

**ENVIRONMENTAL PLANNING
FOR LARGE-SCALE
DEVELOPMENT PROJECTS**

**RECOMMENDATIONS
AND ACTIONS
FOR IMPLEMENTATION**

**INTERNATIONAL WORKSHOP
ON ENVIRONMENTAL PLANNING
FOR LARGE-SCALE
DEVELOPMENT PROJECTS**

OCTOBER 2 - 5, 1983

**WHISTLER, B.C.
CANADA**

This report is based on the results of an International Workshop sponsored by the Governments of Canada and British Columbia, the Canadian Petroleum Association and the East-West Center in October, 1983 at Whistler, B.C. The opinions expressed are those of the authors and participants and do not necessarily reflect the views or policies of the sponsoring agencies.

For further information on this publication, write:

*Environment Canada,
P.O. Box 1540,
15th Floor, 800 Burrard Street,
Vancouver, B.C.
Canada V6Z 2G7*

or

*Canadian Petroleum Association
1500, 633 - 6th Avenue S.W.
Calgary, Alberta
Canada T2P 2Y5*

Other related publications: Environmental Planning for Large-Scale Development Projects..
Results of Session V Workshop.

FOREWORD

The practice of environmental assessment and planning is vital, as demonstrated by the fact that today, twelve years after Stockholm, we continue to search for new and more cooperative methods of environmental planning in large-scale development projects. Industry, labour and government, as well as the public and academia want to ensure that sound environmental decisions are made. All those concerned will benefit from a common understanding of the environmental problems associated with development and from common approaches to solving these problems.

An international workshop on environmental planning for large-scale development projects, sponsored by industry, government and academia, was held in Whistler, B.C. on October 2 - 5, 1983 to address these concerns. I am pleased to support the publication, "Recommendations and Actions for Implementation" arising from that workshop and recommend it to everyone concerned with the planning of major developments.

I invite the reader to implement these recommendations in the spirit of cooperation in which they were prepared.

Charles Caccia
Minister of Environment
Canada

CONTENTS

I. INTRODUCTION	1
II. THE PLANNING PROCESS	2
III. GENERAL PRINCIPLES	4
1. Trust and Cooperation Among All Participants	4
2. Integration of Environmental and Project Planning	4
3. Efficiency, Effectiveness and Fairness	4
4. Flexibility and Adaptability	5
IV. RECOMMENDATIONS AND ACTIONS FOR IMPLEMENTATION	6
A. POLICIES, GOALS AND PRIORITIES	6
1. Resource Use and Development Policy Framework	6
2. Environmental and Social Policies	6
3. Integration of Environmental and Project Planning	7
4. Public Release of Environmental Information	7
B. INSTITUTIONAL ARRANGEMENTS	8
1. Accountability and Responsibility	8
2. Efficient and Coordinated Regulatory Process	8
3. Elimination of Duplication in Regulatory Process	9
4. Resources for Environmental Planning	9
5. Regional Assessments	10
C. PROJECT PLANNING	11
1. Project Description	11
2. Project Justification	11
3. Approval in Principle	11
4. Scoping and Focusing on Key Issues	12
5. Role of Environmental Impact Assessment	12
6. Terms of Reference for Environmental Impact Assessment	12
7. Information Requirements and Handling	13
8. Public Consultation	13
9. Value Systems of Cultural Groups	14
10. Community Expectations	14
11. Incremental Development	15
12. Project Experience and Proven Technology	15
13. Risks to Public Safety and the Environment	15
14. Mitigation and Compensation	16
15. Environmental Management Plan	16
D. TOOLS AND TECHNIQUES	17
1. Environmental Impact Assessment	17
2. Assessment of Cumulative Impacts	17
3. Risk Evaluation	18
4. Regulatory Management and Information Handling	18
E. PROJECT IMPLEMENTATION AND POST PROJECT AUDIT	19
1. Surveillance	19
2. Monitoring	19
3. Reclamation	20
V. CONCLUSION	21
WORKSHOP STEERING COMMITTEE	22
PROGRAM COMMITTEE	22
SPONSORS	23

I INTRODUCTION

A. WHAT THIS REPORT IS

This report comprises a series of recommendations on environmental planning for large-scale development projects. It is based on the results of a three-day workshop, in which 140 participants from ten countries representing international organizations, governments, industries, universities, consulting firms and public interest groups, explored problems, experiences and approaches to the environmental planning of major projects. The objective of the Workshop was **to develop recommendations and actions for applying efficient, cost-effective and timely environmental planning solutions to project decision making for large-scale developments**. The report presents key factors which constrain effective environmental planning and prescribes specific actions for addressing them. For the purpose of this document, environmental planning is defined as an ongoing process which incorporates the consideration of ecological and social systems into project planning and implementation.

The issues, recommendations and actions for implementation contained in this report are presented in five categories:

- Policies, Goals and Priorities
- Institutional Arrangements
- Project Planning
- Tools and Techniques
- Project Implementation and Post Project Audit

B. WHO SHOULD READ THIS REPORT

This report is intended for environmental management professionals and senior representatives of government, industry and the public who have an interest or are involved in policy formulation and project planning for large-scale developments. The solutions presented in this report are considered to be pragmatic and should assist all parties involved in planning and implementing large-scale developments.

C. HOW THIS REPORT SHOULD BE USED

While not all recommendations will apply to every large-scale project or every country, they are, by and large, fundamental to sound project planning. However, a concerted effort by government, industry and the public is required for the recommendations to be applied successfully. It is hoped that senior officials and executives will make the recommendations known throughout their organizations and commit to their implementation. Industrial and professional associations, government and corporate management committees and other such organizations are good forums in which to table the recommendations for consideration.

A separate report is available which presents the specific results of seven concurrent workshops from which the recommendations in this report were developed. An overall Workshop report is planned for future publication.

