SOCIAL IMPACT ASSESSWENT:

A Research Prospectus

May 1985

CANADIAN ENVIRONMENTAL ASSESSMENT RESEARCH COUNCIL

(CEARC)

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PREFACE

The Canadian Environmental Assessment Research Council (CEARC) was established on January 30, 1984, by the Federal Minister of the Environment to advise government, industry and universities on ways to improve the scientific, technical and procedural basis for Environmental Impact Assessment. CEARC is currently in the process of establishing research programmes related to improving the practice of environmental assessment.

The Council has chosen social impact assessment (SIA) as one important focus of research and this prospectus describes CEARC's approach to possible research activities in this field.

In preparing this prospectus, Council has begun the process of consultation with Individuals and organizations working in the field of SIA. A draft of this document was the focus of a very productive one day consultation with several members of the SIA community held in Ottawa, in January 1985. A list of participants attending this workshop is included as an appendix. The assistance of Diane Erickson in the development of the initial review of issues is gratefully acknowledged.

For more Information on the Council's general programme of environmental assessment research or on the details of SIA research outlined in this prospectus, please contact:

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1.0 INTRODUCTION

Social considerations have become a progressively more important element of environmental assessments. In the case of major projects referred for public review, social issues often drive the process and can exert an important bearing on final decisions. The first and best known example is the Mackenzie Valley Pipeline Inquiry, in which the recommendation of the Commissioner for deferment of the Arctic Gas project was based largely upon the potential social and cultural effects on native peoples. As a matter of routine, various impact assessment processes now incorporate a focus on social and economic questions that goes beyond the social changes directly related to ecological or natural resource concerns.

Yet, many questions remain about the legitimate content of social impact assessment (SIA), and about the effectiveness of procedures for analyzing and incorporating social considerations into impact assessment. Ten years have passed since the first SIA reports were completed in Canada. However, there is little consensus on the appropriateness of the content of such documents, the most reliable concepts and methods for organizing SIA research, and the application of study findings to decision making. There is a widespread agreement that SIA has not developed as initially expected and that significant changes in its practice are required.

For these reasons, the Canadian Environmental Assessment Research Council has identified SIA as a major area of attention. The purpose of this prospectus is to identify the major research issues in this field and to outline the role CEARC hopes to play in addressing some of those issues through a research program that will begin immediately. It is CEARC's intention to collaborate with existing funding and research bodies to the maximum extent possible so that its own modest research budget can be stretched to greatest effect.

The prospectus is organized into three sections. The first is a frame of reference around which the discussion is organized. This is followed by an overview of major issues for SIA research. In conclusion, a statement of the priorities favoured by Council is presented along with a strategy for their implementation.

2.0 A FRAME OF REFERENCE

CEARC is committed to the view that social impact assessment is an integral component of environmental assessment. The notion of separating the two into separate and distinct fields of research has been rejected by CEARC as unrealistic and damaging to our evolving knowledge of environmental change. The Council believes that the linkages between social and blo-physical assessments must be strengthened and that the crucial importance of societal values must somehow be reflected in the scope, focus, and methods utilized in all environmental assessment research.

Social analysis at all levels would be enhanced by more rigorous attention to the nature of SIA itself and to the range of possible ways of conducting such assessments. For

instance, a number of recurring problems in the field stem from different views of what SIA is. Many interpretations of SIA can be found on library shelves. It is not our purpose in this section to review or re-define these views. However, it seems useful to set out the perspectives which guide CEARC's discussion of research related issues of SIA.

SIA is considered primarily to be an area of systematic inquiry, which seeks to investigate and understand the social consequences of planned change and the processes involved in that change. It involves the application of various methods of analysis and the documentation and communication of findings. The SIA statement may be used as a basis for decision making and as a source of public information. Such characteristics may be helpful in differentiating SIA from related processes for achieving the same purposes, notably various forms of public consultation.

