INTEGRATING ENVIRONMENTAL AND SOCIOECONOMIC ASSESSMENT

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ABSTRACT

Since the passage of the National Environmental Policy Act (NEPA) in 1969, considerable scientific and regulatory attention has been given to the preparation of environmental impact assessments. Part of this attention has been directed to definition of the proper scope of an environmental assessment and to debate about how the "human environment" should be addressed. This debate continues, and is reflected in the ongoing evolution of the definition of and relationship between the "environmental" and "socioeconomic" components of an integrated environmental impact assessment. This paper discusses the need for close integration between the environmental and socioeconomic assessment efforts and examines some of the benefits and difficulties of achieving this integration.

OVERVIEW

Impacts now typically classified as "socioeconomic" were included within the scope of environmental impact assessments only after a substantial struggle and intense debate about the definition of the term "environment" as it is used in the National Environmental Policy Act. Lingering consequences of this history remain. For example, in many instances, it is unclear whether the term "environmental impacts" or "environmental program" is being used to refer exclusively to the natural and physical environment or whether it includes the human environment--socioeconomics--as well. In addition, the difficulty of attaining recognition of the importance and legitimacy of socioeconomic impacts caused social scientists to try to separate the socioeconomic from the environmental component of the assessment, emphasize the differences between these two components, and establish clear, direct causal linkages between the project and the socioeconomic impacts. These factors, combined with the inherent difficulties of integrating work across disciplinary and organizational boundaries, have tended to constrain and formalize communication between those conducting the environmental and socioeconomic components of an assessment and reduce the degree of integration between these two components. For many projects, this reduced integration detracts from the quality of the overall assessment effort.

Historically, Environmental Impact Statements (EISs) have been tailored to respond to a set of environmental laws and regulations requiring attention to a range of potential environmental changes. In some areas, regulatory agencies, such as the Environmental Protection Agency and the Nuclear Regulatory Commission, have established clear guidelines regarding the amount of environmental impact that is legally acceptable. In many other areas, specifically including most of the socio-economic component, such guidelines have not yet been developed. These differences in regulatory requirements complicate the coordination of environmental planning, assessment, and mitigation efforts by placing specific--and frequently conflicting--time demands on different components.

Typically, comprehensive environmental assessments have been carried out by a loose coalition of specialists, each of whom is responsible for a relatively narrow, focused aspect of the work, which is aggregated (rather than integrated) into various reports over the course of the project. Collaborative efforts, when they happen, are most likely to occur within components. Communication across major disciplinary boundaries is difficult. Differences in terminology exacerbate differences in topics, research questions, and methods. Consequently, given the regulatory setting that does not prescribe social impact thresholds, an historical lack of communication between the social and physical scientists, and a belief that socioeconomic impacts are not pivotal for EIS decision outcomes, it is not surprising that environmental and socioeconomic assessments have been poorly integrated.

The contention of this paper is that environmental programs, particularly those addressing projects, such as the proposed commercial nuclear waste repository, which raise significant acceptability and environmental health and safety issues, are better served by an approach that integrates the environmental and socioeconomic assessment and mitigation planning efforts. The integrated environmental/socioeconomic impact assessment model, shown as Fig. 1, illustrates the relationships among the project, the natural systems, the human systems, and the physical environment over time that create the need for such integration. This model serves as a vehicle to discuss the types of projects for which integration of the environmental and socioeconomic assessment is particularly important. It is also used to present the parameters or characteristics of the project that need to be included in the "description of the proposed project" in order to conduct an adequate assessment of the socioeconomic and environmental impacts of these types of projects.

THE INTEGRATED ENVIRONMENTAL/SOCIOECONOMIC IMPACT ASSESSMENT MODEL

Figure 1 is a simplified model that illustrates the relationships, over time, among the physical environment, natural systems (environment), human systems (socioeconomics), the project, and outside decisions and resources. The time line is included to indicate the ongoing nature of these relationships and the changes they represent.

In this model, the three boxes on the left (physical environment, natural systems, and human systems) represent the environmental and socioeconomic context into which the project is introduced--the "existing environment" in impact assessment terminology. The center box represents the project; the characteristics of the project that cause environmental and socioeconomic impacts are noted in this box. The heavily outlined box above the project represents the introduction or application of outside decisions and resources, either in the form of the project and/or other outside influences on the local area. The three boxes on the right represent environmental and socioeconomic conditions after they have been affected by the project.

Since this model is intended to represent a process by which a project interacts with environmental conditions, it is useful to visualize the right end of the figure folding around and connecting with the left end, as if wrapped around a cylinder. In this way, the project can be thought of as exerting varying influences on the environment over time and causing impacts that evolve and change.