II

THE PLANNING PROCESS

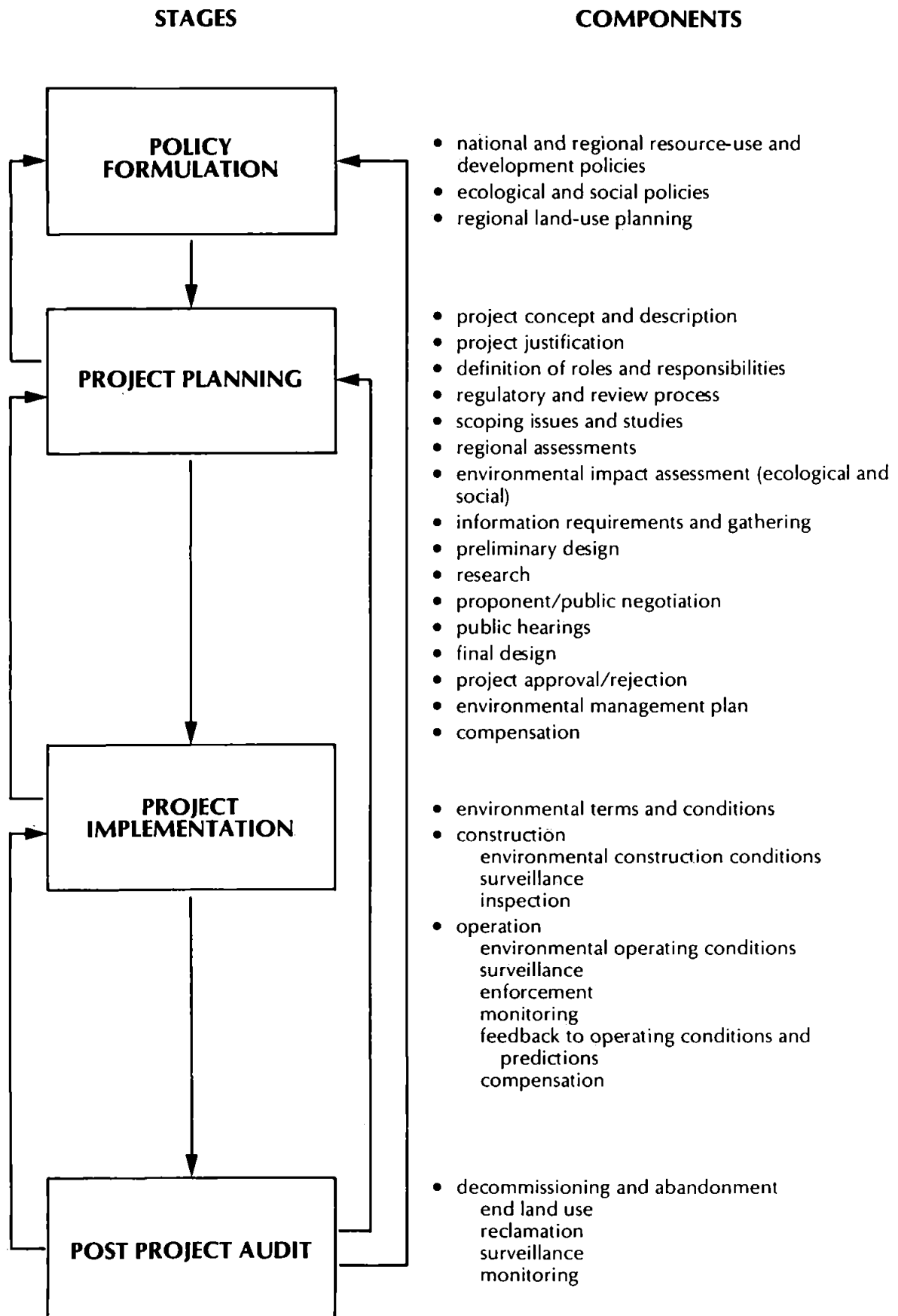
The planning process associated with the development of large scale projects is complex and consists of many components. The process comprises four principal stages: policy formulation; project planning and design; project implementation; and post-project audit. The many components of these stages are shown in the accompanying diagram.

Environmental planning is a prime element of overall project planning and as such requires the same weight and consideration as economic and technological factors are given. Accordingly, environmental planning should not be regarded as simply the identification of environmental impacts associated with development, but as a continuous process which incorporates ecological and social considerations into project planning, design and implementation. Project development strategies sensitive to these considerations can evolve from a multidisciplinary, integrated and flexible approach which focuses on significant issues. The most efficient and cost-effective means of maintaining environmental quality in the development of large scale projects is to anticipate and avoid problems early in the planning process. Environmental planning, done well, provides the means to assure that this happens.

The principles of environmental planning are inherently universal. However, it is recognized that their application will vary in accordance with the institutional frameworks of the many countries and regions which are either developing or improving their approaches to this field.

Environmental planning, carried out early and effectively in the project planning process, will prove to be a valuable input to decision making concerning the development of large-scale projects.

THE PLANNING PROCESS



III

GENERAL PRINCIPLES

Four main principles underlie the recommended improvements to the environmental planning of projects:

- trust and cooperation among all participants;
- integration of environmental and project planning;
- efficiency, effectiveness and fairness; and
- flexibility and adaptability.

1. Trust and Cooperation Among All Participants

Trust and cooperation among government, industry and the public are fundamental to sound environmental planning. Mistrust arises from uncertainty, poor communication, inadequate information exchange, basic philosophical differences, and lack of credibility. Mistrust leads to confrontation, polarized positions, inflexibility, and entrenchment of adversarial roles. Thus, all participants should work to understand, if not accept, the legitimate differing interests, roles, and expectations of other participants. Government and industry should take time to understand the involved public. To the extent possible within the constraints of their resources, public and community groups should examine and become familiar with the industrial and government structures they wish to influence. Representatives of each participating group need to establish and maintain both their own and their organizations' credibility with other involved groups.