SIA, above all, should be about people. It should be community based, rooted in the problems and needs of those who are faced by change or dislocation. Often they are "people in the way" of various kinds of development schemes. The rationale for the emergence of SIA is to make their concerns clearly understood and so make the decisions which affect them both responsive and responsible. Four types of social change are usually investigated as part of SIA:

(a) Demographically - related Changes, e.g. the effects of increases or decreases in population growth on local facilities and services, neighbourhood cohesion and community stability;

(b) Economically - related changes, e.g. the effects of new patterns of employment and income on the financial stability of residents, municipal tax base and the viability of local business and social service organizations;

(c) Resource - related changes, e.g. the effects of changes on natural resources upon which people depend for subsistence, employment or recreation;

(d) Culturally related changes, e.g. the effects of demographic, economic and resource-related changes on community institutions, traditions and values and on the way of life of individuals in communities;

CEARC's primary Interest is to encourage research that will make practical improvements to the way SIA is conducted and the effectiveness of the results of SIA in influencing decisions. In addition, CEARC will be concerned with the more substantive questions related to knowledge of the actual social consequences associated with different types of development projects. Consequently, CEARC will initiate one or two SIA research projects. If possible, co-sponsors for such research will be obtained. In addition to its own modest research programme, the Council will make every effort to encourage other research bodies and funding groups

to focus some much needed attention on the special problems of SIA as an area of research.

3.0 ISSUES FOR SIA RESEARCH

SIA is an emerging field of theory and practice that is the subject already of a sizeable literature. The state of the aft for example, has been reviewed extensively at recent national and international conferences held in Canada. What emerges from these reviews is a long list of "problems" that characterize SIA, that remain largely unresolved and that threaten the continued development of the field. The Council has identified five Issues of major importance which are candidate areas for research to improve the theory and practice of SIA. These involve questions about:

- ORIENTATION TO SIA
- BOUNDARIES OF THE FIELD
- RELATIONSHIP OF IMPACT PREDICTION AND MONITORING
- THE EVALUATION OF SIGNIFICANCE
- THE INSTITUTIONAL ARRANGEMENTS FOR UNDERTAKING AND UTILIZING SIA STUDIES IN DECISION-MAKING.

3.1 Orientation to SIA

Some practitioners and community groups believe that SIA is a community development activity, aimed at influencing the political forces that make decisions about projects. Others, usually including regulatory agencies, consider SIA to be a technical component of the planning process. Each of these two orientations embodies quite different research assumptions, methods and approaches.

The technical/planning approach stresses the value of the scientific method as an objective means for providing information for decision-makers. Emphasis is placed on rigorous analysis, methods grounded in the social sciences, clear and "unbiased" statements of social gains and losses.

The political/community development model is based on the conviction that "interests" lie at the heart of decisions about the environment and is a means of making the community "interests" visible and powerful. This model also emphasizes the dynamic nature of impacts which are determined in part by people's perceptions of whether the anticipated changes will be in their best interest or not. This approach does not require rigorous scientific analysis so much as it requires a high level of communication and organizational skills, and the ability to make known the attitudes, beliefs and values of those who might be affected by proposed projects in such a way that all interests are openly debated by the involved decision-makers.

Table 1 on the following page illustrates some of the dimensions of these two different ways of looking at SIA.

CEARC is interested in the following, related questions:

- Under what conditions and for what types of projects is the technical/planning approach to SIA appropriate?
- Under what circumstances is the community development/political model more suited to the exploration of issues involved in anticipated social changes?

- What research techniques and methods might be common to both approaches?

3.2 The Boundaries of the Field

The geographic, content and time boundaries of SIA studies are not well-established. For instance, in defining the geographic focus of an SIA study of a waste management plant, should one concentrate on those communities adjacent to the site only, or should one extend the study's geographic boundaries to include all communities in which residents feel they might be affected by the plant? In a similar manner there is the matter of content boundaries. The term "social" can be so encompassing as to be useless as a guide to the appropriate content of an SIA study. There are two elements to be considered around the issue. The first is the matter of the proper social unit of analysis. Should the SIA study focus on change at the level of the individual, the family, community institutions or interest groups? Often, social change can be anticipated at all those levels but whether or not each should be assessed as part of the study is a most difficult question. For example, in addressing the possibility of forced relocation associated with a hydro-electric project, there may well be anticipated changes at the individual level (loss of control, feelings of powerlessness, increased anxiety); at the family level (stress among family members resulting from different priorities that surface as a result of the need to move); at the level of community institutions (closure of the local school because of the loss of 60% of students); and at the level of special interest groups (the particular plight of farmers compared to those living on land that will be flooded but not living off that land). There are difficulties of time, resources and scope if one addresses change at all these levels. There are problems of arbitrariness and loss of vital links if one doesn't address change at all these levels.

The second element to be considered with regard to content boundaries is the matter of project justification. To what extent should the SIA study consider the very basic question of the need for the project. If it is to be part of the study, then one has to examine alternatives to the project under review and the anticipated social consequences of those alternatives. How far is it reasonable to consider all these possibilities?

