or features of this activity by some public agencies departs but little, if any, from traditional ways of utilizing the services of natural resources in the production of facilities for irrigation, navigation, power, flood control, water supply, etc. Thus, the production aspects of natural resources continue as the major emphasis, even though problems of quality of the environment increasingly justify public expenditures for programs in natural resource use and development.

A shift in emphasis from production to consumption aspects of our natural environment, from market to extra-market aspects, and from a rural to an urban focus, will in all probability require institutions and programs not yet in existence. Rational shifts in these directions may require a knowledge base not now in existence, and a de-emphasis in current activity to create products or services which the private sectors can (or can be expected to) provide efficiently. Hopefully, public support for instituting and implementing these prerequisites to policy and program changes will emerge in the near future.

REFERENCES

1. Ciriacy-Wantrup, S. V., "Water Quality, A Problem for the Economist," *J. Farm Econ.*, pp. 1133-1144, proceedings, Dec. 1961.

2. Dales, J., *Pollution, Property and Taxes,* paperback, p. 99, University of Toronto, 1968.

3. Enock, C. R., paper presented before the Birmingham Meeting of the British Association for the Advancement of Science, Sept. 1913; quotations from *Scientific American,* p. 38, Sept. 1963.

4. Hanson, Ivan, *Land Settlement Policy,* API Ser. 32, North Carolina State University, 1968.

5. Herfindahl, Oris C. and Allen V. Kneese, *Quality of the Enviornment: An Economic Approach to Some Problems in Using Land, Water and Air,* RFF, 1966.

6. Kneese, Allen V., *Water Pollution: Economic Aspects and Research Needs,* RFF, 1966.

7. Perloff, Harvey S., "A Framework for Dealing with the Urban Environment: Introductory Statement," in a book he edited, *The Quality of the Urban Environment,* p. 6, The Johns Hopkins Press, 1969.

8. Southern Land Economics Research Committee, "Toward a New Land Settlement Policy," unpublished proceedings, Atlanta, Ga., Nov. 27, 1967.

9. Southern Land Economics Research Committee, *Seminar Proceedings,* Virginia Polytechnic Institute, 1969.

10. Tharp, Max, "Recreation and the Leisure-Work Problem," *Amer. Recreation Jour.* Vol. 6, No. 3, p. 61, May-June 1965.

11. U. S. Department of Agriculture, *Publications on Outdoor Recreation Research,* 1962-66. ERS-346 (61 publications are included in this list), June 1967.