At present, some regulatory and review systems tend to foster confrontational approaches. Alternative methods of review and conflict resolution, such as negotiation and mediation, should be tried. Sincere negotiation, between the proponent and government, and between the proponent and affected community groups, may resolve differences and problems. Only irreconcilable differences need to be addressed in more formal hearings. Mediation, to seek consensus among the differing interests of the various participants, is another approach. The objective is to foster a climate of trust and cooperation in environmental planning and review.

2. Integration of Environmental and Project Planning

Sound environmental planning and management are consistent with good engineering design and operating practice. Integration of environmental planning into overall project planning allows early identification and implementation of cost-effective solutions to project-related environmental problems. Ecological, social, economic and technical factors must therefore be considered jointly in project planning. Industry and government should give environmental and economic factors equal consideration, if not equal weight. The objective for all participants is to integrate environmental planning and review into project planning.

3. Efficiency, Effectiveness and Fairness

Regulatory and review processes for large-scale development projects should be efficient, effective, and fair to all participants. The planning of large-scale projects is a lengthy process which can be inefficient if the regulatory aspects are not well managed. Inefficiency may result from the many and sometimes competitive government interests involved, from duplication of review processes and overlapping government jurisdictions, and from reworking issues which have previously been addressed and resolved. Government and industry must ensure integration of project planning and the regulatory process.

Agencies with overlapping regulatory or review responsibilities should pursue combined or "hybrid" hearing processes. Government and industry personnel at all levels must be willing to develop and apply innovative tools and techniques, such as coordinated regulatory management, computer-aided scheduling, and computerized information management systems to improve environmental planning.

The complexity of large-scale projects and the corresponding regulatory processes are often a constraint to effective planning and review. A multitude of peripheral issues may obscure the basic concern for environmental protection and social well-being which is associated with major developments. Planning and review processes must be effective in addressing key issues, so that participants can direct resources to significant areas of concern, and to ensuring sound project design. Early identification and scoping of significant issues, determination of information requirements, and designation of key participants and responsibilities will aid effective planning and review of large-scale projects.

Regulatory and review processes should be visible, accessible and fair to all participants. There is tension between fairness and efficiency. Only through careful process design, application of fair rules of procedure and skillful direction can the process be both fair and efficient. Government must determine what level of public consultation is necessary and beneficial in meeting ecological, social and economic objectives, and in ensuring that the public is adequately involved in shaping sound decisions on development projects.

4. Flexibility and Adaptability

The participants in environmental planning and the approaches designed to carry out the process should be flexible and adaptable. Inflexible processes cause inefficiency, and hinder the integration of environmental and project planning.

For most major developments, the exact nature of an activity or its impact on the environment cannot be known at the planning and assessment stage. Uncertainties regarding future actions and their effects require an adaptive approach to environmental planning, based on sound management techniques and the use of monitoring results. Planning processes should be developed and implemented in a flexible and adaptable manner so that they can respond to new information, issues, and solutions.

IV RECOMMENDATIONS AND ACTIONS FOR IMPLEMENTATION

A. POLICIES, GOALS AND PRIORITIES

1. Resource Use and Development Policy Framework

Development proposals, while usually single-purpose, must fit within the multiple objectives of local, regional, and national interests. However, national policies and priorities for resource management, energy development and regional development, are often not clearly stated. This lack of a visible policy framework creates uncertainty for project proponents, the public, and regulatory agencies alike, and hinders efficient project planning. Proponents need clear national and regional development policies to provide the context for determining and justifying the need for a new development.

Recommendation

- **National and regional governments should:**
 - **define a clear policy framework within which project proposals can be evaluated;**
 - **publicly articulate policies, goals, and priorities for resource use and development;**
 - **commit to implementing these policies; and**
 - **maintain consistency of policy over time.**

Implementation

National and regional governments should undertake periodic internal reviews of their policies, goals, and priorities in order to evaluate their relevance to changing external factors.

National and regional governments should schedule regular public meetings to explain and discuss current government policies for resource use and development. Governments should consider subjecting proposed policies to public review prior to their adoption.

2. Environmental (Ecological and Social) Policies

Government policies which foster a balance between development goals and environmental goals are required.

Recommendation

- **National and regional governments should develop and articulate long-term policies for regional environmental protection, resource management and social development concurrently with resource-use and development policies.**

Implementation

Government agencies with resource development or management roles in a region or industrial sector should make explicit those ecological and social policies which affect or are likely to be affected by major development proposals, when projects are disclosed. Brief and relevant agency position papers may be one means of accomplishing this. Applicable policy areas include resource conservation, environmental protection, wildlife, fisheries and other renewable resource management, aboriginal rights, and social services.

Government and industry representatives should be prepared to debate publicly conflicts between development policies and environmental and social policies which arise from a project proposal.

Government should encourage cooperative regional resource planning among agencies responsible for renewable and non-renewable resources, in conjunction with the various industrial sectors and the public who have an interest in the resources of the region.

3. Integration of Environmental and Project Planning

Environmental planning is sometimes regarded as a cosmetic addition or a “necessary evil” in project planning. While industrial proponents usually have a well-defined business strategy within which project proposals are made, they may not have clear environmental objectives and policies. Lacking such policies, proponents may resort to last-minute changes to nearly completed project proposals, in an attempt to accommodate environmental concerns and to obtain the necessary regulatory approval. When environmental planning policies and procedures fail to be applied at an early enough stage of the project planning process, environmental concerns can only be addressed in a reactive manner.