There is a particular need to integrate the environmental and socioeconomic components in the assessment of projects in which impacts in one domain are caused by the impacts of the project on the other, as for example, when impacts on habitat and water resources are caused by the population growth and urbanization effects of the project. (In Fig. 1, this type of impact results when the impact paths from the project to the human systems and from the human systems to the natural systems are strong.) The studies conducted by the Midwest Research Institute for the U.S. Fish and Wildlife Service on the Secondary Impacts of Oil Shale and Coal Development in Rural Areas on Fish and Wildlife Resources (Thomas et al. 1982), for example, illustrate an analysis of this type where important impacts on the natural systems result from the population growth and development caused by large scale industrial development. While fragile natural environments are particularly vulnerable to impact from socioeconomic changes caused by a project, residents with strong historic, religious, cultural, or economic ties to an area are especially vulnerable to impact from environmental change. (In Fig. 1, this type of impact results when the impact paths from the project to the natural systems and/or the physical environment and from the natural systems and/or the physical environment to the human systems are strong.)

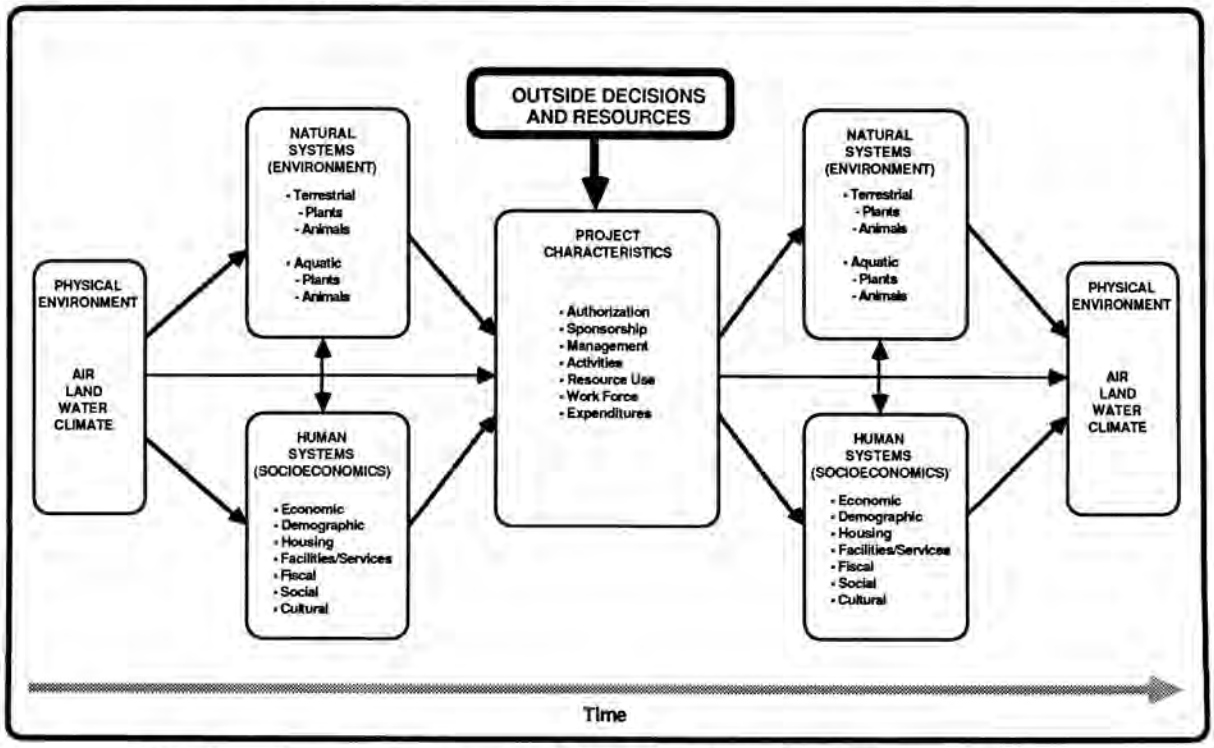

Fig. 1. Integrated Environmental/Socioeconomic Impact Assessment Model

Careful integration and collaboration are also needed to adequately address and interpret impacts that represent a combination of environmental and socioeconomic change, for example those affecting: (1) cultural resources; (2) land use; (3) aesthetics; (4) transportation; and (5) public health and safety. As a result, these aspects of the assessment are frequently considered "problematic," and seem somewhat out of place whether located in the environmental or the socioeconomic sections of the assessment report.

Programs such as the commercial repository program have a particular need to integrate the environmental and socioeconomic assessment efforts. The significant acceptability issues created by these projects reflect an intersection of the environmental and socioeconomic domains that cannot be adequately addressed without an understanding of the potential (or lack of potential) for environmental and health and safety impacts as well as an understanding of the perceptions and responses of the affected publics. In these cases, important impacts on the human systems (socioeconomic impacts) may result from potential or anticipated impacts on the natural systems or physical environment.