Then, there is the matter of time boundaries in SIA. Social change is dynamic. There is no point at which it "stops". What, then, is the appropriate time-frame for studying, for instance, the social implications of introducing a wage-based economy into a traditional native community? Does one look at the possible social ramifications of such an Initiative over a 5 year period? A 20 year period? The solution of the appropriate time horizon can be a highly continuous issue.

The scale of the analysis in SIA in terms of geographic, content and time boundaries can surely be expected to vary depending on the nature of changes generally associated with specific types of pro-

TABLE 1

A COMPARATIVE PERSPECTIVE ON SIA

		THE TECHNICAL MODEL	THE POLITICAL MODEL
1.	Philosophy of Science:	Logical positivism; social science patterned on natural science; search for discoverable regularities on which to base prediction and planning	Critical Theory: Social scientists seek to understand the processes and structures of change in order to develop a more humane society.
2.	Role and Purpose of Planning	Responsible; to maximize net social welfare by efficiently facilitating development and minimizing its adverse impacts	Responsive; to achieve a more equitable process of development by empowering the community to take control of it.
3.	Concept of Decision Making	Rational; choice improved through the provision of comprehensive, accurate, factual information; emphasis on the scientific method	Open; choice improved through citizen participation; emphasis on articulation of needs and values.
4.	Nature of SIA	Technical component of the planning and decision making process; product focus on the social impact statement; reliance on experts, processed and factual inputs	Community development component of the political process; process focus on the quality of participation; reliance on the public, personal experiential inputs.
5.	Mode of Research	Reductionist and objective; detached, value and free analysis to identify and predict impacts; oriented to quantification of information; concern with improving research tools and capabilities	Holistic and subjective; involved, value-laden intervention to clarify the issues; oriented towards qualification of information; concerned with improving communications between local people directly affected and external decision makers

Sources:

B. Sadler, "SIA and Environmental Assessment: Some Lessons from the Canadian Experience," ERDA, 15, New York, 1985.

P. Boothroyd, "Overview of the Issues Raised at the International Conference on Social Impact Assessment," School of Community and Regional Planning, U.B.C., Vancouver, B.C., 1983.

jects. Public perception of risk and danger should be an important consideration in defining the boundaries of SIA studies even though the "scientific" basis for such perceptions may be weak.

The Council would like to see the following questions pursued:

- What guidelines could be applied to determine the appropriate geographic, time and content boundaries of SIA studies associated with different types of projects and different types of communities?

- What is the role of those most likely to be impacted upon in deciding what are the appropriate boundaries of each SIA study?

- How can socio-economic issues be scoped to reveal the most critical questions? What are the current and preferred entry points for SIA in the environmental assessment process?

3.3 The Relationship of Impact Prediction and Impact Monitoring

As a tool to anticipate the vital social changes associated with project development, SIA has generally failed to impress decision-makers and community members alike. Recent efforts at monitoring the actual socio-economic changes associated with particular projects, and comparing actual changes to those that were predicted in the SIA studies, reveal large discrepancies between the two. Several reasons can be advanced to explain this lack of fit between actual and predicted impacts. Some concerns regarding methods used in SIA preparation seem valid. Equally important, however, is the possibility that the difficulties of anticipating social change will be reduced significantly only when the whole field has built up a stronger basis of knowledge about the processes of social change and their cause-effect relationships. Careful monitoring of impacts is one way of adding to this knowledge base.

Some people in the field would like to see SIA shift more emphatically towards a monitoring/management of impacts function. In other words, the purpose of SIA would be to track the changes associated with a particular proposal during its implementation. This information would then be used as a basis for negotiating and managing social impacts. Other individuals, however, would like to retain the use of SIA as a type of assessment that would be conducted largely prior to a decision and one that would assist in determining what that decision should be.

It seems clear that SIA has to move in both directions at the same time. Through more refined conceptual approaches and more reliable methods, it must seek to increase its predictive capabilities. At the same time, project monitoring will add basic knowledge about the processes of social change and it might provide the beginnings of a quite different approach to project planning, involving settlement of disputes and negotiated positions during the decision-making process.

The Council would like to see a great deal more work done in the areas of social impact predictions and monitoring. The questions associated with this type of research

are;

- To what extent can socialimpacts be predicted? What methods are most appropriate? What are the implications of unpredictability of SIA practice?

- What constitutes an effective social impact monitoring programme for various project tvpes?

- How can communities become more effectively involved in impact monitoring: What support do they require from public agencies and proponents to monitor and manage change?

- What appropriate themes, methods or perspectives in the social science disciplines might be utilized to improve our ability to monitor patterns of social change?