Recommendations

- **Proponents (private and government) should establish and make explicit policies that include environmental planning as an integral part of project planning. Senior executives must be accountable for these policies, and should commit their employees to them through personnel performance standards.**
- **Resource development and management agencies should clearly articulate their policies for integrating environmental considerations into project review and approval at an early stage in the project planning process. Employees should be made accountable for them through the establishment of personnel performance standards.**

Implementation

Proponents of large-scale development should establish codes of environmental practice that commit them to objectives for environmental planning and protection and to a set of general performance criteria. Individual companies should establish corporate codes of environmental practice. Each industrial sector, through its industrial associations, should develop sectoral codes of good environmental practice.

Project management for proponent companies or agencies should incorporate environmental considerations into the project planning process from its inception, address them at the same level as economic and technical matters, and integrate them into project design specifications.

Responsibility for environmental affairs should be clearly and visibly placed with a professionally competent individual or group within a project proponent's organization.

Environmental responsibilities should be incorporated into every project employee's job description and performance evaluation and into contractors' terms of reference.

4. Public Release of Environmental and Social Information

Environmental and socio-economic data are sometimes considered the property of project proponents or regulatory agencies, because of the costs of data collection or the perceived sensitivity of such information. Withholding information from the public creates mistrust between the public and the proponent or regulatory agencies. Such mistrust may lead to excess costs to the proponent through delays in approval. Withholding information also denies other researchers and future project proponents the opportunity to benefit from the studies completed.

Recommendation

- **Industry and government should make available to the public the environmental and socio-economic baseline, impact assessment and monitoring data collected during all phases of project planning, construction and operation. Where information is proprietary, industry and government should state their reasons for not releasing such information.**

B. INSTITUTIONAL ARRANGEMENTS

1. Accountability and Responsibility

There is often no clear statement of the respective roles and responsibilities of the proponent, regulatory authorities and public participants in an environmental planning process. Responsibility and authority for environmental planning and management may be divided among numerous government departments. Proponents and regulatory agencies often do not identify individuals or groups within their organizations who are accountable for environmental planning tasks and decisions.

Recommendations

- **All participants should state and make explicit their roles and responsibilities at the outset of a major project review.**
- **Government agencies responsible for project approval should advise the proponent of the manner in which environmental considerations will be taken into account in the decision-making process.**

Implementation

The proponent, relevant government agencies and public interest groups should designate individuals who have the responsibility for speaking on behalf of their respective organizations, throughout project review and implementation. Each representative must be able to speak with the authority of his or her group, agency, or company and be able to fulfil commitments he or she makes.

Review agencies should provide the public with technical evaluations of potential project impacts and proposed environmental management plans.

2. Efficient and Coordinated Regulatory Process

Confusion, inefficient use of planning resources, and unnecessary delays in project approval are caused by a lack of purposeful coordination among agencies responsible for reviewing and approving large-scale projects, or in some cases by overly complex coordination procedures. The environmental review process is often not coordinated with the project approval process. Mechanisms are required for making coordinated regulatory procedures more efficient, while maintaining the quality and objectives of technical and public reviews.

Recommendation

- **Coordinated regulatory and review procedures, which are efficient and respect the existing responsibilities of the relevant agencies, must be established to streamline the approval process for major developments.**

Implementation

Regulatory and review agencies should establish for each project, a coordinating group to plan the review and approval procedures for each stage of project planning. The group must have members representing each agency with a mandate for review or approval of the proposed project. Members must have the authority to undertake commitments on the timing of project review and approval. The group must be supported by an efficient information gathering and distribution system.

The coordinated regulatory management procedures developed in the Colorado Joint Review Process provide one model for streamlining a complex review and approval process.

The environmental objectives and requirements of all relevant agencies should be defined, coordinated, and made explicit to the proponent at the time of project disclosure.

A review and approval schedule, to which the various agencies, proponent and the public are committed, should be established by the coordinating group. Protocol agreements among government agencies must be developed to facilitate the scheduling. The coordinating group must provide regular updates on the status of the review and permitting procedures to the proponent and the public.

Use of management tools such as the critical path method for scheduling, and computerized regulatory information management systems should be used by government agencies.

3. Elimination of Duplication in the Regulatory Process

A multiplicity of government responsibilities often results in duplication of environmental review and regulatory processes between national agencies and regional and local governments. This duplication causes inefficiencies and excess costs in environmental planning and can lead to unnecessary delays in project decision-making. The elimination of bureaucratic duplication is complementary to the coordination of agency mandates discussed in the previous recommendation. Since existing systems and responsibilities within government must be changed to eliminate duplication, such action may require a longer period than implementation of a coordinated regulatory process:

Recommendation

- **Governments need to eliminate overlapping responsibilities and redundant processes for project review and approval, within a predetermined time.**

Implementation

Proponents can facilitate the future elimination of bureaucratic duplication by using existing project reviews and approvals as cases in point; identifying all agencies and government personnel involved; documenting all areas of jurisdictional duplication; recording money and time spent in redundant activities; and raising the issue of jurisdictional and process overlap at the conclusion of the review and approval process.

The requirements of all relevant agencies should be incorporated into a single set of rules and guidelines for environmental review.

National and regional governments should instruct those regulatory and review agencies with overlapping review and hearing processes to modify them into a single hybrid process; to phase the review procedures where one provides input to the other; or to agree to follow one existing process for review of a specific project. Where this would create legal difficulties, formal steps must be taken to legitimize such processes.

The assignment of a lead agency for project review may help reduce bureaucratic duplication while ensuring that all agencies are included in the process.

4. Resources for Environmental Planning

Resources available to proponents, government agencies, and the public are often inadequate to effect sound environmental planning. Such resources include funds, human resources, competent personnel and research capabilities.

Recommendation

- **All participants in project review and implementation must commit sufficient resources for a thorough, competent, and efficient involvement in the environmental planning of projects.**

Implementation

The proponent and regulatory agencies should determine resource requirements for environmental planning early in the project's planning, and should commit those resources to the project team. Review and regulatory agencies, in particular, should be flexible in the allocation of existing human and other resources to meet the demands of new policy priorities and development proposals. This is analogous to the manner in which industrial proponents shift engineering staff to projects of high priority.