Successful interaction between the physical, natural, and societal domains of environmental impact assessments requires a degree of "professional empathy" among the technical and managerial staff. This implies both a willingness and an ability to see the project, the environment, and the impact process from a different, often less familiar, perspective and to draw new insight from that perspective. Integration is a prerequisite for this mutual appreciation of different technical and analytic perspectives to occur. Projects such as the commercial repository are likely to promote such professional empathy by increasing the focus on other aspects of project characteristics (justification, management) and by raising as a serious, program-jeopardizing issue the socioeconomic consequences of environmental risk. Such a shift in focus and perspective makes it professionally more interesting and rewarding for technical staff from both "sides" to become knowledgeable about the intersection of the environmental and socioeconomic domains, and more important for project management to demand integration of the various components of the assessment. Persons with the ability to accomplish this integration are therefore likely to become more prominent as projects with these attributes become more common.

As things now stand, the appropriate treatment of impacts associated with project acceptability and confidence in project management is undergoing considerable debate. In part, this debate centers around the definition of the project that is the source of the impacts.

DEFINITION OF THE PROJECT

The task of impact assessment is to determine how the existing environment has been (or will be) affected by a project. In order to initiate an impact assessment, the "project" to be assessed must be defined, and information about the project's characteristics must be obtained or developed. Establishing the definition of the project can be a difficult and controversial task, since project definition can substantially affect project impacts. Implicit in impact assessment methodology is the establishment of a causal relationship between some attribute(s) of the project and some change(s) in the environment. Indeed, unless such a causal relationship can be demonstrated, impacts cannot be attributed to the project.

Project definition and the need for information about the project reflects one of the important areas in which environmental and socioeconomic assessment needs differ. Assessment of environmental impacts requires primarily information about project activities and schedules, with emphasis on what will be done and when. Some information about resource use (for example, water requirements) is also often needed for environmental impact assessment. Socioeconomic assessment, on the other hand, also needs information about project authorization, sponsorship, management, work force, and expenditures as well as information about project activities and resource use. Socioeconomic assessment places a heavy emphasis on the consequences of the process of project siting and implementation--how things are planned and implemented--as well as what is done and when.

A current issue in impact assessment is the extent to which project characteristics such as authorization, sponsorship, management practices and effectiveness (including risk and hazard management) and resource use are included within the definition of the project. From the perspective of socioeconomic impact assessment, these characteristics are potential sources of important impacts. Figure 1 shows the list of the project characteristics about which information may be needed to conduct a comprehensive environmental impact assessment effort of a project in which public acceptability and competence of project management have become significant issues. It is frequently difficult to obtain information about many of these project characteristics in sufficient detail and on a timely basis.

In many cases, someone from the environmental team has overall management responsibility for the environmental program. Given the different information needs of the environmental and socioeconomic assessment efforts, it is often difficult for the socioeconomic team to establish an appropriate definition of the project and obtain the necessary information about the project characteristics. Unless a good working relationship and a significant degree of "professional empathy" can be established between the socioeconomic and environmental teams, the significance of project definition and access to information about program planning and implementation activities is likely to be missed in the press of work that invariably accompanies an environmental impact assessment. Without this information, the quality of the socioeconomic assessment--and the entire environmental assessment program--can be threatened.

SUMMARY AND CONCLUSIONS

Serious issues have been raised about the potential socioeconomic consequences of the risks and uncertainties introduced by large-scale facilities dealing with hazardous materials and about the public acceptability and political feasibility of siting such projects. Such issues highlight a disjuncture between the environmental and socioeconomic components of comprehensive environmental assessments that detracts from their accuracy and effectiveness.

To satisfactorily eliminate this disjuncture, those responsible for conducting or overseeing "comprehensive environmental impact assessments" of projects that introduce new and/or hazardous technologies must establish a definition of the project that includes all aspects of the project with the potential to cause or significantly affect either the physical, natural, or human environment. This definition must be broad enough to cover characteristics of project justification, sponsorship,

management, activities, resource use, work force, and expenditures. In addition, the assessment effort must be structured to encourage explicit attention to the interrelationships between the physical, natural, and human environment and integration of the information obtained from the various studies and analyses conducted for the project. The environmental and socioeconomic assessment efforts must be closely coordinated, operating on roughly comparable time schedules to allow collaboration on analyses and report preparation. Managers of the assessment effort must find ways to overcome the disciplinary and organizational barriers that can block effective communication among members of the team. Additionally, and of equal importance in achieving effective integration between the environmental and socioeconomic components of the assessment, a sense of "professional empathy" and commitment to the objective of integration must be elicited from the various technical staff, the program sponsor(s), and program regulators.

REFERENCES

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