- What kinds of frameworks and techniques currently exist for undertaking post impact evaluation? How well have they worked?

3.4 The Institutional Arrangements for Undertakings and Utilizing SIA Studies

SIA studies are not conducted in a vacuum. They are required by various regulatory agencies; they are conducted by various proponents; they are appraised by various government officials and community groups. The usual "life" of an SIA starts with a requirement for such a study. Specific terms of reference are drawn up by the organization that requires the work, and a process is instituted to have these terms of reference implemented. There follows a period of implementation and field work followed by a process of writing up, in a format usually established by the review period of review, a decision and, possibly, a period of monitoring during which the actual as opposed to the predicted socio-economic impacts are described and analyzed.

All these procedural and policy arrangements under which SIAs are conducted have an enormous influence on the final outcome of SIA in terms of scope, methods, comprehensiveness, integration with other elements of the environmental assessment, and even on findings. These arrangements can also be a significant determinant of the extent to which the impact assessment process itself can generate positive or negative social consequences. For example, unduly constrained terms of reference, set by proponent or government can have a profoundly negative effect on community attitudes to project development.

Consider, for example, the case of a provincial Ministry of Transportation requesting an SIA study of a new highway proposal in a remote part of the province. The Ministry has prepared a half page Terms of Reference document in which the consultant is asked: a) to study the "social consequences" on communities X and Y; b) NOT to take into account the question of land claims; c) to concentrate on the question of community members' access to services and centres at each end of the proposed stretch of road; d) to complete the study in 2 months. That SIA study will be very different from one that is based on a> broader terms of reference, b) a

longer time frame; c) a more explicit set of factors to explore, and so on.

If those who are likely to be affected by the proposed highway also regard the SIA terms of reference as too little, too fast, they may come to feel victimized by the very process that is intended to serve their needs. Social conflict, psychological stress and alienation are in this case inevitable consequences of "processes" rather than potential social change resulting from the project.

Experience suggests that the institutional influence on the credibility and the final outcome of an SIA study is high. Some types of institutional arrangements seem more likely to produce competent SIA work than do others. The procedures for determining terms of reference, the review process, the standards applied to that review, the role of public consultation, financial resources allocated to this exercise, all these are essential factors in the production of SIA studies.

The Council would like to explore what types of institutional arrangements are most likely to produce the most competent SIA studies. In particular, the following types of question would be addressed:

- Are there inherent limitations to proponent-sponsored SIA studies?

- What do senior representatives of major social intergovernment agencies consider to be the proper focus of SIA work?

- To what extent do present institutional arrangements for social impact assessment cause the process itself to produce negative social consequences?

- What is the structure within particular organizations (proponent, government, communities) for defining the SIA terms of reference and how do different units within these organizations participate in that process?

- What internal procedures and policies have different institutions developed to review SIA studies, determine deficiencies or adequacy, and decide on study recommendations?

3.5 The Question of Significance

Evaluation of the significance of impacts constitutes the heart of environmental assessment. It involves the assignment of values to impacts, making implicit or explicit trade-offs, and arriving at some overall judgment about the social acceptability of a project. This is a complex procedure that creates problems on two levels: how to determine the important, project-induced social changes per se; and how to compare and weigh significant social effects in relation to the overall balance of environmental and economic benefits and costs.

Who decides what constitutes a "significant" social impact and on what basis? As with so many other elements of SIA, this is a highly contentious area. There are those who believe that the judgment of significance must be made by the people who will be subject to such impacts, i.e. if the community believes that impact A is significant, then it is significant, and must be recognized as such by decision-makers. Others believe

that the author of the SIA statement has some obligation to provide a judgment on significance, making explicit the rationale for weighing one impact differently from another. And again, there is an increasing number of people who believe that the matter of significance is essentially a political issue, not a technical one. In other words, the decision-makers must accept the responsibility for deciding which of the many potential impacts of a project are the most important.

The Council recognizes the political dimension of the matter of "significance", particularly in trying to weigh social, economic and biophysical impacts against one another. At the same time, it also believes there is a role for informed expert judgments. For instance, the social consequences of forced relocation are longer lasting, less easily "managed" and compensated for than the social consequences of increasing the town's dentist/population ratio. It would seem a wasted opportunity and "neutral" in the extreme to simply list these two types of impact without comment on their relative importance.