5. Regional Assessments

Cumulative impacts resulting from the construction and operation of a number of projects in a region are seldom addressed adequately by the proponent or regulatory agency. The environmental planning process should include approaches for addressing potential long-term environmental effects which may have regional significance.

Recommendations

- **Cumulative impacts, which may arise from incremental projects or simultaneous development of several large-scale projects in a region, must be addressed by national or regional governments in the context of regional planning programs or regional assessments. This optimally should be done at the beginning of a region's industrial development, but still can be effectively prepared after development begins.**
- **Proponents should be responsible for the assessment of cumulative impacts arising from proposed project expansions or multi-phase projects. Proponents must make detailed project descriptions available to government agencies to allow regional assessments to be conducted.**

Implementation

Governments (national or regional) should have primary responsibility for the assessment of regional impacts of multiple developments.

Government and industry should organize workshops to explore and define development scenarios for areas which require comprehensive regional or area-wide assessments.

C. PROJECT PLANNING

1. Project Description

A concise and informative project description is the starting point for environmental impact assessment, government review and approvals, and cooperative public consultation. Timely submission and public release of an initial project description is central to the sound environmental planning of projects.

Recommendation

- **The proponent should prepare and make available to regulatory agencies and the public a project description at an early stage in project planning.**

2. Project Justification

Large-scale development projects often have a wide range of environmental and social effects; they may use and affect common-property resources, and require public investment in infrastructure. Consequently, project justification is a primary concern to the public and may become the premier issue during the environmental review process. If project justification is not addressed early and satisfactorily, the review process may not be able to focus adequately on key environmental issues, and indeed the project may be in jeopardy. Delays in environmental review for subsequent projects may result from repetitive challenges to project need.

Recommendation

- **Industry and government should prepare and make available to the public, at the project feasibility stage, a clear statement of justification for the proposed development, within the context of national policies and priorities for resource use and regional policies for development.**

Implementation

Where project proposals do not conform to established and previously stated national and regional policies, the regulatory agency should inform the proponent prior to the start of the detailed project planning, to allow the proponent to take this factor into account in project decision making.

The proponent, having shown national need and conformity to regional policies, should also justify to the local community or aboriginal group the need and desirability of the project in terms of net benefits to the residents and the proponent's ability to manage negative effects. This must take place well in advance of formal hearings.

3. Approval in Principle

Proponents need to know whether their project proposals fit into government policies and priorities, and need an indication that the proposed type of project and location is generally acceptable to government before they commit to major expenditures for project planning.

Recommendation

- **Government should consider the granting of an approval in principle for large-scale developments under certain circumstances:**
 - **where the project proposal is consistent with existing national and regional policies;**
 - **where a regional or local planning program has been carried out and the project proposal is consistent with the results of such planning; or**
 - **where experience with similar projects indicated that environmental impacts can be adequately managed.**

Implementation

Project proposals which conform to national and regional policies and for which the need has been justified by the proponent should receive early approval in principle. Such approval in principle should not prejudice the final position of the regulatory or review agencies, should environmental or social costs, prove to outweigh private and public economic benefits. Approval in principle is intended to provide the proponent with an indication that the project will be allowed to proceed, subject to the fulfilment of appropriate conditions and in the absence of overriding economic, social or ecological concerns.

4. Scoping and Focusing on Key Issues

Failure to identify and focus on key issues at the outset of the project planning and review process, or to define the scope of environmental studies and assessments, can result in inefficient or inadequate baseline inventory of a region. This inventory may take several years to complete, and still not provide the data necessary to assess a number of key potential project impacts.

Recommendation

- **The proponent, regulatory agencies and public must, at the outset, scope and focus on the key issues to be addressed in the environmental assessment, review and public hearing process. This fosters efficiency and allows the resources available for planning and review to be directed to significant issues. The participants should then define and agree upon the geographical, temporal, and topical boundaries for environmental data collection and assessment.**

Implementation

A scoping workshop involving the proponent, government review agencies and public interests, convened soon after project disclosure by an appropriate regulatory agency, is one method to facilitate the focusing of attention on key issues and the scoping of study and review requirements.

The time required for resolving issues, through such means as negotiations between proponent and public representatives, or between proponent and government, should be incorporated into planning and review schedules, along with such milestones as major project decisions.

5. Role of Environmental Impact Assessment

Environmental impact assessment, a component of the environmental planning of projects, is often not used appropriately and effectively in project planning and design. The main purposes of environmental impact assessment are to provide predictions and evaluations of project impacts for regulatory decision making; and to provide environmental design information for project planning.

Environmental impact assessment is applicable to project and regulatory decision making at a number of levels.

Recommendation

- **Environmental impact assessment must be an integral part of project planning, providing information to and receiving information from project engineers at various stages during environmental planning and project design.**

6. Terms of Reference for Environmental Impact Assessment

Environmental impact assessment for large-scale projects requires clear, precise terms of reference. As time is a factor, these terms are on occasion written by regulatory or review agencies while the assessment is being conducted by the proponent. This inappropriate phasing can result in assessments containing inadequate analysis or addressing non-significant environmental issues. However, there is value in the proponent beginning preliminary work on the assessment prior to receiving specific terms of reference.

Recommendation

- **Government agencies should cooperatively develop concise, consolidated terms of reference for environmental impact assessment, which focus on key issues at the outset of the environmental assessment process.**

Implementation

Impact assessment requirements identified during a regional or a generic (addressing one type of development) review and hearing process can be used as the basis for project-specific terms of reference.

A single set of terms of reference for environmental impact assessment issued by the regulatory or review agencies should incorporate and consolidate individual government department requirements.

Terms of reference should be initially scoped (boundaries set) and then focused (fine-tuned) on key issues as early as possible. The terms of reference should be reviewed collectively by the proponent, regulatory agencies and the public in draft form, prior to being made final.

Terms of reference should address only significant issues. They should include a requirement for monitoring and performance evaluation to be addressed by the proponent.

Terms of reference should be applied in a flexible manner, allowing the project plan to adapt to new information or critical issues raised during the assessment.

7. Information Requirements and Handling

Sound environmental planning is hindered by inadequate determination of information requirements and by inefficient information handling. In some cases, the information needs of participants in the planning process are not met in a timely or comprehensive manner. In other cases, information collection systems have outpaced information handling and utilization systems.

Recommendations

- **Regulatory and review agencies, in conjunction with the proponent and public representatives, should systematically identify the information requirements of all major participants in project planning and review.**
- **Regulatory and review agencies, together with proponents, should develop information dissemination programs which begin with simple information packages directed to a broad audience, followed by more detailed information to successively smaller but more interested and knowledgeable public and government audiences.**

Implementation

Information requirements should be established by determining what is needed; what existing information is relevant and available; and what new research or evaluation is required to fill information gaps. Too often, useful existing information is ignored in the rush to collect new data.

Information gathering should be a cooperative effort among all participants.

Regulatory agencies should be prepared to deny requests for information which they judge to be irrelevant to effective resolution of key issues, or outside the terms of the review process. Proponents should be willing to question requests they consider to be unnecessary.

The proponent should provide requested information to the review agencies and the public in time to allow adequate review.

The proponent and government agencies should incorporate into project and regulatory schedules time requirements for information generation and review at each stage of project planning.

8. Public Consultation

Projects have incurred extra costs, delays, confrontations and cancellations because the public have not been effectively consulted during project planning. Consultation aids timely identification and resolution of public concerns. Public consultation programs can allow the proponent to identify problems, and may provide knowledge which outside experts cannot. Local elected officials and citizens (resident public), and public interest groups (non-resident public), play an important role in informing the broader public about project details. If participants are willing to work cooperatively with one another, consensus on key issues will be easier to attain. However, public groups and individual citizens may not have the time or resources to participate fully in environmental planning of projects.

Recommendation

- **The proponent and the regulatory or review agencies should each commit to early and sustained consultation with the public, as part of the project planning and review process. This commitment must be made explicit to all participants.**

Implementation

The proponent bears the major responsibility for incorporating public consultation into project planning. Regulatory agencies are responsible for establishing the means to allow public involvement during project review.

Industry and government must understand a public group's or community's level of knowledge, motivation, constituency, credibility and preferred means for involvement, in order to consult effectively with them.

At an early stage in project design, proponents should consult with the public through information meetings, open houses and advisory committees, all of which allow project planners to identify the public's concerns.

Early public consultation, through information exchange, negotiation and agreements between the proponent and community groups, may lead to resolution of major issues prior to hearings. Hearings should be used mainly to address key issues identified in the scoping exercise and those issues which remain unresolved following negotiations with the community and review agencies.

To be effective, the public should determine priorities for the issues they wish to address, develop strategies to sustain involvement, and participate in a responsible manner in project planning and review.

Public participants need to have available sufficient human resources, whether voluntary or contracted, in order to participate actively in project review. Industry and government might consider making resources and funds available to public groups to enable them to sustain their involvement. In such cases, industry and government should develop appropriate mechanisms for a fair allocation of the available funds and resources.

9. Value Systems of Cultural Groups

The values of distinct cultural groups, such as the aboriginal peoples of a region, are often not adequately considered in environmental planning and review processes.

Recommendation

- **The proponent, regulatory agencies and environmental and social service agencies should take into account the value systems of affected cultural groups in planning and proposed development.**

Implementation

The proponent should employ community relations persons who are familiar with and sensitive to the cultural groups who could be affected by the development.

Regulatory and service agencies should provide a local and visible contact person and office to provide information on the regulatory process and government services for community residents. The office should be staffed with people familiar with and sensitive to local cultural groups.

The social, cultural and economic values of cultural groups affected by a project must be recognized and accounted for in the guidelines and conditions of operation set by regulatory agencies.

10. Community Expectations

Proposals for large-scale development projects may lead communities and local populations to have unrealistic expectations of the social and economic benefits which the project may bring. Such projects also may lead governments to establish unrealistic social goals which the project is expected to meet.

Recommendation

- **When planning large-scale development projects, industry and government need to temper the social and economic expectations of residents so that these remain in perspective.**

Implementation

Proponents should prepare and distribute to local communities information packages which help to place the proposed projects and their economic and social benefits into perspective.

11. Incremental Development

The impacts associated with large-scale development projects are often difficult to predict and manage because of the complexity and size of such projects. Incremental approaches to development warrant investigation. Such approaches reduce the financial risk to the proponent and may reduce environmental and social risks. At the very least, such staged development allows the experience gained from each increment of the project to be applied to the prediction and management of cumulative impacts.

Recommendations

- **The use of incremental approaches to large-scale development should be considered by industry and government.**
- **Regulatory agencies should establish a staged approval process for incremental development which includes the granting of an approval in principle for a series of development projects, and a subsequent focused environmental review of each new project proposal or increment.**

Implementation

Pilot projects and test facilities operated during the project design stage may be effective in identifying and resolving environmental problems prior to construction and operation of large-scale developments.

12. Project Experience and Proven Technology

Proven technologies are not always considered by government reviewers and the public when new projects are being evaluated. They often ignore the considerable experience in predicting ecological impacts or in developing and managing community infrastructure that has been gained from past projects. The failure to use experience and proven solutions leads to excess costs and inefficiency in the review process. All participants must avoid regenerating information when available past experience can be applied.

Recommendation

- **The planning and review of new projects should build on proven technologies which have been successfully applied in the past, and on predictive capabilities and management experience gained from past projects.**

Implementation

Resource development agencies, individual corporations and industry associations must take a more active role in explaining proven and successful technologies to the public.