Some of the questions for research around this question of significance are as follows:

- How is the significance of impacts on biological, social and economic systems established by the major participants in the project impact process (governments, proponents, communities/public)?
- How can SIA be strengthened together with other forms of analysis -- such as benefit/cost analysis, to establish values of project impacts? What other methods can be used to place values on impacts?
- What is the appropriate role for the SIA practitioner in assigning values to potential impacts? What are the ethical considerations involved?

4.0 CEARC RESEARCH PRIORITIES AND IMPLEMENTATION

4.1 Priorities

The five areas of research described in the previous section do not encompass all the issues attached to SIA that deserve research attention. There are many questions with regard to the reliability and validity of specific research methods that need answering: for example, the value of structured questionnaires to native communities as an attempt to establish recreational values versus a more anthropological, participant observation approach. The emergence of simulation modelling and its application to SIA is another very interesting development that could be investigated with worthwhile results.

However, the five areas of enquiry listed in this prospectus represent what Council believes to be the most pressing concerns in the field today. These can be expected to change over time as will Council's priorities.

Council resources will be directed immediately to two of these areas:

- Research on institutional arrangements for SIA; and

- Research on improved impact prediction, monitoring and management capabilities.

A) Strengthening Institutional Arrangements

Institutional problems revolve around the constraints imposed by existing administrative frameworks on the function, scope and timing of SIA, and its integration with other components of environmental assessment. The following themes are of particular interest to CEARC.

- The effectiveness of government guidelines and terms of reference for conducting SIA and utilizing the results in decision making;

- The nature of mechanisms for linking socio-economic and biophysical analysis of the assessment process;

- The fairness and efficiency of the procedures which currently govern the roles, relationships and responsibilities of key parties in social impact studies;

- The potential for applying a more focussed process for scoping issues and clarifying values in the SIA.

These studies on institutional arrangements should use case study analysis and also build upon experience gained from more general evaluation of current SIA practice (see references). It will be an important aspect of this research to compare the boundaries of SIA institutional processes with those of public consultation per se and mediation procedures.

B) Research on Improved Prediction Monitoring and Management Capabilities

CEARC considers the development of strong social impact monitoring capabilities to be a basic requirement for advancing SIA. Monitoring results should provide the foundation for a more organized understanding of cause and effect relationships. This foundation will be of value in predicting impacts of future projects with greater confidence than is possible at present. Monitoring should also contribute to the increasing emphasis on impact management and post-project evaluation.

The Council wishes to reinforce these trends. At present, the following themes appear to require particular attention:

- The adequacy of approaches presently used to integrate impact prediction, monitoring and management;

- The effectiveness of current programmes for monitoring impacts in terms of achieving social objectives when defined by government, proponents or communities.

- The current and potential role of impacted communities and groups in monitoring programmes; and

- The nature of the relationship between social and biophysical monitoring, and the opportunities for achieving better integration

between the two.

4.2 Implementation

CEARC will implement its priorities in several ways. First it will commission and undertake research and development. Most of the limited funds allocated to SIA will go directly to the support of research projects. The main mechanism for delivery will be requests for proposals circulated to interested individual's, institutes and private firms. The council will also liaise with other funding bodies such as the SSHRC* and ESRF**, to encourage their formal support for this research programme. The Council also intends to consult actively with institutions and agencies in the public, private and educational sectors that are interested in SIA research. It will encourage, wherever possible, initiatives in support of this research programme.

CEARC will also sponsor workshops and symposia to review new trends and findings in SIA research. Such consultations will generally be required as part of the research contracts sponsored by CEARC. In addition, the Council will convene symposia which cover the broad areas of interest discussed above. Finally, the Council will act as a vehicle for the promotion, dissemination and application of new ideas and practices in SIA. The Council will try to achieve this leadership role through a network of contacts with practitioners and others interested in the field.

This prospectus is both a notice of the Council's general approach to research in the field of SIA and an invitation for involvement by those interested in its future activities.

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* Social Sciences and Humanities Research Council

** Environmental Studies Revolving Fund

SELECTED REFERENCES

F. Tester, and W. Mykes, Social Impact Assessment: Theory and Practice, Detselig Enterprises, Calgary, 1981.

P. Meiser, "Report on the First International Conference on Social Impact Assessment** Social Impact Assessment Newsletter, Jan. 1983, PP. 5-15.

R. Lang and A. Armour, The Assessment and Review of Social Impacts, FEARO, Ottawa, 1981.

Society for Applied Anthropology, "Social Impact Assessment: What it is, and who does it?" reported in the Social Impact Assessment Newsletter, September, 1983, p. 13,

K. Finsterbusch, et al, eds., Social Impact Assessment Methods, Sage Publications, Beverly Hills, 1983.

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