The use of case histories and hindcasting methods should be applied to the assessment of large-scale development proposals and the development of options for environmental management.

13. Risks to Public Safety and the Environment

The public safety and environmental aspects of risk are seldom explicitly incorporated into the environmental impact assessment documentation for large-scale development. Risk, in this context, is defined as a compound measure of the probability and magnitude of adverse effect. Assessment of such risks is not mandatory in most large-scale development reviews, but many companies undertake risk assessment for internal planning and project justification. Where risk is considered, it is often difficult to establish among the participants a consensus on what constitutes acceptable risk. This difficulty is the result of differing values; differences between perceived risk and real risk, lack of knowledge of the workings of ecological and social systems, and inadequate predictive capability. Even when the results of well-designed and well-executed risk assessments are presented, public perception may be shaped more by imagination and dread than by knowledge and understanding. The level of **acceptable** risk is not a technical issue, but is determined by a political process.

Recommendation

- **Levels of risk to humans and ecosystems should be determined as early in project planning as available information will allow.**

Implementation

Industry, government and the public should cooperate in describing levels of risk and in identifying the differences between voluntary (self-imposed) and involuntary (imposed) risks.

The terminology used to describe risks must be defined at the outset.

The proponent should review with regulatory agencies and the public its knowledge of the types and levels of risk associated with the various facets of the *proposed* development. The proponent may require such information for obtaining environmental impairment liability insurance.

Risk evaluation and management should be considered integral parts of project planning and implementation.

14. Mitigation and Compensation

Mitigation programs and compensation policies are often not considered during the planning process. They are often developed only after problems occur, resulting in avoidable environmental damage or confrontation and conflict.

Recommendation

- **Mitigation programs and compensation policies should be developed early in the planning stage and their costs included in the project cost-benefit analysis.**

Implementation

Government and industry should develop mitigation plans and compensation policies for unmitigable resource loss prior to project approval.

Compensation policies can include non-monetary means. For example, the loss of wildlife habitat in one area may be compensated by the enhancement of habitat in another area.

15. Environmental Management Plan

The design of environmental operating procedures and monitoring programmes is often overlooked during project planning. An environmental management plan, incorporating such procedures and programmes, provides a key link between project planning and project implementation.

Recommendations

- **The proponent should develop and make available to regulatory agencies and the public an Environmental Management Plan during project design and prior to completion of the government approval process. An Environmental Management Plan must outline how environmental criteria and factors will be applied during project construction and operation, what experimental studies will be conducted to identify impacts during construction and operation, and what actions will be taken to modify construction or operating activities to reduce or eliminate identified impacts.**
- **Government approval of a project should be contingent upon the proponent preparing an acceptable Environmental Management Plan.**
- **The proponent must commit to carrying out the terms of the Environmental Management Plan, including surveillance and monitoring of predicted effects.**

D. TOOLS & TECHNIQUES

In addition to changes in environmental planning practices, improvements are needed in the tools and techniques used in the environmental planning of projects. The limitations of these tools and techniques, together with the necessary improvements, are presented briefly below. Tools and techniques will be reviewed and evaluated in more detail in a complementary workshop report planned for publication in 1984.

The tools and techniques discussed at the Workshop and described in this section are not exhaustive and do not cover all aspects of environmental project planning. It should be noted that the environmental planning of projects has increasingly incorporated assessments of project impacts on human populations, settlement patterns, and labour and employment conditions. There is a continuing and growing need for the development and refinement of analytical techniques in these areas.

1. Environmental Impact Assessment

Current methods for assessing environmental impacts have a number of limitations which are often ignored by those preparing assessments (industry, government or consultant) and those reviewing them (government and the public). As a result, more credence is given to assessment results than the science used to generate these results may warrant. These limitations arise from the fact that the capability to predict changes in both ecological and social systems is still quite rudimentary; and that the methods used, together with the natural variability of the systems, may not allow project-induced changes to be adequately distinguished from natural changes.

Recommendations

- **Environmental impact assessment should be founded on well-designed and rigorously executed applied science. Government agencies, through collaboration with industry and the public, must identify acceptable assessment methods. Governments must support research on improved predictive capabilities for assessing impacts.**
- **The use of subjective evaluations should be recognized as an important part of environmental impact assessment. Such value judgements must be explicitly stated and be supported by past experience.**

2. Assessment of Cumulative Impacts

Cumulative impacts may result from the expansion of existing operations, additional project phases, the construction and operation of multiple off-site components, or the development of several projects in a region.

One ecological dimension of the problem of cumulative impacts relates to migratory species or populations, which may be subjected to the effects of large-scale projects in more than one region.

The methods available for assessing cumulative impacts are either inadequate or non-existent for most types of large-scale developments.

Recommendation

- **Research is required to develop new predictive and other techniques for assessing cumulative impacts. One approach is to monitor existing large-scale developments and feed back the monitoring results to assessment of project expansions, additional projects, or multiple project phases.**

3. Risk Evaluation

Risk evaluation is often not addressed as a part of environmental assessment, or is inappropriately applied. Accepted techniques for evaluation of risk exist, but the public perception of risk is poorly understood by most practitioners.

Recommendation

- **Risk evaluation should be conducted in the context of how each participant in project planning and review perceives risk. Improved methods for applying risk evaluation to environmental assessment and public review should be developed by government, industry and the academic community.**

4. Regulatory Management and Information Handling

Large-scale development projects and the regulatory mechanisms applied to them are complex undertakings which require and generate a great deal of information for planning and decision making. Such complex processes require innovative techniques for making them efficient and effective.

Recommendations

- **Government and industry should adopt existing management tools such as the critical path method for scheduling, and should apply innovative tools such as computerized information management systems.**
- **Governments and industries should establish joint environmental information networks capable of linking the various environmental data systems.**

E. PROJECT IMPLEMENTATION AND POST PROJECT AUDIT

1. Surveillance

Environmental planning tends to focus on the project approval process and receives less emphasis during project construction, start-up, operation and decommissioning. Whereas projects generally have sound technical and financial controls in place, they may lack appropriate environmental controls. Large-scale developments, in some instances, have not implemented environmental commitments made during project planning and review. Surveillance, the process of inspection to evaluate the developer's implementation of environmental terms and conditions attached to a project is essential to ensuring sound environmental practice. It is also important in providing a basis for future improvements in environmental performance.

Recommendations

- **The proponent should prepare an environmental surveillance programme as part of the Environmental Management Plan**
- **Regulatory or enforcement agencies should prepare an inspection programme for each large-scale development project.**

Implementation

The proponent should provide supervision of the work to ensure that the Environmental Management Plan is adhered to during project construction.

During project operation, the proponent should, for example, measure the quality and quantity of emissions and effluents or the success of job-training programmes, to determine adherence to in-house performance criteria and operating conditions.

Regulatory agencies should audit compliance with the terms and conditions of approval.

Government agencies should inspect and monitor the operation to enforce government-imposed conditions and ensure that the proponent's commitments to environmental protection have been met.

There is a need for flexibility in applying and enforcing the terms and conditions of approval, to allow proponent and regulator to learn from operating experience and to adapt to changing circumstances.

2. Monitoring

Monitoring is a process designed to confirm or refute predictions made during project planning, and to determine if design and operating changes must be made to improve environmental performance during the life of a project. Monitoring of project activities is required to determine environmental and socioeconomic changes resulting from construction or operation of a large-scale project. The accuracy of environmental impact assessment predictions and the effectiveness of proposed mitigative measures presented during project planning are seldom tested during construction, operation and decommissioning of a project. A lack of follow-up and feedback mechanisms hinders improvements in environmental planning and the application to new projects of previously successful solutions and past operating experience.

Recommendation

- **The proponent and appropriate government agencies should individually or jointly conduct environmental and socio-economic monitoring programmes during the construction, operation and decommissioning of large-scale projects.**

Implementation

Monitoring results should be used by the proponent to make necessary changes to project design and procedures, where identified impacts warrant.

Surveillance and monitoring results generated by industry and government should be placed in the public domain for public scrutiny and for use by researchers and project planners designing new projects.

Feedback mechanisms should be developed to allow the results of monitoring programs to be used to improve environmental planning methods and predictive capabilities.

Regulatory agencies should require proponents to submit the results of follow-up studies (monitoring programs) to allow comparison of actual impacts to predicted impacts.

3. Reclamation

Proponents of large-scale developments in some countries have not accepted responsibility for site reclamation. Large-scale resource extraction, transportation and processing developments should not cause permanent detrimental changes to the land they occupy.

Recommendations

- **The proponent should restore to beneficial or previous use lands disturbed by on-site development, upon project decommissioning and prior to abandonment. If restoration proves impractical, compensation must be provided to the landowner or to the government on behalf of the public.**
- **The proponent should rehabilitate lands following construction and during the operating life of the facility in order to reduce reclamation costs at decommissioning, to test techniques and materials, and for aesthetic reasons.**

Implementation

The proponent should incorporate reclamation costs into preliminary and final feasibility studies and project design.

The proponent should negotiate the terms and responsibilities for on-site and off-site reclamation with the appropriate regulatory agency, prior to the setting of project construction and operating conditions. Reclamation requirements should be specific to avoid imposing an unlimited liability on the proponent.

The proponent should incorporate on-going rehabilitation costs into construction (capital) costs and operating costs. Operations should be carried out in a manner which minimizes the ultimate cost of rehabilitation.

V

CONCLUSION

The foregoing recommendations provide a basis for sound environmental planning of large-scale development projects. While the means of applying these recommendations will vary in accordance with the political and administrative situations of the countries and regions using them, the benefits to be gained from their successful application are universal. It is hoped that the implementation of these recommendations will lead to improved environmental planning of large-scale developments and the fair, efficient review of projects in the context of national, regional and local needs.

The contributors to this volume look forward to the wide distribution and the successful application of these **Recommendations and Actions for Implementation** to the environmental planning of major projects throughout North America and the Asia Pacific Region.

WORKSHOP STEERING COMMITTEE

Co-Chairman

John Wiebe,
Environment Canada,
Vancouver, Canada

Ed Kustan,
Canadian Petroleum Association,
Calgary, Canada

Members

David Marshall,
Federal Environmental
Assessment and Review Office,
Vancouver, Canada

Jon Selter,
B.C. Ministry of Environment,
Victoria, Canada

Forbes Boyd,
Department of
Fisheries and Oceans,
Vancouver, Canada

Henri Rothschild,
Energy, Mines and
Resources Canada,
Ottawa, Canada

John Gilbert,
Commission for the
Environment,
Wellington, New Zealand

Toufiq Siddiqi,
East-West Centre,
Honolulu, U.S.A

Maurice Ruel,
Canada Oil & Gas Lands
Administration,
Ottawa, Canada

Ian Sneddon,
Indian and Northern
Affairs Canada,
Ottawa, Canada

Rod Paterson,
Department of
Fisheries and Oceans,
Ottawa, Canada

Program Committee

Su Hum,
Environment Canada,
Vancouver, Canada

George Greene
Environmental Consultant
Ottawa, Canada

Gary Webster,
Dome Petroleum Limited,
Calgary, Canada

SPONSORS

Environment Canada

British Columbia
Ministry of Environment

Canadian Petroleum
Association

Canada Oil and Gas
Lands Administration

Department of
Fisheries and Oceans

East-West Center

Energy, Mines and
Resources Canada

Federal Environmental
Assessment and
Review Office

Indian and Northern
Affairs Canada

